

TAHRAH, Maxwell Road, Arundel

Design and Access Statement

Background

Tahrah is situated at the corner of Maxwell Road and Ford Road, Arundel. It is a 3 bedroom single storey cottage and built around 1932 with later additions. It is constructed of brick cavity walls and predominantly clay tiled roof (with a number of lead roof extensions). The cottage is planned in an L-shaped layout and sits fairly central on its plot (see 1:1250 Location Plan), with garden areas to rear (north-west) and front (south). High hedges separate it from the adjoining property (2 Maxwell Road) to the north-west and Maxwell Road to the west (see photo ref.). Low timber fencing separates it from the adjoining property (72 Ford Road) to the east and north-east, whilst lower hedges separate it from Maxwell Road and Ford Road to the south-west, south and south-east respectively. Ford Road is a fairly busy road particularly during rush hours, whereas Maxwell Road is fairly quiet. Maxwell Road is relatively steep rising up north-westwards from Ford Road and the flood meadows (River Arun) further to the south.

The adjoining property (72 Ford Road) is of brick and white/yellow painted, rendered walls and tiled roof construction of similar pitch to Tahrah. It has been enlarged in the recent past making it into 2 semi-detached properties with an enlarged roof volume providing upper level accommodation with dormer windows. The ridge line is therefore higher than Tahrah. It also has a large parking area to the front (see photo ref.).

The adjoining property to the north-west (2 Maxwell Road) is a 2 storey property, set on a slightly higher contour as it is further up the hill. Its construction is a combination of timber cladding, brick walls and tiled roof with a steeper roof pitch than Tahrah, making the ridge line significantly higher than Tahrah and providing upper level accommodation (see photo ref.). There are no roof windows on the upper level of the south-eastern elevation overlooking Tahrah, and the tall hedges which provide privacy to both properties prevents any views to the south-east. This hedge also provides screening from the properties car parking area. Properties further up Maxwell Road have progressively higher roof ridge lines and comprise a wide mix of constructions and wall/roof materials (see photo ref.).

The property directly opposite across Maxwell Road and to the south-west (76 Ford Road) is a true 2 storey brick and tiled roof property, again making the ridge line considerably higher than Tahrah. It is set slightly in from Maxwell Road, with only a bathroom window facing Tahrah (see photo ref.). There are no properties to the south which provide uninterrupted views toward the River Arun and its flood meadows looking across Ford Road.

New Planning Application Introduction

This new planning application is a direct response to the current context that the property (and family home) finds itself.

A combination of;

- Site conditions
- Original construction
- Building Regulations and Building Control advice (causing negative impacts from improved insulation and radon protection recommendations)
- Flood level advice from the Environment Agency.

has meant that the property has had repeated incidents of damp, wet and dry rot – and is potentially susceptible to flood damage because of the increased risk from higher anticipated flood levels as published and advised by the Environment Agency.

It goes without saying that this combination of factors means that the value and living conditions of the property are significantly compromised.

The combination of all these factors therefore means that a comprehensive adaptation of the substructure/ground floor construction is urgently required in order to provide future resilience and eradication of the above conditions.

The existing substructure/new ground floor naturally influences the new super-structure, therefore the content of this new planning application is a result of all these factors being taken into account.

Anticipated Flood Levels

The Environment Agency carried out a study and provided information (see MF1) on our behalf which established a number of flood level frequency statistical measurements (specific to our property) - and we were advised that a 1 in 200 year flood event suggests that the finished ground floor level would need to be set at **3.310mAOD** (which includes an advised 300mm freeboard allowance – taking into account the likely construction above that flood level and/or any wash from emergency vehicle/personnel attendance) to adequately resist such an event.

Other resilience improving measures were also recommended to be incorporated into the sub-structure (ie. air brick covers, etc.)

The property is also a bungalow (unlike all the neighbouring properties) and therefore does not provide an upper level sanctuary should such a flood event occur.

The current ground floor level which is set at **+2.955mAOD** (795mm above the benchmarked pavement located ground marker stud @ +2.160mAOD *tbc*). is therefore insufficient to resist a 1 in 200 year flood event.

Which means that we have been advised to raise the current ground floor level by a minimum of **355mm**

Indeed, according to the Environment Agency model the current ground floor level would not resist a 1 in 20 year flood event which requires an equivalent ground floor level of **+3.080mAOD**

And completing the equivalent metrics provided by the Environment Agency – in order to resist a 1 in 1000 year flood event the ground level would need to be raised to **+3.390m AOD** meaning raising the ground floor level by **435mm**

The 1 in 200 year event level is regarded as an acceptable criteria for construction and insurability – but for the sake of an extra 80mm we have decided to provide the 1 in 1000 year event level.

