

# ***RSCE CONSULTING ENGINEERS***

Chartered Civil Engineers  
Building and Structural Designers  
Geotechnical and Foundations Consultants

---

## **Structural Inspection Report**

### **Thornley – Knott Farm Barn** **Proposed Conversion to Single Dwelling**



**Report prepared on behalf of :**

**Mrs. Ena Tansley  
34 Redwood Drive  
Longridge  
Preston  
Lancashire PR3 3HA**

**Ref. 3526-1 : August 2022**

## ***RSCE CONSULTING ENGINEERS***

Chartered Civil Engineers  
Building and Structural Designers  
Geotechnical and Foundations Consultants

---

### **Structural Inspection Report**

#### **Thornley – Knott Farm Barn** **Proposed Conversion to Single Dwelling**

<b><u>Contents</u></b>	<b><u>Page</u></b>
1. <b>Introduction</b>	<b>3</b>
2. <b>General Description</b>	<b>4</b>
3. <b>Local Plan Policies DMH3 (Dwellings in the Open Countryside) &amp; DMH4 (The Conversion of Barns and Other Buildings to Dwellings)</b>	<b>5</b>
4. <b>Flood Risk Assessment</b>	<b>7</b>
5. <b>Record of Structural Condition</b>	<b>8</b>
<b><i>RSCE Drawing No. 3526-003</i></b> <b><i>“Existing Plans and Elevations”</i></b>	<b>17</b>
<b><i>RSCE Drawing No. 3526-004 Rev D</i></b> <b><i>“Proposed Plans and Elevations”</i></b>	<b>17</b>
<b><i>RSCE Drawing No. 3526-005 Rev B</i></b> <b><i>Site Location and Block Plan” 1 : 1250</i></b>	<b>18</b>
<b><i>Environment Agency Flood Risk Assessment</i></b>	<b>18</b>

**Structural Inspection Report**

**Thornley – Knott Farm Barn**  
**Proposed Conversion to Single Dwelling**

1. **Introduction**

This Structural Inspection Survey and Report have been undertaken on instructions from Mrs Ena Tansley prior to their submission to the Local Planning Authority for conversion of the subject barn at Knott Farm to a single dwellinghouse.

The initial Inspection of the above subject property was carried out on 8<sup>th</sup> July 2020 and supplemented by further subsequent inspections up to and including 13<sup>th</sup> August 2022, all in accordance with those instructions.

Our Inspection and this Report relate only to the brickwork barn and attached steel framed storage shed along the south west side of the farmyard.

There is a larger and older barn along the north east side of the farmyard and a Wareings steel framed shed to its north, neither of which are included within this Inspection and Report.

We are instructed by Mrs Ena Tansley to attend the above property, record the current structural condition of the south west barn, comment upon any structural repair, remedial and/or alteration works which may be required in connection with the proposed development, and make recommendations for such works as considered appropriate and necessary.

Our Inspection was limited to a non-intrusive visual inspection of those structural elements of the building, walls, floors, roofs, which were readily accessible and visible from ground level with safety. We have not at this stage undertaken any opening up or intrusive investigations or testing.

Dimensions where given are approximate and should not be used where accuracy is required.

2. **General Description**

Knott Farm is located in Thornley with Wheatley, Longridge, near the end of an unadopted farm track from Chipping Road, and passing through the farmyard of Lea House Farm, and for which the Owner/Applicant of the subject property has right of access.

Ordnance Survey Location Plan RSCE Drawing No. 3526-005 Rev B is appended to this Report showing location of the subject property in relation to Chipping Road out of Longridge.

Knott Farm includes a complex of buildings forming the original working farmyard area, including the recently refurbished Farm House, the south west barn which is the subject of this Inspection and Report, the larger and older barn along the north east side of the farmyard and a Wareings steel framed shed to its north, together with several small ancillary buildings mostly previously used for storage or small animals.

The south west barn which is the subject of this Inspection and Report is mostly of traditional form of construction with “9 inch” solid brickwork walls with header bricks as ties, and slate roof supported upon timber purlins and kingpost trusses with slender braces. Ground floor is mostly concrete but with part section in cobble stone setts.

