

DESIGN AND ACCESS STATEMENT

Proposal: **REPLACEMENT DWELLINGHOUSE**
At: **The Croft, Moor Bottom, Heath Hill Road, Halifax, HX2 7SX**
Applicant: **Anthony Patrick O'Leary**

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Appendix 1 - Volume Calculations

1. Surroundings of the existing site

"The Croft" is a single storey two-bed detached dwelling situated on a steeply sloping site with a group of buildings known as "Moor Bottom". Moor Bottom was originally a farm but was used from 1896 to 1926 as an isolation hospital for scarlet fever patients, and is now a small hamlet comprising 4 dwellings and various outbuildings. The nearest listed building is "Boothstead", 230 metres away.

Moor Bottom is accessed via a definitive bridleway (09/49/77) from Heath Hill Road, and is surrounded entirely by working farmland, used for dairy livestock, and some sheep. The site is in the Green Belt and on the edge of a Special Landscape Area.

The following photographs show "The Croft" and its surroundings;



Fig 1: Aerial view showing "The Croft" in the context of the other buildings at the hamlet of Moor Bottom. The Croft is to the south-east with the bright metal roof, numbers 1 and 2 are in the most southerly of the large buildings, and number 3 is the northerly of the large buildings. Number 3 has only recently been given planning permission for use as a dwelling, after many years of lying derelict. To the east of the large buildings there is a large detached garage, and to the west there are various outbuildings and stables. The site as a whole resembles a farm complex similar to the neighbouring farm properties of Boothstead and Oldfields. The rougher looking land to the east is a steep hillside.



Fig 2: Aerial view showing a wider view. The hamlet of Moor bottom is at No.1, and the other properties are: 2 Boothstead, 3 Wild Acres, 4 Oldfields Farm, 5 Little Town, 6 Craven Hole, 7 Causeway Farm, 8 Raw End Cottage, and Raw End Barn. Heath Hill Road runs north-south just right of centre.



Fig 3: Photograph taken from the access lane to Boothstead, looking North-North-East. The Croft is just above dead centre but is almost entirely invisible. Note: the building just to the left of centre with a white roof is the garage of 2 Moor Bottom. Numbers 1 and 2 are to the left of that.



Fig 4: Photograph from the bridleway facing South-East. The existing "Croft" dwelling is at the higher level in the centre of the image. The building in the centre foreground is a detached garage/workshop belonging to number 2 Moor Bottom, and to the right is the gable wall of number 2 Moor Bottom.



Fig 5: Photograph of The Croft (centre of image) from the bridleway facing North, taken in winter. Numbers 1 and 2 Moor Bottom can be seen to the left of the image.



Fig 6: Photograph taken from Heath Hill Road using a telephoto lens. The Croft is 450 metres away in the centre of the image and the building and car just visible in the foreground is called Wild Acres.

2. The existing building and its site

The site "planning unit" consists of an area of 520 square metres adjacent to the bridleway. More land is owned by the applicant to the east and south of the site, totalling 2536 sq.m (0.25 hectares).

The existing two-bedroom building was constructed in 2017 and consists of a 34 x 12 ft mobile home with concrete foundations and permanent steel ground fixings and with masonry extensions to the east and north aspects. The building and its curtilage were granted legal status as a permanent dwelling in August 2023 by way of a Lawful Development Certificate. It has provided an adequate home for the applicants for the last 7 years but they feel that as they are now entering retirement, it will be wholly unsuitable for their future. The layout, the room sizes, the narrow passages, and the low ceiling are a problem, especially if the applicants suffer from any reduced mobility in future. They want to plan now for a dwelling that is fully adapted for wheel chairs and other mobility aids.

In addition, the carbon footprint of the dwelling is terrible. Whilst it does benefit from good double glazing, there is little to no insulation in the walls, roof, or floor. In addition, all the heating, hot water, and cooking energy comes from fossil fuels, in the form of red diesel, bottled gas, and wood logs. Particulate pollution is also created by the use of diesel oil and wood, creating a health risk to the occupants and neighbours. Despite the heating, and good ventilation, the applicants still have terrible problems with condensation in the winter and the resulting black mould, another health risk. Another major issue is the waste treatment. The applicants have achieved some success using a worm composting system, but it is difficult and time-consuming to maintain, and they have regular failures. A modern small packaged sewage treatment plant is urgently required.

