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CAE-CANOL-MAWR, FFESTINIOG, GWYNEDD

[NPRN 28244]

Architectural Record

FINAL REPORT
January 2012

A report commissioned by
The North West Wales Dendrochronology Project
in partnership with
The Royal Commission on the Ancient and Historic Monuments of Wales

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CAE-CANOL-MAWR
Ffestiniog, Gwynedd

[**NPRN: 28244**]

Architectural Record

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CAE-CANOL-MAWR
Ffestiniog, Gwynedd

[NPRN: 28244]

Architectural Record

Summary

Cae-canol-mawr occupies an isolated, upland site high in the hills above Ffestiniog on the northern side of the Cwm Teigl as it emerges beneath the steep upper slopes of Manod Mawr. It is located c.3km south-east of Blaenau Ffestiniog, centred on centred on NGR SH 7201 4389 and is situated at an elevation of c.300m AOD. Cae-canol-mawr is a Grade II listed building and is included on the RCAHMW on-line database Coflein, NPRN 28244. The building was recorded in January 2012 as part of the North-West Wales Dendrochronology Project, undertaken in partnership with the Royal Commission on the Ancient and Historical Monuments of Wales.

The house was constructed in the early 16th century on a three bay, two-unit plan conforming ostensibly to Smith's 'Type A' end chimney plan though closer inspection reveals a more complex structure of a 'hybrid' nature combining certain elements of the developed 'Snowdonia' plan, viz. the distinctive two-unit plan with hall and outer rooms, cross-passage and opposing gable end mural fireplaces heating ground and first floor rooms, with relic features of the late-medieval period. In its primary form, Cae-canol-mawr would appear to have been furnished with a two–bay open hall and paired service rooms to ground floor level with first floor accommodation restricted to the lower bay only, in a manner akin to a 'croglofft'. During a subsequent phase of modification, the first floor accommodation was extended out over the cross-passage forming a gallery overlooking the hall; the open hall has never been fully closed over.

The dendrochronological dating of 1531 places it fairly early in the transitional period between the open hall and the fully storeyed house which may account for the fact that only certain of those features which were to become characteristic of the fully-storeyed house were adopted in this building. Cae-canol-mawr represents a most intriguing building of 'transitional' form and, while the surviving fabric allows for reconstructions of the primary layout to be made with some degree of confidence, a number of features cannot on the available evidence be interpreted with certainty and the building would certainly warrant further investigation.

1 INTRODUCTION

1.1 Background to the Project

1.1.1 Cae-canol-mawr, Ffestiniog, Gwynedd was recorded in January 2012 as part of the North-West Wales Dendrochronology Project (NWWDP),[1] undertaken in partnership with the Royal Commission on the Ancient and Historic Monuments of Wales (RCAHMW).

1.1.2 Cae-canol-mawr occupies an isolated, upland site high in the hills above Ffestiniog on the northern side of the Cwm Teigl as it emerges beneath the steep upper slopes of Manod Mawr (see Plates 1 and 2). It is

[1] http://www.datingoldwelshhouses.co.uk/

centred on NGR SH 7201 4389, *c*.3km south-east of Blaenau Ffestiniog and is situated at an elevation of *c*.300m AOD (Figure 1).

1.1.3 Cae-canol-mawr is a Grade II listed building (CADW Listed Building ID 4701)[2] and, as such, is accepted as being of national significance, while it is also included on the RCAHMW on-line database Coflein, NPRN 28244.[3]

1.1.4 The building recording was undertaken subsequent to a programme of dendrochronological sampling, undertaken by the Oxford Dendrochronology Laboratory in August 2011 (Bridge 2011; see section §.5).

1.2 Scope of Report

1.2.1 The Historic Building Record was undertaken in accordance with a 'Design Brief for Historic Building Recording' prepared by the Project Director; a copy of the brief is included below as **Appendix A**.

1.2.2 This report outlines the results of the building survey, and has been prepared in accordance with English Heritage guidelines as published in *Understanding Historic Buildings: A Guide to Good Recording Practice* (EH, 2006), the Institute for Archaeologists' *Standard and Guidance for the Archaeological Recording of Standing Buildings or Structures* (I*f*A, 2008) and the Association of Local Government Archaeological Officers' *Analysis and Recording for the Conservation of Works to Historic Buildings* (ALGAO, 1997).

1.2.3 This report has been prepared based upon information current and available as of January 2012.

2 AIMS AND OBJECTIVES

2.1 The general objective of the architectural record, as outlined in the design brief, was to generate a drawn, photographic and written record of Cae-canol-mawr to complement the dendrochronological study, previously undertaken.

2.2 Specific aims of the recording action are listed at Section §.5 of the project brief, reproduced at **Appendix A** below.

3 METHODOLOGY

3.1 Documentary Research

3.1.1 No programme of documentary research into the buildings has been undertaken as part of the current Historic Building Record.

3.2 Historic Building Record

3.2.1 The Historic Building Record comprised an exterior and interior examination of the structure of the house and the compilation of drawn, photographic and written records of the same as follows:

The Drawn Record

3.2.2 Measured plans were generated on site at principal floor levels, marking significant architectural and archaeological detail, together with transverse cross-sections on the line of the principal roof trusses. Drawings were prepared on site at a scale of 1:50, using pencil of archivally stable drafting film,

[2] http://www.britishlistedbuildings.co.uk/wa-4701-cae-canol-mawr-ffestiniog, date of listing: 24th April 1951.
[3] http://www.coflein.gov.uk/en/site/28244/details/CAE-CANOL-MAWR/

measurements being captured by a combination of hand tape and hand-held laser measurement. A register of project drawings is included below as **Appendix B**.

The Photographic Record

3.2.3 The photographic record comprised high resolution digital photography using a Nikon D3000 digital single lens reflex camera (10MP) and was commensurate with a 'Level 3' record as defined by English Heritage (2006, 14), extending to include both general and detail shots, contextual views and accessible exterior elevations, visible structural and decorative details (interior and exterior), and general interior views of principal rooms and circulation areas. Where possible, photographs included graded photographic scales. All photographs were recorded on *pro-forma* recording sheets detailing subject, orientation, photographer and date. A register of project photographs is included below as **Appendix C**; digital copies of photographs in *.jpg format are included on CD appended to the rear cover of the report.

The Written Record

3.2.4 To accompany the drawn and photographic records, a written account of the house was made as free text; this forms the basis of the following description.

4 BUILDING DESCRIPTION

4.1 Overview

4.1.1 Cae-canol-mawr comprises three principal, chronologically distinct elements, illustrated in Figure 3. The principal, primary range (**Phase I**) occupies a rectangular plan aligned NE-SW, though this has been simplified for the purposes of the following description and discussion such that the range is assumed to be aligned north-south, with the principal entry via the east elevation (see Figure 4). It is stone built of 1½ storeys beneath a pitched, slate-clad roof, gabled to north and south with ridge stacks above the end gables. Appended to the north gable end of the primary range is a secondary (**Phase II**) block (?bakehouse extension) with projecting, tapered chimney stack set centrally to the northern gable. A tertiary (**Phase III**) store/service range with cat-slide roof has been added to the western lateral wall of the Phase II block; both Phase II and Phase III extensions date most probably to the 19th century; the current study has concentrated on the primary Phase I range.

4.2 The Primary Range

Exterior

4.2.1 The principal range is built on a rectangular plan with exterior measurements of 11.4m (37½ft) N/S x 7.3m (24ft) E/W and standing *c*.6.75m (22ft) to the ridge. The **east elevation** (Plate 3) is stone-built of rubble construction, rising to 1½ storeys above an offset boulder footing (Plate 4) beneath a pitched, slate-clad roof, gabled to north and south with slate copings. Ridge stacks rise above the northern and southern gables, that to the north being the larger, principal stack.[4] The principal doorway (Plate 5), flat headed and housing a modern, recessed planking door, is offset towards the south end of the elevation. Ground floor fenestration comprises a small square opening to the south, housing a two-light timber casement, and a larger, three-light casement to the north; a single first floor window opening is located to the south, hard below the eaves, again housing a two-light timber casement. Though windows have been renewed throughout, all openings would appear to reflect primary locations.

[4] The southern stack has been rebuilt as part of the current refurbishment works (Ben March, *pers. comm.)*. See RCAHMW 2009 description at http://www.coflein.gov.uk/en/site/28244/details/CAE-CANOL-MAWR/ which records a single stack to the north gable only.

4.2.2 The **west elevation** (Plate 6) reflects the arrangements of the east front though with certain modifications. It is again stone-built of rubble construction, rising to 1½ storeys above an offset boulder footing (here obscured by a raised platform for a gin-wheel – Figure 3; Plates 6/9) beneath a pitched, slate-clad roof, gabled to north and south with slate copings (south only) and ridge stacks rising above the gable ends. A former doorway, offset towards the south of the elevation (and opposing the principal doorway to the east) has been partially blocked and converted to form a window housing a two-light casement (Plate 7). To the south, a single-light window lights the ground floor level, though the first floor window opening, surviving to the east, has here been blocked externally.[5] A further ground floor window opening to the north is tall and retains a projecting slate hood-mould, presumed original (Plate 8).[6] An iron gin-wheel located *c*.3m to the west of the range (Figure 3; Plate 9) formerly served the south-west room [**GF04**], presumably functioning as a dairy at that time, the related iron drive-shaft passing through a low level opening within the west wall immediately below the southern window (Plate 10).

4.2.3 The **south elevation** (Plate 11) presents a blind gable of stone rubble construction above a projecting boulder footing, capped by a square ridge stack (recently rebuilt)[7] serving a first floor fireplace; the **north elevation** (Plate 12) was likewise blind though in its current form is for the most part obscured by the Phase II (?)bakehouse extension (Plate 12).

Interior

Ground Floor (Figure 4)

4.2.4 Access to the **ground floor** level is via the original doorway opening offset towards the southern end of the east elevation, which opens onto lobby [**GF01**] (Plate 13) occupying the eastern part of an original cross-passage, 2.3m (7½ ft) wide and extending, together with [**GF03**], across the full width of the range; an opposing door within [**GF03**] has been partially blocked to form a window (Plate 14). The south wall of the cross-passage is formed of a timber-framed partition comprising regularly spaced vertical posts with rendered infill panels, best observed from within the south-east room [**GF05**] (Plate 16). Posts, a total of five of which survive to the east only, measure 1ft x 3in. and are set at *c*.2ft centres,[8] double-pegged to an upper head beam, the latter member measuring 11¼ x 4½in. and extending to the full width of the range. Two primary doorways are evident, that to the east surviving intact (Plate 15) where it serves room [**GF05**], while a second original doorway, slightly wider, is evidenced by chamfer stops within the head beam visible within [**GF05**] and [**GF03**]. A longitudinal groove between post mortices within the soffit of the western section of the head beam, observed within [**GF03**], indicates an original post and panel construction. The southern rooms [**GF04**] and [**GF05**] are unheated and are each lit by a small window in the lateral walls; the rooms are ceiled over with plain chamfered joists, 5 x 3in. at 2ft centres, though no evidence was recorded for a former lateral partition.[9]

