

LAND NE OF TRESLOE VEAN

PERRANCOMBE

PERRANPORTH

CORNWALL

Statement of Significance and Heritage Impact Assessment



South West Archaeology Ltd. report no. 200210



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Land NE of Tresloe Veau, Perrancoombe, Perranporth, Cornwall

Statement of Significance and Heritage Impact Assessment

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Work undertaken by SWARCH for Charles Green Design

SUMMARY

This report presents the results of a walkover survey leading to a Statement of Significance and Heritage impact Statement carried out by South West Archaeology Ltd. for land north-east of Tresloe Veau, Perrancoombe, Perranporth, Cornwall, as part of a pre-determination submission in advance of the proposed construction of two detached dwellings.

The proposed site lies within the parish of Perranzabuloe, within a long linear ribbon development known as Perrancoombe on the southern edge of Perranporth. This area fell within the bounds of the sub-manor of Penwartha, held under the Domesday Manor of Tywarnhayle, by the Pentires, Roscarrocks and, from the early 17th century, the Vyvians. In 1840 the site formed one part of a smallholding leased to the corn miller Thomas Michell; in 1840 the field next to Michell's house was called Stamps Plot, but his house was located c.350m to the south of the proposed site.

The proposed site is in the base of the valley just south-east of Treslow Farm. Perrancoombe Lane runs along the foot of the slope on the other side of the valley, just above a pronounced scarp. This appears to be a tinner's scarp which would indicate the base of the valley was streamed for tin during the medieval and post-medieval period. On the site itself there are tips derived from working and reworking alluvial deposits, as well as that derived from two adits driven into the hillside and below the lane. The cartographic evidence, supported by the results of the walkover survey, indicate at least three phases of late 19th century and 20th century industrial use of the site as a small scale streamworks. The surviving remains include parts of two small wheel pits, a stamps box, crib hut and later cement buddles. The survival and legibility of the site, combined with a relative lack of research into comparable small operations, would indicate this site has clear historical and evidential value.

The proposed development – the construction of two large detached dwellings – is likely to have a significant impact on this relict industrial site as Plot02 would be located very close to or on top of the main concentration of visible structural evidence. The impact of the proposed development is correspondingly pronounced. However, both planned structures would be built on piles, with a lower ground floor lifted above current ground levels. Careful design in coordination with an agreed programme of archaeological recording and monitoring should provide suitable mitigation for this development.



February 2020

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1.0 INTRODUCTION

LOCATION:	LAND NORTH-EAST OF TRESLOE VEAN
PARISH:	PERRANZABULOE
COUNTY:	CORNWALL
NGR:	SW 7513 5323
SWARCH REF.	PPPC20
PLANNING REF.	PA18/10894

1.1 PROJECT BACKGROUND

South West Archaeology Ltd. (SWARCH) was commissioned by Charles Green Design (the Agent) to produce a statement of significance and undertake a heritage impact assessment for a plot of waste land north-east of Tresloe Veau, Perrancoombe, Perranporth, Perranzabuloe, Cornwall, in advance of the proposed construction of two detached dwellings. This work was undertaken in accordance with best practice and CIfA guidelines.

1.2 TOPOGRAPHICAL AND GEOLOGICAL BACKGROUND

The proposed site lies within Perrancoombe, a linear extension of the settlement of Perranporth to the north and north-east (Figure 1). The site is in the base of a deep narrow coombe, with steep hillslopes rising on either side to c.90m AOD; the site itself is located at an altitude of c.25m AOD. The soils of this area are recorded as the well-drained fine loamy soils of the Denbigh 1 Association (SSEW 1983) but, given the location of the site and history of mining in the area, they will be very heavily disturbed. These soils overlie alluvium, with silt- and slatestones of the Grampound Formation at depth (BGS 2020).

1.3 HISTORICAL BACKGROUND

The proposed site lies within the parish of Perranzabuloe, within the deep narrow valley known as Perrancoombe. Perranzabuloe lies within the historic Hundred and Deanery of Pydar. The site lies within the extensive Domesday Manor of Tywarnhayle, a 20-hide estate held by St Petroc's in Bodmin and leased by the Count of Mortain in 1086. In 1840 the site formed part of one of many smallholdings owned by Sir R.R. Vyvyan and parcel of the sub-manor Penwartha. This has been held by the Pentire family, passing by marriage to the Roscarrocks and acquired by the Vyvyans in the first half of the 17th century (Lysons 1814). In 1840 the plot was leased by Thomas Michell, a miller.

1.4 ARCHAEOLOGICAL BACKGROUND

No previous surveys or other archaeological work is known to have taken place on the site, but it is recorded on the Cornwall County Council Historic Environment Record (HER) as follows:

HER Number: 41883

Name: PERRAN COOMBE - Post Medieval streamworks (1540 AD to 1900 AD)

Full description: A tin streamworks established along the valley at Perran Coombe is shown on the OS map of 1880. It had been extended by 1907 to include a processing floor with several circular buddles. A chimney is also shown at SW 7525 5336.

1.5 METHODOLOGY

This work was undertaken in accordance with best practice. The walkover survey was undertaken by R. Waterhouse on the 20th January 2020. The heritage impact assessment follows the guidance outlined in: Conservation Principles: policies and guidance for the sustainable management of the historic environment (English Heritage 2008), The Setting of Heritage Assets (Historic England 2015,

revised 2017), Seeing History in the View (English Heritage 2011), Managing Change in the Historic Environment: Setting (Historic Scotland 2015), and with reference to Guidelines for Landscape and Visual Impact Assessment 3rd Edition (Landscape Institute 2013).



FIGURE 1: SITE LOCATION (THE SITE IS INDICATED).

2.0 HERITAGE IMPACT ASSESSMENT

2.1 HERITAGE IMPACT ASSESSMENT - OVERVIEW

The purpose of heritage impact assessment is twofold: understand – insofar as is reasonably practicable and in proportion to the importance of the asset – the significance of a historic building, complex, area, monument or archaeological site (the ‘heritage asset’), and to assess the likely effect of a proposed development on the heritage asset (direct impact) and/or its setting (indirect impact). This methodology employed in this assessment is based on the approach outlined in the relevant DoT guidance (DMRB vol.11; WEBTAG), used in conjunction with the ICOMOS (2011) guidance and the staged approach advocated in *The Setting of Heritage Assets* (GPA3 Historic England 2015). The methodology employed in this assessment can be found in Appendix 1.

2.2 NATIONAL POLICY

General policy and guidance for the conservation of the historic environment are now contained within the *National Planning Policy Framework* (Department for Communities and Local Government 2018). The relevant guidance is reproduced below:

Paragraph 189

In determining applications, local planning authorities should require the applicant to describe the significance of any heritage assets affected, including the contribution made by their setting. The level of detail should be proportionate to the assets’ importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should be consulted, and the heritage assets assessed using appropriate expertise where necessary. Where a site on which a development is proposed includes or has the potential to include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.

Paragraph 190

Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this assessment into account when considering the impact of a proposal on a heritage asset, to avoid or minimise conflict between the heritage asset’s conservation and any aspect of the proposal.

A further key document is the Planning (Listed Buildings and Conservation Areas) Act 1990, in particular section 66(1), which provides *statutory protection* to the setting of Listed buildings:

In considering whether to grant planning permission for development which affects a listed building or its setting, the local planning authority or, as the case may be, the Secretary of State shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses.

2.3 LOCAL POLICY

Policy 24: *Historic Environment* in *The Cornwall Local Plan: Strategic Policies 2010-2030* makes the following statement:

All development proposals should be informed by proportionate historic environment assessments and evaluations... identifying the significance of all heritage assets that would be affected by the

proposals and the nature and degree of any affects and demonstrating how, in order of preference, any harm will be avoided, minimised or mitigated.

Great weight will be given to the conservation of Cornwall's heritage assets... Any harm to the significance of a designated or non-designated heritage asset must be justified... In those exceptional circumstances where harm to any heritage assets can be fully justified, and the development would result in the partial or total loss of the asset and/or its setting, the applicant will be required to secure a programme of recording and analysis of that asset, and archaeological excavation where relevant, and ensure the publication of that record to an appropriate standard in public archive.

2.4 STRUCTURE OF ASSESSMENT – DIRECT AND INDIRECT IMPACTS

This assessment focuses on a single element: the *direct impact* of the proposed development i.e. the physical effect the development may have on heritage assets within, or immediately adjacent to, the development site. Designated heritage assets on or close to a site are a known quantity, understood and addressed via the *design and access statement* and other planning documents. Robust assessment, however, also requires a clear understanding of the value and significance of the *archaeological* potential of a site. This is achieved via the staged process of archaeological investigation detailed in Section 3.0.

3.0 DIRECT IMPACTS

3.1 STRUCTURE OF ASSESSMENT

For the purposes of this assessment, the *direct effect* of a development is taken to be its direct physical effect on the buried archaeological resource. In most instances the effect will be limited to the site itself. However, unlike designated heritage assets the archaeological potential of a site, and the significance of that archaeology, must be quantified by means of a staged programme of archaeological investigation. Sections 3.2-3.5 examines the archaeological background to the site. Appendix 1 details the methodology employed to make this judgement.

3.2 HISTORICAL SUMMARY

Several mining sites are located within or around Perrancoombe. 350m to the north is an east-west openwork on the line of the Main Lode of Perran Great St George Mine, possibly worked for copper by the Company of Mines Royal in the 1580s and certainly for both copper and tin from 1815-60. It also presumably includes later medieval to early post-medieval surface working on the line of the lode (Todd & Laws 1972, 21; 33). This was known in the 19th century as '*Susan Tregay's Droke*' [perhaps drove, for moving animals from the down to the west), when it was described as a gutter, used to carry the water pumped from Devonshire Shaft of that mine down to the stream at Perran Coombe (Hamilton Jenkin's annotated maps). 1km to the north-east, Wheal Leisure was also probably worked for copper by the Company of Mines Royal and for tin and copper in 1829-40 (Todd & Laws 1972, 21; 33-34). Leat 1 on the proposed site (below) carried water to its South Lode workings by 1840.

Wheal Friendship (also known as Wheal Blandford) was located 500m south of the proposed site. This was worked during the 19th century in a small way on two ENE-trending lodes, crossing the valley of Perrancoombe northeast of Anchor hamlet. The northerly lode was tried by two adits on either side of the valley, the southerly lode by a line of surface workings along its strike. Several lines of surface pits on north-south alignments were probably dug in search of the lodes but these cannot now be identified. The nature of the lodes is not known, but they are believed to have been carrying tin and copper ores.

The sett included another small mine, variously known as Treslow Mine or Polglaze Mine, which Dines (1956, 492) suggested was located west of the B3285 road, now under the airfield. He could see no traces of the mine workings left at surface, perhaps unsurprisingly as the pre-1840 farm sites of Treslow and Polglaze Barton are near the bottom of the Perrancoombe valley, 500m east of the B3285, both very close to the proposed site.

It is therefore assumed that this was the mine to which the adit at the proposed site belonged and which the dressing floors served. Although several sources were searched for further references to this relatively unimportant group of mines, little was found, and no dates of working were identified.

3.3 CARTOGRAPHIC SOURCES

The OS surveyor's draft (Figure 2) is the earliest map which shows the site and its surroundings in any detail. It does show the two farms of Treslow (spelled *Trescow*) and Polglaze (*Penglaze*) overlooking the valley, here called *Piran Coombe*. It is very noticeable that the floors of this and other valleys in the vicinity are open, with solid boundaries following their edges. This may suggest that they were common ground for grazing of animals, for tin streaming, or both. No reference to tin streaming is made, and the only mines named are large ones at St George's and Wheal Leisure, to the north and north-east of the site. The stream in the base of the valley is shown to wind an

unusual amount and this could be indicative of past tin streaming activity. The solid boundaries appear to follow late medieval and post-medieval tinner's scarpers where these are known.



FIGURE 2: EXTRACT FROM THE 1810 ORDNANCE SURVEY SURVEYOR'S DRAFT MAP; THE SITE IS INDICATED (BL).