The following photographs show the existing building and its immediate site;



Fig 7: Photograph of the building from the north end. The modern bungalow called "Wild Acres" can be seen in the distance to the top left.

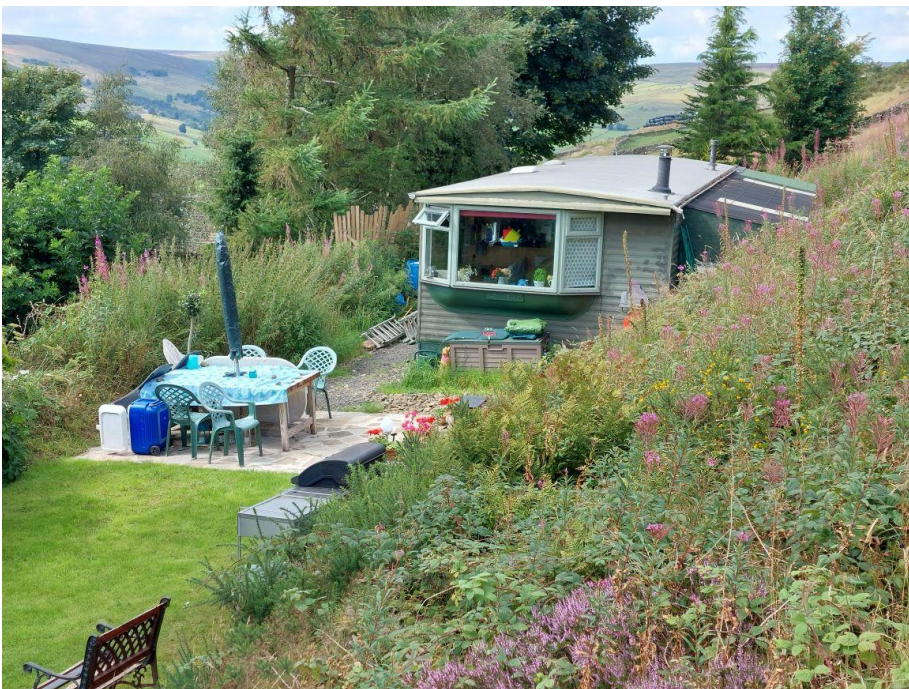


Fig 8: Photograph of the building from the south end. Note how little visibility there is of the nearest neighbours at numbers 1 and 2. The roof is just visible between the trees.



Fig 9: Photograph taken from the bridleway facing east and looking up at about 45 degrees. This was taken in 2017 before the various trees and shrubs grew to their current size. Note that if a sloping roof was added to the top of this building it would not be visible from here on the bridleway.

3. Landscaping and Screening

As can be seen from the previous photographs, the existing structure is very well screened, and hardly visible to anyone. The screening takes two forms, firstly the topography of the landscape, and secondly the trees and other plantings.

The topography of the site is that of a terrace cut into the steep hillside. The building is tight in to the hillside at the back of this terrace. The rest of the terrace provides the garden and exterior curtilage to the dwelling. This steep hillside blocks "The Croft" from any visibility from the north-west and clockwise around to the south-south-east. In addition, the elevation of the dwelling above the bridleway combined with the tree cover ensures the building and its curtilage is virtually invisible from the remaining southerly and westerly aspects and also to passers-by on the bridleway, especially when combined with the small additional banking along the front of the building.

The western edge of the site has a long row of mature trees and shrubs growing on the banking separating the site from the bridleway. These are of mixed heights and types and do an excellent job of screening the dwelling. Many of them are coniferous or evergreen, so the screen remains reasonably effective even in winter. The intention is to retain and manage this screening throughout and after the proposed development, and add to it where necessary.

The only properties within 1200 metres or so that have line of site to the The Croft are those numbered 2, 3, 5, 6, 7, 8 on Fig.2 which all lie in a band to the south/south-west. Those properties however, are at a lower altitude, and this means that the tree cover and front banking are even more effective at screening the property. See Fig 3, which was taken from roughly where the number "6" is on Fig.2. The nearest classified highway is Heath Hill Road. The nearest point on the road that gives visibility of "The Croft" is 450 metres away (see Fig.6).

