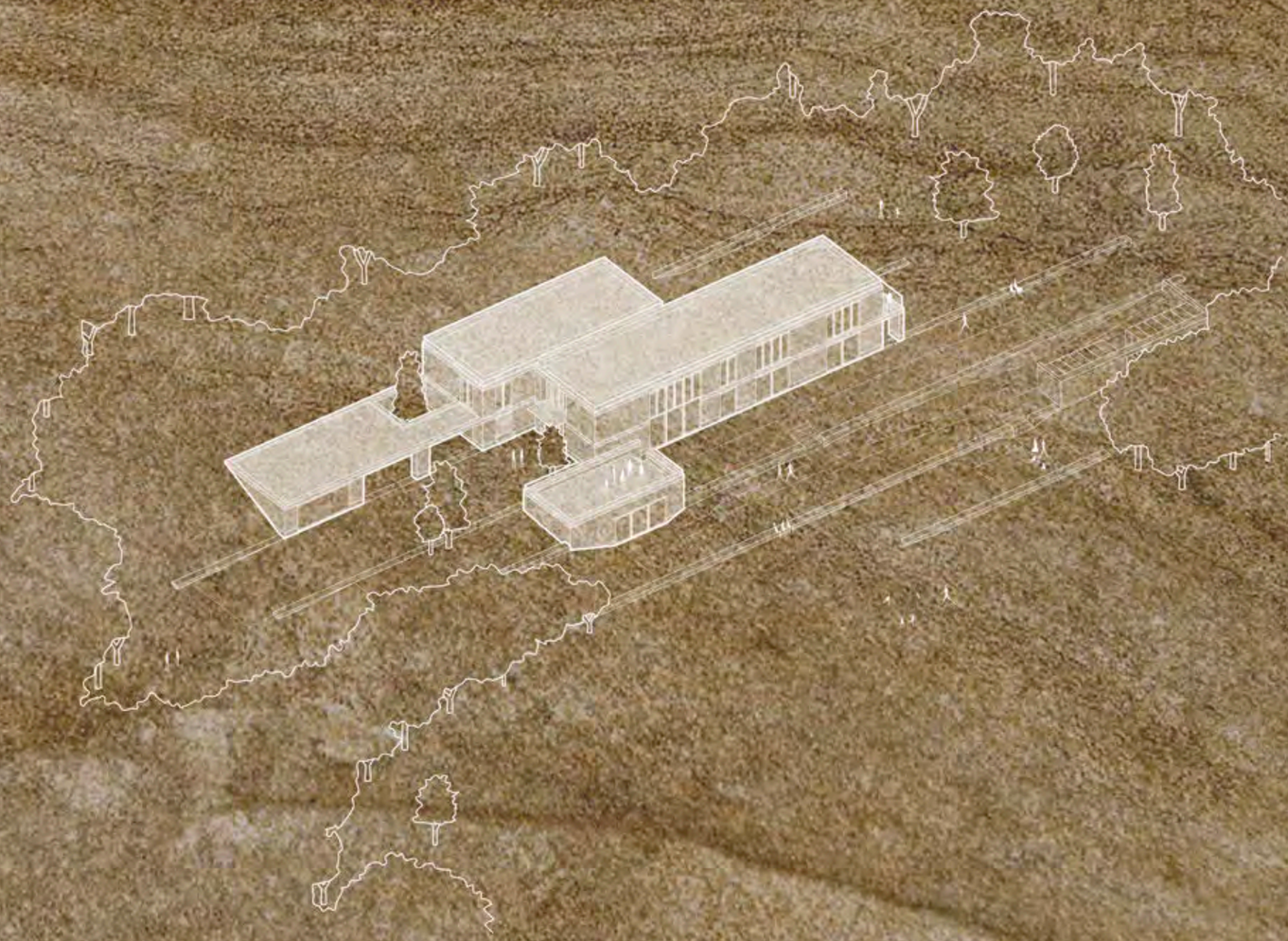
Huntley-Jacobs House

Design & Access Statement

December 2021



BENNETTS
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Revision	\
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Contents

The house and landscape design is curated to create an exemplar building that enhances its surroundings through a strong connection to its landscape and locality. Natural stone quarried only miles from the site is used in rough and smooth finishes across the façades and landscape design, celebrating the material that has been used to construct many local buildings for centuries. The façade design takes inspiration from the timeless rigor, attention to detail and proportion of Georgian architecture to create a building of outstanding design quality.

1.0 Introduction

The arrival sequence is inspired by those curated by the acclaimed landscape architect and gardener Capability Brown, renowned for developing the English landscape garden style. As vehicles approach the new entrance to the site from Sanderson Lane gaps in the trees provide glimpses of the house, before turning onto the tree lined access road, crossing a new bridge and arriving at the entrance forecourt. This moment is framed by landscape datums which project from the ascending ground to form an informal gateway. The courtyard is largely screened from the view by trees, saving this moment for a reveal upon entering the building.

1.0 Introduction

Andrew and Ruth intend to build a new, highly sustainable home of architectural significance, that is sympathetic to the landscape, takes advantage of stunning views to the north and designed and engineered to an exacting standard. The project is located near Heskin, West Lancashire in a 6-acre plot within greenbelt.

The purpose of this report

The Design and Access Statement has been prepared by Bennetts Associates Architects and Exterior Architects in collaboration with the wider design team (see section 1.1) for and on behalf of Ruth and Andrew Huntley-Jacobs ("the applicant"). It's purpose is to explain the design and access proposals for the development at Glendale, Sanderson Lane, Heskin, Lancashire, PR7 5PX which comprises of demolition of existing two residential properties and erection of a replacement dwelling, together with associated landscaping.

This report aims to demonstrate how the design has been developed in response to the unique characteristics of the site and how the new design has evolved through a process of assessment, involvement, and evaluation. The design strategy described in this document has developed through studies of the local environment and character of the site; through ongoing discussions with the client, appointed team of consultants and the pre-planning consultation with West Lancashire Borough Council Planning Authority.

The brief and project vision

The vision for the project has been developed with the client, a combination of highly contextual design, timeless architecture, and a building that can meet the needs of our client, all viewed through the prism of the climate emergency and the desire to create a landmark sustainable building. The following vision statements set out this approach:

Sustainability

A home that seeks to address the challenges of the climate and biodiversity emergency, seeking to target net-zero carbon for both operational and embodied carbon.

Site and Context

An architecture that is connected to its context physically and in the vernacular, responsive to he constraints of the site and symapthetic to the surrounding landscape - whilst celebrating the breathtaking views to the north as a centerpiece of daily life.

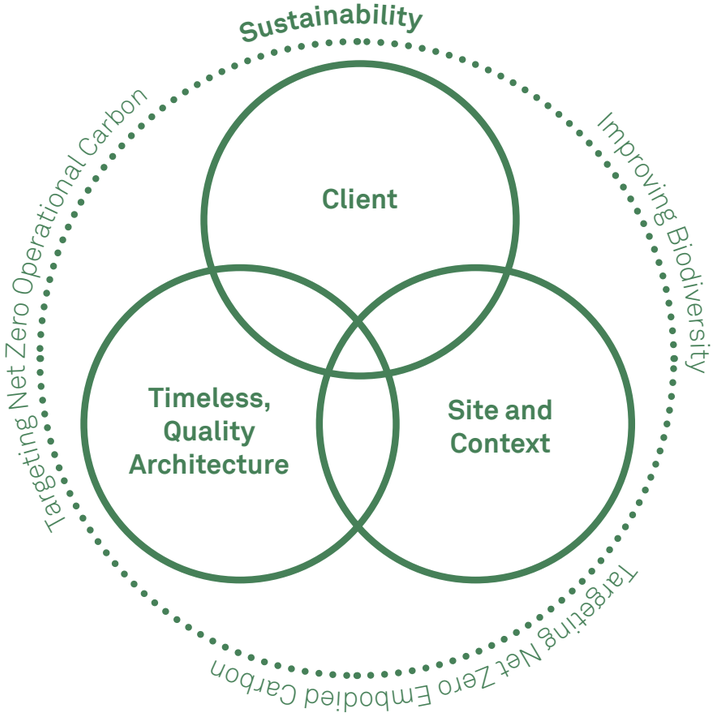
Timeless, Quality Architecture

An English country house for the modern age that sits well in its rural setting and is inspired by Georgian design principles, material use and proportion, with details engineered to an exacting standard. -

Client

An environment that is tailored to the users lifestyle providing a space to relax, that is comfortable, functional and an effortless transition between inside and out for living and entertaining.

We have responded to this brief with a rigorous deign process the result of which is set out in section 3.0 explaining the design approach.



1.1 Team

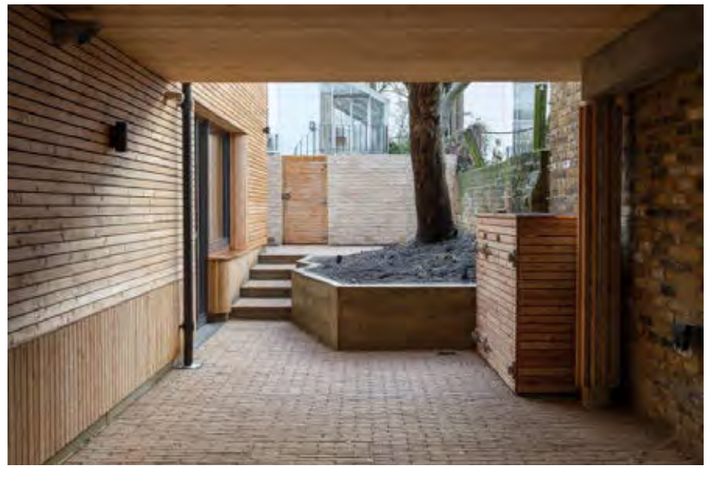
Our client has put together an award winning, high caliber design team to meet their ambitions for a building of both of exceptional design quality, and able to address the challenges of the climate and biodiversity emergency. All of the team are based in the region and have substantial experience in their fields.

Bennetts Associates - Architect

Bennetts Associates are a multi-awarding winning architecture practice with a focus on sustainable and timeless design. They are the first architect globally with approved, Science Based Targets, and the first to commit to the UN's Climate Neutral Now campaign. Their last house in the region, Mill Brow (pictured) was successfully delivered in a highly sensitive site, and was shortlisted for RIBA House of the Year 2016.

Exterior Architecture - Landscape Architect

Exterior Architecture are one of the country's leading landscape architects, and their recent works have included the Manchester Garden at Chelsea Flower Show (pictured, top). Their extensive planting knowledge has been internationally recognised, with commissions including the Savill Garden, Britain's finest ornamental green space containing the largest collection of New Zealand native plants outside of New Zealand (pictured, bottom).



Max Fordham - Services Engineer and Passivhaus Consultant

Max Fordham are pioneers in sustainable, low energy and low carbon building design with the desire to tackle the climate and biodiversity emergency central to their partnership. Their 'Max Fordham House' (pictured) was engineered to not require any heating and won numerous awards including the prestigious RIBA Sustainability Award 2019.

2.0 Site

2.1 Site Location and Description

The site is located in the green belt near the village of Heskin in West Lancashire, on the northern edge of Harrock Hill. The steeply rising, tree covered hill conceals the site from the south, whilst the perimeter of woodland around the site limits the visibility of the site to the north. Historically many of the local buildings are characterised by local Lancashire stone or red bick.

Views looking southwards from the lower area to the north demonstrate the limited visibility of the site due to the surrounding woodland around the site.

Many of the local buildings are characterised by local red brick, with detailling and texture added through brick bonds and accents in local Lancashire stone.

The mass of the wooded hill conceals the profile of any buildings on site, and even in winter when many of the trees have lost their leaves there is very limited visibility of the site.

Many buildings of significance in the local area are characterised by local Lancashire stone, with a mixture of rougher cut stone and detailling in cut ashlar stone around window openings and to express the top of the facades.

In order to understand the constraints and opportunities of the site, reduce the risks of finding unwanted and potentially costly surprises later in the process, and allow the development of a sensitive, contextual design the following surveys have been carried out:

- Site survey - Provides accurate measure of all site features and particularly helpful in understanding how the site levels work. This also provides a measure of road typography to inform the proposal of a new access route into the site.
- Existing building volume survey - Establishes an accurate measure of the volume of the existing buildings on the site which dictate the volume allowed for the new development
- Arboriculture survey - Establishes position of tres canopy root base an condition to guide design development including placement of landscape and building.
- Ground penetrating radar survey – establishes what services are below the ground so the new build can take into consideration.
- Preliminary risk assessment of ground conditions – which shows moderate risk related to ground gas and potential contaminates with fill materials. Potential sulphate risk to concrete.
- Health and Safety Risk assessment - review of the site conditions with a specialist to inform a regularly updated health and safety risk assessment which will be updated throughout the design and construction process.

Site constraints and opportunities

The following diagram highlights the key constraints and opportunities of the site that have been key in developing the design response. These include: the existing buildings on the site, including the main house which the client intends to live in for the duration of the build; the existing site entrance; the steep drop in levels towards the North, the site orientation and sun path; and the surrounding tree canopy.

2.2 Site Images

The exisiting house, bungalow, and outbuildings including a greenhouse are all situated to the southern end of the site. The sourrounding landscaping is dominated by the access road and a large turning circle, as well as a large artificial pond.

The hill rises steeply to the south of the buildings, with a thick canopy of woodland which conceals the buildings from the south as well as disguising their profile from the north.

The existing house sits on a substantial brick plinth containing a basement in order to mediate the steep level changes across the site whilst the bungalow sits on plateau created in the falling site. Neither are of architectural significance and both have degraded poorly over time.

The house, bungalow and outbuildings spread out across the whole of the southern end of the site, and bare no relation to one another, lacking cohesiveness.

These woods are one of our clients favourite parts of the site and since purchasing the site they have invested in responsibly managing the woodland, including the planting of native species including a hawthorn headge around the perimeter of the site.

The south eastern part of the site contains a large greenhouse and a network of paths which seek to mediate the significant level changes. Our client is keen to replace this with a more contextual greenhouse and a far more considered landscape design.

The site is largely disguised from the surrounding area by a perimeter of woodland, but its position on the northern side of Harrock Hill provides stunning views across the landscape.

2.3 The Existing House

The site contains two main buildings, in addition to a series of outbuildings incuding a large greenhouse and stables.

The main house was built around between 1929 and 1940. The house was then extended with a 2 storey extension to the side by the previous owner in 1999. The house appears as a three storey dwelling with a pitched roof and dormer windows, sitting on top of a two storey brick façade, part of which is made up by a large basement that forms a plinth on which the house sits.

In 2000 an additional building, a Bungalow, was built on the site by the previous owner without planning permission as should have been required. In 2021 our client successfully applied for a certificate of lawfulness for this building to resolve this issue. Following analysis at the start of the project it was concluded the existing buildings can't be retained for the following reasons:

Client Requirements

Whilst our client is currently living in the buildings on site, they are currently unable to provide a satisfactory standard of accommodation that can support their way of life. The split in accommodation between the two buildings is highly impractical for our client, who want to consolidate their living spaces into a single building.

The way in which the house has been extended has created spaces of poor quality which whilst imposing on the landscape fail to provide a good connection with the spaces around it, as well as failing to capitalise on the spectacular views to the North. The master bedroom, located in the extended loft, occupies a substantial volume within the property, but much of this is unusable due to being located under the eaves. Similarly, the lower lounge space is located within the plinth of the building, and doesn't have any windows - creating a dark, dank space that offers little to our client.

Thermal Performance

Whilst both of these buildings are currently habitable, they provide very poor thermal insulation and require significant levels of heating throughout the winter, currently fueled by oil and a log burner. Our client wishes to build an exemplary low energy building, of outstanding architectural value, and following early studies on the potential to extend or redevelop these existing buildings it has been concluded that the most appropriate approach is to demolition in favour of a highly sustainable new single building. This will allow for a more efficient building form with a significantly improved building envelope - including highly insulated walls and triple glazed windows. This will allow the project to target the Passivhaus Low Energy Building Standard - which would be impossible to achieve working with the existing buildings.

1. The split in accommodation between the two buildings is highly impractical for our client, and means the buildings of poor quality dominate the top section of the site.

2. The two buildings spread out across the top of the site, lacking any form of cohesiveness. Neither are of any architectural merit.

3. The lower lounge sits within the plinth and doesn't have any windows to provide natural light or capitalise on the beautiful views.

4. The interior of the existing house is of no architectural merit, and the poor roof layout creates lots of wasted space.

Aesthetics

Both existing buildings are of poor architectural quality, and are not attractive or of architectural significance, either on their own or as a composition. They lack cohesiveness having been developed in a piecemeal way, and sit awkwardly on the site.

The main house sits on an imposing brick plinth with a series of brick piers supporting a balustrade. This has weathered poorly and does nothing to enhance the appearance of the house. The house itself has been extended with both a loft and side extension, which have also done nothing to enhance the appearance of the house. The bungalow was developed without a planning application by the previous owner, and its aesthetics or position on site were therefore not developed through any engagement with the planning authority. Our client has sought to rectify this situation by successfully obtaining a certificate of lawfulness, but the building remains lacking in architectural character or merit.

What is required is a more unique approach, one which respects and enhances the landscape and creates an impressive, sensitive building of outstanding architectural merit.

Build Programme

Our client currently lives on site and will need to do so for the duration of the build. As well as allowing them to remain in their current home until their new home is complete, this will also allow them to closely monitor works and help inform decisions as the build develops. The only practical solution to facilitate them living on site for the duration of the build is to retain the existing main house for the duration of the build, then demolish it once they have moved into the new house.

Conclusion

When viewed together these constraints of the existing building demonstrate the need for a new building that is able to meet our clients spatial requirements whilst providing an exemplar sustainable building, both in terms of operational and embodied carbon. A new building will also offer the opportunity to design a building that is far more sympathetic to the site, surrounding landscape and local buildings. The principle of a replacement dwelling was discussed at the first pre-app meeting, and agreement was gained for this approach.

A number of garden structures including a greenhouse and a large shed also sit within the curtilage of the site. These have not required planning permission and will be replaced as part of the proposed development by a shed and greenhouse that is more sympathetic to the site.

1. The plinth imposes significantly on the landscape and has weathered poorly, detracting from the surroundings.

2. The bungalow is of poor architectural quality and badly insulated, offering little to our client.

3. The existing house has a poor relationship with the woods to the west and detracts from the beautiful surroundings.

4. The existing house has a poor relationship with the woods to the south, which is one of our clients favourite part of the site.

2.4 Site History

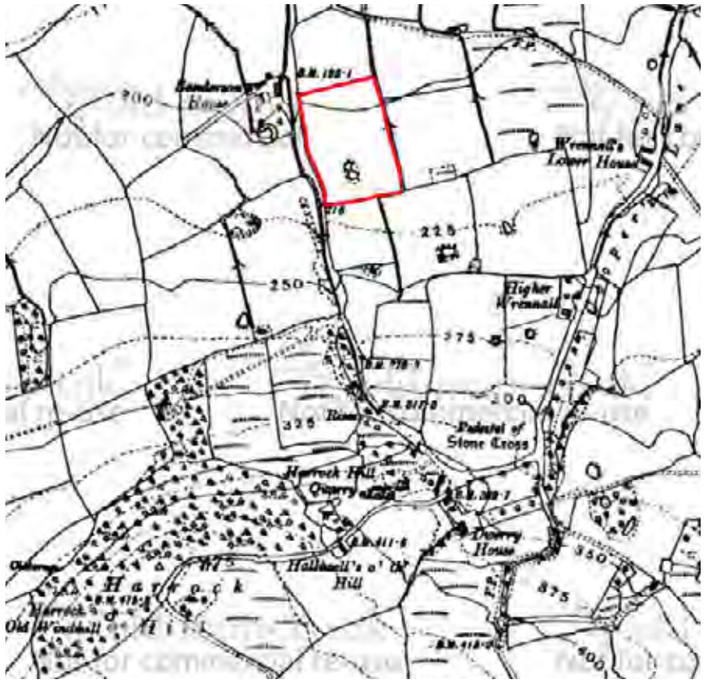
Historic ordinance survey maps show the former coal workings on the site in 1929, prior to the house being built. The 1955 map shows the original house having been built in the intervening period.

The rough chronology of buildings on the site is as follows:

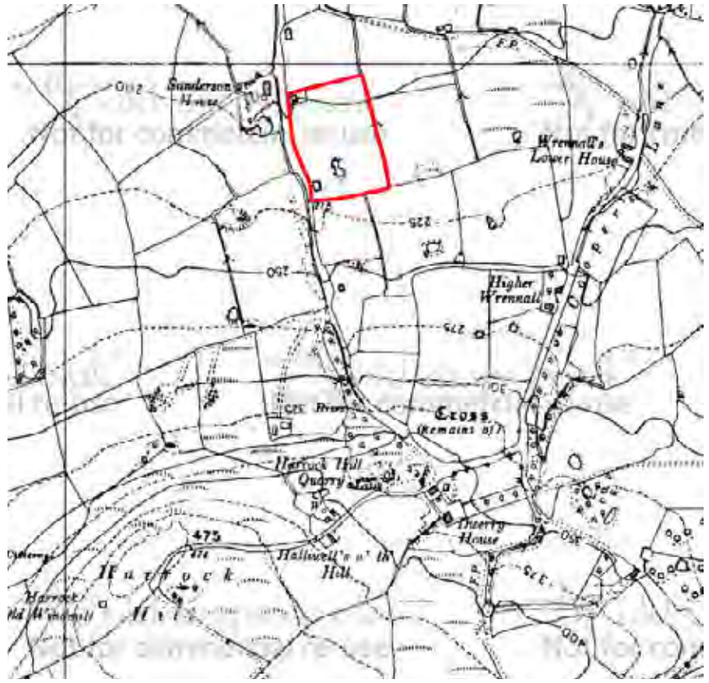
- Estimated between 1929 and 1940 - Original house built

- 1999 - 2 storey side extension built

- 2000 - Bungalow built



1929



1955

2.5 Site Access

The site is currently accessed from Sanderson Lane, which runs along the eastern side of the site. There are a number of issues with this existing access:

- The existing access is as far from the existing (and proposed) buildings as possible, meaning the site is dominated by a long access road which bisects the site and dominates the garden.
- This distance creates issues for bin collections and deliveries, which often serve the site entrance rather than the house.
- The existing access into the site requires traversing over a portion of land owned by the neighbouring property. Whilst the current neighbour is amenable to this our client is keen to find a solution that gives them independent access should future neighbours not permit this route.