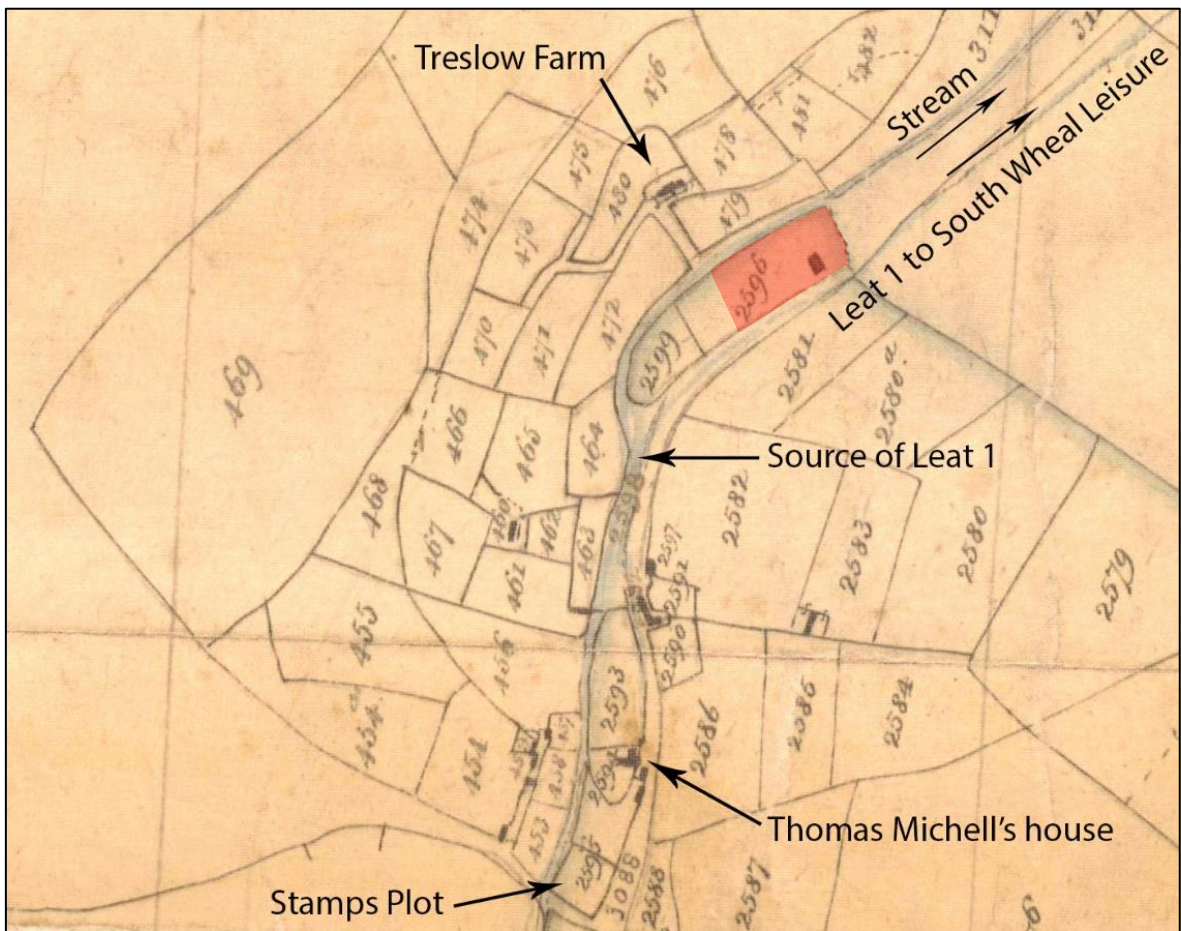


FIGURE 3: EXTRACT FROM THE C.1840 PERRANZABULOUE TITHE MAP; THE SITE IS INDICATED (CRO).

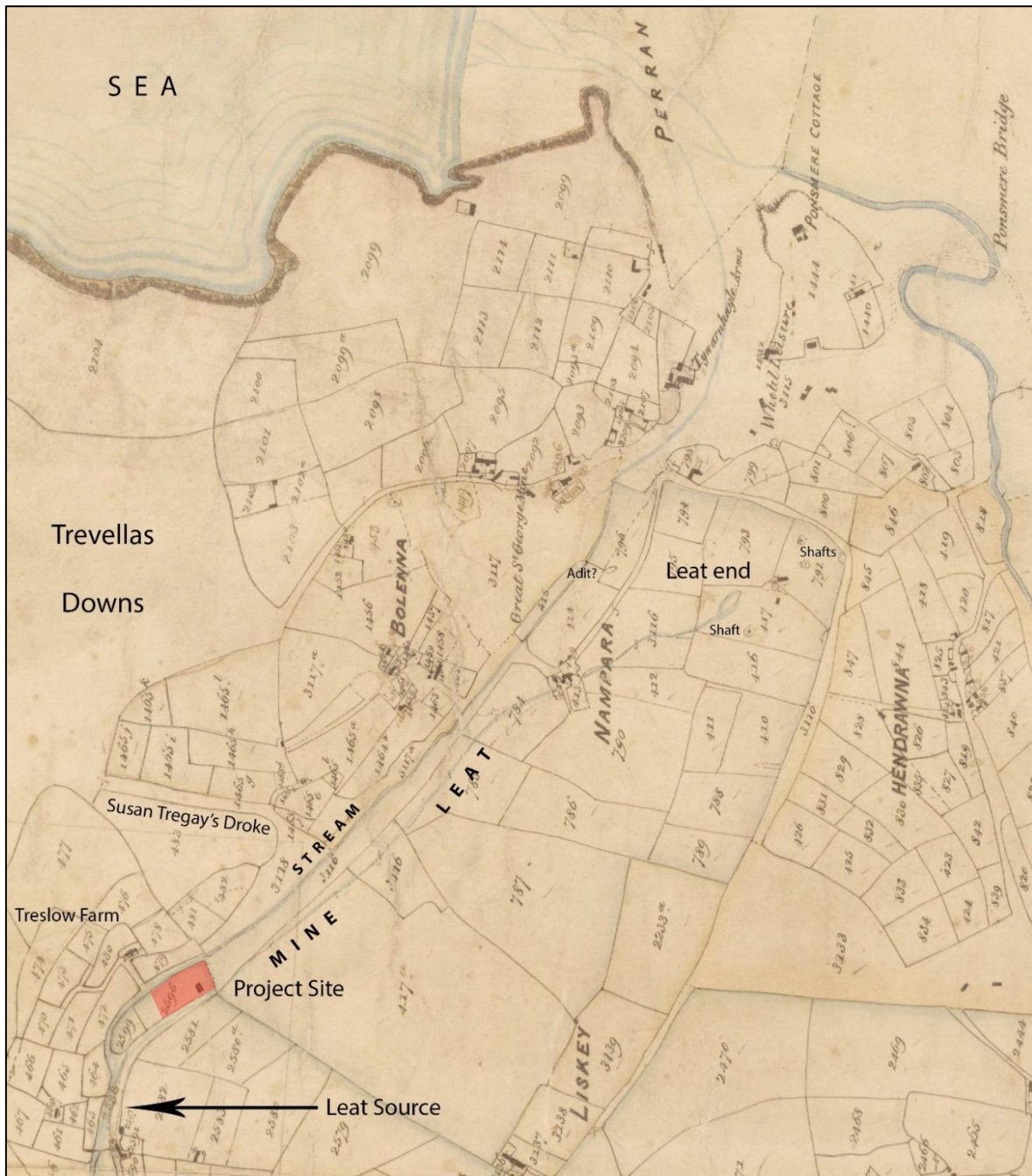


FIGURE 4: LARGER EXTRACT FROM PERRANZABULOE TITHE MAP OF 1840, RE-ALIGNED TO NORTH, SHOWING THE SITE IN RELATION TO AREA SOUTH OF PERRANPORTH, AND COURSE OF LEAT 1 FROM PERRANCOOMBE TO THE SOUTH LODGE OF WHEEL LEISURE.

The Perranzabuloe tithe map (Figures 3-4) is the earliest accurate cartographic source for the site. It will be seen that the valley bottom had begun to be enclosed by this date, although parts, including Plots 3116 3117 and 3118, remained open, the latter including the former openwork known as *Susan Tregay's Droke*. The proposed site had been enclosed: Plots 2596 (*waste*) and 2599 (*orchard*). They were part of a 2½ acre tenanted holding entirely on the valley floor, rented from Sir R.R. Vyvyan by Thomas Michell, a corn miller.

The only structure shown on Plot 2596 is a rectangular building aligned north-west to south-east. It is not known what this was, but it was not described as a dwelling so must have been agricultural or industrial (Building 0). A solid boundary to the road is shown which may represent the retaining wall which can be seen today. These two plots were part of a smallholding, the other part of which

comprised a cottage further south, adjoining another patch of waste called *Stamps Plot*, implying that a tin stamping mill was on or close to it.

In addition to the stream that runs along the valley at its lowest level, an artificial water channel (Leat 1) is shown running along the outer edge of the lane to the south-west of the site and crossing the road immediately to the east. This leat appears to have fed a large reservoir east of Nampara on Wheal Leisure's South Lode. The north-eastern dressing floor in Plot 3116 (see the 1879 & 1880 maps below) is not shown at all, so may not have been present at this date, although it should be noted that tithe maps seldom showed industrial sites in any detail.

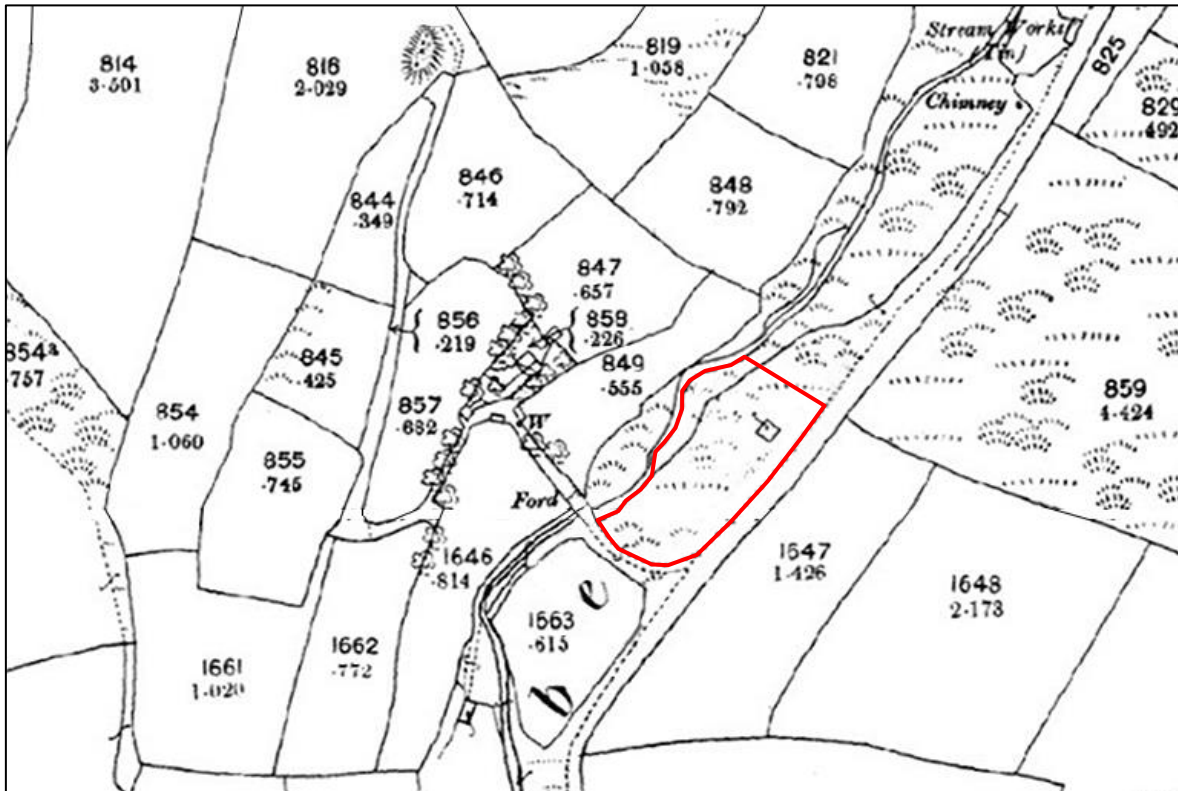


FIGURE 5: EXTRACT FROM THE ORDNANCE SURVEY 25 INCH MAP, SURVEYED 1878, PUBLISHED C.1880 (CORNWALL SHEETS XLVIII.5 AND XLVIII.9); THE SITE IS INDICATED.