The main central section of the barn has a first floor structure comprising timber boards on nominal 75x150 timber joists spanning between intermediate brickwork walls.

At the south end there is a single storey annex of similar form of construction. At the north end there is a more recent extension comprising steel frame with lower stub “9 inch” external brickwork walls, and asbestos sheeting roof supported upon timber purlins and mono pitch trusses.

Knott Farm is set within open countryside within the Forest of Bowland Area of Outstanding Natural Beauty (AONB).

Existing and Proposed Layout Plans and External Elevations are shown on RSCE Drawings No. 3526-003 and 3526-004 Rev D respectively, and which are appended to this Report.

Our Structural Inspection was undertaken from ground level by visual inspection of the naked eye. A fixed ladder was used to provide access to the first floor in the central part of the building.

Photographs were taken to record the condition of the building at the time of our Inspection, and are included within this Report.

3. **Local Plan Policies DMH3 (Dwellings in the Open Countryside) and DMH4 (The Conversion of Barns and Other Buildings to Dwellings)**

The Ribble Valley BC Adopted Core Strategy 2008-2028 includes the following Policies relating to construction of dwellings, barn conversion and other buildings in the Open Countryside and Area of Outstanding Natural Beauty :

***POLICY DMH3: DWELLINGS IN THE OPEN COUNTRYSIDE AND AONB***

***10.20 WITHIN AREAS DEFINED AS OPEN COUNTRYSIDE OR AONB ON THE PROPOSALS MAP, RESIDENTIAL DEVELOPMENT WILL BE LIMITED TO :***

.....

***2. THE APPROPRIATE CONVERSION OF BUILDINGS TO DWELLINGS PROVIDING THEY ARE SUITABLY LOCATED AND THEIR FORM AND GENERAL DESIGN ARE IN KEEPING WITH THEIR SURROUNDINGS.***

***BUILDINGS MUST BE STRUCTURALLY SOUND AND CAPABLE OF CONVERSION WITHOUT THE NEED FOR COMPLETE OR SUBSTANTIAL RECONSTRUCTION.***

.....

***The protection of the open countryside and designated landscape areas from sporadic or visually harmful development is seen as a high priority by the Council and is necessary to deliver both sustainable patterns of development and the overarching core strategy vision.***

***POLICY DMH4: THE CONVERSION OF BARNS AND OTHER BUILDINGS TO DWELLINGS***

***10.21 PLANNING PERMISSION WILL BE GRANTED FOR THE CONVERSION OF BUILDINGS TO DWELLINGS WHERE :***

***1. THE BUILDING IS NOT ISOLATED IN THE LANDSCAPE, I.E. IT IS WITHIN A DEFINED SETTLEMENT OR FORMS PART OF AN ALREADY GROUP OF BUILDINGS, AND***

***2. THERE NEED BE NO UNNECESSARY EXPENDITURE BY PUBLIC AUTHORITIES AND UTILITIES ON THE PROVISION OF INFRASTRUCTURE, AND***

***3. THERE WOULD BE NO MATERIALLY DAMAGING EFFECT ON THE LANDSCAPE QUALITIES OF THE AREA OR HARM TO NATURE CONSERVATIONS INTERESTS, AND***

***4. THERE WOULD BE NO DETRIMENTAL EFFECT ON THE RURAL ECONOMY, AND***

***5. THE PROPOSALS ARE CONSISTENT WITH THE CONSERVATION OF THE NATURAL BEAUTY OF THE AREA.***

***6. THAT ANY EXISTING NATURE CONSERVATION ASPECTS OF THE EXISTING STRUCTURE ARE PROPERLY SURVEYED AND WHERE JUDGED TO BE SIGNIFICANT PRESERVED OR, IF THIS IS NOT POSSIBLE, THEN ANY LOSS ADEQUATELY MITIGATED. THE BUILDING TO BE CONVERTED MUST:***

