

**BARN OUTBUILDING
AT
PLAS FARM
CILYBEBYLL**

**PROPOSED
CONVERSION
TO
SERVE
HOLIDAY
COTTAGES**

**STRUCTURAL SURVEY
REPORT**

JULY 2021

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BARN OUTBUILDING AT PLAS FARM CILYBEBYLL NEATH PROPOSED CONVERSION TO SERVE HOLIDAY COTTAGES STRUCTURAL SURVEY

July 2021

21/031

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BARN OUTBUILDING AT PLAS FARM CILYBEBYLL NEATH PROPOSED CONVERSION TO SERVE HOLIDAY COTTAGES STRUCTURAL SURVEY

1.0 Brief

The brief for the report, as instructed by the Mr R Bowen, the property owner and proposed developer in March 2021 was as follows.

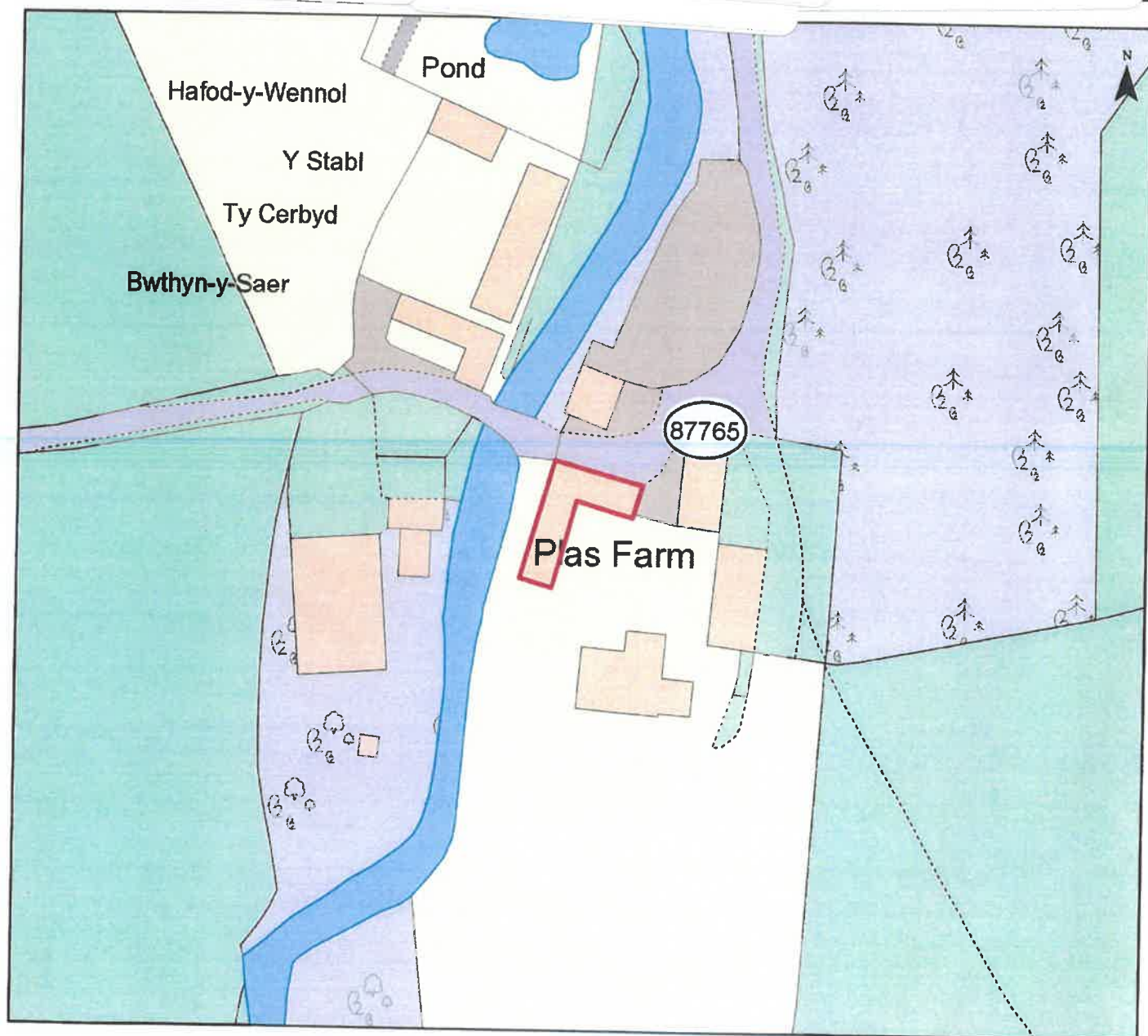
- 1.1** To undertake an inspection of the barn outbuilding at Cilybebyll Farm, Pontardawe Neath, in order to ascertain its current condition and establish whether the existing building and concrete structure can be preserved and maintained, and incorporated into a proposed remodelling scheme for the building, to provide a single bed Holiday let unit at first floor, and communal leisure, laundry and reception facilities at ground floor. .
- 1.2** In parallel to the survey work a review of past survey information was to be undertaken as well as consideration of the CADW grade II listing on the building., in order to ascertain whether the remodelling could be undertaken with the listed building elements considered and taken into account.
- 1.3** Following the survey and review work to prepare a report on the Building summarizing the study findings

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2.0 Methodology

The study work encompassed the following.

