

WHEAL ELLEN ENGINE HOUSE
PORTHTOWAN
ST AGNES
CORNWALL

Updated Historic Building Appraisal



South West Archaeology Ltd. report no. 220303



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Wheal Ellen Engine House, Porthtowan, St Agnes, Cornwall

Updated Historic Building Appraisal

By E. Wapshott, MCIfA, Dr. B. Morris, ACIfA, and Natalie Boyd

Report Version: FINAL

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Work undertaken by SWARCH for a private client (The Client)

Summary

South West Archaeology Ltd. (SWARCH) was commissioned to undertake a historic building appraisal for the engine house at Wheal Ellen Engine House, Porthtowan, St Agnes, Cornwall. This work was undertaken in order to assess the fabric affected by the conversion, restoration and development of this building, and comment on the proposed capping of the adjacent shaft.

The engine house is a fine example of its type, built in 1866 and standing in a valley group of other well-preserved but derelict mining/industrial remains. The engine house was constructed by the Ellen United Copper and Zinc Mining Company (Limited) who were bankrupted the following year. The engine was therefore never installed in this building, leaving its contribution to the mining landscape here as a purely visual one. The building shows signs of patching and repair, so has seen some use, although there are no fittings left to indicate function(s).



March 2022

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ACKNOWLEDGEMENTS

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ROBERT WATERHOUSE (FOR COMMENT ON THE SHAFT TIMBERS)

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FIGURE 1: LOCATION MAP.

1.0 INTRODUCTION

LOCATION: WHEAL ELLEN ENGINE HOUSE, PORTHTOWAN
PARISH: ST AGNES
COUNTY: CORNWALL
CENTROID NGR: SW 70230 46980
PLANNING REF: N/A
SWARCH REF: AWE21
OASIS REF: SOUTHWES1-510840

1.1 PROJECT BACKGROUND

South West Archaeology Ltd. (SWARCH) was commissioned by Scott & Co. Ltd. (The Agent) on behalf of a private client (The Client) to undertake a rapid historic appraisal for the Grade II Listed engine house at Wheal Ellen Engine House, Porthtowan, St Agnes, Cornwall. This work was undertaken in order to assess the structure prior to a planning application.

1.2 TOPOGRAPHICAL AND GEOLOGICAL BACKGROUND

Porthtowan is a small village on the north coast of Cornwall, 2km west of St Agnes, 4km north of Redruth and approximately 10km west of Truro. The name derives from the Cornish words 'porth' and 'tewynn', meaning the landing place at the sand dunes. Wheal Ellen lies to the south-east of the village and forms part of the Cornwall and West Devon Mining Landscape World Heritage Site. The soils of this area are the well drained fine loamy soils over slate or rubble of the Denbigh 2 Association (SSEW 1983); however, the base of the valley is sealed by alluvial deposits and mine waste. These overlie the sedimentary mudstone and sandstone of the Porthtowan Formation at depth (BGS 2022).

1.3 HISTORICAL & ARCHAEOLOGICAL BACKGROUND

The engine house at Wheal Ellen was constructed in 1866 by a company who were intending to rework both Wheal Ellen and Wheal Music and named themselves Ellen United Copper and Zinc Company. The engine was never fitted and there are no records to suggest that the new concern was progressed any further and an entry in the London Gazette (1867) suggests that the company was liquidated in July 1867. Wheal Ellen lies within the St Agnes Mining District of the Cornwall and West Devon Mining World Heritage Site.

1.4 METHODOLOGY

This report builds on an existing report prepared in 2018. That assessment of the structure at that time was conducted by E. Wapshott in June 2017. A second site visit was undertaken by B. Morris on the 7th January 2022. The work was undertaken in line with best practice and follows the guidance outlined in: ClfA's *Standard and Guidance for the Archaeological Investigation and Recording of Standing Buildings or Structures* (2014) and Historic England's *Understanding Historic Buildings: A Guide to Good Recording Processes* (2016).

2.0 DESK-BASED APPRAISAL

2.1 DOCUMENTARY HISTORY

The lodes at Wheal Ellen were worked 1826-1861, the product of a merger between Wheal Music and Old Wheal Basset in 1834. During the period 1845-1865 it produced 9056 tonnes of copper ore, translating to 600 tonnes metal worth £46,687. It also produced £60 of tin in 1861. Works were suspended 1861-64, and an article in the *Western Morning News* for 02.04.1861 noted that all machinery and materials had been sold. The extant enginehouse at Wheal Ellen was constructed in 1866 by the *Wheal Ellen United Copper and Zinc Mining Company* to take a 70" pumping engine. This company intended to rework the original sett in conjunction with Wheal Music, but quickly went into liquidation and the engine was never fitted. The castellated brick chimney of the enginehouse has reputedly only one parallel, the now demolished Wheal Golden (CAU 1986). However, work by SWARCH has identified another example at Wheal Friendly, St Agnes (SWARCH 2017). The *Cornubian & Redruth Times* for 23.10.1868 noted the auction of all materials at Wheal Ellen, including a horse whim, but it is unclear how far the development at Wheal Ellen had progressed beyond the construction of the engine house. In 1884 it was known as Ellen United, with six men employed underground, and the *Royal Cornwall Gazette* noted the site was being reworked in the early 20th century. On 07.04.1904 the *Gazette* noted 30 men were employed opening shafts and adits, and in 21.05.1908 noted that they had hit a copper lode. However, in 17.12.1908 it reported works were once again suspended, the site having been purchased by the Redruth Foundry Co. Sources: see bibliography.