The 1 in 200 year (with climate change sensitisation) suggests a higher level – but we are advised that this is not necessary.

Therefore the following design proposals are predicated on this advised finished ground floor level of **+3.390m AOD**.

Foundations and Sub-Structure

The existing substructure comprises a hybrid of;

- The original trench footings to the north part of the property (1930's)
- Remedial piles and slab – installed to underpin the southern area of the property (1988)
- Piles and ground beams – installed as part of the previous extension works (2007)

These foundations appear to be showing no sign of problems regards movement and/or subsequent settlement. However, any future works need to carefully consider the possibility of avoiding any increased loads and/or concentrated load distribution onto the existing foundations.

The original ground floor construction up to DPC level was originally constructed of T+G timber boarding on timber joists. Originally uninsulated and with no radon membrane separation. The timber joists are supported on independent sleeper walls and separate from the external cavity wall construction. All 3 leaves of construction are constructed from dense block or brick and are located on common trench footings.

The sub-structure, in the later adapted parts consists of brick and dense block cavity wall construction and sleeper walls – all of which is supported on a pile and slab RC construction. This supports a T+G boarded floor and timber joists.

The sub-structure in the latest parts consists of brick and lightweight block cavity wall construction – all of which is supported on a pile and ground beam RC construction. This has a partially insulated timber floor construction (where it adjoins the existing/original building) and a PC beam and block floor construction where the new pile and ground beams are located.

Construction Strategy

The construction strategy is to remove the entire existing super-structure (roof, ceilings, walls and floors down to a level which provides the bearing level and DPC level for a new ground floor level of **+3.390m AOD** to be constructed upon the existing prepared construction.

By raising the ground floor beyond the flood risk level not only will it increase the void below the floor - which in addition to incorporating a comprehensive network of air flow openings across the whole sub-floor environment – it will significantly improve ventilation in and across the floor void helping to both remove the risk of damp/stagnant pockets of air and any radon accumulation as well.

A new PC beam+block floor (incorporating DPM, insulation and a lightweight screed) will then be installed across the whole property at the new level. This will provide a resilience to any radon ingress and damp/wet/dry rot issues.

However, this new PC beam+block floor construction is inherently heavier than the existing timber floor construction being replaced.

Calculations have been carried out to ascertain the increase in loads directly from this new floor construction and the resultant rise (435mm) in the overall super-structure levels.

This information allows us to calculate and develop a design and implementation strategy by offsetting the removed heavier existing wall and roof construction above the new ground floor level – against a new lighter super-structure being imposed.

These calculations suggest that the combination of removing the;

- Dense block internal walls,
- Dense block and brick external cavity walls,
- Dense block and brick sleeper walls
- Timber ground floor construction
- The pitched concrete roof tiles with its timber structure

And then rebuilding the super-structure using;

- Lighter internal block walls,
- Lighter thermal block cavity external walls and insulation,
- A slatted cedar/oak timber panelled cladding/external finish
- A flat roof construction where the existing foundations are most susceptible to any changes in the loading
- A reinstatement of the existing pitched tiled roof where the piled foundations are designed to carry such loads

This strategy will provide the necessary balancing of existing construction load removal and new construction load imposition.

This lighter weight construction strategy will also provide superior performance in terms of energy efficiency to meet current and future Building Regulation criteria.

Drainage and Sanitation

Other benefits also derive from raising the existing floor level. The current property drainage systems do not have enough distance/fall to allow flexibility in location of sanitation provision which means that currently there is a hybrid of gravity and pumped (Saniflo) systems. This is restrictive and is an inevitable on-going maintenance issue.

However, the additional height provided by raising the floor level allows adequate gravity falls across the whole property thereby providing flexibility in locating bathroom, kitchen and utility appliances with easy access for maintenance.

Super-Structure Footprint

The new super-structure external wall layout predominantly adheres to the existing footprint, except where;

- We have removed the curved window projection to Bedroom 2.

**An increased projection in this location was already approved in the previous permission – which we did not implement and are not proposing to complete in this application either.*

The resultant decrease in permitted construction footprint from these reductions is 3.1sqm

The resultant increase in landscape construction footprint (external area) due to the need for access landings, stepped ramps and steps to access the new raised floor level from all entry points is 7.0sqm

Super-Structure Envelope - Walls

The strategic approach to the specifying/building of the external walls follows the same philosophical approach of utilising lower weight construction for the new walls in order to balance the increased weight from the raised wall heights and the new floors.