- 2.1** A visual inspection of the Barn outbuilding undertaken by G M George MSc DIC MICE of atebconsult in March 2021, during which a photographic record was also undertaken...
- 2.2** A review of the CADW listing document on the building [Appendix C]
- 2.3** A review of the proposed remodelling and conversion scheme for the property as laid out in RIO architects scheme drawings dated May 2021 [Fig 3&4].
- 2.4** A review of past studies and report on the building including appraisal undertaken in 2003 by WSC Structures Ltd [as provide by the client
- 2.5** A structural appraisal of the main barn structure and structural elements to determine the bridge general load bearing capacity.
- 2.6** Following the study and appraisal works the results were collated together and conclusions drawn as to the condition of the Barn and its suitability for conversion. and report prepared.



Awdurdod Lleol: Local Authority:	Castell-nedd Port Talbot Neath Port Talbot	Cyfeimod Grid Cenedlaethol: National Grid Reference:	274866 204069
Cymuned: Community :	Cilybebyll	0 25 50 M	

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 Nodyn hysbyrru ym 1998 o ddwyddyn yr Awdurdod Lleol Castell-nedd Port Talbot a'r Awdurdod Lleol Neath Port Talbot. Mae'r hysbyrru hwn yn awgrymu ei bod yn ddwyddyn yr Awdurdod Lleol Castell-nedd Port Talbot a'r Awdurdod Lleol Neath Port Talbot. Llywodraeth Cymru. Rhif Enwydded 100017916 (2011).

Fig.1

BARN OUTBUILDING AT PLAS FARM CILYBEBYLL NEATH PROPOSED CONVERSION TO SERVE HOLIDAY COTTAGES STRUCTURAL SURVEY

3.0 Description

3.1 Location

The existing Barn outbuilding at Plas Farm Cilybebyll is located within the farm grounds as shown [fig.1] The Barn [grid reference 274866 204069] is accessed by a track/private road as shown with a bridge over the river Clydach which flows to the West of the site

3.2 General Description

- 3.2.1** The Barn is an L shaped building as shown, with the one section being of two storey construction, and the remainder single storey as shown on the survey plan [fig 2.] and the upper first floor storey is accessed by masonry external steps.
- 3.2.2** The Barn dating from circa 1891 is of historic interest in that it is a very early example of the use of mass concrete for building construction in 19th century Britain
- 3.2.3** Due to its age and form of construction the Barn building has been granted grade II listing by CADW ,[under the Planning [Listed Buildings and Conservation areas Act 1990]] The CDAW Grade II listing is reproduced in Appendix C of this report.
- 3.2.4** At time of inspection the building was unoccupied, but has we understand been used for storage in the fairly recent past. A photographic survey was undertaken at time of survey to record condition and is reproduced in Appendix A



Fig.2

BARN OUTBUILDING AT PLAS FARM CILYBEBYLL NEATH PROPOSED CONVERSION TO SERVE HOLIDAY COTTAGES STRUCTURAL SURVEY

4.0 Proposed Conversion Scheme

- 4.1** The proposals for the building is to convert and remodel the building to provide a first floor single bed holiday let unit , accessed off an external stairs, with provision of leisure , laundry and reception facilities on the ground floor as shown on RIO Architect's drawings [fig. 3,4]

4.2 Consideration of CADW Listed status and features

It is proposed within the conversion and remodelling scheme to keep wherever possible the existing building layout and form , and incorporate the concrete wall elements in the conversion scheme , thus conserving and hence maintaining the historic nature of the building whilst also bringing the building back into beneficial use