Our client is therefore keen to change the access route into the site to one closer to the new dwelling to the south of the site, that is able to address the issues highlighted.

The site is currently cut in half by the access road, which dominates the centre of the site.

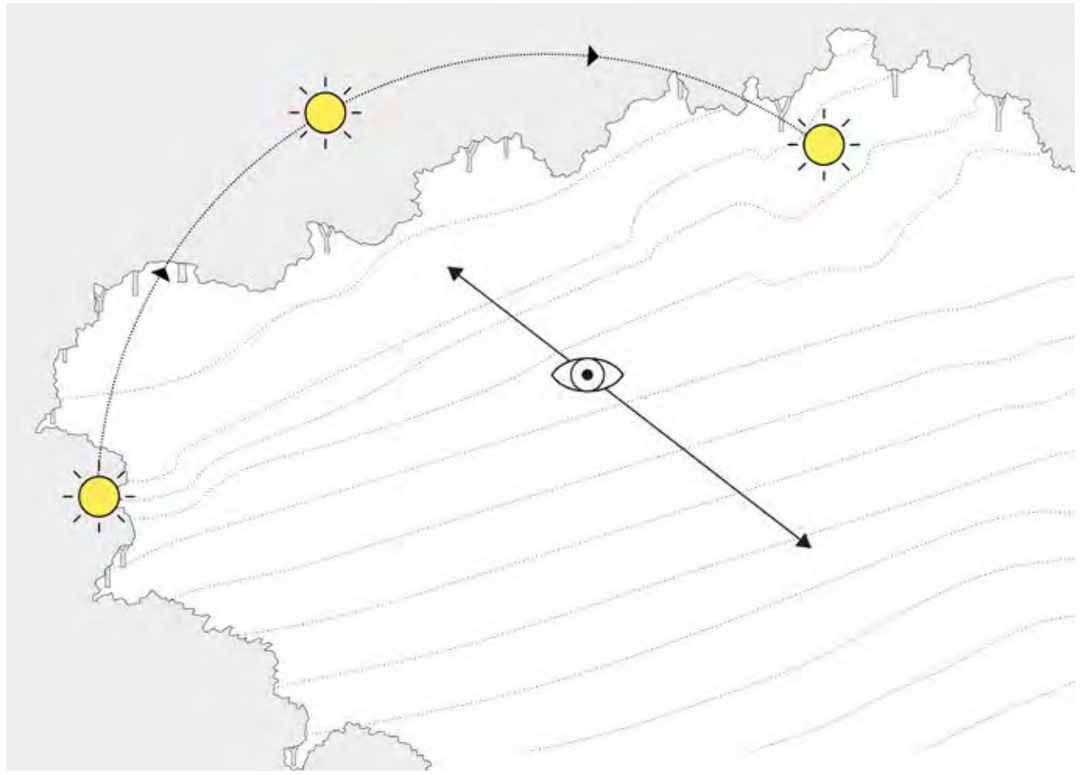
The existing turning into the site from Sanderson Lane, the entrance section of which is owned by the neighbouring property.

The facades will be a celebration of the natural beauty of local Lancashire stone that has characterised buildings in the area for centuries. Sourced from within 10 miles of the site, this is also key to reducing the embodied carbon of the project - critical in addressing the climate emergency.

3.0 Building Design Proposals

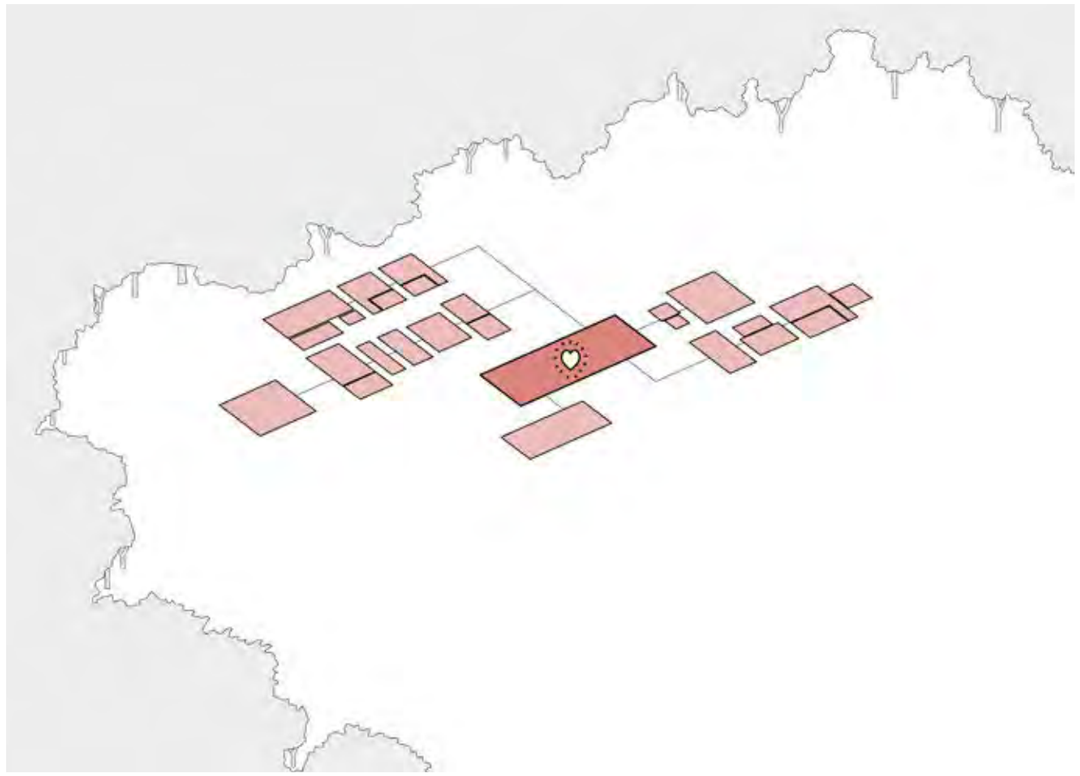
3.1 Approach

The design has been developed in response to client vision brief set out in the introduction, and requirements, site conditions, and planning requirements in addition to our experience and knowledge from the wider design team. These factors have been central to the development of a coherent, contextual design response, the key concepts of which are explained by the following 10 diagrams:



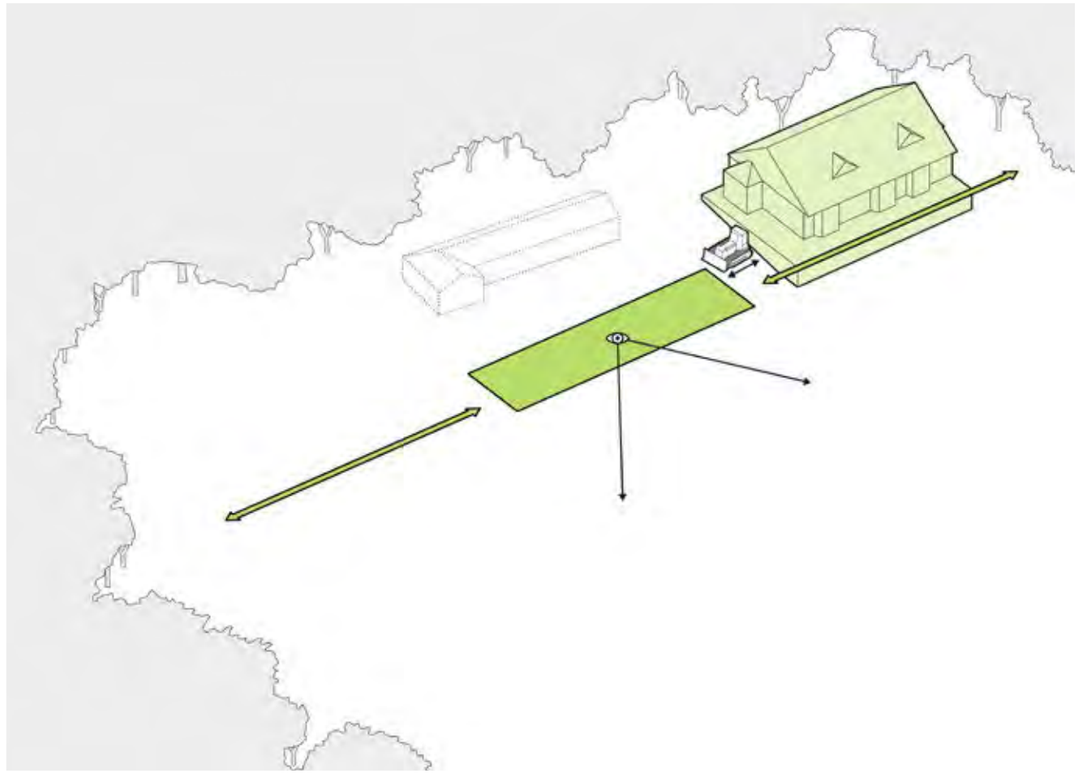
1. The site

The scheme should work with site levels, connect with the woods to the south, maximise daylight entering the house in this shaded location, and work with the amazing views to the north.



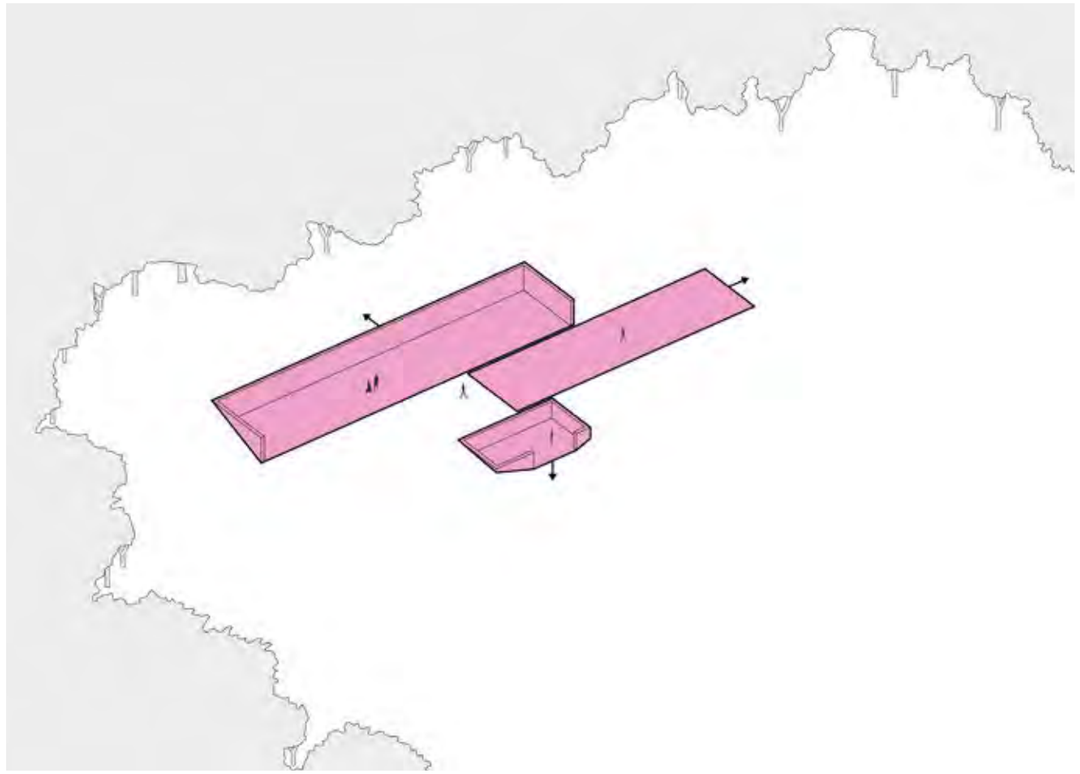
2. Spatial brief

The spatial brief roughly breaks down around three use groups, the 'Heart House', containing all of the primary day-to-day living functions, an 'Entertaining' space, slightly separated from the rest of the house and 'Ancillary' functions, including plant rooms, utility spaces and guest accommodation. All are linked by a central heart space within the 'Heart House'.



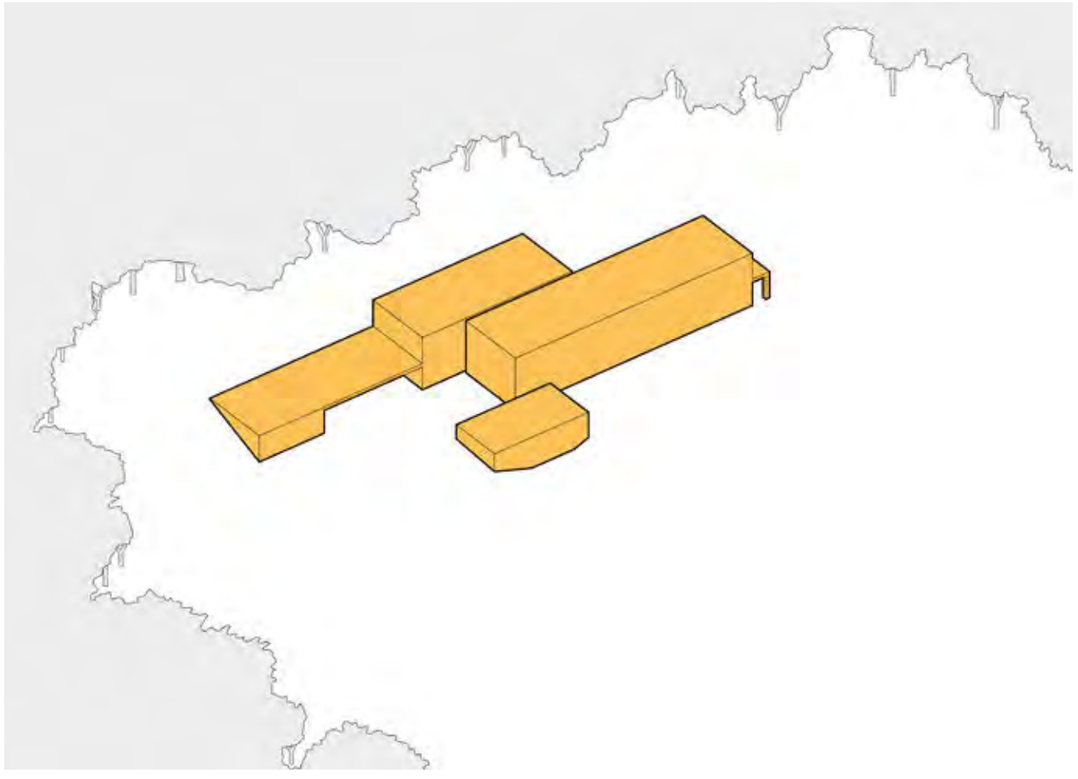
3. Positioning

The building is positioned as close as possible to the existing house, to allow the client to live on site for the duration of the build. The Heart House is then centrally positioned in the east-west direction to capitalise on views, and vertically to minimise its visibility from the surrounding area.



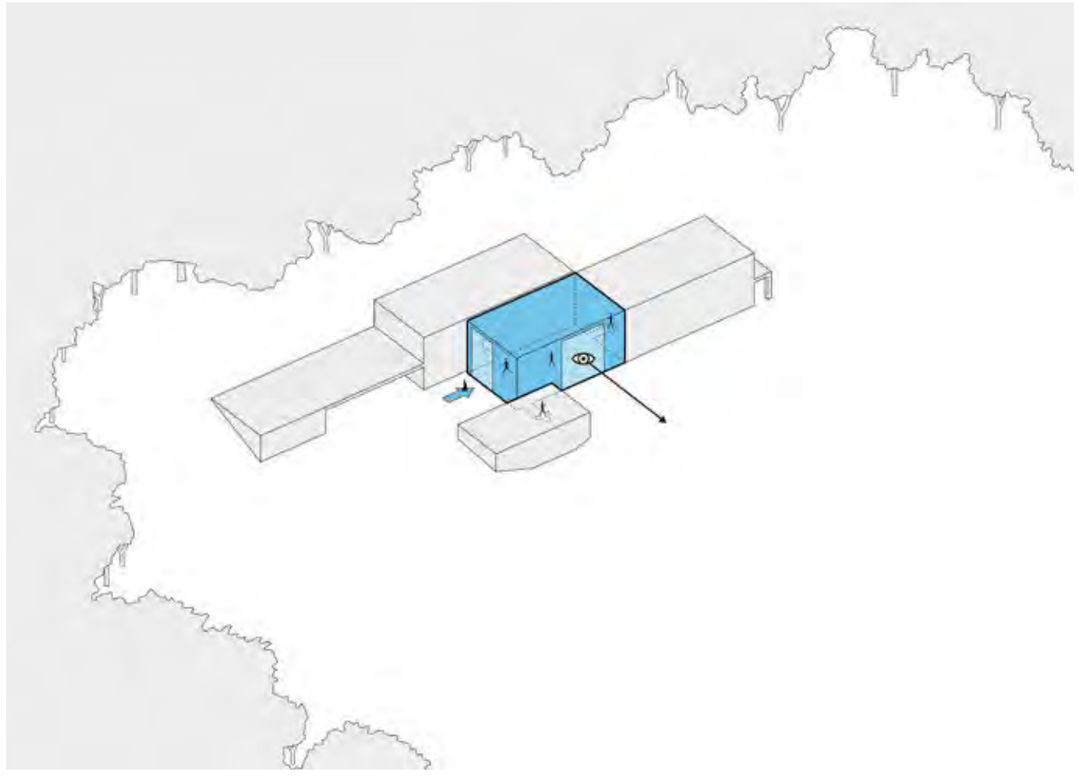
4. Response to levels

Building footprints that respond to each use group are set out in response to the landscape. The Heart House, as the central element containing the primary living accommodation is positioned on the contour line to maximise the ability for spaces to open out to the surrounding landscape. The Entertaining and South Blocks are then sunk into the landscape on either side to reduce their scale and facilitate access to the level changes in the surrounding landscape.



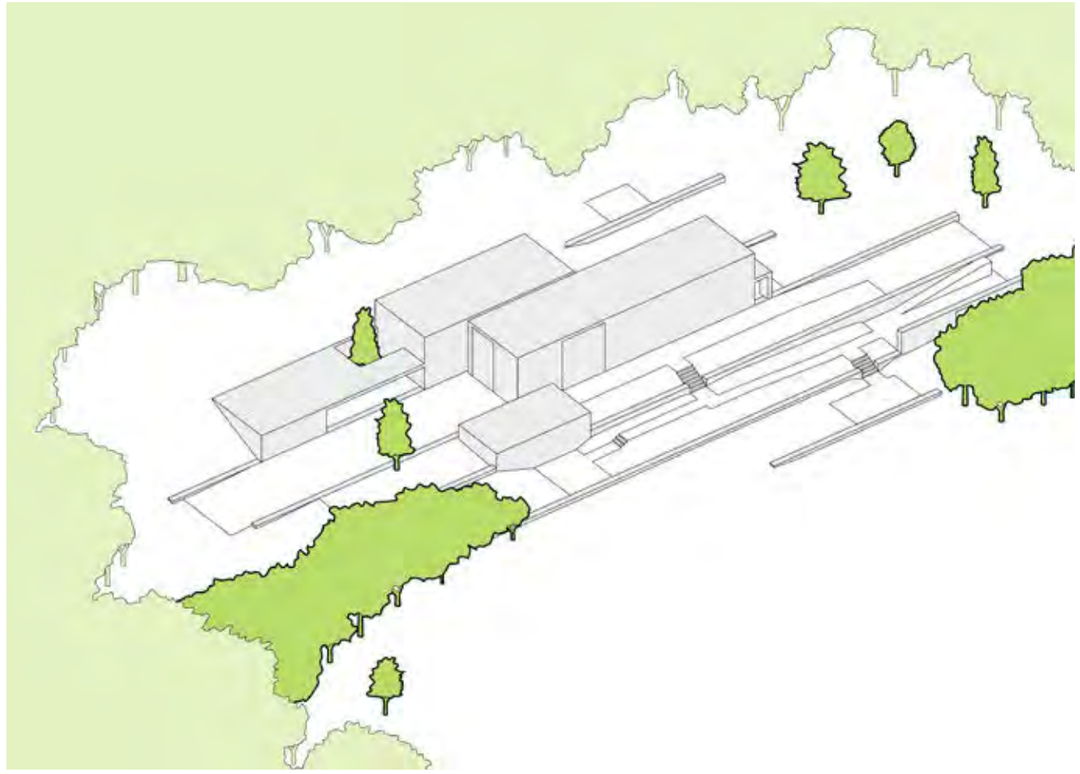
5. Massing

The building mass is broken down by articulating the building as a series of sliding blocks, pushing and pulling along the lines of the contours. These have been arranged to minimise the visual mass, reduce the surface area to improve the building performance, and capitilise on views and light.



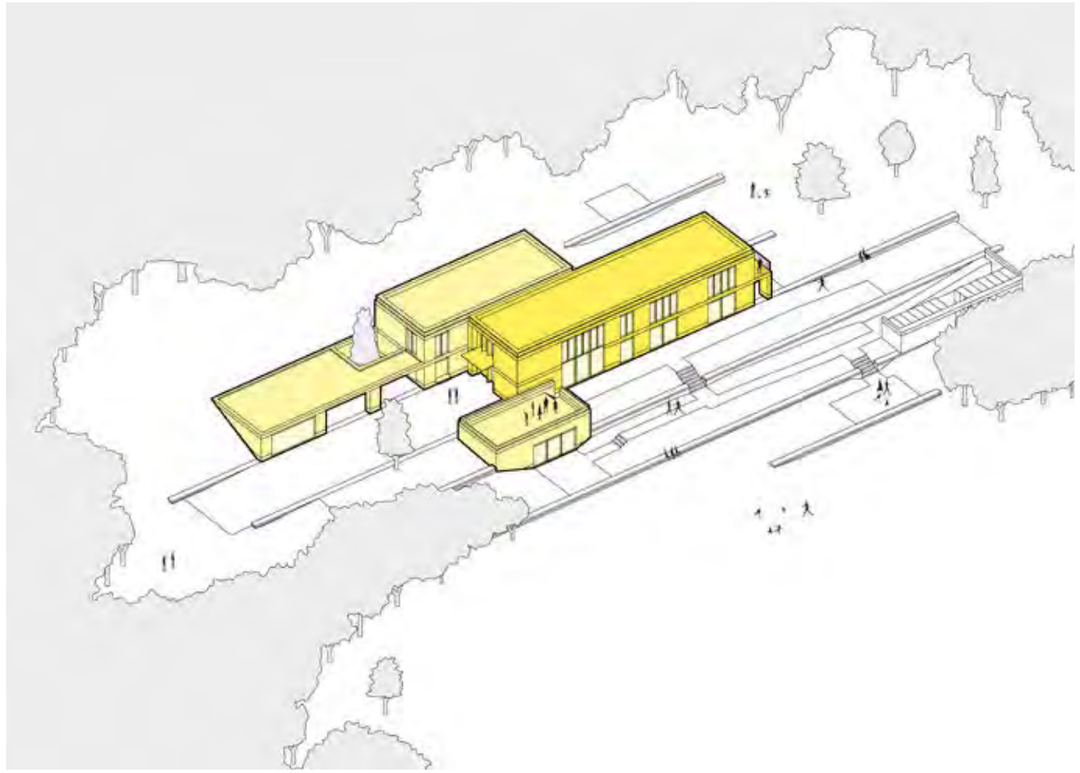
6. Hall

The three blocks are connected by a central living area within the Heart House, a space commanding stunning views to the North. Each space has been carefully positioned throughout the building to capitalise on the unique aspects and relationships with the landscape on each side of the house.