The 1st edition OS map (Figure 5) shows the site as waste and open to the road. The structure shown on the tithe map survives, but the fact it is joined by a ligature to the field could imply it was roofless. Some distance to the north-east an area bears the legend *Stream Works (Tin)*, and a leat (Leat 2) supplying this site runs across the proposed site.

The 2nd edition OS map (Figure 6) shows several features on the proposed site, indicating that a small but busy dressing floor had been developed there at some point over the course of the preceding 28 years. Building 0 has disappeared, with a new smaller building (Building 1) tucked in under the road. Sluices on Leat 1 to the south-east of the road controlled the feeds to two water wheel pits on the valley floor below, parallel to each other and about 24m apart, at right-angles to the road. A small wet dressing floor between them had two large circular buddles on a north-west to south-east axis, off-centre on the floor and closer to the south-western wheel pit (WP2). A pair of small circular settling pits on the same alignment to the south-west of the northern buddle is on the same axis as an extant stamps box (see below) and were presumably fed by slimes (water with crushed tin ore in suspension) from it. Another pair of pits on a north-south alignment just north of Building 1, are clearly associated with the north-eastern wheel pit (WP1) and clearly imply that it had stamps on its south-west side. Presumably the two sets of stamps had the use of a large buddle apiece. The western tailrace discharged northwards into the earlier Leat 2; the eastern race

bent sharp right, joining Leat 2 further down, within the present garden to the north-east. On the lower dressing floors (beyond site to the north-east), another water wheel appears to be shown at right angles to the river, with a possible buddle alongside it. This was evidently a second wet dressing floor, possibly but not definitely related to that on the proposed site.

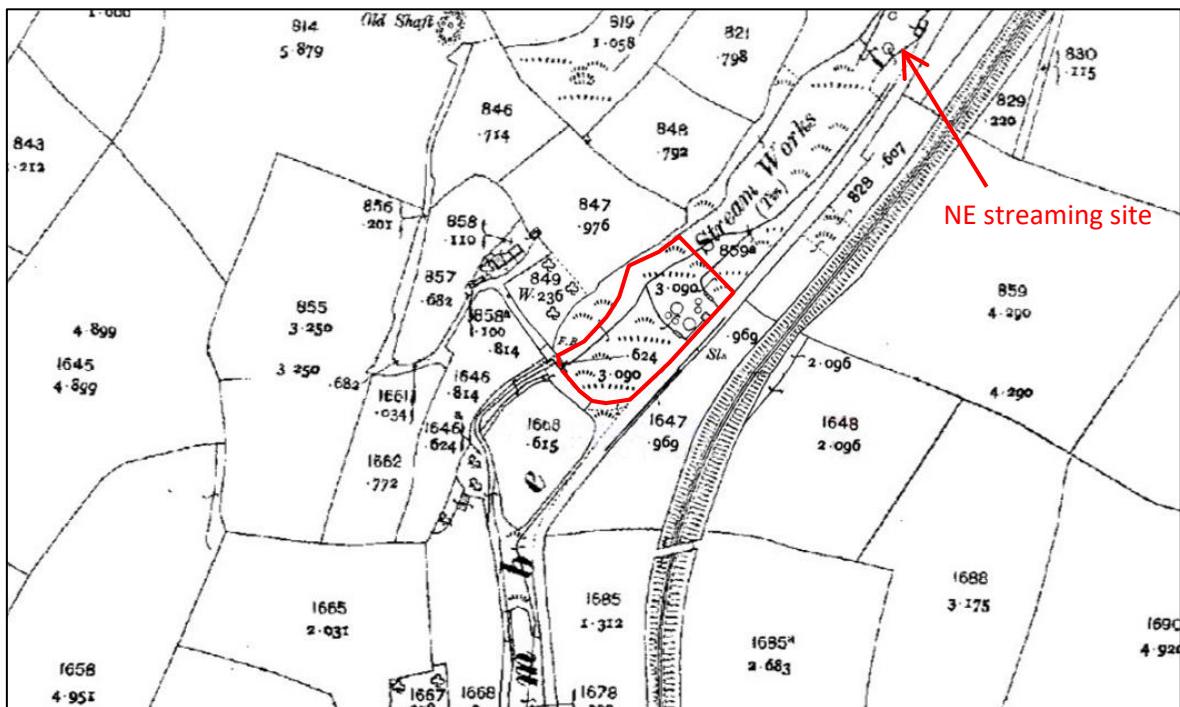


FIGURE 6: EXTRACT FROM THE ORDNANCE SURVEY 25 INCH MAP, SURVEYED C.1906, PUBLISHED C.1907 (CORNWALL SHEETS XLVIII.5 AND XLVIII.9); THE SITE IS INDICATED. NOTE BUDDLES, SLIMES PITS AND WATER WHEELS AT BOTH SITES.

The 1935 OS 3rd revision map (not illustrated) still bears the legend *Tin Streamworks* but only one buddle is shown between the two wheel-pit positions on the proposed site. Although the north-eastern wheel is shown, its settling pits are not, and only one buddle is marked. The arrangement of the two settling pits clearly shows that they were fed by the currently extant stamps box; the water wheel also presumably driving the buddle, whose slimes may have been mixed up manually with water to pour onto it. Building 1 is still shown as a roofed structure.

Note: the house beyond the south-western end of the proposed site (Tresloe Veau) is not marked on the 1879/1880 or the 1907/1908 maps. This is surprising as it appears pre-1900 in character.

3.4 WALKOVER SURVEY AND INTERPRETATION

Two adjacent areas of earthworks lie on a roughly level terrace on a south-west to north-east alignment occupying the valley floor between the present stream bed on the north and an abrupt scarp up to Perrancoombe Lane to the south. They appear to respect, and be laid out between, two adits driven into the steeply sloping valley side to the south-east, although only one of these is known from historical sources. Features common to both areas are considered first.

3.4.1 ANCIENT TIN STREAMING

A consistent feature of both areas is the abrupt and significant change in level between them and Perrancoombe Lane, which runs on a terrace in the valley side three to five metres above the valley floor. This is highly suggestive of a tinner's scarp, typically present on the edges of valley floors which have been streamed for tin, dating to the 12th and 17th centuries in tin-bearing areas of Cornwall and Devon (Gerrard 2000).

Such artificial scarps were produced by digging back the alluvial deposits on a valley floor, washing them in fast-flowing water through artificial curving or winding channels, and collecting tin-bearing stones where gravity deposited them on the insides of the bends. Where the retaining wall to the north-east of B1 has collapsed, the soil behind can be seen, showing it to be a fine yellow clayey but firm material with occasional small stones. This appears to be natural periglacial head, rather than made-up ground, so confirming that the road is on a terrace cut into natural deposits in the hillside, not on an artificial embankment.

Evidence for curving banks of streaming debris common to such valley bottoms are suggested in Figure 7 by the two, perhaps three linear dumps of stony material D1-D3, which angle across the site with gullies between them, a second one on the western edge of the wet dressing floor F3, and the substantial dump of material to its north-west around which the stream has to wind. The behaviour of the three tailraces from the later 19th century water wheel pits WP1, WP2 and the 20th century water turbine housing follow this trend which would imply they followed similar channels and linear dumps, but which are not as evident today.

3.4.2 LEATS

A second feature of both areas are two leats (identified on Figure 7 as L1 and L2).

Leat 1 is of unknown date but was in existence by 1840: the tithe map (Figures 3-4) showing that it took its water from the Perrancoombe Stream about 100m to the south-west of the proposed site. It then followed the south-eastern side of Perrancoombe for about 1km to the South Lode of Wheal Leisure on the hilltop to the south-east of Perranporth town. Where it passed the proposed site, it ran along the south-east side of Perrancoombe Lane, where it survives today as a stormwater drain. It ran beneath the road just east of the site and passed through fields towards Wheal Leisure, but this part seems to have been abandoned, probably when that mine closed in the middle of the 19th century. From the establishment of the dressing floors on the proposed site in the 1880s up to its likely closure in the 1930s, *Leat 1* provided water for the wet dressing floor, its two waterwheels and later the water turbine.

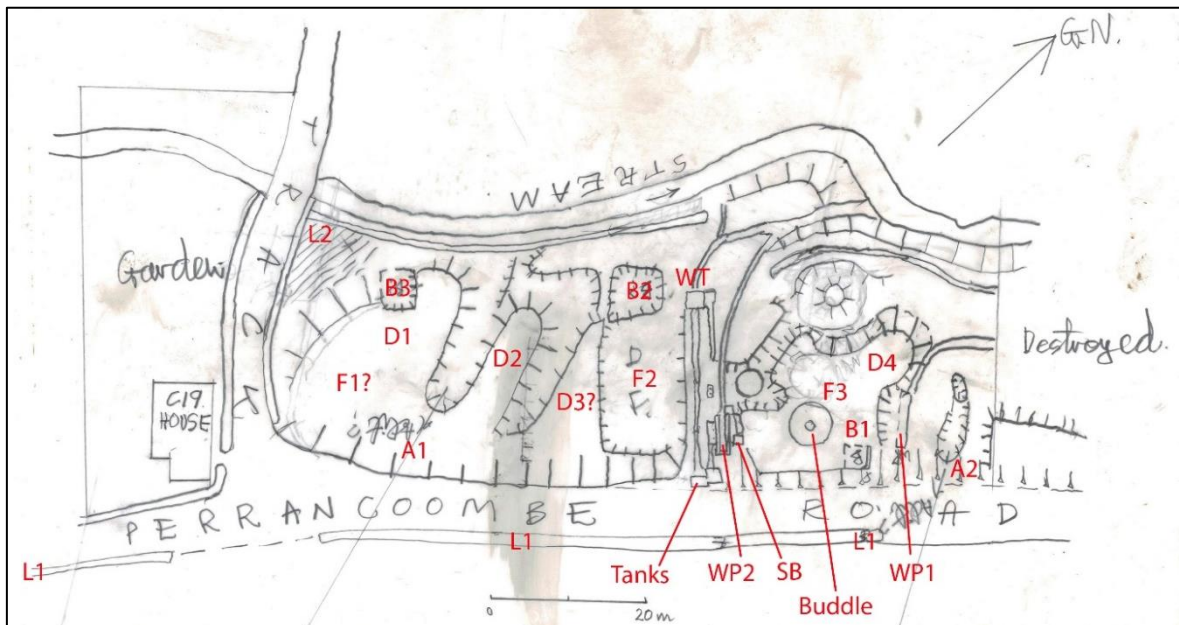


FIGURE 7: SKETCH PLAN OF THE GENERAL LAYOUT OF THE SITE.

Leat 2 is first shown on the 1879 OS map (Figure 5) and served a second dressing floor with similarities to that on the proposed site at the north-eastern end of the Perrancoombe Court, 110m to the north-east. Its dry channel can still be observed in two lengths close to the stream on the north-western edge of the proposed site. *Leat 2* obtained its water from the stream about 50m

upstream of the point the track to Treslow Farm crosses it. It is likely that it was culverted under the track but then ran in an embanked channel about 1.5m-2m above the stream, only moving away from it when it passed into the present garden to the north-east of the proposed site, where it has been levelled. The channel of this leat is cut both by the tailrace from Wheel Pit 2 and from the 1920s-30s turbine shed, indicating that the downstream dressing floor which it served (sited c.110m north-east of the proposed site) was abandoned before the final phase of the latter's period of working. This is supported by map evidence (see above).

