







**Thornton Beam Engine House,  
Thornton,  
Fife,  
Standing Building Record,  
Data Structure Report**



**March 2016**

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## Executive Summary

*ARCHAS Cultural Heritage Ltd were appointed by Mr Mark Bruce to complete a Level 2 Standing Building Record of a derelict Beam Engine House in Thornton, Fife. Proposals have been submitted to Fife Council to turn the property into a dwelling house. As part of the Planning Application process, Fife Council requested that a Level 2 Standing Building Survey be completed prior to development.*

*Historical assessment showed that the Beam Engine House dates to the late 18<sup>th</sup> century when advances in steam and beam engine technology meant that the Balgonie Coal field became economical again and led to the sinking of the Thornton Pit.*

*The building itself is of remarkably high quality, with a finely dressed ashlar frontage facing the main entrance to the site and the pit shaft itself. Although the complex in which the building once sat has been removed, the Beam Engine House itself remains significantly unaltered and is a rare survival of this 18<sup>th</sup> century type.*

*The record compiled for the exterior of the building has been comprehensive, but access to the interior of the structure was not possible. This area has potential to retain important information as to the nature of the machinery and its fittings. ARCHAS Ltd recommend that a further phase of building recording be carried out both before and during the removal of the interior fittings and plaster work within the Beam Engine House.*

*A record of the work has been deposited with the Online Access to the Index of Archaeological Investigations (OASIS) website hosted by the Archaeological Data Service (OASIS ID archascu1-246027) and with Discovery and Excavation in Scotland (DES), the annual publication of fieldwork by Archaeology Scotland.*

# 1 Introduction

## 1.1 General

- 1.1.1 ARCHAS Cultural Heritage Ltd. (hereafter ARCHAS) was appointed by Mr Mark Bruce to undertake a programme of Standing Building recording at Thornton Beam Engine House in Thornton, Fife (NGR: NT 29193 97269). The client has plans to construct a new dwelling house with the beam engine at its core. The building is currently derelict and dangerous to enter.
- 1.1.2 The Beam Engine House at Thornton dates to the late 18<sup>th</sup> century and has statutory protection as a Category A Listed Building through the Town and Country Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997.
- 1.1.3 The client has submitted a series of planning applications to Fife Council in order to gain Planning Permission and Listed Building Consent. This latter is overseen by Historic Environment Scotland.
- 1.1.4 Through planning applications 15/04012/LBC and 13/00601/LBC, Fife Council requested that:
- 'Before any works start on site the developer shall carry out a Level II standing building recording exercise for archaeological purposes and the details shall be submitted by the developer to the Local Authority.'*<sup>1</sup>
- 1.1.5 The archaeological planning condition is supported by the framework provided by FIFEplan Policy 14 – Built and Historic Environment.
- 1.1.6 ARCHAS Ltd completed the building recording on Thursday 24<sup>th</sup> March 2016. The work was completed by Ross Cameron. Weather conditions throughout were well suited for the survey, being damp and overcast with occasional rain.
- 1.1.7 ARCHAS Cultural Heritage Ltd. conforms to the standards of professional conduct outlined in the Chartered Institute for Archaeologists (CiFA) Code of conduct, and relevant Standards and Guidance documents.
- 1.1.8 Data gathering and assessment was undertaken in accordance with the Chartered Institute for Archaeologists (CIfA) Standard and Guidance for the archaeological investigation and recording of standing buildings or structures (2014).

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<sup>1</sup> Fife Council Decision Notice 13/00601/LBC – 29/07/2013

## 1.2 Site Location and Setting

### General

- 1.2.1 Thornton Beam Engine House is located at NGR: NT 29193 97269 and lies on the southern edge of the village of Thornton in Fife (Figure 1).
- 1.2.2 The site lies on an area of disused ground immediately to the north of the Glenrothes with Thornton railway station car park and is surrounded by vacant land or farmland to the north, west and east (Plate 1).

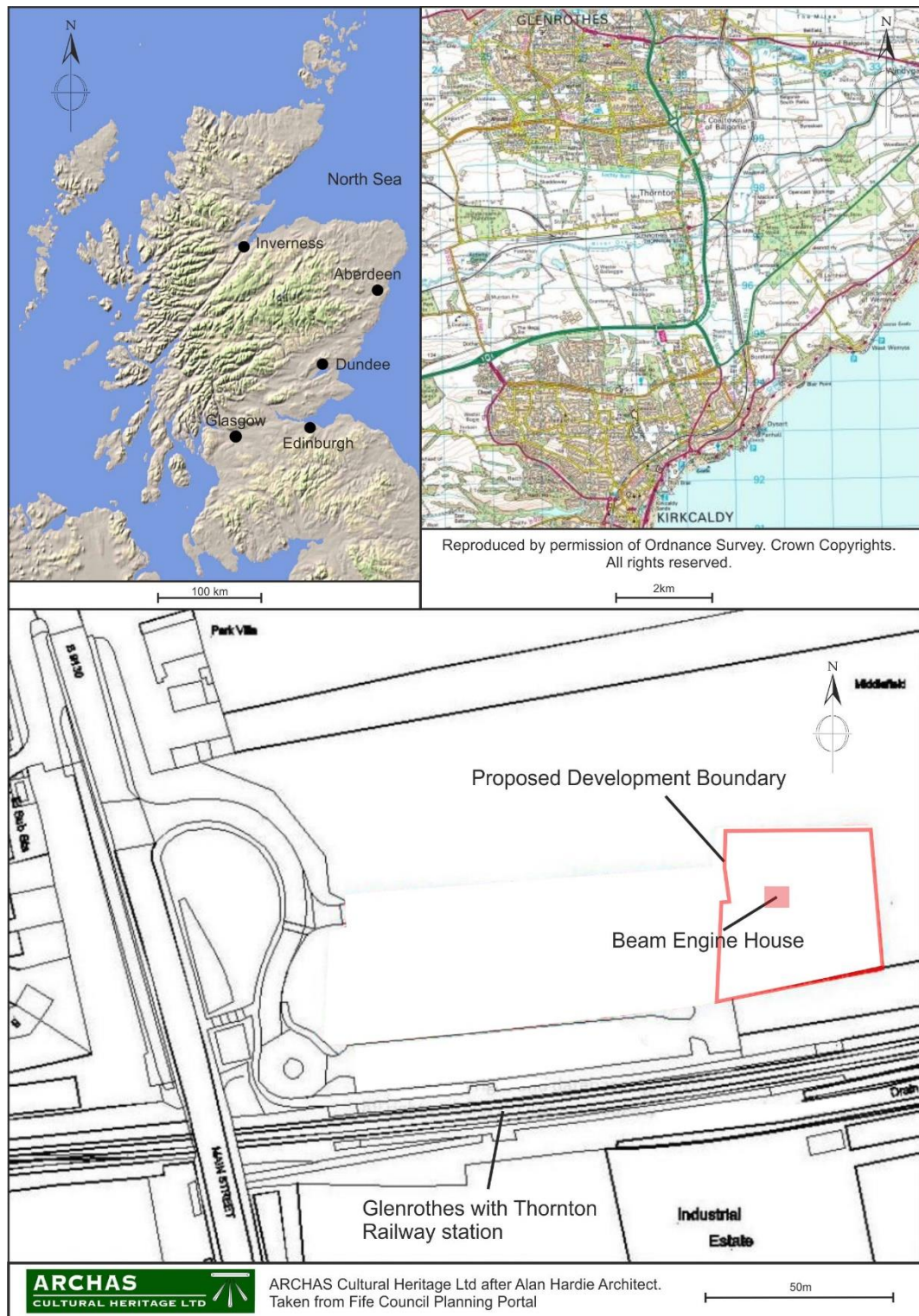


Figure 1: Site location

### *The Building*

- 1.2.3 Thornton Beam Engine House is the last surviving part of what would once have been a more extensive industrial complex. Almost wholly intact, the building survives to three courses, with only the roof in an obvious case of disrepair.



