

Mr N Forshaw

Daniels Farm, Alston – Agricultural Building

Structural Condition Survey for Conversion to Dwelling – Barn No. 2



PSC-357-001- Barn 2

November 2019

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Mr N Forshaw
Structural Condition Survey
Agricultural Building at Daniels Farm

Contents

- 1.0 Terms of reference
- 2.0 Purpose of the survey
- 3.0 Description of Building
- 4.0 External survey
- 5.0 Internal survey
- 6.0 Suitability for Conversion
- 7.0 Conclusions

Appendix A – Existing Layout and Provisional Proposals
Appendix B - Photographs

Mr N Forshaw Structural Condition Survey Agricultural Building at Daniels Farm

1.0 Terms of reference

Paul Snape Consulting were appointed by Mr N Forshaw, through PWA Planning, to carry out a visual structural inspection and produce a structural condition survey report for the existing agricultural building at Daniels Farm, Alston.

2.0 Purpose of the survey

It is proposed to convert the barn to form a new dwelling. The preliminary proposals have been prepared by the architect and a layout is indicated in Appendix A. The visual structural survey is required to confirm the current condition of the building and to assess the suitability for conversion. There are photographic records of the building in Appendix B and these are referenced throughout the report.

The drainage and electrical systems of the building have not been inspected. Therefore we are unable to confirm that these are in a satisfactory condition.

We have not inspected parts of the structure that are covered, unexposed or inaccessible. Hence, we are unable to report if such parts of the property are free from defect.

Our inspection was undertaken on 2nd September 2019 at which time the weather was dry but overcast and damp. This is one of two barns surveyed at Daniels Farm.

The survey was undertaken by a Chartered Engineer, Paul Snape BEng(Hons) CEng MICE

3.0 Description of Building

The building is of a steel framed construction, with steel columns carrying light steel trusses, supporting a cement sheeted, pitched steel purlin roof. The elevations consist of both concrete/masonry walls and steel sheet cladded walls and the building has concrete ground floors. Details of the existing layout are included in Appendix A. It was noted during the survey that the mezzanine floor indicated on these drawings is not now present.

4.0 External Survey

South Gable (Photos 1 to 3)

This gable is mainly open as can be seen from the photos. The lower section has blockwork infill and the apex above the eaves has cement sheet cladding. The blockwork infill is plumb and in reasonable condition. The cladding above is in reasonable condition. The steel columns

Mr N Forshaw
Structural Condition Survey
Agricultural Building at Daniels Farm

to this elevation are approximately 160x100 UB sections and are in reasonable condition. They are plumb and although they have paint loss and surface rust, they have not suffered any loss of section.

East Elevation (Photos 4 to 7)

This elevation has a lower concrete wall (160mm thick) with two courses of 100mm blockwork above, with corrugated steel cladding above. The gables have steel columns at each corner and there are two intermediate columns along the elevation. The columns are as noted above for the south gable in terms of size and condition. The concrete wall is plumb and in serviceable condition with no sign of movement. The concrete is however of a rough finish, with some damage where fixings have been made or impact has occurred (photos 5 & 6). The steel cladding is in poor condition with sections missing (photos 4 & 7).

West Elevation (photos 8, 9, 13 & 15)

This elevation is of the same construction as the east elevation described above. The walls and columns are plumb and the steel columns are in reasonable condition with only surface rust. The concrete wall and blockwork is of a rough finish but in slightly better condition than the east elevation. The steel cladding is in poor condition but does not have sections missing.

The rear section of this elevation has an adjoining building adjacent to this elevation (photos 13 & 15) and this is understood to be being removed under the proposals

North Gable (Photo 17)

This gable is as per the south gable but without the lower blockwork wall. The cladding to the apex is in poor condition with some sections missing. As with the other gable the columns to the corners are plumb, with surface rusting only.

Roof (Photos 10 & 16)

The existing roof is cement or asbestos, profiled sheeting, carried on steel purlins which run between light steel trusses. The roof showed no sign of damage, movement or excessive deflection. The light steel trusses exhibited surface rusting but no loss of section or damaged connections.