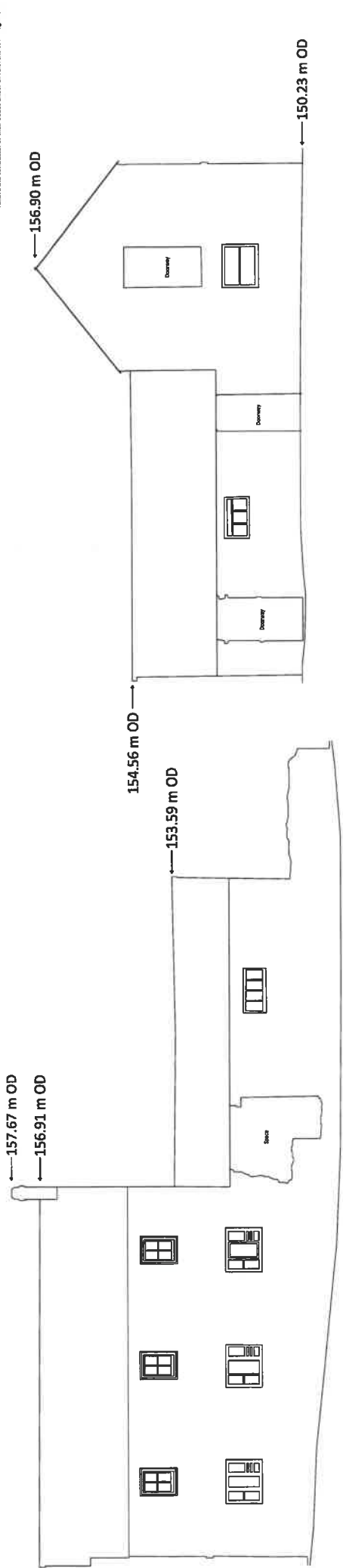
Notes:

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CDM roles are provided to assist the contractor in managing residual health and safety risks. Any such roles do not relieve the contractor of their duties under all relevant CDM Regulations.



West Elevation

North Elevation



Rev	Description	Rev'd	Date

STATUS: PRE APPLICATION

SUBMITTAL TRACKING KEY:

0 - Not Started
1 - In Progress
2 - For Information
3 - For Approval
4 - For Construction
5 - For Completion

REVISIONS:

1 - For Information
2 - For Approval
3 - For Construction
4 - For Completion

DATE: 14/05/2020

RIO

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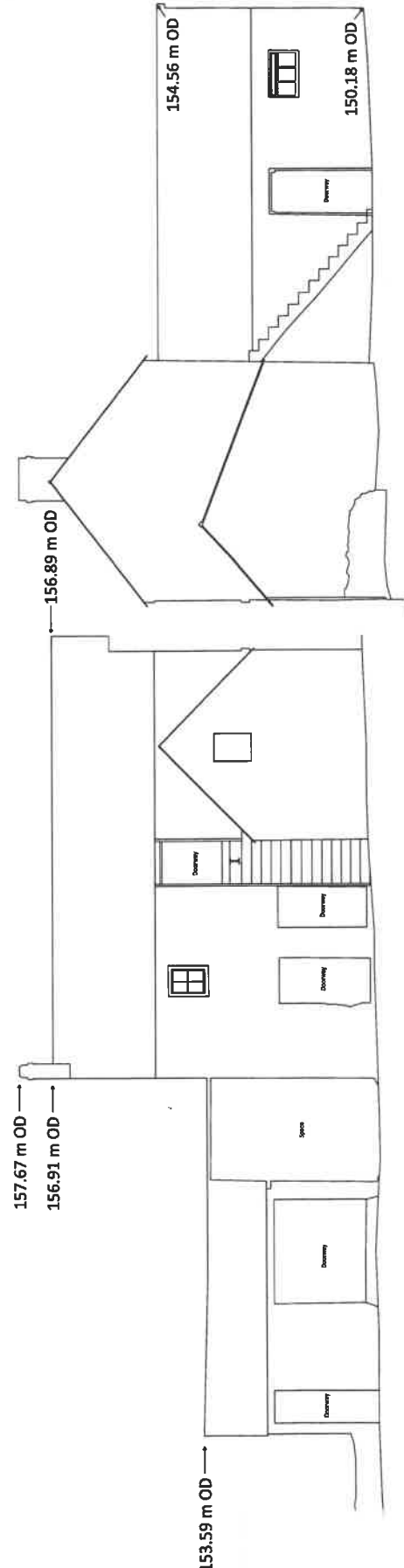
**Swansea Valley
Holiday Cottage**

PROJECT TITLE:
Pias Farm Building
Regeneration and
Conversion

DRAWING TITLE:
Building 1
Existing Elevations

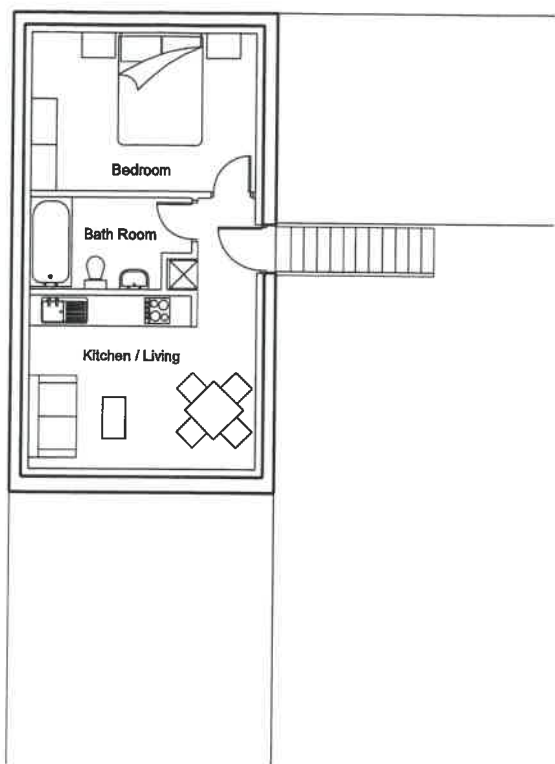
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CHECKED BY: AB
SCALE: 1:50 @ A1