**Plate 1:** View of Thornton Beam Engine House within its wider setting from the east (Photograph 044)

### *Geology*

- 1.2.4 The overlying drift or superficial geology comprises Till, Devensian – Diamicton formed up to 2 million years ago in the Quaternary Period. These deposits are characteristic of an environment previously dominated by ice age conditions.
- 1.2.5 The underlying bedrock geology is composed of sedimentary rock cycles, coal measure type of the Scottish Lower Coal Measures Formation. This is a sedimentary bedrock formed approximately 312 to 313 million years ago in the Carboniferous Period and is indicative of a local environment previously dominated by swamps, estuaries and deltas.<sup>2</sup>

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<sup>2</sup> [www.bgs.ac.uk](http://www.bgs.ac.uk) – 23/03/16

## 2 Planning and Legislative Background

### 2.1 Planning Permission

- 2.1.1 Planning applications have been lodged with Fife Council for the conversion and incorporation of the Beam Engine House into a dwelling. Following assessment of planning applications 13/00601/LBC and 15/04012/LBC, an archaeological planning condition was placed upon the development requesting a Level II Standing Building Recording exercise.
- 2.1.2 The accepted definition of a Level II Standing Building Survey is that outlined by the Royal Commission on the Ancient and Historic Monuments of Scotland (RCAHMS – now part of Historic Environment Scotland). They define a Level II survey as a ‘Visual and Descriptive Record’, with specific guidelines requesting:

*“detailed photography, descriptive and/or analytical text, supplemented as appropriate by measured site plans and/or block plans.”<sup>3</sup>*

- 2.1.3 Before compliance with the condition can be considered as having been met, ARCHAS will produce a Data Structure Report (hereafter DSR) outlining the history of the Beam Engine House, a detailed discussion of its phasing, as well as annotated elevation drawings and plans as required. The DSR will require approval by Fife Council in order to meet the planning condition, and the report archived with The National Monuments Record Scotland (NMRS) and the Fife Council Sites and Monuments Record.

### 2.2 Listed Buildings

- 2.2.1 Buildings (including structures, wall and bridges) of special architectural or historic interest may benefit from statutory protection as Listed Buildings (Graded Category A, B or C(s)) under the terms of the Town and Country Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997. Works which will alter or extend a Listed Building in a way which would affect its character or its setting, require Listed Building Consent. Works requiring Listed Building Consent may also require planning permission (see Section 2.1). It is a criminal offence to undertake such works without this consent. Any object or structure which is fixed to a Listed Building, or which falls within the curtilage of such building and, although not fixed to the building, has formed part of the land since before 1 July 1948, is treated as part of the building and also listed.
- 2.2.2 Thornton Beam Engine House is protected as a Category A Listed Building (LB42992 - listed on 01/03/96). Category A Listed Buildings are described by Historic Environment Scotland as:

*“Buildings of national or international importance, either architectural or historic; or fine, little altered examples of some particular period, style or building type.”<sup>4</sup>*

- 2.2.3 Listed Building Consent will be required from Historic Environment Scotland before any alteration can be made to Thornton Beam Engine House.

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<sup>3</sup> RCAHMS

<sup>4</sup> <http://www.historic-scotland.gov.uk/index/heritage/historicandlistedbuildings/listing.htm> - 25/03/16



## **2.3 Buildings at Risk Register**

2.3.1 The Buildings at Risk Register for Scotland is a project under the auspices of Historic Environment Scotland which highlights properties of architectural or historic merit that are considered to be at risk or under threat.

2.3.2 Thornton Beam Engine House was added to the Register on 24/08/11 (reference: 1978) and is categorised as 'At Risk' with the condition of the building described as 'Very Poor'.<sup>5</sup>

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<sup>5</sup> [http://www.buildingsatrisk.org.uk/search/keyword/Thornton/event\\_id/899779/building\\_name/beam-engine-house-thornton](http://www.buildingsatrisk.org.uk/search/keyword/Thornton/event_id/899779/building_name/beam-engine-house-thornton) - 25/03/16

## **3 Methodology**

### **3.1 Historical research**

3.1.1 Prior to undertaking any work on site, ARCHAS Ltd completed a detailed historical assessment of the site's history and development.

3.1.2 The historical assessment consulted readily available historic sources and documentation. Sources consulted the study included:

- *National Monuments Record of Scotland (hereafter NMRS) as held by Historic Environment Scotland (formerly The Royal Commission on the Ancient and Historical Monuments of Scotland - RCAHMS);*
- *Historic Environment Scotland Database of Listed Buildings;*
- *The Buildings at Risk Register for Scotland;*
- *Early editions of Ordnance Survey and earlier mapping held by the Map Library of the National Library of Scotland (NLS);*
- *Current and historic Aerial imagery as held by online platforms;*
- *Published and unpublished archaeological reports, articles journals and books.*

### **3.2 Photographic Survey**

3.2.1 Thornton Beam Engine House was recorded by a comprehensive photographic survey with the taking of 44 photographs. Detailed images were taken of all external elevations as well as key architectural features. Access to the interior was not possible due to the condition of the building.

3.2.2 Photos were taken using a Nikon D3100 Digital SLR and a detailed Photographic Register can be viewed in Appendix B. All images are available in CD format upon request.

### **3.3 Measured drawings of key architectural features**

3.3.1 Elevations and plans of Thornton Beam Engine House were compiled by RCAHMS in 1987.

3.3.2 In addition, as part of the planning application, scaled architects' plans and external elevations were completed by Alan Hardie Architect.

3.3.3 Both sets of elevations were compared and checked on site for accuracy. The architectural elevations were used as the basis for any architectural observations as part of the survey.

3.3.2 Scaled drawings were made of significant architectural features and elevations (Appendix B). Existing architectural drawings were used as the basis for the elevations. These were checked for accuracy and a baseline was created from which all other features were measured. These drawings can be viewed as Appendix B.

## 4 Historical Background

### 4.1 Previous Historical Assessment

#### *General*

- 4.1.1 Although recognised as nationally significant through designation as a Category A Listed Building, Thornton Beam Engine House has undergone very little study or specialist assessment.

#### *The Industrial Archaeology of Scotland*

- 4.1.2 The building (Plate 2) was visited by John R Hume in 1976 during his collation of 'Industrial' sites in his important series, "The Industrial Archaeology of Scotland". Hume briefly discusses the complex, dating it to the late 18<sup>th</sup> or early 19<sup>th</sup> centuries and describing the surviving buildings as "a unique example of the buildings of an 'engine pit' of the period".<sup>6</sup> Many of the buildings Hume viewed were in use as a farm complex attached to the Beam Engine House. These are now demolished leaving the Beam Engine House standing alone (Plate 2).