5.0 Internal Survey (Photos 11, 12 & 14)

Internal inspection shows concrete floors with concrete & block walls set between the column sections. The floors were raised where cattle stalls have been formed (photo 12). The concrete appeared in reasonable condition where visible.

Mr N Forshaw
Structural Condition Survey
Agricultural Building at Daniels Farm

6.0 Suitability for Conversion and Method of Construction

It can be seen from the survey detailed above that this building is in a poor condition cosmetically but has little or no sign of movement to the steel frame or concrete/blockwork walls.

Provisional proposals for the conversion have been drawn up by PGB Architectural Services Ltd and these can be assessed against the existing structure. The proposals are included in Appendix A.

In converting the building, it would be necessary to provide an inner skin to the existing external blockwork and cladding, forming an insulated cavity wall. Internal loadbearing walls would also be provided. Consideration may should be given to the use of masonry or Structural Insulated Panels (SIP) to form the new internal leaves and loadbearing walls. These walls would be structurally independent of the existing steel trusses and would take the loading from new floor and ceiling structures. They could be founded off the existing concrete floor slab if this is structurally adequate. Cores could be taken through the slab and the loading capacity analysed for the predicted loading. If the slab is not deemed suitable then foundations would be necessary for any load bearing walls. The conversion would require a new screed to the existing floor slab or a completely new floor slab constructed over the existing slab, with insulation under or over it to the Architects details. The proposals set out would retain the steel frame and trusses whilst replacing the cladding to the building. The roof would be recovered with a suitable lightweight system.

Given the proposed construction options briefly outlined above, it is considered that the building is suitable for conversion to a dwelling. When converting agricultural buildings, it is essential that the construction techniques and sequence are carefully considered. It will be essential that any new floor slab does not affect the existing foundations to the columns to be retained. The slab is likely to be designed as a raft foundation to spread the loading and minimise any effects on the existing footings. Trial holes should be hand dug to ascertain the detail of the existing pad footings to the frame and any existing strip footings to the walls, prior to design.

The existing steelwork (columns and trusses) will need to be thoroughly cleaned, removing all rust and then given a protective coating. Loading should not be added to the existing structure and conversion actually gives the opportunity to remove loading from the existing frame and place it on new structural walls. This is the recommended option given the lightweight nature of the existing trusses. Care must be taken in supporting the existing frame if existing wall panels between columns are removed and replaced.

Mr N Forshaw
Structural Condition Survey
Agricultural Building at Daniels Farm

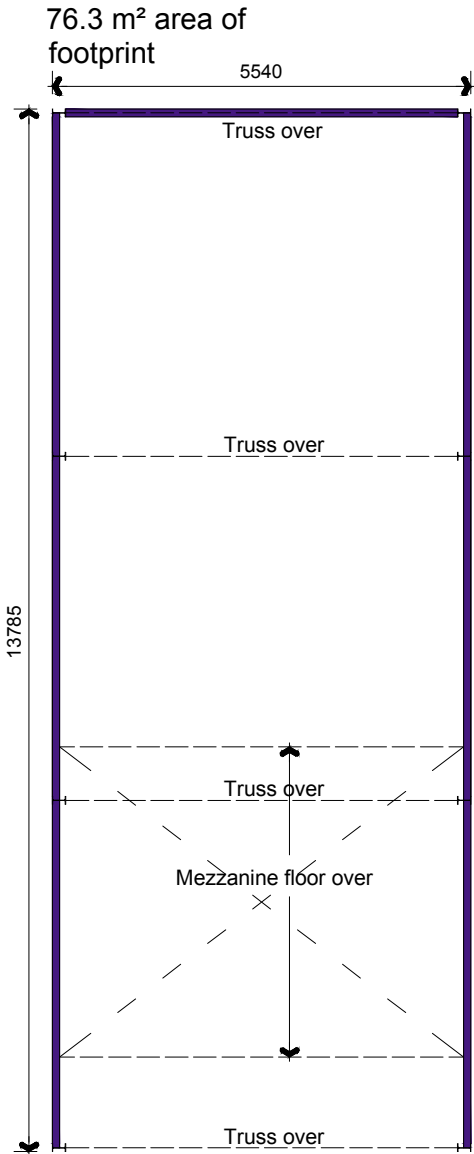
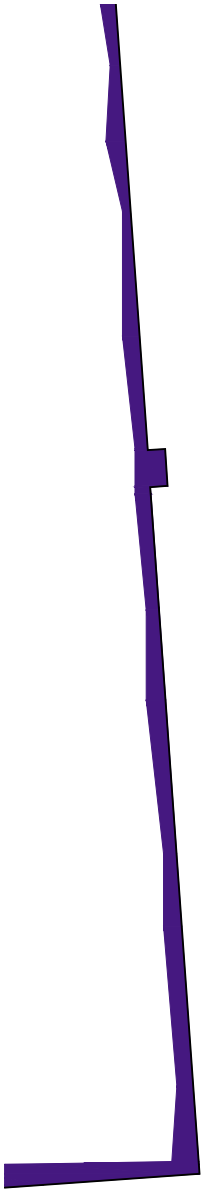
The final proposals should be assessed and designed by an Engineer prior to construction.