4.2.5 To the north of the cross-passage represented by [**GF01**] and [**GF03**], and accessed via a narrow pedestrian doorway on the axis of the range, is the main living area or 'hall' [**GF02**] (Plate 18), measuring 5.35m (17½ft) E/W x 3.7m (*c*.12ft) N/S and fully open to the apex of the roof. The hall is heated by a wide fireplace in the north gable (Plate 19), spanned by a substantial timber bresummer, plain chamfered and stopped, and is lit by opposing windows set high in the lateral walls. The western window retains a primary timber frame (Plate 20), approximately 32in. square with one of three original, square-set plain timber mullions *in-situ*; in its original form the window would have been unglazed with three 4½ x 4in. timber mullions set at 10in. centres thus leaving four gaps of *c*.5in. in width. The eastern window has been enlarged to house a three-light timber casement though it is assumed it would have originally have taken a similar form. The heads of both windows to [**GF02**] are set at +2.26m (7ft 5in.) above interior floor level (Figure 8) which, being above

5 The window survives internally and retains an original mullioned frame; see §.4.2.6, Plate 26.
6 This window also retains an original mullioned frame internally; see §.4.2.5, Plate 20.
7 Mr Ben March, *pers.comm*.
8 One of the posts of the southern passage partition displays distinctive signs of trestle sawing (Plate 17).
9 **NB**: the southern rooms and the cross-passage are ceiled independently.

the level of the first floor (+2m), suggests that the first floor did not extend over the area of the hall in its original state, the hall thus being open to the roof as it remains today. The southern wall of [**GF02**] has been re-made (Plate 21), though an original timber head beam survives, soffit details of which indicate an original partition of post and panel construction (Plate 22) with a wide (*c*.2m/6½ft) central doorway with simple stop-chamfered head (see Plate 23).[10]

First Floor (Figures 5)

4.2.6 The **first floor** is accessed via an inserted, cantilevered slate stair rising from north to south against the west wall of [**GF02**] (Plate 24); no evidence was recorded for the siting of an original stair. First floor level extends to Bay 1 and to most of Bay 2 forming a single, open space [**1F01**], though not to Bay 3 to the north which thus remains fully open from ground floor to the underside of the roof, reflecting the apparent primary arrangement (see §.4.2.5 above). The northern limit of the floored area is defined by a modern timber balustrade and hand rail set atop the northern wall of the ground floor cross-passage, forming a 'gallery' overlooking the hall with access to the inserted stair adjacent the west wall. The upper level is heated by a fireplace within a projecting stack in the south gable (Plate 25) and is lit by a single window hard beneath the eaves in the east wall; a corresponding window to the west has been blocked externally though an original timber frame, formerly with a single square-set mullion, survives (Plate 26).

Roof (Figures 6 and 7)

4.2.7 The **roof** is of three bays (here numbered 1 to 3 from south to north) defined by two primary trusses (**T1** and **T2** to south and north respectively). Truss **T1** (Figure 6; Plates 27/8) comprises substantial principals (17in. x 6in.), bridled at the apex and joined by a high collar, triple-pegged. The soffit of the collar displays redundant mortices for three regularly spaced vertical studs (Plate 29), double-pegged, while the lower faces of the principals, immediately above plate level display long (16in.) mortices, triple-pegged, cut perpendicular to the face of the rafters; regular stave holes indicate that the truss was formerly closed. It is of note that truss **T1** does not aligned vertically with the southern cross-passage partition at ground floor level, with implications for the primary arrangements which will be discussed below (see §.6.1). Truss **T2** (Figure 7; Plate 30), which is likewise offset *c*.1m to the north of the ground floor partition marking the north side of the cross-passage, comprises principals of similar scantling, joined by a short collar, triple-pegged, set somewhat higher than that of **T1**. The collar soffit here displays a single mortice for a central, vertical stud (Plate 31), double-pegged, while the inner faces of the principals each include 2 tiers of mortices cut perpendicular to the rafter face in a fashion similar to those recorded at **T1** (Plate 32), double-pegged to the upper tier, triple-pegged to the lower mortice. The lower arrises of the principals are plain chamfered and stopped to respect the lower mortice, unchamfered above. The original form of the roof trusses is discussed at greater length below (see §.6.1.4).

4.2.8 The roof is carried on two tiers of through purlins (10in. x 4in.) trenched into the upper faces of the principals and a square-section ridge piece notched into the apex of the principals, supporting primary common rafters of 7½ x 2½ scantling at 18in. centres (Plate 34); no purlin scarf detail was visible. Purlins are supported by two tiers of longitudinal wind-bracing, single-pegged, cusped to Bays 2 and 3 (Plate 35),[11] straight to Bay 1 (Plate 36) though absent at the stone-built gable ends.

4.3 The Secondary and Tertiary Ranges

4.3.1 Appended to the north gable end of the primary range is a stone-built, rubble constructed, single-storey extension with shallowly pitched roof, gabled to the north with a projecting, tapering stack (Figure 3; Plate37). The east elevation includes a single, central doorway flanked to north and south by simple, square window openings housing timber casements. Internally, the range retains little of interest. To the west

[10] Only the eastern chamfer stop is visible, the projected width of the door here being based upon an assumed symmetrical layout.
[11] Cusped braces are missing from the NW slope of Bay 2.

side of the Phase II extension, a small lean-to store has been erected with a 'cat-slide' roof continuing the western roofslope of the Phase II range (Plate 38).

5 TREE-RING DATING

5.1 A programme of tree-ring dating was undertaken by the Oxford Dendrochronology Laboratory in August 2011 (Bridge, 2011). Samples were taken from both roof trusses, the bresummer of the first floor fireplace and from the south stud partition wall of the primary cross-passage; samples are summarised in tabulated form overleaf and locations are indicated in Figures 4-7.

5.2 In all, four roof timbers and the fireplace bresummer successfully dated; the five matching series were combined to form a site chronology spanning 114 years (1417-1531). One roof timber [**ccm02**] retained complete sapwood giving a felling date of spring 1530, whereas the first floor fireplace bresummer was formed from a tree felled in 1531/2 suggesting the house was constructed in **1532** or within a year or two of that date. Interestingly, samples [**ccm01**] and [**ccm02**] displayed strong cross-matching and almost certainly derived from the same parent tree which, while common within a single truss, is here worthy of note in that the samples derived from different trusses (**T1** and **T2** respectively). The timbers of the ground floor cross-passage partition ([**ccm06-07**]), and the secondary tie adjacent to **T2** ([**ccm05**]) failed to date.

Sample number	Timber and position	Date of series	H/S boundary date	Sapwood complement	No of rings	Felling date range
***ccm01**	East principal, **T1**	1454-1524	1517	7	71	1528-1538
ccm02	West principal, **T1**	1427-1529	1504	25¼C	103	Spring 1530
ccm03	West principal, **T2**	1432-1501	1501	H/S + 15NM	70	Spring 1530
***ccm023m**	Mean of **02** and **03**	1427-1529	1503	26¼C	103	Spring 1530
ccm04a	Collar, **T1**	*1417-1502*	*1502*	*h/s*	*86*	
ccm04b	Collar, **T1**	*1452-1488*	---	---	*37*	
***ccm04**	Mean of **04a** and **04b**	1417-1502	1502	h/s	86	1513-1543
ccm05	Inserted tie adj. **T2**	---	---	15C	54	---
ccm06	Stud within south wall of cross-pasage	---	---	2	50	---
ccm07	Door jamb within south wall of cross-passage	---	---	---	<40	---
***ccm08**	GF **FP** bresummer, [**GF01**]	1421-1531	1500	31C	111	Winter 1531/2
*= included in site master **CAECANLM**		**1417-1531**			**115**	

Table 1:
Summary of Dendrochronological samples (from Bridge, 2011, table 1).

Key: H/S bdry = heartwood/sapwood boundary - last heartwood ring date; C = complete sapwood, winter felled; ½C = complete sapwood, felled the following summer; NM= not measured.

6 INTERPRETATION

***NB**: The evidence of the extant fabric is inconclusive regarding the primary arrangements of Cae-canol-mawr; the development possibilities outlined below are hypothetical, based upon current understanding and may be subject to revision in the light of documentary research, further archaeological study, dendrochronological sampling and/or exposure of primary fabric within the building.*

6.1 Origins and Development

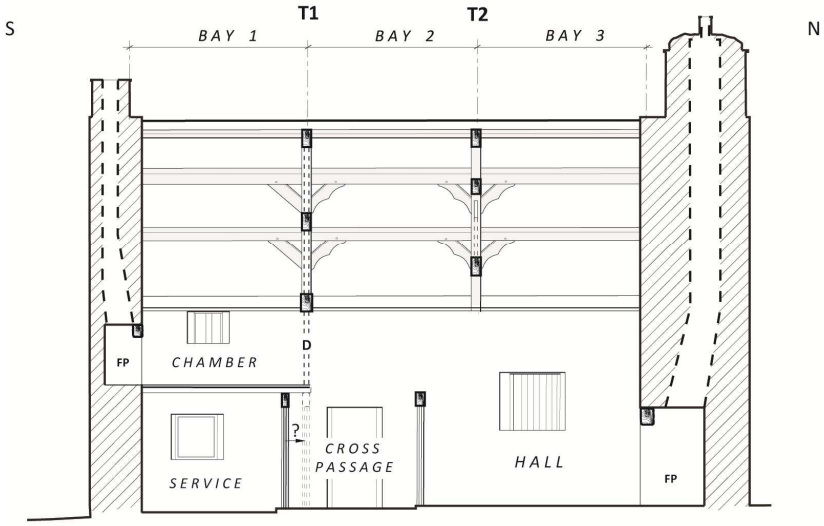
6.1.1 The current project has shown that Cae-canol-mawr was constructed in the early 16th century on a three bay, two-unit plan conforming ostensibly to Smith's 'Type A' end chimney plan (Smith 1988, 157). An

examination of the ground floor plan, for example, initially suggests a standard arrangement of two-bay hall with cross-passage and paired service rooms to the lower, entry end (see Smith 1988, 172; fig.79).

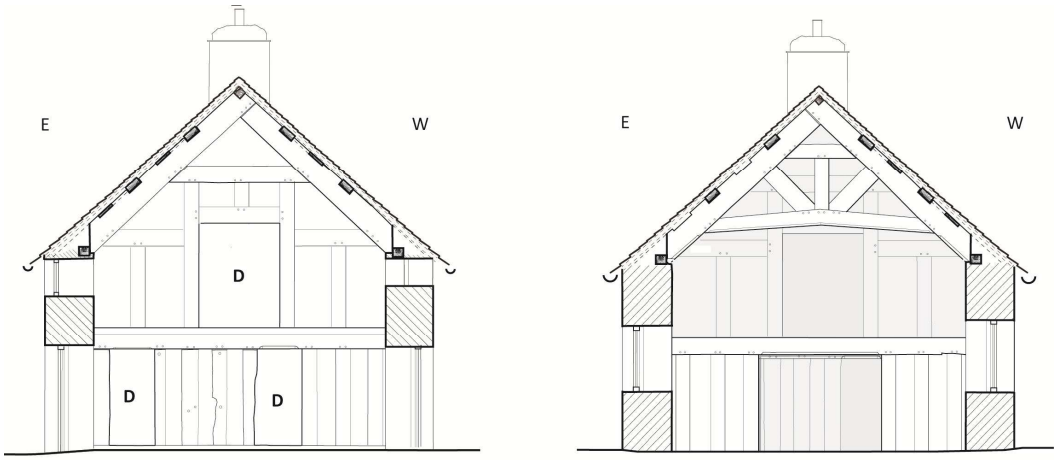
6.1.2 However, on closer inspection, the internal layout of the house reveals a more complex and idiosyncratic form, especially in respect of its vertical arrangements, the layout of the upper storey and the structure of the roof. Of particular note is the fact that the two-bay hall (Bays 2 and 3), although furnished with a mural gable stack is, and would appear always to have been, open to the apex of the roof. The hall was lit by opposing windows within the lateral walls, of timber mullion form, the western of which survives, extending vertically across the projected level of the first floor, present at Bay 1. No evidence was recorded to suggest a winder stair adjacent to the fireplace in the north wall though, in the demonstrable absence of a primary chamber over the hall, such a stair would not have been necessary. The lower end of the hall was defined by a post and panel partition, which survives in part, with two doors serving paired outer rooms to Bay 1; it is of note that the partition wall does not align vertically with truss **T1** over, suggesting either a primary internal jetty or that the partition may have been moved during subsequent modifications. The alignment of the primary, lateral partition between the two outer rooms is not known, though the evidence of the chamfered head of the western doorway, visible within [**GF05**], precludes it being on the line of the extant wall.