**Plate 2: The Beam Engine House from the north west. Note the indications on the fabric of the building showing the presence of now demolished structures (Photograph 007)**

- 4.1.3 Hume's brief work essentially provides the content for any future discussion or mention of the site, including the Listing of the Beam Engine House in 1996.

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<sup>6</sup> 1976, Hume, J R 'The Industrial Archaeology of Scotland: Volume I – The Lowlands and Borders'

4.1.4 Measured sketches were made of the Beam Engine House by RCAHMS on 5<sup>th</sup> August 1987. These elevations are not to scale, but provide detailed measurements and indications of surviving features as well as a helpful interpretation of the Beam Engine House's operation.

## **4.2 Steam Engine technology**

4.2.1 Steam Engine technology was important in the advance in productivity and industrial exploitation of Scotland's coal reserves. At coal mines, steam power was used to drive a beam engine which removed water from a deep mine exploiting a coal seam below ground. The invention of steam technology and its deployment in the coal industry allowed previously inaccessible coal seams to be exploited and deeper shafts to be sunk by rectifying drainage problems. These new deep mines replaced the simpler and limited 'bell pit' mining predominantly used previously.

4.2.2 Steam powered beam engine technology was invented by Thomas Newcomen from the early 18<sup>th</sup> century. Continual development and alteration to Beam Engine technology provides a clear dateable chronology. From the mid 1770s, the market was dominated by Matthew Boulton and James Watt, whose innovations greatly increased efficiency and productivity at mines. Coal as fuel consumption fell by up to 75% following Watt's 1769 patent of the steam condenser this significantly reduced consumption compared to Newcomen's earlier technology.

4.2.3 Water within a boiler was heated by coal with the steam produced used to drive a piston up and down, which in turn pulled the pump contractor rod drawing water from the pit through the pump cylinder from the mine to the surface.

## **4.3 Mining in Scotland – The Balgonie Coal Field and the Thornton Pit**

4.3.1 Ground water ingress was a continual problem in early Scottish mines, and in particular in the Thornton area of Fife.

4.3.2 The Balgonie Coal Field had fallen out of use in 1748 due to continual problems with drainage making extraction of the coal economical. By the 1780s increasing demand for coal and the development of new beam engine technology as exemplified by Boulton and Watt meant that it economical to re-open the Balgonie Coal field with the opening of the Thornton pit.

## **4.4 The History of Thornton Beam Engine House**

4.4.1 Thornton Beam Engine House can be quite securely dated not just through an assessment of the building's style and character, but from the documentary evidence of the chronology of the Thornton Pit.

4.4.2 The Thornton Pit was sunk in 1785, named after Sophia Thornton wife of Alexander Leslie-Melville the soon to become 7<sup>th</sup> Earl of Leven and owner of the Balgonie Coal Field. The modern village of Thornton to the north developed from the miner's cottages established to service the pit.

4.4.3 No direct mention is made of the Thornton pit in The Statistical Account of Scotland from 1791-99, but the Statistical Account of 1834-45 states that coal was worked at Thornton from at least 1785 when 'more powerful engines were erected'.<sup>7</sup>

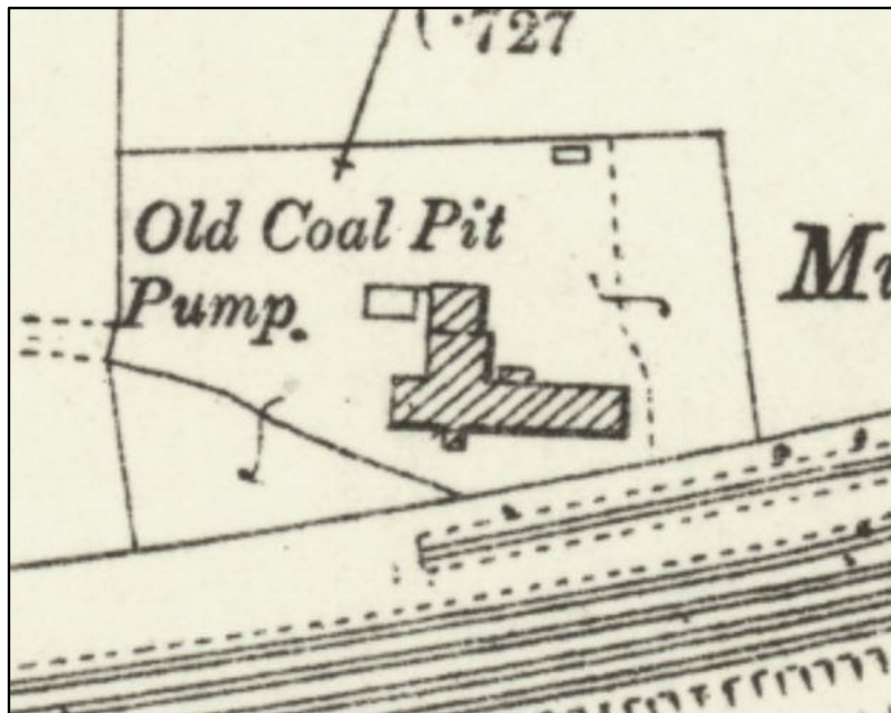
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<sup>7</sup> Sieveright, J. 'Parish of Markinch' in The Statistical Account of Scotland, County of Fife. Account of 1834-35, Volume 9, pages 661

4.1.5 Francis Groome's Ordnance Gazetteer of Scotland produced in 1896 makes no mention of mining in Thornton.

#### 4.5 Layout of the Thornton Pit complex – map evidence

4.5.1 The first map to indicate the Thornton coal pit is the Six inch to the Mile 1<sup>st</sup> Edition Ordnance Survey map (Fife, Sheet 32) of 1854 which shows a roofed rectangular building aligned east-west with what may be part of the beam engine house on the north side of the longer building. The site is indicated as "Old Coal Pit" and there are two smaller unroofed buildings to the north west that are marked as 'Ruin'. This is all within a squarish enclosure at the end of the existing track. Analysis of the south facing elevation (ibid) suggests that the linear building was connected to the engine house as suggested by the cartographic evidence. The second edition of the OS 6 inches to the mile map, shows the trackway, enclosure and an L shaped building. It is presumed that the western end of the linear building noted on the 1<sup>st</sup> edition OS map has been demolished as have the two smaller buildings annotated as ruins. The linear building from the 1<sup>st</sup> edition and the shorter building indicated on the 2<sup>nd</sup> edition appear to be considerably larger than the beam engine house itself with the beam engine house comprising a small part of the larger complex. The best and most detailed cartographic evidence available is from the Ordnance Survey 1:25inch Fifeshire Sheet 028.09 surveyed in 1893 and published in 1895. This map shows the linear roofed building as comprising five separate elements. The engine house appears to comprise the roofed square building at the top of the complex with the linear building to the south (Figure 2) and an unroofed rectangular building to the west.



**Figure 2:** Excerpt from OS 25 inch Fifeshire Sheet 028.09 Surveyed 1893.

#### 4.6 Significance

4.6.1 Thornton Beam Engine House is one of only three remaining beam engine houses in Fife and only six across the rest of Scotland. Of the Fife examples (the others being Kilmux and Preston Island), Thornton is likely the oldest and best preserved.