7. Planting and landscape

The tree canopy to the east and west sides of the site is brought forward to articulate the houses' position, with planting curated to help soften the house into the landscape and increase biodiversity across the site. Landscape datums are extended from the house, emphasising the 'sliding blocks' concept and providing a structure for lower level planting.



8. Materiality and façade articulation

The sliding blocks concept is emphasised by the material strategy which plays with the contrast of different applications of local stone. The Heart House is articulated with larger ashlar blocks whilst the Entertaining and South Blocks use the smaller rubble stone, emphasising the Heart House. The façades will reference timeless aspects of Georgian architecture including a rigorous attention to proportion through the golden ration, the play of light and shadow through depth, and a common design language to unite the different blocks.

3.2 Pre-app Feedback

We have been keen to engage with West Lancashire Planning Authority throughout the design process to allow feedback to influence the design development. As such we have held 2 pre-application meetings where current thinking has been shown and discussed, with feedback logged. The following images and diagrams help illustrate how the design development has responded to feedback through the pre-application meetings:

Pre-app 1 - April 2021

Key aspects of scheme shown:

- Principle of new build replacement dwelling.
- Principle of new building upper volume limit of The proposed scheme will have a maximum volume of 2765m3 based on volume of existing house + 20% + permitted development rights of existing buildings.
- Principle of highly sustainable building, seeking to substantially increase biodiversity and targeting net zero-carbon both embodied and in operation.
- Three, two storey blocks arranged to surround a double height glazed hall space.
- Proposal for building to be predominantly clad in local stone.
- Proposed additional access route into site from the southern end of Sanderson Lane as current entrance requires access over neighbours land.

Key feedback from planning authority:

- Principle of replacement house was accepted.
- The proposed volume should be made clear to allow an assessment to be made.
- Width of the building impacts the openness of the Green Belt. Further information to be submitted to demonstrate the scale of the design is appropriate for the site.
- Some movement of footprint not objected to but there are concerns regarding spread of development to the east.
- The new access is accepted subject to detailed technical work.
- The curtilage of the replacement dwelling should be no larger than that established for the dwelling it replaces.

Pre-app 2 - August 2021

Key changes and design development made since pre-app 1:

- Building mass changed to be articulated as a series of three sliding blocks, with the hall now incorporated into the central block.
- The most northern block is reduced in height from double to single storey to reduce the visual mass of the building.
- Facade principles informing the creation of a contemporary reinterpretation of a Georgian country house.
- Facade material concepts showing the mass broken up through the use of local stone in both ashlar and rough cut / rubble finishes.
- Proposal for underground bowling alley.
- Updated net-zero carbon approach.

Key feedback from planning authority:

- This is likely to be the first building targetting net-zero carbon the local authority has dealt with, which was appriciated as a really positive aspiration for the project.
- General positive appreciation of the design development, philosophy and changes made following the first pre-app.
- Confirmation that the below ground volume will need to be included in the volume calculations, although a case could be made that any underground areas don't impact on the openness of the greenbelt.
- Confirmation that the car port should be excluded from the volume as it is not fully enclosed.
- Confirmation landscape information should be submitted as part of the planning application as this has a positive impact on the design.

Submitted Scheme

Key changes and design development made since pre-app 2:

- Building shifted westwards, to as close to the existing house as possible whilst providing a safe construction distance between this and the proposal.
- The South Block is slid to the west, behind the Heart House, to minimise the width of two storey building to reduce the visual scale of the house from the north and create a more thermally efficiant building.
- Northernmost block, the entertainment block, sunk down 500mm to reduce its visual impact.
- Underground bowling alley removed from scheme.
- Tree canopy extended to west and east to articulate the house as sunk back into the canopy.
- Thorough analysis of volume position including the impact of targeting NZC on wall thickness submitted as part of this Design and Access Statement as requested (section 3.4).
- Further development of NZC strategy, including preparation of NZC Statement submitted as part of this application as requested.
- Further development of the facade design and details to adhear to Georgian architectural principles of rigour and proportion.
- Further development of landscape design, submitted as part of this application as requested (section 5.0).

Minimising Visual Impact

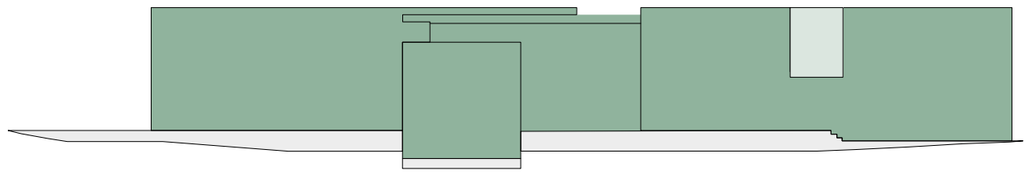
As highlighted in this report, the rising Harrock Hill to the south and its thick tree canopy mean that the only elevation with visibility from the surrounding area is the north elevation.

The elevations to the right are representative of the schemes shown at both pre-application meetings, the existing buildings on the site and the proposal submitted as part of this application.

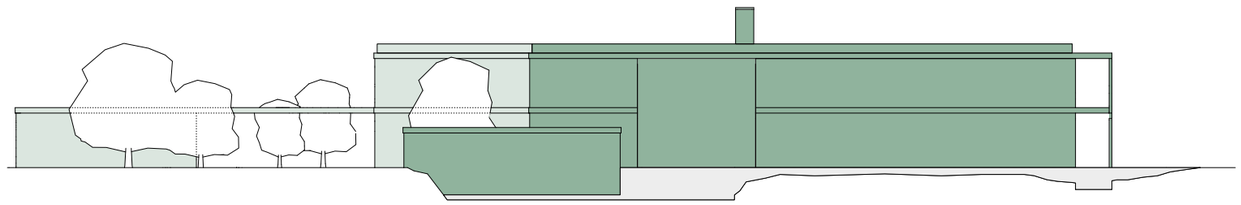
These demonstrate how the proposal has developed in response to feedback over the pre-application meetings, each time reducing the visual width of the primary 2 storey facade, by rearranging the blocks to slide further behind each other.

Existing House and Bungalow

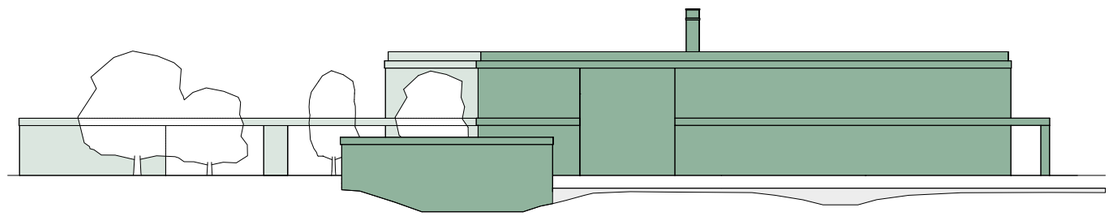
Proposal at Pre-app 1



Proposal at Pre-app 2



Submitted Proposal



3.3 Scale and Position

The building mass has been scaled and positioned to minimise its visual impact, whilst allowing our client to remain living in their existing house for the duration of the build. This has been verified by an independent assessment which has concluded where any change is visible it is predicted to be minor and either beneficial or neutral.

The determining factors for the building scale and position are as follows:

- The scale of the building is broken into three distinct blocks, positioned behind each other to reduce their visual impact.
- Each block clad in different textures of local stone in order to further break down their scale and reduce their visual impact.
- The South Block is sunk into the hill to the south, reducing its visual impact further and allowing the house to read as only a single storey building when viewed from the south.
- The Entertaining Block to the north is sunk by half a level to respond to the descending contours to further reduce the visual impact.
- The building is carefully positioned on the site, both laterally and in terms of levels to minimise its visibility from the surrounding area.
- The building is positioned on the site of the existing bungalow, and as close to the existing house as possible to allow a safe and practical construction zone around the new house whilst allowing our client to remain living in their existing main house during the construction works.

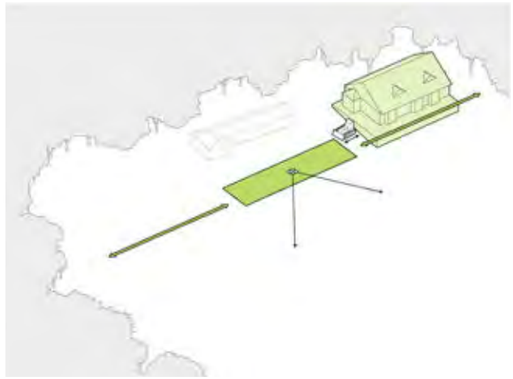
The efforts to reduce the visual impact of the proposal through careful manipulation of scale and position are evidenced by the LVIA Assessment carried out by Exterior Architecture. This tests the visual impact of the proposal against that of the existing buildings from 15 viewpoints around the surrounding area. The full LVIA Report is included within the planning submission, with a summary provided below with extracts from 3 key viewpoints on the following pages. The summary below does not take into account the significant planting around the site that will further reduce the visual impact of the proposal, although the LVIA report and following pages include a commentary on how planting will impact the visibility of the proposal over the next 15 years.

Of the 15 identified viewpoints, the assessment finds that the development would not be visible from four viewpoints (3, 4, 9 and 10).

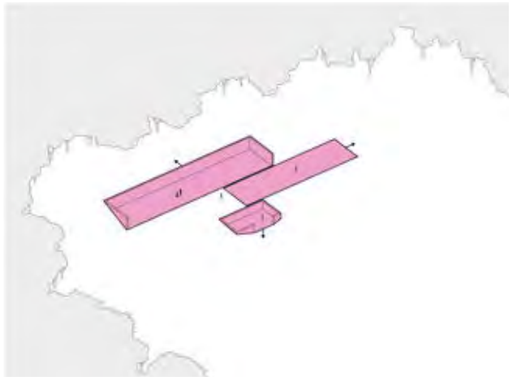
From each of the remaining viewpoints, the magnitude of visual change is predicated to be minor and either beneficial or neutral. No adverse visual effects are predicted as a result of the proposed development.

Where a minor beneficial magnitude of change is predicted (viewpoints 1, 2, 5, 6, 8, and 11) this has resulted in a moderate-minor visual effect for high sensitivity receptors which comprise residents and footpath users and a minor visual effect for less sensitive receptors. From these viewpoint locations the demolition of the existing buildings on site and construction of the proposed dwelling will result in less built form being visible.

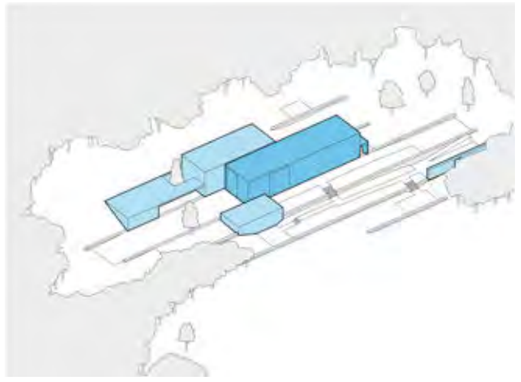
Where a minor neutral magnitude of change is anticipated (viewpoints 7, 12, 13, 14 and 15) this is due to the proposed built form being likely to be visible to a similar extent to the existing built form on site. The development forms a small part of the background of the view. From these viewpoint locations a moderate-minor neutral effect is predicted for high sensitivity receptors and a minor neutral effect for less sensitive receptors.



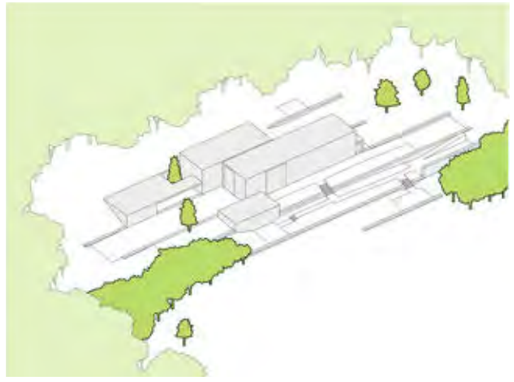
The building is positioned to minimise its visual impact - on the site of the existing bungalow, and as close to the existing house as possible whilst allowing a safe construction distance.



The building is sunk into the contours to reduce its visual mass.



The masses are articulated as 3 sliding blocks, slid behind each other to further reduce their visibility, especially from the north.



Whilst not included in the LVIA summary, tree planting and subsequent growth will further reduce the visual impact of the proposal.

Photo from Sanderson Lane showing the existing buildings on site.

Photo from the same position on Sanderson Lane showing the proposed development - which is not visible from this position.

Viewpoint 5 – Sanderson House

This viewpoint lies 375m to the north of the site on Sanderson Lane at the entrance to Sanderson House Farmhouse. It is representative of residential receptors in the properties here as well as pedestrians and road users. This view is also representative of the group of three grade II listed buildings at Sanderson House which as well as the farmhouse include a barn and pair of gate piers. This view looks due south up Harrock Hill. In the right-hand foreground, the converted grade II listed barn at Sanderson House Farmhouse is partially visible. The centre of the view looks along the property boundary and in the left of the view Sanderson Lane is visible, bound on both sides by trees. A partial view of the pitched roof of the main house on site is afforded between hedgerow trees, and beyond that the tree covered slope of Harrock Hill forms the background of the view.

Predicted View (at completion): It is anticipated that the demolition of the existing house will mean that there will not be a be a view of built form on the site from this viewpoint. Existing vegetation is predicted to screen views of the proposed built form.

Predicted View (year 15 post construction): Proposed tree planting will have matured, further softening the site and which is predicted to appear indistinguishable from the adjacent woodland.

Magnitude of Visual Change: A minor beneficial magnitude of change is anticipated from this viewpoint location as the development will result in a perceived reduction in built form.

Anticipated visual effect: A moderate-minor beneficial visual effect is predicted for residents and a minor beneficial visual effect for pedestrians and road users from viewpoint location.

Photo location plan.

Photo from Bentley Lane showing the existing buildings on site.

Photo from the same position on Bentley Lane showing the proposed development - which has approximately the same visibility as the existing.

Viewpoint 7 – Bentley Lane, Andertons Mill

The viewpoint is located approximately 655m to the north of the site and is taken standing on Bentley Lane, to the west of the junction with Sanderson Lane. This view is representative of Residential receptors in the properties along Bentley Lane and visitors to the equestrian centre as well as pedestrians and road users. The view looks south up Harrock Hill towards the site. In the foreground is the hedge and timber fence that form the boundary of the show jumping arena at the equestrian centre. A pole top light to the arena is the tallest element within the view. In the right hand foreground a property on Bentley road is almost completely concealed by vegetation with a large tree terminating the view after a length of hedging. There are restricted views of both house and bungalow on site in the middle-distance, set higher than the viewpoint, above open fields and partially concealed by mature hedgerow trees. Beyond the site, the tree covered Harrock Hill forms the background of the view.

Predicted View (at completion): The existing buildings will no longer be visible as a result of demolition. It is anticipated that they'll be a partial view of the proposed building in a similar position to the existing bungalow. This is anticipated to be the only element visible on the site.

Predicted View (year 15 post construction): It is anticipated that tree planting will further soften views of the development.

Magnitude of Visual Change: A minor neutral magnitude of visual change is anticipated as there will be a small change to the components in the background of the view.

Anticipated visual effect: A moderate-minor neutral visual effect is anticipated for residents, and a minor neutral effect for equestrian centre users, pedestrians and road users.

Photo location plan.

Photo from public foot path to the north of the site showing the existing buildings on site.

Photo from the same position on the public footpath showing the proposed development - which slightly less visible than the existing.

Viewpoint 11 – Salt Pit Farm

This view is located on footpath 19-9-FP-58 close to Salt Pit Farm, approximately 1,350m to the north of the site. It is representative of residential receptors in the cluster of buildings off Salt Pit Lane at Salt Pit Farm as well as walkers on the footpath. This view looks due south across an open field. A dense line of hedgerow trees forms the far boundary to the field. The upper part of Harrock Hill is visible in the background with the pitched roof of the main house on the site visible and distinct as the only built element within the view.

Predicted View (at completion): There will no longer be a view of the existing property on site following its demolition. A partial view of the western edge of the proposed building is anticipated. This is predicted to be the only element of development on the site that will be visible.

Predicted View (year 15 post construction): As at completion, there is predicted to be only a glimpsed view of the development.

Magnitude of Visual Change: A minor beneficial magnitude of change is anticipated as the proposed development is predicted to result in a reduction in visible built form.

Anticipated visual effect: A moderate-minor beneficial visual effect is anticipated for residents and footpath users at this viewpoint location.

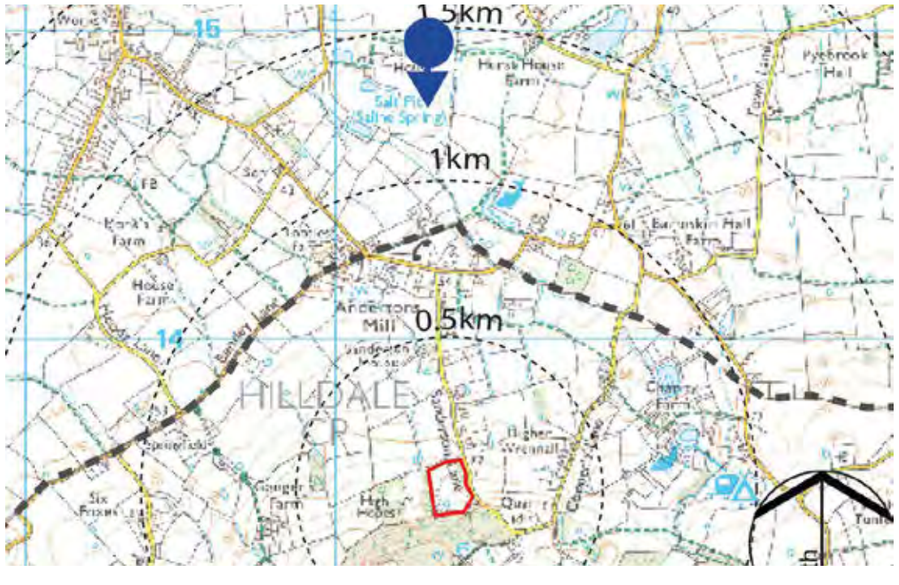
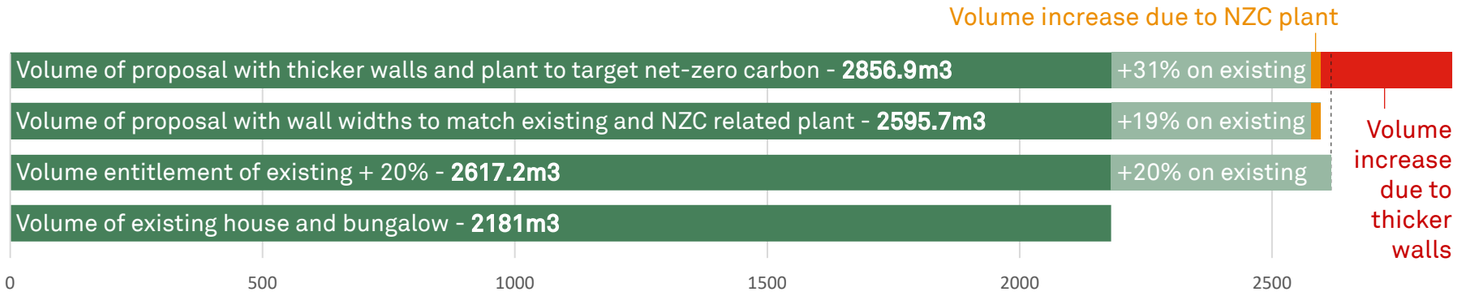


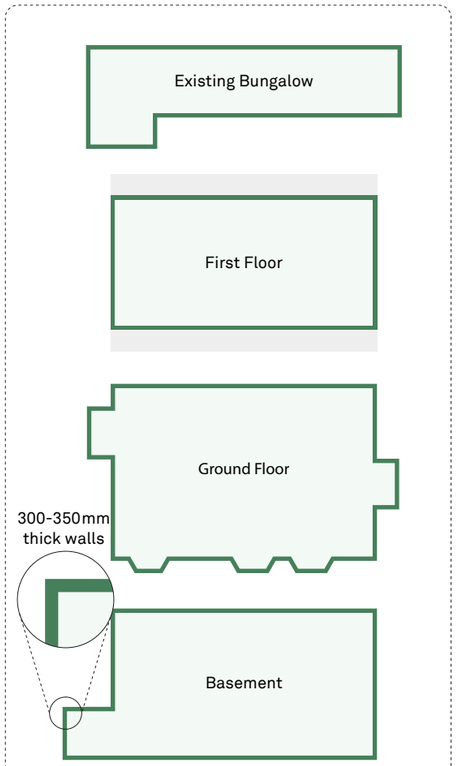
Photo location plan.