3.4.3 SOUTH-WESTERN PART OF SITE

About two-thirds of the site at its south-western end is occupied by two, perhaps originally three parallel dumps of rubble material (D1-D3) on an approximately NNW to SSE alignment with shallow gullies between them. The western dump D1 is broader and spread out; it is possible that its level crest F1 was later used as a hand-dressing floor. A shallow sub-rectangular depression may represent a small building B3 which appears to have been cut at a later date into the northern edge of the dump. It is unclear whether these dumps represent material dug out of adit A1, whose portal was in their vicinity, or are older banks of streambed material. The western of the two parallel gullies is deeper and longer; it is possible that it represents the approach cutting to adit A1. The site of the adit portal cannot be precisely located as garden waste has been dumped over the area from the road to the south.

The eastern gully is shorter and shallower, a narrow but there is a prominent finger dump D2 lying between the two. The original shape of the eastern dump D3 is unknown as it was subsequently truncated by a large rectangular dressing floor, 18m long by at least 10m wide, cut into its eastern flank at right angles to the road. At its north-west end, a shallow sub-rectangular depression may represent the site of another building B3.

All three dumps and the possible dressing floor and buildings respect a shallow leat L2 which runs along the northern edge of the site, appearing from beneath the track to the west of the site. The leat was apparently truncated by the tailrace gully from Wheel Pit 1.

3.4.4 NORTH-EASTERN PART OF SITE

This represents one-third of the proposed site but is much more complex: a mass of gullies, pits, dumps and depressions representing the late 19th century wet dressing floor and the tailraces from its two water wheel pits. These features terminated abruptly at the property boundary, and if they did originally extend into that garden then they have been mechanically levelled. Leat 2 fed these structures with water for dressing and power via culverts or pipes beneath the road surface from its course on the south-eastern side of the road.

A short and narrow gully cuts into the scarp below the road just south-west of the property boundary. This may be the approach cutting of a second adit, designated A2, although the minerals survey for the site did not note it (Cornwall Consultants, 2018). Any *in situ* waste material associated with Adit 2 has been removed by later activity, with the tailrace of Wheel Pit 2 cutting across its former position. However, it may survive in part as an amorphous mound D4, standing up to 1.80m high, 10m to the north-west; this was later modified to form a wet dressing floor between Wheel Pits 1 and 2. A 30m length of Leat 2 survives as an earthwork along the northern edge of the site here, disappearing as it passes into the adjoining property to the north-east.

The late 19th century wet dressing floor F3 is a sub-rectangular area flanked by two wheel-pits at right angles to the road and backed by a high rubble retaining wall cut into the tinner's scarp parallel with the road to the south. This retaining wall is built of drystone rubble, some of which is pitched in the style of a hedgebank. At its east end are the remains (two walls) of a small square structure B1 of semi-coursed mortared slatestone; the retaining wall appears to have continued beyond it to

the north-east but has since collapsed. This structure had a monopitch roof and a fireplace in its angled eastern corner and is interpreted as a crib hut.

Wheel Pit 1 lay between B1 and Adit 2 and appears to be cut into dump D4; however, it has been largely infilled and latterly further obscured by tree brash from the trimming of the large Monterey Pine on the adjoining property. Part of its rear end and north-east side walls survive showing it to have been c.1.20m wide and c.4.50m long; a possible vertical conduit for a fixing-down bolt can be seen in the side wall. No trace of a stamps box or any other flanking features was observed, but this area is very overgrown, and these features may be present.

Wheel Pit 2 is much better preserved, measuring 6.10m long and 1m wide, narrowing to 0.92m wide at its rear end. It is open to its outer end, but the masonry rear end is curved to respect the wheel, whose original diameter was about 18ft 6in by 2ft 6in breast. The lower third of WP1 is infilled with rubble but lying at the surface of this is the fractured but largely complete cast iron axle of a water wheel. The south-west side wall survives almost to its full height and is 0.58m thick. It contains two vertical conduits for fixing-down bolts relating to the 18ft 6in wheel, but has at a perhaps later date contained a much smaller wheel, whose shrouds have rubbed and scored the masonry in two areas; from these grooves we can calculate a wheel with a diameter of 10ft 6in. The north-east side wall was 0.70m thick, indicating that this was the drive side. A possible bolt conduit here is not in line with the opposite pair, suggesting that there were four vertical fixing bolts along this side. Spots of tar on cement can be seen on the wall above but these may relate to the last use of the site when the wall was truncated down to about a metre below the opposite side.



FIGURE 8: WHEEL PIT 2, GENERAL VIEW FROM NORTH-WEST WITH 1920s-30s CONCRETE STAND FOR DRIVE-SHAFT IN FRONT OF LATE 19TH CENTURY MASONRY PIT. PERRANCOOMBE LANE RUNS ALONG THE TERRACE BEHIND.

On the north-east side of WP2 is a rare survival: a partially intact two-stamp stamps box (marked SB on Figure 7). The box is 0.57m wide by 0.38m wide and it stands about 0.6m high. The surviving remains clearly show complex construction, with four wrought iron uprights supporting planked sides (remnants of the timber elements survive). The front or throat plate is of cast iron, and internally there are the remains of wrought iron plates to either end. One end is of complex construction, with a mix of wrought and cast-iron parts. The cast iron throat plate of the stamps box has been smashed but it still bears the casting *CARN BREA*, the casting mark of Bartle's Basset Foundry at Pool (near Carn Brea). This foundry started work in 1860 and was taken over by Holman's

of Camborne in 1951. As Cornish stamps were generally superseded by revolving Californian stamps by the end of the 19th century it would suggest that this set predates 1900; however, it was probably acquired second-hand. Two-stamp mills were fairly unusual as four or six heads were more common for small-scale operations. Another oddity of this stamps box is its position. As drive shafts were usually placed *behind* the stamps box it cannot have been driven directly by either of the two wheels known to have been placed in the pit. This would imply some form of gearing was used to transfer power from the wheel. It seems most unlikely that the small wheel which had rubbed the pit side drove the stamps as it would have been too small, so presumably the original 18ft 6in wheel drove them.



FIGURE 9: STAMPS BOX AT FOOT OF ORE CHUTE FROM ROAD, WITH WP1 TO RIGHT AND DF3 TO LEFT. VIEWED FROM THE NORTH-WEST (SCALE 1M & 0.5M).

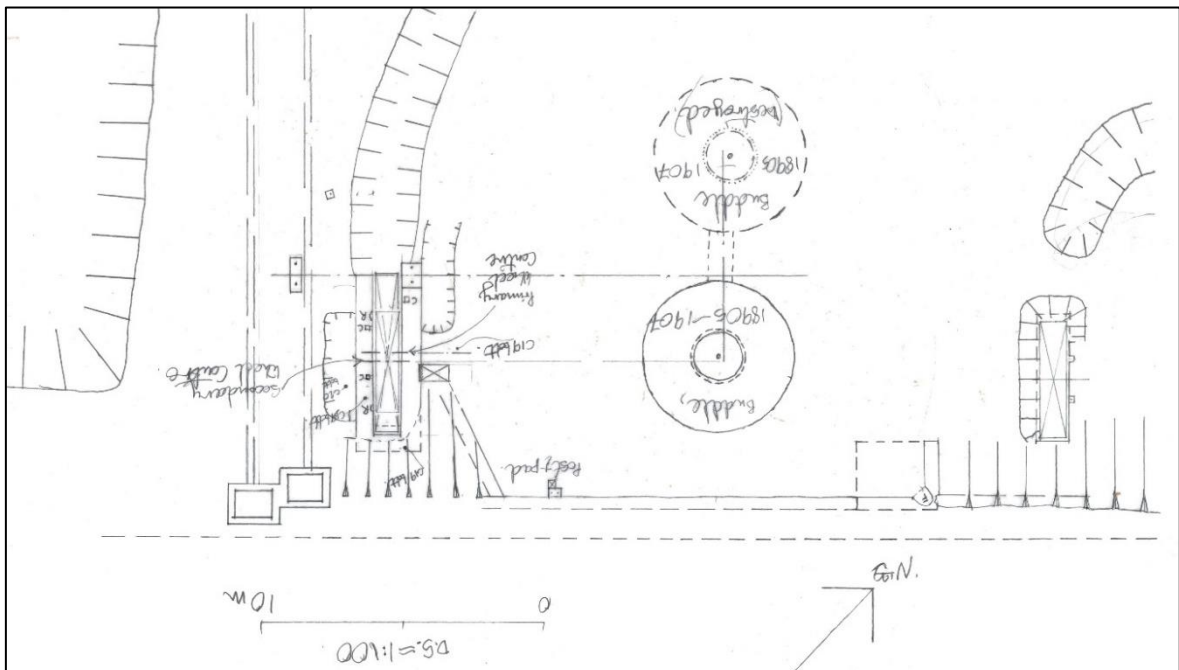


FIGURE 10: SKETCH PLAN OF WET DRESSING FLOOR DF3, WHEEL PITS 1 & 2 AND CRIB HUT B1.

The angled wing-wall projecting from the south-west end of the older retaining wall clearly formed one side of a structure supporting a funnel-shaped timber chute down which tin ore was cast from a barrow-way along the roadside. The iron fixing on the opposite side behind the wheel pit presumably held the opposing edge of this chute, whose approximately 45-degree angle is preserved in the sloping scarp here. This would indicate the chute was 2m wide at its upper end, rapidly narrowing to 0.57m at its lower end where it fed the stamps.

3.4.5 FINAL PHASE STRUCTURES

These are located at the south-western edge of the wet dressing floor F3 and represent the last phase of use. They comprise a number of structures built of cast concrete, concrete block and cement render, and as such, are presumed to date from the 1920s to 1930s. They seem to relate to a refurbishment of the southern of the two large circular buddles, driven by a raised driveshaft in bearings on a pair of cast concrete stands, across the tail of WP2. It is presumed that the stamps remained in operation at this time, perhaps driven from the 10ft 6in water wheel in WP2, or via belting from the driveshaft to their north-west.



FIGURE 11: VIEW ACROSS WET DRESSING FLOOR DF3, WITH B1 TO RIGHT AND 1920s-30s BUDDLE IN LEFT FOREGROUND; VIEWED FROM THE SOUTH (SCALES 2M AND 1M).

The power source for the buddle appears to have been a small water turbine (probably a variety of Pelton wheel) housed in a small engine-shed of breeze-block construction, 30m to the north-west (WT on Figure 7). This was fed by a sloping pipe, since removed, which carried water from one of two adjoining concrete tanks beside the road to the south-east. These tanks were fed by a pipe across the road from Leat 1. A pipe ran down to the engine shed, and a drive-belt from a pit beside the shed ran back up to the driveshaft serving the buddle; these survive as parallel gullies.

A second pipe from the tanks was presumably directed to the stamps and buddle, but if so, it only survives in the form of the stump of a timber post located next to the retaining wall to the east. The 1935 OS map indicates that B1 was still roofed during this period, and indeed remained roofed long after the abandonment of the site. No trace of roofing materials or timber walling was observed during the walkover survey.

The absence of the water turbine, its drive shaft and the buddle machinery, the stamps and their driving drum, and the shrouds and hubs of the water wheel would indicate the machinery was scrapped at or after the abandonment of the site. It is likely that this was carried out by hand: the broken water wheel axle in WP2 and the partly smashed cast iron throatplate of the stamps box would suggest that a sledgehammer was employed, with the parts that put up the greatest resistance being left on site.

3.5 PROVISIONAL PHASING

The phasing below is conjectural and is based on the relationships between the earthworks and structures observed on site. The lack of documentation and the overgrown character of the site makes this phasing more tentative than usual.