## 5 Description

### 5.1 General

- 5.1.1 Thornton Beam Engine House survives today in immediately adjacent to Glenrothes with Thornton Railway Station (Plate 1). The history of the site as outlined above has shown that this was not always the case, with a complex of farm buildings surrounding the Beam Engine House when Hume visited the site in 1976. These were demolished c.1986.
- 5.1.2 The Beam Engine House is a remarkably unaltered structure, with little significant alteration or any real phasing. The main part of the edifice dates from the primary phase of construction, while indications of later additions subsequently removed can be traced on all sides of the structure. Rectangular in plan, the building is aligned between W-E and WNW-ESE (taken as W-E for ease of description). It survives to its full height, with a roof of red pantiles surviving in places.
- 5.1.3 The western elevation is constructed from well-dressed and regularly dressed ashlar, sandstone blocks of very high quality. The eastern elevation also has high quality ashlar blocks, but here only used for quoins, jambs, lintels and *voussoirs*, with the remainder comprising roughly dressed sandstone blocks. Both the north and south elevations are composed almost wholly of roughly coursed and dressed sandstone blocks of poor quality, with the exception of the ashlar quoins.
- 5.1.4 The various entry points have been blocked in the 20<sup>th</sup> century with bricks and mortar, and the same is true of other primary portals in the fabric of the building, including the opening for the steam pipe and another for the beam itself in the eastern elevation.
- 5.1.5 The only real access to the interior of the Beam Engine House survives on the southern elevation where an entranceway is located at first floor height. Although this and other safety concerns preclude access to the building, inspection through this opening show the interior to be much denuded (Plate 3 and Plate 4), with only a number of floor beams surviving between ground and first floor level – none survive between the first and second floors. Much of the interior walls have sections where lime plaster survives *in situ*.



**Plate 3:** View of the interior showing the poor condition of the roof  
(Photograph 024)



**Plate 4:** View of the interior showing internal plasterwork & features  
(Photograph 026)

5.1.7 Despite the long history of the building, there is no evidence for re-pointing or any historic consolidation of the stone.

## 5.2 The North elevation

5.2.1 The north elevation of Thornton Beam Engine House is the most unremarkable and unaltered elevation of the building (Plate 5). It has an entrance built as a primary feature in the western half of the wall, although this is now blocked with modern nine inch concrete blocks. The jambs and lintel of this opening are well dressed sandstone blocks, although not as high quality as those in the western elevation. The coursing of the stonework is reasonably consistent, specifically at the lower level, although this loses its consistency above door level, particularly on the western side.



**Plate 5: North elevation of the Beam Engine House (Photograph 012)**

5.2.2 On the eastern side of the wall, a small hole has been punched into one of the sandstone blocks while a short Fe bar also protrudes. These are likely to be secondary additions.

5.2.3 A faint raggle may also be discernible on the eastern side of the elevation. Although a faint line can be discerned, this did not seem to continue further than c.1m and it is possible this is merely scarring on the stone from some other function.

5.2.4 A stone has been robbed from the dressed foundation course which runs around the base of the Beam Engine House, creating a gap c.0.70m wide. This opening does not continue all the way through the wall of the building.

### 5.3 The East elevation

5.3.1 The East elevation contains a number of openings (Plate 6). An entrance at ground level is now blocked by modern breeze blocks, while of the two arched openings above, located at first and second floor levels, the uppermost is blocked by what appear to be 19<sup>th</sup> century bricks. The function of these openings is not clear. The opening on first floor level has the height and location at floor level to have acted as a doorway. The upper, now blocked opening appears too small for this and may have been a window or associated with the use of machinery.



**Plate 6: East Elevation of Thornton Beam Engine House (Photograph 016)**



**Plate 7: Detail of the wall stub on south side of the East Elevation (Photograph 022)**

5.3.2 There are also two large, square slots running through the wall above the first floor opening. On casual inspection, the northernmost of the two is more roughly constructed and has the appearance of being cut through an existing wall. However, closer inspection of the specifically cut and placed stonework around these openings shows them to be an integral part of the primary build of the structure. Their function is unclear, but the size of the slots and their location may indicate a function related to the stabilisation of the steam engine located directly on the other side of the wall.

5.3.3 The teeth of a wall survive as a stub protruding eastwards from the southern corner of the east elevation (Plate 7). This wall is securely tied into the fabric of the Beam Engine House and was clearly an integral part of the primary build as evidenced by the cartographic evidence.

5.3.4 Like the north elevation, a number of small punched holes and an Fe bar were noted in the wall, here at southern side. A possible faint raggle could also be discerned running towards the brick blocked upper opening, although like that on the northern side, this is likely to just be scarring of the stone.



## 5.4 The South elevation

- 5.4.1 The South elevation is that which has the most features to interpret (Plate 8). The stonework here is clearly the roughest and poorest quality of all elevations, with only semi-regular coursing and poorer quality stone, particularly in the south west corner.
- 5.4.2 As discussed, it retains an open entrance into the interior of the building at first floor level. This entrance is a primary feature, but without the well-dressed ashlar quoins found to varying degrees elsewhere around the building.



**Plate 8:** South Elevation of Thornton Beam Engine House (Photograph 029)



**Plate 9:** Detail of wall stub retaining plaster from the south east. Note the line of the raggle (top) and scorched stonework (right) (Photograph 034)

- 5.4.3 There is a small area of 19<sup>th</sup> century bricks in the middle of the wall, adjacent to the doorway. Presumably these block an opening in the wall rather than a repair to the otherwise sound fabric in this area. It is not possible to tell from the external inspection whether this is a primary opening or is cut into the wall.
- 5.4.4 A clear raggle indicates the former presence of a substantial building with a red pan tiled roof which once extended southwards from the main edifice. The raggle is uneven and offset from the centre of the elevation, extending lower on the west side to meet the teeth of a broken wall stub running southwards (Plate 9). The eastern side of this now demolished building extended beyond the eastern end of the south façade. This is indicated by the higher placement of the raggle against the eastern side of the south elevation, and the eastwards running wall running from the south east corner (described under Section 5.3.3 above) which would have formed part of the same building. This now demolished building was part of the primary build of the Beam Engine House structure as the remaining stub is closely tied into the main Beam Engine House structure.

- 5.4.5 Fragments of plaster adhering to the return of the southwards running wall stub indicate the internal finish of this building, with the plaster lipping and finishing at head height in line with the entrance on the first floor level.
- 5.4.6 The southwards running wall stub retains one socket above the plaster lip at first floor level. This is the last survivor of a series of such sockets which would have run along both the southwards running wall and the now wholly lost east elevation of this building. These sockets would have held a series of floor joists, supported by a main, north-south aligned central joist as indicated by the single socket in the centre of the South Elevation of the Beam Engine House.
- 5.4.6 The stonework at the south western side of the wall shows signs of scorching, almost certainly an event which post-dates the dereliction of the building.

## 5.5 The West elevation

- 5.5.1 The ashlar stone work on the West Elevation is of very high quality (Plate 10). This facade was clearly the most important side of the Beam Engine House, facing the main access track to the site, accentuating and enhancing the quality and importance of the structure, while providing a stable building to withstand the rigours of a functioning beam.



**Plate 10: West Elevation of Thornton Beam Engine House (Photograph 038)**

- 5.5.2 As with elsewhere around the building, the main openings through the wall have been blocked. The main beam of the engine would have protruded from the uppermost of these openings, blocked now with what appear to be 19<sup>th</sup> century bricks (Plate 11). A small square opening with a timber lintel left in the centre of this blocking, is a window relating to the re-

use of the building. Although it was not possible to access this opening for closer inspection, protruding Fe rods and pintles on either jamb indicate the opening could be closed off by two large doors. This is curious as they appear from distance to be primary to the main build and it is difficult to see why, or how the opening would be closed with the beam in place.