7.0 Conclusions

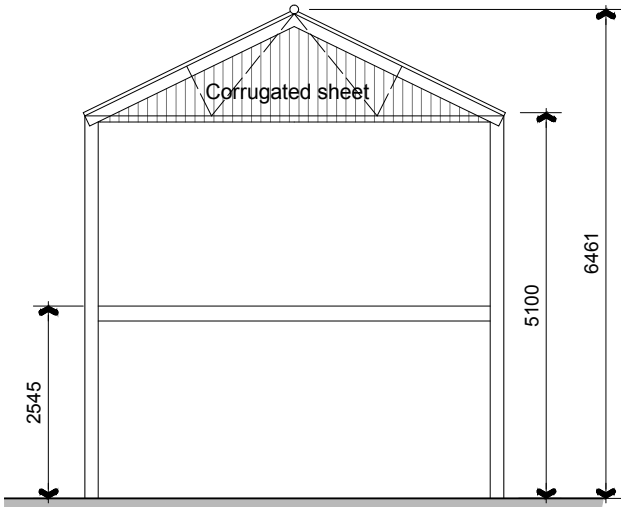
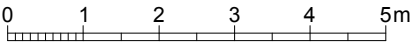
The building is in a reasonable structural condition and is considered suitable for conversion by the method or options outlined above. The new internal structure should be independent of the existing steel frame and be designed to have little or no effect on the existing structure.

Mr N Forshaw
Structural Condition Survey
Agricultural Building at Daniels Farm

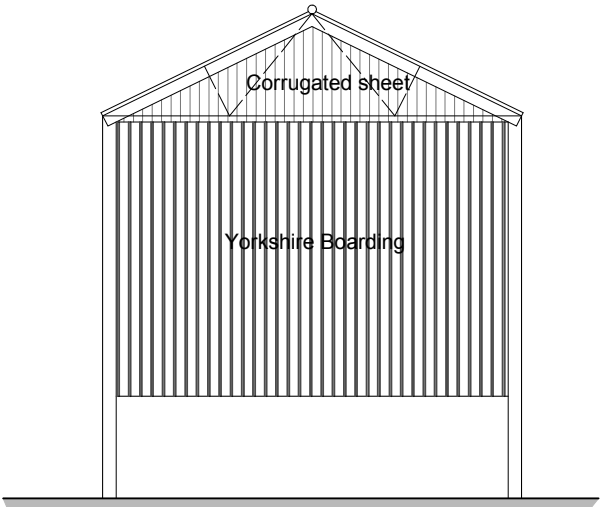
Appendix A
Existing Layout and Provisional Proposals