***1. BE STRUCTURALLY SOUND AND CAPABLE OF CONVERSION FOR THE PROPOSED USE WITHOUT THE NEED FOR EXTENSIVE BUILDING OR MAJOR ALTERATION, WHICH WOULD ADVERSELY AFFECT THE CHARACTER OR APPEARANCE OF THE BUILDING. THE COUNCIL WILL REQUIRE A STRUCTURAL SURVEY TO BE SUBMITTED WITH ALL PLANNING APPLICATION OF THIS NATURE. THIS SHOULD INCLUDE PLANS OF ANY REBUILDING THAT IS PROPOSED ;***

2. BE OF A SUFFICIENT SIZE TO PROVIDE NECESSARY LIVING ACCOMMODATION WITHOUT THE NEED FOR FURTHER EXTENSIONS WHICH WOULD HARM THE CHARACTER OR APPEARANCE OF THE BUILDING, AND
3. THE CHARACTER OF THE BUILDING AND ITS MATERIALS ARE APPROPRIATE TO ITS SURROUNDINGS AND THE BUILDING AND ITS MATERIALS ARE WORTHY OF RETENTION BECAUSE OF ITS INTRINSIC INTEREST OR POTENTIAL OR ITS CONTRIBUTION TO ITS SETTING, AND
4. THE BUILDING HAS A GENUINE HISTORY OF USE FOR AGRICULTURE OR ANOTHER RURAL ENTERPRISE.

*The re-use of existing rural buildings provides an important opportunity to preserve buildings that contribute to the areas character and setting, can usefully provide a housing resource and promote sustainability. It is important however in an area such as Ribble Valley that this is carefully managed through the development management process and that clear guidance is offered.*

*The conversion of buildings should be of a high standard and in keeping with local tradition. The impact of the development, including the creation of garden area and car parking facilities (or other additions) should not harm the appearance or function of the area in which it is situated. Access to the site should be to a safe standard and be capable of being improved to a safe standard without harming the appearance of the area.*

*Proposals will also be determined having regard to the Historic Environment Local Management (HELM) Good Practice guidance on the Conversion of Traditional Farm Buildings.*

*The creation of a permanent dwelling by the removal of any condition that restricts the occupation of dwellings to tourism/visitor use or for holiday use will be refused unless it can be demonstrated that the unit will meet an identified local/affordable housing need in accordance with policy DMH1.*

The above two Policies require proposed buildings and conversions to be structurally sound and capable of conversion without the need for complete or substantial reconstruction, nor extensive building or major alteration which would adversely affect the character or appearance of the building.

The Local Planning Authority (Ribble Valley Borough Council) requires this Structural Survey and Report to be prepared and submitted with the Planning Application, together with plans of the proposed barn conversion.

4. **Flood Risk Assessment**

Environment Agency Risk of Flooding (Rivers and Sea) is appended to this Report.

The River Loud is located about 100 metres from the subject barn building at its nearest point, and courses through a relatively deep and moderately steep sided valley. The proposed barn conversion is located well beyond the crest of the river western embankment slope, and there is a former stone quarry between the barn and river.

We estimate that the barn conversion is in excess of 10 metres above river bed level.

The appended Environment Agency Flood Map indicates that the proposed barn conversion Application site lies within Flood Zone 1 with a low probability of flooding from rivers and the sea, with less than 0.1 per cent (1 in 1000) chance of flooding occurring each year.

## 5. **Record of Structural Condition**

This Section includes a brief summary of recommendations for structural works and further investigations which are deemed to be within the scope of this Inspection and Report.

It is not a schedule of works for the proposed development and many other works are required which are not outlined herein.

Comments and recommendations herein should not be interpreted as a detailed Specification or Schedule of Work.

### 5.1 **Ground Conditions and Foundations**

British Geological Survey Sheet No. 67 indicates that this area is underlain by superficial undifferentiated Glacial Till Drift deposits overlying the Hodder Mudstone Formation within the Thornley anticline, and with a small outcrop of the Knoll Reef to the south east of the Application site exposed in the north west embankment of the River Loud.

The flood plain of the River Loud comprises undifferentiated River Terrace deposits.

Detailed ground conditions have not been investigated at this stage, but it is possible that some areas of made ground may exist associated with the previous farming activities.