- 5.5.3 Twin slots either side at the base of the opening would have acted as supports for the pivot of the beam.
- 5.5.4 A large vertical gouge running upwards from the north side of the opening is more difficult to explain, but is a secondary insertion and must relate to the use of and complexities of the machinery fitted in this tight space.
- 5.5.5 Lower down the wall a circular opening is also blocked with bricks, these likely to be later in date than those blocking the beam opening (Plate 12). This hole would have been for the steam pipe, but is now also smeared with cement, likely in an attempt to disguise the blocking.



**Plate 11:** Detailed view of opening for the Beam in West Elevation (Photograph 037)



**Plate 12:** Detailed view of the blocked steam hole. Note the raggle running across the opening (Photograph 038)

- 5.5.6 Two sockets below the blocked steam hole are bearing bolt access holes. These have been left unaltered.
- 5.5.7 A raggle running from a high point on the southern side of the West elevation, slopes down at a c.45° angle before cutting horizontally along the face of the blocked steam pipe hole, before once again sloping downwards to terminate c.1.20m above ground level. Blocking or obscuring important parts and areas of the Bean Engine House's primary function, this raggle relates to a now demolished secondary building, likely from the use of the site as a farm complex. The low level at which it reaches on the north side, indicates that this area in particular would have been some sort of storage area.
- 5.5.8 A series of small, inserted or cut holes around the steam pipe hole and directly to the south of this all concentrate below this raggle and are almost certainly secondary to the main Beam Engine House.

## 6 Discussion

- 6.1.1 The standing building survey of Thornton Beam Engine House was necessarily limited due to the absence of scaffolding and the inability to access the interior of the structure. The limitations of a Level II Standing Building Survey must also be noted at this stage.
- 6.1.2 However, it is clear that Thornton Beam Engine House is an important survival of an early industrial structure of this type which has undergone very little alteration or irreversible change. The building is now the sole survivor of what would have been an extensive mining complex and as such cannot be viewed in its correct historical context, however, the main fabric of the Beam Engine House is almost wholly intact with later alterations confined to turning what was clearly an important functional part of an industrial complex into a useful farm building.
- 6.1.3 The high quality of the dressed ashlar West Elevation is remarkable in what is primarily a functional building, clearly designed to impress from the main access. This in itself tends to indicate an early or 18<sup>th</sup> century date for the Engine House before such structures became more commonplace and functional again highlighting its importance.
- 6.1.4 The raggles and wall stubs recorded, particularly on the southern and, to a lesser extent, eastern sides of the building clearly indicate the presence of structures which formed part of the primary mining complex associated with the Beam Engine House. Although the area was subsequently much altered when in use as a farm, these areas have potential to retain buried deposits and features of important industrial archaeology.

## 7 Conclusions and Recommendations

- 7.1.1 The historical assessment and analysis of the structure of Thornton Beam Engine House has shown it to be a very important, rare and valuable survival of an early industrial site with few parallels in Scotland.
- 7.1.2 The work completed by ARCHAS Ltd recording the external fabric of Thornton Beam Engine House has provided a valuable record of the exterior of the building prior to any proposed alteration. The lack of any previous alteration or modification to the structure means that there is little complexity or phasing and consequently merits very little analytical discussion.
- 7.1.3 It was not possible to access the interior of the Engine Beam House in order to complete a record of this. A detailed examination of this both before and during the removal of relict plaster surfaces may reveal details about the type of engine housed in the building.
- 7.1.4 Assessment of the fabric of the structure showed the former presence of structures which are an integral part of the primary build of the Beam Engine House complex. These areas are likely to retain important archaeological features and deposits significant to the history of early industrial Scotland.
- 7.1.5 ARCHAS Ltd recommend that a further short phase of building recording is completed when access to the interior of the structure can be safely secured. This is unlikely to be an onerous exercise. In addition, consideration should be given to the archaeological implications of any excavations associated with the construction of the development and any impact that may have on buried deposits or structural remains. This is particularly true on the south and east sides of the Beam Engine House.

## **8 Acknowledgements**

- 8.1.1 ARCHAS would like to thank the client, Mr Mark Bruce for his assistance and enthusiasm in preparing this project. Mr Bruce deserves credit for his commitment to ensuring Thornton Beam Engine House was accurately recorded prior to any development commencing.
- 8.1.2 Thanks also go to Douglas Speirs, Archaeology Officer at Fife Council who provided advice, guidance and a wealth of information relating to Thornton Beam Engine House.

# Bibliography

## Documents include

Fife Council Decision Notice 13/00601/LBC – 29/07/2013

Groome, F. H. 1896 Ordnance Gazetteer of Scotland, London

Hume, J. 1977 The Industrial Archaeology of Scotland, The Lowlands and Borders, Volume I, London

Sieveright, J. 'Parish of Markinch' in The Statistical Account of Scotland, County of Fife. Account of 1834-35, Volume 9, pages 655-689

Thomson J. 'Parish of Markinch' in The Statistical Account of Scotland, County of Fife. Account of 1791-99, Volume 12, pages 525-555

## Websites include

[www.bing.com/maps/](http://www.bing.com/maps/)

[www.buildingsatrisk.org.uk](http://www.buildingsatrisk.org.uk)

[www.bgs.ac.uk](http://www.bgs.ac.uk)

