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ENGINEERING FOR TOMORROW

FORMER AGRICULTURAL BARN, WEST END FARM, PIRTON

**West End Farm
Pirton
Stevenage
SG5 3QP**

May 2021

Rev No - P01

Project Title: Pirton Barn, Pirton

Report Title: Former Agricultural Barn, West End Farm, Pirton

Project No: 5205

Report Reference: 5205-RP001

Status: S2: Suitable for Information

Client: Legal Estates

Client Contact: Luke Winham

Issued By: DB Structural
Unit 6 Media Village
Liscombe Business Park
Soulbury
LU7 0JL
Tel: + 44 (0)1525 643043
Email: james@dbstructural.co.uk

Report Production and Approval Record				
Reference	Name	Signature	Date	Position
Produced	James Kemp		06.05.21	Senior Engineer
Checking	Darren Ball		06.05.21	Director

Document Revision Record		
Rev No	Date	Details
P 01	05.05.21	First Issue
P 02	11.05.21	Revised following client comment

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1. Introduction

This report has been prepared to give an overview of the condition of an existing barn at West End Farm, Pirton and to give an opinion of the suitability of the existing structure for conversion into new dwellings.

2. General Information

2.1. Project Description

There are three agricultural buildings at West Lane Farm just off the main road through Pirton. It is an arable farm and the site had originally been used for the storage and drying of grain. It is now more economical to have this facility centralised off site and the dryer has not been run for at least 10 years.

The Barn which is the focus of this report is a concrete storage shed which consists of four individual elements all constructed in concrete and connected to form a single structure. Please refer to annexure 1 for photographs of the site and barn.

2.2. Site Location

The site is located off West Lane, Pirton, SG5 3QP (grid reference TL 14591 32195), which is a rural village in Hertfordshire. The overall site comprises various agricultural buildings and is generally secured from the public.



Figure 1 - Site Location Plan

3. INSPECTION

A site walkover was carried out by the author on 28th April 2021. A previous report is also available as reference titled 'Disused Barns at West End Farms, Pirton' Ref: DWS LTD 2203 Dated June 2018.

3.1. History

The Barn consists of four individual structural elements linked together to form a single unit. To the left is a small portal frame (concrete) which is linked to a larger concrete portal frame (grain store) with a lean to section in between. The main frame to the grain store is extended to the righthand side with a further lean to which increases the storage area. These two sections are wholly enclosed with perimeter walls reinforced to carry the weight of the stored grain. The small left hand portal and lean to are separated from the grain store and are open on all sides. A concrete slab is provided within this area, as well as to the main frame itself.

It is not clear which unit is the original, but the layout suggests that perhaps the smaller portal is the original and the grain store came along later. Had the main store been the original building then if further space was required the site would probably not have been laid out in the ad hoc manner that it has been. Either way it is not material to the report, the frames are of modular construction and the easy extension of them has always been the aim of the manufacturer.

The smaller portal to the left hand side (when viewed from the front) is to be demolished and it is the larger central grain store that is to be converted, this will form the basis of the rest of the report.

Please refer to annexure 1 for the suite of site photos.

3.2. Structural Form & Framing

The primary framing of the building is a series of concrete portal frames, these are in good order and are in a good state of repair.

The secondary framing to the roof consists of pre-cast concrete purlins and pre-cast gutters as eaves ties. The condition of which are also good.

The ground floor slab is concrete and is in a good state of repair. The previous report by DWS has identified some small shrinkage cracks, but the author would concur with the conclusion that these are normal and not of detriment to the performance of the slab.

Secondary perimeter framing consists of pre-cast concrete and blockwork retaining walls supplemented with kingposts (presumably to hold back the stored grain) these are substantial and are in a good state of repair.

4. PROPOSALS

It is proposed to convert the barn into 4 new dwellings, copies of the current architectural plans can be found in annexure 2.

The structural strategy to achieve this, whilst retaining the original structure is described below

4.1. Roof

The new roof coverings would be supported back the existing purlins, the centres of which are at circa 1m centres. The capacity of the existing purlins is impossible to determine without the amount of reinforcement being known however this is not necessarily an issue as during the detailed design process a comparison will be made of the weight of new coverings versus the old.

4.2. Ground Floor

The ground floor slab will be re-used for the proposed works. As there is no first floor proposed the loading applied to the existing slab will be domestic live, finishes and partitions only, this is considerably less than the slab will have been designed for and subjected to previously.

4.3. Walls

The existing perimeter walls will have been designed and subjected to retained forces during service. Again as there is no first floor in the proposals there is a significant reduction in load applied to these walls (due to the removal of retained grain and no additional vertical load). The current external walls will be adequate to resist the applied wind loading.

5. CONCLUSION

The existing structure is in a good state of repair considering the age and previous use. It is suitable for conversion into the new dwellings.

Conversion of the barn into new dwellings will increase the design life of the frame considerably by protecting it from the elements and thus increasing its durability.

The barn main frame portals are inherently stable, capable of supporting themselves and any new roof coverings.