3.5.1 PHASE 1 – MEDIEVAL TO POST-MEDIEVAL

A tinner's scarp runs along the south-east side of the proposed site and can be seen to extend for some distance in both directions, following the outer edge of the road. This is a classic feature of valleys streamed for tin in the later medieval and early post-medieval periods. The two angled gullies between Dumps 1-3 at the south-western end of the site, and the curved leat/tailrace alignments north of the wet dressing floor at the eastern end of the site, could potentially be evidence of streaming activity. An accurate survey would more readily be able to address this theory. It is to be noted that the later 19th and early 20th century activity on the site is recorded on the OS maps as *Streamworks* although there seems to be no indication of such activity at that date and it appears that the description was being inaccurately applied to dressing floors where stamping, settling and buddling was carried out instead. Tin processing was always a feature of valley bottom sites, but it grew in importance as underground mining grew became more prominent, typically from the 17th century onwards.

3.5.2 PHASE 2 – EARLY-MID 19TH CENTURY

The evidence of the 1840 tithe map and the 1879-80 OS maps shows that B0 was in existence by 1840 (on Plot 2596). It clearly suggests that some form of industrial activity was occurring on the site by 1840, but the absence of any other structures on the tithe map makes it very uncertain what this was. Although the historic maps give no indication that the proposed site was anything other than scrub-covered waste ground during this period (listed as *waste* in the tithe apportionment), it should be noted that the tithe apportionment records that the tenant Thomas Michell also held *Stamps Plot* (Plot 2595) located 100m down Perrancoombe Lane to the south-west. The southern area that comprised *Stamps Plot* and Michell's house survives; *Stamps Plot* now forms the lawned garden south-west of the house.

Thomas Michell appears in the 1841 and 1851 Census as a *miller*, and his son Samuel appears on Censuses up to 1891 variously as *miller*, *flour merchant* or *corn merchant*. As no corn mill is associated with Thomas Michell in the apportionment it is presumed that the mill was elsewhere. It is probable, therefore, that the two pieces of waste ground in Perrancoombe were sublet by Michell to tanners in 1840 and perhaps by his son later in the century

3.5.3 PHASE 3 – c.1880-1907

Most of the tin dressing structures on the site are considered to date to this phase. The earliest of these are characterised by mortared masonry which tended to be superseded by concrete and cement after c.1900 but sometimes earlier.

B0 had been replaced by B1; the south-east side wall of B1 appears to have been cut into the earlier retaining wall, so it is clearly secondary. The presence of a fireplace in its east corner shows that it was designed as a shelter for workers on the site to make tea or heat their lunches, known in Cornwall as a crib hut.

It is suggested that Wheel Pits 1 and 2, and therefore the wet dressing floor between them, were probably built at the beginning of this period, i.e. c.1880-1900. Little can be reconstructed of the arrangements for the machinery in WP1, although its wheel appears to have been a little larger than that in WP2. The presence of two sets of settling pits and two buddles on the wet dressing floor suggests that both wheels drove stamps, but perhaps that the bigger north-eastern wheel had a correspondingly larger battery.

Vertical conduits for fixing down bolts in the sides of masonry wheel pits is a technique recorded back to the 1840s on mine sites in Devon and Cornwall, but there is no evidence that this method of integrating water wheels with their pits to control operational stresses was used on new wheel pits after c.1900. The cast iron water wheel axle with continuous external projections, engaging with slots in the hubs, is common to later 19th century stamps wheels in Western Cornwall; the example from Nancledra now on display at Geevor Mine in St Just being of this form.

3.5.4 PHASE 4 – 1907-c.1939

There may be more than one sub-phase in this period. It is evident from the wear marks in Wheel Pit 2 that a smaller wheel of 10ft 6in diameter was present in the pit after the original 18ft 6in wheel was removed. This may have driven the buddles as they often used small diameter wheels.

The final phase of work on the site saw the abandonment of WP1, the removal of its wheel and stamps battery, the infilling of its two settling pits and the removal of the north-western buddle. It is probable that the wheel in WP2 was abandoned, though perhaps not removed, with a new water turbine being installed in a new concrete blockwork shed to its north-west and driven by water from the old leat at road level via a long sloping pipe. This seems to have driven the remaining buddle via a belt-drive and long driveshaft on concrete piers, across the north-west end of the old wheel pit. It is possible that an additional belt drive was taken off the driveshaft to power the old stamps battery. The buddle was refurbished with a Portland cement lining. B1 was retained as a crib hut.

It should be borne in mind that mining and dressing sites of this period were often partially covered with lightweight timber structures, generally roofed with corrugated iron sheeting. Evidence for this is shown by the large concrete support pier for the driveshaft, on which impressions of timber and corrugated iron shuttering can still be seen.

3.5.5 PHASE 5 - MODERN, c.1939-1960s

It is likely that tin dressing ceased here at the onset of the Second World War, perhaps due to labour shortages and rationing. Falling tin prices in the post-war period, coupled with significant poverty levels, meant that even small-scale tin dressing became unprofitable. Many sites like this one are known to have entered an extended period of dereliction and partial scrapping, though there are occasional examples of tin processing sites surviving as shoestring operations as late as the 1960s. The last of these at Tolgus near Portreath finally closed in 1970 and has since been preserved as part of a visitor attraction. The 1976 OS map shows nothing but scrub woodland on the proposed site.

3.6 STATEMENT OF SIGNIFICANCE AND IMPACT SUMMARY

The direct *effect* of the development would be the disturbance or destruction of archaeological features or deposits present within the footprint of the two proposed detached dwellings; the *impact* of the development depends on the presence and significance of archaeological features and deposits.

3.6.1 STATEMENT OF SIGNIFICANCE

In terms of the *conservation values* of the proposed site, the site does not have *communal* value and has some limited *aesthetic* value as a ruined and overgrown industrial site. The significance of the site lies in its *historical* value as an example of a multi-phase tin prospecting and tin processing site, and the *evidential* and archaeological value of the remains that survive on site.

The site clearly contains the remains of three phases of tin processing (processing floors, wheel pits, buddles, possible structures) associated with deep rock mining and the reworking of earlier deposits, overlaid on an earlier phase of tin streaming. While this represents a complex narrative, it is one likely to have been commonplace throughout the metalliferous regions of Cornwall. In a purely local context, development along the base of the valley has already destroyed or damaged other, similar sites here, and the survival of this site enhancing its significance. There will be other, similar complexes in Cornwall, but outside of the WHS they will be a diminishing resource.

This site has been neglected and ignored since it was abandoned in the mid-20th century and this has ensured the survival and legibility of the remains that are visible here; this legibility also enhances its significance. Lastly, the site is overgrown and elements have been infilled (e.g. Wheel Pit 1) or otherwise concealed (e.g. adit portals); while the walkover survey was reasonably thorough, other structural remains and, in particular, buried archaeological deposits, will be present across the site. Based on what could be observed in the field, the north-eastern part of the site is the most sensitive and contains the most complex visible archaeological remains.

Small-scale tin dressing sites, and later 19th century machinery with evidence for post-1900 concrete structures driven by a modern power, have been highlighted as categories both poorly understood and in need of further research (*Research Framework for the Extractive Industries*; Newman 2016).

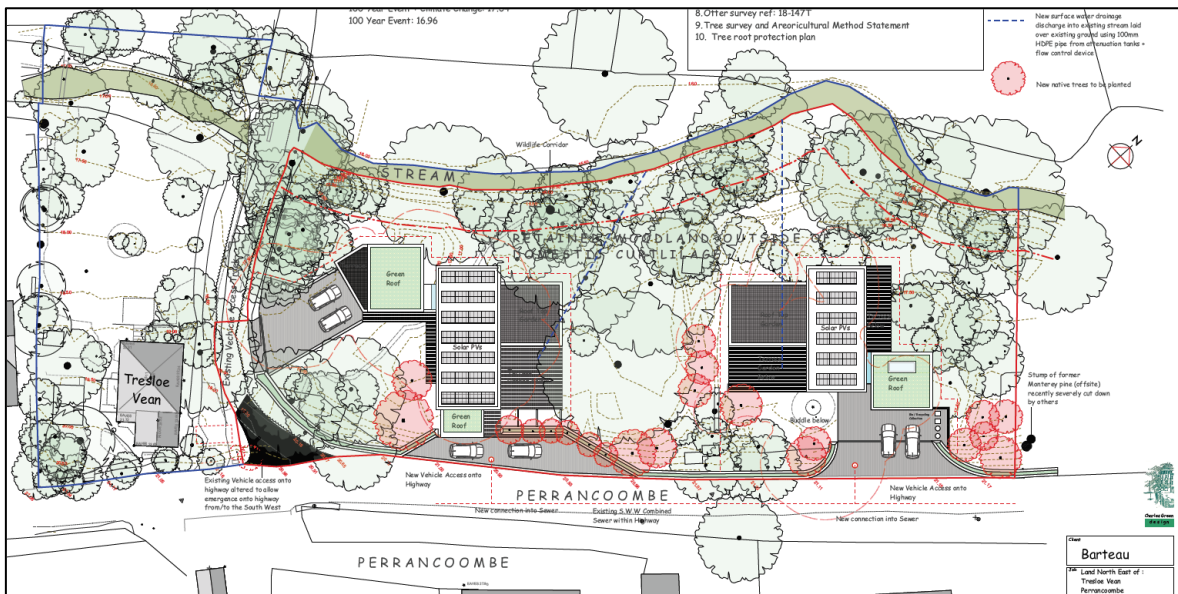


FIGURE 12: MAP SHOWING THE PROPOSED DEVELOPMENT (SUPPLIED BY AGENT).

3.6.2 IMPACT ASSESSMENT

The proposed development would see the construction of two large detached dwellings on the site, with associated landscaping and access provision. This impact assessment will not comment on the design and massing of the proposed structures, only the effect on the upstanding industrial remains around the site and the possible archaeological implications.

The two dwellings would be accessed from the level of Perrancoombe Lane and thus have a lower ground floor at, or just above, current ground levels on the site. These structures would have piled

foundations due to the uncertain structural performance of the ground, and this will reduce the damage the development will cause to any buried remains. Some effort has been made to plan Plot02 around the extant buddle and over or around the other upstanding features in this area. Careful design should allow the piling to avoid the other structures identified here. The apparent lack of features beneath the footprint of Plot01 would indicate the potential impact of this structure is likely to be considerably less. Mitigation in the form of the detailed recording with archaeological monitoring of would help offset the harm caused by the development and provide much needed data on a poorly researched sub-category of the extractive industries.

TABLE 1: SUMMARY OF DIRECT IMPACTS.

Asset	Type	Distance	Value	Magnitude of Impact	Assessment	Overall Assessment
Direct Impacts						
Upstanding industrial remains	U/d	On site	Medium	Major	Moderate/Large	Negative/Moderate
Buried archaeological features	U/d	On site	unknown	Moderate	Moderate	Negative/Minor to Negative/Moderate
<i>After mitigation</i>			Negligible	Minor	Neutral/Slight	Neutral/Negligible



FIGURE 13: ELEVATIONS OF THE PLOT02 HOUSE, SHOWING THE PILED STRUCTURE (SUPPLIED BY AGENT).

4.0 CONCLUSION

The proposed site lies within the parish of Perranzabuloe, within a long linear ribbon development known as Perrancoombe on the southern edge of Perranporth. This area fell within the bounds of the sub-manor of Penwartha, held under the Domesday Manor of Tywarnhayle, by the Pentires, Roscarrocks and, from the early 17th century, the Vyvyans. In 1840 the site formed one part of a smallholding leased to the corn miller Thomas Michell; in 1840 the field next to Michell's house was called *Stamps Plot*, but his house was located c.350m to the south of the proposed site.

The proposed site is in the base of the valley just south-east of Treslow Farm. Perrancoombe Lane runs along the foot of the slope on the other side of the valley, just above a pronounced scarp. This appears to be a tinner's scarp which would indicate the base of the valley was streamed for tin during the medieval and post-medieval period. On the site itself there are tips derived from working and reworking alluvial deposits, as well as that derived from two adits driven into the hillside and below the lane. The cartographic evidence, supported by the results of the walkover survey, indicate at least three phases of late 19th century and 20th century industrial use of the site as a small scale streamworks. The surviving remains include parts of two small wheel pits, a stamps box, crib hut and later cement buddles. The survival and legibility of the site, combined with a relative lack of research into comparable small operations, would indicate this site has clear historical and evidential value.