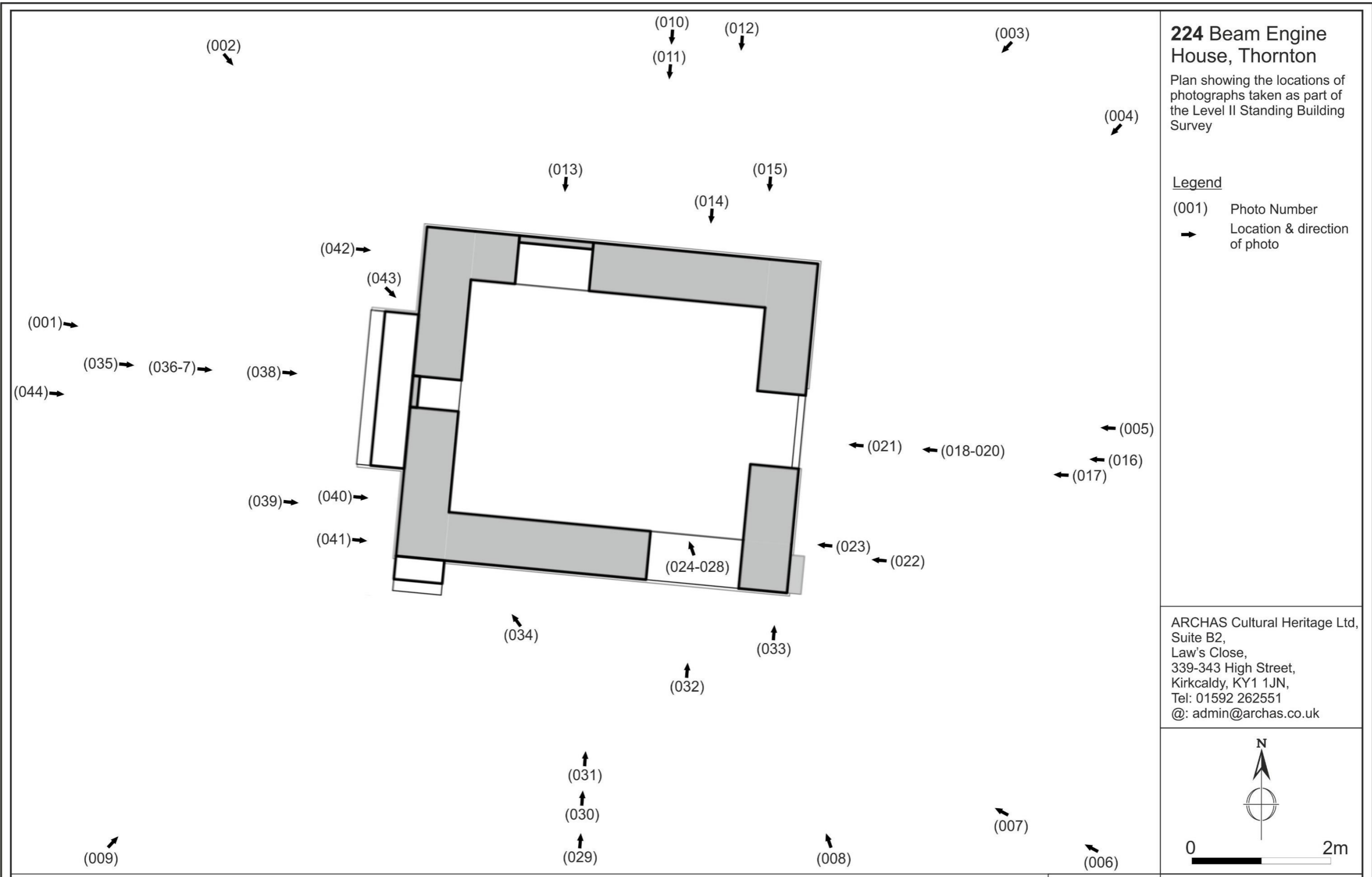
[www.google.co.uk/maps/](http://www.google.co.uk/maps/)

[www.historic-scotland.gov.uk](http://www.historic-scotland.gov.uk)

[www.nls.uk](http://www.nls.uk)

[www.rcahms.gov.uk](http://www.rcahms.gov.uk)

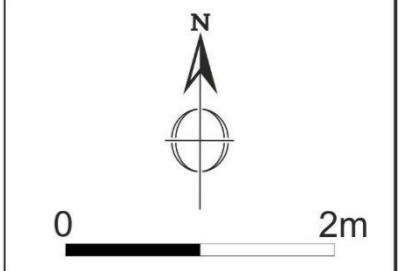
# Appendix A: Photographic Register



**224 Beam Engine House, Thornton**  
 Plan showing the locations of photographs taken as part of the Level II Standing Building Survey

**Legend**  
 (001) Photo Number  
 → Location & direction of photo

ARCHAS Cultural Heritage Ltd,  
 Suite B2,  
 Law's Close,  
 339-343 High Street,  
 Kirkcaldy, KY1 1JN,  
 Tel: 01592 262551  
 @: admin@archas.co.uk



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Date:	24/03/16
Scale:	As indicated. 1:50 at A3
Illustrator:	RC

## Appendix B: Architectural Elevations

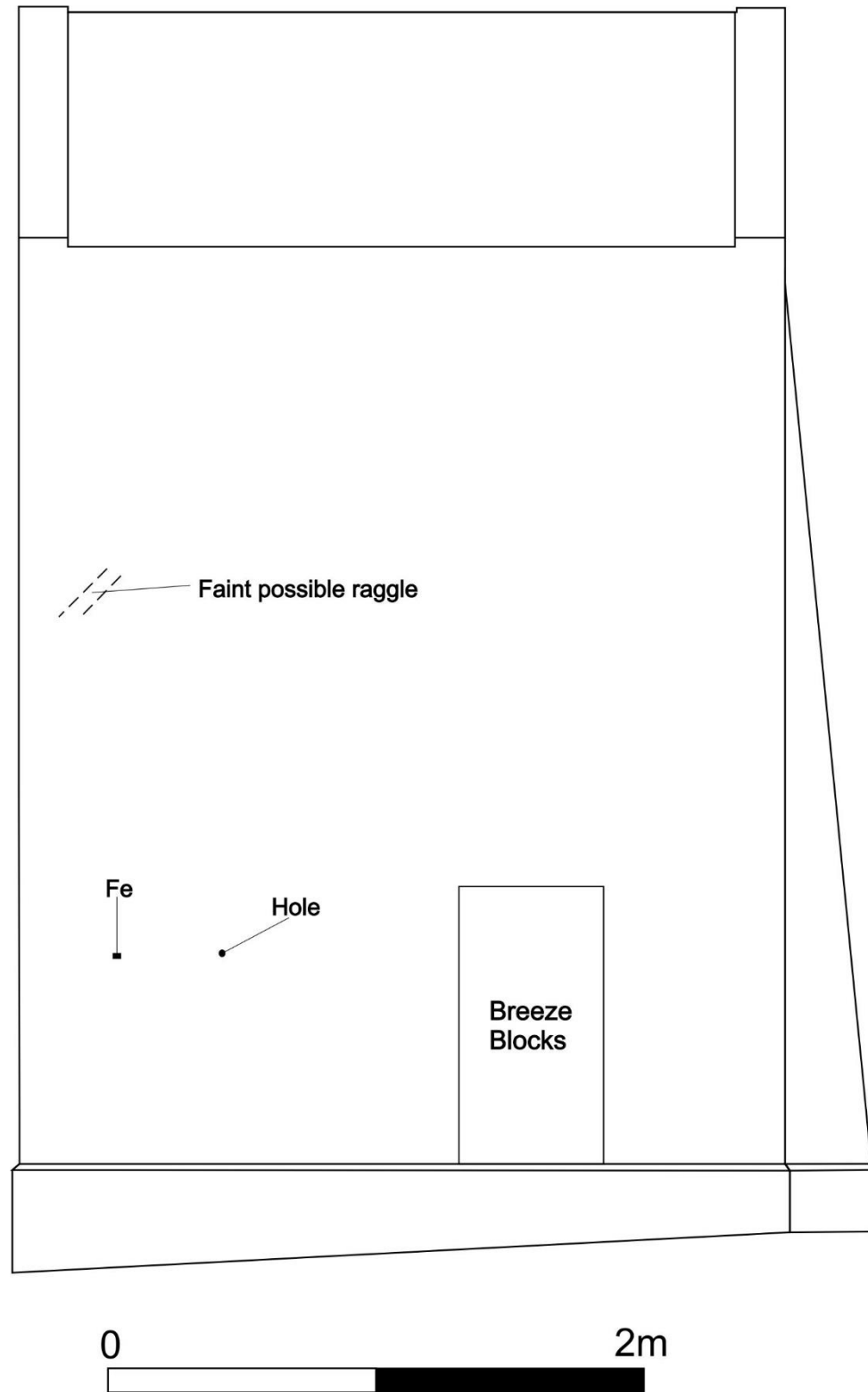


Figure 3: North facing elevation of Thornton Beam Engine House. Base elevation checked and edited from original courtesy of Alan Hardie Architect