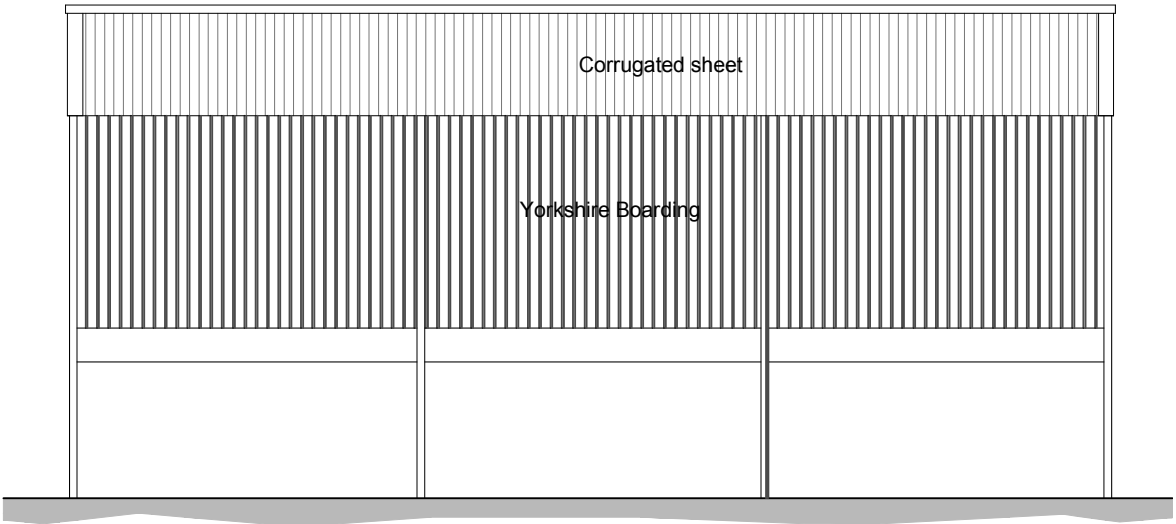
Floor Plan



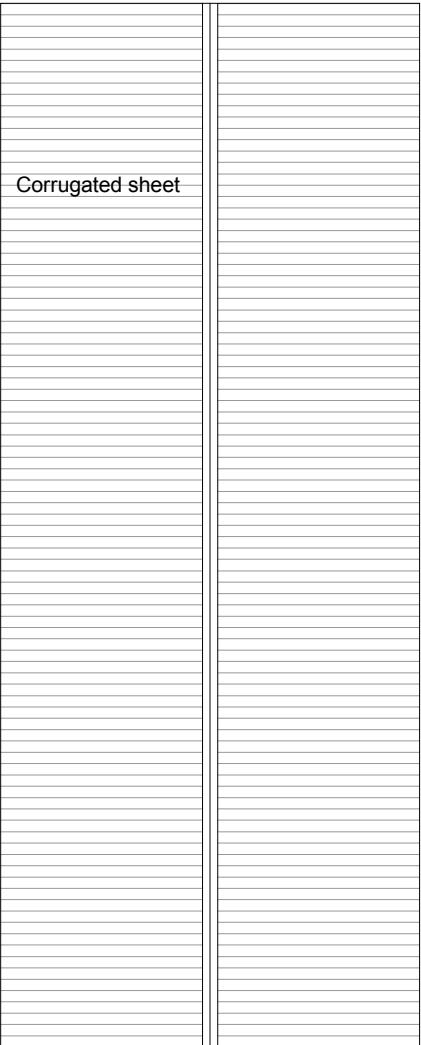
Front Elevation



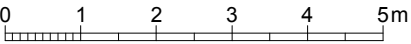
Rear Elevation



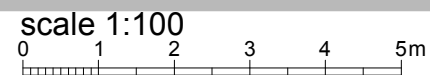
Side Elevation



Roof Plan



1: Do not scale this drawing, use figured dimensions only 2: The Contractor, Sub Contractor or specialist supplier are responsible for confirming site dimensions prior to fabrication 3: Any dimensional discrepancies are to be reported to the Archi tect immediately