DATE: 14/05/2020	REVISION:
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NO: 0274	XX: A

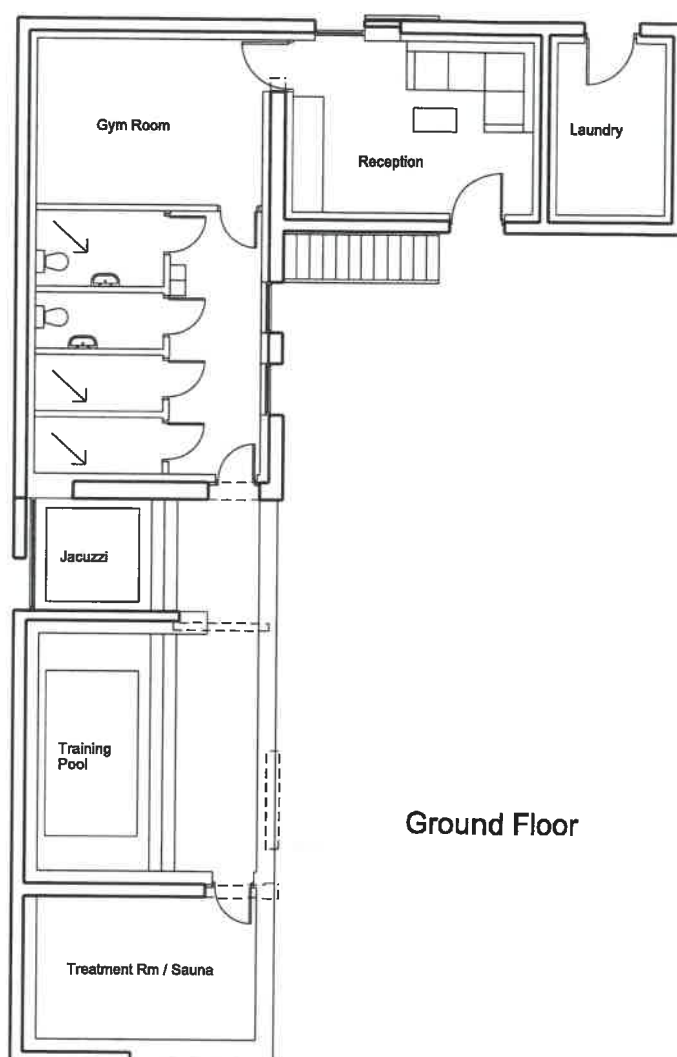


South Elevation

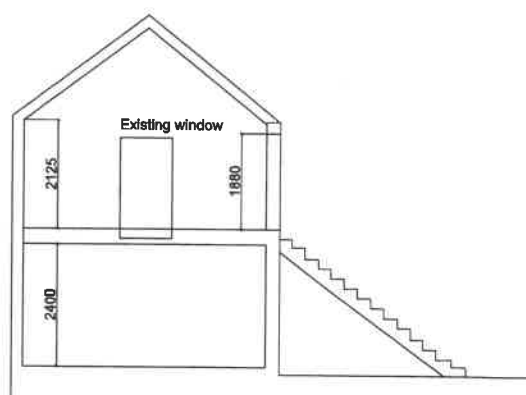
Fig.3



First Floor



Ground Floor



Section

BARN OUTBUILDING AT PLAS FARM CILYBEBYLL NEATH PROPOSED CONVERSION TO SERVE HOLIDAY COTTAGES STRUCTURAL SURVEY

5.0 Structural Survey & Appraisal

5.1 Form of Structure

The building structure is of mass concrete walls with timber first floor elements and roof in metal/corrugated sheeting shown on the record photographs in Appendix A

5.2 Roof

The roof structure to the Barn consist of timber A frame trusses that carry timber purlins that also span onto the gable walls .The trusses and purlins carry metal corrugated sheeting

The roof sheeting is in relatively poor condition and would not be suitable for incorporation into a conversion scheme. The roof Timber trusses appeared in reasonable condition considering their age [they do not however appear as being original] and subject to timber rot and specialist survey could possibly be made good where necessary and reused in a rebuild scheme, with new timber members also introduced where necessary to carry a new roof

The rood rainwater goods and eaves boards and verges where present are in poor condition and would need replacement

5.3 First Floor

The first floor area is of timber construction, carried off timber and in places steel beams The floor areas where access was possible were not in good condition and areas of rot an distress observed . New floors would be needed in a rebuild, as the existing floors are not structurally sound and would not support the proposed imposed loads .