3.4 Volume

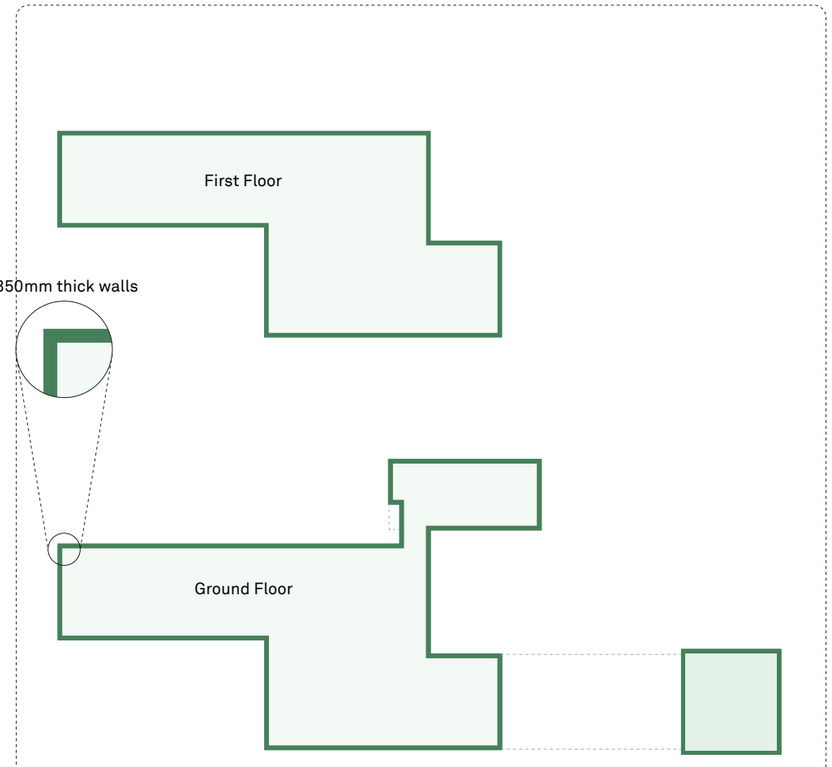
Our client would like to create a new home with 20% increase in their space and to meet the highest levels of sustainability.

These two goals are in conflict when measuring to the external face of the building. Whilst exactly the same proposal with walls to match the existing is only a 19% increase on the existing (within the volume entitlement), the production of an exemplary NZC house requires high levels of insulation, and use of low carbon materials, which all take up volume. Further volume within this 19% is also required for NZC related plant, reducing usable area further. It's unreasonable that a house responding to the climate emergency in this way should be penalised in terms of volume. The following pages explain the calculations and rationale behind these figures.

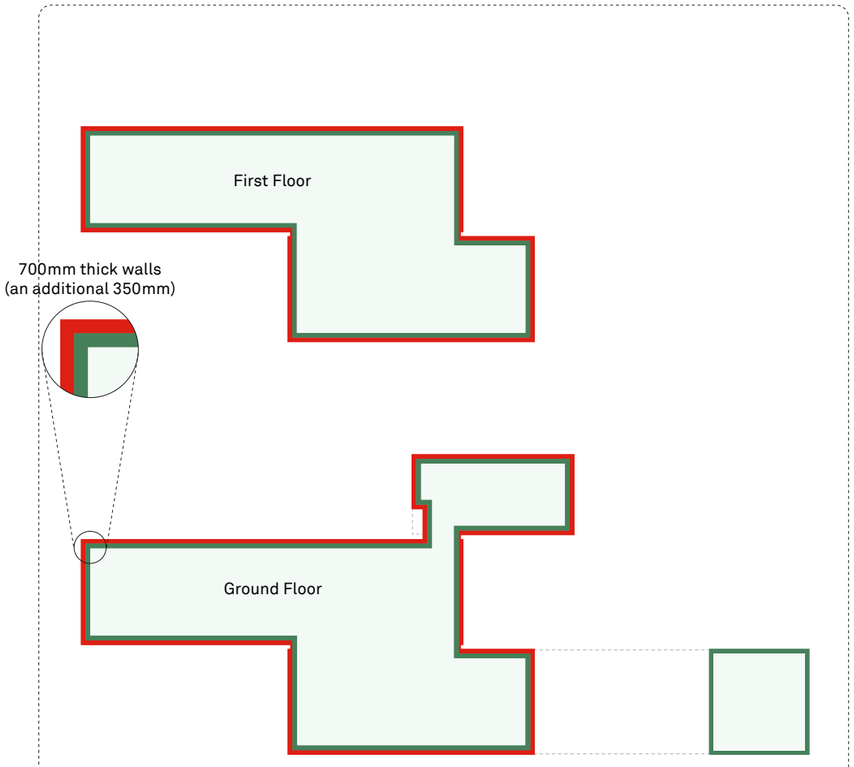




Volume of existing house and bungalow = **2181m3**



Volume of proposal with walls to match existing and NZC related plant = **2595.7m3**



Volume of proposal with super-insulated, low embodied carbor walls in order to NZC and NZC related plant = **2856.9m3**

(garage remains the same as not insulated)

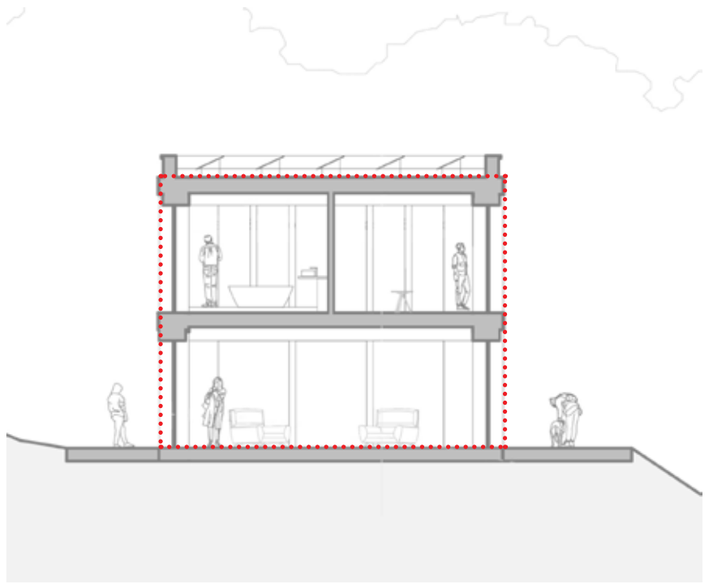
Volume Calculation - Methodology

The volume of both the existing house and bungalow and the proposed scheme have been calculated using the same methodology, which seeks to fairly and consistantly assess the external volume of each building.

The assessment has used the following approach:

- Measurements taken from the top of the slab at ground floor / lowest floor level.
- Measurements taken from the outer face of all external walls, including the volume within all window reveals.
- Measurements taken to the external roof surface (the tiled / surface finish), excluding solar panels, parapets, gutters and chimneys on both existing and proposed

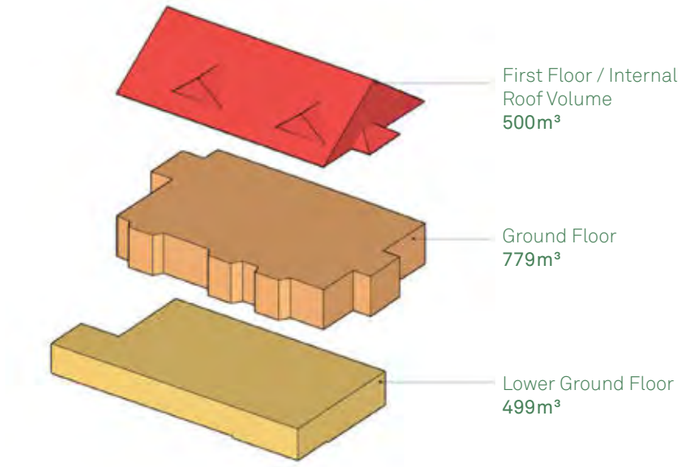
The red dotted line on the following diagram highlights how this methodology is applied:



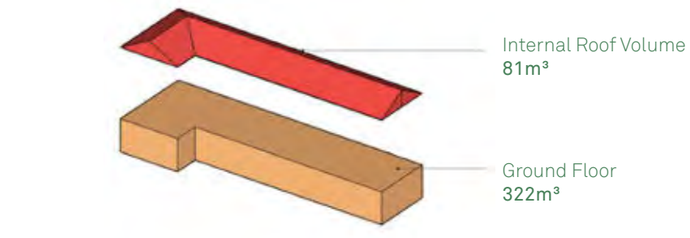
Volume Calculation - Existing House and Bungalow

The volume of the existing house and bungalow has been calculated at 2181m3, using measurements from an independant building survey carried out to inform the proposal and planning application.

Existing House - 1778m³



Existing Bungalow - 403m³

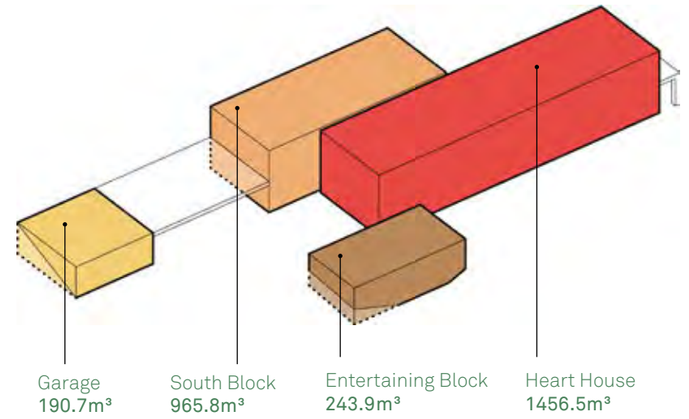


	Volume
Existing House	1778.0
Existing Bungalow	403.0
Total	2181.0

Total Volume of Existing House and Bungalow = 2181m³

Volume Calculation - Proposal (with the thicker walls and plant space required to target net-zero carbon)

The volume of the proposal is calculated using the same methodology as the existing building. The diagram and table below highlight the volume of the submitted scheme, including the thicker walls and plant space required to target net-zero carbon in us and in operation.



	Height	Area	Volume
Garage	3.145	60.6	190.7
Entertaining	3.3	73.9	243.9
Heart House	6.3	231.2	1456.5
South Block	6.3	153.3	965.8
		Total	2856.9

Total Volume of Proposal = 2856.9m³

Additional Wall Thickness

Our client has commissioned us to design them a new home that is both of a timeless, exemplary quality design and able to respond to the climate emergency by targeting net-zero carbon for both operational carbon (the carbon emissions produced in the running of a building) and embodied carbon (the carbon emissions produced in the production of materials).

Net-zero carbon in operation will be targeted and evidenced by targeting the Passivhaus Low Energy Building accreditation. In summary Passivhaus buildings work by creating a highly insulated building with a much higher level of airtightness compared to conventional builds. This combination allows the house to require only minimal heating, with fresh air supplied by a heat recovery unit that takes heat out of extracted air and transfers this to the fresh air entering.

To achieve this the external walls need to provide a significantly more effective thermal envelope than you would find in a conventional home or is required by Building Regulations. This will be achieved through a significant amount of additional insulation around the perimeter of the whole building.

In addition to minimising operation carbon, the client is seeking to build using materials that are low in embodied carbon. The primary materials used in the construction of the building will be a combination of natural materials such as timber structure, straw insulation, clay plaster and local stone, all of which also add to the depth of the perimeter walls.

The additional wall thickness incurred by targeting these admirable sustainability ambitions amounts to an additional 261.2m3 of volume - this equates to an additional 12% of volume compared to the existing house. The following page explains the calculation to reach this number.

The desire of our client to support West Lancashire Council in their Net Zero Carbon ambitions through a drive to reduce both operational and embodied carbon is to be commended, but does equate to a significant amount of additional volume taken up by the perimeter walls compared to their existing house.

400mm of straw insulation and 60mm of wood fibre board are proposed around the perimeter of the building, neccessary to create such a super-insulated building as well as significantly reducing embodied carbon.

Timber is the primary structural material used across the building for both walls, floors and roof. Whilst thicker than the equivalent support in steel or concrete, the use of timber throughout is a significant reduction in embodied carbon.

200mm of local stone will be used as the primary facade material across the building, contibuting significantly to reducing the embodied carbon of the facades.

Clay plaster will be used for the inside faces of the external walls, both helping reduce the embodied carbon from cement and facilitating the use of straw insulation, which requires a breethable internal wall finish.

Additional Wall Thickness Calculation

As highlighted in order to build a new house that can achieve the Passivhaus Low Energy Building Standard whilst minimising embodied carbon, the external walls of the new house will be about 700mm deep, compared to approximately 350mm deep on their existing house or for a standard new build home. This equates to an additional 350mm wall depth.

When extrapolated across the surface area of the perimeter walls of the whole building (minus the garage as this won't be insulated) the volume of the additional wall depth is calculated at 261.2m3 – significantly more than the 239.7m3 the proposal is over the planning guidance, even without taking into account the space within this allocated to NZC related plant highlighted in the section to the right.

The additional wall thickness has been calculated as shown below, firstly by calculating the surface area of the external walls (not including the parapet, roof or garage as this isn't insulated). This is then multiplied by the additional wall depth of 350mm - the difference between the walls of the existing building at their thickest (350mm) and the highly insulated, low embodied carbon walls of the submitted scheme (700mm).

	Height	Area	Volume
Garage	3.145	Excl.	Excl.
Entertaining	3.3	33.3	109.8
Heart House	6.3	60.7	382.7
South Block	6.3	40.3	253.9
		Total	2856.9

746.4m²	X	350mm	=	261.2m³
Surface area of perimeter walls		Additional wall depth		Additional wall volume due to sustainability ambition

Area Devoted to Net-Zero Carbon Plant

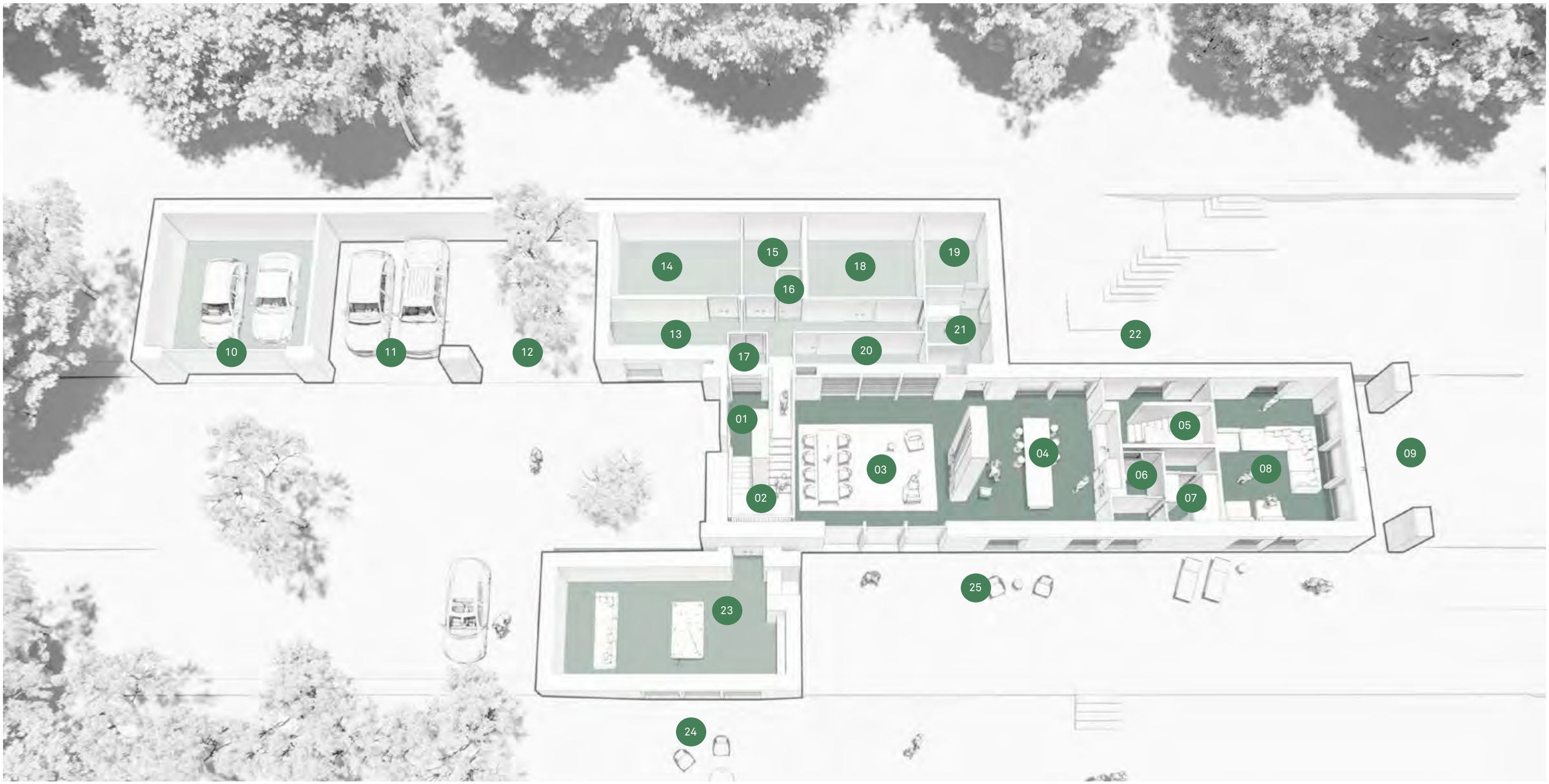
A proportion of the buildings internal volume is also given over to addressing the climate emergency, by accommodating a number of pieces of mechanical plant required to support the buildings net-zero carbon ambitions.

This includes three MVHR (Mechanical Ventilation with Heat Recovery) units, which are required to extract heat from stale air being extracted from the building and transfer this to fresh air entering the building - thereby reducing the operational energy and carbon needed to heat the building. Additional volume is also used up to accommodate batteries, which are critical in storing the energy generated by the rooftop solar panels to use in evenings and at night whilst the panels aren't generating power.

Tho following table summarises the additional internal volume given over to accommodating net-zero caron related plant.

	Width	Length	Height	Volume
MVHR 1A	0.73	1.55	3.00	3.37
MVHR 1B	0.73	1.55	3.00	3.37
MVHR 2	1.20	1.32	3.00	4.73
Batteriesk	3.00	0.75	3.00	6.75
			TOTAL	18.23

3.5 Layout and Organisation - Ground Floor Plan



The accommodation brief is organised into three blocks: at ground floor the 'Heart House' contains most of the primary living accommodation, the 'South Block' containing the utility functions including plant spaces, garage and car port, and the 'Entertaining Block' sunk down half a level which contains the entertaining space. This 'Heart House' concept of consolidating the primary accommodation will help minimise operational by minimising heat and light requirements in day-to-day use.

Heart House

01. Entrance
02. Grand Stair
03. Hall
04. Kitchen
05. Stair
06. WC
07. Pantry
08. Lounge
09. Evening Terrace

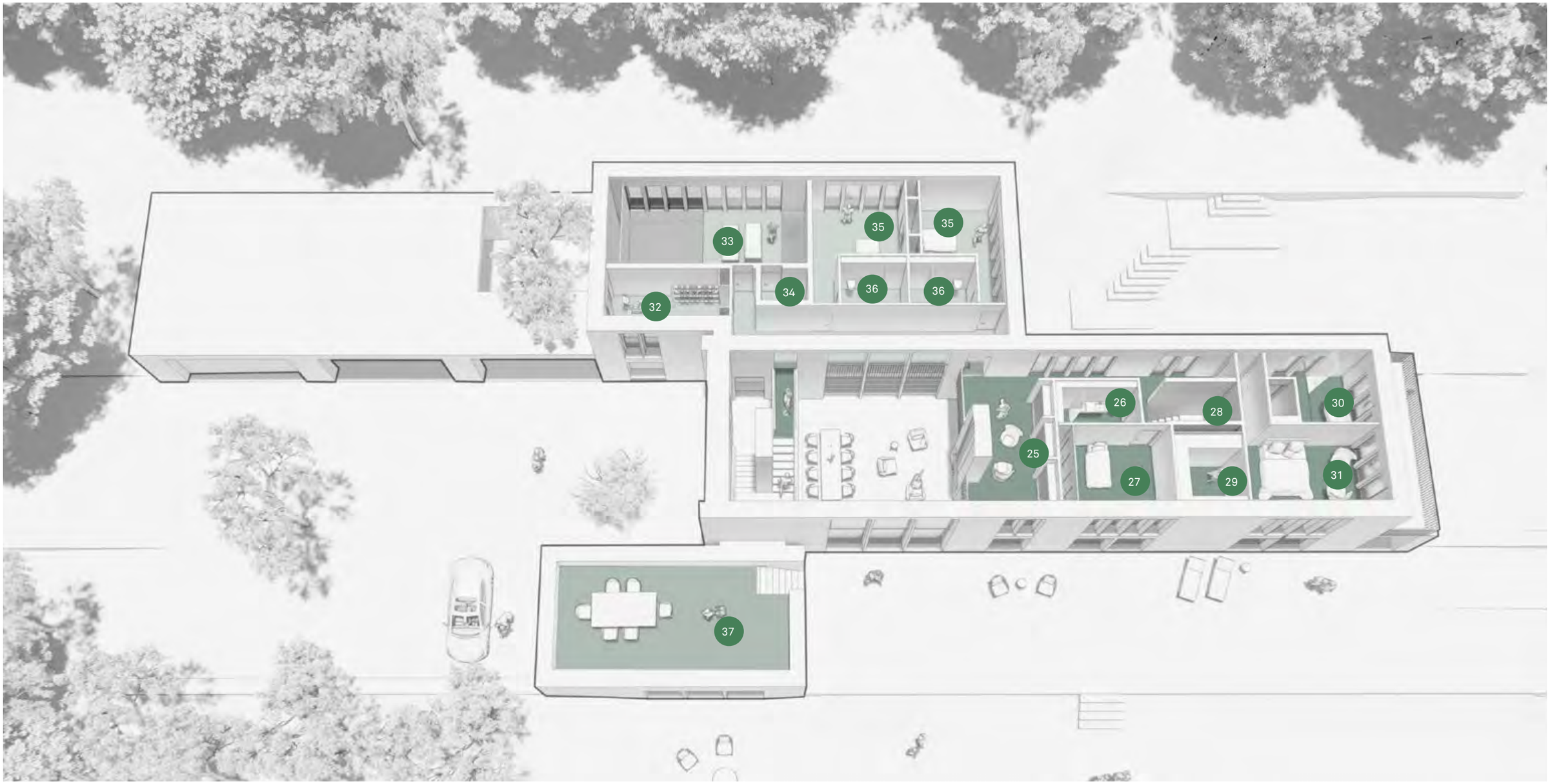
South Block

10. Garage
11. Carport
12. External Courtyard with planting
13. Dog Wash/Utility
14. Pool Plant Room
15. Plunge Pool Plant Room
16. Coats
17. South Block WC
18. Plant
19. Storage
20. Laundry
21. Bottling Room
22. Woodland Terrace

Entertaining Block

23. Entertaining Space
24. Entertaining Terrace

3.5 Layout and Organisation - First Floor Plan



At first floor the 'Heart House' contains most the master bedroom suite and primary guest bedroom, the 'South Block' containing the spa, gym and further guest bedroom, whilst the roof of the 'Entertainment Block' provides a terrace commanding spectacular views to the North.