The proposed development – the construction of two large detached dwellings – is likely to have a significant impact on this relict industrial site as Plot02 would be located very close to or on top of the main concentration of visible structural evidence. The impact of the proposed development is correspondingly pronounced. However, both planned structures would be built on piles, with a lower ground floor lifted above current ground levels. Careful design in coordination with an agreed programme of archaeological recording and monitoring should provide suitable mitigation for this development.

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APPENDIX 1: IMPACT ASSESSMENT METHODOLOGY

Heritage Impact Assessment - Overview

The purpose of heritage impact assessment is twofold: Firstly, to understand – insofar as is reasonably practicable and in proportion to the importance of the asset – the significance of a historic building, complex, area or archaeological monument (the ‘heritage asset’). Secondly, to assess the likely effect of a proposed development on the heritage asset (direct impact) and its setting (indirect impact). This methodology employed in this assessment is based on the staged approach advocated in *The Setting of Heritage Assets* (GPA3 Historic England 2015), used in conjunction with the ICOMOS (2011) and DoT (DMRB vol.11; WEBTAG) guidance. This Appendix contains details of the methodology used in this report.

National Policy

General policy and guidance for the conservation of the historic environment are now contained within the *National Planning Policy Framework* (Department for Communities and Local Government 2018). The relevant guidance is reproduced below:

Paragraph 189

In determining applications, local planning authorities should require the applicant to describe the significance of any heritage assets affected, including the contribution made by their setting. The level of detail should be proportionate to the assets’ importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should be consulted, and the heritage assets assessed using appropriate expertise where necessary. Where a site on which a development is proposed includes or has the potential to include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.

Paragraph 190

Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this assessment into account when considering the impact of a proposal on a heritage asset, to avoid or minimise conflict between the heritage asset’s conservation and any aspect of the proposal.

A further key document is the Planning (Listed Buildings and Conservation Areas) Act 1990, in particular section 66(1), which provides *statutory protection* to the setting of Listed buildings:

In considering whether to grant planning permission for development which affects a listed building or its setting, the local planning authority or, as the case may be, the Secretary of State shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses.

Cultural Value – Designated Heritage Assets

The majority of the most important (‘nationally important’) heritage assets are protected through *designation*, with varying levels of statutory protection. These assets fall into one of six categories, although designations often overlap, so a Listed early medieval cross may also be Scheduled, lie within the curtilage of Listed church, inside a Conservation Area, and on the edge of a Registered Park and Garden that falls within a world Heritage Site.

Listed Buildings

A Listed building is an occupied dwelling or standing structure which is of special architectural or historical interest. These structures are found on the *Statutory List of Buildings of Special Architectural or Historic Interest*. The status of Listed buildings is applied to 300,000-400,000 buildings across the United Kingdom. Recognition of the need to protect historic buildings began after the Second World War, where significant numbers of buildings had been damaged in the county towns and capitals of the United Kingdom. Buildings that were considered to be of ‘architectural merit’ were included. The Inspectorate of Ancient Monuments supervised the collation of the list, drawn up by members of two societies: The Royal Institute of British Architects and the Society for the Protection of Ancient Buildings. Initially the lists were only used to assess which buildings should receive government grants to be repaired and conserved if damaged by bombing. The *Town and Country Planning Act 1947* formalised the process within England and Wales, Scotland and Ireland following different procedures. Under the 1979 *Ancient Monuments and Archaeological Areas Act* a structure cannot be considered a Scheduled Monument if it is occupied as a dwelling, making a clear distinction in the treatment of the two forms of heritage asset. Any alterations or works intended to

a Listed Building must first acquire Listed Building Consent, as well as planning permission. Further phases of 'listing' were rolled out in the 1960s, 1980s and 2000s; English Heritage advise on the listing process and administer the procedure, in England, as with the Scheduled Monuments.

Some exemption is given to buildings used for worship where institutions or religious organisations (such as the Church of England) have their own permissions and regulatory procedures. Some structures, such as bridges, monuments, military structures and some ancient structures may also be Scheduled as well as Listed. War memorials, milestones and other structures are included in the list, and more modern structures are increasingly being included for their architectural or social value. Buildings are split into various levels of significance: Grade I (2.5% of the total) representing buildings of exceptional (international) interest; Grade II* (5.5% of the total) representing buildings of particular (national) importance; Grade II (92%) buildings are of merit and are by far the most widespread. Inevitably, accuracy of the Listing for individual structures varies, particularly for Grade II structures; for instance, it is not always clear why some 19th century farmhouses are Listed while others are not, and differences may only reflect local government boundaries, policies and individuals. Other buildings that fall within the curtilage of a Listed building are afforded some protection as they form part of the essential setting of the designated structure, e.g. a farmyard of barns, complexes of historic industrial buildings, service buildings to stately homes etc. These can be described as having *group value*.

Conservation Areas

Local authorities are obliged to identify and delineate areas of special architectural or historic interest as Conservation Areas, which introduces additional controls and protection over change within those places. Usually, but not exclusively, they relate to historic settlements, and there is c.7000 Conservation Areas in England.

Scheduled Monuments

In the United Kingdom, a Scheduled Monument is considered an historic building, structure (ruin) or archaeological site of '**national importance**'. Various pieces of legislation, under planning, conservation, etc., are used for legally protecting heritage assets given this title from damage and destruction; such legislation is grouped together under the term 'designation', that is, having statutory protection under the *Ancient Monuments and Archaeological Areas Act 1979*. A heritage asset is a part of the historic environment that is valued because of its historic, archaeological, architectural or artistic interest; those of national importance have extra legal protection through designation. Important sites have been recognised as requiring protection since the late 19th century, when the first 'schedule' or list of monuments was compiled in 1882. The conservation and preservation of these monuments was given statutory priority over other land uses under this first schedule. County Lists of the monuments are kept and updated by the Department for Culture, Media and Sport. In the later 20th century sites are identified by English Heritage (one of the Government's advisory bodies) of being of national importance and included in the schedule. Under the current statutory protection any works required on or to a designated monument can only be undertaken with a successful application for Scheduled Monument Consent. There are 19,000-20,000 Scheduled Monuments in England.

Registered Parks and Gardens

Culturally and historically important 'man-made' or 'designed' landscapes, such as parks and gardens are currently "listed" on a non-statutory basis, included on the 'Register of Historic Parks and Gardens of special historic interest in England' which was established in 1983 and is, like Listed Buildings and Scheduled Monuments, administered by Historic England. Sites included on this register are of **national importance** and there are currently 1,600 sites on the list, many associated with stately homes of Grade II* or Grade I status. Emphasis is laid on 'designed' landscapes, not the value of botanical planting. Sites can include town squares and private gardens, city parks, cemeteries and gardens around institutions such as hospitals and government buildings. Planned elements and changing fashions in landscaping and forms are a main focus of the assessment.

Registered Battlefields

Battles are dramatic and often pivotal events in the history of any people or nation. Since 1995 Historic England maintains a register of 46 battlefields in order to afford them a measure of protection through the planning system. The key requirements for registration are battles of national significance, a securely identified location, and its topographical integrity – the ability to 'read' the battle on the ground.

World Heritage Sites

Arising from the UNESCO World Heritage Convention in 1972, Article 1 of the Operational Guidelines (2015, no.49) states: 'Outstanding Universal Value means cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity'. These sites are recognised at an international level for their intrinsic importance to the story of humanity and should be accorded the highest level of protection within the planning system.

Value and Importance

While every heritage asset, designated or otherwise, has some intrinsic merit, the act of designation creates a hierarchy of importance that is reflected by the weight afforded to their preservation and enhancement within the planning system. The system is far from perfect, impaired by an imperfect understanding of individual heritage assets, but the value system that has evolved does provide a useful guide to the *relative* importance of heritage assets. Provision is also made for heritage assets where value is not recognised through designation (e.g. undesignated 'monuments of Schedulable quality and importance' should be regarded as being of *high* value); equally, there are designated monuments and structures of *low* relative merit.

TABLE 2: THE HIERARCHY OF VALUE/IMPORTANCE (BASED ON THE DMRB VOL.11 TABLES 5.1, 6.1 & 7.1).

Hierarchy of Value/Importance	
Very High	Structures inscribed as of universal importance as World Heritage Sites. Other buildings of recognised international importance. World Heritage Sites (including nominated sites) with archaeological remains. Archaeological assets of acknowledged international importance. Archaeological assets that can contribute significantly to international research objectives. World Heritage Sites inscribed for their historic landscape qualities. Historic landscapes of international value, whether designated or not. Extremely well-preserved historic landscapes with exceptional coherence, time-depth, or other critical factor(s).
High	Scheduled Monuments with standing remains. Grade I and Grade II* (Scotland: Category A) Listed Buildings. Other Listed buildings that can be shown to have exceptional qualities in their fabric or historical associations not adequately reflected in the Listing grade. Conservation Areas containing very important buildings. Undesignated structures of clear national importance. Undesignated assets of Schedulable quality and importance. Assets that can contribute significantly to national research objectives. Designated historic landscapes of outstanding interest. Undesignated landscapes of outstanding interest. Undesignated landscapes of high quality and importance, demonstrable national value. Well-preserved historic landscapes, exhibiting considerable coherence, time-depth or other critical factor(s).
Medium	Grade II (Scotland: Category B) Listed Buildings. Historic (unlisted) buildings that can be shown to have exceptional qualities in their fabric or historical associations. Conservation Areas containing buildings that contribute significantly to its historic character. Historic Townscape or built-up areas with important historic integrity in their buildings or built settings (e.g. including street furniture and other structures). Designated or undesignated archaeological assets that contribute to regional research objectives. Designated special historic landscapes. Undesignated historic landscapes that would justify special historic landscape designation, landscapes of regional value. Averagely well-preserved historic landscapes with reasonable coherence, time-depth or other critical factor(s).
Low	Locally Listed buildings (Scotland Category C(S) Listed Buildings). Historic (unlisted) buildings of modest quality in their fabric or historical association. Historic Townscape or built-up areas of limited historic integrity in their buildings or built settings (e.g. including street furniture and other structures). Designated and undesignated archaeological assets of local importance. Archaeological assets compromised by poor preservation and/or poor survival of contextual associations. Archaeological assets of limited value, but with potential to contribute to local research objectives. Robust undesignated historic landscapes. Historic landscapes with importance to local interest groups. Historic landscapes whose value is limited by poor preservation and/or poor survival of contextual associations.
Negligible	Buildings of no architectural or historical note; buildings of an intrusive character. Assets with very little or no surviving archaeological interest. Landscapes with little or no significant historical interest.
Unknown	Buildings with some hidden (i.e. inaccessible) potential for historic significance. The importance of the archaeological resource has not been ascertained.

Concepts – Conservation Principles

In making an assessment, this document adopts the conservation values (*evidential, historical, aesthetic and communal*) laid out in *Conservation Principles* (English Heritage 2008), and the concepts of *authenticity* and *integrity* as laid out in the guidance on assessing World Heritage Sites (ICOMOS 2011). This is in order to determine the relative importance of *setting* to the significance of a given heritage asset.

Evidential Value

Evidential value (or research potential) is derived from the potential of a structure or site to provide physical evidence about past human activity and may not be readily recognised or even visible. This is the primary form of data for periods without adequate written documentation. This is the least equivocal value: evidential value is absolute; all other ascribed values (see below) are subjective. However,

Historical Value

Historical value (narrative) is derived from the ways in which past people, events and aspects of life can be connected via a place to the present; it can be *illustrative* or *associative*.

Illustrative value is the visible expression of evidential value; it has the power to aid interpretation of the past through making connections with, and providing insights into, past communities and their activities through a shared experience of place. Illustrative value tends to be greater if a place features the first or only surviving example of an innovation of design or technology.