Using higher thermal performance - but lighter - blockwork with cavity insulation with slatted cedar/oak timber panels will compensate for the increased loads.

(see picture references regards quality and appearance intended)

Super-Structure Envelope - Roof(s)

The strategic approach to the specifying/building of the roof(s) follows the same philosophical approach of utilising lower weight construction for the new roof(s) in order to balance the increased weight from the raised wall heights and the new floors.

Using high performance thermal roof construction to create a warm deck flat roof will create a smaller (physical and visual) volume of built form which will reduce the visual impact and compensate for the increased loads.

(see picture references regards quality and appearance intended)

Super-Structure Envelope - Doors and Windows

The strategic approach to the specifying/building of the windows and doors follows the same philosophical approach of utilising lower weight construction for the new facades in order to balance the increased weight from the raised wall heights and the new floors.

Using high performance windows and doors will allow optimal areas of natural light and ventilation (aligned with Building Regulations standards) whilst reducing the weight of the overall facade which will compensate for the increased loads.

The new design locates areas of glazing which relate to the orientation, room uses and views into the garden areas and/or beyond.

(see picture references regards quality and appearance intended)

Super-Structure Internal Arrangement

The strategic approach to the specifying/building of the internal walls follows the same philosophical approach of utilising lower weight construction for the new walls in order to balance the increased weight from the raised wall heights and the new floors.

Using higher performance - but lighter blockwork - will compensate for the increased loads.

The internal walls roughly follow the current arrangement but where the walls are non-loadbearing their locations can be more flexible. The loadbearing walls follow the roof configurations and existing foundation positions.

Rainwater Drainage

The philosophy for rainwater harvesting is important to the overall project and is achieved by providing an ascertained volume of rainwater collection capacity/facilities strategically located at the outfall/discharge points from the roof(s).

The aim is to minimise the volume of discharge into the mains drainage system by storing the optimum volume of rainwater on-site in order to irrigate the surrounding landscape and replenish the ponds. Existing main drainage locations will be retained also but used only to discharge rainwater in the unlikely event of the new ascertained volume of harvested water exceeding the storage capacity.

Building Envelope – Visual and Physical Impact

As the ground floor level will need to rise by 435mm (approximately 6 courses of brickwork) this will mean that if we replicated the current built form with its current ceiling heights (2.4m), pitched roofs, hips, valleys and overhanging eaves - it will have a degree of visual and physical impact;

- On our neighbours to the east – 72 Ford Road (which has the closest boundary).
 - However, the massing and arrangement of the proposed flat roofs actually reduces the "overall" visual impact, shadow profile and envelope silhouette that is imposed currently by the existing pitched tiled roof. However, at the

near boundary location the new envelope is higher by approx. 300mm and 435mm.

- The new ridge line of the reinstated pitched roof is 985mm higher but is located significantly further away than the removed existing pitched roofs – therefore the sightlines are improved.
- There are no openings present at the lower level on the adjacent property's ground floor elevation, only a gas boiler flue – and the roof window which opens from their roof line at first floor level is above the proposed works directly adjacent – and therefore the proposed works will have a reduced visual impact than is created currently by the ridge line of the existing pitched tiled roof.
- On our neighbours to the north – 2 Maxwell Road (but only if the high hedge were removed).
 - The ridge line of the reinstated new pitched tiled roof will be higher by 985mm however the closest of the existing “dual pitched” roof wings is being removed being replaced by the proposed flat roofs and therefore this will have a negligible (if not reduced) visual and envelope silhouette impact.
- On the south and west boundary's the impact will be negligible as they are both road facing boundaries.
 - The ridge line of the reinstated new pitched tiled roof will be higher by 985mm however as one of the existing “dual pitched” roof wings is being removed and being replaced by the proposed flat roof this will have a reductive visual and envelope silhouette impact viewed from Maxwell Road and the properties adjacent – which are also predominantly screened by the high hedge.
 - Similarly, the envelope silhouette from Ford Road - from the pavement is higher by 985mm but its impacts will be negligible. Even more so, the envelope silhouette from the distant vantage point on the river embankment pathway will be negligible.