First Floor - Heart House

25. Study/Library
26. Bathroom
27. Guest Bedroom
28. Stairs
29. Walk-in Wardrobe
30. Master Bedroom
31. Master Bathroom

South Block

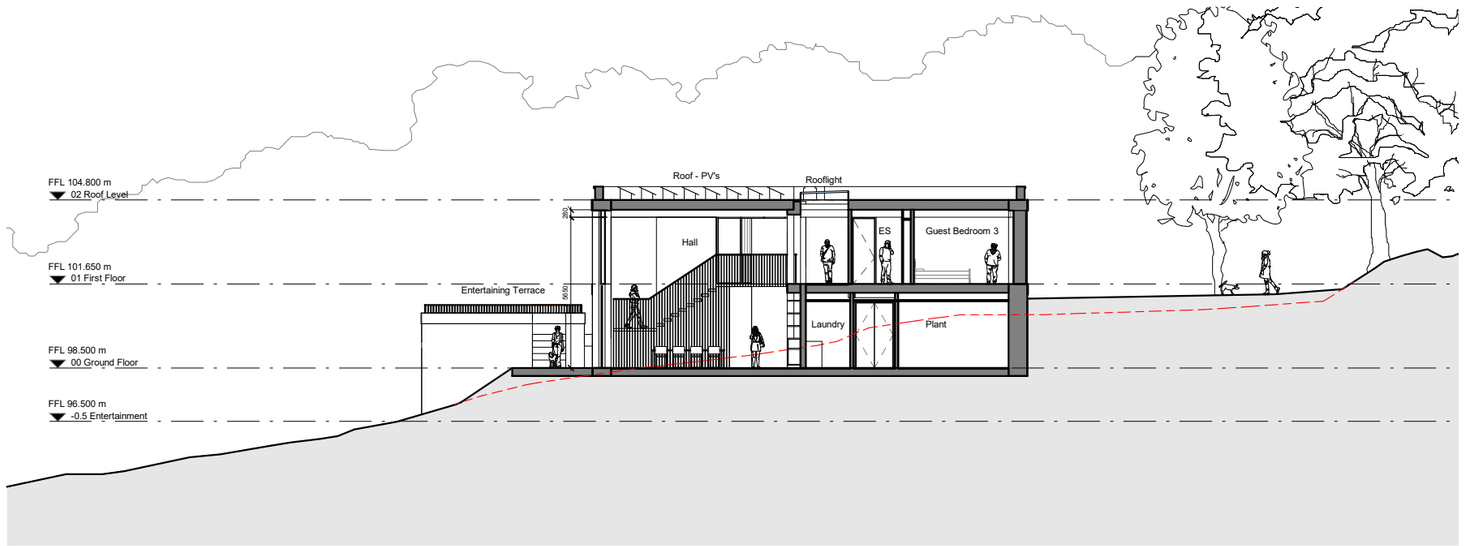
32. Gym
33. Spa
34. Sauna
35. Guest Bedroom
36. En Suite

Entertainment Block

37. Entertainment Terrace

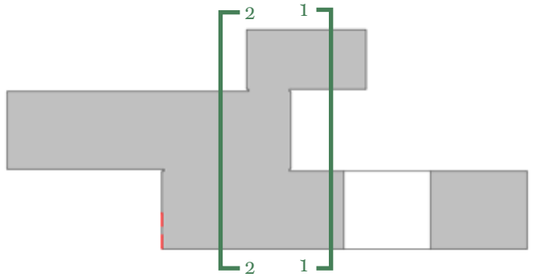
3.5 Layout and Organisation - Sections

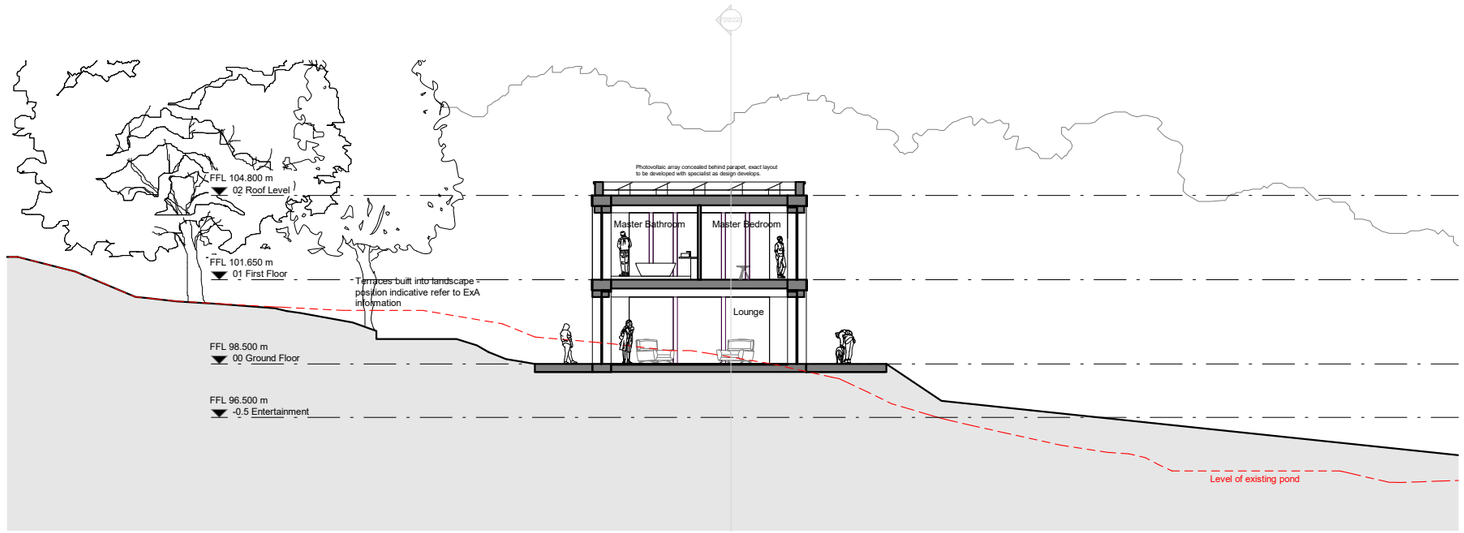
Section 1
Entertaining space and spa looking west



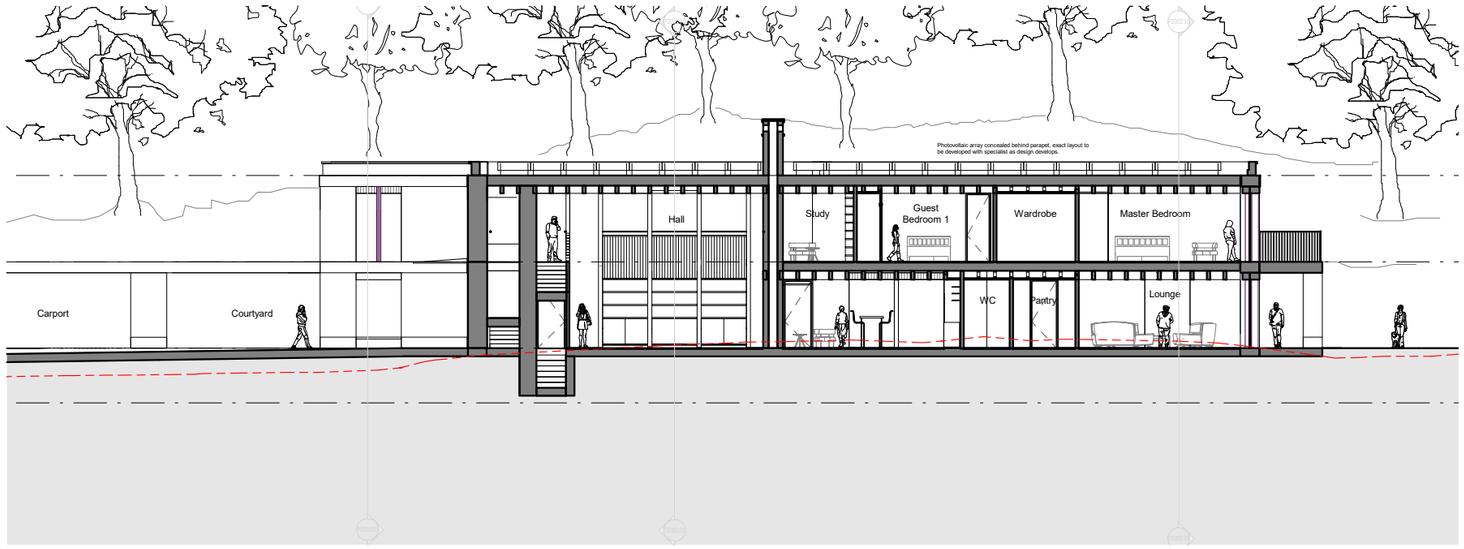
Section 2
Kitchen and hall looking east

The three blocks are positioned to respond to the surrounding level changes and reduce their visual impact. The landscape forms a plateau around the Heart House to maximise the opportunity to spill out to the surrounding terraces to north whilst the South and Entertaining Blocks are sunk into the landscape.



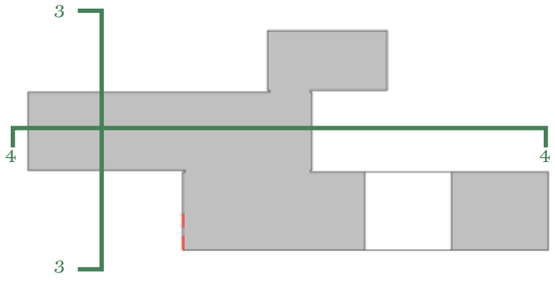


Section 3
Lounge and master bedroom looking west



Section 4
The Heart House looking south

As highlighted by the south facing section, the visual impact of the south block is minimised as the majority of the two storey portion is slid behind the Heart House. Tree planting in and to the north of the entrance courtyard will further reduce its impact on the landscape.



3.6 Appearance - Contemporary Reinterpretation of Georgian Elegance

Georgian Architecture

From the outset of the project a key component of the brief has been to develop a contemporary reinterpretation of Georgian elegance. The following components have been key in inspiring the design response.

Arrival sequence

Curate the experience from the site entrance to arrival at the house with carefully considered reveal and first impression of the house.

Colonade and Entrance

Buildings often have repeated colonades and covered entrance space defining the front door.

Proportion elegant

Elegant proportions of building and windows set by Golden Ratio.

Grand entrance hall

Provides an impressive space to arrive into and entertain in.

Forecourt

Generous space in front of the house framing the entrance and accommodating vehicles.

Building and landscape designed as one.

Parterre and walled and hedged gardens as outdoor rooms.

Grand Staircase

linked to the hall, generous in width and with beautiful detailing of materials creating a showpiece.

Horizontal emphasis

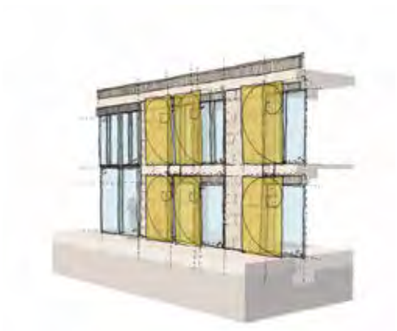
Buildings often have strong horizontal layering with changes in scale and detail across different layers and horizontal parapets capping the building.

Decorative ceilings

Ceilings often have decorative cornice and features.

3.6 Appearance - Principles

The desire to echo the elegance and timelessness of Georgian architecture is central to brief. The following Georgian principles have therefore been key in the development of the façade design:



1. Load bearing structure

Due to traditional building methods there was an honesty in Georgian construction techniques. Vertical load paths are clearly defined and are reflected in the facade as load bearing wall elements spanning from roof level to ground floor.

2. Formalising the façade

The vertical alignment of windows is a product of the construction technique used. It formalises the façade creating a uniformity to Georgian properties that expresses simplicity and grandeur.

3. Crafted elements

Crafted elements were often used to highlight window details or to create interest around the parapet. The crafted elements provide a unique touch to a building and act as a common thread that can links the façade together. Vertical elements on the ground floor are spaced at half intervals to that of the first floor to create a ‘crowning’ piece to the facade

4. Application of golden ratio

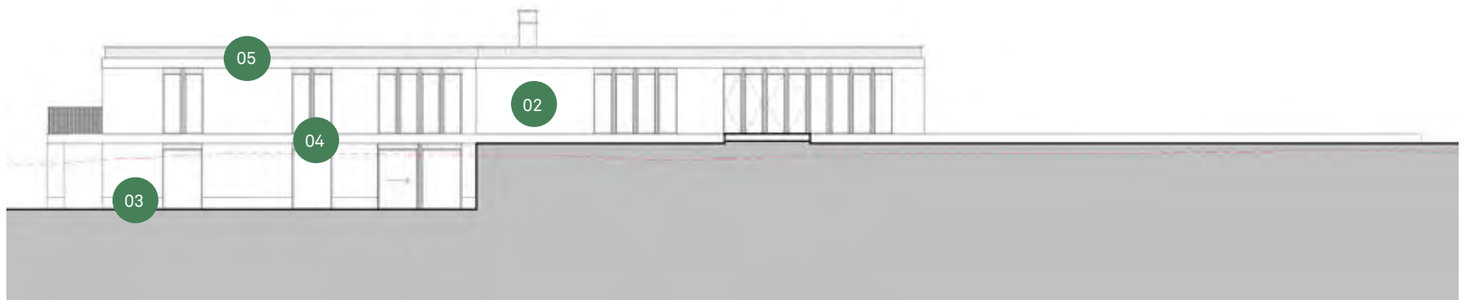
The application of the golden ratio is a technique used to ensure proportion and elegance to the façade. In Georgian properties the golden ratio is often applied to repetitive elements such as windows to ensure proportion and uniformity

5. Expressing floor plates

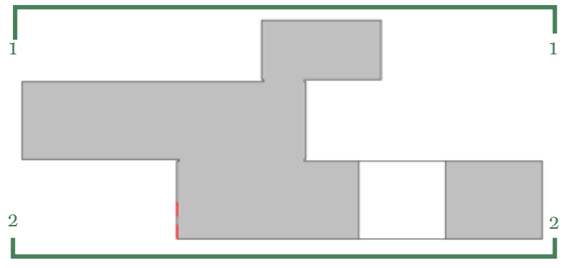
A string course expresses the position of the internal floor plates often described as horizontal bands. The string course visual links the façade and internal spaces creating a simplicity and honesty to the building.

3.6 Appearance - North and South Elevations

1 - North Elevation



2 - South Elevation



Massing

The massing of the three blocks creates a layered composition and breaks up the mass of the building from all view points, and especially when viewed from the north.

The façade and massing both give a horizontal emphasis to the design which helps the building sit into the surrounding landscape and peripheral tree canopy. The South and Entertaining Blocks sit into the existing topography to mediate the levels of the site.

The Heart House sits on top of the landscape and acts as a central anchor to the building. The South and Entertaining Blocks are spaced 300mm from the Heart House to create a shadow gap and give the impression of the blocks sliding past each other.

The garage, carport and planted courtyard extend from the South Block defined by equal openings to create a rhythm to the entrance sequence and guide people to the front door.

The end pieces to each block are treated slightly differently to the north and south façades. Windows generally align however the rhythm of the vertical elements is not dictated by internal structure, instead are positioned to maximise views and connection to surrounding landscape. Depth is also used to create shelter and both ends of the Heart House in the form of a canopy and balcony.

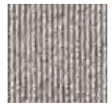
Materials

1. Local Sandstone - coursed ashlar blocks with flush lime mortar.

4. Reconstituted Stone - smooth finish

2. Local Sandstone - coursed rubble with recessed joints.

5. Reconstituted Stone - smooth finish with fluted outer face.

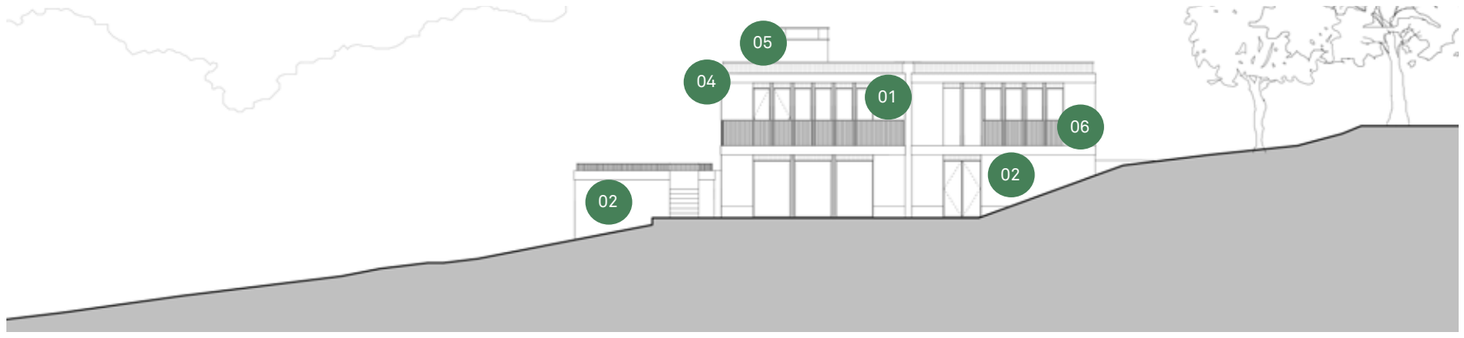


3. Local Sandstone - ashlar blocks with tooled finish.

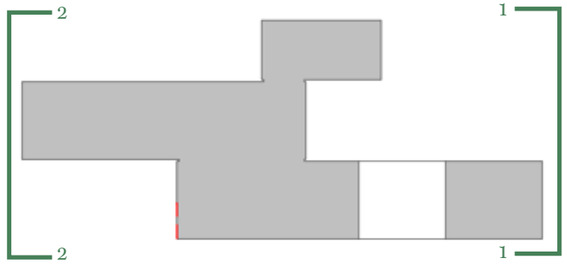
6. Bronze coloured metal.

3.6 Appearance - East and West Elevations

1 - East Elevation



2 - West Elevation



Materials

Local sandstone is used as the primary façade material across the building, with the same material cut and laid in different ways to define each block. Coursed ashlar blocks are the primary material on the Heart House to create a distinct grandeur and echoing coursed ashlar blocks often used in Georgian properties. The South and Entertaining Blocks use coursed rubble sandstone as the primary façade material which contrasts with the smooth finish of the ashlar blocks. The rubble stone provides a softer finish to the façade and allows the South and Entertaining Blocks to sit more naturally into the landscape.

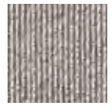
Reconstituted stone details such as vertical elements and fluted panels are used to unify the three blocks. The rhythm of the vertical elements at first floor emphasising a 'crowning' piece that is sat on top of a solid base that echoes the rhythm above. The 900mm rhythm expresses the internal glulam structure and creates a consistency across the façade. A precast string course articulates the internal levels of the building and wraps around all three blocks.

Bronze coloured metal is used to signify special interventions including the double height hall space and entrance door. Bronze metal is also used to unify details such as balustrades and drip details.

Materials

1. Local Sandstone - coursed ashlar blocks with flush lime mortar.

2. Local Sandstone - coursed rubble with recessed joints.



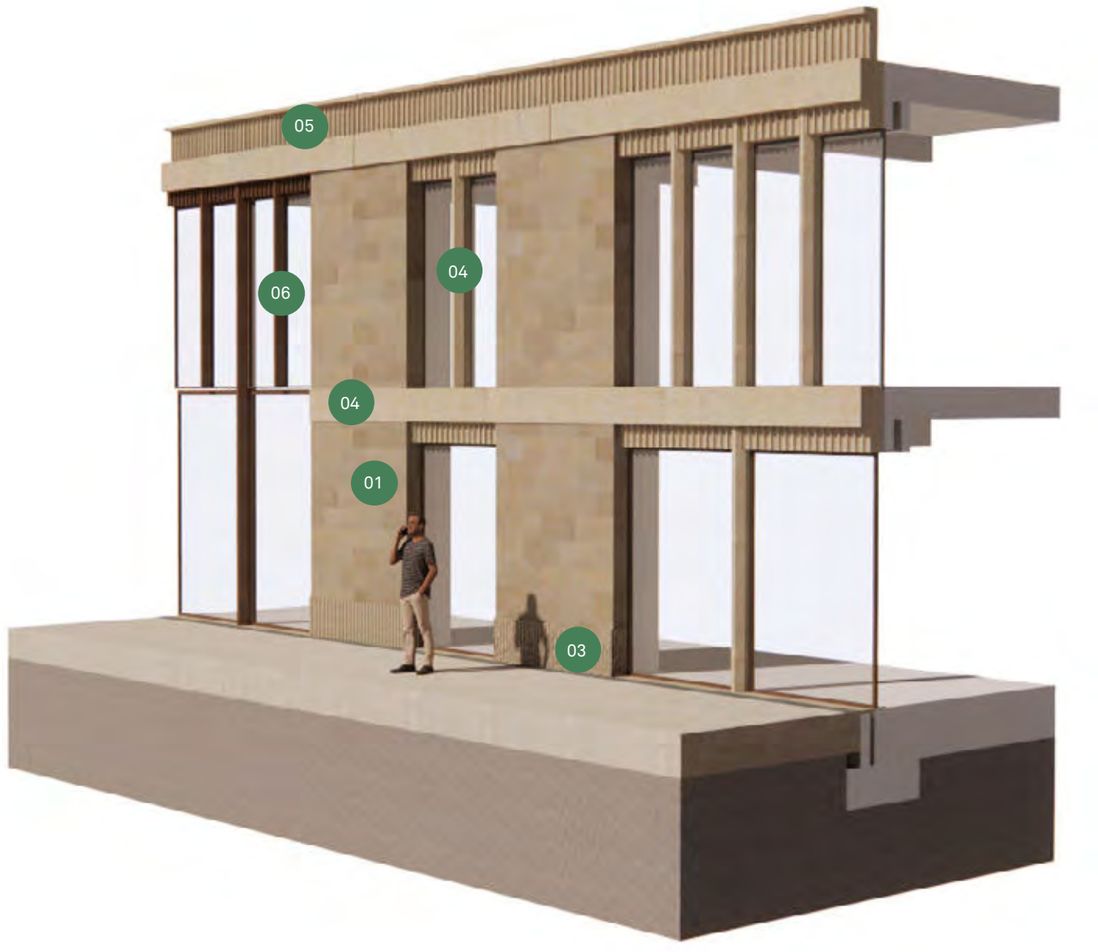
3. Local Sandstone - ashlar blocks with tooled finish.

