



King Edward Mine Museum Redevelopment Project, Troon, Cornwall

Impact assessment



Cornwall Archaeological Unit

King Edward Mine Museum Redevelopment Project, Troon, Cornwall

Impact Assessment Report

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The views and recommendations expressed in this report are those of Historic Environment Projects and those of the other authors and organisations whose reports are summarised here. They are presented in good faith on the basis of professional judgement and on currently available information.

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Freedom of Information Act

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Cover illustration

Front cover image of the former Assay and Samples House, King Edward Mine (2012), before it was re-roofed in 2011.

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Abbreviations

CAU	Cornwall Archaeological Unit
CC	Cornwall Council
CMP	Conservation Management Plan
CSM	Camborne School of Mines
EH	English Heritage
GFL	Great Flat Lode
HAR	Heritage at Risk
HER	Cornwall and the Isles of Scilly Historic Environment Record
HES	Historic Environment Service
HE(P)	Historic Environment Projects, Cornwall Council
HLF	Heritage Lottery Fund
KEM	King Edward Mine
LB	Listed Building
NGR	National Grid Reference
OS	Ordnance Survey
OUV	Outstanding Universal Value
PRN	Primary Record Number in Cornwall HER
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WHS	World Heritage Site

1 Summary

Following the establishment of Camborne Mining School in the late 1880s, the eastern section of South Condurrow Mine (1864-1896) was leased from the Pendarves Estate and renamed King Edward Mine (KEM) in 1901. Three years later, after the mine was equipped with new surface machinery, buildings and a new Mill. It was successfully operating as a training facility (above and below ground) for students of Camborne School of Mines, the main practical mine training school in the country.

King Edward Mine is now the oldest complete mine site left in Cornwall. The entire site contains a number of buildings, many grouped into larger complexes; for example the Count House, Carpenters' Shop and Assay complexes (all unoccupied and deteriorating), with the hugely significant Mill complex. All of the main buildings on the site are Grade II* Listed due to their individual or group value, with the exception of South Condurrow Stamps Engine House, which is Grade II. The entire site is within the UNESCO inscribed Cornish Mining World Heritage Site (WHS). KEM has Outstanding Universal Value as the best preserved mine head complex within the WHS for the 1700 – 1914 period. The museum receives an annual grant from Cornwall Council.

In December 2010 a Condition Survey, Options Appraisal and Outline Business Plan was subsequently extended in December 2011 to develop a Master Plan and Business Plan for the whole site. Successful grants from European Convergence funding in 2013 are currently funding the restoration and adaptive re-use of both the Counthouse and Carpenters' Complexes, both presently underused buildings. This will generate income to improve sustainability, improve the condition of some of the core Listed Buildings, and reinforce recognition of KEM's standing within the Cornish Mining World Heritage Site. An application to HLF is currently underway to fund repair and adaptive reuse works to other sites including the Assay Complex, the Boiler house and the Mill.

A detailed Conservation Management Plan (CMP) for King Edward Mine was produced by Historic Environment Projects, Cornwall Council (CC) (now Cornwall Archaeological Unit) in early 2013. This has informed both the 2014 adaptive works to the Counthouse/Carpenters' Shop and will also inform the proposed HLF funded 2015 works to other core parts of the site namely: the Assay complex, the Boiler House transition to a museum facility, and repair works to the Mill. Architects (PdP Green Consulting Ltd) were appointed in 2013 to produce low impact proposals for these works, closely following the site's conservation philosophy as detailed in the CMP.

This Impact Assessment Report will accompany the Listed Building consent application for adaptive re-use and repair of the Assay complex to a Café and adaptive re-use and repair of the Boiler House to an exhibition space, both of which are currently on the Heritage 'At – Risk' Register (HAR). Other works include replacement of the Mill roof and doors, general consolidation repair works to the Stamps engine house and provision of an increased viewing platform to view part of the Great Flat lode industrial landscape. It is intended that generic specifications used for the KEM Workspace project are replicated for this project. Archaeological impact mitigation recommendations include a programme of historic buildings consultancy before works start (to ensure the proposals have a minimal impact), a photographic record prior to and after works to ensure that there is a detailed record of the works, a Level 3 annotated survey of the Listed Grade II* sites affected by the scheme, and production of a detailed archaeological recording after works finish.

However, it should be noted that although many of the major impacts to the site are known at the present time, there may be slight variations to the specifications presented in this report (and supplementary information from the project engineers). This report should therefore be viewed as a generic impact assessment for the project.

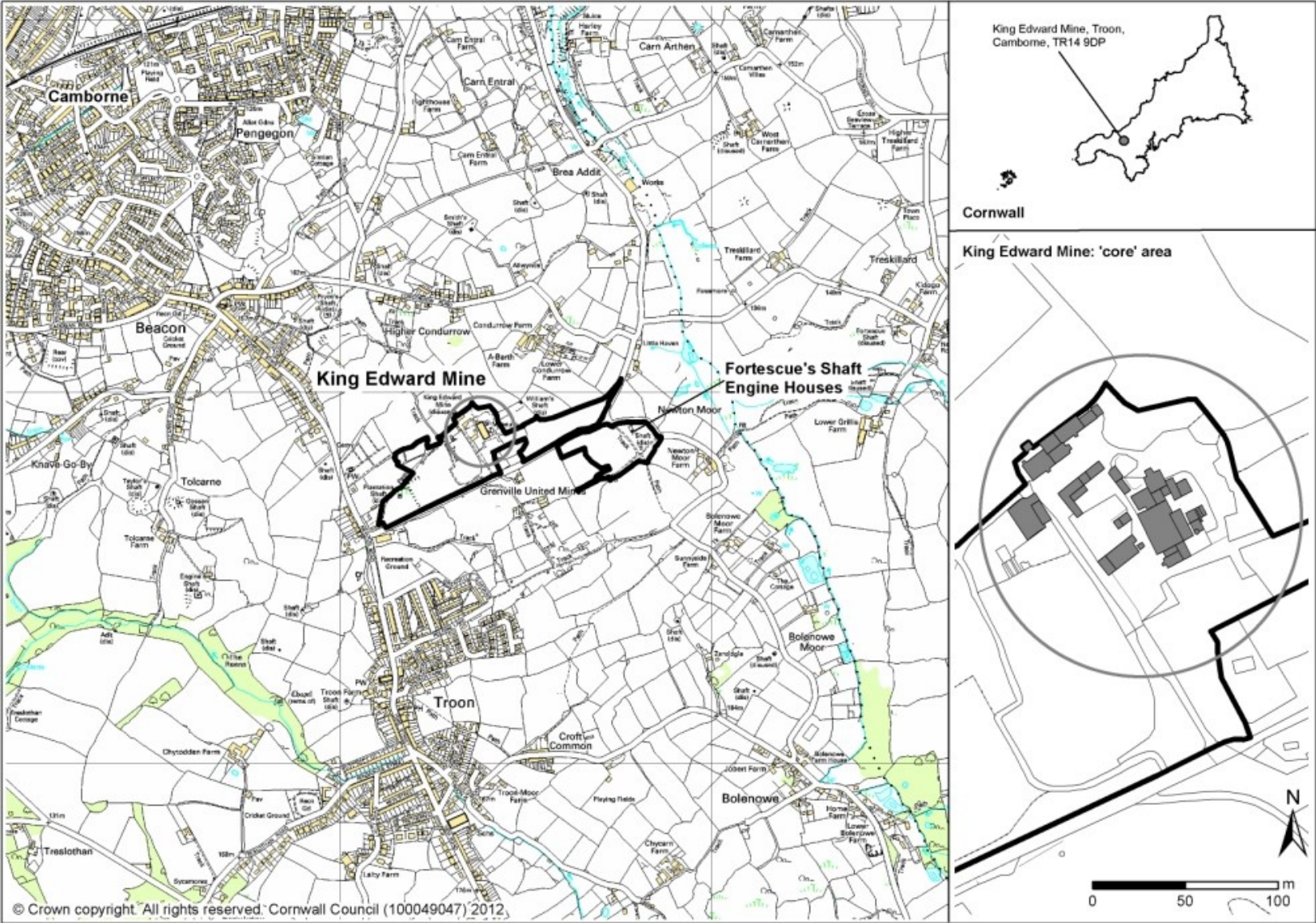


Figure 1 Location map of King Edward Mine and the surrounding area

2 Introduction

2.1 Project background

King Edward Mine is sited at the western end of the Great Flat Lode, an area demonstrating key authentic aspects of the 19th and early 20th century Cornish mining industry. The overall complex has Outstanding Universal Value as the best preserved mine head complex within the WHS for the relevant 1700-1914 period, and as a prominent mine site in the best preserved mining landscape within the WHS (WHS 2007).

King Edward Mine was developed within a part of the former South Condurrow sett which worked from 1864 to 1896. It was taken over by the Camborne School of Mines (CSM) in 1896 and reorganised as a training mine to enable its students to gain practical experience in all fields of their discipline. Part of the site, which included the mill complex and its associated buildings, became redundant in 1974 when CSM relocated from Camborne to Pool. A volunteer group was set up in 1987 to try to preserve these now redundant structures, to restore the mill and in time to open it as a museum. This was achieved and the museum opened in 2001. CSM finally terminated their lease for the whole KEM site in 2005, when responsibility for the operation and development of the museum passed to King Edward Mine Ltd. (a not for profit company). In 2009 Cornwall Council (CC) acquired the freehold of the site from the Pendarves Estate. The King Edward Mine site area is entirely in the ownership of CC, and in 2012 KEM Ltd obtained a 30 year lease from CC.

The complex of structures making up the core area of the King Edward Mine site are unique in that they were almost all constructed during a single development phase (1897 – 1907), each for a specific function (Brooks and Watton 2002). It is extremely rare that most of the original buildings have survived without significant modification. For this reason, many have been accorded designation as Grade II* Listed Buildings.

Successful grants from European Convergence funding in 2013 are currently (2014) funding the restoration and adaptive re-use of both the Couthouse and Carpenters' Complexes, both presently underused buildings. However, some other elements of the site, in particular the Assay Office and the Boiler House of the former Winding engine house are not appropriately utilised, and since 2013, proposals have been prepared for their adaptive re-use with the help of an HLF grant and the Challenge Fund. A master and business plan to inform an HLF grant bids has been prepared by CC to achieve these works to improve the visitor experience, their engagement with the heritage of the site and area, and to increase the number of visitors with the overall aim of making the site more financially sustainable.

A Conservation Management Plan was produced by Historic Environment Projects (now Cornwall Archaeological Unit) in early 2013 to set the framework, policies (referring to WHS Management Plan 2013), and conservation philosophy to inform and guide the management and future proposals that could impact upon the site's setting, character and significance.

This report (commissioned by the Economic Development & Culture Service, CC), assesses the impact of the proposed HLF funded adaptive re-use building works on the significant assets of the Assay complex and Winding engine boiler house, with other smaller scale works on the Mill, and the Stamps Engine house etc. PdP Green Consulting Ltd. produced a detailed schedule of works and specifications, with an outline Heritage Impact Statement and design principles (PdP Green June 2014).

This report identifies the archaeological impacts resulting from the proposed adaptive re-use building scheme, and describes the mitigation of the works on the site's significant assets. In addition, it refers in detail to the Conservation Management Plan conservation philosophies and describes how these are integrated into the architect's proposals.

2.2 Aims

The purpose of this impact assessment is to:

1. Assess the impact of the proposed repairs and adaptive re-use building works to the Assay complex, the Boiler House, and repairs to the Mill and the Stamps Engine house on the significance and character of King Edward Mine. This report will be considered as part of the Listed Building Consent application, which will be sent to both the area Conservation Officer and English Heritage (EH) (Jenny Chesher).
2. Indicate the steps that have already been taken by the historic buildings consultant (HBC) to avoid or minimise adverse impacts upon the site, its features and archaeology.
3. Ensure that the site methodologies and principles accord with the conservation philosophies as detailed in the Conservation Management Plan, and with general EH guidance on the Conservation/adaption of Historic buildings.
4. Indicate that the proposed methods and techniques are appropriate to the history, character and outstanding universal value (OUV) of the site and accords with the Cornish Mining World Heritage Site revised management plan (2013 – 2018).
5. Make recommendations for an archaeological mitigation strategy.
6. Ensure the detailed site information presented by pdp Green Consulting Ltd conforms to the overall mitigation strategy for the site.

2.3 Conservation philosophy

General conservation philosophy

A site's importance may relate to its historic heritage, its ecological or mineralogical heritage, or more usually, to a combination of two or more of these factors. Statutory designations (Listed Buildings, etc) and non-statutory designations (World Heritage Site), may well affect or constrain the scope of a proposed project and detailed consultation with relevant statutory agencies will need to take place both prior to and during a project, with a marked emphasis on a continual dialogue with consultants, focussing on the preservation of the historic character of the mining landscape and buildings.

Conservation work usually involves more than just the consolidation of a building or structure. The work carried out must respect its character and should take into account future access and interpretation, as well as the integrity of its surroundings. It is particularly important that all of these aspects are considered from the outset to avoid situations where consolidation or safety works compromise future plans for the site. Thus the process of professional dialogue and assessments needs to be co-ordinated, often by a conservation accredited architect, and broadly follow the pattern of assessment (or conservation management plan), evaluation (excavation or in this case Impact Assessment), and Mitigation (the results of an agreed mitigation strategy). If the project manager is not a conservation accredited architect then the assistance and close liaison of a Historic Buildings Consultant is very important before, during and after works have finished to ensure communication protocol with the respective statutory agencies and to ensure that the works are undertaken to the required standard.

Therefore disturbance to a site should be kept to the minimum required to achieve the aims of the schedule of works and impact assessment mitigation strategy (all of which should have been designed in close consultation with appropriate statutory agencies that is to say, EH, CC (HE Advice), etc. Thus the site should be (as far as possible) left in an enhanced or similar condition as when work started.

Building conservation/adaptive re-use

The conservation of a structure is likely to include a combination of one or more of the following approaches: stabilisation, partial or full repair, selective or full demolition and

adaptive Re-use. schedules of work should incorporate some flexibility of approach and be tailored to specific site conditions and problems. The particular options selected are likely to be influenced as much by immediate objectives (for example, stopgap measures to prevent further deterioration), as long-term aims intended to serve for many decades, but should always take into consideration the intended longstanding use of both the structures and the sites within which they stand.

Wherever possible, conservation approaches should be based on carrying out repairs rather than rebuilding, other options being resorted to only where absolutely necessary. Other structural remediation works are likely to necessitate operations such as masonry removal and re-setting, masonry replacement, re-installation of lintels and other structural timber or stonework, pointing and weatherproofing of areas of exposed walls and perhaps reinstatement or replacement of roof structures and coverings.

The conservation philosophy should be based on principles of replication of existing specifications, perhaps adopting an appropriate period style (if large scale refurbishment is necessary), and following a basic principle of impact reversibility. For example when considering replacement window styles for the Assay complex, appropriate archive evidence needs to be provided to substantiate a general principle of replacement, especially when the adjacent building (Carpenter's Shop) still has its original windows, all dating from the early 20th century when many new buildings were constructed across the site.

Specifications

- Traditional building materials (for example, brick, stone, or appropriate timber) can be used when consolidating historic buildings.
- Traditional lime mortar mixes should generally be used, using locally sourced aggregates to match the original mortar composition or locally sourced rab for the Couthouse Complex. Mortar test panels should be made to permit the selection of appropriate aggregate mixes/colour and finish before the pointing work is undertaken.
- Cement and modern materials should be used very rarely and only when the need for their use can be demonstrated.
- Where possible the original form and specification of windows, gutters, downpipes, timber weatherboarding, etc should be researched by viewing archive information and reference on site, to replicate and complement the existing style found at KEM, if replacement is warranted.

Whatever approach is taken, the need for flexibility, sensitivity, authenticity and above all, reversibility must be recognised from the outset, and, where possible incorporated into the design brief.

3 Statements of Significance

3.1 Definition of Outstanding Universal Value and Significance

The Outstanding Universal Value (OUV) of the Cornwall and West Devon Mining Landscape was described in the Nomination document for World Heritage Site Status *'The Cornwall and West Devon Mining Landscape was transformed during the period 1700 – 1914 by early industrial development that made a key contribution to the evolution of an industrialised economy and society in the United Kingdom, and throughout the world. Its outstanding survival, in a coherent series of distinctive cultural landscapes, is testimony to this achievement'*. The *'coherent series of distinctive cultural landscapes'* comprises ten areas of Cornwall, one of which is the Camborne and Redruth Mining District (Area A5i). There are seven main components identified in the Nomination Document through which the OUV is physically expressed: mine sites, mine transport, ancillary industries, mining settlements and social

infrastructure, miner's smallholdings, great houses and estates, and mineralogical and other sites of scientific importance. Individual aspects of the cultural heritage making up the site have differing levels of significance; some may be of an international importance, whilst others will be of national, regional or local significance (OUV of the Cornwall and West Devon Mining Landscape 2007, 2).

The **Outstanding Universal Value** statement for WHS Area A5i is: '*The mid-west Central Mining District, the richest non-ferrous metal mining district of the late C18th and first half of the C19th, the most populated, most urbanised, the most innovative in the Site, an internationally significant centre for safety-fuse and rock-drill manufacture and an epicentre of migration ... **King Edward Mine**, the former practical training base for students at the world-famous Camborne School of Mines, is one of Cornwall's two complete mine sites and contains a unique collection of restored historical machinery*'.

Once the overall relative significance of mine sites has become apparent, through statutory (Scheduling), non-statutory (WHS areas) designation, and the process of compiling a conservation management plan, identifying and prioritising significant elements within the mine site can take place. These are usually graded in relative categories from High, Medium to Low.

3.2 Statements of Significance for King Edward Mine

International significance

Significance of the Site to the World Heritage Site

King Edward Mine is a central pillar within the Cornish Mining World Heritage Site (WHS). The overall complex has Outstanding Universal Value as the best preserved mine head complex within the WHS for the 1700 – 1914 period. Outstanding Universal Value is a central theme of the World Heritage Convention, and it means exceptional international significance. It is only used for heritage, which meets the World Heritage Convention relevant criteria and conditions of integrity, authenticity and management for the particular WHS.

Sited at the western end of the Great Flat Lode, this is the most complete 19th/early 20th century mine site and the most significant example left in Cornwall, demonstrating key authentic aspects of the Cornish mining industry. In addition, it is virtually a complete example of a late 19th and early 20th century mine training school (by Camborne School of Mines to learn practical mining, mineral processing and surveying). As such it was of international importance for training mining professionals. Camborne graduates are known and respected throughout the international mining industry, maintaining the influence that Cornwall has on the mining world over the centuries.

Of special significance is the nature and extent of working examples of 19th and 20th century tin dressing equipment and mine machinery at KEM, many of which are unique or rare survivals in the world. Stored within the site is an extensive collection of Trevithick Society artefacts, many of which are internationally rare examples.

There are only five mine sites in the World Heritage Site that are left with substantial elements of their original equipment; there will not be any more. Three are in close proximity in the former Camborne/Redruth Mining District, where tin mining continued through much of the twentieth century. They collectively and predominantly represent exceptional survivals from the first quarter of the twentieth century and all contribute to the best preserved mining landscape in the Cornish Mining WHS.

KEM lies within the Camborne and Redruth Mining District (WHS Area A5i), amidst one of the densest concentrations of significant industrial sites anywhere within the WHS. It lies within the south-western sector of the Area and at the western end of the Great Flat Lode; a landscape renowned particularly, for its tin mining and dressing (mineral processing) archaeology.

National significance

King Edward Mine individual buildings

The entire KEM site contains over thirty nationally significant buildings, many part of larger complexes; including the Assay Office complex and the Mill complex – all of which are Grade II* Listed, with the exception of the nearby South Condurrow Stamps Engine House which is Grade II. To the east, the Fortescue pumping and winding engine houses are also Scheduled Monuments of National importance.

Significance of individual buildings to group value

All the major buildings on the site are Grade II* Listed because of their group value, with the exception of South Condurrow Stamps Engine House. The KEM complex is of the highest integrity with exceptional group value that represents key authentic aspects of the Cornish mining industry and a training school site (Camborne School of Mines) of international significance. The significant sites within the core complex includes the Counthouse and Carpenters' Shop complexes (See Figure 4: Sites 1-7, and 11-14); both are highly significant, and retain high degrees of originality and character (although this may be masked externally). Other significant sites are either rebuilt or lack degrees of originality, etc.

Significance to Cornwall

King Edward Mine Museum now performs a role as a visitor and educational gateway centre to provide interpretation and orientation for the Camborne and Redruth Mining District of the WHS. It also features relevant WHS interpretation strategy themes for Mining the Resource: the Great Flat Lode; Cornish tin dressing (with steam stamping); Camborne: Engineering Town of the West, including in particular Holman's and the 'Widow Maker' Holmans rock drills, including the Mineral Tramways multi-use trails that have been created within the past decade.

Other local and popular mining heritage attractions in this WHS Mining District include Heartlands and East Pool Mine. KEM will further develop joint co-operation and help to promote their combined industrial heritage relationship, which will be of great potential significance in the future.

4 King Edward mine buildings

4.1 Site history (summary)

Following the establishment of Camborne School of Mines in 1896, the eastern section of South Condurrow Mine (1864-1896) was leased from the Pendarves Estate and renamed King Edward Mine (KEM) in 1901. Three years later after the mine was equipped with new surface machinery, buildings and a new Mill, it was successfully operating as a training facility (above and below ground) for students of Camborne School of Mines, the main practical mine training school in the country.

The new Stamps and Mill building were built first, followed by the Carpenters' Complex in c1903. King Edward Mine had no building for a Counthouse (administrative offices), a Carpenters' Shop, an Assay office or Machine Shop, as South Condurrow Mine still retained ownership of these original sites (Sites 1 – 6). It does seem therefore that soon after the new timber shiplap construction of the Carpenters' Shop (Sites 11 – 14), South Condurrow Mine folded (in 1903) and gave up the lease of the (earlier) Counthouse and Assay Complexes (Sites 1 – 10). All of which was subsequently purchased by KEM in the same year. An aerial view of the site is shown in Figure 2.

Figure 4 is a site inventory map of all the King Edward Mine buildings. Construction of buildings from the early 20th century continued after the Carpenters' Shop (Sites 11-16), a Calciner (Site 21), a new Mill (Site 26), and a new Winding engine boiler house (Site 25 - after 35 years of use a more modern efficient boiler was necessary!). Also at

this time a new (Californian) Stamps (Site 27), and a new steam Mill engine (Site 28), were installed. In 1907, when it was plain that the cost of renewing the existing winding engine was prohibitive (and the new boiler that had been installed had not really helped proceedings), a decision was taken to construct a new building for the installation of a new twin drum horizontal steam winder (Site 30). This stayed *in situ* until the 1940s when it was sold to Castle an Dinas wolfram mine. It has subsequently returned and has been rebuilt.