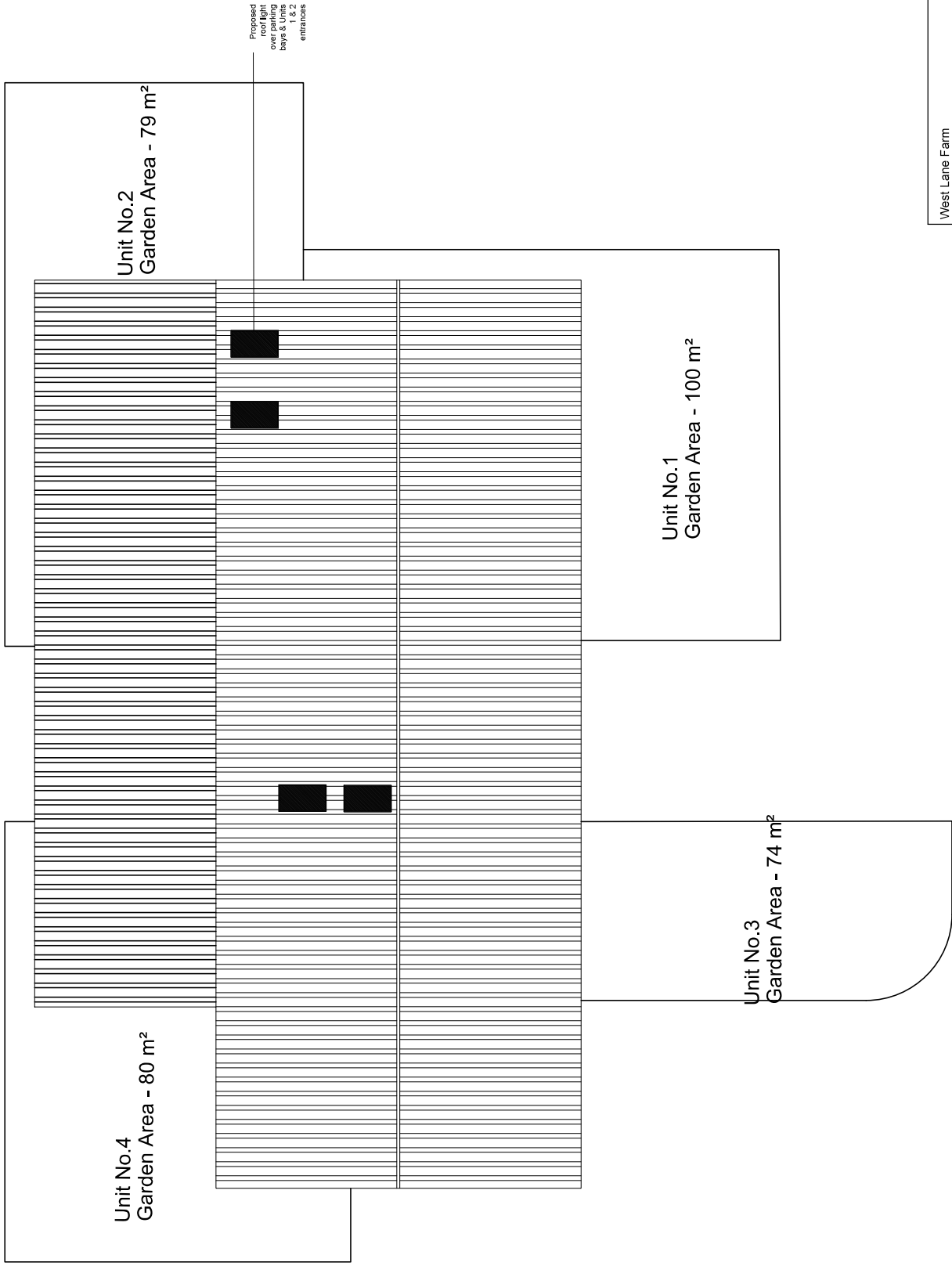
6. **ANNEXURE 1 - PHOTOS**







7. **ANNEXURE 2 - ARCHITECTURAL PROPOSALS**



Curllitage Area Plan - As Proposed
(1:100)