*Trial pits located adjacent to existing footings and foundations will be required, and to be inspected by RSCE Consulting Engineers and Building Inspector in order to confirm foundation design.*

We would typically expect corbelled brickwork for buildings of this age, type and function. Older and larger buildings would typically be founded upon large stone “plums”.

Foundations would typically be expected to be at relatively shallow depth thus providing little or no opportunity to lower ground floor levels without very extensive and costly foundation strengthening and/or underpinning works.

The overall reasonable condition of the Barn external walls throughout suggests that the existing foundations are most probably adequate without any additional significant loadings.



5.2 **Main Brickwork Two Storey Barn and Single Storey South East Annex**

5.2.1 **External and Internal Walls**



External walls are of solid brickwork construction throughout, mostly nominal 9 inch thick, with header brick courses as ties.

Internal cross walls are similarly of solid brickwork “9 inch” construction, but there is a dividing wall within the south east annex which is of single leaf brickwork construction.

*There are dressed stone corner quoins to external walls at the north and west corners of the main two storey barn building, and we would suggest consideration of the introduction of matching dressed stonework corner quoins elsewhere within the proposed conversion and restoration of the building.*

External brickwork walls appear to be reasonably plumb within tolerances normally accepted for buildings of this age, type and character,

*There are very occasional bricks which have spalled due to frost action, or are broken mostly adjacent to openings, and which will require careful cutting out and replacement to match existing adjacent. Volume is estimated at less than 1%*

*Small localised areas of external brickwork have been previously repointed, but pointing generally is in poor to moderate condition and we would advise that all external brickwork elevations are raked out to a depth of at least 20mm and repointed in a suitable lime based mortar with a recessed bag finish to shed water from the face of the brickwork and thereby avoid or minimise future spalling.*

*Some existing precast concrete lintels above openings are showing evidence of structural distress in the form of longitudinal cracking most likely associated with corrosion of embedded steel reinforcement, and we advise installation of suitable temporary propping, removal of all existing concrete lintels and sills and replacement preferably with suitable natural stone lintels and sills, or possibly reconstituted stone, on suitable brickwork bearings.*

*We would note that there is insufficient headroom within the existing barn to provide full width first floor accommodation, particularly if the existing timber roof trusses are to remain, and therefore it would be necessary to raise the height of the external walls by approximately one metre, to provide the necessary headroom.*

*Provide sufficient internal cavity and additional leaf of lightweight thermal blockwork internally with stainless steel cavity wall ties in accordance with BS 5628. Cavity partially infilled with insulation to comply with current Building Regulations Part “L”.*

*Cavity closers around all openings incorporating damp proof course and cavity trays with weep holes through the outer brickwork above all door and window heads.*

*There is no evidence of any effective damp proof course and therefore provision of new damp proof course is required to new inner leaf blockwork walls and to existing remaining external and internal brickwork masonry walls. In addition, installation of vertical damp proof course will be necessary at junctions of external walls and remaining internal walls. All damp proof courses must be continuous with damp proof membranes beneath floors to ensure no water ingress.*

*Incorporate lateral restraints to walls, roof and floors in accordance with British Standard BS 5628; Appendix C and current Building Regulations.*

There are various openings through the external elevation walls most of which will almost certainly be retained, and need to be utilised effectively.

### 5.2.2 Ground Floor

Ground floor of the two storey barn appears to have been previously used for livestock, and that of the single storey south east annex for storage.

The ground floor plan is essentially divided into four sections by nominal “9 inch” solid brickwork separating walls.

The northern compartment ground floor is of cobble stone setts with headroom to underside of first floor joists of about 2½ metres.

The adjacent two compartment floors to the south are of concrete with an approximately central step of about 0.15 metres, and appear to have been used as milking parlours. Available headroom up to underside of first floor joists is about 2.4 metres.

The southern compartment floor within the south east single storey annex, is of concrete construction with headroom up to underside of roof ridge of about 4½ metres.