2.2 CARTOGRAPHIC SOURCES

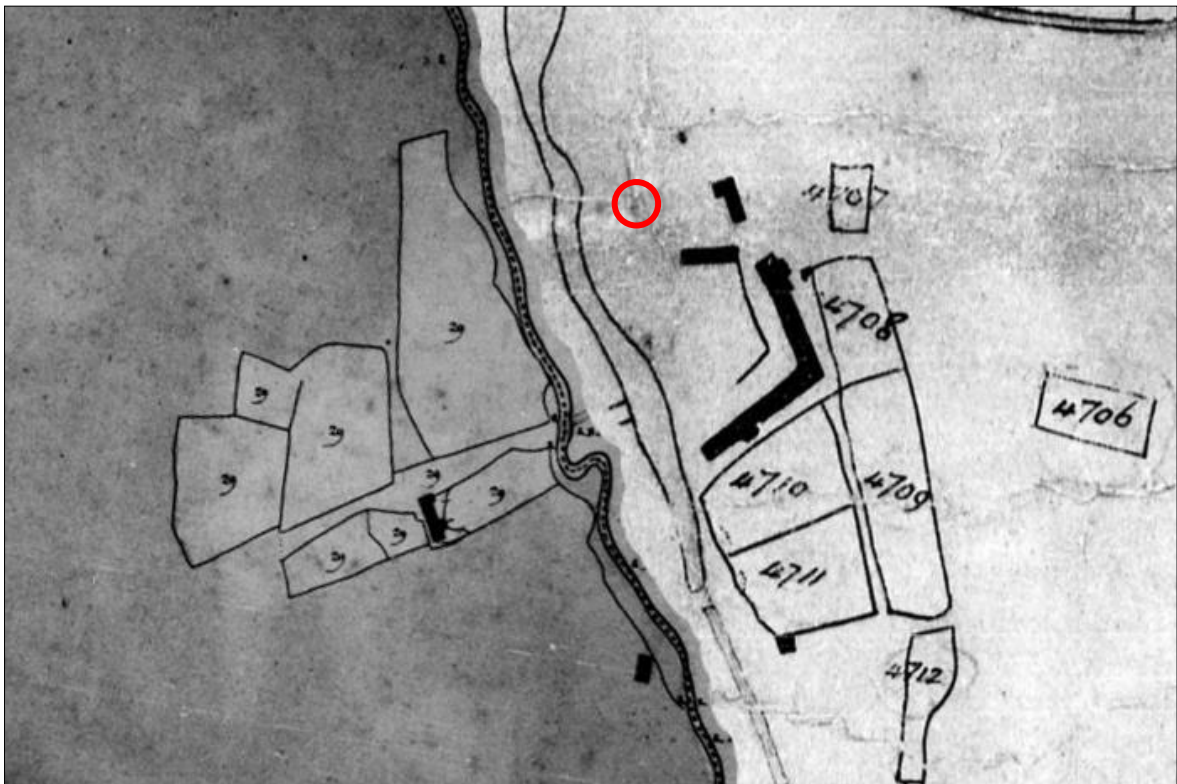


FIGURE 2: EXTRACT FROM THE C.1840 ST AGNES (RIGHT) AND ILLOGAN (LEFT) TITHE MAPS. THE APPROXIMATE LOCATION OF THE ENGINEHOUSE IS INDICATED (TNA).

The readily-available cartographic sources show the engine house was built within an existing industrial landscape. It was constructed within what was, in 1840, open unenclosed

land. The enclosed fields to east and west were owned by John Basset Esq. and rented to Oliver Willoughby (fields all numbered 29), and Humphry Williams and rented to Elizabeth James (field numbered 4707-4711); all of the fields were listed as in arable use. The anonymous buildings to the east shown on the tithe map were presumably what became known as *Old Wheal Basset*. The later OS maps show the engine house, but none of the other buildings (e.g. boiler house etc.) usually associated with such structures.