During the last seven years there have been no complaints made to the applicant, or the planning authority, and during the 12 month process of obtaining the certificate of lawful development there was no objections raised. Most people passing by aren't aware of the building at all, and if they do see it, they assume it is a part of a farm complex.

As regards the nearest neighbours at numbers 1 and 2 Moor Bottom, the nearest window of The Croft is about 37 metres from the nearest window of number 2, and about 42 metres from the nearest window of number 1. These windows are perpendicular to each other, not facing. As the minimum distance allowed between facing windows is 21 metres (according to The Local Plan) no issues of privacy or taking of light exist. It should also be noted that the oldest and most dense of the tree cover is between The Croft and the other houses, and again, the difference in elevation is quite large. See Fig.1 for the layout.

4. Design of the Proposed Replacement Dwelling

The applicants propose to replace the existing dwelling with another single storey two-bedroom structure, in a simple rectangular shape, and built as close as is affordable to the "*Passivhaus*" standards (whilst not necessarily attempting full certification). This means the walls and the roof will be of a thickness of about 600 mm and the vast majority of the glazing will be on the south and west facing walls. The glazing will be triple glazed to achieve u-values below 0.8 W/m²K, and the frames will be finished in light grey. The walls will have a dark grey painted metal outer cladding and the roof will have a green living roof system planted to match the surrounding hillside as closely as possible (see Fig.12). The applicant does not intend to spoil the look of the roof with roof windows.

The house will have solar PV panels (concealed on the hillside behind the roof), and the applicant hopes to investigate a heat storage system to maximise the usefulness of the renewable source. Any additional heating will be provided by a small air-source heat pump, and a heat recovery and ventilation system will be required. All energy requirements will be met by mains electricity backed up with solar PV, there is no natural gas supply to the site.

In order to keep the new building as low profile and as discrete as the existing building the applicants propose that it should maintain a similar width (north to south dimension) to the existing dwelling, but be increased in depth in the easterly direction. That way most of the additional volume would be

cut into the hillside and be mostly underground, and the front (west facing) wall would remain in its current location. The west wall height would be increased slightly, but only by the amount necessary for the highly insulated roof.

The applicants prefer not to have a flat roof and seek to implement a roof slope of 25 degrees which is similar to the slope of the surrounding hillside. The roof will be of an asymmetric pent roof design with the larger slope facing west and with north and south facing gables. The applicant intends to include a mezzanine floor in the loft space, for storage and home-office, and to contain the various items of plant and equipment required for a Passivhaus, for example, heat recovery unit, ducting, ventilation, large hot water tanks, storage batteries, heat pumps and so on. Overhangs to the south and west will keep out the full summer sun, whilst allowing sunlight in the rest of the year round. The green living roof should mean that the structure remains virtually invisible, especially given the fact that most neighbours and passers-by see the building from a depressed angle well below the ground level. Given the slope of the hillside the design should mean that no part of either gable wall will be higher than about 3.5 metres above ground level (that is, the surrounding slope level).