*We advise that existing ground floors are broken out to enable construction of new reinforced concrete floor slab incorporating thickened edge strips to support the new inner leaf blockwork load bearing walls.*

*Excavations to formation level must not extend below the underside of existing foundations without inspection and express approvals and instructions from a suitably qualified and experienced Chartered Engineer.*

*The new floor construction should incorporate suitable and effective dry and firm sub-base, damp proof membrane and insulation, all to comply with current Building Regulations.*

### 5.2.3 First Floor

First floor joists are nominal 75x150mm deep at nominal 400mm centres and spanning approximately 3.6 metres between the supporting brickwork cross walls.

First floor joists generally appear to be in good condition and suitable for re-use for normal domestic loadings, although joists would need to be doubled up beneath first floor timber stud partitions.

### 5.2.4 Roof Structure and Coverings



The existing roof is pitched and covered in slate.

The north side pitch has a bitumen based underfelt which is non-breathable.

The south side pitch has no underfelt at all and there are numerous holes through the slate roof covering due to missing, broken or displaced slates.

*Recent water ingress has marked the brickwork walls and first floor boards in the vicinity of holes through the roof coverings and such areas should be investigated during construction for evidence of decay and rot and remedied as necessary.*

Timber roof structure comprises nominal 50x75mm rafters at nominal 400mm centres, supported upon ridge and single nominal 100x225mm purlins on each pitch. The purlins and ridge are notched into the upper sloping chords of 2 No. timber king post roof trusses with additional diagonal bracing struts. The purlins and ridge are supported at north and south ends by the external brickwork walls.

*Those parts of the timber roof structure which were readily accessible and visible from the first floor appear to be generally in good condition.*

*Timber embedded within damp brickwork or located in the vicinity of holes through the roof would be regarded as susceptible to decay and rot and should be exposed and inspected, and any defective timber should be cut out and replaced with similar section new preservative treated timber.*

Provided the existing roof truss end bearings in brickwork prove to be structurally sound following exposure and inspection, then the trusses may be re-used. However, the lower chords of the roof trusses are nominal 100x225mm deep section and are about 1.35 metres above the first floor boards. This low headroom would not permit the full width of the building to be utilised as living accommodation and hence the roof structure and supporting walls would need to be raised by about one metre to provide sufficient headroom.

*The building will need to be re-roofed to provide a new breatheable roofing felt as secondary means of defence against water ingress, together with insulation and ventilation requirements, all to comply with current Building Regulations Part “L”. From our inspection, we observed no evidence of any significant decay, however the re-roofing works will permit access to all parts of the roof structure and we advise detailed inspection of all structural timber including rafters, purlins, trusses, wallplates, etc. for evidence of decay or other defect and repair or replace with new as necessary.*

Purlins are approximately 100x225mm deep. Only minor sag deflection was noted and within tolerances normally accepted for buildings of this age, type and character.

*Capacity of purlins to support actual roof loadings should be checked by Structural Engineer and if necessary it would be a relatively simple matter to strengthen purlins using steel flitch plates bolted to the side, or alternatively by doubling up.*

*We advise engagement of timber specialist to inspect all parts of the timberwork within the building, prepare report with recommendations for repair and remedial works, and implement in full including preservative treatment of all existing timberwork within the building.*

*All new timber work incorporated within the new development should be vac vac preservative treated.*

*Insulation and ventilation should comply with current Building Regulations.*

*Either Cold Roof or Warm Roof type construction should be acceptable.*

*Cold Roof type construction with mineral fibre insulation laid over ceiling joists would be most economical; through ventilation of the roof void is required including eaves ventilation and ridge vents.*

#### 5.4 Steel Framed North West Extension



At the north end of the barn there is a more recent extension comprising steel frame with lower stub “9 inch” external brickwork walls, and asbestos sheeting roof supported upon timber purlins and mono pitch trusses.

The steel portal frameworks comprise 178x102 RSJ/UB steel sections. The lower brickwork stub walls are just under 2 metres in height above external ground level, and asbestos cement sheeting extends from there up to the roof eaves.

There is a full height timber sliding door at the end of the north east facing elevation.

This extension appears to have been used largely for storage and probably livestock also. Steelwork and brickwork are generally in reasonable condition for buildings of this type and usage.