6.1.3 First floor accommodation was originally restricted to the southern bay (Bay 1) only, the upper chamber here being lit by small windows hard beneath the eaves within the lateral walls and heated by a projecting mural fireplace in the south gable. Access to the chamber may have been from one of the outer rooms, or alternatively via a ladder rising from the area of the cross-passage, in a manner akin to a *croglofft* (see Wiliam 2010, 71), serving a central doorway within the southern truss, **T1**.

6.1.4 The original form of the roof trusses is problematical. Both retain evidence for former vertical studs and raking stuts which would seem to imply the existence of a lower, horizontal timber, either in the form of a tie beam or a second, lower collar. While the latter arrangement would allow, in the case of **T2** in particular, for a persuasive reconstruction of a double collar-beam truss with stud and v-strutting between collars (see reconstruction **A**), the lower, perpendicular-cut mortices to the principals are of a form not commonly used to receive a transverse collar. This said, the form of the upper collar mortice to **T1** does appear (as observed from 1F level) to be cut in a similar manner, to the lower edge of the mortice at least, while the double-/triple- pegged discrepancy of the upper and lower mortices in **T1** must be assumed to reflect some form of primary structural distinction.



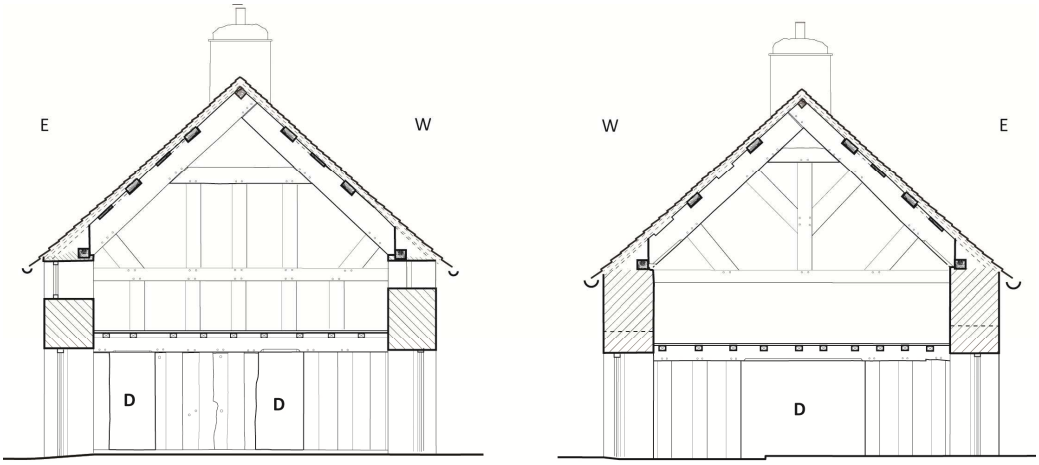
***Reconstruction A**: Possible primary arrangements in longitudinal cross-section (with lower collar)*



Section at Truss T1 (cross-passage, looking south) **Section at Truss T2** (open hall, looking south)

***Reconstruction A**: Possible primary arrangements in transverse cross-section (with lower collar)*

6.1.5 The alternative arrangement of a former tie would imply a full truss with fairly elaborate framing of studs and struts (see reconstruction **B**), which would be atypical in a stone-walled building of this date where the open, collar-beam form was the norm; truss **T2** above the open hall in particular would represent a most unusual arrangement.



Section at Truss T1 **Section at Truss T2**

***Reconstruction B**: Possible primary arrangements in transverse cross-section (with tie beams and raking stuts)*

6.1.6 A further feature of interest is the screen forming the north side of the cross-passage, with wide central doorway creating a passage plan similar to that recorded at Bryn yr Odyn, Cwm Cynfal of 1557,[12] 2 miles/ 3.25 km south-west of Cae-canol-mawr. Though somewhat unusual, free-standing partitions within a two-

[12] NPRN 28229; http://www.coflein.gov.uk/en/site/28229/details/BRYN-YR-ODYN%3B+BRYNRODYN/

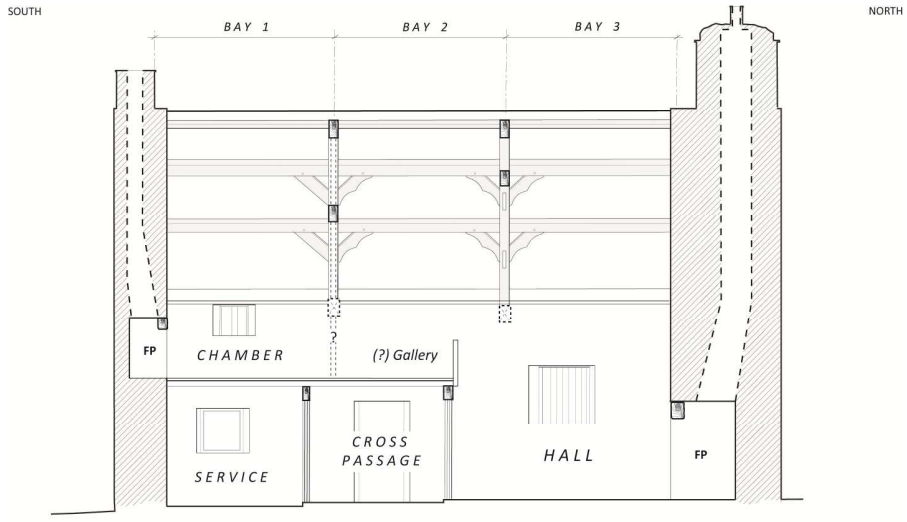
bay hall are known from late-medieval hall houses of gentry type (R Suggett, *pers. comm.*),[13] where they are often vulnerable to the insertion of a chimney, though in houses of a lower social status they would often have been incorporated into a truss.

6.1.7 Cae-canol-mawr as originally built would thus appear to represent something of a 'hybrid' structure, built to include a number of features that were to become standard elements of the developed 'Snowdonia' plan, *viz*. the distinctive two-unit plan with hall and outer rooms to either side of a cross-passage and with opposing gable end mural fireplaces heating ground and first floor rooms, though retaining the two-bay open hall, a relic feature of the medieval period.

6.1.8 Dendrochronological sampling has established a construction date of 1532 or within a year or two of that date for the primary range, which places Cae-canol-mawr fairly early in the transitional period between the open hall and the fully storeyed house.[14] This may account for the fact that only certain of those features which were to become characteristic of the fully-storeyed house were adopted in this building, although the unusual internal arrangements of the house are not easily accounted for or, indeed, to parallel.

6.2 Modifications to the Primary Range

6.2.1 During a phase of modification, the first floor accommodation was extended out over the cross passage, with the associated re-siting of the vertical access, originally within the wide cross-passage, to the main body of the hall. The primary status of the partition, which survives as a head beam only, has not been verified dendrochronologically as part of the current project.



***Cae-canol-mawr**: Possible secondary arrangements in longitudinal cross-section (incl. putative 'gallery')*

6.2.2 It appears that the upper floor was never extended to the full area of the range and that the north end of the hall (Bay 3) remained open to the roof; thus the extension of the first floor into Bay 2 would have created a wide 'gallery' overlooking the hall, much as survives today (see sketch section above). The

13 Suggett (2005) illustrates examples at Carter's Croft, Stapleton, Presteigne (p.73-6; fig. 74) and at Upper Skynlais, Glasbury (p.117; figure 118) both in Powys, the former being a classic three-unit cruck-hall, the latter a stone-walled storeyed structure with winged service end.

14 This transition, accepted until recently to have origins around 1540, has been shown during the course of the current NWWDP project to be of somewhat greater antiquity with an example of a fully storeyed house dated to 1515 having being identified at Dugoed, Penmachno, 12km north-east of the current site (Miles and Bridge, 2010; Tyler 2010).

opening up of the southern truss **T1** may be contemporary with the extension of first floor accommodation, likewise the modification of **T2** to form, in effect, two open trusses of single, high collar-beam form. The removal of the ties/collars apparently compromised the structural integrity of the roof trusses and, at a later date it was necessary to reintroduce a secondary tie at **T2**.[15]

6.3 Conclusion

6.3.1 Cae-canol-mawr represents a most intriguing building of 'transitional' form and, while the surviving fabric allows for reconstructions of the primary layout to be made with some degree of confidence, a number of features cannot on the available evidence be interpreted with certainty and the building would certainly warrant further investigation. Supplementary sampling of the northern wall of the cross-passage in particular would have the potential to clarify the phasing of this feature while the removal of internal render / limewash surface treatments may reveal fabric allowing for a more detailed and definitive reconstruction.

7 ACKNOWLEDGEMENTS

7.1 The project was commissioned by Mrs Margaret Dunn, Project Director of the North-West Wales Dendrochronology Project, to whom thanks are given for help and cooperation throughout. Thanks are due to the owner, Mr Tom Lorenz for allowing access to the property, and especially to Mr Ben March, building contractor currently undertaking refurbishment at the property, for organising site access and for most generous hospitality during the course of survey work.

7.2 Thanks are also extended to Mr Richard Suggett of the RCAHMW and to Dr Dan Miles and Dr Martin Bridge of the Oxford Dendrochronology Laboratory for valuable discussions on the interpretation of the primary building; thanks to Richard Suggett additionally for comments on the draft text of the current report.

7.2 Site recording and assessment were undertaken by Mr Ric Tyler AI*f*A who also wrote, collated and illustrated the current report.

[15] The current phase of renovation work has included the strengthening of the collar/principal joint at **T1** (W) with the introduction of iron plates, again to alleviate the spreading of the principal rafters.

8 SOURCES

a) Published Sources

ALGAO, 1997. *Analysis and Recording for the Conservation of Works to Historic Buildings*.

English Heritage, 2006. *Understanding Historic Buildings: A Guide to Good Recording Practice.*

Institute for Archaeologists, 2008. *Standard and Guidance for the Archaeological recording of Standing Buildings and Structures*. University of Reading, I*f*A.

Smith P, 1988. *House of the Welsh Countryside: A Study in Historical Geography*. 2nd Edition. London, HMSO.

Suggett R, 2005. *Houses and History in the March of Wales: Radnorshire 1400-1800*. Aberystwyth, RCAHMW.

Wiliam E, 2010. *The Welsh Cottage*. Aberystwyth, RCAHMW.

b) Unpublished Sources

Bridge M, 2011. 'The Tree-Ring Dating of Cae Canol Mawr, Ffestiniog, Gwynedd.' Oxford Dendrochronology Laboratory report no. 2011/27.

Miles D and Bridge D, 2011. 'The Tree-Ring Dating of Dugoed, Penmachno, Betws-y-Coed, Conwy'. Oxford Dendrochronology Laboratory report no. 2011/20.