4. Reconstituted Stone - smooth finish

5. Reconstituted Stone - smooth finish with fluted outer face.

6. Bronze coloured metal.

3.6 Appearance - Heart House Bay Study



Bay study location

This bay study shows a typical section of the north elevation, illustrating the relationship between the double height hall window and the Heart House façade. The bay study provides a closer look at detail and material use whilst also demonstrating the composition of façade elements.

Primary material

Ashlar sandstone blocks are used in areas of load bearing construction. This provides an opportunity to showcase the local sandstone and natural grain and to reflect the honest principles of construction used during the Georgian period. The depth of the wall is revealed at connections with windows to show the solidity of the construction.

Complimentary material

The reconstituted stone vertical elements, spaced at 900mm at first floor and 1800mm at ground floor, create an elegance and refinement to the façade. The addition of reconstituted stone fluted panels reflects the craftsmanship and detail often seen in Georgian properties around the parapet or above windows.

Secondary materials are used such as a tooled sandstone to create a small plinth for the building to sit on. Bronze coloured metal is also used to highlight special interventions such as the double height hall space.

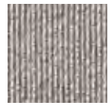
Layering of elements

A play on shadow and relief is a mechanism Georgian properties use to illustrate grandeur and beauty. The façade features a variety of elements which are layered to create depth, detail and echo the elegance of Georgian architecture.

Materials

1. Local Sandstone - coursed ashlar blocks with flush lime mortar.

2. Local Sandstone - coursed rubble with recessed joints.



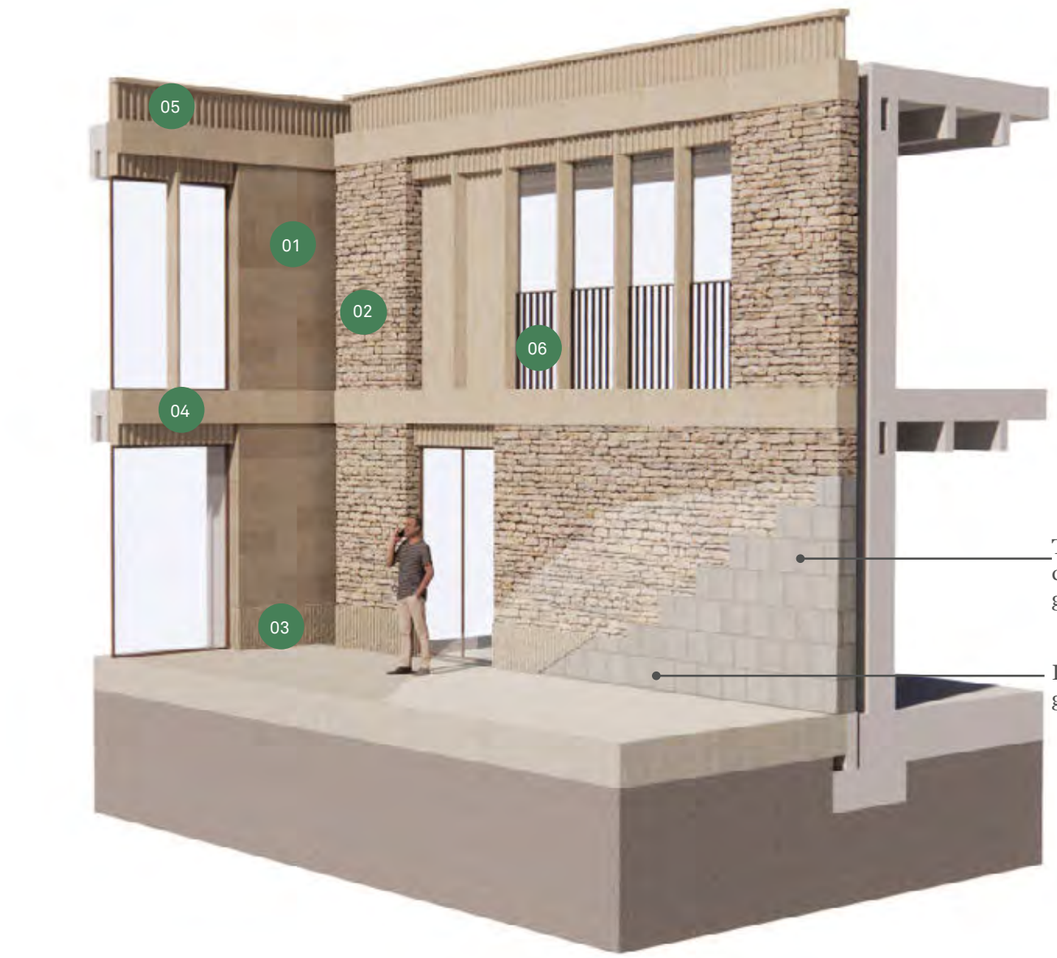
3. Local Sandstone - ashlar blocks with tooled finish.

4. Reconstituted Stone - smooth finish

5. Reconstituted Stone - smooth finish with fluted outer face.

6. Bronze coloured metal.

3.6 Appearance - South Block Bay Study



Bay study location

This bay study is located on the west elevation of the South Block and aims to illustrate how the rubble course stone is treated on both the South and Entertaining Block. It also explains the relationship between the existing topography and the South Block. Both bay studies also show how consistent details such as fluted precast and bronze elements are used to tie the façades together.

Primary material

Course rubble stone is used to emphasise the Heart House as the more formal part of the composition by providing a contrast between the ashlar and rubble sandstone. The rougher façade material also reflects the transition between the more formal Heart House and the surrounding landscape.

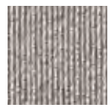
Complimentary materials

The reconstituted stone components such as the fluted panels, string course and vertical elements are used in a similar language to the north façade to unify the building together. In certain moments reconstituted stone panels are used to echo the formalised window alignment and to create extra depth within the façade. Bronze coloured metal is used for Juliet balcony and other metalwork to compliment and unify the three blocks and reference the ornate metalwork often seen in Georgian facades.

Materials

1. Local Sandstone - coursed ashlar blocks with flush lime mortar.

2. Local Sandstone - coursed rubble with recessed joints.



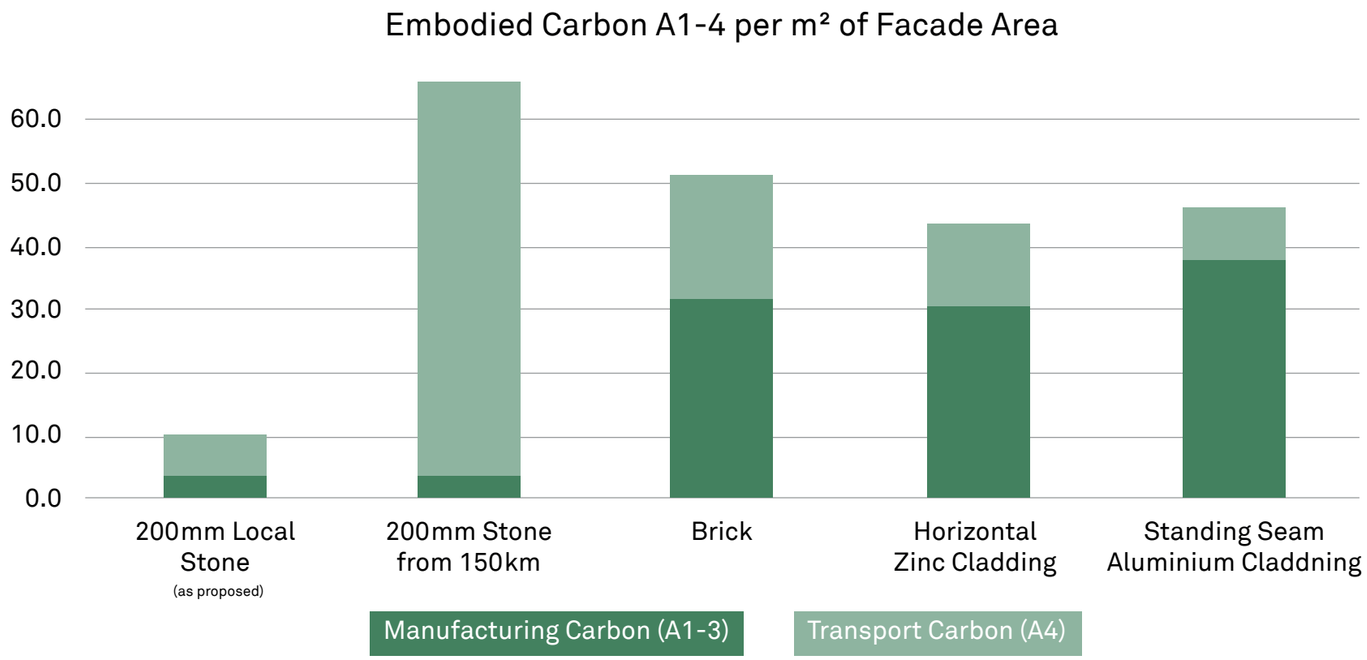
3. Local Sandstone - ashlar blocks with tooled finish.

4. Reconstituted Stone - smooth finish

5. Reconstituted Stone - smooth finish with fluted outer face.

6. Bronze coloured metal.

3.7 Materials - Local Sandstone



Local Sandstone

A local sandstone will be used as the primary façade material. The sandstone will be sourced from a stone quarry within 10 miles of the site which has been used to construct many local buildings throughout the centuries.

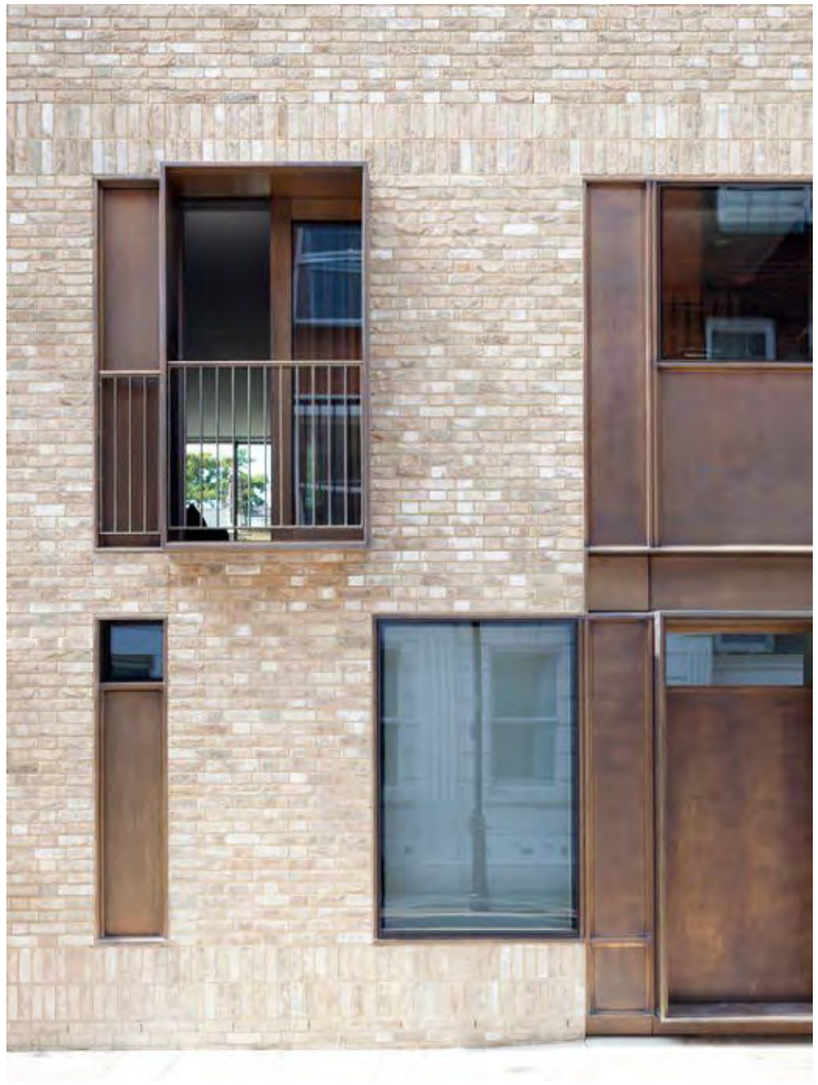
The sandstone is of the local vernacular, and gives a distinct identity to West Lancashire. The use of this timeless, local material is a mark of the high quality of the proposal, and will give the house commonality with its context, adding a contemporary addition to the buildings faced in local stone throughout West Lancashire.

The stone façade will be load bearing reflecting the honesty in Georgian and local construction techniques. The stone will be cut and laid in two different techniques, using ashlar blocks and coursed rubble.

The other key factor in selecting the facade material has been embodied carbon. Stone, as a ready made material is very low in embodied carbon, as the only energy needed to manufacture it (A1-3 emissions) is the energy required to cut it. The choice to source the stone locally is also crucial as due to the weight of stone it can incur high carbon emissions to transport it to site (A4 emissions).

The graph to the left highlights how low the embodied carbon of local stone is compared to other common cladding materials.

3.7 Materials - Complimentary Materials



A combination of a sandy coloured load baring stone/brick facade and with warm coloured metal accents provide a sophisticated, cohesive material palette.

Complimentary material palette

Application of complimentary materials

Bronze finish metal

A bronze finish metal will be used to highlight special interventions on the façade including the entrance and double height hall window. The same finished metal will be used for external railings and drip details across all three blocks to unify the buildings external appearance. The bronze colour will be used to compliment the darker orange and brown tones in the local sandstone whilst providing a contrast to highlight details and special moments.

Fluted reconstituted stone -

Crafted elements were often used in Georgian architecture to highlight windows or create details around the parapet. Fluted reconstituted stone will be used to provide detail as well as compliment the local sandstone. The fluted elements will sit above the windows and around the parapet. Fluted bronze finish metal will also be used at special interventions to create a consistent language across the façade. The tone of the fluted reconstituted stone will be slightly lighter than the local sandstone to create a subtle difference between the elements and to compliment the sandstone.

4.0 Sustainability

4.0 Sustainability - Overview

It is vital that all construction projects address the climate and biodiversity emergency, and these have been central themes in the development of the proposal. The project is seeking to achieve 'Net Zero Carbon' for both operational and embodied energy, as well as looking to significantly improve biodiversity of the site.

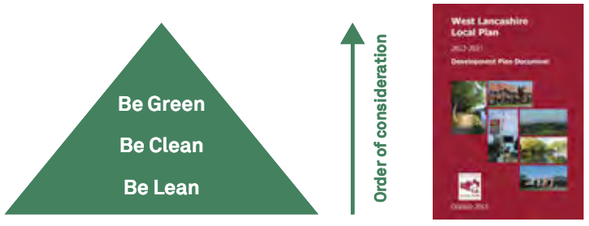
For the purposes of this project the UK Green Building Council (UKGBC) definitions of 'Net Zero Carbon' have been adopted, which are defined as follows:

Net-Zero Carbon - Construction (Embodied Carbon)

When the amount of carbon emissions associated with a building's product and construction stages up to practical completion is zero or negative, through the use of offsets or the net export of on-site renewable energy.

Net-Zero Carbon - Operational

When the amount of carbon emissions associated with the building's operational energy on an annual basis is zero or negative. A net zero carbon building is highly energy efficient and powered from on-site and/ or off-site renewable energy sources, with any remaining carbon balance offset.

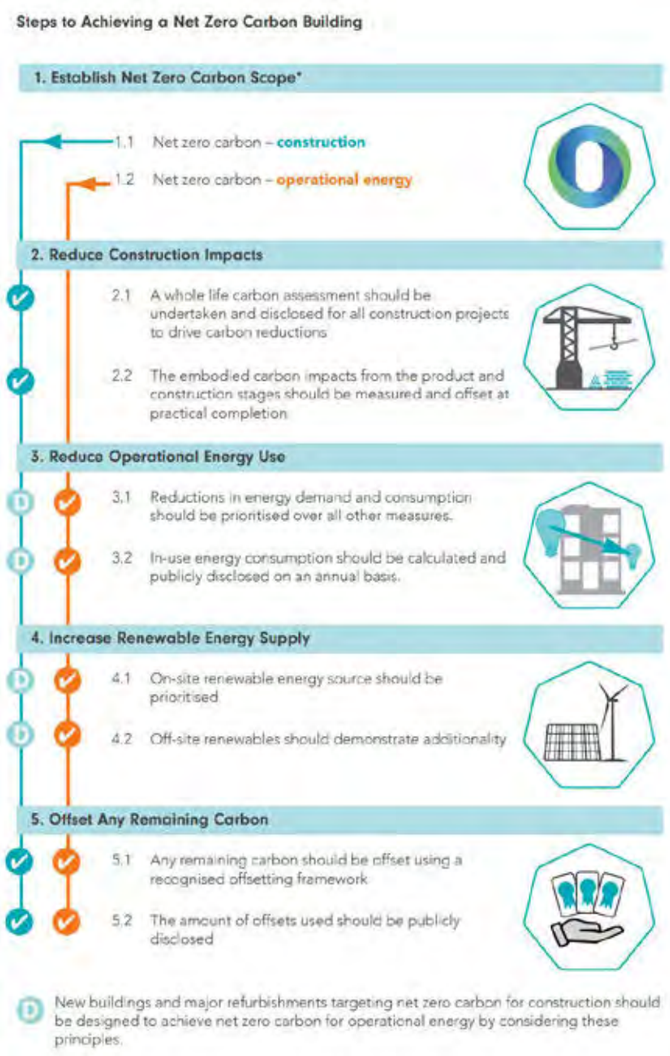


The approach to targeting net-zero operational carbon aligns the order of consideration set out in the West Lancashire Local Plan of 'Be Lean, Be Clean, Be Green', and is explained in more detail in '4.2 Reducing Operational Energy' and '4.3 Increasing Renewable Energy Supply and Maximising its Effectiveness'.

Biodiversity

Biodiversity targets and monitoring will be measured in terms of 'biodiversity net gain' on a site wide basis. This is explained in more detail within Exterior Architecture's information, including the 'Biodiversity Net Gain' assessment which supports the planning application.

The following diagram highlights the UKGBC's recommended steps to creating a Net Zero Carbon building, with annotations highlighting how each of these have been addressed as part of the design process to date:



From the outset the project has sought to minimise embodied carbon through the massing, façade design and material choices across the scheme. Following the completion of RIBA 2 an embodied carbon assessment was carried out for each of the materials and quantities identified in the cost plan. This assessment has then been used to inform design development over RIBA 3, with particular attention paid to the structural elements which were shown to be many of the greatest sources of embodied carbon. Further details on these are highlighted within the 'Reducing Embodied Carbon' page. The embodied carbon assessment is currently being updated which will be used to further inform embodied carbon reduction measures as the design progresses. Key targets and figures are highlighted in the Net-Zero Carbon Statement, submitted as part of the planning application.

The key strategy for reducing operational energy use is to target the Passivhas Low Energy Building Standard. Over the course of RIBA 3 Max Fordham have carried out a Passivhaus assessment, to measure the energy demand and consumption across the building. This has informed refinements to the building form, glazing / façade design and service strategy in order to reduce operational energy use. Refer to the 'Reducing Operational Energy' page and the Net-Zero Carbon Statement for further information.

On site solar panels, batteries, and a ground source heat pump will allow a significant proportion of the house's energy demands to be met by on site renewables. Refer to the 'Increasing Renewables Energy Supply and Maximising their Effectiveness' page and the Net-Zero Carbon Statement for more information. Any additional energy required will be sourced from a renewable tariff.

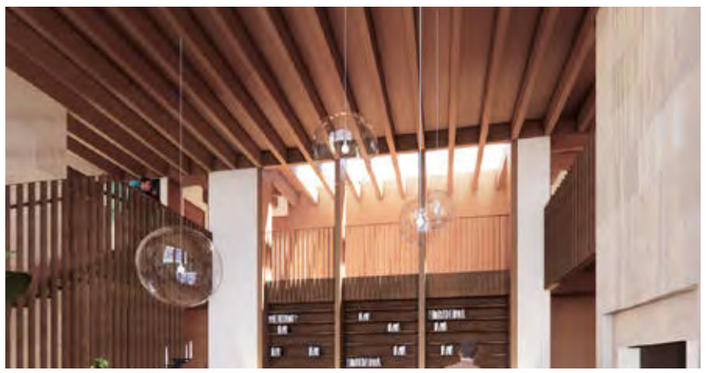
4.1 Sustainability - Reducing Embodied Carbon

Reducing Embodied Carbon

As the grid decarbonises and the majority of buildings are run on renewable energy embodied carbon will increasingly become the dominant form of carbon emissions from the built environment. Embodied carbon is all the carbon incurred in the sourcing of materials and products, the construction process, and maintaining the building following completion - as illustrated by the diagram opposite. The project is seeking to minimise embodied carbon throughout all these stages. As highlighted below, each of the key building components is making use of naturally occurring materials such as timber, straw, stone and earth, or waste products such as fly ash in order to minimise the energy needed to extract and process these - especially compared to commonly used materials such as steel and concrete. Many of these materials such as straw and timber also offer significant sequestration (the ability to store carbon that would otherwise be in the atmosphere), meaning that they can often end up as 'carbon negative'.

Load baring walls

The external walls will be constructed using a timber frame system which is inherently low in embodied carbon. This will be infilled with a super insulating, low embodied carbon form of insulation - likely to be compacted straw. The preferred product of Ecococon straw cassettes are Passivhaus approved and is prefabricated in a factory to precise sizes allowing simple and quick assembly on site, to a high level of quality.