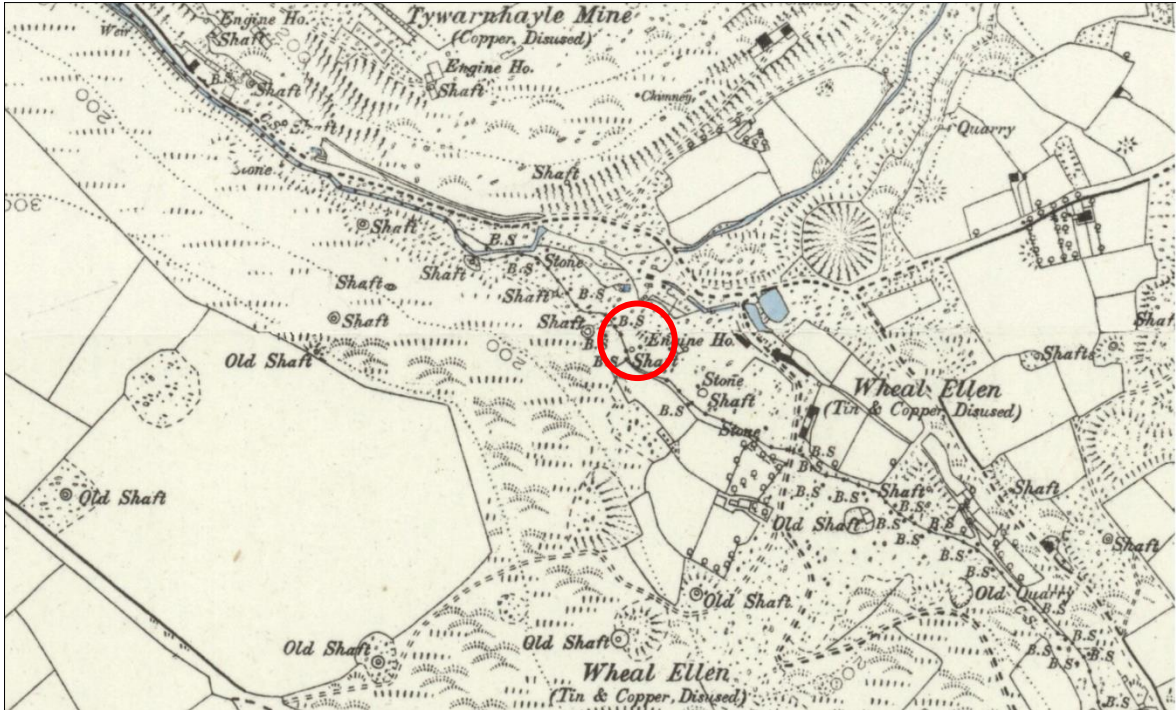


FIGURE 3: EXTRACT FROM THE 1ST EDITION OS 6" MAP (CORNWALL SHEETS LVI.SE & LVI.NE) PUBLISHED 1888 (CRO). THE ENGINEHOUSE IS INDICATED.

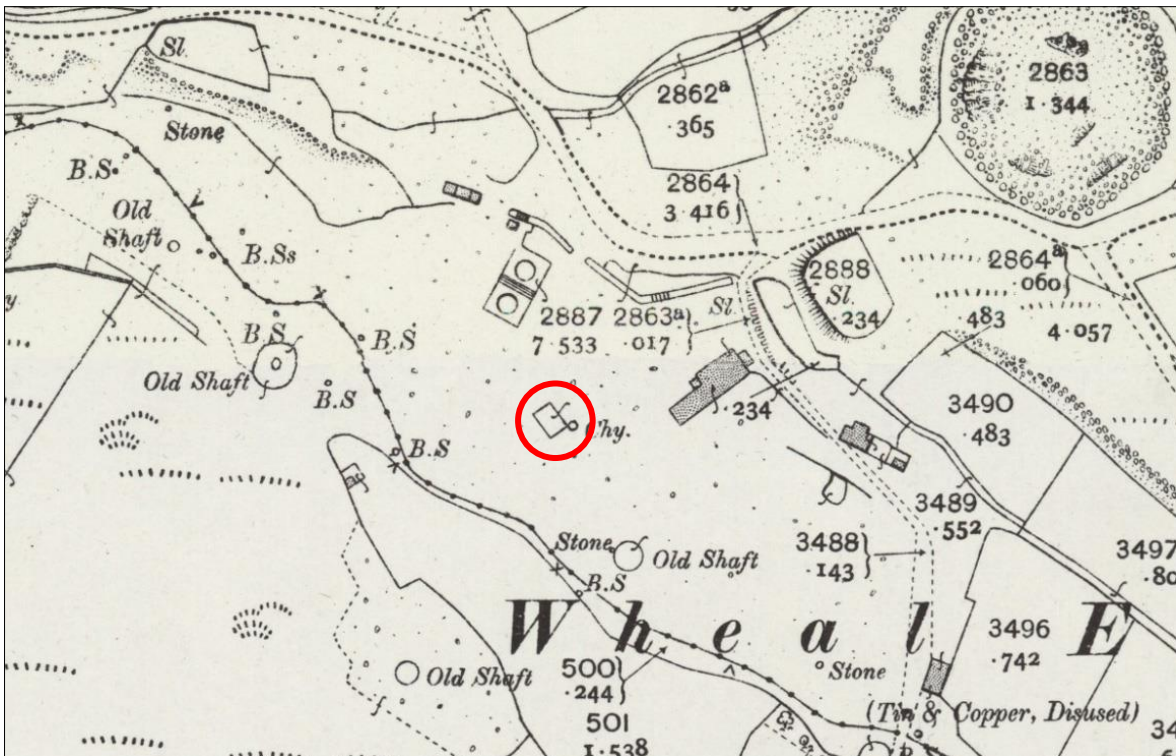


FIGURE 4: EXTRACT FROM THE 2ND EDITION OS 25" MAP (CORNWALL SHEETS LVI.7 & LVI.11) PUBLISHED 1907 (CRO). THE SITE IS INDICATED.