5.4 Ground Floor

The ground floor consist of mass concrete and solid earth , typical of old Barns of this era. The ground floor is not suitable for a conversion scheme and would need to be replaced

With regards to the proposed works it is recommended that anew reinforced concrete floor slab is cast across the building , with the floor then tied into the main walls , so as to act as restraining tie/plate as well as a ground slab . This would tie the building together and allow a lightweight inner timber frame construction to be introduced to support the first floor and also allow thermal uplift of the building .

BARN OUTBUILDING AT PLAS FARM CILYBEBYLL NEATH PROPOSED CONVERSION TO SERVE HOLIDAY COTTAGES STRUCTURAL SURVEY

5.5 Walls

The walls to Barn building are in mass concrete , with window and door openings formed . The windows and doors where present are in timber and show signs of rot and decay and woodworm . These would need replacement with similar style timber windows

The external walls whilst having cracks present in them do however appear structurally stable considering their age and lack on maintenance ,

Whilst the cracking is limited in places there is a large vertical crack in one elevation that also needs local rebuild and recasting of a section of wall to tie all together

At other crack locations it is recommended that specialist stitching is introduced with stainless ties used to tie the original walls together and a compatible concrete mix used to seal the cracks .A detailed drawing /svy and specification should be drawn up for implementation

Due to the age and condition of the walls it is also concluded that in the build/conversion consideration should be given to introduce an inner timber frame structure alongside the external walls and tied back to them. This would then afford additional structural support and also allow the new first floor a roof elements to be supported. The external walls would then in effect become facing walls, with less structural capacity required. In this way the listed concrete walls could be maintained and supported thus maintaining the listed features of the Barn but also allowing it to be remodelled and brought back to use.

In parallel with this work the steel beams that have been inserted in the buling at some time in the past should be removed the concrete walls made good at this locations.

5.6 Foundations

The foundations could not be inspected. Generally the building appeared stable, but subsidence has occurred to one corner, which was also noted in the survey of 2003. From comparison of the results of 2003 with the current survey, little evidence of any ongoing movement is present and it appears the building has stabilized. However local underpinning works will be needed, to maintain the building long term

5.7 External Staircase

The external concrete staircase appeared in reasonable condition and suitable for reuse, subject to local concrete repair introduction of hand railing and balustrading

5.8 Drainage and Services

There is no functional drains or suitable services to the building and new services would be needed

BARN OUTBUILDING AT PLAS FARM CILYBEBYLL NEATH PROPOSED CONVERSION TO SERVE HOLIDAY COTTAGES STRUCTURAL SURVEY

5.9 Review of 2021 svy V 2003 svy

A general review of the recent 2021 survey by atebconsult against the factual results of the earlier 2003 WSC survey was undertaken to ascertain change in the Barn structure over time and the following conclusions drawn ,

1] Generally whilst deterioration over time to timber elements had occurred over the 18 years between surveys there appears was little change generally in the structural walls and elements

2] The cracking and crack patterns to the building observed in 2021 was also noted in 2003 , with little change apparent in width and crack lengths . As a result it is concluded there does not appear to be any ongoing movements in the buildings

3] The subsidence noted in 2003 at the right hand side of the building does not appear to have got worse or increased

4] Sulphate damage around the chimney stacks is still present and needs attention,

5] There has been some deterioration possibly due to frost over the years of the structure where it was damaged by installation of steel beams in the past but the general he structure remains stable, but needs repair in these areas.

BARN OUTBUILDING AT PLAS FARM CILYBEBYLL NEATH PROPOSED CONVERSION TO SERVE HOLIDAY COTTAGES STRUCTURAL SURVEY

6.0 Conclusions and Recommendations

6.1 Conclusions

A] It is concluded that the Barn building whilst currently in a relatively poor condition due to its age and lack of maintenance, is at present structurally stable and it is suitable for repair and local reconstruction

B] These works, which together with introduction of a new reinforced concrete ground slab to tie the foundations and walls together and a secondary timber frame internally would allow the building to be saved and remodelled and brought back into beneficial use, with the new timber frame acting as a structural support and also allowing a thermal upgrade of the building to be achieved

C] These works would thus allow the proposed remodelling and conversion to take place whilst preserving the listed building structural walls

6.2 Short Term Recommendations

1] Concrete repairs to the existing walls to tie across the main cracks in the building so as to maintain integrity

2] Underpinning of the external corner where there is evidence of past subsidence

3] Timber survey to establish which timbers can remain and treated and which timbers need to be taken out

6.3 General Recommendations

To maintain the structural integrity of the Barn and to facilitate its conversion the following works are recommended.