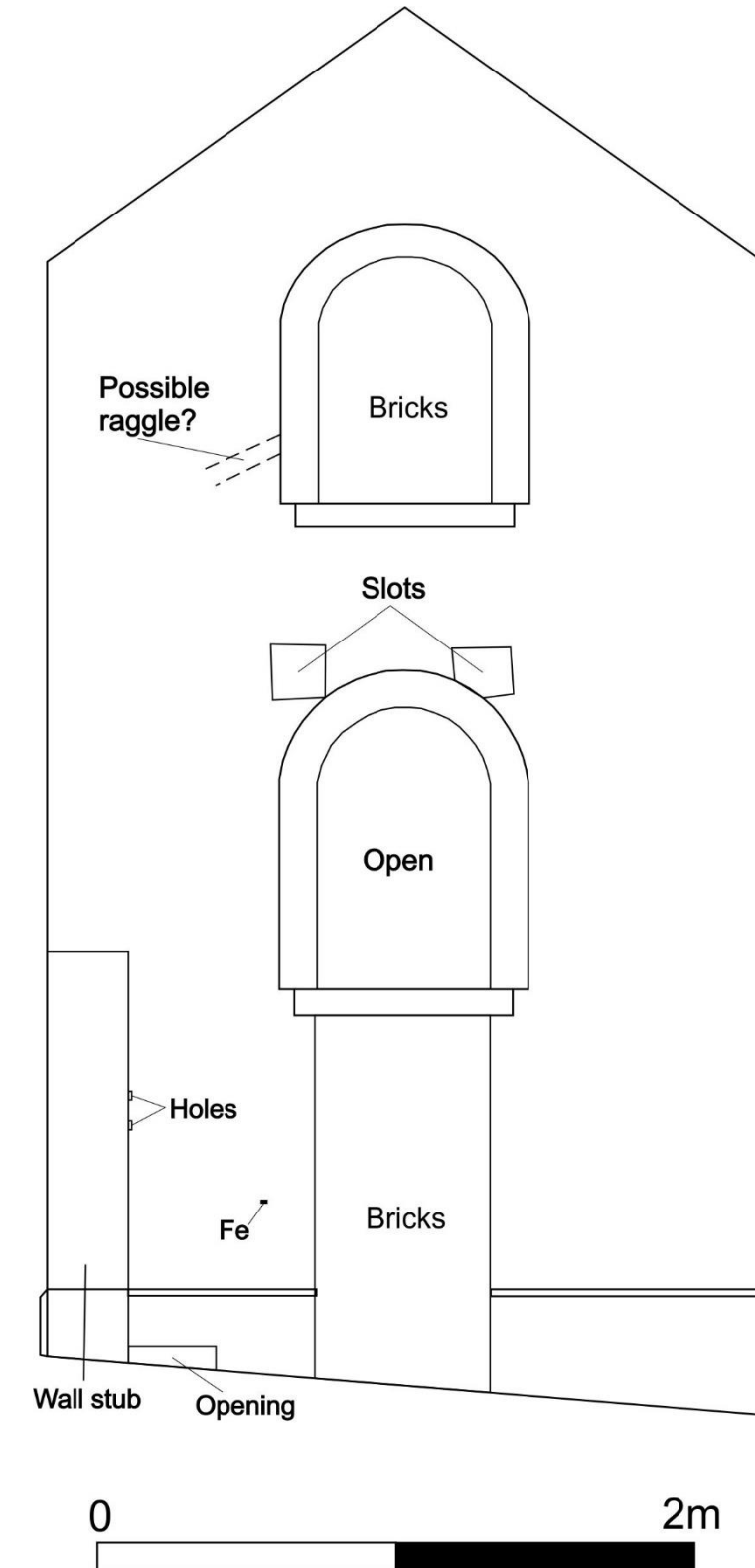


Figure 4: East facing elevation of Thornton Beam Engine House. Base elevation checked and edited from original courtesy of Alan Hardie Architect



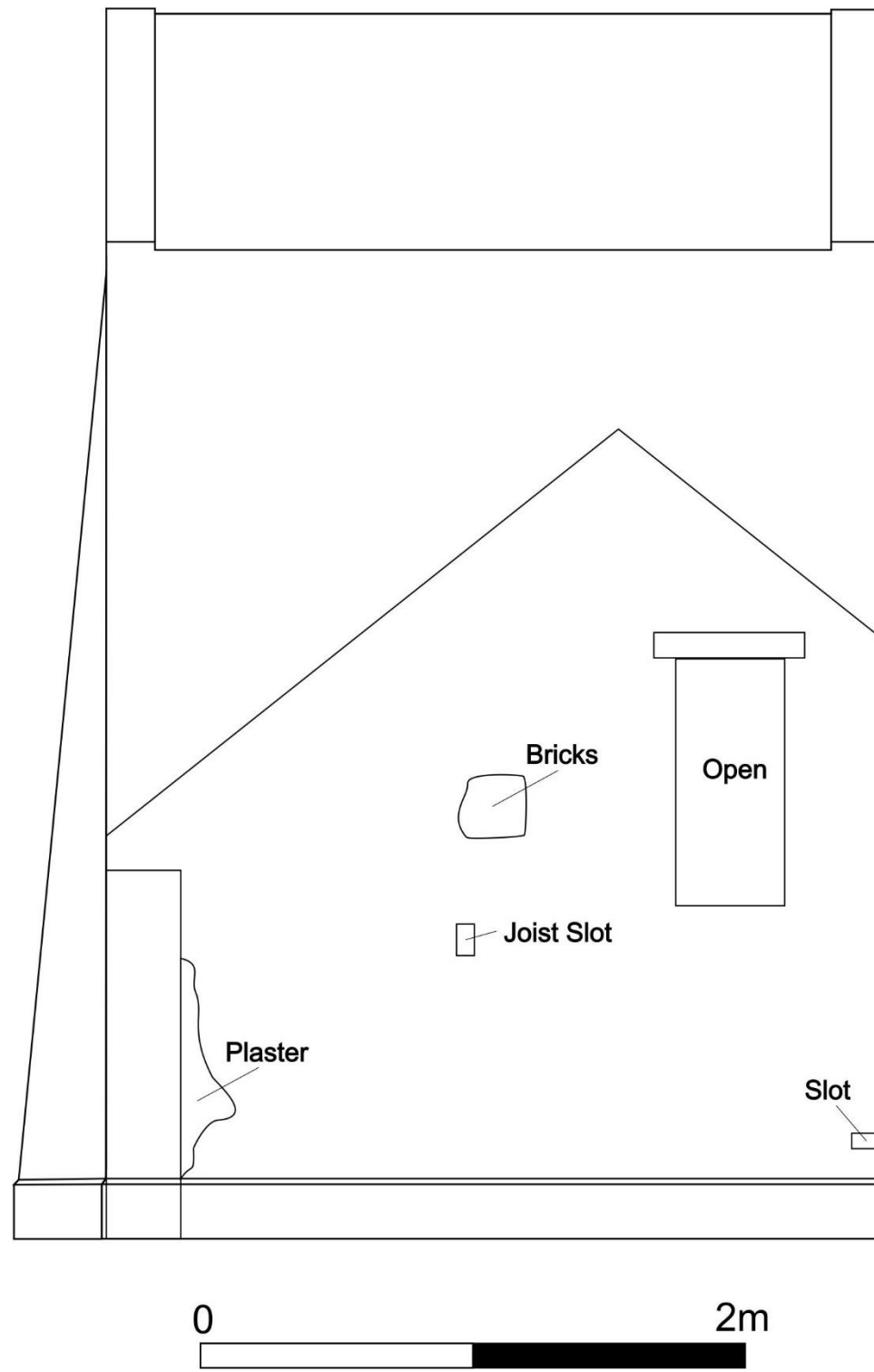


Figure 5: South facing elevation of Thornton Beam Engine House. Base elevation checked and edited from original courtesy of Alan Hardie Architect