First Floor and Roof Structure

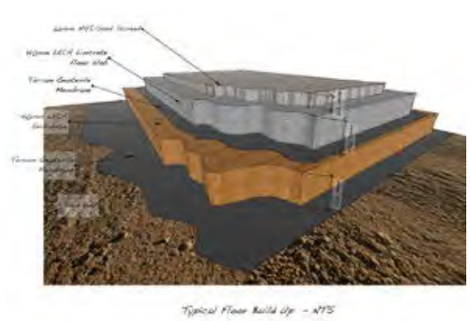
The first floor and roof structure will be constructed out of single span, exposed oak/ cross-laminated timber beams, which again are inherently low in embodied carbon. These are exposed throughout most of the building to avoid the need for applied materials such as plasterboard which would otherwise add to the embodied carbon of the building.

Local Stone Facades

The primary facade material will be locally sourced sandstone, quarried and proceed within 10 miles of the site. As highlighted in the 'Materials' section, stone is a ready made material, with the only embodied carbon occurring from processing and transport to site. Sourcing this locally means the facades will have about 1/5 of the embodied carbon of brick.

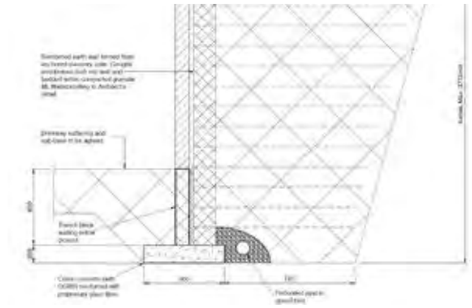
Foundations

The foundations are the one area where concrete won't be avoided, however, low carbon concrete will be used, seeking to avoid cement use as much as possible through the use of low carbon alternatives such as fly ash.



Ground Baring Slabs

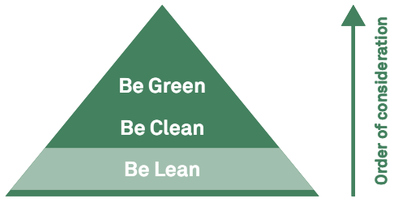
Limecrete will be used for the ground baring slabs, helping reduce embodied carbon compared to concrete and providing a breathable base for the proposed straw cassette walls.



Retaining Walls

The majority of retaining walls will be contracted using an earth block retaining wall structure, which uses mesh mats to tie into the existing ground.

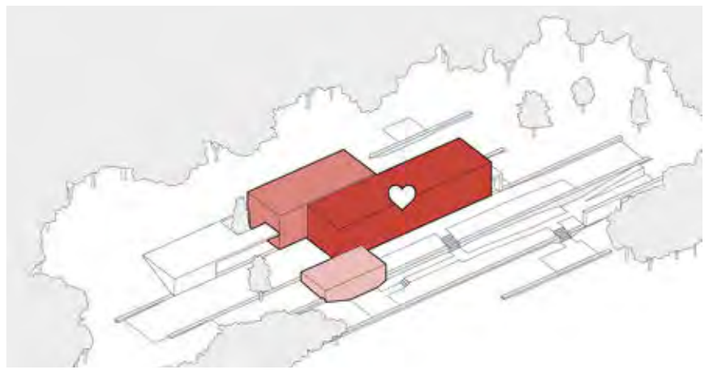
4.2 Sustainability - Reducing Operational Energy Use



Be Lean

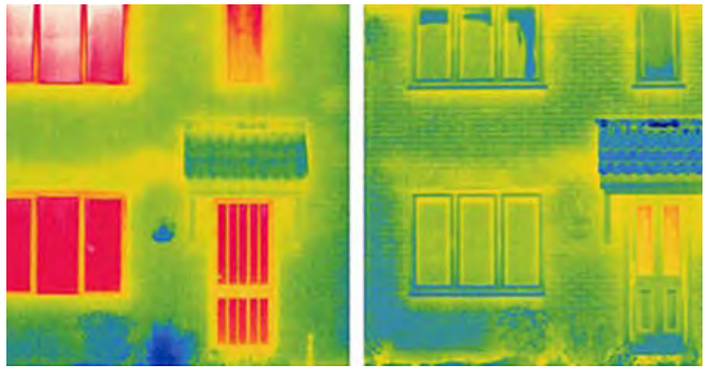
'Be Lean', as described in the West Lancashire Local Plan encourages the use of passive and active measures to reduce energy consumption. The passive measures to minimise energy demand include optimising the building form, providing a super insulated thermal envelope with a high level of air tightness, and optimising the glazed area. The active measures to reduce energy use involve the implementation of energy efficient services including heat exchangers and underfloor heating powered by the ground source heat pump.

The targeting of NZC operational will be implemented, measured and evidenced through the targeting of Passivhaus Low Energy Building Standard, which provides targets for the reduction of operational energy through the measures highlighted. Further information on this approach is detailed within the 'Net-Zero Carbon Statement' submitted as part of this application. The proposal will likely be the first house in West Lancs to achieve this standard, which will have to become commonplace to meet national and local carbon targets.



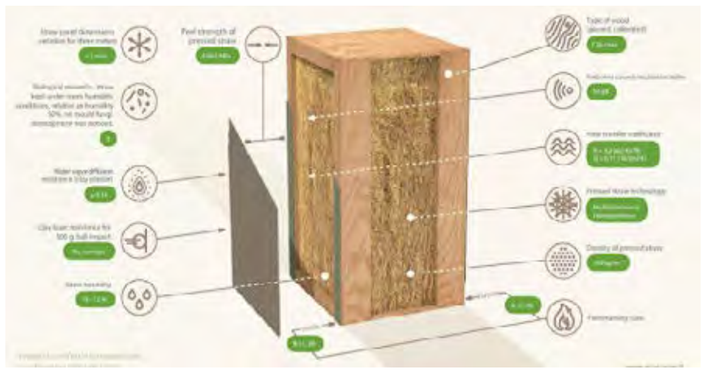
Optimising Building Form

The building form has been optimised to minimise its surface area, which helps minimise the amount of heat lost through the building envelope. In addition, the day-to-day living functions have been consolidated in the 'Heart House' to allow our client to shut down areas of the house at times while its only the two of them.



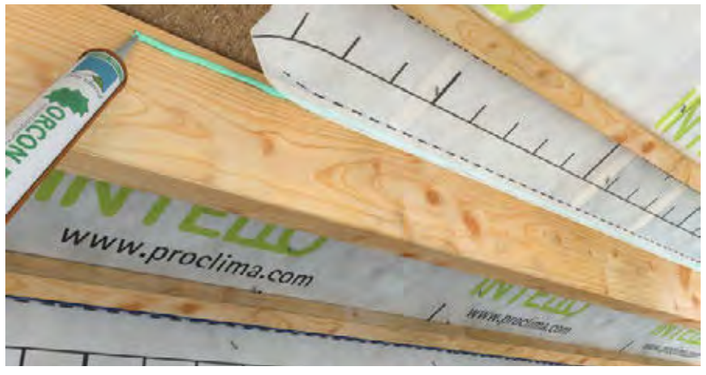
Optimising Glazed Areas

The extent and positions of glazing across the building have been curated to optimise their efficiency, whilst balancing this with the client desire to capitalise on the views to the north. Large windows to the south are largely shaded by the tree canopy, whilst the extent of west and east facades have been minimised as these are difficult to shade.



Super Insulated Thermal Envelope

Vital to reducing heat loss is providing a super insulated thermal envelope that is able to achieve the incredibly U-values (measure of how insulative a material / facade is) required to target Passivhaus. As such we have allowed for a 460mm structure and insulation zone, currently proposed to be 400mm compacted straw and 60mm wood fibre board.

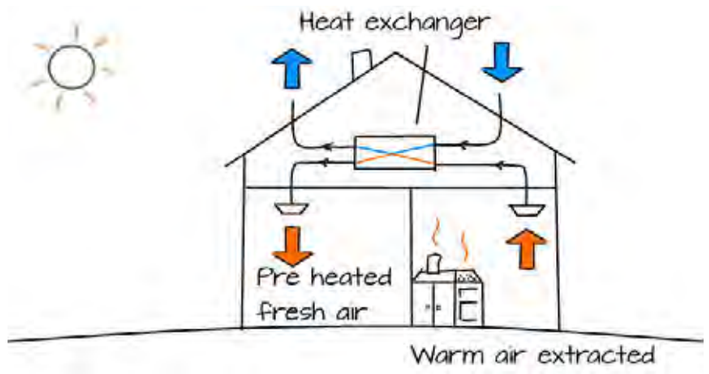


High Level of Air Tightness

A high level of airtightness is required to avoid energy loss through draughts and air leakage. This will be achieved through a high quality of construction, with the proposed Ecococon straw and timber cassettes precision made in a factory before being assembled on site. Additional membranes and taping of joints will further improve air tightness.

Low Level Underfloor Heating provided by GSHP

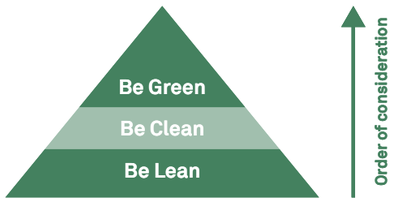
Heating throughout the house will be provided by an underfloor heating system, powered by the Low level underfloor heating will be used throughout the house, powered heating be provided by a ground source heat pump which will provide constant low level underfloor heating throughout the winter months.

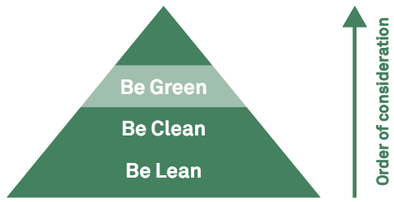


Heat Exchangers

To ensure the building has a healthy supply of fresh air whilst avoiding heat loss, heat recovery systems will be used throughout the building. These extract heat from stale air and use it to heat fresh air which will be supplied though vents around the building.

4.3 Sustainability - Increasing Renewable Energy Supply and Maximising its Effectiveness



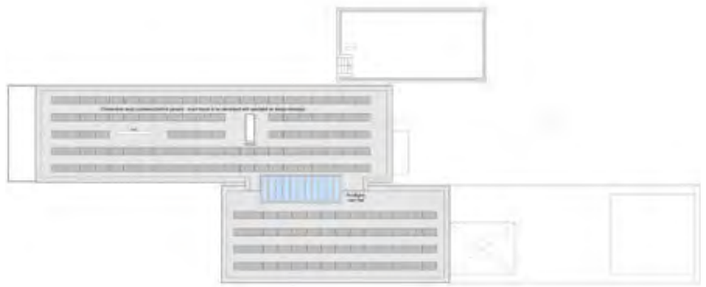


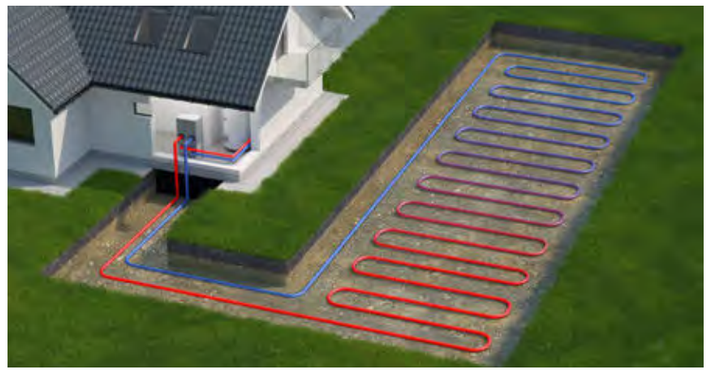
Be Green

'Be Green', as described in the Local Plan encourages the use of renewable technologies in order to offset carbon emissions and further reduce the building's impact on the environment. The project is seeking to become an exemlar in its use of renewables, and a drastic improvement on the existing house which relies on oil for heating and cooking. The new house will be all electric, allowing all power to be supplied through renewable energy, and a significant proportion by on-site generation from the photovoltaic panels which extend across most of the roof. On-site batteries will allow power generated to be stored for times when production is lower. Heating throughout the building will be supplied by a ground source heat pump.

Be Clean

'Be Clean', as described in the West Lancashire Local Plan encourages efficant energy supply by connecting to district heating networks or using cogeneration for efficient on-site energy production. Due to the site's isolated position and the lack of any district heating networks in the area this isn't possible, and efforts have therefore been focussed on the use of renewables and maximising their efficancy.





PV Array

Solar panels on top of the Heart House and South Block will provide renewable energy for much of the house. Any excess power will be able to be stored in batteries for use when there's no sun, or sold back to the grid to help decarbonise the power supply to other homes throughout the region.

Battery Storage

As the grid decarbonsises the key sustainability issue around electricity supply will be making most efficient use of power. On site battery storage will allow the house to store electricity generated by the solar panels during the day for supplying energy in the evenings and at night - reducing the houses reliance on the grid during peak times.

Ground Source Heat Pump

A ground source heat pump system will be installed underground in the garden, which will extract heat from the ground, even in freezing temperatures, and use this to provide the heat for the underfloor heating throughout the house. The system is also able to be reversed to allow the house to be cooled through renewables in the summer months.

All Electric Building

Unlike the existing house which uses oil for heating and cooking the new house will be all electric, allowing any additional electricity required to power the house to be sourced from a renewable tariff.

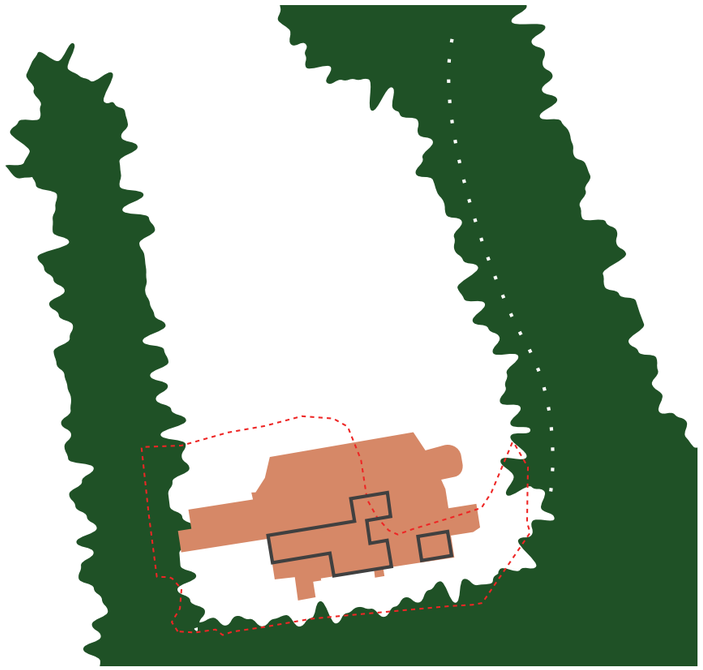
5.0 Landscape proposals

5.1 Landscape - Site Analysis

Site Analysis

The existing landscape of the site is predominantly amenity grassland with low ecological value, with semi natural woodland constrained to the east and west flanks. The southern area of the site, where the ground is highest is where the existing house and bungalow are located, along with various outbuildings. There are large expanses of hardstanding associated with the access road and turning circle in front of the house. An ornamental pond is also located in this area

The two plans below demonstrate the area of building curtilage of the existing site compared with the proposed. The area of the existing, including the buildings on site amounts to 5310m^2, compared with an area of 3060m^2, for the proposed scheme.



5.1 Landscape - Site Analysis

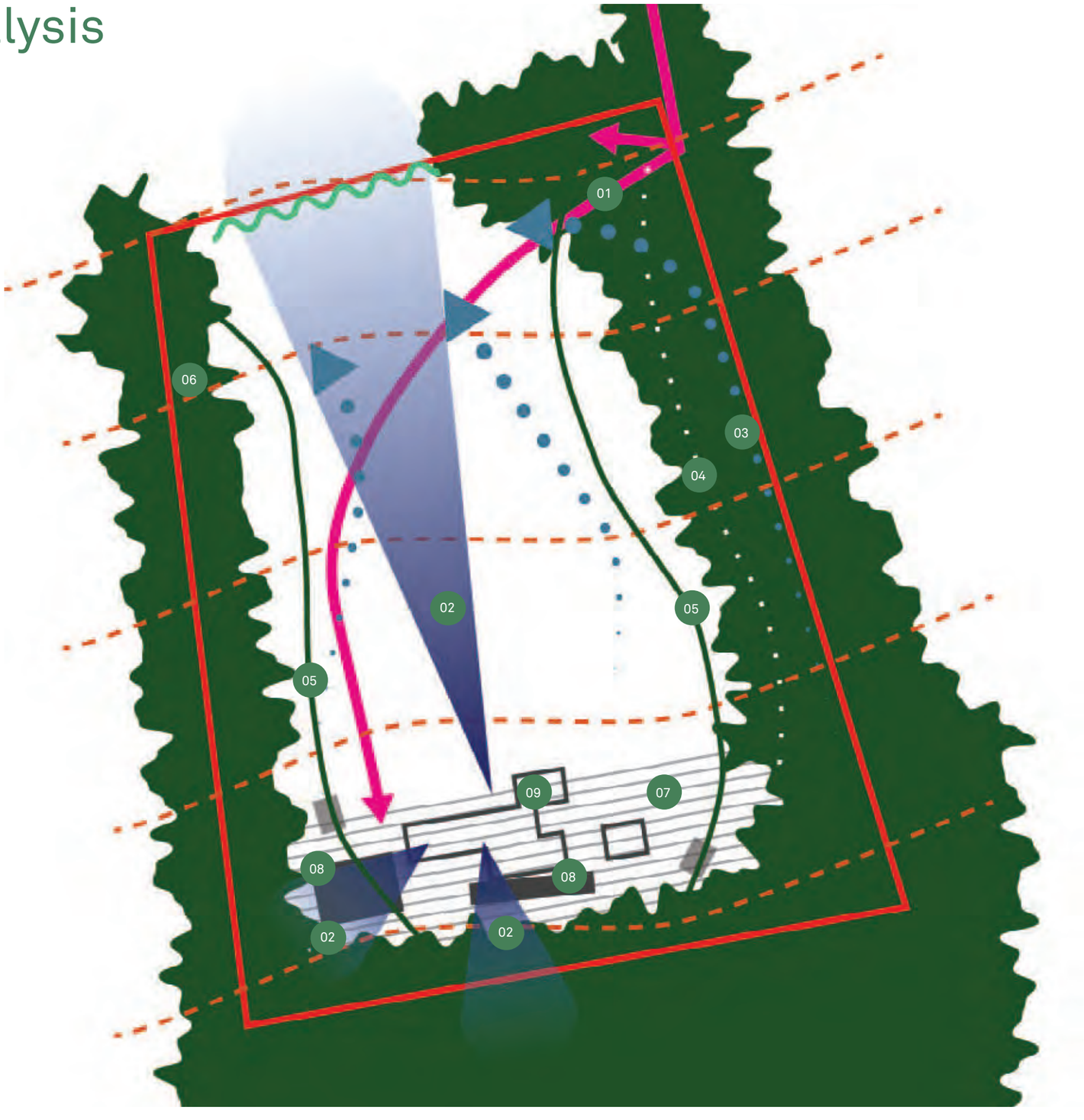
Site Analysis

01. Existing access road with shared access from Sanderson Lane
02. Key views: across countryside to the north, into woodland to the south
03. Ditches to east and west boundaries - opportunity to redirect water into the site
04. Existing route through eastern woodland edge
05. Opportunity to extend woodland character into the site, whist retaining views
06. Contours at 5m spacings, showing a 20m fall across the site from south to north
07. Southern part of site shaded by landform and woodland
08. Existing house and bungalow
09. Outline of proposed house

The existing site is full of potential, however the current property location fails to maximise the site assets. Through analysis of the existing site, the design has be tailored to make the most of the incredible setting whist taking account constraints of the existing site

The landscape proposals work with, and look to enhance the existing site assets as well as the proposed architectural design language. From this a series of strategic opportunities arise:

- Improving biodiversity, enhancing the woodland and reducing the proportion of hard landscape
- Cohesion with the proposed architecture with the landscape. Complementing the strong architectural forms whilst softening and screening the building and assimilating it into the landscape.
- Promoting sustainability through the irrigation strategy, choice of materials and providing space for food production.



5.2 Landscape - Vision

Landscape Vision

The transitions from formality to wildness can be drawn on all sides of the site and climax in both woodland and water meadow - two of the most prevalent naturally occurring landscape typologies in the area.

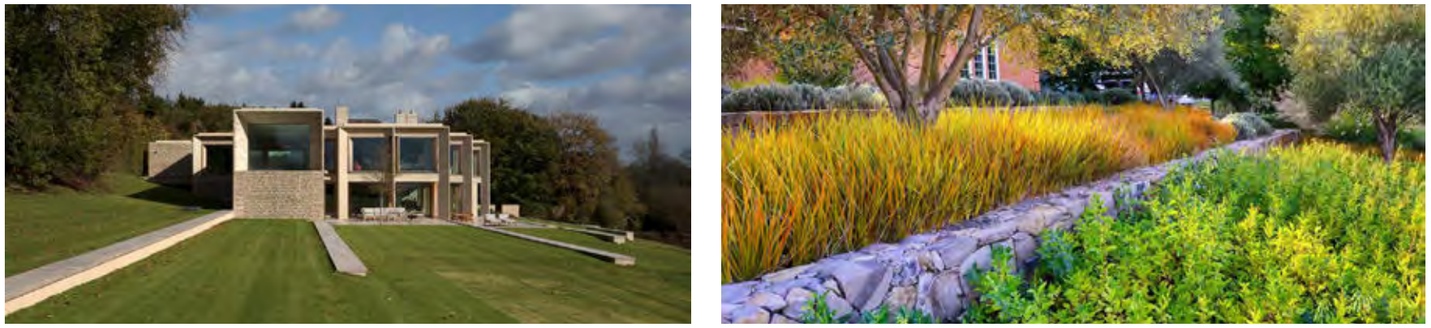
Both transitions take as the starting point a space central to the site, close to the house. The woodland transition moves through borders punctuated with ornamental trees, defining individual gardens, though routes running along the woodland edge and into the mature tree cover that wraps around the site. The transition to water meadow is as much a creation of management as design. Moving down the slope, the terraced lawns feather into meadow grassland and as rain water is directed to the low point of the site, a naturalistic, seasonally wet area is created. Through using these transitions as a key driver of the landscape design, strong ecological networks are created, increasing the biodiversity of the site and surrounding area.

The design of the landscape, especially around the building, takes reference from the strong geometry that is created by the three blocks. The tensions created by this language have been continued through the external spaces with a series of lines running from the building and defining key spaces within the landscape. This approach also serves to anchor the house within the landscape, and combined with softening through planting, and the building location,set into the slope, ensure that the house feel grounded and responds to its place.