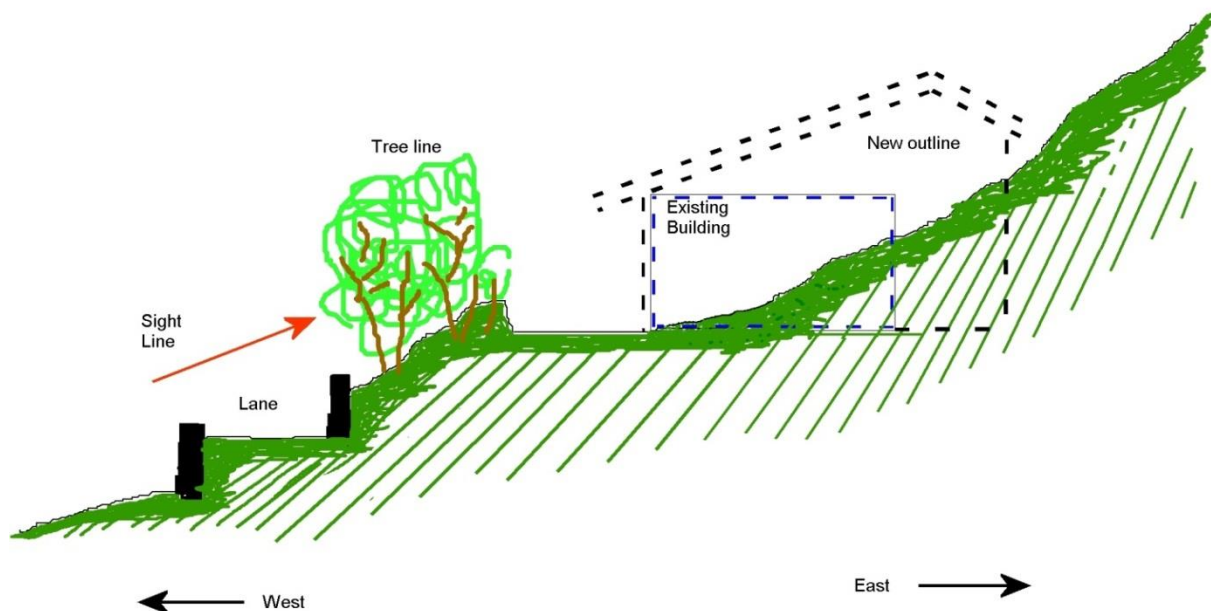


Fig 10: Sketch showing a cross-section of the site to illustrate how the enlarged dwelling will be cut into the hillside, and its increase in size will be virtually invisible from the normal sightlines. This also illustrates how the wall heights will remain similar to existing heights when measured from the immediate (sloping) ground level. NOTE: this is not to exact scale, it is here to illustrate the case regarding visibility. There are accurate elevation points marked on the site plan (proposed).

The grey metal wall cladding and the simple rectangular shape with minimal windows will give any parts of the building that are visible an agricultural look, especially with the living roof. This is not incompatible with the two surrounding farms at Oldfields and Boothstead, both of which have several large metal clad buildings, and the large garage/workshop of 2 Moor Bottom which has a pale blue metal roof, rendered walls, and timber clad doors. The use of grey metal clad window frames should keep the windows from standing out, although most of the windows will be below the tree/shrub line when viewed from the bridleway or the south-west. Few people are likely to see the hamlet of Moor Bottom as anything other than a typical working farm with various types of agricultural looking buildings scattered around a central stone farmhouse, just like those neighbouring farms.

Fig.11 shows a nearby development that makes effective use of the same idea.



Fig 11: Winterburn Hill Barn conversion to residential showing effective use of shallow sloping metal roof and cladding to retain the impression of farm buildings.

All things considered, the applicants feel that the proposed building will not be materially more visible than the existing building, nor appear to be disproportionate in scale, or in policy terms will *"not detract from the visual amenity of the Green Belt"* or *"will not have a significant impact on the openness of the green belt"*.

Section 11 includes a detailed discussion of the proposed increase in volume and floor-space.

5. Improvements to the curtilage and access

As the proposal is to replace the existing dwelling it is not really necessary to consider the curtilage in any great detail. The existing site has a parking area for 2 to 3 cars adjacent to the bridleway, and the occupants of all the Moor Bottom properties and Oldfields Farm regularly contribute to the maintenance of the bridleway out to Heath Hill Road. However, the applicant does intend to improve the parking area and access path to the dwelling with the use of various retaining walls. These will be finished in the local stone and made to look as close as possible to the local heritage dry stone walls that surround all the farmland. The entire site is surrounded by a heritage dry stone wall, and this boundary wall will be repaired, maintained and improved as necessary.

6. Biodiversity

The applicant remains unsure as to whether a "*Biodiversity Net Gain*" survey is necessary for a small scale self-build such as this. It looks like the requirement will change in April 2024.

However, looking at the existing trigger requirements for species protection measures as available on the Calderdale website, it is worth pointing out that none of the conditions that require a survey are met;

- The development replaces an existing building that is only 7 years old and is entirely unsuitable for nesting birds or roosting bats, the roof and walls are sealed and taped metal cladding material with no holes or cracks.
- No quarries or cliff faces are affected.
- The nearest natural water is a spring and horse trough over 80 metres away (and below) the site. No other ponds or water courses are nearby.
- The site is only 520 sq.m. (so less than 0.1 Hectares), but in any case the development is to replace an existing dwelling. Only 50 square metres or so of additional land will be excavated, and this will be offset by 150sq.m. of new living roof.
- There is a row of trees between the site and the public bridleway. These will not be affected in any way, they are on a very steep banking that will be unsuitable for any development use. None of the trees are over 100 years old or have a girth greater than 1 metre, with the possible exception of a large Sycamore near the parking area.