3.0 HISTORIC BUILDING RECORDING

3.1 BUILDING DESCRIPTIONS

3.1.1 BUILDING SUMMARY

19th century engine house of stone rubble build, with granite dressings and brick detailing. The building is rectangular in plan, with a round chimney of stone rubble topped with brick claspings the south-east corner. The building rises three storeys over its cataract pit. The building was constructed to contain a pumping beam engine, but the company folded before one was fitted and no internal fittings or fixtures survive. A key observation for this mine is that only the enginehouse survives – all trace of the boiler house and any other associated buildings has been lost or were never built. The openings would suggest the boiler house would have been on the north-east side. The shaft in front of the engine house has been exposed. This was capped by metal sheeting supported by four substantial timbers (see below).



FIGURE 5: THE NORTH-EAST ELEVATION; FROM THE EAST-NORTH-EAST (NO SCALE).

3.1.2 THE NORTH-EAST ELEVATION

The long north-east flank wall is of three storeys, with three irregularly placed openings, the round chimney shaft bracing the south-east corner. Heavy dressed and faced granite quoins can be seen to the north corner to the bob wall. The base of the elevation exhibits heavier battered stonework, of more irregular build and form and incorporates larger stones; the granite quoins at this level are also more roughly dressed. The stonework c.2m above ground level is less tightly built, in more typically 19th century rubble form. The stonework is graduated, becoming lighter in weight as the wall rises. Patches of the stonework here exhibit a mix of the original mortar pointing, cement repairs and a large area of more recent pointing, providing evidence of ongoing maintenance. There are three openings in this elevation. At internal ground-floor level there is a low doorway with granite reveals and timber lintel; this was the door to the boiler house. There is a small square opening just above this doorway with patched brick reveals and narrow timber lintel; this was for the boiler pipe. On a level with the top of the bob wall is a large sub-square irregular opening with narrow timber lintel and sill and ragged patched reveals; this was the cross-

beam socket. Two, possibly three lines of putlog holes (or perhaps joist sockets for the boiler house?) survive close to ground level. Internally, the same three openings are apparent, together with four lines of joist sockets. The walls steps in twice, once at internal ground-floor height, and again when level with the top of the bob wall. The chimney is round and tapers to the apex, built onto the engine house with straight joins, also of rubble build and tied in to the main building. The top of the chimney is in red brickwork top, with a projecting cornice to the top and crenelations.

3.1.1 THE NORTH-WEST ELEVATION

The front wall facing north-west is the former bob wall, much more substantial in build to withstand the force of the beam. The wall rises to two storeys, with heavy irregular stonework to the base, graduating as it rises to looser set and lighter stonework, all of killas rubble. There are formal quoins to the east and west corners, of dressed and faced granite blocks. There is a double height round-headed doorway (plug door) within the elevation, with granite block reveals and a segmental round-headed quadruple-row brick relieving arch. Above the arch is a single narrow section of timber lacing. This elevation shows evidence of removed ivy and some mortar patching indicative of ongoing maintenance. Internally, there are two square joist sockets, either side of the doorway.

3.1.2 THE SOUTH-WEST ELEVATION

The long south-west flank wall is of three storeys, with four openings and heavy dressed and faced granite quoins to the north and south corners. The stonework c.2m above ground level is less tightly built, in more typically 19th century rubble form. The stonework is graduated, becoming lighter in weight as the wall rises. The stonework of this elevation exhibits the original mortar pointing, with some patches of cement repairs. To internal ground-floor level there are two small rectangular low openings with granite reveals and timber lintels, the southern opening ragged and forced at the base. To the first floor there is a large round-headed window opening, with formalised granite block quoins to the reveals and double-row segmental brick arch. Just above this and to the south is a small square opening with ragged reveals a narrow timber lintel; this is the cross-beam socket. Internally, the same four openings are apparent, together with four lines of joist sockets, and a larger socket with timber lintel above the lower left-hand opening. The walls steps in twice, once at internal ground-floor height, and again when level with the top of the bob wall. Timber lacing is visible in this elevation.

3.1.1 THE SOUTH-EAST ELEVATION

The south-east elevation to the rear is of three storeys, with three centrally positioned openings, one on each floor. The top of the gable has collapsed and has been lost. The elevation is dominated by the large round chimney shaft at its east side. There are heavy dressed and faced granite block quoins on the west corner. The largest opening is to the lower level, a large round-headed arched doorway with segmental quadruple-row brick relieving arch and granite dressed reveals, obscured by dense ivy; this is the cylinder door. Above this, on the first and second floors, there are small square openings with granite block reveals; the middle opening has a narrow timber lintel, the top opening is partly truncated. Internally, the same three openings are apparent, together with a line of four joist sockets below the upper opening. Note that sockets for spring beams are absent. The chimney on its east, south-east side has a small arched opening at its base with segmental double-row brick arch and stone reveals to the sides.