Associative value arises from a connection to a notable person, family, event or historical movement. It can intensify understanding by linking the historical past to the physical present, always assuming the place bears any resemblance to its appearance at the time. Associational value can also be derived from known or suspected links with other monuments (e.g. barrow cemeteries, church towers) or cultural affiliations (e.g. Methodism).

Buildings and landscapes can also be associated with literature, art, music or film, and this association can inform and guide responses to those places.

Historical value depends on sound identification and the direct experience of physical remains or landscapes. Authenticity can be strengthened by change, being a living building or landscape, and historical values are harmed only where adaptation obliterates or conceals them. The appropriate use of a place – e.g. a working mill, or a church for worship – illustrates the relationship between design and function and may make a major contribution to historical value. Conversely, cessation of that activity – e.g. conversion of farm buildings to holiday homes – may essentially destroy it.

Aesthetic Value

Aesthetic value (emotion) is derived from the way in which people draw sensory and intellectual stimulation from a place or landscape. Value can be the result of *conscious design*, or the *fortuitous outcome* of landscape evolution; many places combine both aspects, often enhanced by the passage of time.

Design value relates primarily to the aesthetic qualities generated by the conscious design of a building, structure or landscape; it incorporates composition, materials, philosophy and the role of patronage. It may have associational value, if undertaken by a known architect or landscape gardener, and its importance is enhanced if it is seen as innovative, influential or a good surviving example. Landscape parks, country houses and model farms all have design value. The landscape is not static, and a designed feature can develop and mature, resulting in the 'patina of age'.

Some aesthetic value developed *fortuitously* over time as the result of a succession of responses within a cultural framework e.g. the seemingly organic form of an urban or rural landscape or the relationship of vernacular buildings and their materials to the landscape. Aesthetic values are where a proposed development usually have their most pronounced impact: the indirect effects of most developments are predominantly visual or aural and can extend many kilometres from the site itself. In many instances the impact of a development is incongruous, but that is itself an aesthetic response, conditioned by prevailing cultural attitudes to what the historic landscape should look like.

Communal Value

Communal value (togetherness) is derived from the meaning a place holds for people and may be closely bound up with historical/associative and aesthetic values; it can be *commemorative*, *symbolic*, *social* or *spiritual*.

Commemorative and symbolic value reflects the meanings of a place to those who draw part of their identity from it, or who have emotional links to it e.g. war memorials. Some buildings or places (e.g. the Palace of Westminster) can symbolise wider values. Other places (e.g. Porton Down Chemical Testing Facility) have negative or uncomfortable associations that nonetheless have meaning and significance to some and should not be forgotten. *Social value* need not have any relationship to surviving fabric, as it is the continuity of function that is important.

Spiritual value is attached to places and can arise from the beliefs of a religion or past or contemporary perceptions of the spirit of place. Spiritual value can be ascribed to places sanctified by hundreds of years of veneration or worship, or wild places with few signs of modern life. Value is dependent on the perceived survival of historic fabric or character and can be very sensitive to change. The key aspect of communal value is that it brings specific groups of people together in a meaningful way.

Authenticity

Authenticity, as defined by UNESCO (2015, no.80), is the ability of a property to convey the attributes of the outstanding universal value of the property. 'The ability to understand the value attributed to the heritage depends on the degree to which information sources about this value may be understood as credible or truthful'. Outside of a World Heritage Site, authenticity may usefully be employed to convey the sense a place or structure is a truthful representation of the thing it purports to portray. Converted farm buildings, for instance, survive in good condition, but are drained of the authenticity of a working farm environment.

Integrity

Integrity, as defined by UNESCO (2015, no.88), is the measure of wholeness or intactness of the cultural heritage and its attributes. Outside of a World Heritage Site, integrity can be taken to represent the survival and condition of a structure, monument or landscape. The intrinsic value of those examples that survive in good condition is undoubtedly greater than those where survival is partial, and condition poor.

Summary

As indicated, individual developments have a minimal or tangential effect on most of the heritage values outlined above, largely because almost all effects are indirect. The principle values in contention are aesthetic/created and, to a lesser degree aesthetic/fortuitous. There are also clear implications for other value elements (particularly historical and associational, communal and spiritual), where views or sensory experience is important. As ever, however, the key element here is not the intrinsic value of the heritage asset, nor the impact on setting, but the relative contribution of setting to the value of the asset.

Setting – The Setting of Heritage Assets

The principle guidance on this topic is contained within two publications: *The Setting of Heritage Assets* (Historic England 2015) and *Seeing History in the View* (English Heritage 2011). While interlinked and complementary, it is useful to consider heritage assets in terms of their *setting* i.e. their immediate landscape context and the environment within which they are seen and experienced, and their *views* i.e. designed or fortuitous vistas experienced by the visitor when at the heritage asset itself, or those that include the heritage asset. This corresponds to the experience of its wider landscape setting.

Where the impact of a proposed development is largely indirect, *setting* is the primary consideration of any HIA. It is a somewhat nebulous and subjective assessment of what does, should, could or did constitute the lived experience of a monument or structure. The following extracts are from the Historic England publication *The Setting of Heritage Assets* (2015, 2 & 4):

The NPPF makes it clear that the setting of a heritage asset is the surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve.

Setting is not a heritage asset, nor a heritage designation. Its importance lies in what it contributes to the significance of the heritage asset. This depends on a wide range of physical elements within, as well as perceptual and associational attributes, pertaining to the heritage asset's surroundings.

While setting can be mapped in the context of an individual application or proposal, it does not have a fixed boundary and cannot be definitively and permanently described for all time as a spatially bounded area or as lying within a set distance of a heritage asset because what comprises a heritage asset's setting may change as the asset and its surroundings evolve or as the asset becomes better understood or due to the varying impacts of different proposals. The HIA below sets out to determine the magnitude of the effect and the sensitivity of the heritage asset to that effect. The fundamental issue is that proximity and visual and/or aural relationships may affect the experience of a heritage asset, but if setting is tangential to the significance of that monument or structure, then the impact assessment will reflect this. This is explored in more detail below.

Landscape Context

The determination of *landscape context* is an important part of the assessment process. This is the physical space within which any given heritage asset is perceived and experienced. The experience of this physical space is related to the scale of the landform and modified by cultural and biological factors like field boundaries, settlements, trees and woodland. Together, these determine the character and extent of the setting. Landscape context is based on topography and can vary in scale from the very small – e.g. a narrow valley where views and vistas are restricted – to the very large – e.g. wide valleys or extensive upland moors with 360° views. Where very large landforms are concerned, a distinction can be drawn between the immediate context of an asset (this can be limited to a few hundred metres or less, where cultural and biological factors impede visibility and/or experience), and the wider context (i.e. the wider landscape within which the asset sits).

When new developments are introduced into a landscape, proximity alone is not a guide to magnitude of effect. Dependant on the nature and sensitivity of the heritage asset, the magnitude of effect is potentially much greater where the proposed development is to be located within the landscape context of a given heritage asset. Likewise, where the proposed development would be located outside the landscape context of a given heritage asset, the magnitude of effect would usually be lower. Each case is judged on its individual merits, and in some instances the significance of an asset is greater outside of its immediate landscape context, for example, where church towers function as landmarks in the wider landscape.

Views

Historic and significant views are the associated and complementary element to setting, but can be considered separately as developments may appear in a designed view without necessarily falling within the setting of a heritage asset *per se*. As such, significant views fall within the aesthetic value of a heritage asset, and may be *designed* (i.e. deliberately conceived and arranged, such as within parkland or an urban environment) or *fortuitous* (i.e. the graduated development of a landscape ‘naturally’ brings forth something considered aesthetically pleasing, or at least impressive, as with particular rural landscapes or seascapes), or a combination of both (i.e. the *patina of age*, see below). The following extract is from the English Heritage publication *Seeing History in the View* (2011, 3):

Views play an important part in shaping our appreciation and understanding of England’s historic environment, whether in towns or cities or in the countryside. Some of those views were deliberately designed to be seen as a unity. Much more commonly, a significant view is a historical composite, the cumulative result of a long process of development.

The Setting of Heritage Assets (2015, 3) lists several instances where views contribute to the particular significance of a heritage asset:

- Views where relationships between the asset and other historic assets or places or natural features are particularly relevant.
- Views with historical associations, including viewing points and the topography of battlefields.
- Views where the composition within the view was a fundamental aspect of the design or function of the heritage asset.
- Views between heritage assets and natural or topographic features, or phenomena such as solar and lunar events.
- Views between heritage assets which were intended to be seen from one another for aesthetic, functional, ceremonial or religious reasons, such as military or defensive sites, telegraphs or beacons, Prehistoric funerary and ceremonial sites.

On a landscape scale, views, taken in the broadest sense, are possible from anywhere to anything, and each may be accorded an aesthetic value according to subjective taste. Given that terrain, the biological and built environment, and public access restrict our theoretical ability to see anything from anywhere, in this assessment the term *principal view* is employed to denote both the deliberate views created within designed landscapes, and those fortuitous views that may be considered of aesthetic value and worth preserving. It should be noted, however, that there are distance thresholds beyond which perception and recognition fail, and this is directly related to the scale, height, massing and nature of the heritage asset in question. For instance, beyond 2km the Grade II cottage comprises a single indistinct component within the wider historic landscape, whereas at 5km or even 10km a large stately home or castle may still be recognisable. By extension, where assets cannot be seen or recognised i.e. entirely concealed within woodland, or too distant to be distinguished, then visual harm to setting is moot. To reflect this emphasis on recognition, the term *landmark asset* is employed to denote those sites where the structure (e.g. church tower), remains (e.g. earthwork ramparts) or – in some instances – the physical character of the immediate landscape (e.g. a distinctive landform like a tall domed hill) make them visible on a landscape scale. In some cases, these landmark assets may exert landscape *primacy*, where they are the tallest or most obvious man-made structure within line-of-

sight. However, this is not always the case, typically where there are numerous similar monuments (multiple engine houses in mining areas, for instance) or where modern developments have overtaken the heritage asset in height and/or massing.

Yet visibility alone is not a clear guide to visual impact. People perceive size, shape and distance using many cues, so context is critically important. For instance, research on electricity pylons (Hull & Bishop 1988) has indicated scenic impact is influenced by landscape complexity: the visual impact of pylons is less pronounced within complex scenes, especially at longer distances, presumably because they are less of a focal point and the attention of the observer is diverted. There are many qualifiers that serve to increase or decrease the visual impact of a proposed development (see Table 2), some of which are seasonal or weather-related. Thus, the principal consideration of assessment of indirect effects cannot be visual impact *per se*. It is an assessment of the likely magnitude of effect, the importance of setting to the significance of the heritage asset, and the sensitivity of that setting to the visual or aural intrusion of the proposed development. The schema used to guide assessments is shown in Table 2 (below).

Type and Scale of Impact

The effect of a proposed development on a heritage asset can be direct (i.e. the designated structure itself is being modified or demolished, the archaeological monument will be built over), or indirect (e.g. a housing estate built in the fields next to a Listed farmhouse, and wind turbine erected near a hillfort etc.); in the latter instance the principal effect is on the setting of the heritage asset. A distinction can be made between construction and operational phase effects. Individual developments can affect multiple heritage assets (aggregate impact) and contribute to overall change within the historic environment (cumulative impact).

Construction phase: construction works have direct, physical effects on the buried archaeology of a site, and a pronounced but indirect effect on neighbouring properties. Direct effects may extend beyond the nominal footprint of a site e.g. where related works or site compounds are located off-site. Indirect effects are both visual and aural, and may also affect air quality, water flow and traffic in the local area.

Operational phase: the operational phase of a development is either temporary (e.g. wind turbine or mobile phone mast) or effectively permanent (housing development or road scheme). The effects at this stage are largely indirect and can be partly mitigated over time through provision of screening. Large development would have an effect on historic landscape character, as they transform areas from one-character type (e.g. agricultural farmland) into another (e.g. suburban).

Cumulative Impact: a single development will have a physical and a visual impact, but a second and a third site in the same area will have a synergistic and cumulative impact above and beyond that of a single site. The cumulative impact of a proposed development is particularly difficult to estimate, given the assessment must take into consideration operational, consented and proposals in planning.