The trees and other planting that hide the existing building very effectively will all remain, and any gaps filled in with new planting, some evergreen, but without losing the natural and sustainable mix of local varieties. There are mature birch, sycamore, elder, and mountain ash trees already in place, and we have added some leylandii and other conifers, and some laurel and hawthorn. Again, due to the elevation and slope of the site, we can have planting that screens the building from observers,

while allowing the sun to come into the windows, and retaining good views for the occupants, especially to the west where there are no other dwellings in the line of sight.

The living roof will, in itself, be a major gain in bio-diversity compared to the metal roof of the existing dwelling, attracting bees and other insects and birds, and retaining rainwater. The applicant hopes that the roof could contain heather and gorse to give a similar effect to the photographs in Fig.12 which were taken just 5 metres from the dwelling in late August. The heather and the gorse combine to create a stunning palette of natural greens, yellows, and lilacs.



Fig 12: The hillside in August

The adjoining land to the south (about 2000 sq.m. or 0.2 Ha), that is owned by the applicant, is still in its natural moorland state with a peat surface and native wild grasses and heathers. It provides a hunting ground for the many Kestrels that regularly visit, and a family of Green Woodpeckers that nest nearby and feed on the ants that proliferate under the rocks on the hillside. The applicant is committed to keeping this land in its natural state, and is also open to improving the biodiversity by whatever means is necessary and sustainable, including the planting of additional trees and shrubs.

A "*Bat Roost Potential Assessment Form*" has been submitted by the applicant. It confirms that the development is not in a Bat Alert zone and that the site is very exposed, being west facing, and over 300 metres in elevation. It also confirms that the existing building is entirely unsuitable for roosting bats being sealed and taped metal clad.

However, the applicant is very committed to improving the biodiversity of the site, and intends to install fixed bird and bat boxes following the guidance provided by Calderdale Council dated January 2022. These will be installed under the large overhangs proposed to the west and south elevations. At least two bat boxes, and two bird boxes suitable for swifts will be installed.

7. Drainage and Sewage Treatment

The applicant has submitted the FDA and the SWD forms as required. Again, it should be stated that the development is to replace an existing dwelling that has had no issues with surface water for over 7 years. The replacement dwelling is unlikely to increase chance of problems.

There is no mains sewage connection available within at least 300 metres. All the surrounding properties such as Boothstead, Oldfields Farm and 1 and 2 Moor Bottom use septic tanks. The applicant proposes the installation of a packaged sewage treatment plant approved to EN12566-3. As the property is to remain as two bedroomed, it should be sized for 4 to 5 persons. It must be located at least 10 metres from the dwelling, and within 30 metres of large vehicle access for sludge removal.

The site is above the spring line, the nearest spring being 75 metres away, and 13 metres lower in elevation, situated below Moor Bottom. This means that the treatment plant will require a drainage field even though the effluent is considered fit to discharge to a water course. It also means, however, that there should be no problems with high water table levels or surface water contamination. No part of the drainage field must be within 15 metres of the dwelling, or 3 metres of large tree root systems or boundaries, or covered by roads, driveways, or paved areas.

The applicant intends to have percolation tests carried out as soon as possible. He is confident that the subsoil around the site is suitable for a drainage field, as the existing composting system has had a drainage soakaway in use for over 7 years with no occurrences of leakage outside of the drainage area.

The proposed location of the sewage treatment system is shown on the site plan (proposed). It uses the land belonging to the applicant to the south of the dwelling, where it can be situated only 6 metres from the road, and as far as necessary from the dwelling.

Rainwater drainage will be channeled into existing groundwater drainage ditches and through into existing soakaways. Car parking and pathway surfaces will remain porous, and there will be no non-porous surfaces introduced. Water butts will be fitted to capture some rainwater for gardening use. The living roof can reduce the stormwater run-off rate by up to 65%.

The applicant has also submitted a flood map showing that Moor Bottom is in Zone 1 for flood risk. He has also submitted an environmental report that shows no flood risk other than a small risk of surface water flooding within 250 metres, but a look at the map in the report shows this to be over the top of the hill near Heath Hill Road, and the topography means that this is not relevant to Moor Bottom.