FIGURE 6 (LEFT): THE CHIMNEY WHICH CLASPS THE CORNER OF THE ENGINE HOUSE, FROM THE SOUTH (**NO SCALE**).
FIGURE 7 (RIGHT): INTERIOR FACES OF THE TWO LONG WALLS IN THE ENGINE HOUSE; FROM NORTH AND WEST.



FIGURE 8: THE ENGINE HOUSE AND ITS IMMEDIATE SETTING; VIEWED FROM THE NORTH.

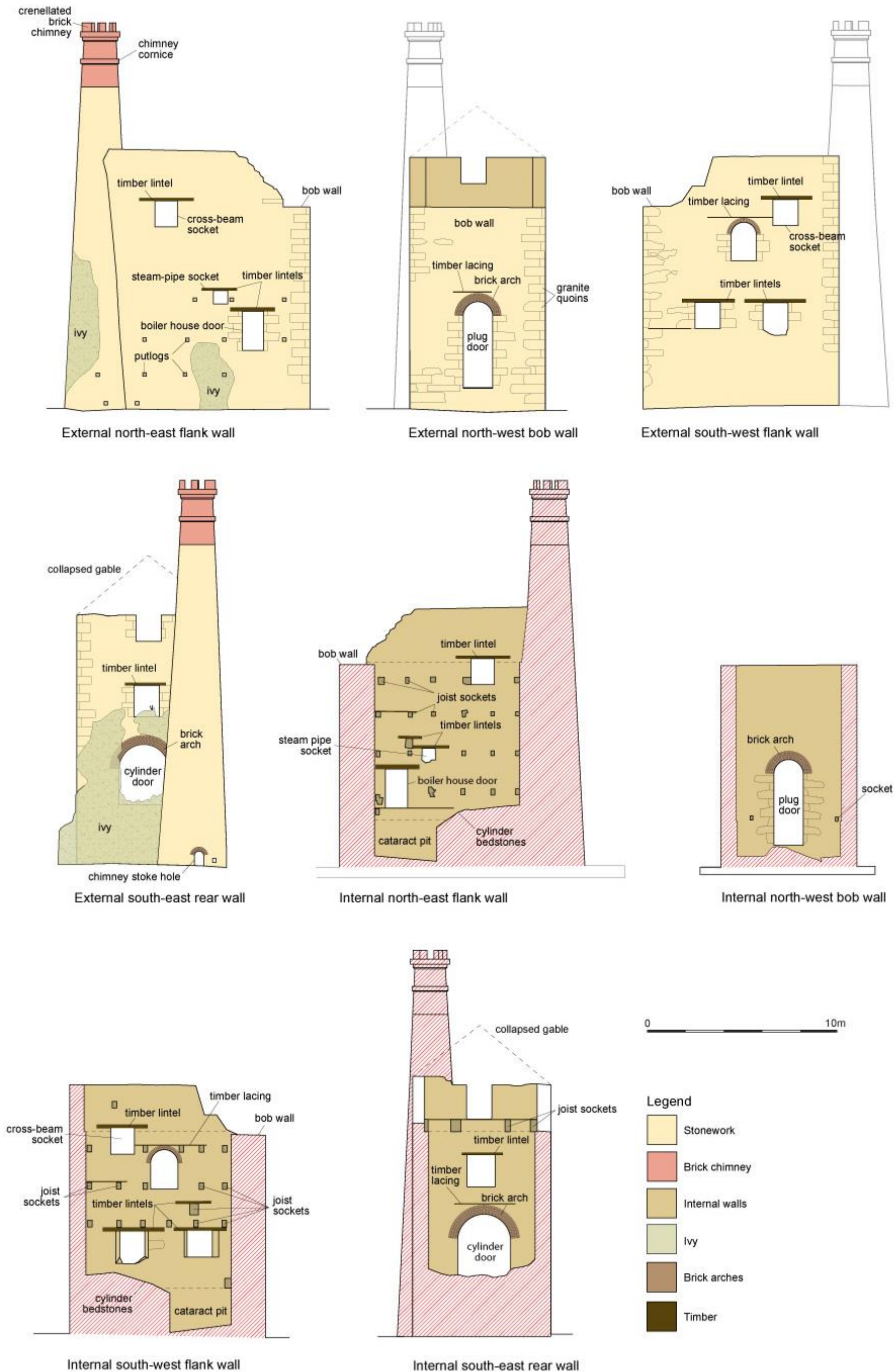


FIGURE 9: ENGINEHOUSE ELEVATIONS (BASED ON ARCHITECT'S DRAWINGS).

3.2 THE SHAFT AND IMMEDIATE SETTING

The main difference between 2017 and 2022 has been the exposure of the shaft that lies in front of the bob wall. A large rectangular hole c.2m wide and c.3m long and at least 30m deep. At the time of the site visit in January, it was full to the brim with water and a high water table was evident elsewhere around the site. During the summer the water may drop as low as 4m below current ground level. Timberwork survives around the head of the shaft. Three of the four timbers which had supported the original capping had been recovered and were recorded. Each one was a substantial sawn timber 0.18-0.2m square and 2.34m, 2.58m, and 3.47m long. The two ends of each timber were cut to fit a half-lap joint. The timbers were in excellent condition, stained orange or greenish-orange by the sulphides in the mine water. One of the timbers still preserved one of the carpenter's pencil marks. These timbers are probably re-used shaft lining.