This mine complex retained the same building footprint for approximately 60 years until the mid-1960s when a few relatively unnoteworthy buildings were added – mostly of galvanised steel and timber frame construction. Happily, it appears all of the timber buildings that had been erected during the early 1900s have been regularly maintained – no doubt resulting in their excellent general condition in the 21st century. The build quality of reconstruction of the steam engine and compressor houses in 2009, after they had been burnt down in 1957, is perhaps testament to the conservation philosophy of the King Edward Mine volunteers, reflecting the site's significance, character and closely following EH guidance for its conservation philosophy (Section 2.3).

Part of the site, which included the mill complex and associated buildings became redundant in 1974 when CSM relocated from Camborne to Pool. A volunteer group was set up in 1987 to try to preserve these now redundant structures, to restore the mill and in time to open it as a museum. This was achieved and the museum opened in 2001. CSM finally terminated their lease for the whole KEM site in 2005, when responsibility for the operation and development of the museum passed to King Edward Mine Ltd. In 2009 Cornwall Council acquired the freehold of the site from the Pendarves Estate.

A more detailed history of the site is produced in the King Edward Mine Conservation Management Plan (Buck 2013).

4.2 Project background information

Investment by Cornwall Council and a grant of over a million pounds from the ERDF Convergence Programme for Cornwall and the Isles of Scilly (2007 to 2013) is currently being used to restore and adapt both the Couthouse and Carpenters' Complexes, both presently underused buildings. This will bring back into economic use both buildings, remove the Couthouse from the HAR Register, improve long-term sustainability and underline KEM's standing within the Cornish Mining World Heritage Site.

A second phase of works are now proposed: An application to HLF is currently in assessment to fund repair and adaptive reuse works to other sites within KEM including the Assay Complex, the Boiler house, the Mill and secondary conservation works to the Stamps engine house.

The site inventory map for the core King Edward Mine buildings is reproduced in Figure 4. This shows site numbering for every building, cross referencing to the appropriate detail record sheet given in the two sections below. The history of the phased development of each site or complex is described in each specific detail record sheet; however, a general summary is also given. Figure 3 is an aerial photograph of KEM with building functions labelled. In order to promote the sustainability of King Edward Mine in the future, it is important to understand the site's significant assets, particularly as the site has such high statutory designations and is such a significant part of the World Heritage Site; by analysing in detail all significant buildings, features, fittings, etc and in particular those sites that may be impacted by future projects, for example, adaptive reuse. This information can be given to the relevant officers and architects to enable them to mitigate negative impacts, and promote positive conservation specifications.



Figure 2 A HES aerial photograph (2009) of King Edward Mine with building functions labelled (before the horizontal steam engine winder and compressor house was rebuilt)



Figure 3 A plan showing existing views of King Edward Mine transposed onto a phase map of site development. Only the Assay, Boiler house, and Mill buildings are relevant to this report



Figure 4 A core plan site inventory map of King Edward mine buildings. Refer to the Table 1 for site number descriptions

4.3 Summary site inventory table of building conservation, adaption and repair works impacted by the proposed changes (Table 1)

Site No.	Site	NGR (SW)	MCO No.	LB Ref.	EH HAR Register	Existing function	Proposed function	Assess Sheet No.	Site Impact (Rating)	Physical Impact (comments)
8	Assay Office Complex: Sample House	66317 38905	56570	1142686	Yes	Unused	Café	R4	R (H)	High external visual and internal impacts
9	Assay Office Complex: Wash House	66320 38902	56570	1142686	Yes	Unused	Café	R4	R (H)	High external visual and internal impacts
10	Assay Office Complex: Cycle House	66322 38898	56570	1142686	Yes	Unused	Café	R4	R (H)	High external visual and internal impacts
15	Welding Shop	66360 38922	56720	N/A	No	Workshop	Workshop	N/A	M (L)	Low external visual and internal impacts
16	Machinery workshop	66363 38916	56720	N/A	No	Workshop	Workshop	N/A	M (L)	Low external visual and internal impacts
17	Toilet block	66361 38896	56721	N/A	No	Toilets	Toilets	N/A	M (L)	Low external visual and internal impacts
19	Survey office	66362 38879	56722	1311128	No	Lecture room	Lecture room	R6	M (L)	Low external visual and internal impacts
20	Lecture/AV Room	66355 38873	56722	1311128	No	Lecture room	Lecture room	N/A	R (L)	Low external visual and internal impacts
21	Calciner and chimney	66393 38878	52506	1159243	No	Exhibition Room	Exhibition Room	R7	R (L)	Low external visual and internal impacts
23	Infill site	66390 38881			No	Entrance corridor	Entrance corridor	N/A	R (L)	Low external visual and

Site No.	Site	NGR (SW)	MCO No.	LB Ref.	EH HAR Register	Existing function	Proposed function	Assess Sheet No.	Site Impact (Rating)	Physical Impact (comments)
										internal impacts
25	South Condurrow winding engine boiler house	66395 38895	56723	1159235	Yes	Unused store	Exhibition room	R9	R (M)	Medium external visual and internal impacts
26	Mill House	66385 38895	56724	1142687	No	Dressing floor demonstration	Dressing floor demonstration	R10	R (L)	Low external visual and internal impacts
27	Californian Stamps and Building	66377 38909	56728	1159218	No	Dressing floor demonstration	Dressing floor demonstration	R11	R (L)	Low external visual and internal impacts
28	Mill Engine Room	66380 38919	56728	1159218	No	Exhibition Room	Exhibition Room	R12	R (M)	Medium external visual and internal impacts
33	Sulzer engine room	66372 38907	56725	N/A	No	Working engine room	Working engine room	N/A	R (L)	Low external visual and internal impacts
43	Walled Yard (Stamps Engine House)	66308 38896	N/A	N/A	No	Cobbled yard	Cobbled yard and new Café extension	N/A	R (H)	High external visual and below ground impacts
44	South Condurrow Mine Stamps Engine House, boiler house and loadings	66301 38874	56539	66556	No	Accessible Monument	Accessible Monument	R14	R (M)	Medium external visual and internal impacts

Note:

- Site numbers relates to core site inventory plan (Fig 4).
- MCO No. is the unique identifier given to each record in the HBSMR.
- LB Ref. is the National List Entry number on the National Heritage List for England.
- EH HAR Register: English Heritage at Risk Register 2014.
- Assess Sheet No. related to the relevant Detail Record Sheets (Sections 6.2.1 and 6.3.1).
- The impact significance column shows that all sites are regionally important 'R'. The letter in brackets (H=High, M=Medium, L=Low) summarises the impact of the proposed works on the site. Section 5 and the site inventory text describe this in more detail (Section 5.2.1).
- Many unused buildings have been used for temporary storage by Trevithick Society/KEM for a variety of items of historical interest.

The methodology of approaching the issue of sustainability to such significant buildings has been to focus on two fronts; firstly, to utilise and adapt existing building surveys of the mine to assess each building's significance, originality and phasing. Secondly, to produce building record sheets (for significant sites only), describing in detail all aspects of the building's history, condition, function, significant features, contents/fittings, machinery, and if appropriate, any known recent site impacts. These sheets are in effect, conservation statements. But they also include information relating to proposed impacts, a result of the proposed scheme for adaptive reuse and to promote future sustainability of the entire site as a whole.

5 Assessment of impact and mitigation

5.1 Impact significance definitions

The potential impacts during works are described below (and summarised in tabular form in Table 1), for each site. Impacts are described in the text section for each site on a feature-by-feature basis. The following site impact terms are used within each site identification description relating to the impact assessment and site gazetteer:

Major positive	Site continues in, or is restored to, its original design and use.
Moderate positive	Site restored as far as possible respecting its original function, but its use is altered.
Minor positive	Site partially restored; interpretation introduced.
Negligible positive	Stabilisation/maintenance of site,
Negligible negative	Benign neglect – losses of fabric over a long period of time.
Minor negative	Site suffers areas of alteration or damage, which contribute to loss of meaning.
Moderate negative	Significant loss of fabric or alteration, leading to erosion of original character.
Major negative	Complete demolition/removal.

5.2 King Edward Mine Museum redevelopment project

5.2.1 Site impact and remediation summary

Figures 2 to 4 show the spatial relationship between the buildings that will be impacted; primarily adaption of the timber framed Assay complex to a café (with a modern extension), and adaption of the Winding Engine boiler house to create an exhibition facility, in order to increase visitor numbers and so improve sustainability. Other works include general building repairs to the mines' building fabric namely: Like for like replacement of the Mill and Stamps Roof, consolidation works and improved public access to the South Condurrow Stamps Engine house, like for like replacement of the KEM AV/meeting room and entrance flat roof, and other small insulation improvements. The King Edward Mine Conservation Management Plan (Buck 2012), contains a detailed significance and character description and a conservation philosophy (in Section 2.3), that has informed and guided the architect and design team when forming these proposals.

Proposed physical and visual impacts are varied for both sites; the Assay complex being of traditional 1860's timber frame and horizontal ship lap construction with (originally) a timber boarded or corrugated steel roof, whilst the Winding Engine boiler house was re-built and enlarged in 1904. The proposed functional use of these buildings and resulting impacts to these different construction forms are markedly different. Refer to Figs 5 and 6 for detailed significant features and to Figures 7 to 10 for the site impacts, etc.

Assay Complex (Section 6.2 Sites 8 to 10)

Externally, the Assay complex (Assay house, Samples House and Cycle house with shelter), will have its old weathered assortment of timber facing carefully removed from its timber frame, and replaced with a style replicating other timber buildings around the site. The roof, recently replaced with new galvanised corrugated sheets, is to remain galvanised – although it will be insulated internally. The two assay hearth chimneys are to be rebuilt (based on original photographic evidence) to their original height. This building style has been shown to exist around the turn of the 20th century – a period that was highly significant for the KEM site, and for which detailed archive information is evidenced photographically. The same conservation principles extend to the window design; again these replicate the style shown by photographic evidence (see Pdp Green Consulting Outline Heritage Impact report June 2014). Internally, the consequences of dampness through the deteriorating roof and walls have affected the timber frame and lath/plaster ceiling of the Assay hearth building. Remediation impacts will need to include re-lathing and plastering, re-timbering and the consequence of adhering to 21st century building regulations for insulation measures.

Given the small size of the assay buildings, it is proposed that a new build is constructed parallel to the existing (on the site of the former Stamps Engine Boiler House coal yard), to a similar length and width for a new kitchen preparation area and additional seating etc. The existing opening in the west wall will need to be enlarged to permit a doorway, and a new doorway added from the former Samples House to the new build. This will improve access to the three buildings that are on different levels. There is no doubt that this will impact upon the external character of the existing building, and archaeologically below ground level through the former cobbled coal yard for foundations and services, etc. However, the careful siting of this new build (given its comparative external styling), should not detract too much from the 19th century Assay complex building's existing character (as seen from the KEM core site). The proposed design internally reflects 21st century functional changes in order to attract outside investment to improve long term sustainability. Overall, the visual impacts of newness will be high and significant but they can be seen in the context of arresting the obvious fabric decay of this 'At Risk' building, which in the past has effectively reduced the character of this part of the complex.

The major impact sites are described in the first instance, with the remainder (in the main roofing and cladding repairs) described in summary form:

Winding Engine Boiler House adaption to exhibition space (Site 25)

The aim of this part of the project is to convert the Boiler house (Grade II*, also an EH At Risk building – previously used for storage), into an open plan exhibition space and interpretation centre, focussing on social and human stories related to the Great Flat Lode covering the last 5000 years to the present day – from the archaeology of Carn Brea to the work of the KEM volunteers to promote the sustainability of this important site.

Externally, the building will have its patched and deteriorating scantle slate roofing removed and replaced with newer (but second hand) scantle slate (wet laid to match the existing specification), to restore this roof to its original appearance in line with the adopted conservation approach. In addition, archive photographs show the boiler house roof had a vent along a section of the ridge line. This is to be replicated in the revised roof design (based on photographic archive evidence), and will be an enhancement to the building (mirroring the same specification for the vent constructed to the Smithy part of the Counthouse Complex in 2014). The stone masonry walls will be raked out and re-pointed, the style matching existing. Defective timber to windows, window frames, cills and doors will be replaced or sections re-scarfed where relevant. Generally the windows are to be repaired and retained utilising their existing style (c1904); all the boarded-over windows are to be revealed and former blocked doorways reinstated. New gutters and downpipes are to be installed to match the 1904 specification (when this boiler house was rebuilt).

The (front) south elevation doors (possibly dating to 1904 when the building was rebuilt), tend to blow open in the wind – an operational Health and Safety issue for the KEM volunteers. It is proposed to utilise sliding doors (hanging from the visible newer concrete lintel), with a vertical timber Tongue and Grooved external finish to mimic the door's existing character. The doors will be accessed via a new raised section of ground from the exit of the site entrance kiosk through the opened sliding doors into the new lobby (see Fig 13). The newness of these external and visual impacts are therefore visually significant, although their physical impact is localised at ground level. The provision of inclusive access is an important factor in HLF funding eligibility which is vital for this project. Their reversible physical and visual impacts are considered to be reasonably outweighed by the consequent benefits.

Internally, there is a greater physical and character impact to provide an alternative and more sustainable change of use for the mine. At the entrance it is proposed that a lobby area space be formed, with the existing small decorative floor tiles carefully removed and reused at a similar location. The studwork, glazed partition and lobby doors will allow a view all the way through the building to minimise the impact of the new lobby. The shape and form of the original boiler will be highlighted on the new timber floor and an etched pattern on the new front entrance doors. The boiler house still retains its earth floor and may never have been boarded), but is likely to contain the buried but extant underground flues to the chimney, and possibly the curved mounting stones that once supported the long Cornish boiler. It is proposed that this floor be covered with a blinding material, a plastic membrane and then a concrete floor slab (with insulation and a timber floor finish over). Although this would technically be a reversible impact, in reality it would be very expensive to undertake, an unlikely scenario for a charity. It would therefore be a permanent solution. However, the archaeology would be preserved! The most significant (physical) impact therefore would be the installation of a new concrete floor, albeit hidden.

Internal walls would be repointed where appropriate and lined where the outside face is below ground level. (Reversible) damp lining solutions will be applied to the internal face of the walls (as physical constraints to the external face do not present an alternative). However, the open roof showing the purlins and rafters will be retained.

Mill and Stamps building refurbishment (Sites 26 and 27)

The aim of works to this site is to provide an improved (from asbestos roofing to cement based), new weatherproof roof over the existing Mill and Stamps buildings (and to install solar panels on two south elevations) – that house the only 19th century working dressing and Stamps floor in the world. Like many of the core mine buildings, these are also Listed Grade II*. Other works to this complex includes limited repair or replacement of decayed roof timbers and purlins, valley gutter timbers and the installation of new timber doors to replace existing (where decayed/damaged).

Externally, the building will have its asbestos based roofing panels replaced with cement panels of the same design. Solar panels will be installed on two southern slopes, with its former rooflights removed and re-sited on the northern side, all of which are to be renewed to a GRP translucent specification. Having additional (north) roof lights is less damaging to the timber machinery and provides more natural light. In addition, some of the steel sheets lining the walls will need replacement where they have rusted. The newness of these external and visual impacts (especially the new solar panels) are therefore significant, although these will be set back from the west side of the building by 1.5m, and their physical impact is therefore less.

Internally, the physical impacts relate to the replacement of some failing timber components (valley gutters and some upper sections of timber columns), and the installation of new (some wider for improved disabled access), timber doors – matching the style of existing openings.

Other general impacts (within the core (LBII) site:*

Section 4.3, the summary table of building conservation, repair and adaption works outlines the relevant sites. A large majority of the remaining site impacts relate to general repairs (Note: Some of the specifications in this text may yet be altered following consultation with EH, etc):

Sites 15 and 16 (Welding and machinery workshop – Sites **not** Listed): Replace existing asbestos roof and wall cladding with cement equivalents. Localised repairs of exterior timberwork and frame. Replace 1960s period gutters with half round cast aluminium profiles and the addition of new internal background heating.

Site 17 (Toilet block– Site **not** Listed): The replacement of an existing corrugated steel roof with a new steel equivalent. Replacement of the existing asbestos flue pipe with cement equivalent.

Site 19 (Survey Room): General repair works to the roofing slates, the exterior timber cladding and repair of the window frames/cills where necessary (with re-painting). Replacement of the existing boiler hut asbestos roof with insulated GRP. Replacement of the existing Safe Room bituminous flat roof with insulated GRP or a new felt roof.

Site 20 (Lecture/AV Room): General repair works to the exterior timber cladding and repair of the window frames/cills where necessary (with re-painting). Replacement of the existing bituminous flat roof with insulated GRP or a new felt roof, and construction of a new concrete ramp to replace the (unsuitable) existing version. Internally, the existing plasterboard lining will be removed and replaced by insulated plasterboard lining. The existing chipboard floor will be removed and a new suspended insulated chipboard floor inserted.

Site 21 (Calciner and chimney): A new lightning conductor will be added to the exterior chimney. The copper rod from the aerials will go down the inside of the chimney to an earth mat/drill hole to provide earth impedance.

Site 23 (Entrance corridor section): Replacement of the existing bituminous flat roof with insulated GRP.

Site 28 (Mill Engine Room): General repair works to the roofing slates, the exterior timber cladding and repair of the window frames/cills where necessary (with re-

painting). Replacement of the cast iron ogee gutters/downpipes with new equivalents. Internally, the existing asbestos cement boarding will be removed and replaced with a cementitious equivalent specification.

Site 33 (Sulzer Engine Room): Replace existing asbestos roof with plastic rooflights with cement and GRP equivalents. Localised repairs of timberwork and frame.

Stamps Engine House conservation works (Site 44)

Given the proximity of this Stamps engine house to the proposed Assay Café and the existing Mineral Tramways path/cycle route, it is an ideal site for providing increased public access, and an excellent viewpoint for seeing the eastern section of the Great Flat Lode. To this end, this building needs to have enhanced building conservation works and to improve some of the previous conservation works undertaken in 2000 by Kerrier Groundwork Trust.

Externally, the building will be scaffolded to provide access to the remaining wing wall and upper sections of the engine house (bob wall/gable wall, etc), for wall capping and general repointing, since it was first conserved fifteen years ago. In addition, the north east corner will be built up to strengthen the building (up to plinth level), and to permit safe public access into the building (and loadings viewpoint) via granite steps on the west side. In places, the stone masonry walls will be raked out and re-pointed, the style to matching existing. The existing black painted steel loadings fence is to be extended around the outside edges of the loadings, rather than just around the shaft (sited within the loadings – see Buck 1999).

Internally, a granite cylinder bedstone (currently located outside the building on its north side), will be repositioned back to its original site, helping to present the original form of the internal layout of the building and its main components. In addition, safety measures of using steel grilles for dangerous openings will be used to make the site a safe experience for children and adults alike.

Site compounds and site (vehicular) access

The works will involve installation of services to the Assay complex site only, which will require some excavation externally (some under the recently excavated Stamps engine house 'coal yard'. Service installation trenches will use similar or reused materials to retain the ground's current character. These sites are not shown in this report (their nature and extent are not known in detail at present). Where shown, finer grain matching resin based material will be used to create paths suitable for wheelchair users (again on the west side of the proposed Assay Café), and the nearby Mineral Tramways Trail. Elsewhere existing surfaces will be retained. Thus, there will be very little impact on the character of the existing (industrial 'feel') surface surrounding the core buildings.

Site compounds will be at a mutually agreeable site (to KEM) close to these buildings but not affecting nor impacting upon the publicly accessible and working operation of the museum. It is likely that this will be in the former dressing floor site west of the core buildings, and north of the new Artefact Store. Site vehicular access will be via the existing access road into the complex.

Impact reduction measures:

Detailed liaison with the project's conservation architect (Claire Newman of pdp Consulting Ltd) and appropriate statutory officers EH (Rhiannon Rhys), Conservation Officer (Nina Paternoster) and County Planners, with non-statutory advisers (Cornwall Archaeological Unit and KEM Ltd), will minimise impacts to the site's setting and character. Throughout the design and specification process the Design Team have ensured that the impacts have been reduced as much as possible, and that the scheme accords with the general conservation philosophy produced in the Conservation Management Plan.

An historic buildings consultancy, and archaeological recording before and during the site works may be able to minimise any further below ground site impacts, but also

record any visible/disturbed archaeological features and to record the nature and extent of the building conservation works.

Residual impact mitigation:

There will be a high degree of visual residual impacts – mainly affecting the external appearance of the main core buildings in terms of new roof and wall coverings, repaired and re-painted timber cladding and window frames, but these have been deemed to be positive, accentuating the character of this complex. The only new build being the Café extension, as the existing Assay complex is too small to accommodate its desired function. However, the (new) residual visual impact of the overall scheme will soon fade from people’s memories, as the benefits of increased public access will come to fruition to improve the long term sustainability of KEM, and will be seen to be a substantial public gain for Cornwall and the World Heritage Site.

6 Site inventory impact description and remediation measures

6.1 Methodology

The following sites are described in more detail in the Conservation Management Plan (Buck 2013, Section 3.6.2 (Assay Office Complex) and Section 3.6.4 (Mill and other buildings). All the sites mentioned are summarised in Section 5.2.1, and all have variable impacts. The proposed works for each site are described, followed by a text section describing the reduction (or mitigation and remediation) of each impact, followed by a final section which details the residual impact. To avoid repetitive duplication in this site inventory section, site impact and remediation measures already given in Section 5.2.1 are not reproduced – simply referred to.

The following annotated survey plans for the Assay Complex, the Winding Engine Boiler House, the Mill and the Stamps, etc have been reproduced (with permission) from drawings produced by pdp Green Consulting Ltd, as part of Listed Building Applications for planning permission for change of use. The following detail record sheets provide the site background for each significant part of the complex. They describe in detail all aspects of the building’s history, condition, function, significant features, contents/fittings, machinery, and the proposed site impacts.

- **R4** Assay Office Complex (Sites 8-10).
- **R6** Survey Office (Site 19).
- **R7** Calciner and chimney (Site 21).
- **R9** South Condurrow winding engine boiler house (Site 25).
- **R10** Mill House (Site 26).
- **R11** Stamps building (Site 27).
- **R12** Mill engine room (Site 28).
- **R14** Stamps engine house (Site 44).

6.2 Assay Office Complex adaption to Café

6.2.1 Detail record sheet

Site name:	KING EDWARD MINE	Sheet R4
Building name/identifier:	Assay Office Complex (Sites 8-10): Assay House (Site 9)	
Survey date:	22/7/2014	
Designations:	Listed Building Grade II* (Ref. 1142686 – Assay Office). This site is on the EH Building at Risk Register 2013.	
Location:	NGR: SW 66319 38902 North west side of KEM site. Block Plan Fig 4	
Building at Risk:	Yes	
Recorder:	C Buck	
Plan Ref:	Archaeological Survey Plan Figs 5 and 6. PdP Green Cons. Ltd Proposed annotated survey drawings for LBC (4310I/4311E/4312F to 4315F/4316E to 4320E/4330B).	