West Lane Farm

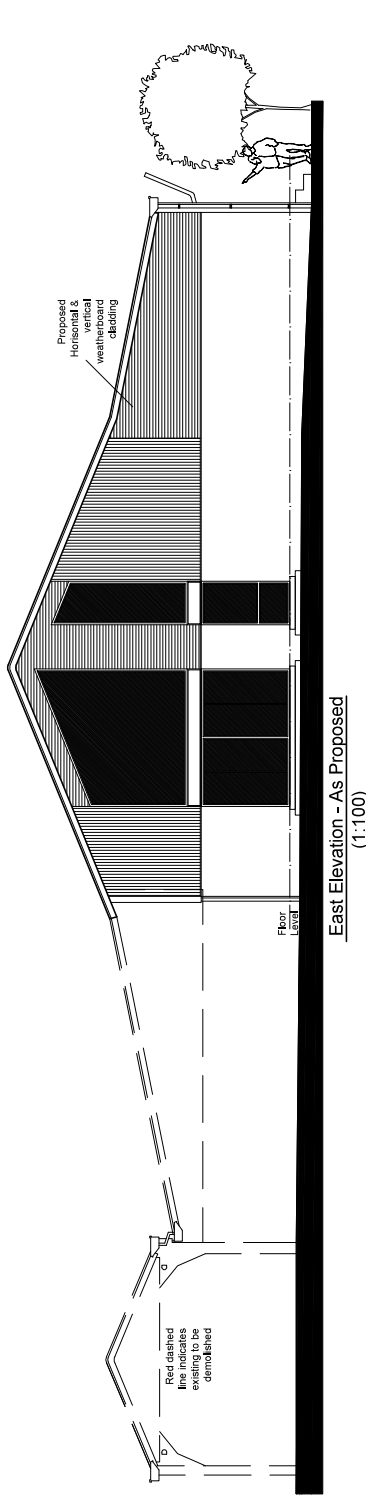
Roof Plan - as proposed

Drawing No.: 0003

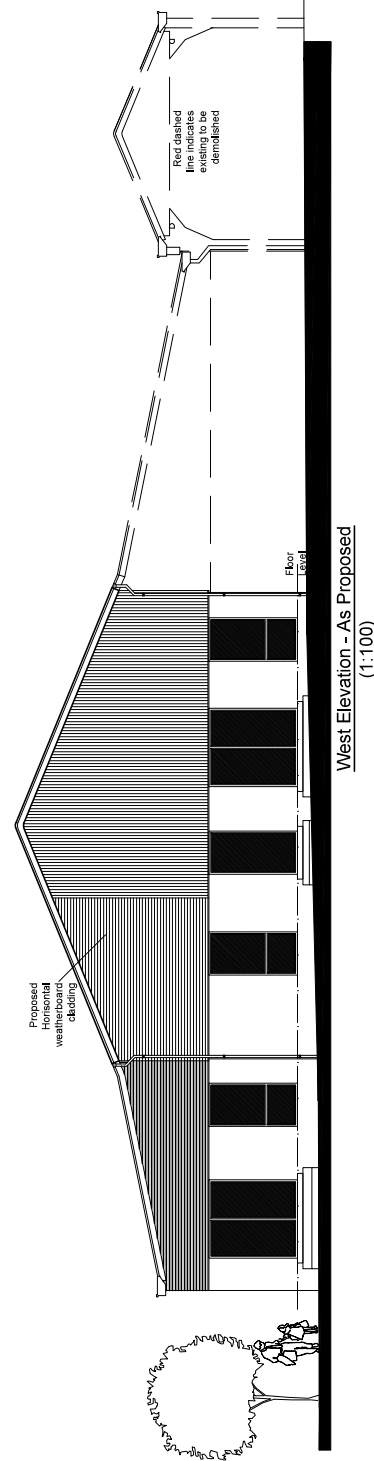
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Date: April 2021

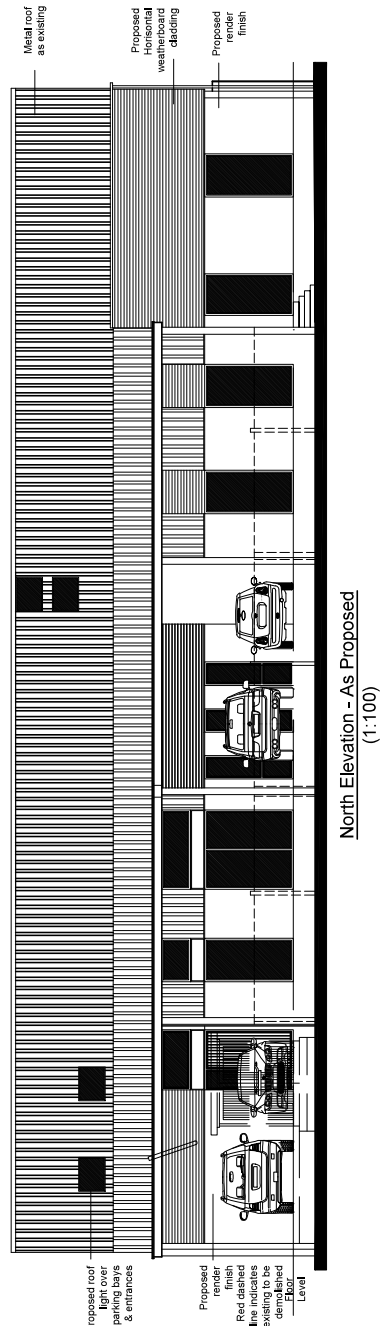
Revision: 28/04/2021



East Elevation - As Proposed
(1:100)



West Elevation - As Proposed
(1:100)



North Elevation - As Proposed
(1:100)

West Lane Farm Elevations			
Drawing No.: 0002	Scale: 1:100@A2	Date: April 2021	
Revision: 28/04/2021			