FIGURE 10: THE THREE TIMBERS RECOVERED FROM THE SHAFT CAPPING (2M SCALES).

The engine house stands in a flat area of ground, with spoil heaps to the south, and wrapping around to the south-west, west and north-west. Some of these spoil heaps appear to have been disturbed, but this occurred before the current owners took possession. There are several uncapped shafts in the immediate vicinity. South-east of the engine house is a possible shaft, swathed in vegetation. South-west of the engine house (adjacent to a telegraph pole) is a third shaft; this currently presents as a shallow circular pool. Three granite marker posts were identified in a line to the south of the engine house; these are likely to be the boundary stones ('BS') marked on the historic OS maps, marking the boundary between St Agnes and Illogan. It is also possible they marked the boundary between mining setts. In either case, their survival *in situ* is fairly rare and noteworthy. Two of the stones had a 'W' carved into one face, with a number ('22') carved beneath. The style of the numbering would suggest a late 18th or early 19th century date.



FIGURE 11: THE UNCAPPED SHAFT IN FRONT OF THE BOB WALL, WITH SCAFFOLDING COVERING IT; VIEWED FROM THE WEST (NO SCALE). THE HIGH WATER TABLE IN THE WINTER IS EVIDENT.



FIGURE 12: THE UNCAPPED SHAFT SOUTH-WEST OF THE ENGINE HOUSE. THE LOCATION OF ONE OF THE BOUNDARY STONES IS INDICATED.



LEFT FIGURE 13: THE EASTERNMOST BOUNDARY STONE, WITH THE ENGINE HOUSE IN THE BACKGROUND; VIEWED FROM THE WEST.
RIGHT FIGURE 14: DETAIL OF THE BOUNDARY STONE NEXT TO THE UNCAPPED SHAFT (FIGURE 11); VIEWED FROM THE WEST.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSIONS

The engine house is a fine example of its type, built in 1866 but never used for its intended purpose. It stands within a valley group with other well-preserved but derelict mining/industrial remains. The form and build of the engine house are key to its historic value, architectural interest and primarily to its visual contribution to the wider group, within the World Heritage site. The engine house was constructed by the Ellen United Copper and Zinc Mining Company (Limited) who went into liquidation the following year. The engine was therefore never installed in this building, leaving its contribution to the mining landscape here as a purely visual one. The building shows signs of forced entries, patching and repairs, so has seen some use, although there are no fittings left to indicate function(s). The survival of the boundary stones is noteworthy.

A careful comparison between the two sets of photographs – those from 2017 and these of 2022 – demonstrates little apparent change to the physical structure over that time. However, there has been a loss of mortar during that time, particularly from the upper walls and stack, and the building does feature some unsympathetic cement mortar repairs. The amount of ivy varies but has, on the whole, increased slightly over the 4 years. One small shrub is growing on the bob wall.

4.1.1 RECOMMENDATIONS

The exposed shaft should be capped sympathetically and covered over. Leaving it open (e.g. open but with a wall and pyramidal metal grid) would threaten the long-term stability of the shaft head, and there is no precedent for this at this location (e.g. issues with authenticity etc.). As the shaft was until recently sealed, and fills to the brim with water in winter, there is no ecological reason (e.g. bats) to retain an opening.

The very well-preserved timbers that were recovered are a result of a sealed environment, and it would be best to replicate this to ensure the preservation of the timbers around the head of the shaft. Left exposed to fluctuating water levels, the exposed timbers will weaken and rot, albeit slowly. As these timbers retain the unconsolidated material above the rockhead, the failure of those timbers will lead to the collapse of the shafthead and potentially – subject to the depth of the foundations – undermine the bob wall.

5.0 Bibliography

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http://www.pastscape.org.uk/hob.aspx?hob_id=427961

Newspapers:

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Cornubian & Redruth Times 23.10.1868

Royal Cornwall Gazette 07.04.1904

Royal Cornwall Gazette 21.05.1908

Royal Cornwall Gazette 17.12.1908

Cornwall Record Office Archives:

Plan late C19 AD798/18

Plan 1856-61 CL/P/574/2/1 crusher and driller houses

Plan 1856-61 CL/P/574/2/2 head gear

Mine report 1892 TL/104/22

Plan sett 1866 W/52

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CAU 1986: *Engine House in St. Agnes, Cornwall 2*. CAU report 1986R014.

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SWARCH 2018: *Wheal Ellen Engine House, Porthtowan, St. Agnes, Cornwall: updated historic building recording and heritage impact assessment*. SWARCH report 170612.

APPENDIX 1: LISTING TEXT

ST AGNES WHEAL ELLEN

SW 74 NW

7/258 Engine house at SW70234698

GV II

Pumping beam engine house at Wheal Ellen Mine, disused. Circa mid C19. Granite and slate killas rubble with granite dressings. Brick to upper part of chimney. Brick arches and timber lintels.