Aggregate Impact: a single development will usually affect multiple individual heritage assets. In this assessment, the term aggregate impact is used to distinguish this from cumulative impact. In essence, this is the impact on the designated parts of the historic environment as a whole.

Scale of Impact

The effect of development and associated infrastructure on the historic environment can include positive as well as negative outcomes. However, all development changes the character of a local environment, and alters the character of a building, or the setting within which it is experienced. change is invariably viewed as negative, particularly within respect to larger developments; thus while there can be beneficial outcomes (e.g. positive/moderate), there is a presumption here that, as large and inescapably modern intrusive visual actors in the historic landscape, the impact of a development will almost always be **neutral** (i.e. no impact) or **negative** i.e. it will have a **detrimental impact** on the setting of ancient monuments and protected historic buildings.

This assessment incorporates the systematic approach outlined in the ICOMOS and DoT guidance (see Tables 6-8), used to complement and support the more narrative but subjective approach advocated by Historic England (see Table 5). This provides a useful balance between rigid logic and nebulous subjectivity (e.g. the significance of effect on a Grade II Listed building can never be greater than moderate/large; an impact of negative/substantial is almost never achieved). This is in adherence with GPA3 (2015, 7).

TABLE 3: MAGNITUDE OF IMPACT (BASED ON DMRB VOL.11 TABLES 5.3, 6.3 AND 7.3).

LAND NE OF TRESLOE VEAN, PERRANCOOMBE, PERRANPORTH, CORNWALL

Factors in the Assessment of Magnitude of Impact – Buildings and Archaeology	
Major	Change to key historic building elements, such that the resource is totally altered. Change to most or all key archaeological materials, so that the resource is totally altered. Comprehensive changes to the setting.
Moderate	Change to many key historic building elements, the resource is significantly modified. Changes to many key archaeological materials, so that the resource is clearly modified. Changes to the setting of an historic building or asset, such that it is significantly modified.
Minor	Change to key historic building elements, such that the asset is slightly different. Changes to key archaeological materials, such that the asset is slightly altered. Change to setting of an historic building, such that it is noticeably changed.
Negligible	Slight changes to elements of a heritage asset or setting that hardly affects it.
No Change	No change to fabric or setting.
Factors in the Assessment of Magnitude of Impact – Historic Landscapes	
Major	Change to most or all key historic landscape elements, parcels or components; extreme visual effects; gross change of noise or change to sound quality; fundamental changes to use or access; resulting in total change to historic landscape character unit.
Moderate	Changes to many key historic landscape elements or components, visual change to many key aspects of the historic landscape, noticeable differences in noise quality, considerable changes to use or access; resulting in moderate changes to historic landscape character.
Minor	Changes to few key historic landscape elements, or components, slight visual changes to few key aspects of historic landscape, limited changes to noise levels or sound quality; slight changes to use or access: resulting in minor changes to historic landscape character.
Negligible	Very minor changes to key historic landscape elements, parcels or components, virtually unchanged visual effects, very slight changes in noise levels or sound quality; very slight changes to use or access; resulting in a very small change to historic landscape character.
No Change	No change to elements, parcels or components; no visual or audible changes; no changes arising from in amenity or community factors.

TABLE 4: SIGNIFICANCE OF EFFECTS MATRIX (BASED ON DRMB VOL.11 TABLES 5.4, 6.4 AND 7.4; ICOMOS 2011, 9-10).

Value of Assets	Magnitude of Impact (positive or negative)				
	No Change	Negligible	Minor	Moderate	Major
Very High	Neutral	Slight	Moderate/Large	Large/Very Large	Very Large
High	Neutral	Slight	Moderate/Slight	Moderate/Large	Large/Very Large
Medium	Neutral	Neutral/Slight	Slight	Moderate	Moderate/Large
Low	Neutral	Neutral/Slight	Neutral/Slight	Slight	Slight/Moderate
Negligible	Neutral	Neutral	Neutral/Slight	Neutral/Slight	Slight

TABLE 5: SCALE OF IMPACT.

Scale of Impact	
<i>Neutral</i>	No impact on the heritage asset.
<i>Negligible</i>	Where the developments may be visible or audible but would not affect the heritage asset or its setting, due to the nature of the asset, distance, topography, or local blocking.
<i>Negative/minor</i>	Where the development would have an effect on the heritage asset or its setting, but that effect is restricted due to the nature of the asset, distance, or screening from other buildings or vegetation.
<i>Negative/moderate</i>	Where the development would have a pronounced impact on the heritage asset or its setting, due to the sensitivity of the asset and/or proximity. The effect may be ameliorated by screening or mitigation.
<i>Negative/substantial</i>	Where the development would have a severe and unavoidable effect on the heritage asset or its setting, due to the sensitivity of the asset and/or close physical proximity. Screening or mitigation could not ameliorate the effect of the development in these instances.

TABLE 6: IMPORTANCE OF SETTING TO INTRINSIC SIGNIFICANCE.

Importance of Setting to the Significance of the Asset	
Paramount	Examples: Round barrow; follies, eyecatchers, stone circles
Integral	Examples: Hillfort; country houses
Important	Examples: Prominent church towers; war memorials
Incidental	Examples: Thatched cottages
Irrelevant	Examples: Milestones

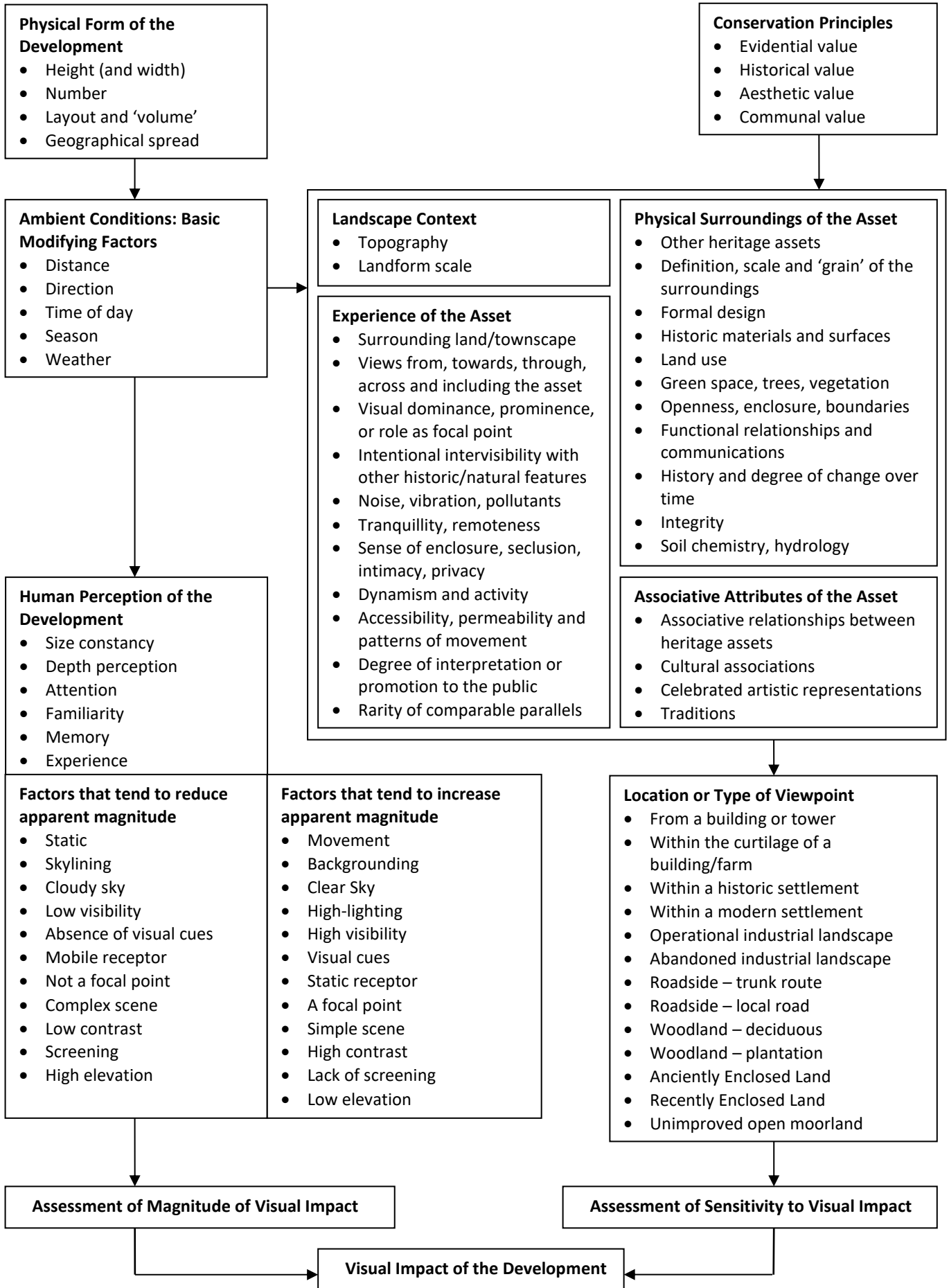


TABLE 7: THE CONCEPTUAL MODEL FOR VISUAL IMPACT ASSESSMENT PROPOSED BY THE UNIVERSITY OF NEWCASTLE (2002, 63), MODIFIED TO INCLUDE ELEMENTS OF ASSESSMENT STEP 2 FROM THE SETTING OF HERITAGE ASSETS (HISTORIC ENGLAND 2015, 9).

APPENDIX 2: PHOTOGRAPHIC ARCHIVE



1. DRESSING FLOOR 2, VIEWED FROM THE NORTH-WEST. RANGING RODS ARE AT THE REAR CORNERS AGAINST THE TINNER'S SCARP. THIS WAS A COBBING FLOOR FOR HAND-BREAKING ORE (SCALES 2M).



2. VIEW ALONG WATER WHEEL PIT 2 FROM THE NORTH-WEST. NOTE THE CORRUGATED IRON AND TIMBER IMPRESSIONS IN THE CAST CONCRETE DRIVESHAFT STAND TO THE LEFT (SCALES 2M, 1M AND 0.5M).



3. SCORE MARKS FROM A 10FT 6IN DIAMETER WATER WHEEL IN WP2; VIEWED FROM THE NORTH-EAST (SCALES 1M).



4. VIEW ALONG WATER WHEEL PIT 2 FROM THE SOUTH-EAST, WITH STAMPS BOX ON EXTREME RIGHT (SCALES 2M, 1M AND 0.5M).



5. CAST IRON AXLE OF WATER WHEEL IN WP2; VIEWED FROM THE NORTH-WEST (SCALE 1M).



6. CAST IRON THROAT PLATE OF STAMPS BOX; VIEWED FROM THE NORTH-WEST (SCALE 0.5M).



7. SIDE OF STAMPS BOX FROM SOUTH-WEST, SHOWING CONSTRUCTION (SCALES 0.5M & 0.4M).



8. RUBBLE RETAINING WALL TO ROAD AT REAR OF WET DRESSING FLOOR; VIEWED FROM THE WEST (SCALE 2M).



9. 1920s-30s ROUND BUDDLE ON WET DRESSING FLOOR DF3; VIEWED FROM THE SOUTH (SCALES 2M & 1M).



10. 19TH CENTURY CRIB HUT B1 BUILT INTO THE RETAINING WALL OF THE TINNER'S SCARP; VIEWED FROM THE NORTH-WEST (SCALES 2M & 1M).



11. 1920s-30s CONCRETE TURBINE HOUSE WITH HOLES FOR AXLES; VIEWED FROM THE SOUTH-WEST (SCALE 2M).



12. CONCRETE STANDS FOR 1920s-30s DRIVE-SHAFT IN FOREGROUND (0.5M SCALE) AND HEADER TANKS FOR WATER TURBINE AND WET DRESSING BESIDE ROAD BEYOND (2M SCALE). VIEWED FROM THE NORTH-WEST.



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