Tyler R, 2010. 'Dugoed, Penmachno, Betws-y-Coed, Conwy: Architectural Record August 2010'. Report No.2011-005 prepared for North-West Wales Dendrochronology Project.

c) Online Sources

- http://www.britishlistedbuildings.co.uk
- www.coflein.gov.uk
- http://datingoldwelshhouses.co.uk

APPENDIX A: Project Brief

DATING OLD WELSH HOUSES
NORTH WEST WALES DENDROCHRONOLOGY PROJECT

DESIGN BRIEF FOR HISTORIC BUILDING RECORDING.

1 Project Background

1.1 The North West Wales Dendrochronology Project (2009-2012) aims to identify, sample and date using dendrochronology, and record Tudor buildings with suitable original timber. Volunteers will undertake documentary research and the results will be widely disseminated and deposited in regional Historic Environment Records (HERs) and Coflein. The copyright of all project reports and materials will belong to the Project.

1.2 Project Phase 1 [September 2009 - June 2010] will include buildings in the following areas i) parts of south Denbighshire; ii) Anglesey; iii) parts of Arfon & Dwyfor in Gwynedd. Project Phase 2 [April 2010 – March 2012] will include buildings in iv) Conwy, v) parts of Merioneth in Gwynedd and vi) some possibly other buildings across the region.

1.4 Grants have been obtained for the Project costs from a wide range of organisations, each with their own conditions. In order to meet these conditions it was necessary as part of the grant application to identify potential buildings and obtain the owner's written permission. A long list of potential buildings has been drawn up for each area, with a short list in order of potential priority.

2 Site Locations

2.1 The dendrochronologists will block several days work in an area. They will visit the buildings on the short list for that area in order of priority and will determine whether or not there are sufficient suitable timbers to sample. They will move down the priority short list visiting and sampling buildings until the money allocated for dendrochronology in that area has been used.

2.2 As it will not be certain beforehand how many building phases are contained within any particular building, it cannot be stated how many buildings will be involved. See the accompanying letter. There may be additional buildings located elsewhere.

2.3 Most of the buildings are scattered farmhouses, but in some areas town houses will be included.

2.4 Some may have already been surveyed in detail by RCAHMW or others.

3 Background of each Site

3.1 As part of 1.4., existing sources of information were consulted. This included the RCAHMW inventories and records, Cadw listed building schedules and local knowledge. All buildings were visited. Most but not all buildings are listed grade II or II*.

3.2 The teams of trained volunteers will be undertaking further documentary research whilst the professional dendrochronology and building recording work proceeds.

3.3 Some recording may take place alongside the dendrochronologists and / or the volunteers.

4 General Requirements

4.1 The building recording must be undertaken by an appropriately qualified individual or organisation, fully experienced in work of this character. Access to small awkward loft spaces may be necessary.

4.2 Contractors and sub-contractors are expected to
i) conform to standard professional guidelines;
ii) meet all Health and Safety requirements, including the Project's risk assessments;
iii) possess current adequate insurance cover

4.3 If contingencies arise, such as the need for additional work to record unexpected and important features, the Project Director should be contacted immediately and before any additional work is undertaken.

4.4 Many people in North Wales speak Welsh as their first language, and many of the archive and documentary references are in Welsh. Contractors should therefore give due consideration to their ability to understand and converse in Welsh.

5 Building Detail Record of each Building

5.1 The amount of recording required will depend on what has already been undertaken by RCAHMW or others. The aim is to provide sufficient information of the early historic features to identify their significance. Detailed recording will be reserved for components which have been dendro-dated during this Project. Because of the nature of the timber samples required (certain numbers of rings) it is likely that the timbers will be structural timbers and probably, mostly, roof trusses and ceiling/floor beams.

5.2 An important component of the dating programme will include a detailed, measured and drawn, record of the timbers to be dated.

5.3 Particular attention should be paid to diagnostic features, detail and structure, as the association of dendrochronological dates with the shape or style of the timbers has the potential to contribute to the development of a dated typology of such features.

In particular, attention should be paid to details such as:

i) the scale and positioning of collar beams and tie beams
ii) the detail of major joints, for example, mortice and tenon, lap-joints, scarf joints
iii) the presence or otherwise of struts springing from collars or king-posts
iv) the number and position of peg holes at joints and any re-pegging
v) the presence, or indication, of panelling between the spaces of structural members of trusses (seen as grooves/dowel holes)
vi) the presence of decorative features, such as cusping, bosses, chamfering and fancy stops; and mortices below collars, tie-beams or floor/ceiling beams to accommodate stud partitions
vii) the presence, or indication (seen as mortices), of arched braces and wind braces;
viii) that some collar beam trusses with arched braces exhibit an arched profile at the level of the collar - some are more pointed than others and this is likely to be a chronological feature

ix) the number of purlins (distinguish between butt purlins and through-purlins with scarfed joints); re-cutting of purlin slots and positioning and re- pegging of joists could be an indication of a reset truss or a re-vamped roof.

5.4 The minimum requirement for recording of dendrochronologically-dated timbers should include:

5.4.1 **Contextual Information**

i) Brief description of the building from which the sample is taken.
ii) Summary of period phases represented in the building.
iii) Brief description of the relationship to other contemporary features and other relevant, non-contemporary features within the building. (Written description, preferably supplemented by sketch plans/elevations and/or photographs)

5.4.2 **Detailed Recording**

Structural features being dated require measured drawings, in elevation and cross section, including associated components. That is, if part of a truss is being dated, the complete truss should be recorded. Similarly, if a ceiling/floor beam is recorded, the style of chamfer/chamfer stops, cross section of beam and style and spacing of joists should be recorded.

5.4.3 **Brief Written Statement of Possible Potential for Future Recording.**

5.5.1 **Photographs** should be used not only to show the appearance of the building but also to record the evidence on which the analysis of its historic development is based. Each print should be clearly labelled with the subject, orientation and the date taken, and cross-referenced to its negative and or digital file.

5.5.2 If utilising digital technology, high resolution images (preferably in tiff. format) must be produced. These should be presented within the report as a hard copy and a compact disc must be included as an archive to accompany the report.

6 Time Scale

It is expected that the dates when the dendrochronologists will be in each area will be known by late January 2011. It is hoped that the building recording can take place very soon after the results of the dendrochronological sampling has been received, with further visits arranged with the owner of a building as necessary.

7 Reports

Reports will be required by the deadline (given in advance) for each block of work, usually within 3-4 weeks of site visits.

8 Monitoring

The Project will be monitored by experienced members of the Project to ensure the fulfilment of the brief and specifications.

9 Payment

9.1 Only a finite amount of money has been allocated to this aspect of the project.

9.2 Once the work has been satisfactorily completed, invoices, including VAT etc, should be sent to the Project Director.

10 Summary re. Surveys & Reports:

1. Follow the attached RCAHME Recording Historic Buildings Specification. It has to be adjusted to for digital survey. Copies are available from Margaret Dunn.
2. The emphasis should be on SURVEY & DRAWINGS and PHOTOGRAPHY. By and large others cover the history and interpretation though sometimes detailed descriptions are needed.
3. A ground-floor plan is always needed, simplified first-floor plan with position of roof trusses and fireplaces, cross-sections with the key historic trusses; architectural detail. Location of samples if possible.
4. Photography – as RCAHME specification.
5. Each site is different and some have been recorded before. There will to be a different specification for each site.
6. Final report in digital format is essential with hard copies including plans at relevant scale, with summary: i) Description. ii) Ground-floor plan, roof plan, cross-section of historic trusses (= level 3); iii) Photography (= level 3.) ; iv)Final report in digital form and hard copy.
7. **Copyright**: North-west Wales Dendro Project with agreement to put the report as PDF on Coflein RCAHMW's on-line dabase as part of partnership.
8. **Archive.** Archive to be deposited in RCAHMW's archive (National Monuments Record for Wales) as part of partnership.
9. **Logos.** Partnership with RCAHMW to be noted on cover of report.

APPENDIX B: Register of Project Drawings

NB: All site drawings were prepared in pencil on archivally stable drafting film at a scale of 1:50 and/or 1:20 as appropriate.

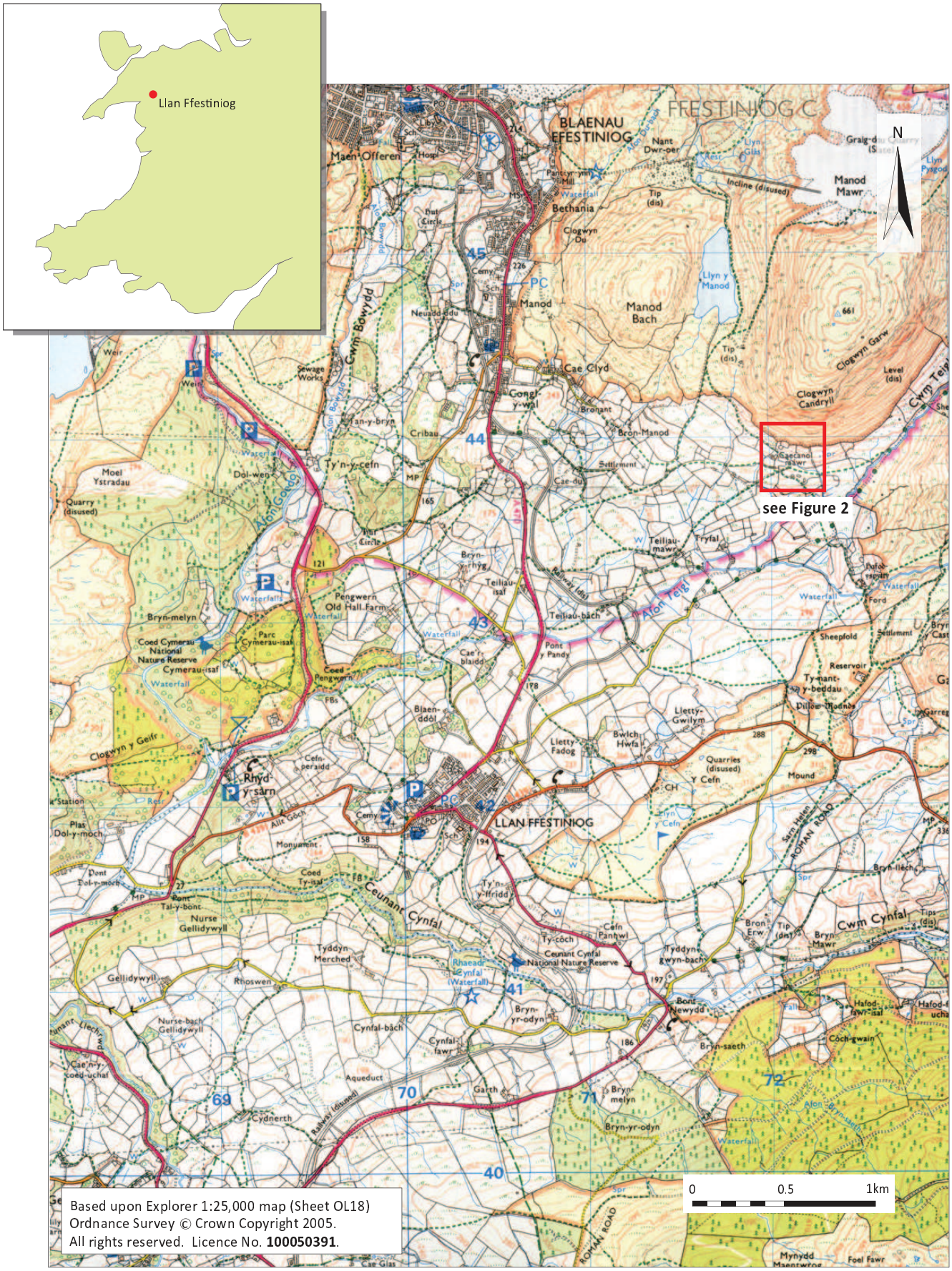
Drg. No.	Subject	Format	Scale	Date	Recorder
2011-013c/001	Overall Plan	A3	1:100	10.01.12	R Tyler
2011-013c/002	Ground Floor Plan	A3	1:50	10.01.12	R Tyler
2011-013c/003	First Floor Plan	A3	1:50	10.01.12	R Tyler
2011-013c/004	Transverse cross sections at **T1** and **T2**	A3	1:50	10.01.12	R Tyler

APPENDIX C: Register of Project Photographs

NB: All photographs taken with Nikon D3000 digital SLR camera, 10 mega-pixels. Files are included in *.jpg format on the CD appended at the back of this report. Photos marked with an asterix (*****) are reproduced as plates within the current document.