8. Land contamination and stability, Coal Mining, Radon

The applicant has submitted an environmental report for Moor Bottom. This concludes the following;

- No contaminated land has been identified within 500 metres.
- No pollution incidents have been identified within 500 metres.
- Various historical registered landfill sites have been identified on the hillside to the east of the applicants land, but over 25 metres from the proposed development. These sites were historically small stone quarries that have been filled in.
- A "*potentially contaminative activity*" has been identified within 500 metres, that being a "*mobile screening and crushing process*" in 1994 at Sentry Edge Quarry over 400 metres away.
- "*Potentially contaminative*" land uses are also identified, being mostly the general stone quarrying in the locality, but also the use of Moor Bottom as a hospital (up to 1929).
- The site is in an area classified as a "*coal mining area*". However, the applicant is not aware of any coal mining activity occurring within 500 metres of the site.
- The potential for natural ground instability is "*low*" in this area.
- The area is classified as "*Radon Affected*", 3% to 5% of homes are above the action level. The applicant intends to ensure that the membranes laid below the floor of the new development are gas proof as well as water proof.

9. Policy regarding increase in size in the Green Belt

The National Planning Policy Framework (NPPF) states when referring to exceptions to inappropriate development in Green Belts;

(c) the extension or alteration of a building provided that it does not result in disproportionate additions over and above the size of the original building;

(d) the replacement of a building, provided the new building is in the same use and not materially larger than the one it replaces.

The definition of "*materially larger*" and "*disproportionate*" are left to the local authorities. In the Calderdale Local Plan no additional guidance is offered, and Policy GB1 quotes the NPPF verbatim. It is presumed by the applicant that extending a building and replacing a building with a larger one can be treated in a similar way, the scale of the finished development is all that matters, although it should be said that replacing a building with a well designed larger building is always likely to be preferable to extending a poorly built existing building by the use of ad-hoc permitted development (which can now include additional storeys).

10. Examples of development in the immediate area

This section describes some of the neighbouring properties also in the Green Belt and the Special Landscape Area that have been extended or replaced in recent years, with a view to illustrating that the "Croft" development will not detract from the visual amenity of the Green Belt and the Special Landscape Area any more than several other approved developments, and indeed, a lot less.

Wild Acres: 300 metres from "The Croft" (No.3 on Fig 2).

This is a large detached bungalow built in the 1980's to a modern design with large white uPVC "picture windows" and a blue slate roof. It is very different from the surrounding heritage farm properties. It is two storeys to the front and one at the back. It has recently been given approval (22/00787/HSE) for three extensions with rendered walls including a two-storey extension with large amounts of modern glazing overlooking the valley to the west. The increase in volume is only 28%, but that amounts to over 280 additional cubic metres.

The two-storey mostly glazed extension on the west facia will be visible from most of the properties labelled on Fig 2, although the officer report stated;

"The site, although visible from the highway, is approximately 100m from the main road and is not within the vicinity of any neighbouring properties and so any harm from the newly proposed design, would be minimal."

The proposed development at "The Croft" is 450 metres from the same point on the same road.

As a further interesting point, the officer report also commented on the flat roofed extensions stating that they were "somewhat discordant", lending some additional weight to the owners of "The Croft" wishing to avoid a flat roofed building as they also believe it would be discordant with the surrounding buildings.

Causeway Farm: 550 metres from "The Croft" (No.7 on Fig.2)

In 2008 this dormer bungalow had some very large extensions added to its northerly facade, with large amounts of glass, and balconies and decking (08/01333/HSE). Dormer windows were added to the south facade. The officer report at the time included the following statement;

"A 54% increase is generally considered to be disproportionate thus having an impact on the openness of the green belt. In this case the majority of the proposed extension is to the rear of the site, which is partially hidden from the surrounding area due to the topography of the land. It is therefore considered that the extensions would not have a significant impact on the openness of the green belt and the development is in accordance with policy NE2."

The 54% increase in volume amounted to an additional 224 cubic metres according to the applicant. Whilst the extensions may not be visible from Raw End Road, they are certainly very visible from the hamlet at Moor Bottom, and from the public bridleway access road to it. By comparison, the "Croft" proposal will have much less impact on the openness of the green belt from all directions.