Site map and photograph:		
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Construction materials: (walls, roof, floor, ceiling, windows, doors):	<p><i>External:</i> Photographs taken in 2012 (front cover) show a rusty corrugated iron sheet roof, with various forms of rotted ship lap with tongue and grooved timber repairs. All of these are in a precarious state. Within the past year, a new corrugated iron sheet roof with some new rafters has been added by KEM – providing a degree of interior protection for water ingress. The windows are of different periods and styles, but given their condition, all need to be replaced. The north and south (original) exterior side walls are both timber ship lap on a timber frame.</p> <p><i>Internal:</i> Internally, the complex was divided into three rooms with varying functions through time (see site inventory Fig 14). These are separated by stone/brick lime plastered partitions, the middle section (Site 9), with remnants of a lath and plaster ceiling (possibly the original building of the three). The other two room's ceiling was open to the roof. The same middle section has a stone blocked opening, possibly a low door or window to the yard, the remains of an Assay oven, an assay hearth and adjacent, a Victorian fireplace. The original chimneys have gone.</p>
Build date:	Original Assay House Complex (Site 9) c1865-1877.

<p>Modification date:</p>	<p>It is possible that the original specification for the roof (1865) was timber planking painted with bitumen (remnants were removed during the recent re-roofing), but by 1898 (archive photo) the central assay section had newly installed corrugated iron sheets Also at this date the south end wall was partially built of stone and lime (1904 watercolour photo). A corrugated sheet roof was probably replaced by CSM a number of years later when it took over the leasehold of the remaining mine buildings. This (or a subsequent version) was then replaced last year by a modern equivalent, with a northern extension and new supporting timbers to an existing concrete block wall (to provide additional roofed (open fronted) storage space for Trevithick Society Museum items). After 1904 the south end masonry wall was removed and replaced with timber weatherboarding. The existing weatherboarding style varies – a product of its patch replacement during the 20th century. Internally, each of the three rooms appears to have had different functions over time. Internally (no physical access) both Sites 8 and 10 are featureless, with Site 9; the most significant room, retaining the un-modified Assay features. Site 41, immediately outside Site 9 was formerly the mine weighbridge (see Figure ? for site location). Parts of the surface iron plate have been kept by KEM. Early photographs show two chimneys from Site 9, the Assay Office. These are no longer extant.</p>
<p>Original functions:</p>	<p>Variously: South Condurrow Mine Assay sample House/Wash House/Cycle House</p>
<p>Current function:</p>	<p>Unused, derelict and damp. Temporary store for items.</p>
<p>Proposed function:</p>	<p>Provision of a new Café and internal seating area, utilising all existing window openings and access doorways. Given the space in the building is too small it is proposed that a similar sized timber and glass building be added to the west side. It is proposed to provide an option for exterior seating in the former adjacent Stamps Engine House Coal yard (Site 43).</p>
<p>Significant features/contents:</p>	<p>A significant feature is the style of the exterior timber ship lap cladding (replicating similar new buildings at KEM dating from the end of the 19th century). The original footprint and floor level of the adjoining buildings appears to be unaltered. The main significant internal features are those within Site 9 (the Assay Office). The original Assay furnace survives on the west side, near an original (blocked opening). On the north side of this small room, another feature (possibly remnants of a small Assay hearth), is visible next to an original Victorian fireplace and iron surround and inset space for shelving. The original lath and plaster ceiling survives, but is in a very poor condition.</p>
<p>Original fixtures and fittings:</p>	<p>There is debris within each of these buildings – some of which may well obscure original fixtures etc. No other original features were observed (externally) other than those described above.</p>
<p>Machinery:</p>	<p>This is not applicable within each of the three rooms, but there were Trevithick Society Museum items stored.</p>

<p>Summary description:</p>	<p>The Assay House Complex is Listed Grade II* and is now on EH Buildings at Risk Register (2013). This small range of three rooms under a single roof was built to serve the needs of South Condurrow Mine (1865-1896). It appears to have been originally constructed with a masonry rear wall (backing onto the Stamps Engine House Yard: Site 43), and timber frame front and side walls. Although many of KEM's buildings were constructed of ship lap timber, and this site was no exception, it has not been periodically repaired as has other buildings. It has been patched for many years, but not recently, with the exception of a replacement corrugated steel sheet roof within the past two years. The old roof leaked for years, making the interior very damp, negatively affecting the original ceiling and walls.</p>
<p>Completeness and condition:</p>	<p>This is a rare example of a 19th century Cornish mine Assay House Complex. However, this building has been in disuse for many years, much of its timber frame and ship lap is rotten and will need to be replaced. Its existing roof has been replaced with new corrugated steel sheeting, allowing the building to dry out.</p>
<p>Significance/conservation strategy:</p>	<p>The historic group value of this complex of buildings is highly significant. However, given the condition of the structure internally and externally (which negatively affects the site character), its significance and overall site value can be enhanced by rebuilding the external timber frame and (temporary) roof (including new window/door openings) to follow the conservation philosophy of replicating a 1904 specification (a period in time that dominates many of the new adjacent KEM buildings). Given the condition of the external ship lap weatherboarding and windows, they will need to be replaced in a similar style to match the earliest forms on the building and other early forms on the site. The structural condition of the stone partition walls will need to be assessed. The specification for the roof covering, chimney reconstruction and window style will need to be agreed after reference to the conservation philosophy (Section 6.0). However, the conservation strategy could be further informed by research in order to provide evidence of earlier forms of the timber frame fabric style, window openings style and chimney rebuild. Adaptive re-use of its existing form is recommended as long as its significant features (after another site survey), are not compromised.</p>
<p>EH at Risk Register 2013:</p>	<p>Assay Office Complex (Sites 8-10)</p>
<p>Additional requirements for proposed work/any other factors affecting reuse/repair etc:</p>	<p>Additional photographic/filmed research could be undertaken in order to provide definite evidence of earlier forms of its timber frame style, and its form of window openings in order to compile conservation specifications for its repair/rebuild for adaptive re-use. Part of this process has already included post clearance survey into each room to investigate any other significant archaeological features and site constraints. Justification could be made for reinstatement of the Assay Office chimneys, which would add significantly to the site's original character/value.</p>

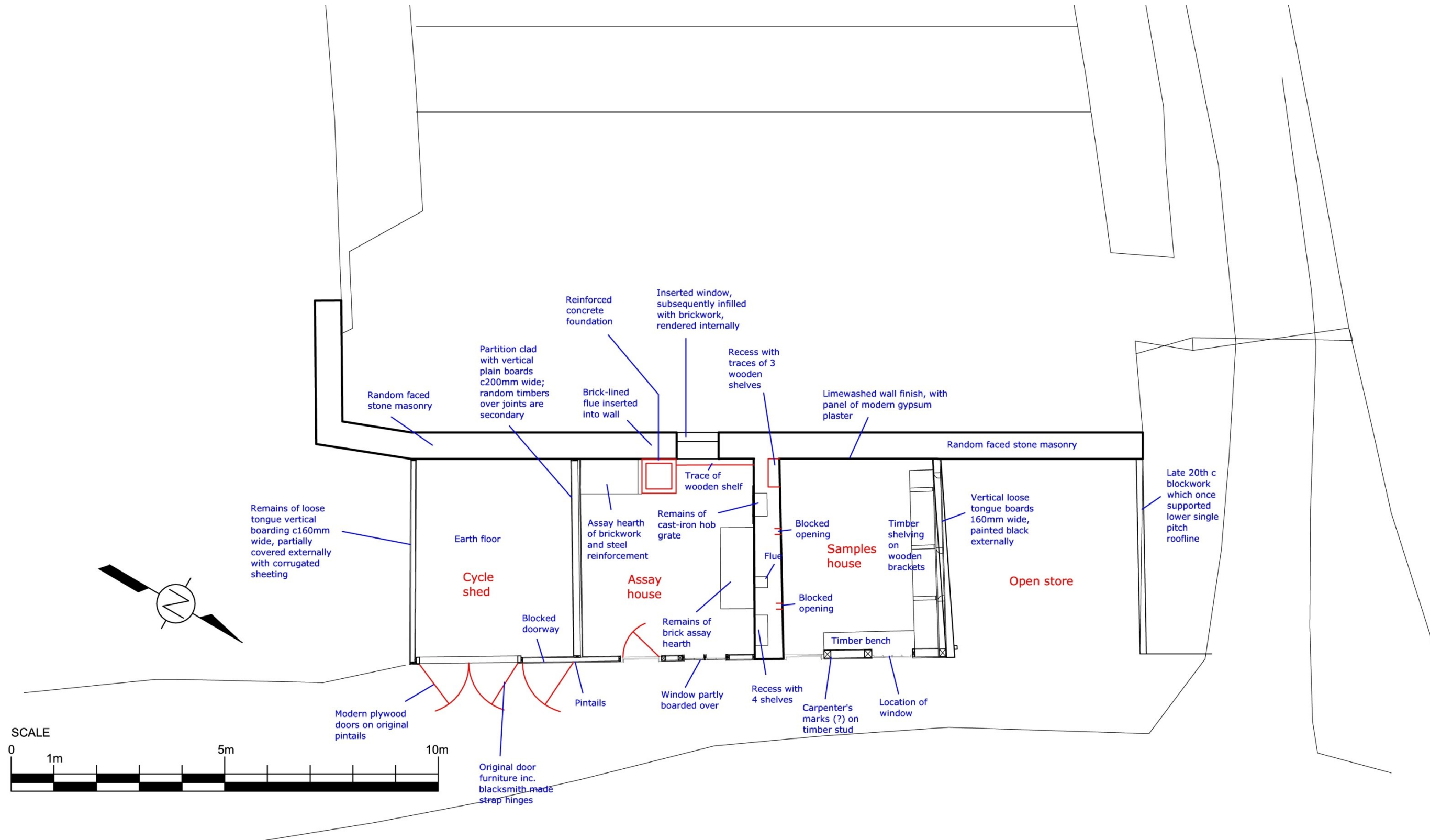


Figure 5 Existing plan site survey and significant archaeological features within the Assay Complex

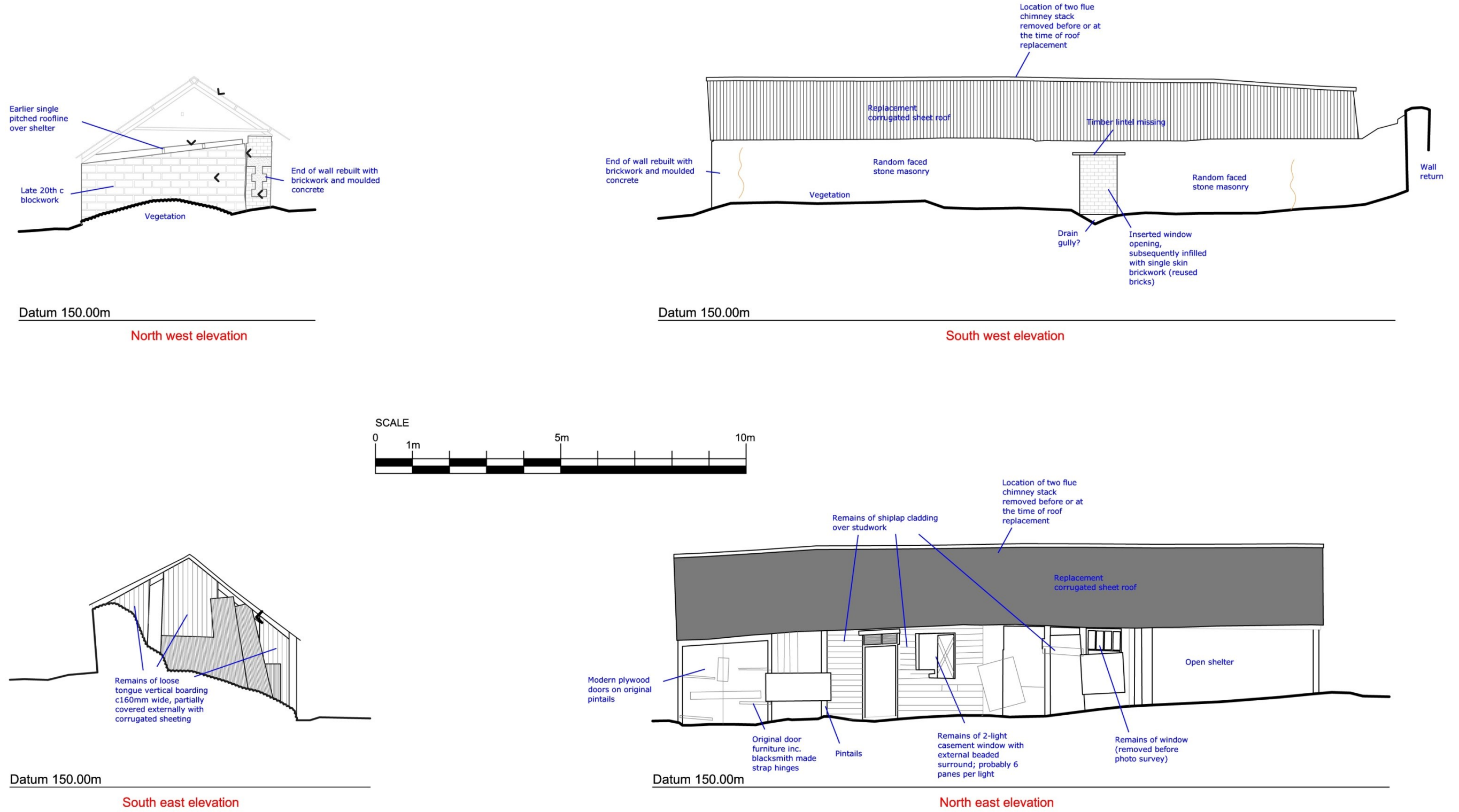
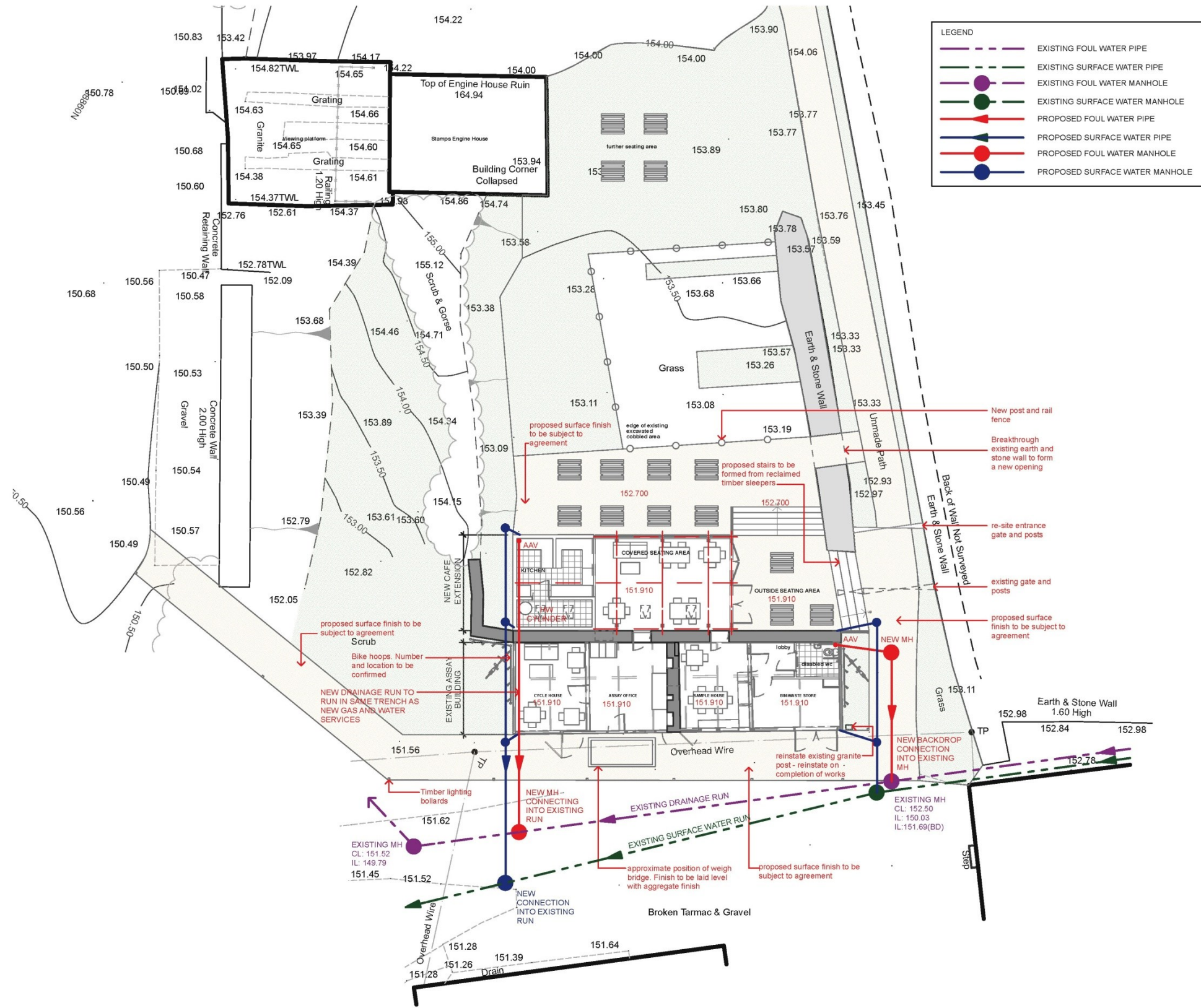


Figure 6 Existing elevation site survey and significant external archaeological features of the Assay Complex



LEGEND

- EXISTING FOUL WATER PIPE
- EXISTING SURFACE WATER PIPE
- EXISTING FOUL WATER MANHOLE
- EXISTING SURFACE WATER MANHOLE
- PROPOSED FOUL WATER PIPE
- PROPOSED SURFACE WATER PIPE
- PROPOSED FOUL WATER MANHOLE
- PROPOSED SURFACE WATER MANHOLE

Proposed Site Plan

1:200

PdP Green Consulting Ltd.
 Calenick House
 Truro Technology Park
 Heron Way, Newham
 Truro, Cornwall
 TR1 2XN
 Tel: 01872 265400; Fax: 01872 276356
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Proposed Site Plan

Scale: 1:200	Date: 16/09/2014	Drawn: KB
J14-008		4320E

Client KEM
Job Title King Edward Mine Museum Redevelopment
PROPOSED

Revisions:

- A. First Issue: 07/04/14
- B. Back scheme D continued to planning scheme 07/5/14
- C. Final scheme 27/06/14 - Round 2
- D. Levels amended to provide level information for construction subject to agreement: 16/09/14

Project Leader: CN
Designer: CN
Assistant: KB

UKAS MANAGEMENT SYSTEMS

bsi

CORNWALL COUNCIL

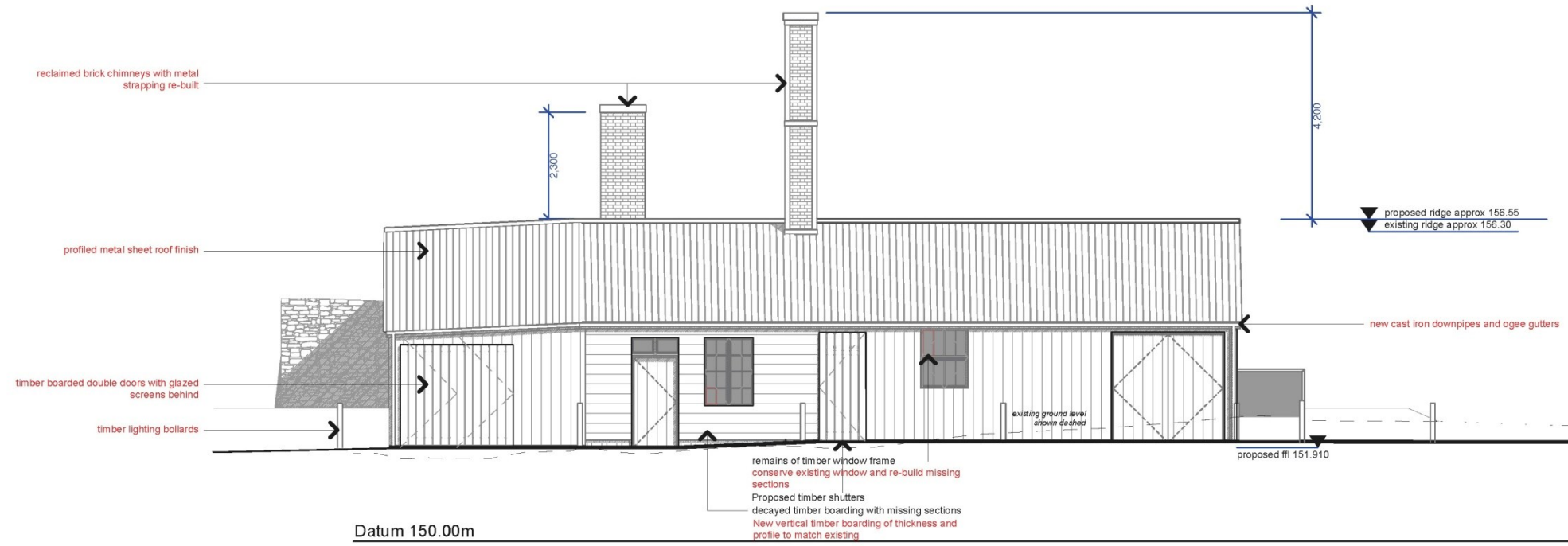
heritage lottery fund

LOTTERY FUNDED

FS 21557

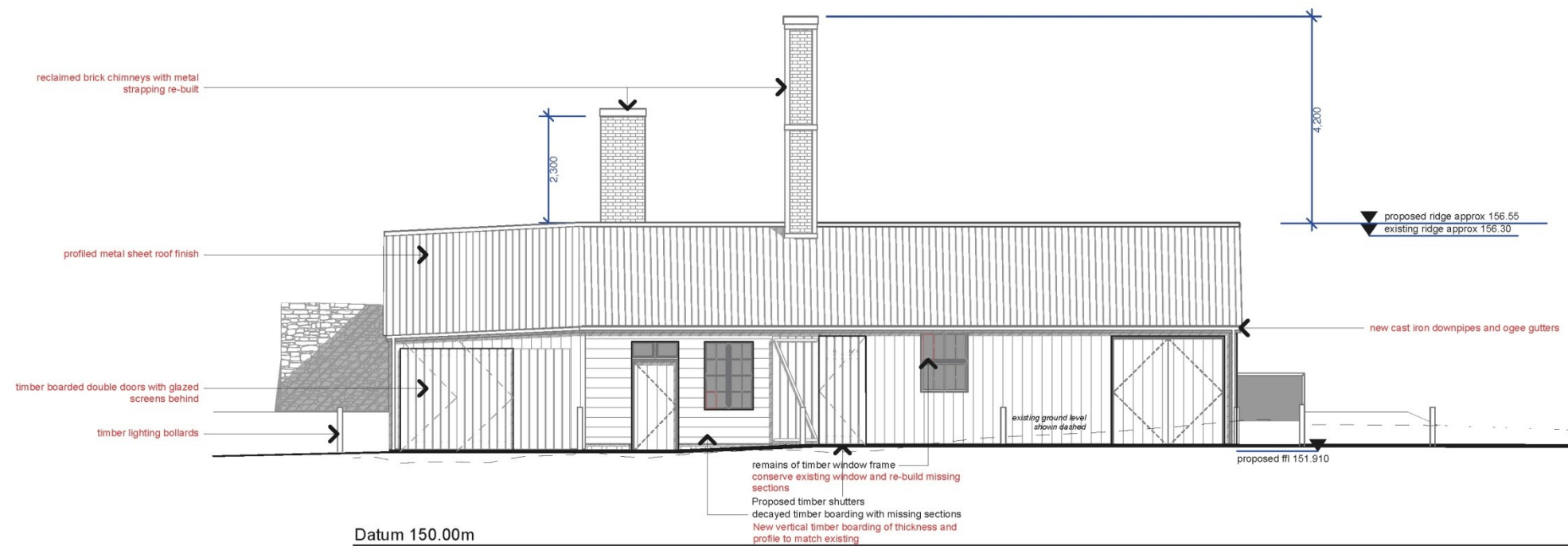
Prefer larger scale drawings. Prefer figured dimensions to scaled dimensions. Check all relevant dimensions, lines and levels on site before proceeding with the work. Take site dimensions for fabrication of joinery and other fittings. Refer all discrepancies to the architect for his/her decision before putting work in hand.
 Copyright in this drawing and in the work executed from it remains the property of the architect.