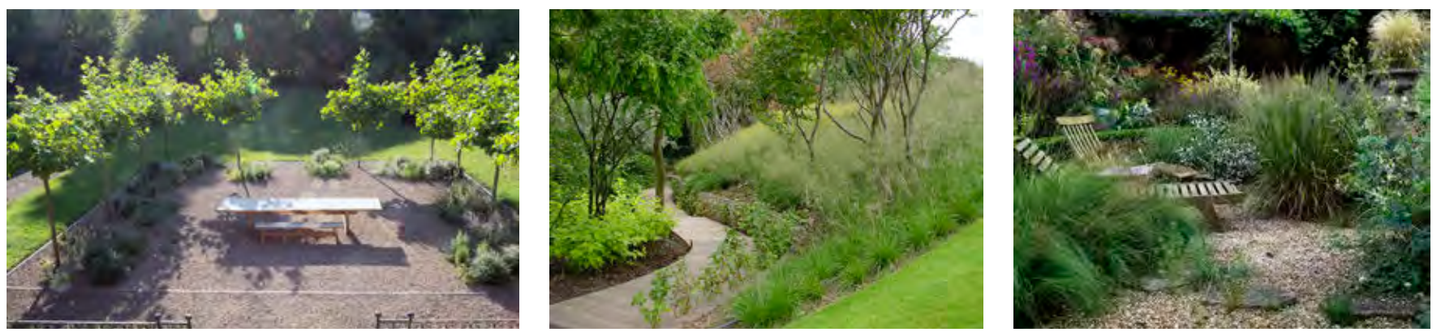
Additionally, the choice of materials within the landscape draws on those used for the house, with local stone used alongside natural materials such as timber. This aligns with the sustainability ambitions of the proposed development.

Planting plays a key role in softening the building but also as a way of defining the landscape spaces and their uses. Tree planting is proposed to extend the woodland into the gardens, reducing visibility of the house and assimilating the site into the surrounding woodland. Planting is also combined with landform to create a series of striking and seasonally variable gardens flowing from the house down the site.

—Gradual transitions into the surrounding landscape



—Strong lateral geometry and sustainable materials



—Planting and landform as tools to define spaces

5.3 Landscape Masterplan

Landscape Masterplan

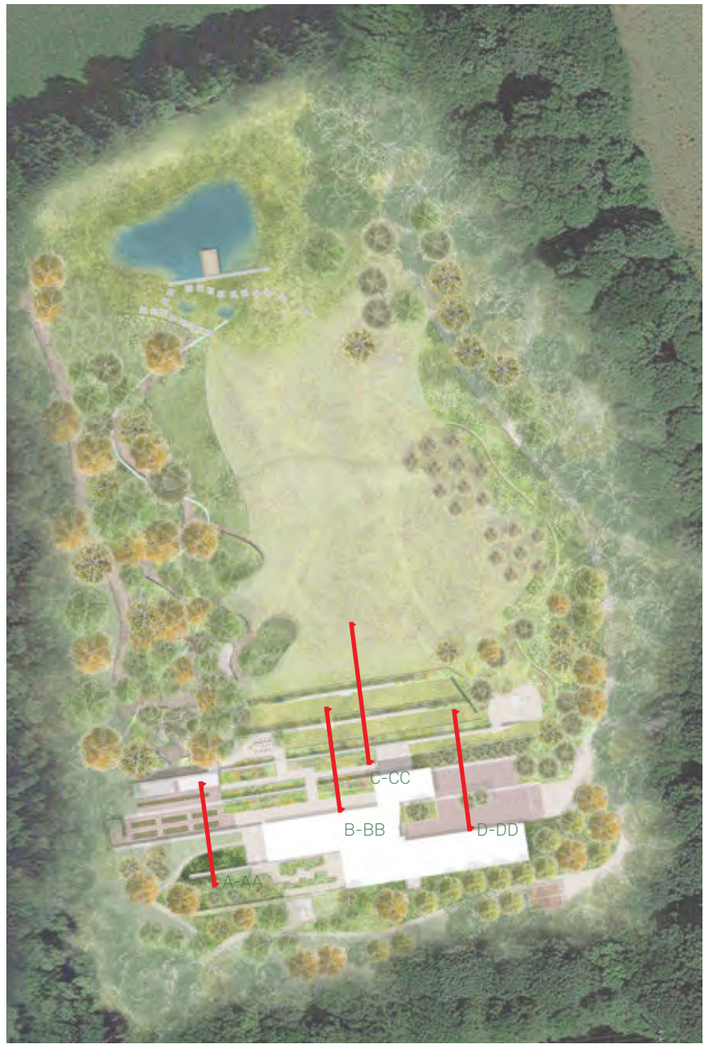
01. Wetland
02. Wildflower meadow
03. Orchard
04. Ornamental woodland
05. Secret garden
06. Kitchen garden
07. Terraced garden
08. Ornamental and productive gardens
09. Parterre
10. Arrival courtyard
11. Proposed access route
12. Evening terrace
13. Night garden
14. Woodland coppice garden

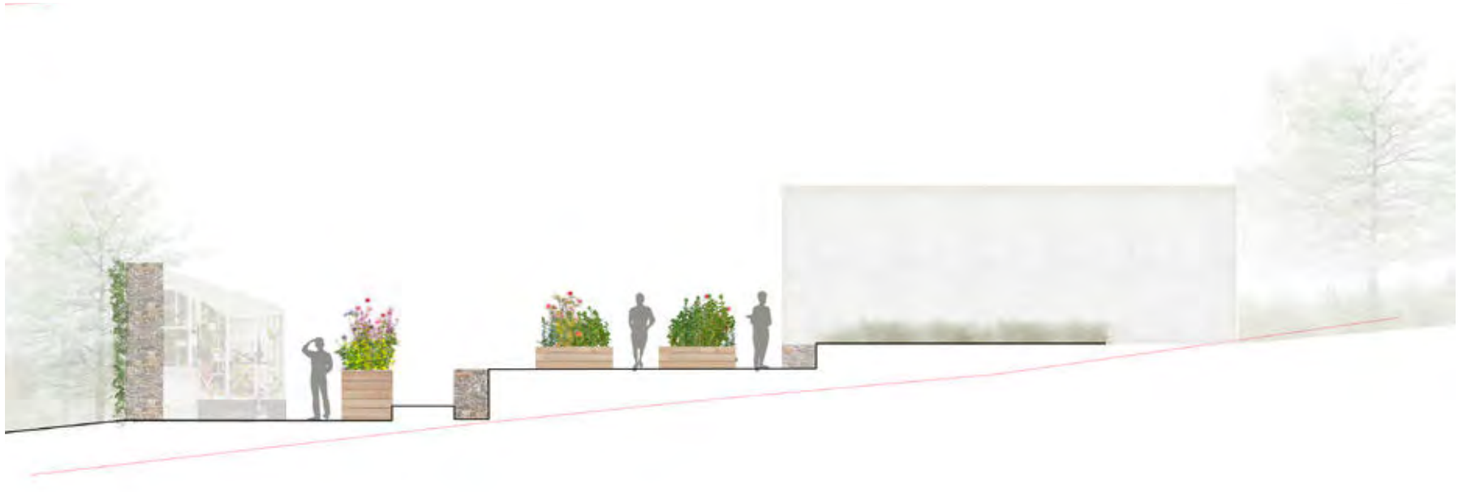
The proposed landscape masterplan looks to create a naturalistic and ecologically rich setting for the new house, and at the same time provide the client's with a series of garden spaces that are practical and accessible. The layout has been driven by the client's brief for a garden that is productive as well as beautiful and which responds to the unique site setting.

The garden spaces shown on the plan each carry forward the key principles of sustainability, increasing biodiversity and assimilating the building into the landscape.

5.4 Landscape - Sections

Illustrative Sections





—Section A-AA

Section A-AA cuts through the proposed kitchen garden. This space is located close to the house to allow ease of access. It is split over two levels with a ramped connection path. Raised beds are arranged throughout the kitchen garden for growing food, and two lean-to greenhouse structures are proposed on the south-facing garden wall that defines the northern edge of the kitchen garden. Tree planting to the northern side of this wall and its position, set down the slope from the house, means that it is concealed in views from the north.

—Section B-BB

Section B-BB cuts through the planted terraces that front the house. The design for this space deals with the 2m level change between the hallway FFL and the entertainment room FFL which is set at a lower level. A series of routes and spaces meander through the terraces with planting used to conceal the vertical elements of the terraces.

5.4 Landscape - Sections

Illustrative Sections

—Section C-CC

Section C-CC runs from the terrace directly to the north of the entertaining block through the terraced garden. It shows the sloping terraces with planting set between gently sloping areas of lawn. The stone bands that are set through the garden as a continuation of the architecture set the datum at the top of each of the planting slopes.

—Section D-DD

Section D-DD is taken through the arrival courtyard and the banked landscape to the north of this space. It shows an area of planting creating a turning circle within the entrance courtyard. Trees to the northern edge of the arrival courtyard screen views of the garage building and continue the woodland aesthetic into the site.

5.5 Landscape - Garden Spaces

Garden Spaces

Wetland

A wetland area that captures water running through the site and celebrates its dynamic and life-giving qualities

- Attenuates water running through the site, reducing pressure on the local water network in times of heavy rain
- Creates an area that is rich in biodiversity and connects to the wider green infrastructure network
- Provides areas for interaction with the water and for relaxing

Wildflower Meadow and Orchard

Naturalistic spaces that bring the wider landscape into the garden and attract a diverse range of wildlife

- The orchard includes a range of fruiting trees with an opportunity to take cuttings and graft from original orchard to provide continuity of varieties
- The meadow forms a the transition to the wider landscape. The species mix will be used to limit dominance of grasses and create a diverse and attractive meadow
- Paths and clearings allow the area to be used in a variety of ways and can be managed depending on use

Ornamental Woodland

An informal garden that grows from the existing wooded edge and introduces a range of ornamental trees and underplanting

- Creates a visually attractive space that changes with the seasons to provide year-round interest
- Incorporates informal routes that connect to the adjacent spaces and allow exploration
- Uses swoodland understorey planting including bulbs and ferns to further enhance the experience of walking through the woodland
- Introduces interesting and unusual tree species including both broad-leaf and coniferous species

Secret Garden

A series of gardens that borrow the shade and atmosphere of the mature trees to create spaces of tranquillity and intrigue.

- Creates a series of informal garden spaces using planting and landform to define and break up the space
- The individual gardens incorporate different but related themes including a zen space, a fernery and a moorland garden
- Introduces scattered ornamental trees and native woodland trees to transition from the terraced garden to the wooded edge
- Creates pockets with seating and the potential to include follies and art as things to be discovered.

5.5 Landscape - Garden Spaces

Garden Spaces

Kitchen Garden

A garden for nurturing, using timeless design interventions to create a space that celebrates productivity and seasonality

- Creates a practical and usable kitchen garden that provides sufficient room for growing food whilst being easy to manage.
- Utilises a garden wall and lean-to glass houses to allow year-round use as a garden to enjoy spending time in as well as a space for growing.
- Incorporates an irrigation system that collects rain water, controls watering and can be managed remotely
- Provides an area for composting and wood storage

Terraced Garden

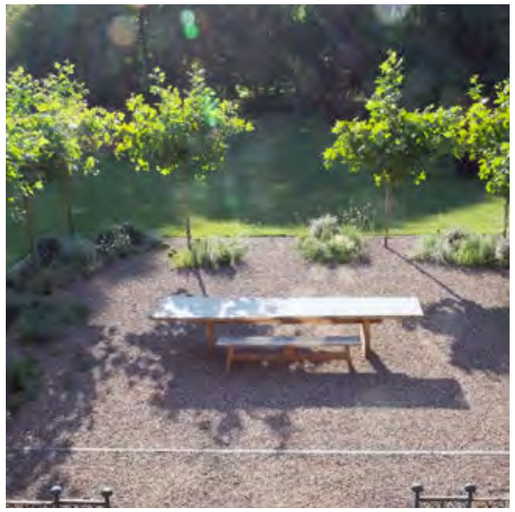
The terraced garden reconfigures the slope to create a series of flat spaces. The terraced lawns can accommodate games, and gatherings and transition from the parterre terrace to the meadow beyond

- Creates a legible and attractive starting point to explore the gardens
- Responds to the geometry of the house whilst facilitating the transition to the more informal wider gardens
- Uses planting to emphasise the direction of the view across the Lancashire Plain

Ornamental and Productive Gardens

A series of gardens that are both beautiful and practical with planting that provides interest throughout the year

- Creates a series of gardens that are attractive throughout the year for both people and wildlife
- Uses planting that provides a long season of flowering interest and is easy to manage through as once established.
- Creates places to sit within the gardens as well as informal spaces to discover whilst moving through them
- Uses planting that appeal to a range of senses including scented plants and incorporate planting that can be used in natural dyeing.



Parterre

Creating a connection between the house and landscape and providing space for entertaining, relaxing and dining

- Overcome the level transition between the house and the landscape through the continuation of form and materiality to tie these elements together
- Announces the view across the gardens and the landscape beyond
- Provides flexible space that can be used for entertaining as well as family gatherings
- Uses planting to soften the space and bring the landscape to the threshold of the house

5.5 Landscape - Garden Spaces

Garden Spaces

Arrival courtyard and access route

Enhance the arrival sequence through the creation of an access route that winds sensitively through woodland before emerging in a courtyard that responds to the house

- Minimises the impact on the woodland belt through design and construction of new access route
- Considers access for refuse, servicing and deliveries and design for easy management.
- Creates a courtyard space that ties together the house and the landscape setting.
- Uses planting to screen the garage block from the north and to conceal views, before entering the house.

Evening Terrace

Intimate terraced spaces that bleed into the surrounding woodland and provide space for sanctuary and respite throughout the day and particularly in the evening

- Provides external spaces that connect the house with the woods to the south
- Allows for a range of activities from evening entertaining to solo respite.
- Uses planting that takes inspiration from the woodland setting and immerses the spa into the woodland landscape
- Provides connections into the moon and woodland gardens to the rear of the house.

Night garden and woodland coppice

Garden spaces that celebrate the woods of Harrock Hill and bring their character into the site

- Creates a set of gardens that enhance the southern woodland boundary of the site and draw the woods towards the house
- Uses the existing levels to create playful spaces with numerous routes passing through the gardens
- Provides spaces for relaxing in the woodland setting and use the existing trees as points of interest
- Introduces planting that can be used productively from hazel coppicing to shrubs for wreath making and foraging.

5.6 Landscape - Materials

Materials Strategy

Materials have been selected prioritising sustainability, with local natural stone proposed to the areas around the house. This material choice will correspond with the materiality of the building, tying the house and landscape together. Within the wider gardens, softer, permeable materials including compacted gravel and timber are proposed to ensure the proposals minimise the impact on the landscape.

01. Natural stone flag paving

02. Natural stone sett paving

03. Compacted gravel surface

04. Natural stone paving band

05. Timber deck

06. Natural stone wall

5.7 Landscape - Tree Planting

Tree Planting Strategy

The tree selection looks to maximise the biodiversity value of the site and create a dynamic, seasonally varied setting to the development. The woodland belts to the east and west of the garden will be enhanced and extended, with trees used to screen the built form of the garage. Trees have been selected based on their location within the garden and use potential, with orchard trees and hazel for coppicing proposed as part of the scheme.

01. Waterside trees -
Salix spp; *Alnus* spp; *Taxodium* spp

02. Ornamental woodland trees -
Sorbus spp; *Acer* spp; *Pinus* spp

03. Orchard trees -
Malus spp; *Pyrus* spp; *Prunus* spp

04. Woodland edge trees -
Crataegus spp; *Carpinus* spp; *Ilex* spp

05. Feature Trees -
Halesia spp; *Neoshirakia* spp; *Acer* spp

06. Woodland Coppice trees -
Corylus spp; Alnus spp; Betula spp

Natural, local stone will be used throughout the landscape design, echoing its use across many local buildings and tying into its use across the facades.

6.0 Access

6.1 Access

Site Access

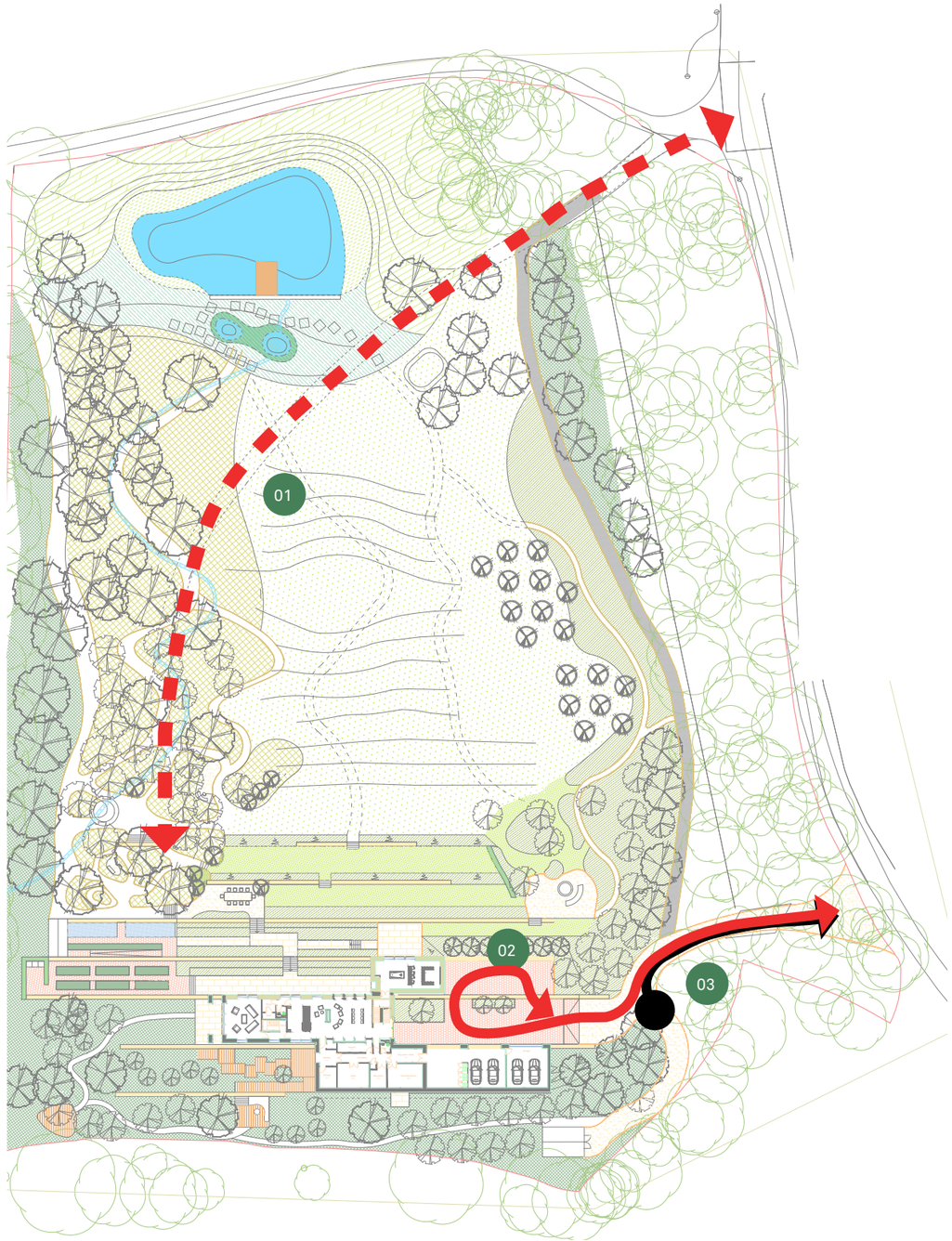
A new vehicular access is proposed from Sanderson Lane in the south east corner of the site to replace the shared access with the neighbouring property in the north east corner (shown dashed).

This is beneficial as it provides the client with an independant access without having to pass over their neighbour's land which is the case with the current access proposals.

It also removes the need for a lengthly access route running centrally up the hill reducing the area of hardstanding within the site. A pedestrian access will be retained in the north east of the site.

The new access road has been designed to minimise the impact on the existing trees within the woodland that runs along the eastern site boundary. Any areas of hard surfacing within the RPAs of existing trees would be formed using a no-dig construction methodology. Further information on this is provided within the Arboricultural Impact Assessment that accompanies this application

Bin, service and delivery access (shown in black) will be provided from the main access point. A turning point is provided to the east of the arrival courtyard to allow these vehicles to turn prior to reaching the arrival courtyard.



01. Existing access road with shared access from Sanderson Lane
02. Proposed access road terminating in arrival courtyard
03. Delivery and refuse access, turning before reaching the arrival courtyard

Car Parking

The rural location means car is main form of transport. To reduce their carbon emissions our clients main vehicle is a Tesla, and the proposal accommodates 2 electric car charging bays to futureproof for a second electric vehicle. In total the proposal provides 4 car parking spaces plus overflow for at least 6 others around turning circle and access road.

Active Transport

To help facilitate and encourage active transport (cycling and walking) wherever possible, the proposal includes an indoor bike wash and store. This will allow our clients to easily wash their bikes down when returning from cycle rides, and the ability to securely store their bikes indoors to keep them in good condition.

Garden Circulation

The terraces around the house have will all be accessed from level thresholds with the building, helping futureproof the garden for wheelchair or frail users. Whilst the wider site contains significant level changes from north to south, the landscape design has been developed with alternative ramped access routes wherever steps are provided. As well as facilitating appropriate wheelbarrow and lawnmower access for maintenance, these routes also help futureproof the garden for those unable or less able to navigate steps.

Internal Access

Upon arrival at the house, the internal layout has been developed to allow easy movement throughout the building, with potential to adapt the house to allow wheelchair access to the upper floors if required at a later date.

Level access is provided from the car parking bays to the front door, with a level threshold entering at a level which runs consistently across the ground floor of both the Heart House and South Block. Corridors have been avoided through much of the ground floor, with the primary circulation running from room to room with generous door openings sized to easily be able to accommodate a wheelchair. Where corridors have been used these are also sized to easily accommodate wheelchairs. The lounge to the west of the heart house has the ability to be easily converted to a bedroom if required at short notice, whilst a soft spot in the floor between the utility room and gym will allow the easy installation of a lift to first floor should this be required at a later date. The first floor level remains consistent throughout the building, allowing this lift to serve the whole of the floor. Additional measures including a laundry chute from first floor to the laundry room have also been implemented to reduce the risk of falls.

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