Planning Application Drawing Register

Photo Images

VP 1 Existing long distance view from south

VP 2 Existing view from south west

VP 3 Existing view from west

VP 4 Existing view from north west

VP 5 Existing view from east

VP 6 Existing view from south

Other Images

MF 1 Modelled Flood Depths and Levels

Proposed Works Drawings

AB 1 Ground Floor Plan (1:50)

AB 2 Roof Plan (1:50)

AB 3 South Elevation (1:50)

AB 4 East Elevation (1:50)

AB 5 North Elevation (1:50)

AB 6 West Elevation (1:50)

AB 7 Section A-A (1:50)

AB 8 Section B-B (1:50)

AB 9 Section C-C (1:50)

AB 10 Section D-D (1:50)

AB 11 Section E-E (1:50)

AB 12 Section F-F (1:50)

AB 13 Site Plan/Location Plan (1:200/1:1250)

AB 14 Section D-D (Adjacent Property Relationship) (1:50)

AB 15 Section C-C (Adjacent Property Relationship) (1:50)

Proposed Images

PVP 1 Proposed Viewpoint

Existing Plans/Sections/Elevations Drawings

EP 1 Site Plan/Location Plan (1:200/1:1250)

EP 2 Ground Floor Plan (1:50)

EP 3 West Elevation (1:50)

EP 4 South Elevation (1:50)

EP 5 North Elevation (1:50)

EP 6 East Elevation (1:50)

EP 7 Section A-A (1:50)

EP 8 Section B-B + C-C (1:50)

EP 9 Section D-D (1:50)

EP 10 Section E-E (1:50)

EP 11 Section F-F (1:50)

Precedent Reference/Examples Images

PR 1 External Timber Façade

Outline Construction Specification Notes

Note 1

Reinstatement of the existing pitched roof – at the higher level (+985mm approx.)

Concrete tiles (plain, eaves, ridge, gable, etc.), battens, breather membrane underlay/felt, timber rafters, purlins, struts, etc.

Eaves fascia to conceal guttering.

Gable overhang detail formed with aluminium tray

Note 2

Lightweight block cavity wall with full width cavity insulation.

Internal skin to receive 12mm plaster.

External skin to receive bitumastic paint finish.

Weep holes to be incorporated above window lintols/trays

Treated timber vertical battens at 600mm c/c and dressed around new window/door openings and wall returns.

Oak/Red Cedar/Sweet Chestnut/Larch (to be decided) boarding fixed to vertical battens. Boards to be spaced with 10mm gaps between each – except at eaves and base level where boards to be butt joined.

Guttering and RWP's to be located/concealed behind timber boarding.

Boarding to extend above eaves level to conceal flat roof behind.

Boarding to finish at render level at base.

Note 3

Existing brickwork and new blockwork below new DPC level to be prepared and receive waterproof render.

Additional airbricks to be incorporated.

Weep holes to be incorporated at appropriate c/c above new DPC/Floor Tray.

Note 4

Timber porch formed from polycarbonate sheeting laid/fixed over Oak/Red Cedar/Sweet Chestnut/Larch (to be decided) boarding to match external timber boarding.

Porch to be dressed over top of adjoining wall.

Porch to be supported on timber posts.

Note 5

Timber decking and steps on steel framing/supports.

Balustrading comprising steel uprights and horizontal cables at appropriate c/c.

Steel and timber handrail.

Note 6

Aluminium windows to be flush fixed to external wall finish.

Note 7

Doors to be flushed fixed to external wall finish.

Note 8

External blockwork skin to extend to fill gable end.

Blockwork to receive bitumastic paint finish.

Treated timber vertical battens at 600mm c/c. and forming triangular template to roof pitch.

Oak/Red Cedar/Sweet Chestnut/Larch (to be decided) boarding fixed to vertical battens and dressed into triangular template to roof pitch. Boards to be spaced with 10mm gaps between each.

Note 9

Wood burner flues to extend to appropriate distance above roof line.

Roof finish to be dressed around flue appropriately.

Note 10

Multiple water harvesting butts linked together to provide adequate/ascertained storage capacity.

Note 11

Flat roof (warm deck) construction comprises;

EDPM membrane bonded over ply faced insulation/vapour barrier.

Insulation secured to timber firings/noggins to provide adequate falls.

Timber joists strapped to external walls.

Plasterboard ceiling fixed to joists/noggins and plaster skim finished.

EDPM membrane dressed over eaves and gables and into guttering.

Note 12

Floor construction comprises;

Lightweight self-levelling screed poured over prepared insulation.

Self-supporting insulation (proprietary system such as Tetris) laid into PC Beams and prepared to receive screed.

PC Beams laid over DPC at appropriate c/c.

Floor trays dressed over/into external wall.

Services holes and other penetrations to be prepared and sealed.

Internal walls to be located and additional support incorporated.

Note 13

Wood burners located on appropriate floor finish and flues secured to wall/ceiling and dressed through ceiling/roof finish.

Note 14

Sun-pipes providing natural light and ventilation located and dressed through ceiling/roof finish.