Photo No.	Plate No.	Subject	Orientation	Date	Photographer
DSC_0323		General view looking south-west	→ SW	10.01.12	R Tyler
***DSC_0324**	**1**	General view looking north-west	→ NW	10.01.12	R Tyler
DSC_0325		General view looking north-west	→ NW	10.01.12	R Tyler
DSC_0326		General view looking north-east	→ NE	10.01.12	R Tyler
DSC_0327		General view looking north-east	→ NE	10.01.12	R Tyler
DSC_0328		General view looking south	→ S	10.01.12	R Tyler
***DSC_0329**	**2**	General view looking south	→ S	10.01.12	R Tyler
***DSC_0330**	**3**	East elevation	→ W	10.01.12	R Tyler
DSC_0331		East elevation	→ NW	10.01.12	R Tyler
***DSC_0332**	**4**	East elevation; offset boulder footing	→ N	10.01.12	R Tyler
***DSC_0333**	**5**	East elevation; principal doorway	→ W	10.01.12	R Tyler
DSC_0334		East elevation; northern GF window	→ W	10.01.12	R Tyler
DSC_0335		East elevation; southern windows	→ W	10.01.12	R Tyler
***DSC_0336**	**11**	South elevation	→ NW	10.01.12	R Tyler
DSC_0337		South elevation	→ NE	10.01.12	R Tyler
***DSC_0338**	**6**	West elevation	→ E	10.01.12	R Tyler
***DSC_0339**	**7**	West elevation; southern window	→ E	10.01.12	R Tyler
DSC_0340		Gin-wheel mechanism	→ NE	10.01.12	R Tyler
***DSC_0341**	**9**	Gin-wheel mechanism	→ E	10.01.12	R Tyler
***DSC_0342**	**12**	North-east corner of principal range	→ SW	10.01.12	R Tyler
DSC_0343		North-east corner of principal range	→ SW	10.01.12	R Tyler
DSC_0344		West elevation; northern window with drip mould	→ E	10.01.12	R Tyler
DSC_0345		West elevation oblique	→ SE	10.01.12	R Tyler
DSC_0346		West elevation; northern window with drip mould	→ E	10.01.12	R Tyler
DSC_0347		West elevation; northern window with drip mould	→ E	10.01.12	R Tyler
DSC_0348		Northern, C19th extension; east elevation	→ W	10.01.12	R Tyler
***DSC_0349**	**37**	Northern, C19th extension oblique	→ SW	10.01.12	R Tyler
DSC_0350		Northern, C19th extension; north elevation	→ S	10.01.12	R Tyler
DSC_0351		Northern, C19th extension; north elevation	→ S	10.01.12	R Tyler
***DSC_0352**	**38**	Northern, C19th extensions; oblique	→ SE	10.01.12	R Tyler
DSC_0353		Northern, C19th extensions	→ NE	10.01.12	R Tyler
***DSC_0354**	**8**	West elevation; northern window with drip mould	→ E	11.01.12	R Tyler
DSC_0355		West elevation; northern window with drip mould	→ E	11.01.12	R Tyler
DSC_0356		Gin-wheel mechanism	→ NE	11.01.12	R Tyler
DSC_0357		Gin-wheel mechanism	↓	11.01.12	R Tyler
DSC_0358		Gin-wheel mechanism	↓	11.01.12	R Tyler
***DSC_0359**	**10**	Gin-wheel drive-shaft	↓	11.01.12	R Tyler
DSC_0360		Entrance lobby [**GF01**]	→ W	11.01.12	R Tyler
DSC_0361		Entrance lobby [**GF01**]	→ W	11.01.12	R Tyler
***DSC_0362**	**13**	Entrance lobby [**GF01**]	→ W	11.01.12	R Tyler
DSC_0364		Entrance lobby [**GF01**]	→ E	11.01.12	R Tyler
***DSC_0365**	**15**	Primary door within southern P&P partition [**GF01**]	→ S	11.01.12	R Tyler
DSC_0366		Primary southern P&P partition [**GF01**]	→ SW	11.01.12	R Tyler
***DSC_0367**	**16**	Primary southern P&P partition of cross passage from [**GF05**]	→ NW	11.01.12	R Tyler
***DSC_0369**	**17**	Trestle saw marks on post of above	→ N	11.01.12	R Tyler
DSC_0370		Primary southern P&P partition of cross passage from [**GF05**]	→ NW	11.01.12	R Tyler
DSC_0371		[**GF05**] window to east wall	→ E	11.01.12	R Tyler
***DSC_0372**	**14**	[**GF03**]; window formed from primary doorway	→ W	11.01.12	R Tyler
DSC_0373		[**GF03**]; window formed from primary doorway	→ W	11.01.12	R Tyler
DSC_0374		Head beam of south wall of cross passage[**GF03**]	→ S	11.01.12	R Tyler
DSC_0375		Bathroom [**GF04**]	→ S	11.01.12	R Tyler
DSC_0376		Window to west wall of [**GF04**]	→ W	11.01.12	R Tyler

DSC_0377		Main fireplace [**GF02**]	→ N	11.01.12	R Tyler
DSC_0378		Main fireplace [**GF02**]	→ N	11.01.12	R Tyler
***DSC_0379**	**19**	Main fireplace [**GF02**]	→ NE	11.01.12	R Tyler
DSC_0380		Main fireplace [**GF02**]	→ NE	11.01.12	R Tyler
DSC_0381		[**GF02**] primary mullioned window in west wall, Bay 3	→ W	11.01.12	R Tyler
DSC_0382		[**GF02**] primary mullioned window in west wall, Bay 3	→ W	11.01.12	R Tyler
***DSC_0383**	**20**	[**GF02**] primary mullioned window in west wall, Bay 3	→ W	11.01.12	R Tyler
DSC_0384		[**GF02**] primary mullioned window in west wall, Bay 3	→ W	11.01.12	R Tyler
DSC_0385		[**GF02**] primary mullioned window in west wall; soffit detail	→ W	11.01.12	R Tyler
DSC_0386		[**GF02**]; inserted cantilevered slate stair	→ SW	11.01.12	R Tyler
***DSC_0387**	**24**	[**GF02**]; inserted cantilevered slate stair	→ SW	11.01.12	R Tyler
DSC_0388		[**GF02**]; window in east wall, Bay 3	→ SW	11.01.12	R Tyler
***DSC_0389**	**21**	[**GF02**]; southern partition to cross passage	→ SE	11.01.12	R Tyler
***DSC_0390**	**22**	Soffit of head beam of above	↑	11.01.12	R Tyler
***DSC_0391**	**23**	Detail of stop-chamfered head beam	↑	11.01.12	R Tyler
DSC_0392		[**GF02**]; southern partition to cross passage	→ SE	11.01.12	R Tyler
DSC_0393		[**GF02**]; southern partition to cross passage; head beam	→ SE	11.01.12	R Tyler
DSC_0394		[**GF02**]; inserted cantilevered slate stair	→ W	11.01.12	R Tyler
***DSC_0395**	**30**	Truss **T2** from GF level	↑	11.01.12	R Tyler
***DSC_0396**	**18**	[**GF02**] from gallery	↓	11.01.12	R Tyler
DSC_0397		Truss **T2**	→ NE	11.01.12	R Tyler
DSC_0398		Truss **T2**	→ NW	11.01.12	R Tyler
DSC_0399		Truss **T2**; secondary tie	→ NE	11.01.12	R Tyler
DSC_0400		Truss **T2**; redundant mortice for raking strut	→ NE	11.01.12	R Tyler
DSC_0041		Cusped wind bracing	↑	11.01.12	R Tyler
DSC_0402		Truss **T2**; redundant mortices for central queen strut and raking strut	↑	11.01.12	R Tyler
***DSC_0403**	**31**	Truss **T2**; redundant mortices for central queen strut and raking strut	↑	11.01.12	R Tyler
***DSC_0404**	**32**	Cusped wind bracing	↑	11.01.12	R Tyler
DSC_0405		Truss **T2**; secondary tie and raking strut	→ NW	11.01.12	R Tyler
DSC_0406		Truss **T2**; redundant mortices for central queen strut and raking strut	↑	11.01.12	R Tyler
DSC_0407		Primary common rafters to Bay 2 (E)	↑	11.01.12	R Tyler
DSC_0408		Cusped wind bracing	↑	11.01.12	R Tyler
***DSC_0409**	**35**	Cusped wind bracing	↑	11.01.12	R Tyler
***DSC_0410**	**28**	Truss **T1** (W)	→ SW	11.01.12	R Tyler
***DSC_0411**	**27**	Truss **T1** (E)	→ SE	11.01.12	R Tyler
DSC_0412		Truss **T1** ; collar soffit	↑	11.01.12	R Tyler
***DSC_0413**	**29**	Truss **T1** ; collar soffit	↑	11.01.12	R Tyler
DSC_0414		Truss **T1** ; collar soffit	↑	11.01.12	R Tyler
DSC_0415		Truss **T1** ; collar soffit	↑	11.01.12	R Tyler
DSC_0416		Truss **T1** ; stave holes to western principal	→ SW	11.01.12	R Tyler
DSC_0417		Truss **T1** ; stave holes to upper eastern principal	↑	11.01.12	R Tyler
***DSC_0418**	**25**	[**1F01**] FP in south wall	→ S	11.01.12	R Tyler
DSC_0419		[**1F01**] FP in south wall	→ S	11.01.12	R Tyler
DSC_0420		[**1F01**]; primary window in west wall, Bay 1	→ W	11.01.12	R Tyler
***DSC_0421**	**26**	[**1F01**]; primary window in west wall, Bay 1	→ W	11.01.12	R Tyler
DSC_0422		Roof structure looking north	→ NE	11.01.12	R Tyler
DSC_0423		[**1F01**]; window in east wall, Bay 1	→ W	11.01.12	R Tyler
DSC_0424		Truss **T1**, east principal rafter foot	→ NE	11.01.12	R Tyler
***DSC_0425**	**36**	Truss **T1**, straight wind-bracing to lower purlin	→ E	11.01.12	R Tyler
***DSC_0426**	**34**	Common rafters, western roof slope, Bay 1	↑	11.01.12	R Tyler
DSC_0427		Truss **T1**, iron straps to principal/collar	↑	11.01.12	R Tyler
DSC_0428		Truss **T1**, iron straps to principal/collar	↑	11.01.12	R Tyler
DSC_0429		Truss **T1**, apex detail	↑	11.01.12	R Tyler
***DSC_0430**	**33**	Truss **T1**, apex detail	↑	11.01.12	R Tyler
DSC_0431		Common rafters, eastern roofslope, Bay 3	→ NE	11.01.12	R Tyler