Figure 7 Site plan of the proposed new Café and extension within the former Assay Complex (PdP Green Cons. Ltd Dwg No.4320E)



Proposed North East Elevation (closed shutters)

1:100



Proposed North East Elevation (open shutters)

1:100



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Drawing Title		Proposed North East Elevation	
Scale	Date	Drawn	KB
1:100	16/09/2014	4312F	

Client	KEM
Job Title	King Edward Mine Museum Redevelopment
O.A.:	CN CN CN CN CN CN
By:	KB KB KB KB KB KB
Revisions:	A First Issue - 24/04/14 B Sketch scheme D completed to planning scheme 07.2.14 C Final revisions for HLP Round 1 D Final revisions for HLP Round 2 E Submission 27/06/14 to provide level access throughout 15.7.14 F Final material approved 15.8.14
Project Leader	CN
Designer	CN
Assistant	KB
PROPOSED	

UKAS MANAGEMENT SYSTEMS

bsi

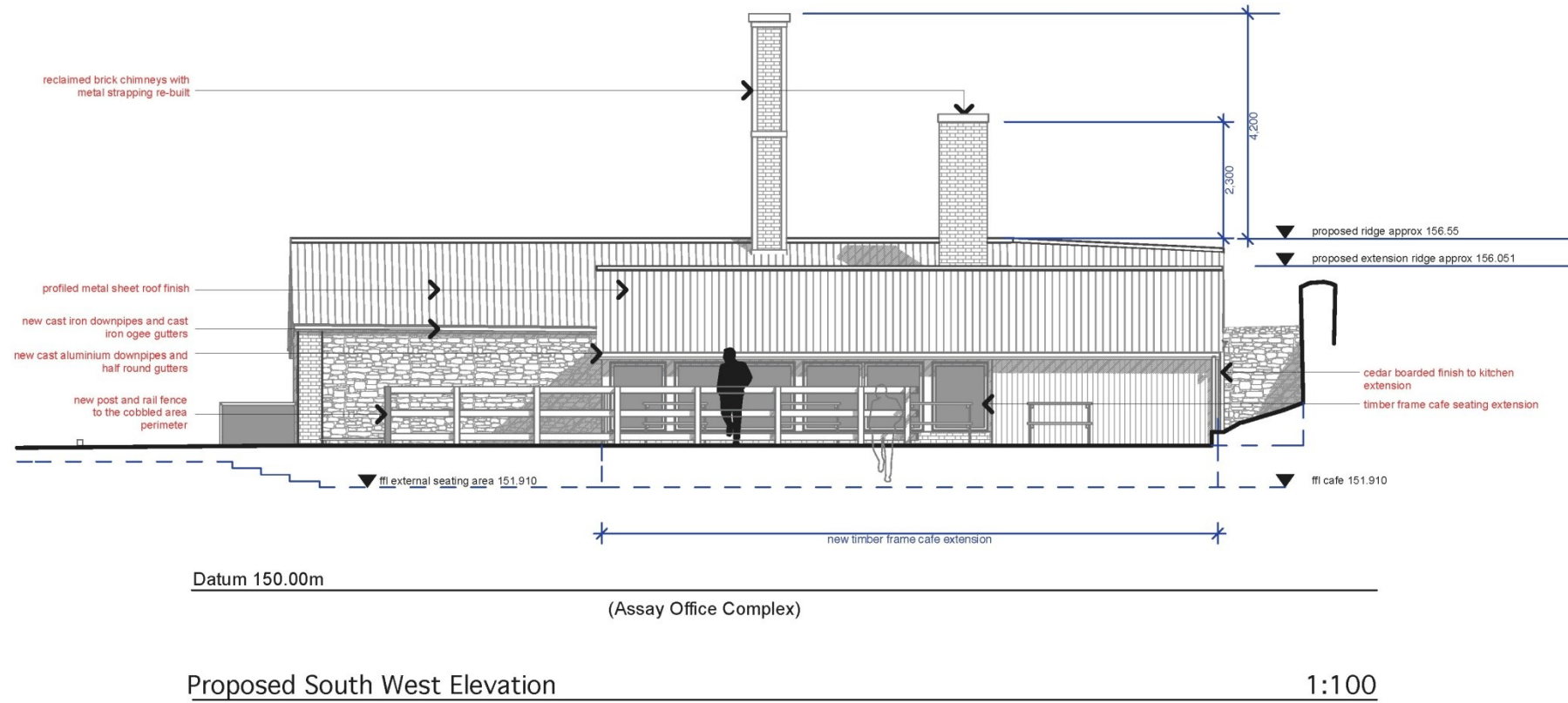
CORNWALL COUNCIL

heritage lottery fund

LOTTERY FUNDED

FS 21557

Figure 8 North east elevation of the proposed new Café and extension of the former Assay Complex (Pdp Green Cons. Ltd Dwg No.4312F)



Prefer larger scale drawings. Prefer figured dimensions to scaled dimensions. Check all relevant dimensions, lines and levels on site before proceeding with the work. Take site dimensions for fabrication of joinery and other fittings. Refer all discrepancies to the architect for his/her decision before putting work in hand. Copyright in this drawing and in the work executed from it remains the property of the architect.



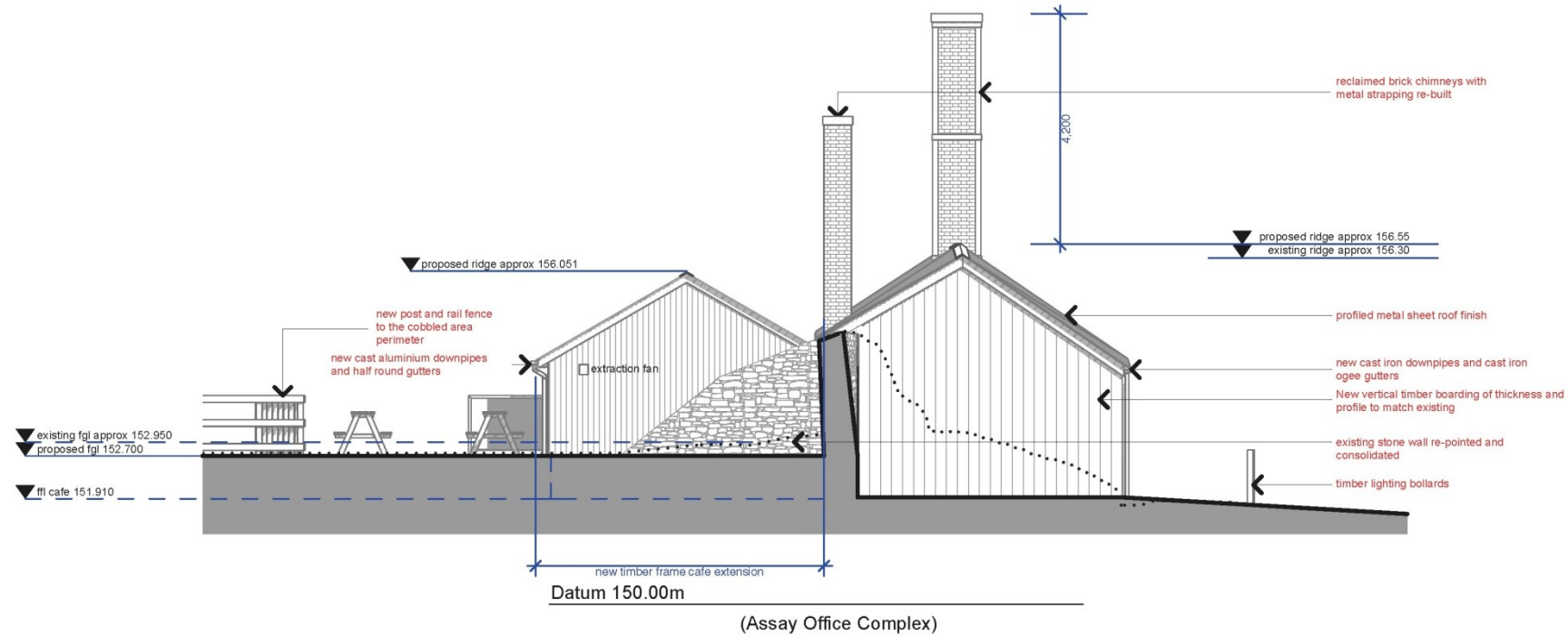
Revisions:	Project Leader	Designer	Assistant
* First Issue - 24.04.14	CN	CN	KB
A Sketch Scheme D 24.04.14			
B Sketch Scheme D continued to 24.04.14			
C Proposed F.F.E. to cafe raised 291.5.14			
D Final revisions for L.F. Round 2			
E Levels amended to provide level			
F Section through to 15.7.14			
G Section through to 15.9.14			

Client	KEM
Job Title	King Edward Mine Museum Redevelopment
PROPOSED	

Drawing Title	Proposed South West Elevation
Scale	1:100
Date	16/09/2014
Drawn	KB
J14-008	4314F

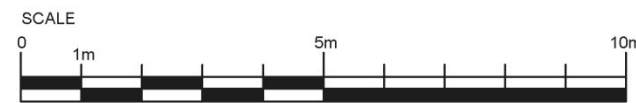
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Figure 9 South west elevation of the proposed new Café and extension of the former Assay Complex (PdP Green Cons. Ltd Dwg No.4314F)



Proposed South East Elevation

1:100



Prefer larger scale drawings. Prefer figured dimensions to scaled dimensions. Check all relevant dimensions, lines and levels on site before proceeding with the work. Take site measurements and photographs. Refer all discrepancies to the architect for his/her decision before putting work in hand. Copyright in this drawing and in the work executed from it remains the property of the architect.

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Drawing Title	
Proposed South East Elevation	
Scale	1:100
Date	19/09/2014
Drawn	KB
J14-008 4313F	

Client	KEM
Job Title	King Edward Mine Museum Redevelopment
PROPOSED	

By:	KB	Assistant	KB
Project Leader	CN	Designer	CN

Revisions:
 - First Issue - 24.04.14
 A (Sketch Scheme D) 28.4.14
 B (Sketch Scheme D) revised to 28.4.14
 C Proposed FFL to café raised 28.5.14
 D Final revisions by HLF Round 2 28.5.14
 E Levels amended to provide level access throughout 15.7.14
 F Final minor amendments 18.8.14

Figure 10 South east elevation of the proposed new Café and extension of the former Assay Complex (PdP Green Cons. Ltd Dwg No.4313F)

Site impacts

Refer to Figures 2, 3 and 4 for site location. Site information for each building is given in Table 1 and detail record sheet 9. Figures 5 and 6 are annotated survey drawings showing the significant features within and around the Assay complex of three buildings, in their existing condition. Figures 7 to 10 are a selective reproduction of proposed plans for the Assay complex conversion to a Café, as produced by pdp Green Consulting following extensive dialogue with the clients. These figures should be referred to during this section.

Significant impacts

- A change in function and use of the former derelict 19th century Assay Complex.
- Construction of a new smaller dimensioned (timber) building on the west side of the Assay Complex. This will necessitate removal of c1.0m depth of ground surface (former coal yard flooring). The adjacent coal yard flooring to the west is being excavated by volunteers.

External:

- All timber cladding will be replaced and renewed, as will some of the timber frames that are unusable.
- Existing windows to be retained and repaired (existing styles to be reused with single glazing).
- The two assay hearth chimneys to be rebuilt to promote a period roof line character.
- On the west elevation outer masonry wall, a blocked window to be reopened, heightened and opening inserted.
- On the west elevation outer masonry wall, a new opening is to be formed to provide access to a seating area and toilets with store.
- The existing corrugated galvanised roof (laid 2011), is to be replaced by a thicker heritage grade and higher grade corrugated galvanised profile. New roof section over new build to have conservation roof lights.
- Black cast iron rainwater goods to be used where none previously exist.
- Resin based gravel pathways to be formed around the new build and former Assay complex to aid disabled users.

Internal:

- New opening to be formed through south timber partition wall of former Assay House to former Cycle House (for additional Café seating/meeting area). Two existing doorways to be infilled with secured doors (Unit 2.2.2).
- New opening to be formed through north timber partition wall of former Sample House to former open storage area (for access to disabled toilets and bin waste/storage area).
- Sound and heat insulation added to all internal Cafe areas.
- Timber frames and original shelving to be renewed where necessary. Lathe and plaster ceiling to be renewed and walls re-plastered with lime mortar (former Assay house only).
- Original earth floors to have new concrete floors.

To summarise, the main tenets of the conservation philosophy has been followed in order to minimise impact; to retain the site's character, to allow reversibility, and it is proposed that new Café build has been located on the west side of the Assay complex – outside the core KEM site. Its design should reflect the timber fabric of the main KEM

buildings erected around the turn of the 20th century. The specification and design for the replacement of old and un-repairable external and internal fixtures and fittings (including windows) has followed the philosophy of replicating a significant period in time (early decades of 20th century) for KEM, and for which archive information (photographs) is available.

The main exterior visual impact of the scheme relates to the new build (only from the west side), and the new exterior timber cladding and some windows. The new roof will be similar in appearance to the existing. The two assay hearth chimneys will bring back a period feel – again, the specification based on archive information.

The main interior visual impact of the scheme relates to the transformation of a dilapidated, failing (EH Heritage at Risk building), to a modern day Café. However, the significant archaeological features of the Assay hearths, lime ceiling, original exterior openings and windows are all to be retained *in situ* – with some new doorway openings for public and disabled access.

The overall impact of these proposed works on the site can be defined as '**Moderate positive**' (Site restored as far as possible respecting its original function, but its use is altered), from its pre-project definition as '**Moderate negative**' (Significant loss of fabric or alteration, leading to erosion of original character). The scheme will restore this late 19th century complex of timber mine buildings as far as possible respecting their original function, but their use will be substantially altered. It should be noted that as a result of these proposed works, the Assay Complex will be able to be removed from the EH Buildings at Risk Register 2013.

6.2.2 Impact mitigation recommendations

Reduction of impact measures and residual impact mitigation has been described in Section 5.2.1. Site impacts; visually, physically and to the overall site's character have been mitigated as part of a consultancy process by the project's conservation architect (Claire Newman, Pdp Green Consulting Ltd) with KEM Ltd (primarily Tony Brooks), EH (Rhiannon Rhys), the area Conservation Officer (Nina Paternoster), and CAU (Colin Buck), whilst drawing up the design and producing the project specifications.

The impact mitigation strategy for the project is fully described in Section 7. There are more significant external and internal impacts to the former Assay complex than the remainder of the KEM project sites, but this relates more to the present condition of the site (and capital works necessary to bring it to an appropriate standard for adaptive reuse), compared to the latter.

It should be noted that an archive photographic survey has already been undertaken before any works are started (exterior and interior) and annotation of a Level 3 survey of the buildings to include descriptions of historic elements that may be impacted (Figures 5 and 6). These details informed the design process, as an archaeological/historical site constraint.

It is recommended that a necessary prerequisite (and a planning condition) for statutory and Listed Building Consent should be:

- Archaeological recording during works (particularly site evaluation excavation of the footprint of the new café build under the former coal yard cobbles).
- Production of an archaeological report detailing the results of the above archaeological recording interventions.

6.3 Winding engine boiler house adaption to exhibition space

6.3.1 Detail record sheet

Site name:	KING EDWARD MINE	Sheet R9
Building name/identifier:	Winding Engine Boiler House (Site 25)	
Survey date:	23/7/2014	
Designations:	Listed Building Grade II* (Ref. 1159235 – included with Winding engine house). This site is on the EH Building at Risk Register 2013.	
Location:	NGR: SW 66395 38895 at South east corner of core KEM site. Figure 4 site plan	
Building at Risk:	Yes	
Recorder:	C Buck	
Plan Ref:	Archaeological Survey Plan Figs 11 and 12. pdp Green Cons. Ltd Proposed annotated survey drawings for LBC (4210C/4211A/4212B/4213Cto4216C/4217D/4218B/4230B/4231A/4232A/4233A/4234A)	

Site map and photograph:		
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Construction materials: (walls, roof, floor, ceiling, windows, doors):	<p><i>External:</i> This long and high building is constructed of uncoursed granite rubble with granite quoins. The building has a slurried scantle slate pitched roof which is in a poor condition (patched to stabilise it last year). There is a brick edged window opening in the top section of each gable and a central window in the west side. A blocked doorway formerly led to the adjacent winding engine house loadings with three windows adjacent on the east side. There is a double door opening with timber doors in the south elevation – the main entrance/exit. The external walls were repointed in c1992 at the same time as the adjacent engine house, and as a result appear to be in a relatively good structural condition.</p> <p><i>Internal:</i> Internally, there is evidence in places of the original lime plaster wall render. The floor was presumably infilled when the boiler was removed, but still retains original clay floor tiles in places. The roof is visible with its open 'A' frame trusses, purlins and rafters. Cement from the slurried roof is also visible from the underside. All of the floor area has been full of stored Trevithick Society items of an industrial nature – now mostly cleared out.</p>
Build date:	The original shorter (built for a Lancashire boiler), mono-pitch building dates back to 1869, with both ends extending either side of the engine house with a hipped roof. It was built by South Condurrow Mine at the same time as the

	winding engine house (Site 24). However, in 1904 the building was demolished and a new longer, higher, pitched building constructed to take a longer Cornish boiler (to increase steam pressure). The building has been used to store items for many years.
Modification date:	The entire building was rebuilt in 1904. Although the winding engine no longer consistently operated, the boiler remained in use up until approximately 1920 (<i>pers comm</i> Tony Brooks). The exterior masonry walls were repointed with a lime mortar in c1992, and the scantle slate roof patched in places last year.
Original functions:	Boiler house for winding from Engine/Sump Shaft.
Current function:	Storage for Trevithick Society and KEM items.
Proposed function:	KEM have a medium term aim to reuse and adapt this building to create a 'hands on' educational resource for children and adults.
Significant features/contents:	Both externally and internally, this building retains its original character and design. Its repointing a decade ago has enabled the structure to retain structural integrity and enhanced its appearance. There are no significant internal features – apart from extant openings related to its previous function, windows, doorways, steam pipe outlet opening, and small clay floor tiles at its southern end (where coal was fed into the boiler). There is significant potential for archaeological remains of buried flues and boiler supports etc below ground level within the building.
Original fixtures/fittings:	Not applicable.
Machinery:	No above ground boiler remains.
Summary description:	This building is Listed Grade II* (as part of the adjacent Winding engine house). It retains its distinctive character of an extant and well preserved early 20 th century Cornish steam engine boiler house. It's relatively recent external conservation overhaul structurally improved and conserved the building's walls but the roof now needs to be re-slatted. There are proposals by KEM to recommend adaptive re-use – although this would not affect the external character of the building. Externally it will continue to function as a visual resource of a bygone technology.
Completeness and condition:	This building reflects a similar construction style (granite uncoursed stone with granite quoins), as some of the older buildings within the core of the site. With the exception of the roof and facias, it is well preserved, but unfortunately retains no internal original fittings/features (apart from a rotted window, and steam pipe openings). The building appears to be in a good structural condition, no doubt a result of masonry conservation two decades ago.
Significance/conservation strategy:	The historic group value of this early 20 th century building is highly significant, as well as it's contextual and working relationship to the adjacent winding engine house. The conservation strategy is to reroof the building and restore it to good condition through adaptive reuse.
EH at Risk Register 2013:	Winding Engine Boiler House (Site 25)
Additional requirements for proposed work/any other factors affecting reuse/repair etc:	Given the statutory designation of this building it is likely to be a condition of planning consent that archaeological surveys are commissioned before any proposed non-reversible impact works are undertaken.