6.3.1 Local underpinning at the corner where subsidence appears to have occurred in the past

6.3.2 Provision of a new ground floor slab/raft tied into the walls at floor level to form a subfloor and lateral tie/plate holding all together at this level

6.3.3 Specialist concrete repairs to the original concrete walls

BARN OUTBUILDING AT PLAS FARM CILYBEBYLL NEATH PROPOSED CONVERSION TO SERVE HOLIDAY COTTAGES STRUCTURAL SURVEY

- 6.3.4** New internal timber frame with ply sheathing and insulation introduced off the new ground slab and ties into the existing concrete walls so as to afford support, with new timber first floor and repaired roof structure taken back to the timber frame to take loads off the original concrete walls
- 6.3.5** Removal of the steelwork that have been inserted into the walls, make good walls and install new beams carried off the internal timber frame walls and frame
- 6.3.5** .Provision of new timber doors and windows, with appropriate damp courses and waterproofing
- 6.3.6** .Provision of new weatherboards rainwater goods and drainage systems to the building
- 6.3.7** .Repairs to external staircase and addition of a balustrade/railings
- 6.3.8** Detailed inspection of the redundant concrete chimney, with ideally the void infilled so as to ensure long term stability

APPENDIX A















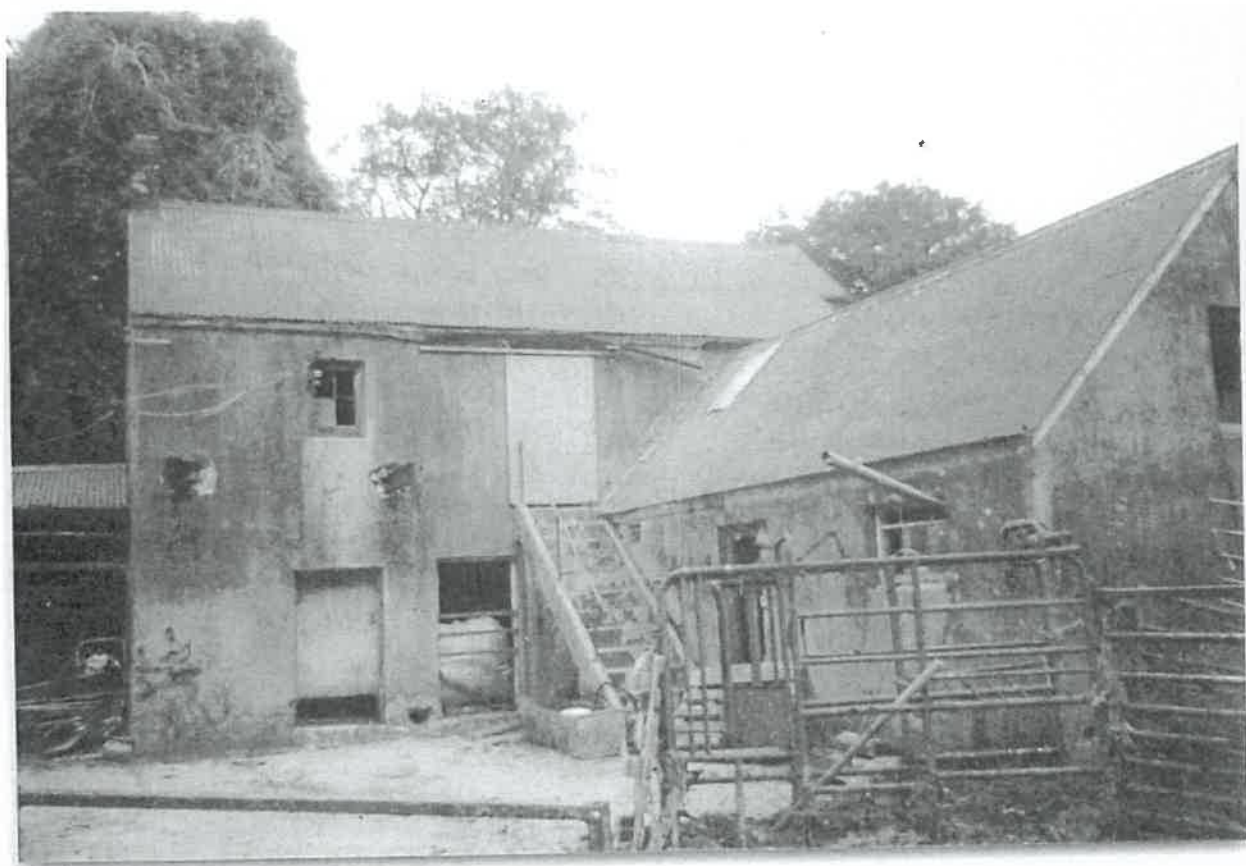








APPENDIX B





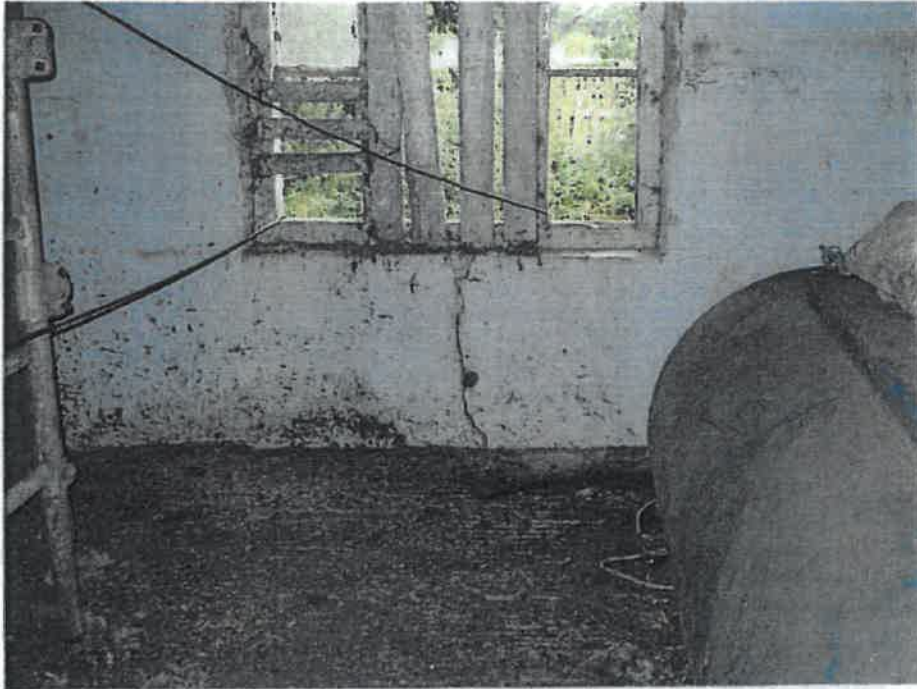




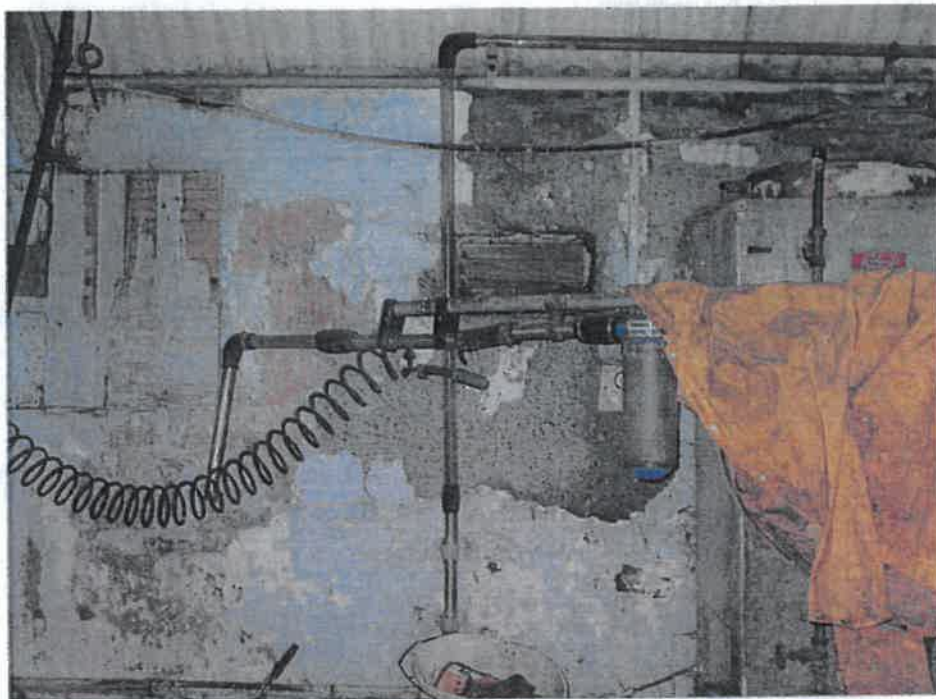
Photograph number 13-Sulphate damage to the gable wall



Photograph number 14-Sulphate damage to the gable wall



Photograph number 15-Vertical crack
in wall



Photograph number 16-Poor condition
of the internal render

APPENDIX C

Cadw

This building is listed under the Planning (Listed Building & Conservation) Areas Act 1990

Listed Building: Report for Building

Authority :	Neath Port Talbot	Record Number :	87765
		Date of Listing :	19 Dec 2017
Community :	Cilybebyll	Date of Ammendment :	
Locality :		Date Delisted :	
		Grid Ref :	274866,204069
		Grade :	II

Name : Outbuilding at Plas Farm

Street No, Name :

Street Side :

Location :

At Plas Farm, c100m south of Plas Cilybebyll. Approached via a drive and farm track from Cwm Nant-Llwyd Road. On the E side of the river Clydach, the farm is accessed via a concrete bridge.