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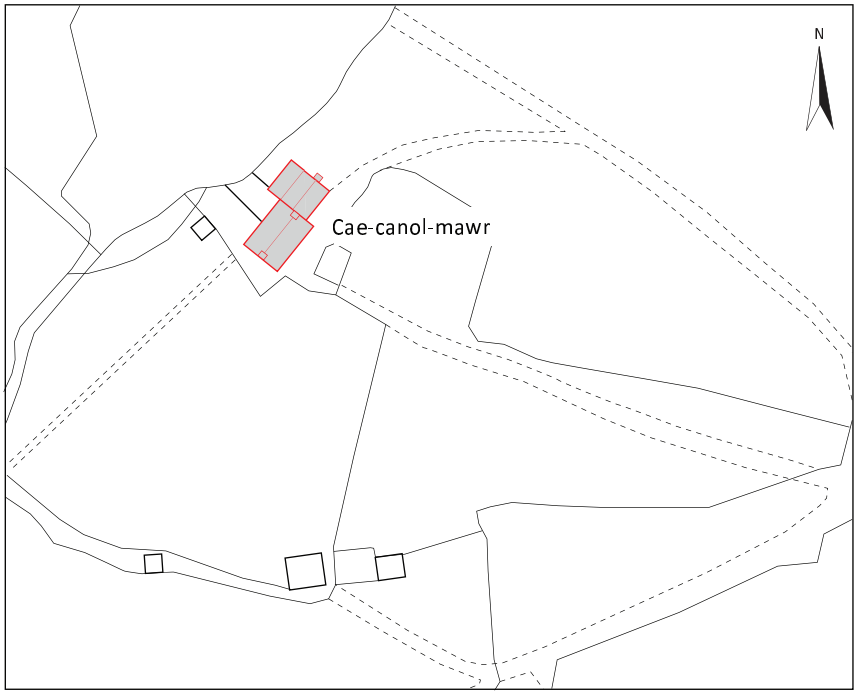
Cae-canol-mawr, Ffestiniog, Gwynedd
Figure 1: Location plan

(a) Modern aerial photograph © Google Earth



(b) Plan based on 1919 Ordnance Survey map

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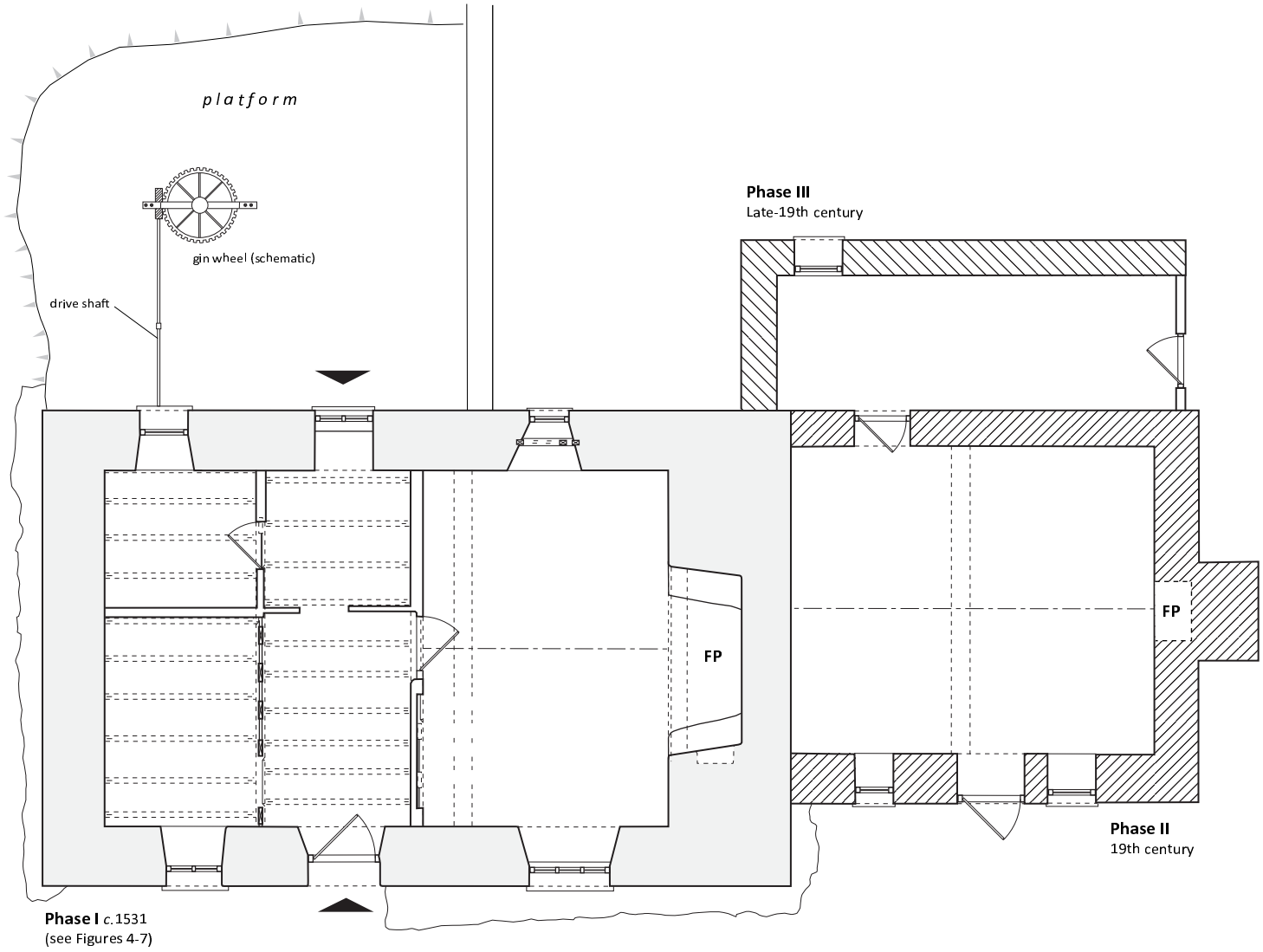
Cae-canol-mawr, Ffestiniog, Gwynedd
Figure 2: Detailed location plan



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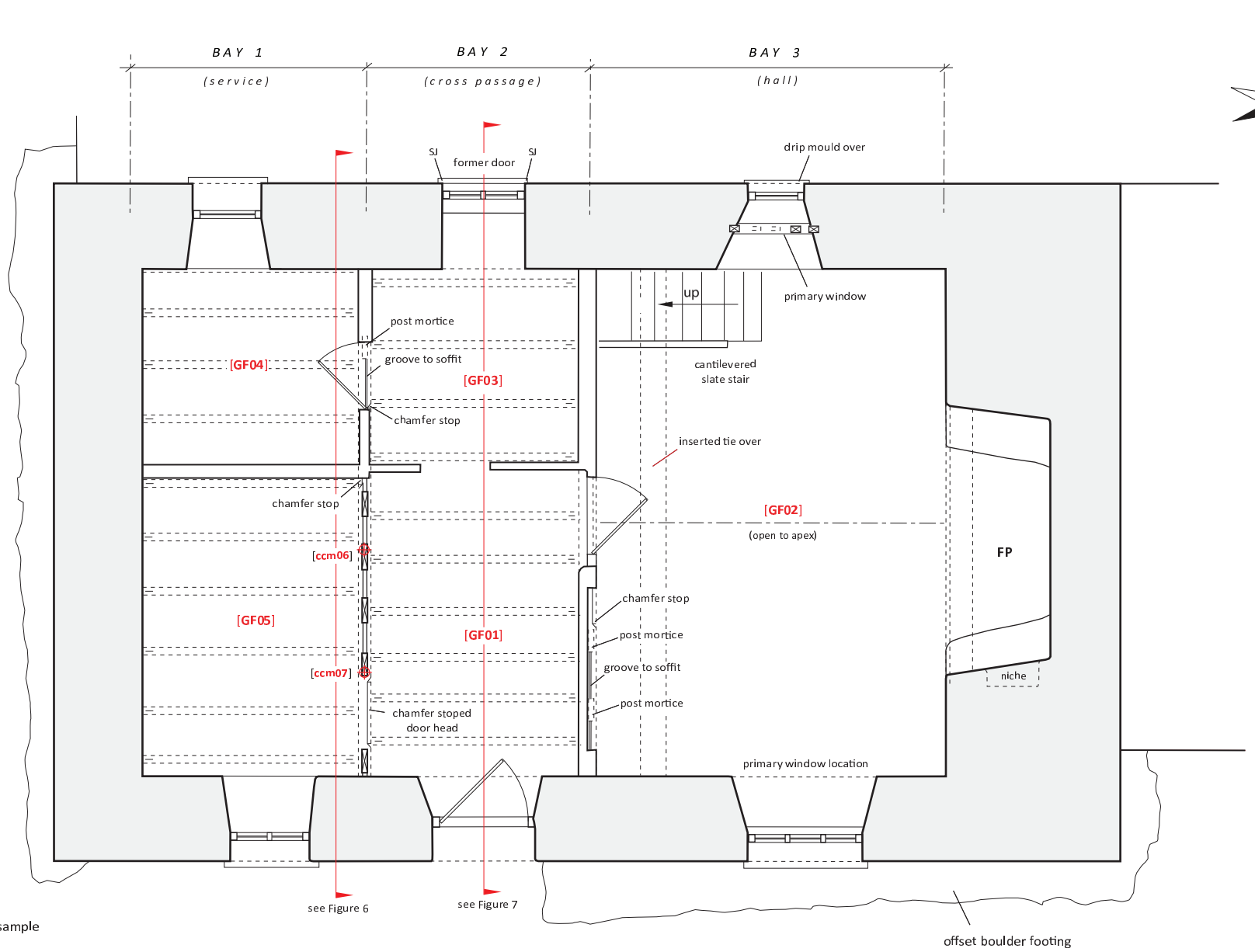
Cae-canol-mawr, Ffestiniog, Gwynedd
Figure 3: Overall plan (as existing)