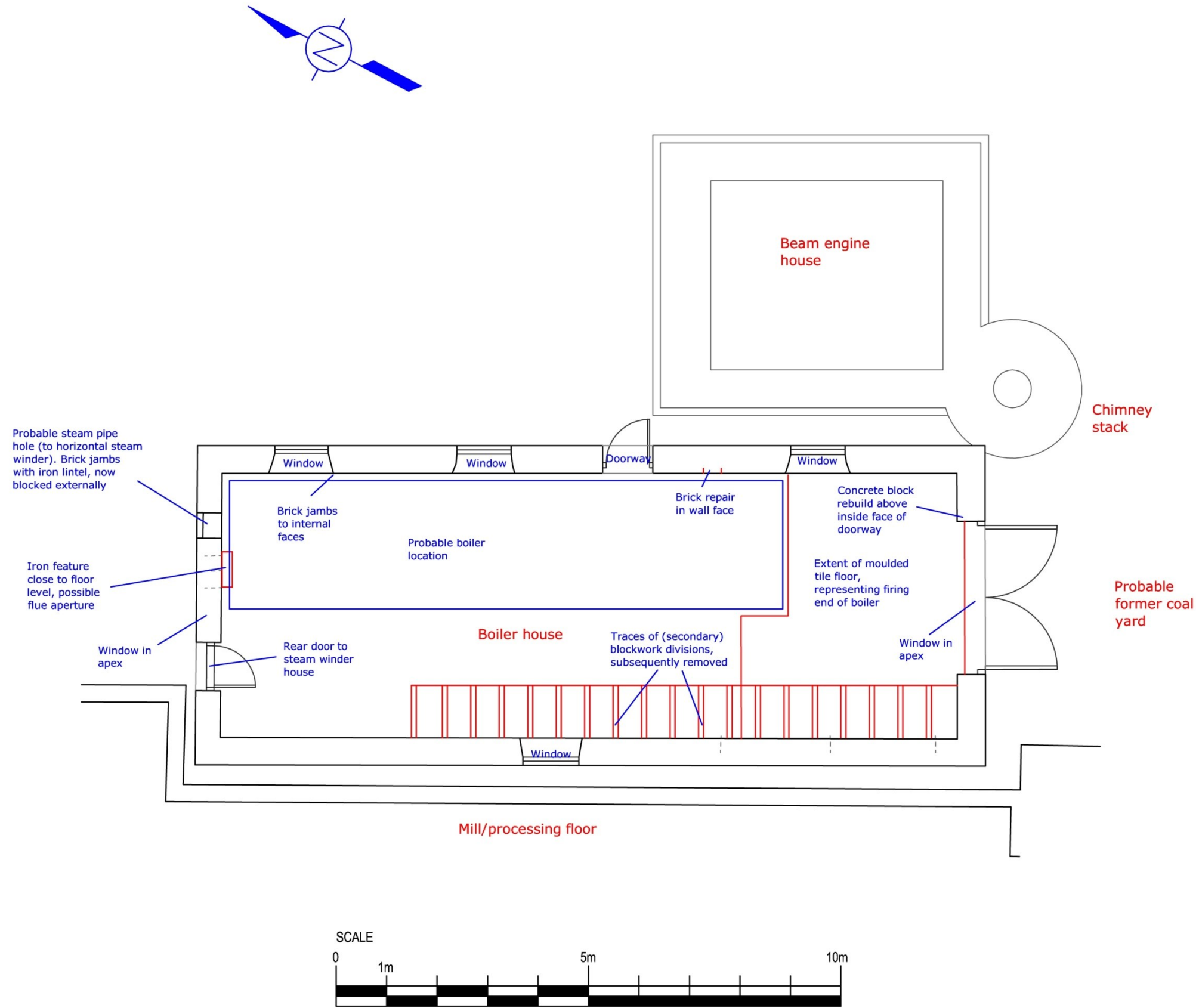


Figure 11 Existing plan site survey and significant archaeological features within the Winding engine boiler house

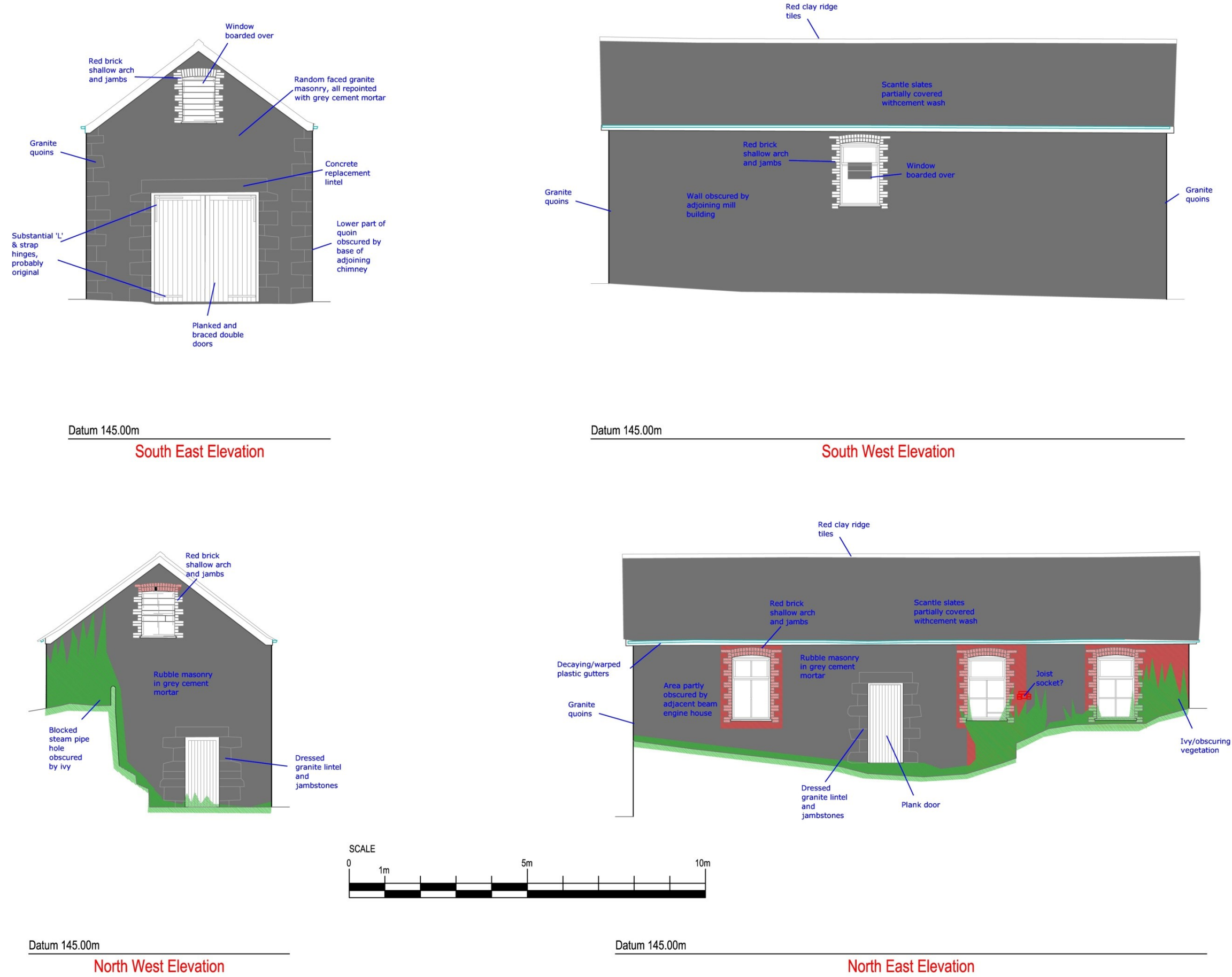
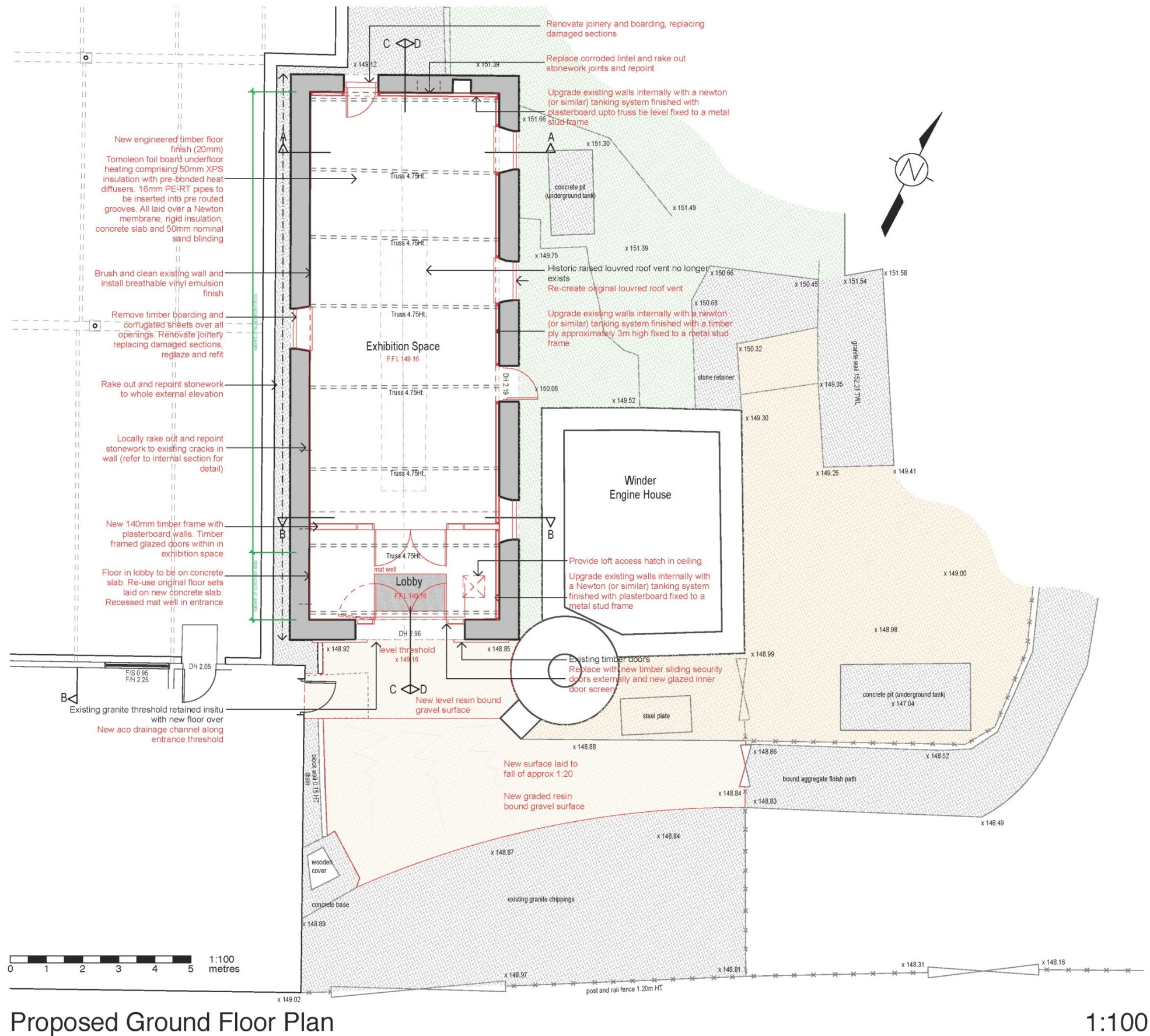


Figure 12 Existing elevation site survey and significant external archaeological features of the Winding engine boiler house



Proposed Ground Floor Plan

1:100

Prefer larger scale drawings. Prefer figured dimensions to scaled dimensions. Check all relevant dimensions for accuracy. Refer to the drawings for details of materials and construction. Check all dimensions for accuracy. Refer to the drawings for details of materials and construction. Check all dimensions for accuracy. Refer to the drawings for details of materials and construction.

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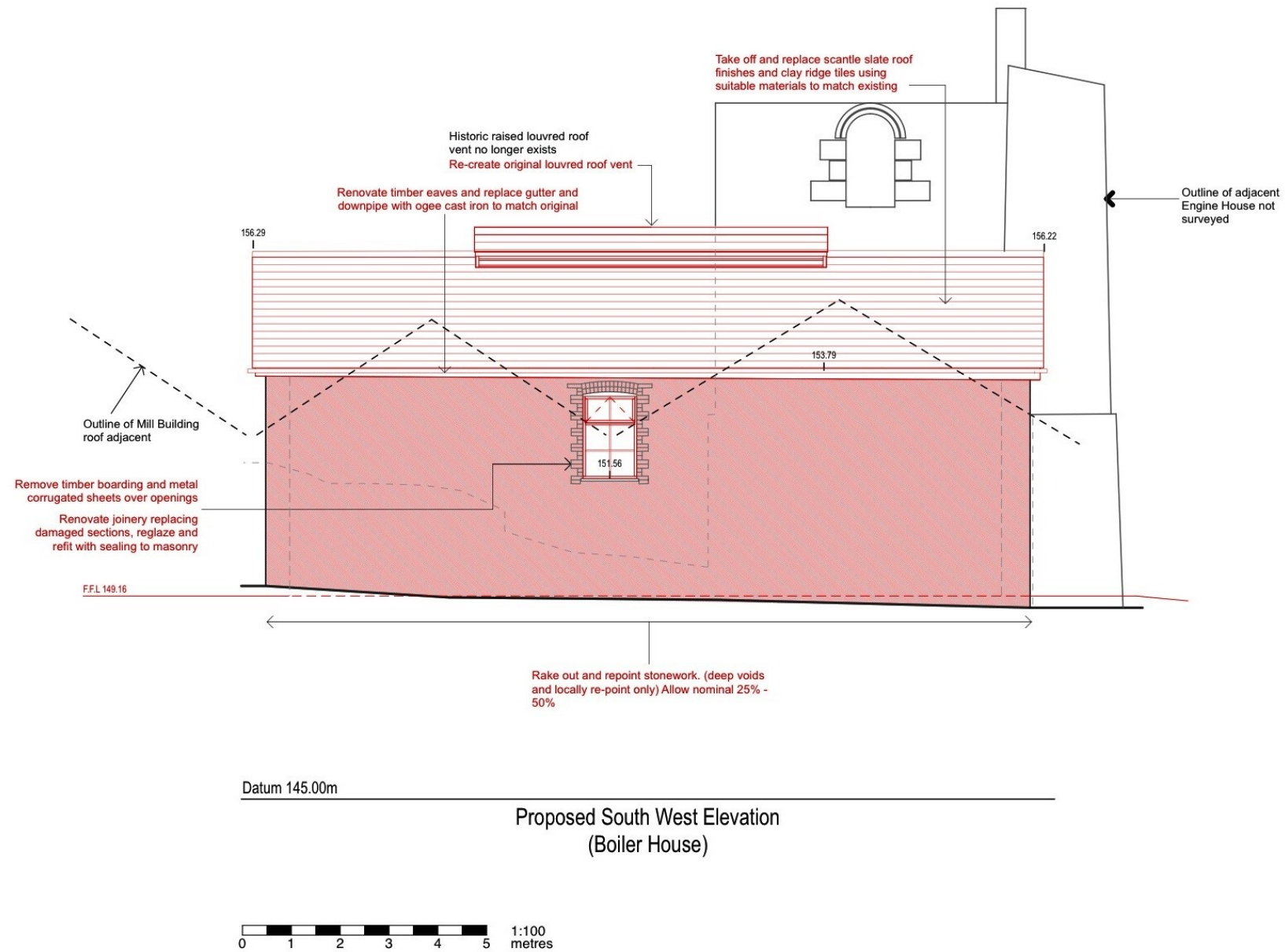
Revisions:	Q.A.	Assistent
- First Issue - 01.04.14	CN	
A - Additional details added	DB	
- 24.05.14	KB	
B - HLF Round 2	KB	
Submission 27.06.14	KB	
C - Signlights added to entrance doors - 10.09.14	KB	
Project Leader	CN	DB
Designer	DB	

Client	KEM Trust
Job Title	King Edwards Mine Museum Redevelopment
Project Leader	PROPOSED

Drawing Title	Boiler House Proposed Works Ground Floor Plan
Scale	1:100
Date	16.09.14
Drawn	DB
Drawn No	J14-008
Drawn No	4210C

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Figure 13 Site plan of the proposed new winding engine boiler house exhibition space (PdP Green Cons. Ltd Dwg No.4210C)



Proposed South West Elevation
(Boiler House)

Prefer larger scale drawings. Prefer figured dimensions to scaled dimensions. Check all relevant dimensions, lines and levels on site before proceeding with the work. Take site dimensions for fabrication of joinery and other fittings. Refer all discrepancies to the architect for his/her decision before putting work in hand. Copyright in this drawing and in the work executed from it remains the property of the architect.

Revisions:

* - First Issue - 01.04.14	Project Leader	Designer
A - Adjacent Mill Building indicated - 24.04.14	CN	DB
B - Additional details added - 24.05.14	DB	DB
C - HLF Round 2 Submission 27.06.14	KB	DB

By:	Q.A.:	Assistant
DB	CN	
DB	CN	
KB	CN	
KB	CN	

Client	KEM Trust
Job Title	King Edwards Mine Museum Redevelopment
PROPOSED	

Drawing Title	Boiler House Proposed Works Southwest Elevation
Scale	1:100
Date	27.06.14
Drawn	DB
Drawn	DB
J14-008 4215C	

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Figure 14 South west elevation of the proposed new winding engine boiler house exhibition space (PdP Green Cons. Ltd Dwg No.4215C)



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Revisions:
 - First Issue - 01.04.14
 A - Adjacent engine house indicated - 24.04.14
 B - Additional details added - 24.05.14
 S - HLF Round 5 Submission 27.06.14

Q.A.:	CN	CN	CN	Assistant
By:	DB	DB	KB	KB
Project Leader	CN	Designer	DB	DB

Client: KEM Trust
 Job Title: King Edwards Mine Museum Redevelopment
PROPOSED

Drawing Title: Boiler House Proposed Works Southeast Elevation
 Scale: 1:100
 Date: 27.06.14
 Drawn: DB
J14-008 4214C

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Figure 15 South east elevation of the proposed new winding engine boiler house exhibition space (PdP Green Cons. Ltd Dwg No.4214C)

Site impacts

Refer to Figures 2, 3 and 4 for site location. Site information for each building is given in Table 1 and the detail record sheet 4. Figures 11 and 12 are annotated survey drawings showing the significant features within and around the Assay complex of three buildings, in their existing condition. Figures 13 to 15 are a selective reproduction of proposed plans for the Boiler house conversion to an exhibition space, as produced by Pdp Green Consulting following extensive dialogue with the clients. These figures should be referred to during this section.

Significant impacts

- A change in function and use of the former early 20th century winding engine boiler house.
- Construction of a new solid concrete floor (to allow hot air ducting) over the existing earth floor (with potential sub-surface archaeological features), except at the south end where the small clay tiles will be re-set into the floor surface.
- The existing wet laid scantle slate roof (patch repaired in 2011), is to be replaced by either new or second hand wet laid scantle slate (to match existing).
- A new ridge vent is to be built on the new roof ridge section based on specifications evidenced by archive photographs.
- The outer double doors are to be replaced by sliding doors.
- A raised resin based gravel pathways to be formed from the nearby entrance kiosk to the new boiler house exhibition space to aid disabled users.

External:

- All exterior walls to be repointed where necessary (and ivy removed).
- Existing window frames to be retained and repaired (new single glazing inserted).
- Exterior lower wall tanking measures at the east and north sides may need to be taken due to rising damp internally.
- Both of the north and south doorways are to be rebuilt based on their original specification, but the southern double doors are to be changed from opening outwards to a sliding mechanism.

Internal:

- The original earth floor to be covered with a new concrete floor with a timber finish (no evidence of original floor covering – apart from the tiles at the south end).
- A lobby is to be formed (with timber frame with plasterboard partitioning and glazed door and sidelight) at the south end (reusing the existing small floor tiles), and a lowered ceiling.
- All interior walls to be repointed where necessary, then painted with white breathable paint.
- Assumed roof joists structurally capable of supporting new wet laid roof slates.

To summarise, the main tenets of the conservation philosophy has been followed. The specification and design for the replacement of old and un-repairable external and internal fixtures and fittings (including windows), has followed the philosophy of replicating a significant period in time (early decades of 20th century) for KEM, and for which archive information (photographs) is available. The same comments apply to the new roof covering and new roof vent.

The main exterior visual impact of the scheme relates to the newly laid scantle roof slates in a wet laid lime mortar (to match the existing style. Thus, the new roof will be similar in appearance to the existing. The new ridge roof vent will bring back a period

feel – again, the specification based on photographic archive information. The new sliding doors will also be a new visual impact from existing (but a safer alternative).

The main interior visual impact of the scheme relates to a low impact transformation of a redundant (EH Heritage at Risk building), to an exhibition space benefitting visiting members of the public. The main physical impact being at the entrance lobby and floor.

The overall impact of these proposed works on the site can be defined as '**Moderate positive**' (site restored as far as possible respecting its original function, but its use is altered), from its pre-project definition as '**Negligible positive**' (stabilisation/maintenance of site). The scheme will restore this early 20th century building as far as possible respecting its original function, but its use will be substantially altered. It should be noted that as a result of these proposed works, the boiler house will be able to be removed from the EH Buildings at Risk Register 2013.

6.3.2 Impact mitigation recommendations

Reduction of impact measures and residual impact mitigation has been described in Section 5.2.1. Site impacts; visually, physically and to the overall site's character have been mitigated as part of a consultancy process by the project's conservation architect (Claire Newman, Pdp Green Consulting Ltd) with KEM Ltd (primarily Tony Brooks), EH (Rhiannon Rhys), the area Conservation Officer (Nina Paternoster), and CAU (Colin Buck), whilst drawing up the design and producing the project specifications.

The impact mitigation strategy for the project is fully described in Section 7. It should be noted that an archive photographic survey has already been undertaken before any works are started (exterior and interior) and annotation of a Level 3 survey of the buildings to include descriptions of historic elements that may be impacted (Figures 11 and 12). These details informed the design process, as an archaeological/historical constraint.

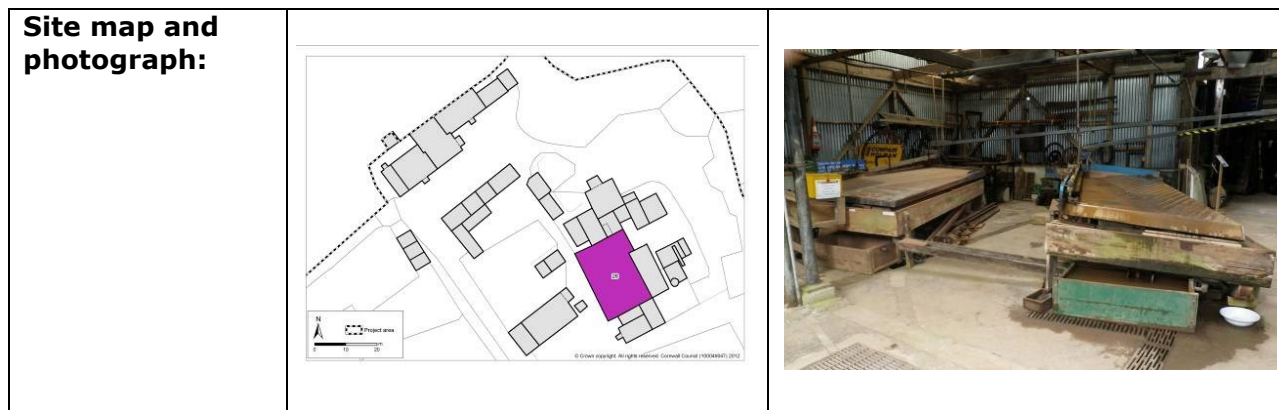
It is recommended that a necessary prerequisite (and a planning condition) for statutory and Listed Building Consent should be:

- Archaeological recording during works (assuming there are no additional below ground impacts resulting from the solid floor covering).
- Production of an archaeological report detailing the results of the above archaeological recording interventions.