Sunningdale House: 650 metres from "The Croft"

In 2014 permission was given for this house on Stocks Lane to be replaced (14/00077/FUL). Whilst the new house was not much bigger in terms of height or footprint area, the internal volume was increased significantly by digging a lower ground floor partially into the hillside. The officer does not say by how much the volume has increased (which seems unusual), but if the building has gone from 2 storeys to 3 and grown slightly higher then we can assume it is in excess of 50%. As the footprint area is 127 sq.m. we can estimate there is over 400 additional cubic metres assuming a floor height of 2.4m, plus the 0.6m overall height increase, and the 6 sq.m. footprint increase. The officer report stated:

"Although the height of the proposed dwelling has only increased by 0.6m and the footprint increase is also minimal, the volume of the build has increased due to the provision of a lower ground floor. Although this increase gives the proposal the appearance of being much larger in scale than the existing residential development from the elevational drawing, the retention of the boundary wall and evergreen hedge means that the view from Stocks Lane will still be that of a two storey dwelling. A new drive to the proposed garage will also be screened by the existing boundary treatment. Furthermore the design of the building has been simplified since previous schemes, and as such is now considered to be acceptable."

This is an interesting case in that it has parallels to "The Croft", where the proposal is to dig much of the extra volume into the hillside where it can't be seen, and also to retain the existing dense tree cover.

Butts Green Lane: 1600 metres from "The Croft"

In 2018 approval was given to replace a stable with a dwelling and a large garage (18/00465/FUL). Whilst the increase in the actual dwelling house was small the large garage created a significant increase in overall scale, adding 215 cubic metres. The planning officer made the following comments; *"With regards to the proposed garage, this would have a volume of 191m³. The existing shed has an approximate volume of 26.2m³. When taking both buildings into account, the proposal represents an increased volume of 58%. Although the proposed garage is a significant increase in volume when compared to the existing shed, in the context of the site, the dominant building will be the dwelling. In the immediate area, the site can be glimpsed only for a short time when viewed from the road; whilst long range views would result in the neighboring residential and agricultural buildings at Butts Green garages and Butts Green Farm. It is considered that the resultant impact on openness would be marginal and overall the development would preserve the openness of the Green Belt."*

Applying similar logic to "The Croft" it is unlikely that anyone will see the new building at all from the road 450 metres away, and long range views would result in the various other buildings of "Moor Bottom".

11. Size increase details

"Appendix 1" at the end of this document contains a detailed analysis of the volumes of the existing and proposed dwellings.

The applicant notes that local authorities generally wish to base their decisions on the percentage increase in volume rather than other measures, such as additional floor area. This is a concern, as the percentage increase in volume is very large with this proposal, even though the resulting floor space will be very modest.

Based on the exterior dimensions of both dwellings the gross increase in volume is 327 cubic metres, a percentage increase of some 128%. However, the following important points should be considered which are peculiar to this particular development;

1. To provide the level of insulation required for "*Passivhaus*" the new dwelling will have walls and roof thickness of 600mm. The volume of these walls and roof account for 195 out of the 327 cubic metres, so only 132 cubic metres of the increase will be available inside the dwelling. This represents an increase to the internal space of only 52%, less than most of the examples in section 10 above.
2. A significant 240 cubic metres of the new dwelling will be effectively underground, just like in the "*Sunningdale House*" example in section 10, so there will be only 87 cubic metres increase visible from outside. This represents only 34% more outside volume than the existing dwelling.
3. The sloping roof accounts for 243 out of the additional 327 cubic metres, but as noted previously, the applicant feels that a flat roof would be discordant in this location, and may also lead to technical difficulties with the living roof. Note that the applicant does not intend to install roof windows, so the green roof should be virtually invisible, especially when viewed from the lower elevations where all the neighbours reside.
4. The proposal adds only 42 square metres of internal floor area (excluding any possible mezzanine floor). The interior floor area of the new dwelling will only be 108 square metres, not a large home by any standards, in fact, the entire dwelling is smaller than a single floor of the three floors in the "*Sunningdale House*" replacement property (see section 10).