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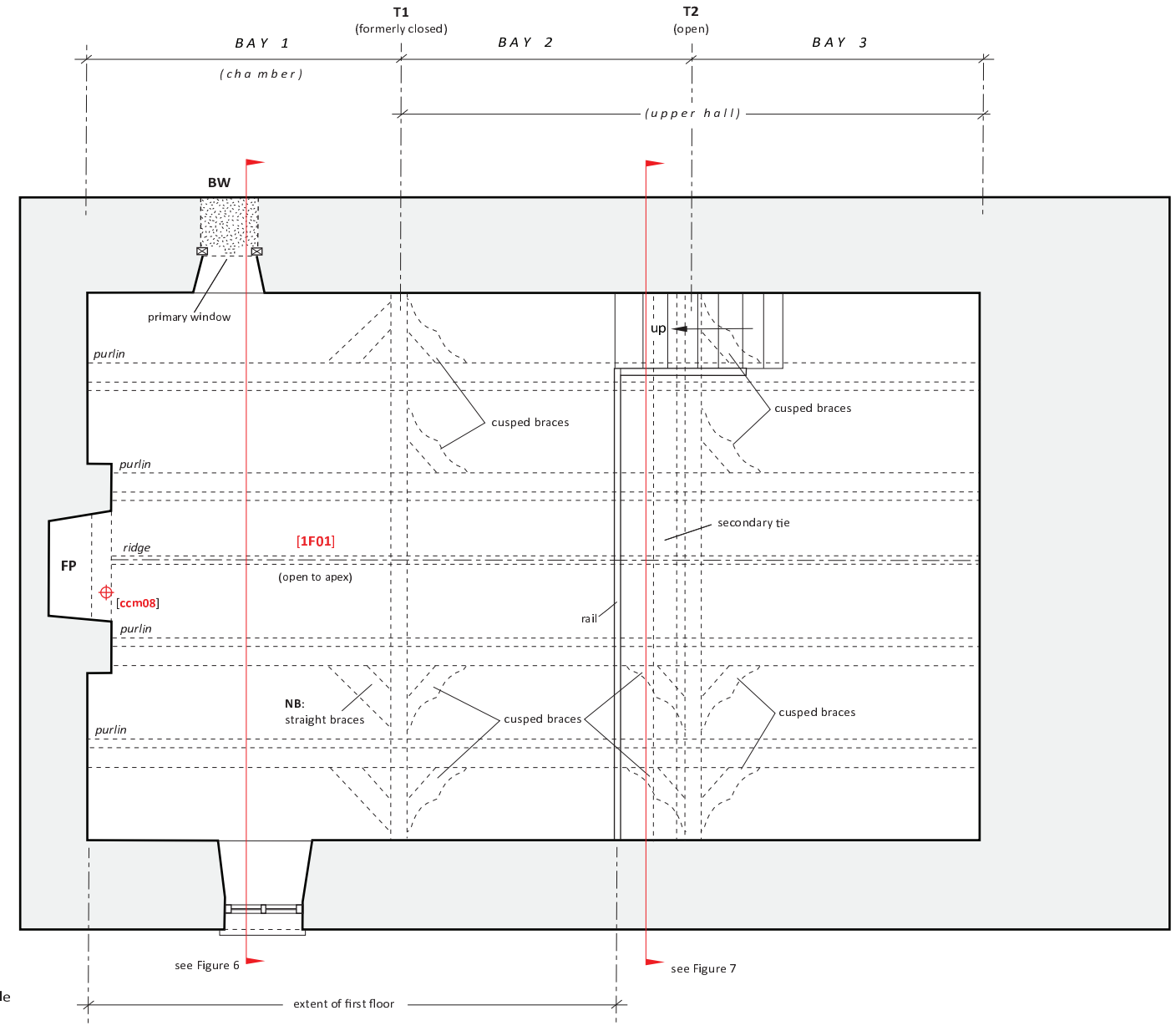
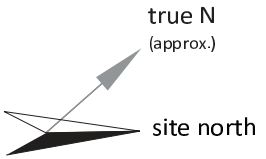
Cae-canol-mawr, Ffestiniog, Gwynedd
Figure 4: Ground floor plan (as existing)





KEY

location of dendro sample

blocking

inserted features

0 1 2 3 4 5 metres

SCALE IN METRES (1: 75 @ A4)

SCALE IN FEET

0 5 10 15 ft

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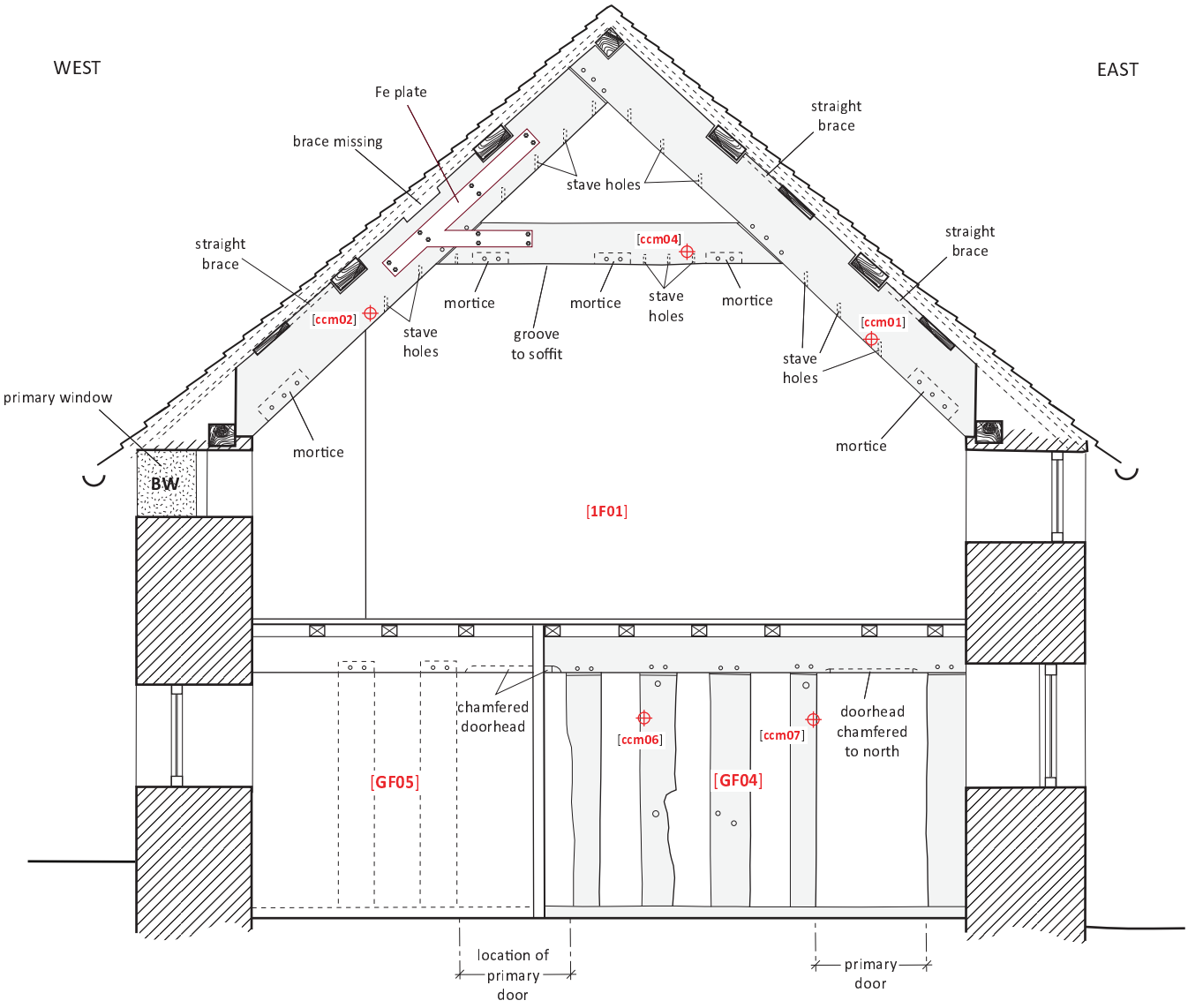
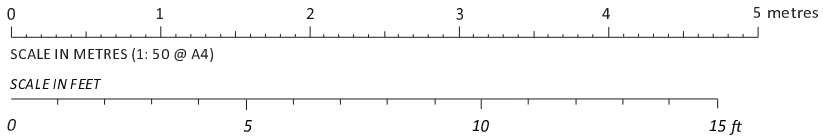
Figure 5: First floor plan (as existing)





KEY

location of dendro sample

blocking

inserted features

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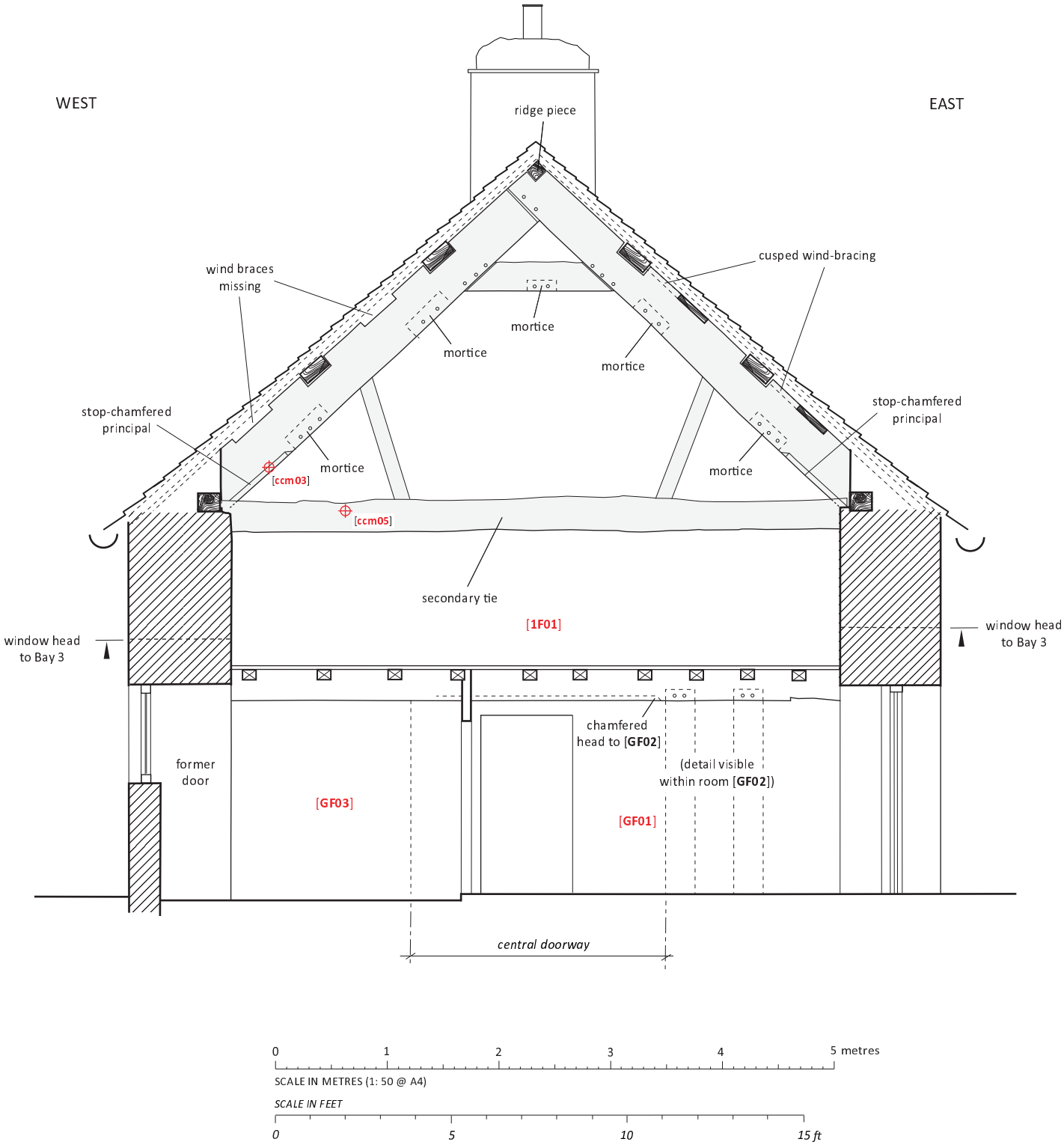
Figure 6: Transverse cross-section at **T1**



KEY

location of dendro sample

blocking

inserted features

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Figure 7: Transverse cross-section at **T2**