History

Farm building constructed on the Plas Cilybebyll estate c1891 using concrete as a walling material. During the C19 industrialisation and improved transport enabled the increasingly widespread use of new materials such as concrete, creosote and corrugated sheeting for farm buildings. They were cheaper to buy, simpler to use and did not require skilled labour for their use. Concrete was quickly harnessed for foundation work, dock construction, and on estates, particularly under the stewardship of improving landlords but generally its use for walling or as a construction material was limited.

Mass concrete had been used in 1870 for a barn on the Buscot Estate in Berkshire and articles on its use had started to be published from this date in the Journal of the Royal Agricultural Society of England. In Wales the Gregynog Estate (Powys) under Henry Hanbury-Tracy was also building in mass concrete. Similar work was also underway during the 1870s at Dinas Mawddwy in Gwynedd. Concrete was also being used in South Wales in the same period; an advert from Oldfield Bros. of Bute Dock Cardiff, agents for the Economic Concrete Building Company of Gracechurch Street, London had appeared in the South Wales Daily News in May 1874 for 'economic' concrete building. A letter to the editor of the Cambrian in September 1876 described the erection of an 8-roomed concrete house in the Swansea Valley, constructed using shuttered concrete (a mix of 1:7 Portland cement to crushed local stone) incorporating large stones within each layer. The owner of the Cilybebyll estate from the mid C19 was Herbert Lloyd, an improver in estate management, and concrete had already been used on the estate by the time these farm buildings were constructed in the early 1890s: an out building at the mill, c500m south of Plas Farm was built using concrete, possibly in the 1860s or 1870s.

The experimental use of concrete was largely abandoned by the 1890s, superseded by reinforced concrete: the Weaver flour mill on the N Dock in Swansea in 1897 was the first reinforced concrete framed building in Britain. It is possible that the earlier experiments in concrete construction informed this new departure in the

use of the material.

Exterior

Farm building. Mass concrete with plain cement render with platt band, gable chimney and corrugated sheet roof. Tripartite windows to ground floor, central light opening, 4 light windows to first floor. L-plan, 2 storey gabled N-S range to river with single storey wing to S (partly demolished) and single storey wing to NE. W elevation to river of 3 windows, S gable single bay with loading door and hoist to first floor with projecting roof. 2 bay E (yard) elevation with small window above ground floor door to left door to right and steps with handrail up to first floor door. Single storey wing attached in line with the gable. S elevation with doorway and wide window, N elevation of 2 doorways and central 3-light window. Single window to gable. Single storey wing to S of main range retains evidence of pig sty arrangement but roof raised to front (yard) side.

Interior

Largely refitted mid-late C20 in conversion to dairy farm use. S single storey range retains 1891 dated roof truss.

Listed

Included for its special architectural interest as an extremely rare example of a mass concrete building from the C19 pioneering phase of the use of concrete for building construction.

References

None recorded

Sources

Author	Date of Publication	Title	Volume
	21st May 18	South Wales Daily News	
	22nd Septem	The Cambrian	
N Harvey	1984	A History of Farm Buildings in England and Wales	
S Wade Martins	1991	Historic Farm Buildings	
S Wade Martins	2002	The English Model Farm, Building the Agricultural Ideal, 1700-1914	

**Llywodraeth Cymru
Welsh Government**

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qA1219579

Section 1 of the Planning (Listed Buildings and Conservation Areas) Act 1990

Listing of: Outbuilding at Plas Farm, Cilybebyll, Neath Port Talbot

Record Number: 87765

Grade: II

Grid Reference: 274866 204069

Signed by Matthew Coward under authority of the Minister for Culture, Tourism and Sport, one of the Welsh Ministers.



Matthew Coward
Senior Heritage Planning and Designations Manager
in the Welsh Government

Date: 19 December 2017

Adran 1 o Ddeddf Cynllunio (Adeiladau Rhestredig ac Ardaloedd Cadwraeth) 1990

Rhestru: Adeilad allan yn Plas Farm, Cilybebell, Castell-nedd Port Talbot

Rhif Cofnod: 87765

Gradd: II

Cyfeirnod Grid: 274866 204069

Llofnodwyd gan Matthew Coward dan awdurdod Y Gweinidog Diwylliant, Twristiaeth a Chwaraeon, un o Weinidogion Cymru.



Matthew Coward
Uwch Reolwr Cynllunio Treftadaeth a Dynodiadau
yn Llywodraeth Cymru

Dyddiad: 19 Rhagfyr 2017

qA1219579

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yn Llywodraeth Cymru

Dyddiad: 19 Rhagfyr 2017