*The upper walls and monopitch roof are covered in corrugated asbestos cement sheeting and will require very careful removal by a suitably qualified and experienced licensed asbestos removal specialist.*

The remaining steel frameworks and lower brickwork walls could probably be incorporated within the proposed barn conversion if necessary, however, we note that the facing brickwork differs very significantly from that in the adjacent main two storey barn building in terms of colour, texture, age, etc. and it seems most likely that existing foundations may not be adequate to support additional loadings without excessive settlement.

*This more recent extension is of little or no particular architectural or historical merit, and we suggest consideration is given to its demolition and replacement with new extension using more appropriate external materials and design features to match and compatible with the much older parts of the barn adjacent.*

5.5 **Services, Utilities, Drainage, Water Supply, Rainwater Goods, etc.**

We have not at this stage undertaken any investigation or inspection of services, utilities, drainage, etc. and consequently are unable confirm their location and condition, and are unable to confirm that they are free from defect.

*A comprehensive desk top and field investigation is required prior to development to establish location, condition and adequacy of all services and utilities, electric, gas, water supply, drainage, telecoms, etc.*

*Rainwater goods and downpipes are in poor condition throughout with some downpipes currently discharging directly onto adjacent ground surfaces which is unsatisfactory and may eventually result in structural movement of nearby shallow foundations.*

*Rainwater goods and downpipes require replacement with new, and discharge arrangements need to be reviewed and directed to suitable remote soakaways or underground drainage systems, as appropriate.*

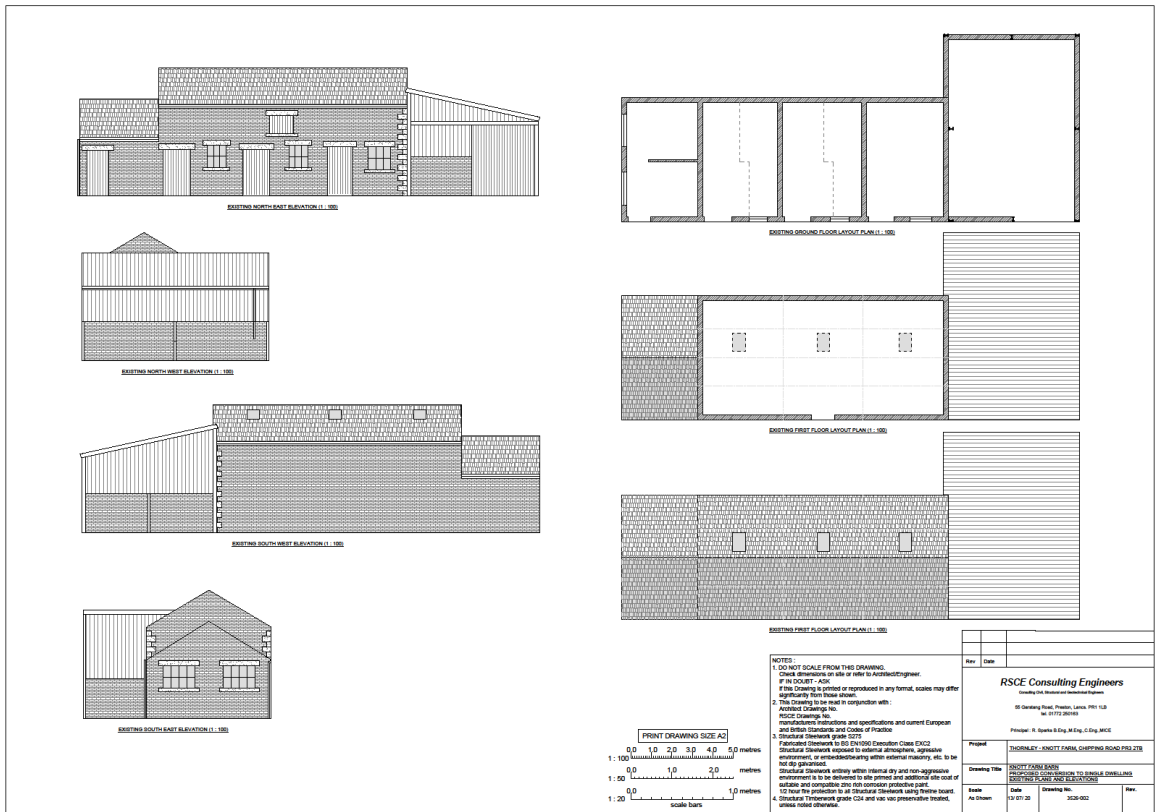
*It is likely that a sewage treatment plant will be required with discharge to soakaway, reed beds or watercourse for which Environment Agency approval would be required.*