Mr Forshaw
Barn 2

Elevations

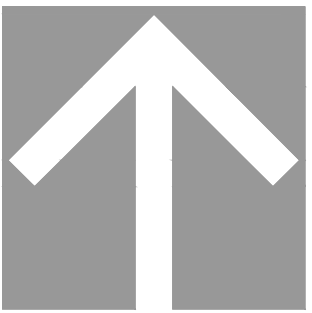
DATE 05.11.2019

REVISION

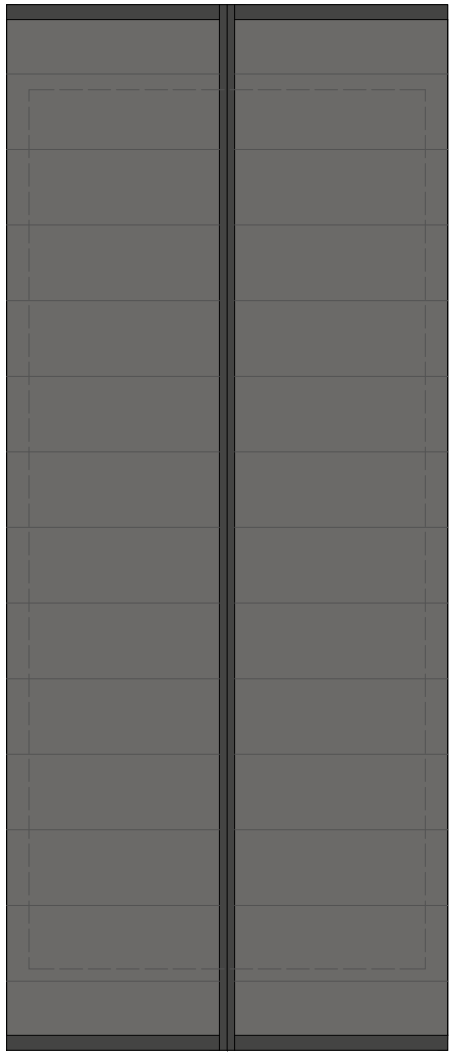
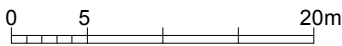
SCALE 1:100 @ A3

PGB
ARCHITECTURAL
SERVICES LTD

NOTES:
1: Do not scale this drawing, use figured dimensions only 2: The Contractor, Sub Contractor or specialist supplier are responsible for confirming site dimensions prior to installation 3: Any dimensional discrepancies are to be reported to the Architect immediately



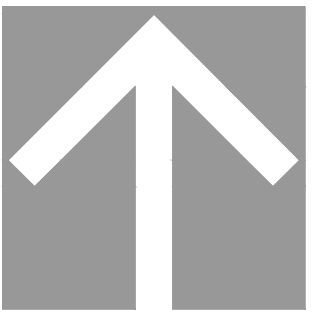
Indicative Block Plan
scale 1:500



Roof Plan - Barn 2
scale 1:100



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Existing Block Plan
scale 1:500

0 5 20m



Conversion: Proir Notification
Preston Road, Alston, Preston PR3 3BL
Mr Forshaw
Barns 1 and 2

Existing Block Plan
DATE 05.11.2019

JOB NO. 3153
DRAWING NO. 007
REVISION
SCALE 1:500 @ A2



Mr N Forshaw
Structural Condition Survey
Agricultural Building at Daniels Farm

Appendix B Photographs



Photo 1 - South Gable



Photo 2 – South Gable - blockwork



Photo 3- South Gable – Corner Column



Photo 4 – East Elevation



Photo 5 – East Elevation – concrete & block wall



Photo 6 – East Elevation – intermediate column and damage to concrete



Photo 7 – East Elevation Cladding



Photo 8 – West Elevation



Photo 9 – West Elevation



Photo 10 – Roof Structure



Photo 11 - Internal



Photo 12 - Internal



Photo 13 – West Elevation at Rear (north)



Photo 14 - Internal showing concrete wall



Photo 15 - West Elevation at rear (north)



Photo 16 – Roof Structure



Photo 17 – North Gable