12. Conclusion

To summarise, the applicant does not believe that the proposed building is disproportionate in its scale, and should be given planning approval for the following reasons;

1. The existing building is very small (too small) by current dwelling standards, and wholly unsuitable in future should either of the newly retired applicants develop mobility problems. The replacement is still only a single storey two-bedroom dwelling, and remains very modest in size. Whilst the percentage increase may appear large, the increase from a very small building to an adequate building should not be described as disproportionate.
2. A lot of the increase in size is due to the very thick walls and roof required for the insulation standards that the applicant (and building control) desires, and also space will be required for the internal systems, such as heat recovery, ventilation, large hot water tanks, batteries, heat pumps and so on.
3. A big proportion of the increase is due to the introduction of a sloping roof. The applicant believes that a flat roof building will be discordant with the surrounding farm buildings, and a green living roof with a slope will be much more practical and acceptable, and will also increase biodiversity on the site, and slow down surface water run-off.
4. Much of the increase will be effectively below ground, and local precedents have been set that suggest that this extra volume can be discounted under some circumstances.
5. The green living roof and dark metal cladding, combined with the extensive tree and shrub cover, and the topography of the site will mean the building will blend very well into its surroundings, more so than many of the surrounding developments.
6. The site is 450 metres from the nearest public road, and can only be seen from a very small number of other dwellings. It will be virtually invisible to most observers and locations.
7. The Croft forms a part of the hamlet of Moor Bottom which to most passing observers will appear to be a working farm complex with various outbuildings typical of the area. The nearest neighbour to the north is Oldfields Farm, and the nearest to the west is Boothstead Farm.
8. Government policy states that developments of exceptional architectural significance should be considered for approval, even in Green Belts. The applicant is not saying that this proposal achieves such a hurdle, but does believe the building will have some architectural merit if it blends into the hillside in the way that he envisages, and if it achieves energy efficiency close to the Passivhaus standard for a relatively modest budget.

9. A replacement building to a high standard of design and building control is desirable to an inferior building that has grown through multiple extensions and without building control. This proposal offers a significant improvement to the structure that already exists, it promotes higher design standards, offers more substantial environmental contributions and makes better use of the specific qualities of the site that the applicant needs to enhance their quality of life in retirement.

10. Bungalow homes that can be easily adapted for elderly people or those with mobility issues are extremely difficult to find in the area. Of 1250 homes listed on Rightmove within 5 miles of Mount Tabor there are only 106 classed as bungalows. Whilst this is not an immediate issue for the applicants as they start their retirement, it is certain to become one in the not-so-distant future.

APPENDIX 1 - Volume Calculations

Elements that are divided by 2 are 90 degree triangular prism shapes.

Wall and roof thickness is assumed to be 600mm to achieve Passivhaus standard.

For the purposes of these calculations the wall thickness of the existing building is assumed to be zero, as most of it is only 40mm thick.

All dimensions (X, Y, Z) in metres, and all volumes in cubic metres.

Element;	X	Y	Z	Div.by	Volume
Proposed ground floor	13.00	10.00	2.60	1.00	338.00
Proposed west roof space prism	13.00	7.50	3.74	2.00	182.33
Proposed east roof space prism	13.00	2.50	3.74	2.00	60.78
PROPOSED EXTERIOR VOLUME TOTAL:					581.10
Existing ground floor	12.50	6.25	3.10	1.00	242.19
Existing roof space	12.50	6.25	0.30	2.00	11.72
EXISTING EXTERIOR VOLUME TOTAL:					253.91
Proposed below ground level	13.00	10.00	3.70	2.00	240.50
TOTAL PROPOSED BELOW GROUND VOLUME:					240.50
Roof thickness west	13.00	8.40	0.60	1.00	65.52
Roof thickness east	13.00	4.50	0.60	1.00	35.10
Wall Thickness north	10.00	2.60	0.60	1.00	15.60
Wall Thickness south	10.00	2.60	0.60	1.00	15.60
Wall Thickness east	13.00	2.60	0.60	1.00	20.28
Wall Thickness west	13.00	2.60	0.60	1.00	20.28
North gable apex west	7.50	3.74	0.60	2.00	8.42
North gable apex east	2.50	3.74	0.60	2.00	2.81
South gable apex west	7.50	3.74	0.60	2.00	8.42
South gable apex east	2.50	3.74	0.60	2.00	2.81
TOTAL PROPOSED VOLUME OF WALLS & ROOF:					194.82
INCREASES, EXISTING TO PROPOSED;				Vol	% increase
Gross additional external volume proposed:				327.19	128.00
Additional internal volume (exc.thickness of walls and roof):				132.37	52.00
Additional external volume excluding below ground part:				86.69	34.00