6.4 Mill and Stamps building refurbishment

6.4.1 Detail record sheets

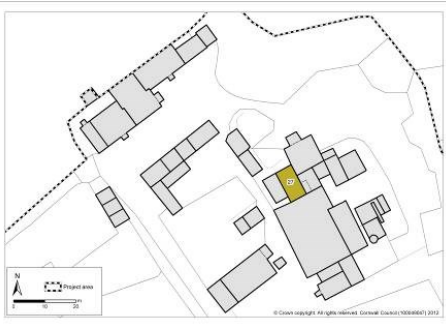
Site name:	KING EDWARD MINE	Sheet R10
Building name/identifier:	Mill (Dressing) House (Site 26)	
Survey date:	2/8/2012	
Designations:	Listed Building Grade II* (Ref. 1142687 – included with Stamps-Site 27)	
Location:	NGR: SW 66385 38895 Centre of core KEM site. See Figure 4 for site location	
Building at Risk:	No	
Recorder:	C Buck	
Plan Ref:	PdP Green Cons. Ltd Proposed annotated survey drawings for LBC (4110B/4111B to 4118B)	



<p>Construction materials: (walls, roof, floor, ceiling, windows, doors):</p>	<p><i>External:</i> This large single storey tin dressing plant building is constructed of asbestos corrugated sheet cladding to the roof and galvanised corrugated sheeting to the walls, all supported by a timber frame. It is rectangular in plan with a three span roof on an east-west axis, triple gabled to west and east. There is a door between the first and second gables, and internally to the south, with roof skylights.</p> <p><i>Internal:</i> The floor is mostly concrete, to site tin dressing machinery: This includes a Dipper wheel, a Frue Vanner, a Cornish Round Frame, A Buddle, Rag Frames, Slime Tables, Kieve Tossing and packing gear, Flotation Cell, and Sand Table. Internally, the building is open on its north side where it adjoins the stamps, creating a far larger building than it appears externally.</p>
<p>Build date:</p>	<p>The dressing floor was erected 1902–1904 on the former site of the South Condurrow spalling sheds.</p>
<p>Modification date:</p>	<p>It was extended in 1905 to include the third gable to the south. The walls of the building have been sporadically re-clad with corrugated iron sheeting throughout its lifetime, the most recent episode being in 2001 (in part). The roof had its corrugated iron sheeting replaced in the 1960s with a cement fibre roof asbestos equivalent, which still remains (albeit in a poor condition).</p>
<p>Original functions:</p>	<p>Tin concentration dressing plant.</p>
<p>Current function:</p>	<p>Individual machinery demonstrations of the tin concentration dressing plant as part of the KEM guided tour and open days.</p>
<p>Proposed function:</p>	<p>Unchanged from current function.</p>
<p>Significant features/contents:</p>	<p>Taken as a whole – this is the most complete working collection of tin dressing plant in Europe, and one of the most significant sites at KEM. Individual items have been rescued by KEM volunteers from other sites in Cornwall – all are rare (some unique), but all have been rebuilt and are in working order for use in regular demonstrations as part of the KEM experience: Cornish Round Frame (rescued 1974) and reinstated on original site; a very rare survival one of only two surviving working examples. Kieve Tossing and Packing gear (rescued 1989) and reinstated on original site; a unique survival of this equipment. Dipper Wheel (rescued 1989 from the former Tolgus Tin site) and reinstated on original site; another unique survival of equipment. Sand and Slime Tables (rescued 1989 from Geevor and Tolgus), and reinstated on original site; more examples of unique survival of tin dressing equipment.</p>

	<p>Buddle sited on original concrete base (typical examples can still be seen across the great Flat Lode mines. Frue Vanner (reconstructed from other sites) and reinstated on original site; an example of equipment used since the turn of the 20th century for tin dressing. Rag Frames (newly built of timber) and reinstated on original site; a working example of equipment commonly used since the 1860s for tin dressing. In the south west corner is the Tin Store, a safe, lockable (ship lap timber walled), site to store the tin ready for export. A Flotation Cell (rescued in 1989 from Geevor) is also present (a rare survival of this equipment dating from the 1930s), although it was not originally used in the Mill.</p>
Original fixtures and fittings:	<p>The description above describes the equipment that has been brought into the Mill – which replicates its original contents that were disposed of in the mid 1970s. There are original fittings in the concrete floor where items have been reinstated and in the roof space (ie shaft drives etc).</p>
Machinery:	<p>No original machinery remains, with the exception of the Californian Stamps.</p>
Summary description:	<p>This building is Listed Grade II* (as well as the adjacent Stamps (Site 27). Now its equipment has been restored and rebuilt and is in working order, this site retains its distinctive character of a working and well preserved late 19th/early 20th century tin dressing floor. Taken as a whole, it represents survival of the only working tin concentration dressing plant in Europe. There are no proposals by KEM to recommend any other changes internally or externally (apart from repair of defective timbers/roofing etc), and it is hoped it will continue to function as a visual and working resource of a bygone technology.</p>
Completeness and condition:	<p>This site now has all of the main working tin dressing equipment that would have been used from the early years of the 20th century, demonstrating the localised resurgence of tin mining of the Great Flat Lode. All the equipment has been rebuilt from either second hand sources, or new timber items, carefully replicating the original design and specifications. Although the side walls were partially re-clad in 2001, the 1960s cement fibre corrugated roof and timber facias are in a poor condition.</p>
Significance/conservation strategy:	<p>The historic group value of the contents of this working tin mill, and its contextual and working relationship to other adjacent mine buildings cannot be understated. It is highly significant, and is the only example of a complete working tin concentration plant in Europe. Without this site and its working machinery, KEM could not survive or be perceived as a complete example of a Cornish mine.</p>
EH at Risk Register 2013:	<p>Not applicable</p>
Additional requirements for proposed work/any other factors affecting reuse/repair etc:	<p>Presumably when items break down they will be repaired by KEM volunteers. Funding should be kept in reserve for such occasions.</p>

Site name:	KING EDWARD MINE	Sheet R11
Building name/identifier:	Stamps (Site 27)	
Survey date:	2/8/2012	
Designations:	Listed Building Grade II* (Ref. 1142687 – included with Mill building-Site 26)	
Location:	NGR: SW 66377 38909 Centre of core KEM site. See Figure 4 for site location	
Building at Risk:	No	
Recorder:	C Buck	
Plan Ref:	PdP Green Cons. Ltd Proposed annotated survey drawings for LBC (4110A/4111A to 4118A)	

Site map and photograph:		
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Construction materials: (walls, roof, floor, ceiling, windows, doors):	<p><i>External:</i> This tall double storey building to site the Californian Stamps is constructed of corrugated sheet cladding to walls supported by a timber frame and an asbestos fibre corrugated roof. It is rectangular in plan with a single pitched roof. There are two windows on the west side, one on the south side and one on the east side. The north side opening is blocked with timber, formerly the opening for the overhead tramway from Engine Shaft headgear.</p> <p><i>Internal:</i> The building is built around the massive timber frame to support the five head of stamps. The book on King Edward Mine (Brooks & Watton 2002, Plate 44), shows a photograph of the stamps building being erected around the already constructed stamps. To allow safe public access from the Mill Engine Room (Site 28), timber stairs have been constructed down to the Mill floor.</p>
Build date:	These Stamps, built by Fraser & Chalmers were erected in 1901, purchased after display in the Paris Exposition a year earlier (presumably at a discounted price !).
Modification date:	The stamps themselves have never been modified, but they have occasionally been repaired. The building has been sporadically re-clad with corrugated iron sheeting throughout its lifetime, the most recent episode being in 2001. The roof had its corrugated iron sheeting replaced in the 1960s with a

	cement fibre roof.
Original functions:	Californian design Tin Stamps.
Current function:	Still operational as Tin Stamps.
Proposed function:	Unchanged from current function. Operates occasionally on special occasions.
Significant features/contents:	These tin stamps are complete and the only full size working set in Europe, a highly significant feature. They also include a small jaw size crusher. The first stamps of this Californian design were installed at Dolcoath Mine in 1893.
Original fixtures and fittings:	KEM retains this original equipment which at the time was at the forefront of a new technological design, and amazingly is still in good working order.
Machinery:	Californian Stamps.
Summary description:	This building (and presumably the contents) is Listed Grade II* (as well as the adjacent Mill House (Site 26)). Taken as a whole, the Stamps and Mill House represents survival of the only working tin concentration dressing plant in Europe. There are no proposals by KEM to recommend any other changes internally or externally, and it is hoped it will continue to function on special occasions as a visual and working resource of a bygone technology.
Completeness and condition:	This site now has all of the main working tin dressing equipment that would have been used from the early years of the 20 th century as part of the localised resurgence of tin mining in the Great Flat Lode. This is a highly significant massive piece of machinery, which is now over a century old, and the only one in Europe that is still functioning.
Significance/conservation strategy:	The significance of the stamps and the historic group value of the contents of this working tin mill, together with its contextual and working relationship to other adjacent mine buildings cannot be underestimated. It is highly significant to the site and is the only example of a complete working tin concentration plant in Europe.
EH at Risk Register 2012:	Not applicable
Additional requirements for proposed work/any other factors affecting reuse/repair etc:	In case of Stamps breakdown, it may be prudent to keep a sum of money available for repair. Given the height of the building, repair of the roof covering would be quite expensive.

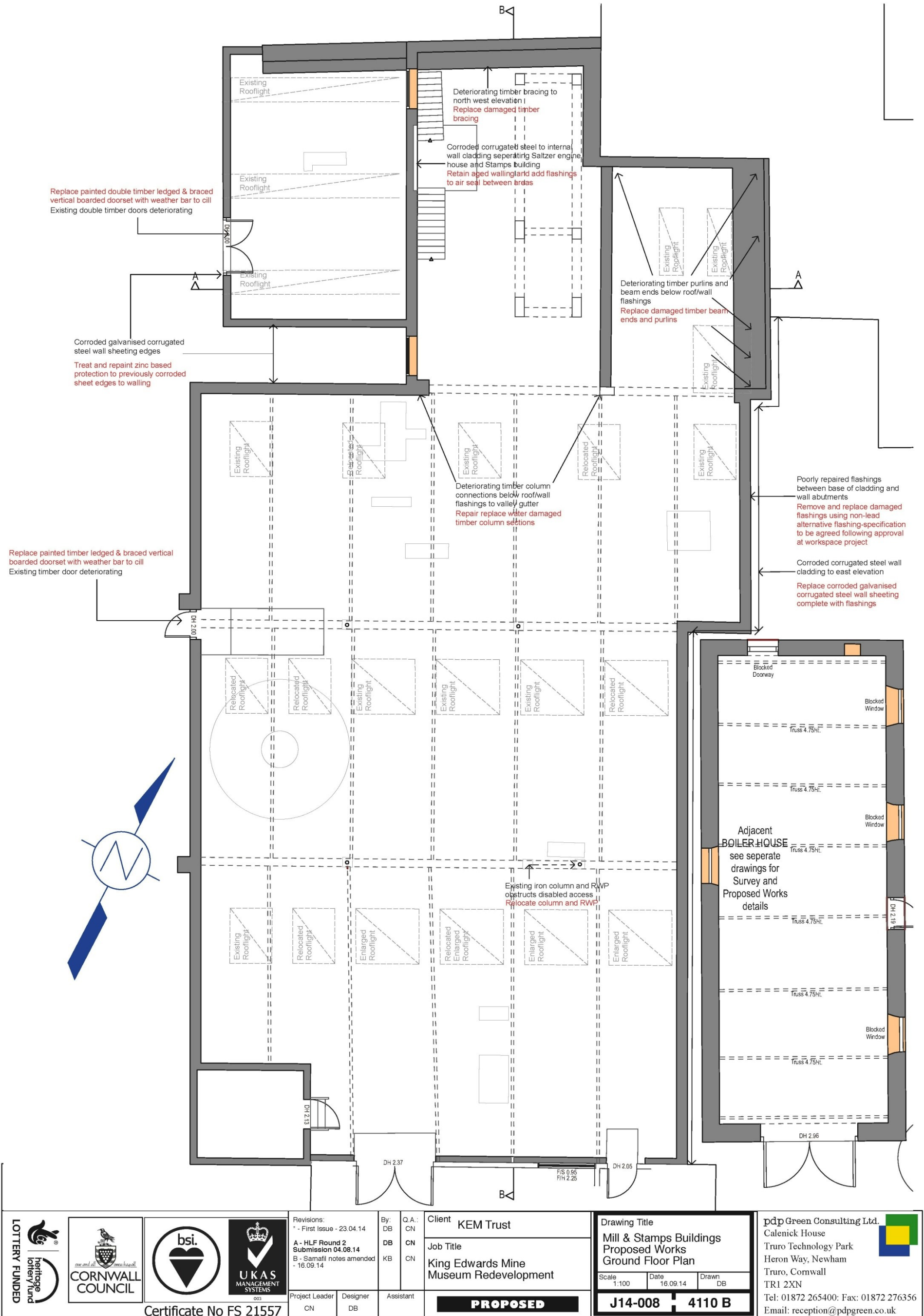
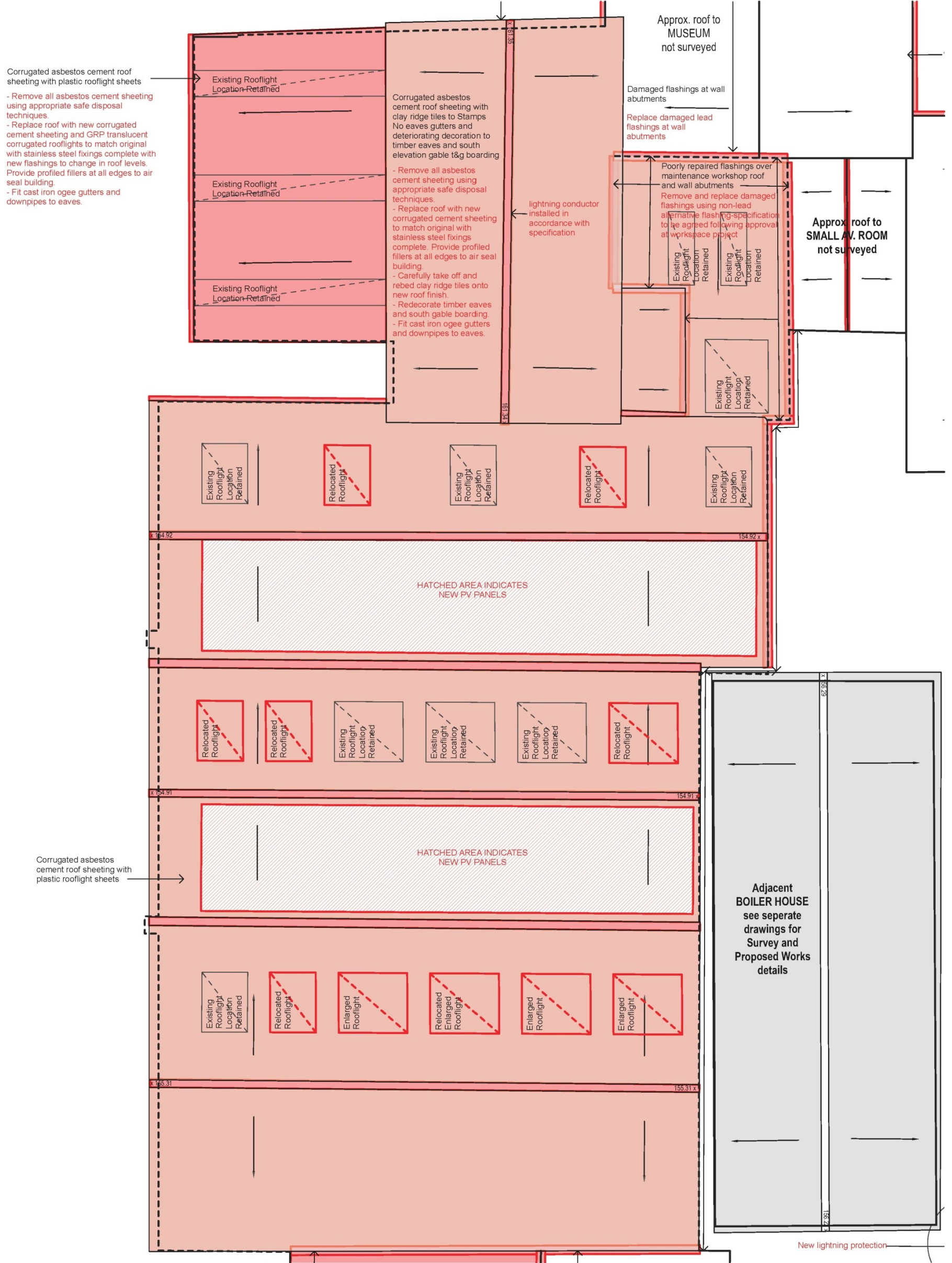


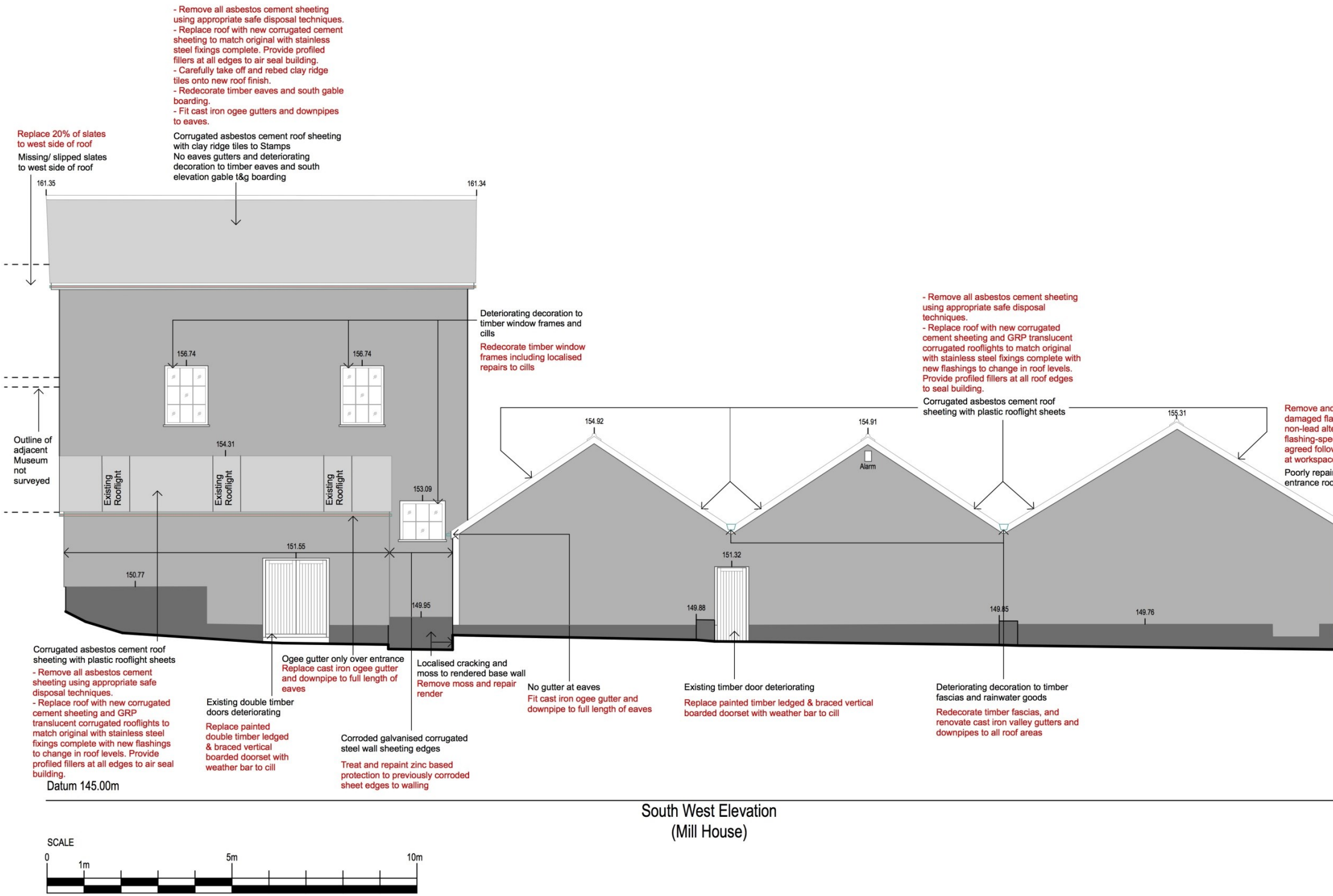
Figure 16 Ground floor plan of the Mill and Stamps proposed works (PdP Green Cons. Ltd Dwg No. 4110B)



Prefer larger scale drawings. Prefer figured dimensions to scaled dimensions. Check all relevant dimensions, lines and levels on site before proceeding with the work. Take site dimensions for fabrication of joinery and other fittings. Refer all discrepancies to the architect for his/her decision before putting work in hand. Copyright in this drawing and in the work executed from it remains the property of the architect.