Plan: Rectangular plan engine house with round chimney clasping the rear left-hand corner. No surviving wooden floors, roof structure or machinery.

Exterior: 3 storeys over basement. Unaltered elevations except that rear gable has fallen and front upper corners of the wing walls have been demolished. Front (bob) wall has central round-headed doorway. Rear formerly gable end wall has large round-headed cylinder doorway and window opening to each floor above. Right-hand (nearside) wall has 2 ground floor openings, a central round-headed window opening to the first floor and another opening slightly above and to the right of the windows. Left-hand (offside) wall has small doorway on the right and a small opening to each of the upper floors. The tapered chimney has a brick collar near the top and brick battlements over a brick cornice, at the top. Interior has no machinery.

Source: Sharpe, Adam and Smith, John. Engine Houses in St Agnes Parish. (Cornwall Archaeological Unit survey for Carrick District Council.

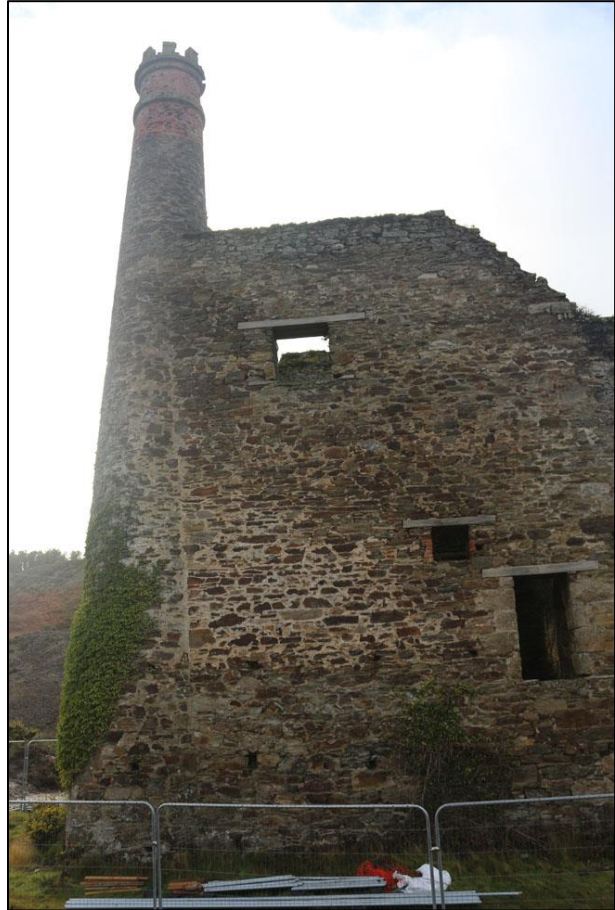
APPENDIX 2: SUPPORTING PHOTOGRAPHS



LEFT: THE NORTH-EAST AND NORTH-WEST ELEVATION; VIEWED FROM THE NORTH (2M SCALE).
RIGHT: THE NORTH-EAST ELEVATION; VIEWED FROM THE NORTH (2M SCALE).



THE LOWER PART OF THE NORTH-EAST ELEVATION; VIEWED FROM THE NORTH-EAST (NO SCALE). NOTE THE PUTLOG HOLES.



LEFT: THE WESTERN PART OF THE NORTH-EAST ELEVATION; VIEWED FROM THE NORTH-EAST (NO SCALE).

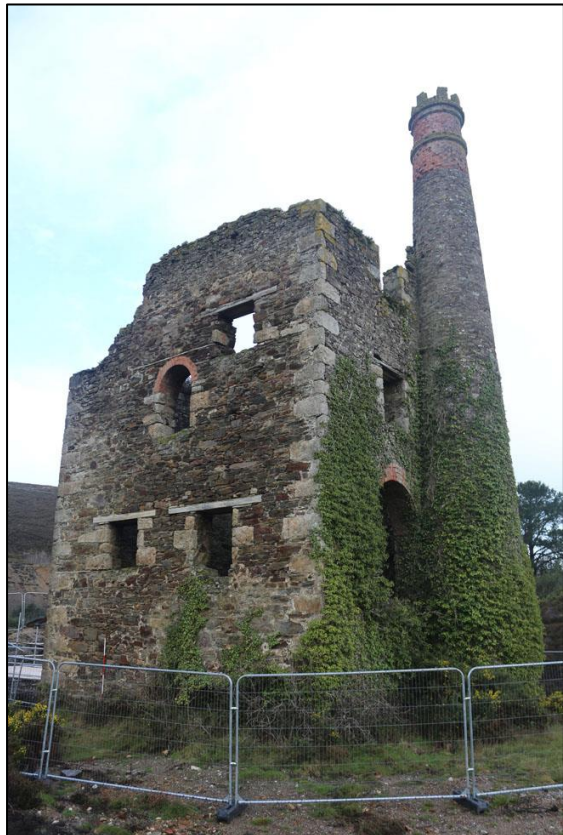
RIGHT: THE EASTERN HALF OF THE NORTH-EAST ELEVATION; VIEWED FROM THE NORTH-EAST (NO SCALE).