*The provision of effective soakaways in glacial clay soils can often be problematic and permeability testing is required to facilitate design to comply with current Building Regulation requirements.*

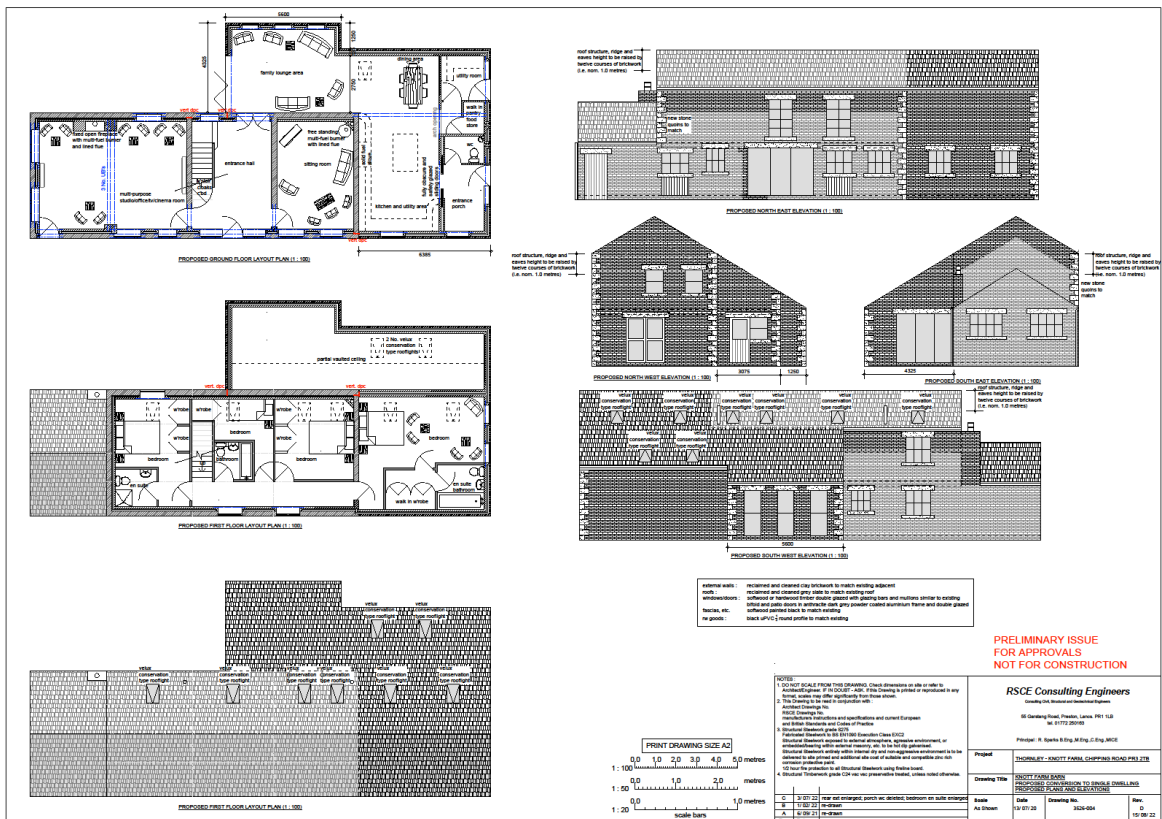
**Robert Sparks B.Eng.,M.Eng.,C.Eng.,MICE**  
**Chartered Engineer**

**22<sup>nd</sup> August 2022**





NOTE : This drawing has been reproduced from the original and is NOT TO SCALE



NOTE : This drawing has been reproduced from the original and is NOT TO SCALE