	Revisions: * - First Issue - 23.04.14 A - HLF Round 2 Submission 04.08.14 B - GRP gutters and Saranfil notes amended - 16.09.14	By: DB DB KB	Q.A.: CN CN CN	Client KEM Trust Job Title King Edwards Mine Museum Redevelopment	Drawing Title Mill & Stamps Buildings Proposed Works Roof Plan Scale 1:100 Date 16.09.14 Drawn DB	pdp Green Consulting Ltd. Calenick House Truro Technology Park Heron Way, Newham Truro, Cornwall TR1 2XN Tel: 01872 265400; Fax: 01872 276356 Email: reception@pdpgreen.co.uk
	Project Leader CN	Designer DB	Assistant CN	PROPOSED	J14-008 4112 B	

Figure 17 Roof plan of the Mill and Stamps proposed works (Pdp Green Cons. Ltd Dwg No. 4112B)



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Drawing Title		Date		Drawn	
Mill & Stamps Buildings Proposed Works Southwest Elevation		16.09.14		DB	
Scale		1:100		J14-008 - 4116 B	

Client		KEM Trust	
Job Title		King Edwards Mine Museum Redevelopment	
Q.A.	CN	Assistant	
By:	DB	Designer	DB
Revisions: - First Issue - 24.04.14 A - HLF Round 2 B - Eaves and Small not amended - 16.09.14			
Project Leader		CN	

UKAS MANAGEMENT SYSTEMS

bsi

CORNWALL COUNCIL

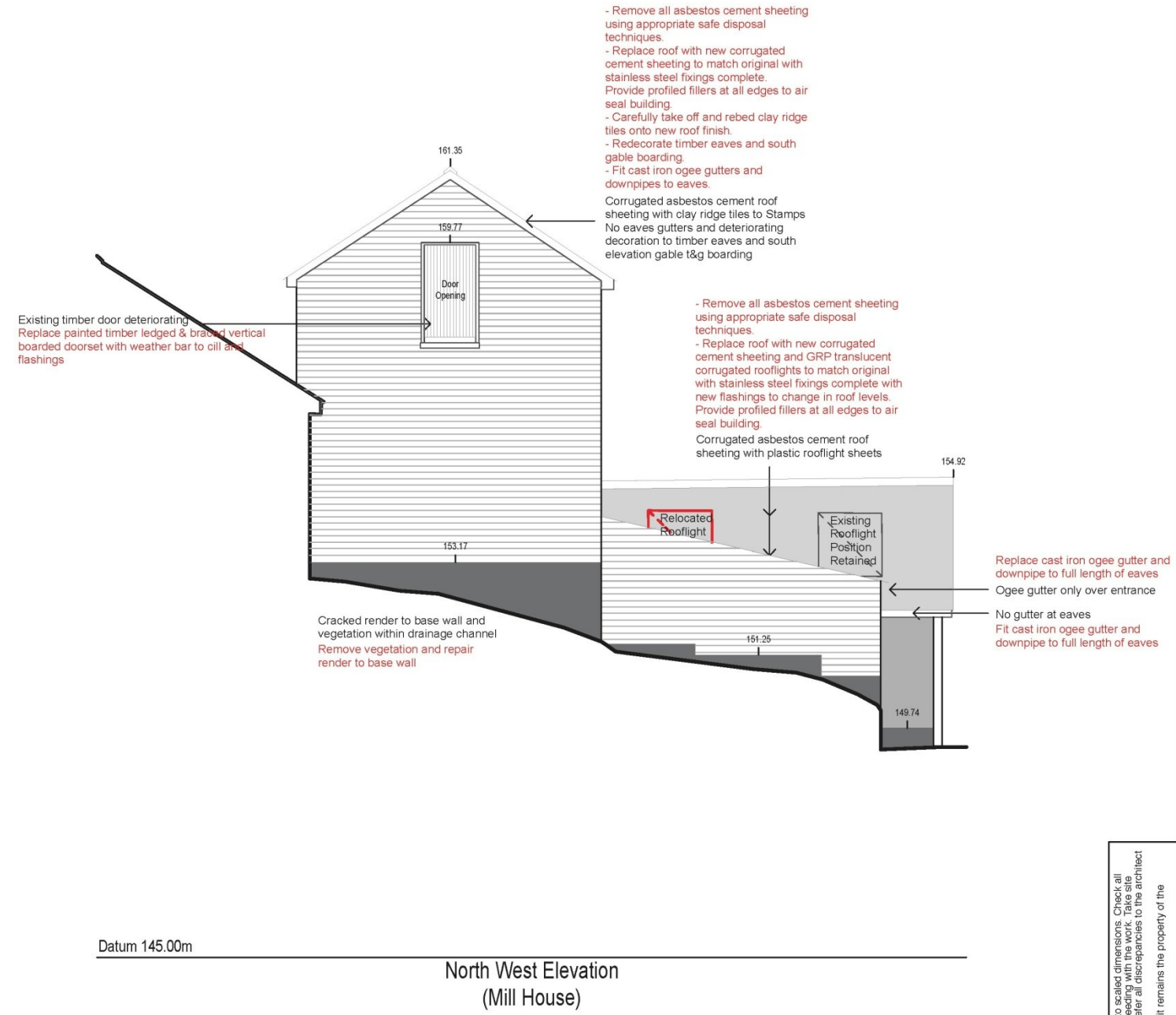
heritage lottery fund

LOTTERY FUNDED

Certificate No FS 21557

Prefer larger scale drawings. Prefer figured dimensions to scaled dimensions. Check all relevant dimensions, lines and levels on site before proceeding with the work. Take site photographs and levels at all stages. Refer all discrepancies to the architect for his/her decision before putting work in hand. Copyright in this drawing and in the work executed from it remains the property of the architect.

Figure 18 South west elevation of the Mill and Stamps proposed works (PdP Green Cons. Ltd Dwg No. 4116B)



Datum 145.00m
North West Elevation
(Mill House)

Prefer larger scale drawings. Prefer figured dimensions to scaled dimensions. Check all relevant dimensions, lines and levels on site before proceeding with the work. Take site dimensions for fabrication of joinery and other fittings. Refer all discrepancies to the architect immediately. Copyright in this drawing and in the work executed from it remains the property of the architect.

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bsi.

CORNWALL COUNCIL

LOTTERY FUNDED

heritage lottery fund

Certificate No FS 21557

Revisions:	Project Leader	Designer	DB
* - First Issue - 24.04.14	CN	DB	
A - HLF Round 2 Submission 04.06.14	DB	KB	
A - Change notes amended - 16.08.14	CN	KB	
By:	Assistant		
G.A.:			
CN			

Client	KEM Trust
Job Title	King Edwards Mine Museum Redevelopment
PROPOSED	

Drawing Title	Mill & Stamps Buildings Proposed Works Northwest Elevation
Scale	1:100
Date	16.09.14
Drawn	DB
Drawn	DB
J14-008	4113 B

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Figure 19 North west elevation of the Mill and Stamps proposed works (PdP Green Cons. Ltd Dwg No. 4113B)

Site impacts

Refer to Figures 2, 3 and 4 for site location. Site information for each building is given in Table 1 and detail record sheets 10 and 11. Figures 16 to 19 are a selective reproduction of proposed plans for the Boiler house conversion to an exhibition space, as produced by Pdp Cons. Engs following extensive dialogue with the clients. These figures should be referred to during this section. Given the minimal physical impacts to these buildings (primarily direct replacement of roof coverings, etc), detailed archaeological site surveys have not been undertaken.

Significant impacts

- The existing corrugated asbestos roof covering is to be replaced by a similar profiled and coloured cement corrugated roof – a limited visual impact.
- The installation of solar panels on two of the north elevations (moving the rooflights on these elevations to the south side) will be a different visual impact – but again, of limited visual significance, with the positive impact of providing income for this deserving charity trust.

External:

- All asbestos based roofing material to be replaced with cement based roofing material of a similar profile.
- All corroded or damaged side corrugated sheeting to be replaced where appropriate.
- All exterior walls to be repainted where necessary (vegetation removed).
- Existing window frames to be retained and repaired (new single glazing inserted).
- Lightning conductors are to be erected on the tall Stamps building roof – the specification and site of the earthing rods to be agreed.

Internal:

- Internal timber components (valley gutters, timber frames, rafters/purlins, structural beams and doors), to be checked for structural weaknesses and if necessary, replaced with similar specifications

To summarise, the main tenets of the conservation philosophy has been followed . The specification and design for the replacement of the existing asbestos based roofing products, will mimic the existing material, and has followed the philosophy of replicating a significant period in time (early decades of 20th century) for KEM, and for which archive information (photographs) is available.

The main exterior visual impact of the scheme relates to replacement of the entire roof covering, and the installation of solar panels to two of the north roof faces. The corrugated steel walls will be repaired where necessary and repainted. The main (temporary) visual impact being its newness.

The main interior visual impact of the scheme relates to a low impact repair of defective timber components throughout both buildings.

The overall impact of these proposed works on the site can be defined as '**Major positive**' (Site continues in, or is restored to, its original design and use), with the same pre-project definition, a very rare scenario! The scheme will restore this early 20th century building as far as possible respecting its original function; its use will be the same as it has always been and it will hopefully not need any maintenance for some time – helping the long term sustainability of this charity trust site.

6.4.2 Impact mitigation recommendations

Reduction of impact measures and residual impact mitigation has been described in Section 5.2.1. Site impacts; visually, physically and to the overall site's character have been mitigated as part of a consultancy process by the project's conservation architect

(Claire Newman, Pdp Cons. Ltd) with KEM Ltd (primarily Tony Brooks), EH (Rhiannon Rhys), the area Conservation Officer (Nina Paternoster), and CAU (Colin Buck), whilst drawing up the design and producing the project specifications.

The impact mitigation strategy for the project is fully described in Section 7. These details informed the design process, as an archaeological/historical constraint.

It is recommended that a necessary prerequisite (and a planning condition) for statutory and Listed Building Consent could be:

- An archive photographic survey to be undertaken before any works are started (exterior and interior).
- Archaeological recording during works to be undertaken.
- Production of an archaeological report detailing the results of the above archaeological recording interventions, accompanied by 'as-built' survey drawings.

6.5 Other general impacts within the core (LBII*) sites

6.5.1 Detail record sheets

The Conservation Management Plan (Buck 2013) only produced detailed record sheets for significant buildings within the core site. The following sites are to be impacted by the proposed works, with only Sites 19 (Survey Room) having a detailed record Sheet (R6), and Site 28 (Mill Engine Room), with detailed record Sheet (R12). Some of the remaining sites are not Listed and are therefore not as significant, except in a group context.

Site name:	KING EDWARD MINE	Sheet R6
Building name/identifier:	Survey Office (Site 19)	
Survey date:	2/8/2012	
Designations:	Listed Building Grade II* (Ref. 1311128 – Survey Office)	
Location:	NGR: SW 66361 38879 South west of core KEM site. Block Plan Fig 4	
Building at Risk:	No	
Recorder:	C Buck	
Plan Ref:	PdP Green Cons. Ltd Proposed annotated survey drawings for LBC (4411C)	

Site map and photograph:		
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<p>Construction materials: (walls, roof, floor, ceiling, windows, doors):</p>	<p><i>External:</i> The roof is constructed with slate – it is unknown if this is the original construction or a replacement, but it appears to be in a good condition, as are the clay ridge tiles. The top clay air vents have recently been replaced. This building has iron rainwater gutters/downpipes. The side and end walls are built of horizontal boarded ship lap, some of which (north side especially), is in need of redecoration. The external joinery is in a reasonable condition, again some needs replacing and re-decorating. Site 20, an extension to provide a lecture/AV room was built of concrete block, with an external painted cement render and mono-pitch felt roof is also Listed.</p>
	<p><i>Internal:</i> All the original internal partition walls are built of vertical tongue and grooved timber. The ceiling is also boarded out with tongue and grooved timber, with visible steel joists below the ceiling. The floor is also constructed of timber parquet. The windows, for the most part appear to be original specification. Internally, the survey office is remarkably unaltered. It consists of a large survey room, with two small rooms on the east end, one a drawing office/store, the other now used for making drinks etc and access to a walk-in safe (a later 1960s addition). Above these rooms is a single room accessed via a timber staircase from the main survey drawing room. A small room by the entrance doorway is used as a map room.</p>
<p>Build date:</p>	<p>CSM built the Survey Office in c1899. The lecture room extension was built in 1967.</p>
<p>Modification date:</p>	<p>In 1967 the original west facing windows to the survey office were removed, and built into the west face of the new lecture room extension. In addition, the new west wall partition (between the survey office and new lecture room), was also built with vertical tongue and groove, replicating the internal specifications of the survey office. At a later date (1990s) the old original warm air pipe channels with iron grating were removed and replaced with timber parquet flooring to match the style of the adjacent floor.</p>
<p>Original functions:</p>	<p>Survey drawing office and ancillary rooms. New lecture/AV room extension built in 1967.</p>
<p>Current function:</p>	<p>KEM meeting room/lecture room and venue for start/finish of KEM guided tours. Drawing/survey walls used for display of survey plans and other mining information.</p>
<p>Proposed function:</p>	<p>Retain existing function. Revamp existing display features as ongoing project.</p>
<p>Significant features/contents:</p>	<p>This is probably the most untouched original building (internally and externally) within KEM, and in an excellent state of preservation. Even the original stools and benches are still in use (photograph taken in 1899 – see Fig 26).</p> <p>These timber framed buildings (with the exception of Site 12), are highly significant in terms of their original external timber ship lap design, and replicated in other parts of the mine from the turn of the 19th century onwards, with original internal tongue and grooved timber partitions. This complex</p>

	also retains many original windows and doorway openings.
Original fixtures and fittings:	Original benches, stools and shelving in the main survey drawing room. Original drawing office shelving is also still extant. The 1960s walk-in safe is still extant.
Machinery:	Not applicable.
Summary description:	The Survey/drawing room is Listed Grade II*. There are no proposals by KEM to recommend adaptive re-use. This purpose built building has always functioned as a drawing office until CSM moved to its new campus at Pool in 1975. As such it still retains its original features, character, purpose and function. This is amplified by the degree of preservation of its internal timber tongue and grooved décor. It is still used for its original purpose, meetings and education about the mine, although survey drawings are not drawn up anymore. Externally, especially on the north side, the timber ship-lap needs complete re-decoration.
Completeness and condition:	This is possibly the best example of an late 19 th century timber frame mine building at the KEM site. It must be the best preserved student drawing offices in Cornwall, and not only demonstrates period construction design, but also reflects a similar construction style around the mine and unusually retains a number of original features. Internally, very little needs to be done. This building is still in use over a century later although its exterior timber ship lap needs to be redecorated and possibly some timbers and facias replaced. Its slate roof appears to be in a good condition. Internally, the walls and structures are in a good condition, no doubt a result of ensuring during the past century that the roof has always been well maintained.
Significance/conservation strategy:	The historic group value of this late 19 th century building is highly significant, as well as its contextual relationship to other buildings of a similar date and style across the site. Internally, the quality of its fixtures and fittings is breathtaking when compared to an internal photograph of the building in 1899. The conservation strategy is to preserve the building in its present state.
EH at Risk Register 2012:	Not applicable
Additional requirements for proposed work/any other factors affecting reuse/repair etc:	Given the statutory designation of these buildings it is likely to be condition of planning consent that an internal and external photographic survey is commissioned before any proposed works are undertaken.

Site name:	KING EDWARD MINE	Sheet R12
Building name/identifier:	Mill Engine Room (Site 28)	
Survey date:	2/8/2012	
Designations:	None	
Location:	NGR: SW 66385 38895 Centre of core KEM site. See Figure 4 for site location	
Building at Risk:	No	
Recorder:	C Buck	
Plan Ref:	PdP Green Cons. Ltd Proposed annotated survey drawings for LBC (4411C)	

Site map and photograph:		
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Construction materials: (walls, roof, floor, ceilings, windows, doors):	<p><i>External:</i> This single storey timber building was built to house the steam engine which powered (via a belt drive), both the main Stamps (Site 27, Detail record R11) and the Mill dressing floor machinery (Site 26, Detail record R10). The building is rectangular in plan with a single pitch roof of slate. It is unknown if this is the original construction or a replacement, but it appears to be in a good condition. The walls are built of horizontal boarded ship lap, all of which is in need of a coat of paint. The rainwater goods are of original cast iron profile. The external joinery is in reasonable to poor condition, again some needs replacing and re-decorating.</p> <p><i>Internal:</i> All the original internal walls are built of vertical tongue and grooved timber. The ceiling is also boarded out with tongue and grooved timber, under the roof joists. The floor is also constructed of timber floorboards, with newer floorboards used to infill the former site of the steam engine. The windows mostly appear to be original.</p>
Build date:	The 90HP compound steam engine from Holman's of Camborne was erected in 1902.
Modification date:	The roof slates were replaced in 1993. This room has been used to site an exhibition of photographs and site history information, both on the walls and standing displays and cabinets.

Original functions:	Mill engine room with belt drive to Stamps/mill below floor level.
Current function:	Exhibition room and access to AV room (Site 31).
Proposed function:	Unchanged from current function.
Significant features/contents:	Unfortunately the steam engine was removed long ago (and has not been replaced). These timber framed buildings are highly significant in terms of their original external timber ship lap design – replicated in other parts of the mine from 1903 onwards, with original internal tongue and grooved timber walls. This complex also retains original windows and doorway openings.
Original fixtures and fittings:	There are original fittings in the ceiling for ventilation and structural roof support. The original position of the steam engine can be seen in the wooden floorboards.
Machinery:	No original machinery remains.
Summary description:	Externally, this building retains its original character. However, removal of its main focus, the steam engine to power the Stamps and mill machinery, has left it devoid of its 'raison d'être'. However, its internal wall finish is still preserved, as it is in many of KEM's early 20 th century buildings. Its light and rectangular open plan provides an excellent setting for a detailed exhibition of KEM.
Completeness and condition:	This is another rare example of a relatively untouched early 20 th century mine building. It not only demonstrates period construction design, but also reflects a similar style around the mine and unusually retains a number of original architectural features. However, its exterior timber ship lap needs to be redecorated, as well as the timber facias. Its slate roof is also in a poor condition, and has previously been patch repaired. Internally, the walls and structures are in a good condition.
Significance/conservation strategy:	The historic group value of this early 20 th century complex of buildings is highly significant, as well as its contextual relationship to other buildings of a similar date and style across the site. Adaptive re-use of its existing form has not compromised or impacted existing features. Future conservation work should reflect, not impact the building's character.
EH at Risk Register 2012:	Not applicable
Additional requirements for proposed work/any other factors affecting reuse/repair etc:	It may be prudent to keep (or raise) a sum of money to fund purchase/repair and installation of another steam engine to power the mill as a long term objective.

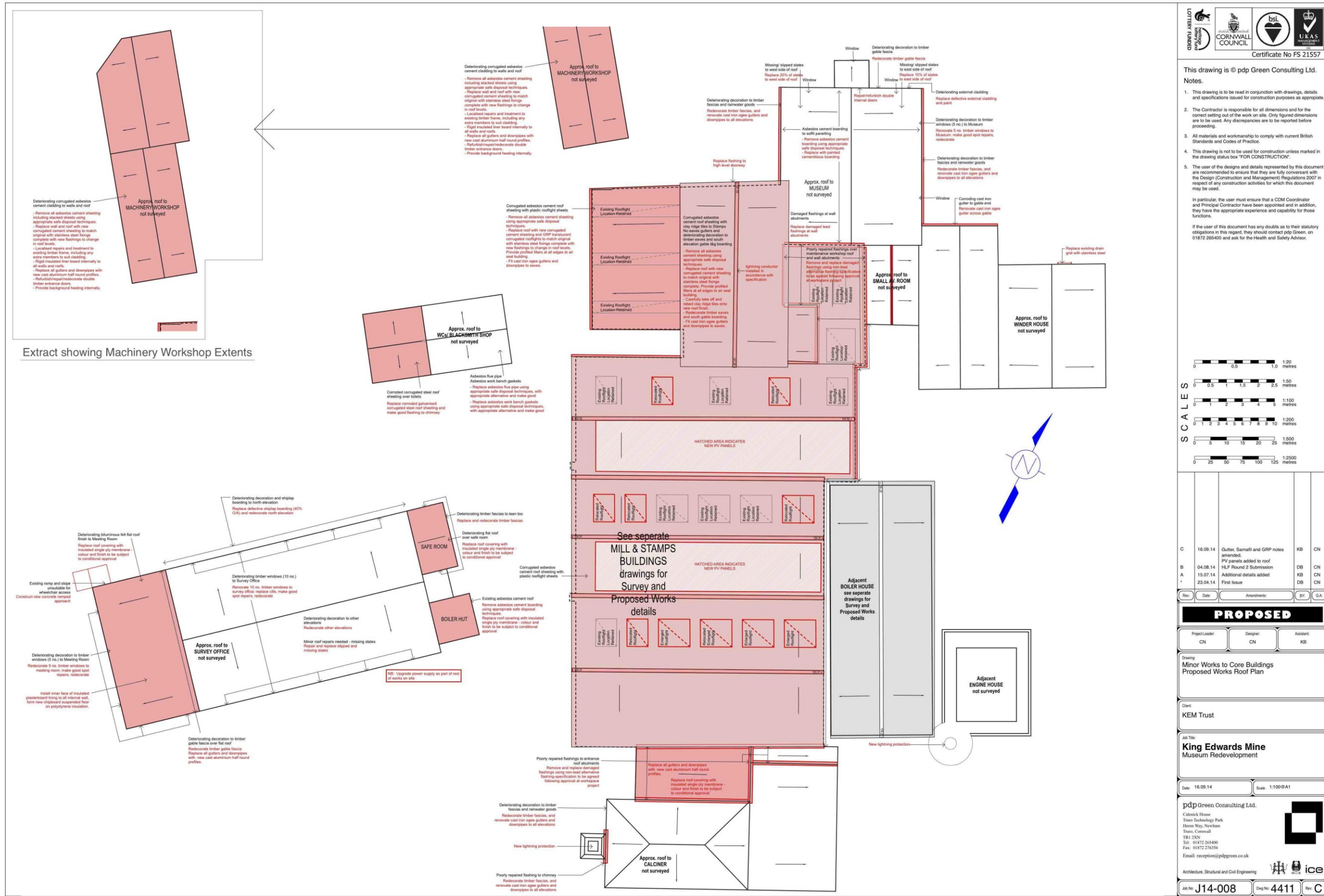


Figure 20 Plan of the minor works to core buildings (PdP Green Cons. Ltd Dwg No. 4411C)

Site impacts

Refer to Figures 2, 3 and 4 for site location. Site information for each building is given in Table 1 and detail record sheets 6 and 12. Figure 20 is a reproduction of a proposed plan showing all the minor works to the core buildings, as produced by Pdp Cons. Engs following extensive dialogue with the clients. These figures should be referred to during this section. Given the minimal physical impacts to these buildings (primarily direct replacement of roof and wall coverings, etc), detailed archaeological site surveys have not been undertaken.

Significant impacts

- Existing corrugated asbestos roof coverings are to be replaced by a similar profiled and coloured cement corrugated roof – a limited visual impact.
- All corroded or damaged roof/wall corrugated sheeting to be replaced where appropriate.
- All bitumastic flat felt sheeting to be replaced where appropriate with either GRP or similar bitumastic felt sheeting.

External:

- All exterior timber cladding or corrugated steel walls to be repainted where necessary.
- Existing window frames to be retained, repaired and re-puttied where appropriate.
- A disabled ramp to be formed in place of existing on the north side of Site 20 (Meeting/AV room).
- Flashings to be replaced where necessary with a lead substitute.

Internal:

A large percentage of these works are to the exterior fabric of the buildings, reducing short term site maintenance. However, the exception being the provision of additional floor and wall insulation to Site 20, the meeting and A/V room (built in 1967 but Listed Grade II*). These works will enable the room to have an enhanced level of insulation in order to reduce heating costs in the winter months.

Summary of core building works:

Sites 15 and 16 (Welding and machinery workshop – Sites not Listed): Replace existing asbestos roof and wall cladding with cement equivalents, and localised repairs of exterior timberwork and frame. Replace 1960s period gutters with half round cast aluminium profiles and the addition of new internal background heating.

Site 17 (Toilet block– Site not Listed): The replacement of an existing corrugated steel roof with a new steel equivalent. Replacement of the existing asbestos flue pipe with a cement equivalent.

Site 19 (Survey Room): General repair works to the roofing slates, the exterior timber cladding and repair of the window frames/cills where necessary (with re-painting). Replacement of the existing boiler hut asbestos roof with insulated GRP. Replacement of the existing Safe Room bituminous flat roof with insulated GRP or a new felt roof.

Site 20 (Lecture/AV Room): General repair works to the exterior timber cladding and repair of the window frames/cills where necessary (with re-painting). Replacement of the existing bituminous flat roof with insulated GRP or a new felt roof, and construction of a new concrete ramp to replace the (unsuitable) existing version. Internally, the existing plasterboard lining will be removed and replaced by insulated plasterboard lining. The existing chipboard floor will be removed and a new suspended insulated chipboard floor inserted.

Site 21 (Calciner and chimney): A new lightning conductor will be added to the exterior chimney. The copper rod from the aerials will go down the inside of the chimney to an earth mat/drill hole to provide earth impedance.

Site 23 (Entrance corridor section): Replacement of the existing bituminous flat roof with insulated GRP.