THE BASE OF THE CHIMNEY SHOWING THE STOKE HOLE; VIEWED FROM THE SOUTH-EAST (2M SCALE).



LEFT: THE SOUTH-EAST ELEVATION SHOWING THE CYLINDER DOOR; VIEWED FROM THE SOUTH-EAST (NO SCALE).
RIGHT: AS ABOVE, DETAIL OF THE OPENINGS.



LEFT: THE CHIMNEY AND EMBATTLED BRICK TOP; VIEWED FROM THE SSE (NO SCALE).
RIGHT: THE SOUTH-EAST AND SOUTH-WEST ELEVATIONS; VIEWED FROM THE SOUTH (NO SCALE).



THE UPPER PART OF THE SOUTH-WEST ELEVATION; VIEWED FROM THE SOUTH-WEST (NO SCALE).



THE LOWER PART OF THE SOUTH-WEST ELEVATION; VIEWED FROM THE SOUTH-WEST (2M SCALE).



LEFT: THE SOUTH-WEST AND BOB ELEVATIONS; VIEWED FROM THE SSW (NO SCALE).

RIGHT: THE NORTH-WEST ELEVATION (BOB WALL); VIEWED FROM THE NORTH-WEST (NO SCALE).



THE EXPOSED SHAFHEAD OUTSIDE THE BOB WALL; VIEWED FROM THE NORTH-EAST.

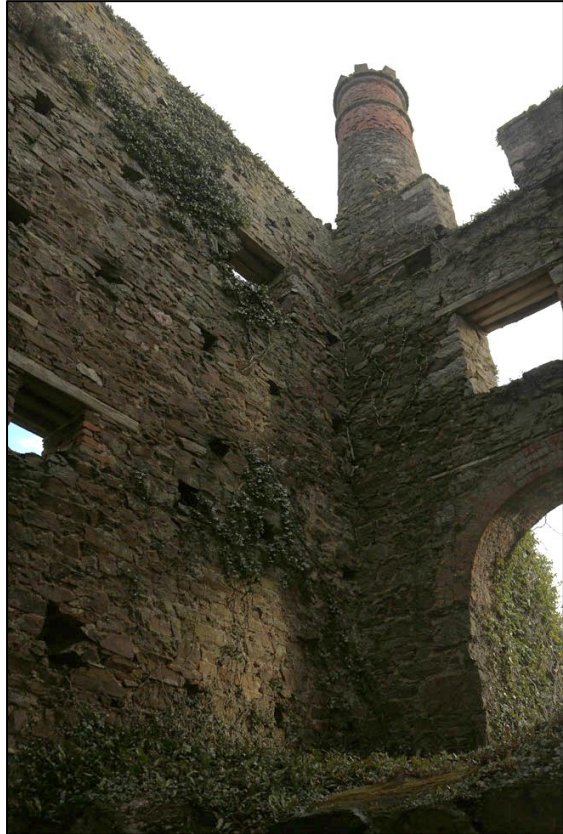


TUMBLER STONE IN THE BASE OF THE CATARACT PIT; VIEWED THROUGH THE PLUG DOOR; VIEWED FROM THE NORTH-WEST (NO SCALE).



LEFT: THE NORTH CORNER OF THE ENGINE HOUSE AND BOILER HOUSE DOOR; VIEWED FROM THE SOUTH (NO SCALE).

RIGHT: THE INTERNAL NORTH-EAST ELEVATION; VIEWED FROM THE SOUTH-WEST (NO SCALE).



LEFT: THE INTERNAL NORTH-EAST ELEVATION; VIEWED FROM THE SOUTH-WEST (NO SCALE).

RIGHT: THE EAST CORNER OF THE ENGINE HOUSE; VIEWED FROM THE WEST (NO SCALE).



LEFT: THE INTERNAL SOUTH-EAST ELEVATION AND CYLINDER DOOR; VIEWED FROM THE SOUTH-WEST (NO SCALE).

RIGHT: THE SOUTH CORNER OF THE ENGINE HOUSE; VIEWED FROM THE WEST (NO SCALE).



LEFT: THE INTERNAL SOUTH WEST ELEVATION; VIEWED FROM THE NORTH (NO SCALE).

RIGHT: THE INTERNAL SOUTH WEST ELEVATION; VIEWED FROM THE NORTH-EAST (NO SCALE).



THE WEST CORNER OF THE ENGINE HOUSE AND PLUG DOOR; VIEWED FROM THE EAST (NO SCALE).



THE ENGINE HOUSE HAS VIEWED ACROSS THE SPOIL HEAPS TO THE WEST; VIEWED FROM THE WEST (NO SCALE).



AS ABOVE.



LEFT: THE SPOIL HEAPS TO THE SOUTH-WEST OF THE ENGINE HOUSE; VIEWED FROM THE WEST (NO SCALE). NOTE THE BOUNDARY STONE.
RIGHT: THE CENTRAL BOUNDARY STONE, WITH THE ENGINE HOUSE IN THE BACKGROUND; VIEWED FROM THE SOUTH-WEST (NO SCALE).



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