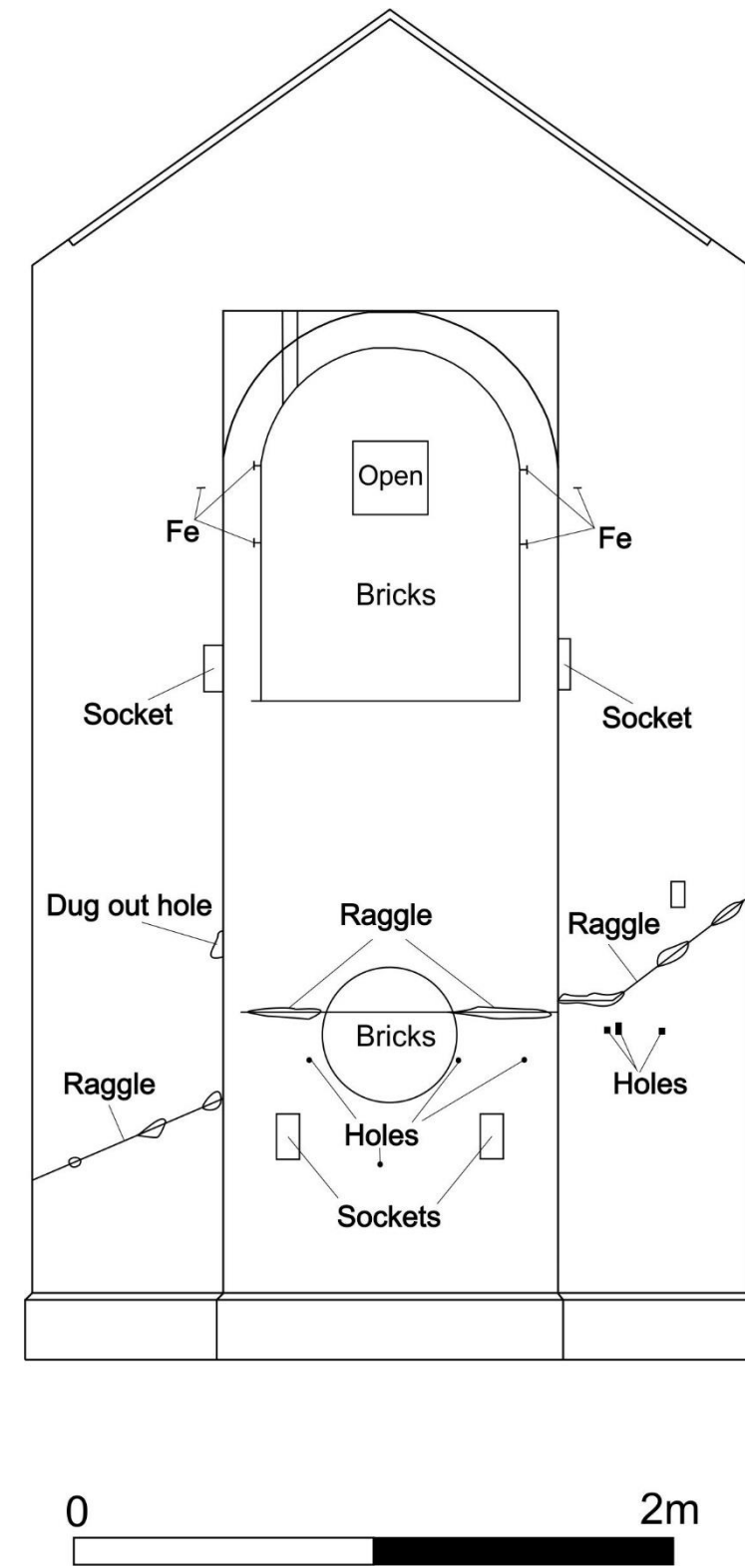


Figure 6: West facing elevation of Thornton Beam Engine House. Base elevation checked and edited from original courtesy of Alan Hardie Architect

## Appendix C: Proposed Discovery & Excavation Scotland entry

<b>LOCAL AUTHORITY:</b>	Fife Council
<b>PROJECT TITLE/SITE NAME:</b>	Thornton Beam Engine House – Standing Building Recording
<b>PROJECT CODE:</b>	224
<b>PARISH:</b>	Markinch
<b>NAME OF CONTRIBUTOR:</b>	Ross Cameron
<b>NAME OF ORGANISATION:</b>	ARCHAS Cultural Heritage Ltd.
<b>TYPE(S) OF PROJECT:</b>	Standing Building Recording
<b>NMRS NO(S):</b>	n/a
<b>SITE/MONUMENT TYPE(S):</b>	n/a
<b>SIGNIFICANT FINDS:</b>	None
<b>NGR</b> (2 letters, 8 or 10 figures)	NT 29193 97269
<b>START DATE</b> (this season)	24/03/16
<b>END DATE</b> (this season)	24/03/16
<b>PREVIOUS WORK</b> (incl. <i>DES</i> ref.)	None
<b>MAIN (NARRATIVE) DESCRIPTION:</b> (May include information from other fields)	<p>ARCHAS Cultural Heritage Ltd were appointed by Mr Mark Bruce to complete a Level 2 Standing Building Record of a derelict Beam Engine House in Thornton, Fife. Proposals have been submitted to Fife Council to turn the property into a dwelling house. As part of the Planning Application process, Fife Council requested that a Level 2 Standing Building Survey be completed prior to development.</p> <p>Historical assessment showed that the Beam Engine House dates to the late 18th century when advances in steam and beam engine technology meant that the Balgonie Coal field became economical again and led to the creation of the Thornton Pit.</p> <p>The building itself is of remarkably high quality, with a finely dressed ashlar frontage facing the main entrance to the site and the pit shaft itself. Although the complex in which the building once sat has been systematically removed, the Beam Engine House itself remains significantly unaltered and is a rare 18th century survival of its type.</p> <p>The record compiled for the exterior of the building has been comprehensive, but access to the interior of the structure was not possible. This area has potential to retain important information as to the nature of the machinery and its fittings. ARCHAS Ltd recommend that a further phase of building recording be carried out both before and during the removal of the interior fittings and plaster work within the Beam Engine House.</p>
<b>PROPOSED FUTURE WORK:</b>	None
<b>CAPTION(S) FOR ILLUSTRS:</b>	n/a
<b>SPONSOR OR FUNDING BODY:</b>	Mr
<b>ADDRESS OF MAIN CONTRIBUTOR:</b>	ARCHAS Cultural Heritage Ltd Suite B2 Laws Close 339-343 High Street Kirkcaldy KY1 1JN
<b>EMAIL ADDRESS:</b>	ross.cameron@archas.co.uk
<b>ARCHIVE LOCATION</b>	NMRS and Fife SMR (intended)