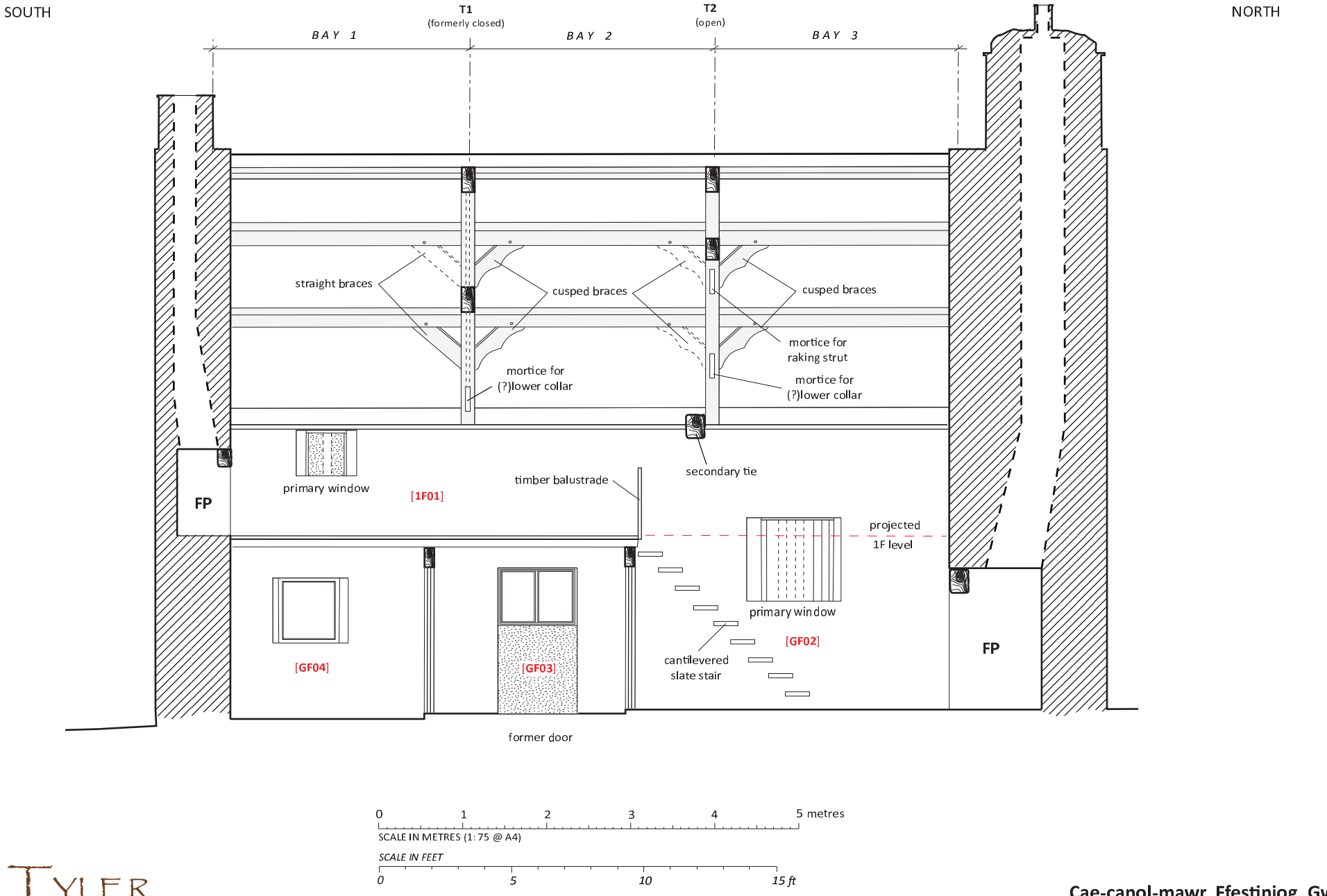

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Figure 8: Longitudinal cross-section (approximate)

Plate 1: General view from south-east with the upper slopes of Manod Mawr in the background.

Plate 2: General view from north looking down the Cwm Tiegl towards Llan Ffestiniog.

Plate 3: Primary range, east elevation.

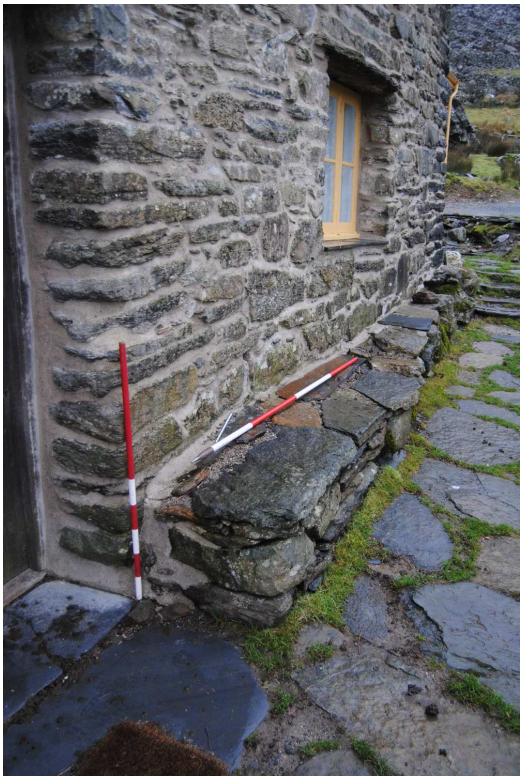

Plate 4: Offset boulder footing to east elevation.

Plate 5: Principal doorway.

Plate 6: Primary range, west elevation (note platform for gin-wheel).

Plate 7: Western doorway of cross-passage. partly blocked to form window

Plate 8: Projecting stone drip-mould above north window of west elevation.

Plate 9: Detail of gin-wheel mechanism.

Plate 10: Drive shaft from gin wheel passes through void southern window.

Plate 11: South gable elevation.

Plate 12: North elevation abutted by C19th block.

Plate 13: Lobby [**GF01**] occupying eastern part of cross passage.

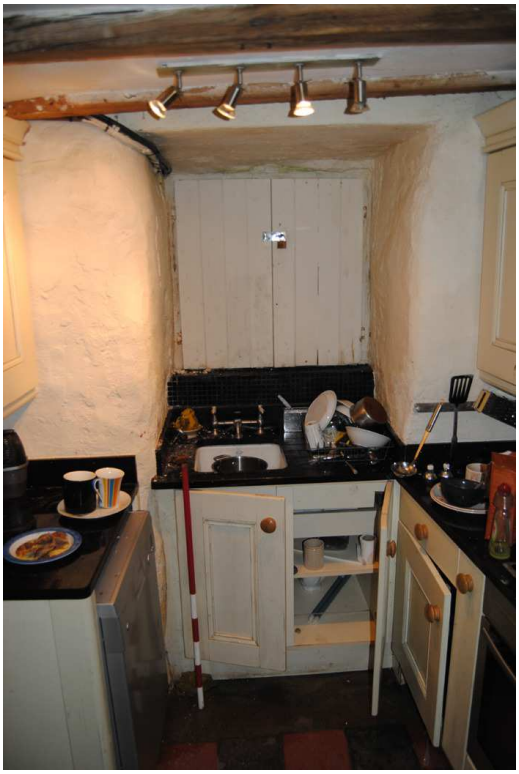

Plate 14: Window within [**GF03**] formed from door at west end of cross-passage.

Plate 15: Primary door within south wall of cross-passage serving [**GF05**].

Plate 16: Primary partition forming south side of cross passage, as exposed within [**GF05**]; **NB**: doorway to right is primary.

Plate 17: Distinctive evidence of trestle sawn timbers within primary partition.

Plate 18: Room [**GF02**] as seen from 1F gallery, looking north-west.

Plate 19: **FP** to north gable, [**GF02**].

Plate 20: Surviving, primary mullioned window frame to [**GF02**] (W).

Plate 21: South partition wall of Room [**GF02**].

Plate 22: Head beam of south partition showing redundant mortices and groove for primary post and plank partition.

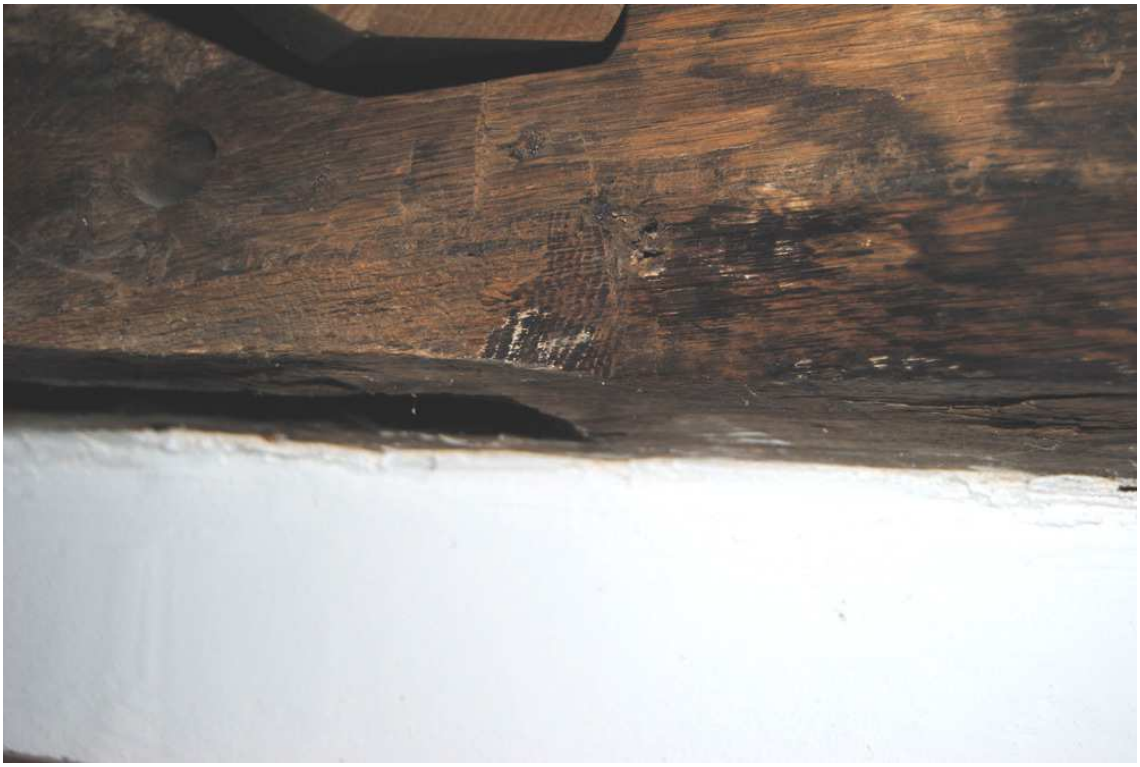

Plate 23: Chamfer stop to head beam denotes former wide, central opening from passage onto [**GF02**].

Plate 24: Inserted cantilevered slate stair rises to 1F level.

Plate 25: **FP** to south gable, [**1F01**].

Plate 26: Surviving primary window [**1F01**](W).

Plate 27: Truss **T1**, east.

Plate 28: Truss **T1**, west.

Plate 29: Truss **T1**, collar soffit with redundant mortices for x3 original vertical studs.

Plate 30: Truss **T2** from ground floor level, note secondary tie set to south of principals.

Plate 31: Truss **T2**, high collar with mortice for former central stud + double-pegged mortice for raking strut.

Plate 32: Eastern principal of **T2**; note mortices for primary raking strut/ (?)lower collar.

Plate 33: T2 bridled apex detail, double pegged.

Plate 34: Surviving primary common rafters; Bay 1 (W).

Plate 35: Cusped wind-brace at Bay 2 (NW).

Plate 36: Straight wind-brace at Bay 1 (NE).

Plate 37: 19th-century extension abutting north gable of primary range.

Plate 38: 19th-century extension with later 'cat-slide' store; view from north-west.