Site 28 (Mill Engine Room): General repair works to the roofing slates, the exterior timber cladding and repair of the window frames/cills where necessary (with re-painting). Replacement of the Cast iron ogee gutters/downpipes with new equivalents. Internally, the existing asbestos cement boarding will be removed and replaced with a cementitious equivalent specification.

Site 33 (Sulzer Engine Room): Replace existing asbestos roof with plastic rooflights with cement and GRP equivalents. Localised repairs of timberwork and frame. To summarise, the main tenets of the conservation philosophy has been followed in order to minimise impact; to retain the site's character and to allow reversibility. The specification and design for the replacement of the existing asbestos based roofing products, will mimic the existing material, and has followed the philosophy of replicating a significant period in time (early decades of 20th century) for KEM, and for which archive information (photographs) is available.

The overall impact of these proposed works on the site can be defined as '**Major positive**' (Site continues in, or is restored to, its original design and use), with the same pre-project definition, a very rare scenario! The scheme will restore these early and late 20th century buildings as far as possible respecting their original functions; their use will be the same as it has always been and they will hopefully not need any maintenance for some time – helping the long term sustainability of this charity trust site.

6.5.2 Impact mitigation recommendations

Reduction of impact measures and residual impact mitigation has been described in Section 5.2.1. Site impacts; visually, physically and to the overall site's character have been mitigated as part of a consultancy process by the project's conservation architect (Claire Newman, Pdp Cons. Ltd) with KEM Ltd (primarily Tony Brooks), EH (Rhiannon Rhys), the area Conservation Officer (Nina Paternoster), and CAU (Colin Buck), whilst drawing up the design and producing the project specifications.

The impact mitigation strategy for the project is fully described in Section 7. These details informed the design process, as an archaeological/historical constraint.

It is recommended that a necessary prerequisite (and a planning condition) for statutory and Listed Building Consent should be:

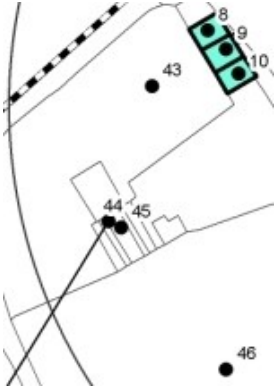

- An archive photographic survey of all sites to be undertaken before any works are started (exterior and interior)
- Archaeological recording during works to be undertaken.

Production of an archaeological report detailing the results of the above archaeological recording interventions, accompanied by 'as-built' survey drawings.

6.6 Stamps Engine House conservation works (LBII)

6.6.1 Detail record sheet

Site name:	South Condurrow Mine	Sheet R14
Building name/identifier:	Stamps Engine House, and loadings (Site 44)	
Survey date:	8/8/2012	
Designations:	Listed Building Grade II (Ref. 1328114 – Stamps engine house).	
Location:	NGR: SW 66301 38874 North west part of core KEM site. Figure 4 for location	
Building at Risk:	No	
Recorder:	C Buck	
Plan Ref:	PdP Green Cons. Ltd Proposed annotated survey drawings for LBC (4510B to 4514B)	

Site map and photograph:		
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Construction materials: (walls, roof, floor, ceilings, windows etc):	<p><i>External:</i> The walls are constructed of un-coursed granite rubble with granite quoins. The roof is no longer extant, presumably either collapsed through neglect or removed when the steam engine was sold after 1903 when the mine ceased operating. Part of the rear (gable) and east wing wall has collapsed between this date and 2000, when the remaining walls were consolidated with new mortar (possibly cement based). However, before this in 1997, the auxiliary pumping shaft (located in the loadings) was grided, as a Health & Safety measure by KDC (Buck 1999c). The walls appear to be in a relatively good condition, although vegetation is now growing out of parts of the building, with ivy spreading up the walls. There are three windows in the west wing wall, one in the east side and the plug door. The earthwork remnants of the stamps platform are overgrown with vegetation, although the front retaining wall is extant. The loadings were fenced in 1997 when the shaft was grided.</p> <p><i>Internal:</i> The interior is overgrown, and cataract pit infilled.</p>
Build date:	This building dates back to 1869 to house a double acting engine to drive the stamps. The stamps were located to the south east of the engine house, the boiler house to the north

	west and a yard to the east (see Fig 7 and Site 43). The dressing floor buddles and rag frames were sited downslope to the south. This engine had a dual function to power an auxiliary bob from the crankshaft to pump water from underground for use on the dressing floors.
Modification date:	There are no known modifications to the building.
Original functions:	Stamps engine house.
Current function:	Conserved Listed building.
Proposed function:	KEM have a short term aim of adapting the nearby Assay Complex (Sites 8-10) for reuse as a café, and utilising the former yard area for outside seating. Clearing the surface of the yard to any buried hard standing for the café seating will be undertaken, but it would also be preferable if the vegetation over the stamps platform and engine house interior could be cleared to give increased public access – which will surely be a focus for interesting wandering. In addition, perhaps thought should also be given to extending the fence around the loadings, and grilling the remaining loading slots – to allow the platform to be used as a viewing point for seeing this section of the GFL.
Significant features/contents:	Both externally and internally, this building retains some of its original character and design. Its repointing over a decade ago has enabled the structure to retain structural integrity and enhanced its appearance.
Original fixtures/fittings:	Not applicable.
Machinery:	No original machinery remains.
Summary description:	This building is Listed Grade II. It retains its distinctive character of a late 19 th century Cornish steam stamps engine house, and it's relatively recent external conservation overhaul structurally improved and conserved the building. Presumably it will continue to function as a visual resource of a bygone technology, and perhaps its loadings as a viewing platform to view this section of the GFL.
Completeness and condition:	This building reflects a similar construction style (granite uncoursed stone with granite quoins), for some of the older buildings within the core of the site. It still retains some of its main structural features of the (unsupported) wing walls, but unfortunately retains no internal original fittings/features. The building appears to be in a reasonable structural condition, no doubt a result of masonry conservation a decade ago.
Significance/conservation strategy:	The historic group value of this mid/late 19 th century building as part of South Condurrow Mine is highly significant, as well as its contextual and working relationship to other adjacent mine buildings. It is one of only a few buildings that date back to the original South Condurrow Mine (1864-1897), the primary mine for this site. The conservation strategy is to keep the building in its present condition for preservation (remove vegetation) and public enjoyment, although it would be advantageous to remove any cement repointing.
EH at Risk Register 2012:	Not applicable

Additional requirements for proposed work/any other factors affecting reuse/repair etc:	Vegetation management is necessary in the short term, with ongoing regular management thereafter (especially if the adjacent yard area is to have regular public use). Listed building consent is necessary for any building conservation works.
--	--

Site impacts

Refer to Figures 2, 3 and 4 for site location. Site information for each building is given in Table 1 and detail record sheet 14. Figures 21 to 24 are reproductions of proposed plans showing the conservation and limited rebuilding works to the engine house and loadings, as produced by Pdp Cons. Engs following extensive dialogue with the clients. These figures should be referred to during this section. Detailed archaeological site surveys have not been undertaken.

Significant impacts

- Rebuilding (to plinth level) of the north east corner of the engine house primarily for structural stability.
- An extension of the loadings steel fence to provide a larger viewing area across the Great Flat Lode (GFL).

External:

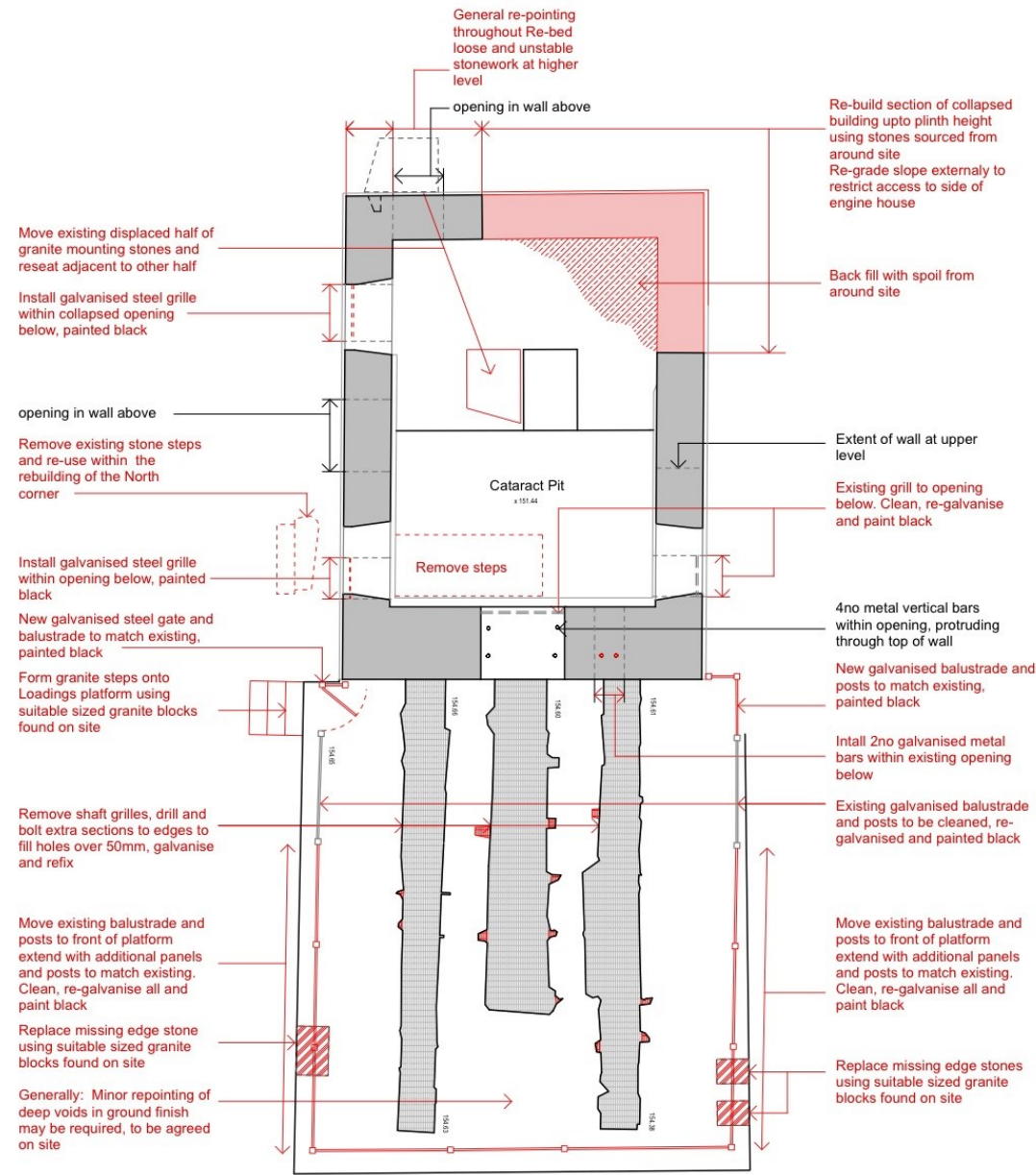
- Repointing and capping of the upper and lower exterior walls to the engine house where appropriate
- Placement of granite steps to provide safe public access into the engine house and loadings viewpoint.

Internal:

- Re-positioning of a segment of original granite cylinder bedstone from outside the building to its original location to match with the existing remnants.
- Installation of steel grilles within existing openings as a Health & Safety measure (given the potential for increased public access).
- Repointing and capping of the upper and lower exterior walls to the engine house where appropriate.

To summarise, the main tenets of the conservation philosophy has been followed. The specification for the mortar repointing, steel grilles and rebuilding style will mimic the existing fabric.

The overall impact of these proposed works on the site can be defined as '**Negligible positive**' (Stabilisation/maintenance of site), with the same pre-project definition. The scheme will conserve this mid/late 19th century iconic building as far as possible respecting its original function and form. There is a significant potential for increased and safer public access (to experience the physical impact of an engine house and to view the setting and some surface features of the eastern end of the GFL), especially via the Mineral Tramways Trail and the proposed new Café. All of should help the long term sustainability of this charity trust site.



Proposed Ground Floor Plan

1:100



GENERAL NOTES

- Where noted; remove vegetation to top of all walls, consolidate by bedding and re-pointing to ensure a curved profile is formed capable of shedding water.
- Localised re-pointing where noted; re-point the wall in accordance with the Specification (assume % for re-pointing surface of wall as detailed on drawings). Areas of deep re-pointing and where hearing mortar has been eroded are noted specifically on drawings.

THIS DRAWING IS A GUIDE TO THE LIKELY EXTENT OF STRUCTURAL STRENGTHENING, CONSERVATION, STABILISATION AND CONSOLIDATION OF THE STONE MASONRY STRUCTURES WHICH THE CONTRACTOR MUST ALLOW FOR. THE ACTUAL SCOPE OF THE WORK WILL BE DEFINED ON COMMENCEMENT OF THE WORKS.

REPLACEMENT STONE FOR ALL REPAIRS TO BE SALVAGED ON SITE USING FALLEN STONES ONLY. Stones may only be recovered from the ground if they are not embedded. Removal of embedded stones must be done with the express permission of the Project Manager, and under a watching brief. Stones must not be removed from extant walls under any circumstances.

INSTALL LIGHTING CONDUCTOR IN ACCORDANCE WITH SPECIFICATION

Health and Safety Risks remaining following consolidation works:

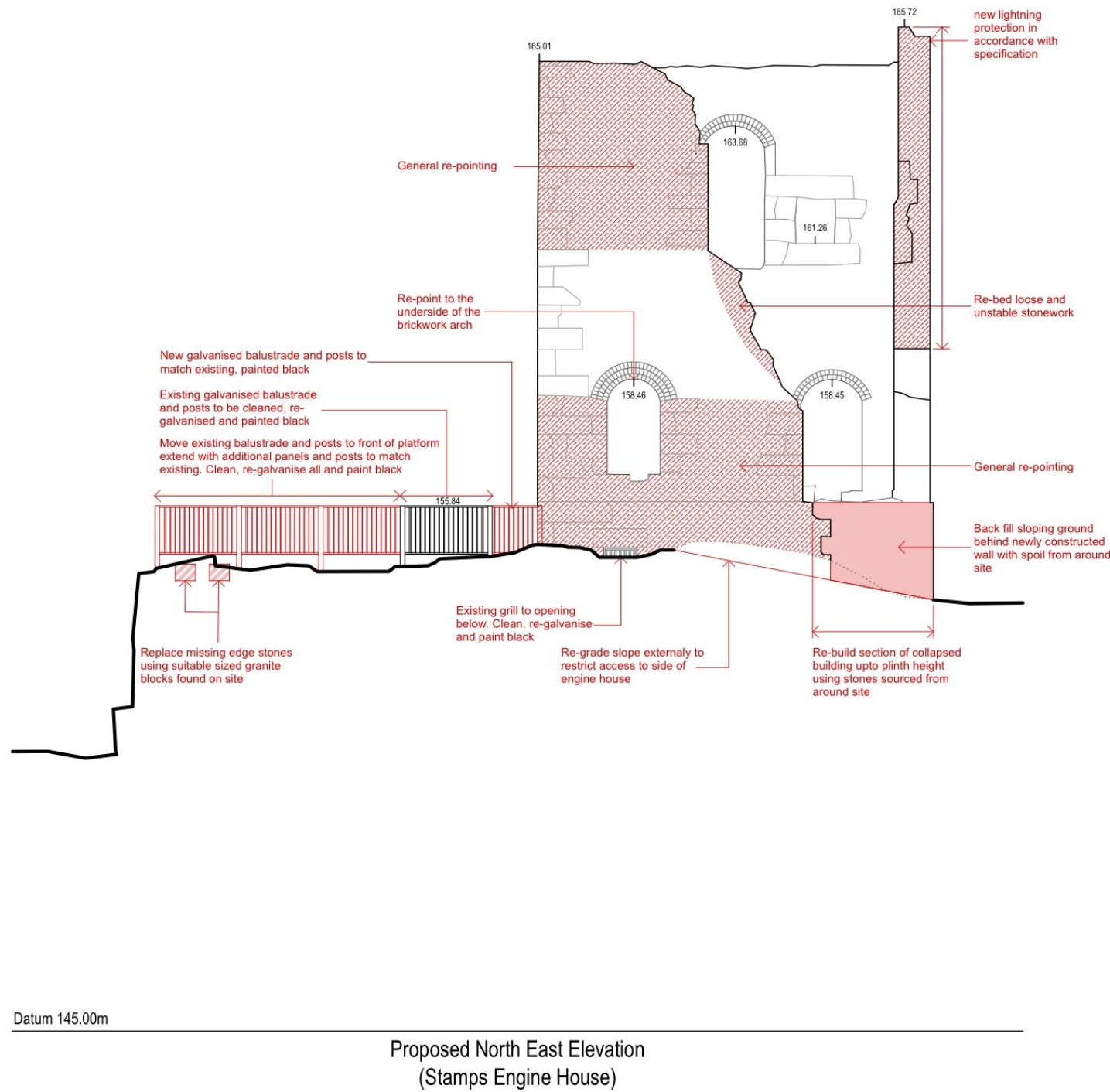
General:
 Steep drops and level changes
 Climbing risks
 Trip hazards

Specific:
 Level change of land topography
 Flue holes - trips and uneven ground

Prefer larger scale drawings. Prefer figured dimensions to scaled dimensions. Check all relevant dimensions, lines and levels on site before proceeding with the work. Take site dimensions for fabrication of joinery and other fittings. Refer all discrepancies to the architect for higher decision before putting work in hand.
 Copyright in this drawing and in the work executed from it remains the property of the architect.

 Calenick House Truro Technology Park Heron Way, Newham Truro, Cornwall TR1 2XN Tel: 01872 265400; Fax: 01872 276356 Email: reception@pdgreen.co.uk			
Drawing Title Stamps Engine House Proposed Works Ground Floor Plan	Scale 1:100	Date 28.05.14	Drawn KB
Client KEM Trust	Job Title King Edwards Mine Museum Redevelopment	PROPOSED	
Q.A.: CN CN RG	By: DB KB CN	Revisions: - First Issue - 01.04.14 A - Additional details added - 01.04.14 B - Issue for HLF 04.08.14	Assistant Designer DB
Project Leader CN		Certificate No FS 21557	UKAS MANAGEMENT SYSTEMS 003
bsi.		Cornwall COUNCIL	heritage lottery fund LOTTERY FUNDED

Figure 21 Plan of the proposed works to the Stamps engine house (PdP Green Cons. Ltd Dwg No. 4510B)



Prefer larger scale drawings. Prefer figured dimensions to scaled dimensions. Check all relevant dimensions, lines and levels on site before proceeding with the work. Take site measurements and photographs of any fittings. Refer all discrepancies to the architect for higher decision before putting work in hand.
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heritage lottery fund
LOTTERY FUNDED

Certificate No FS 21557

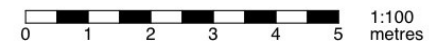
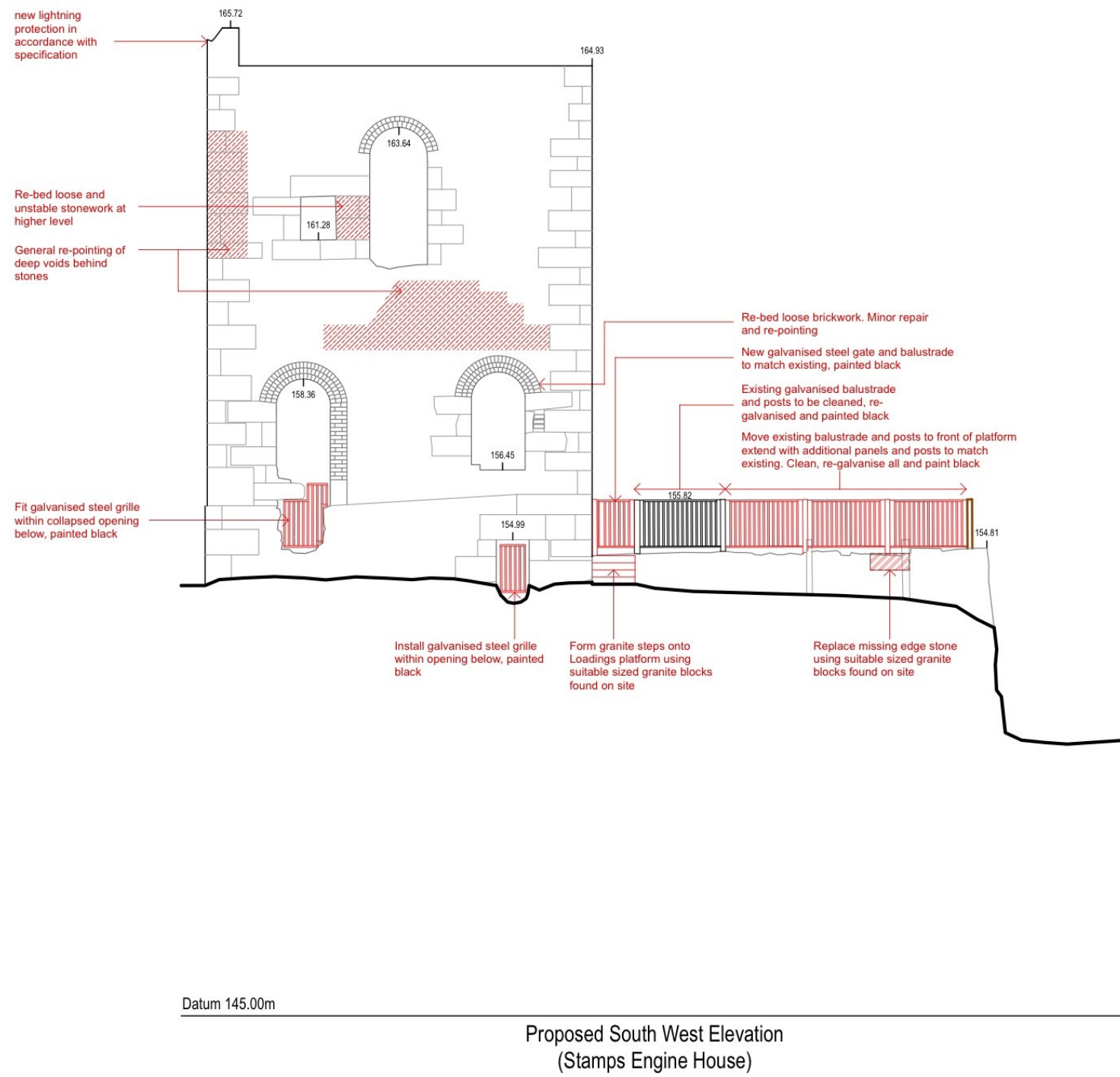
Revisions:	Project Leader	Designer	Assistant
* - First Issue - 01.04.14	CN	DB	CN
A - Additional details added - 01.04.14			
B - Issue for HLF 04.08.14			
By:	DB	KB	CN
G.A.:	CN	CN	RG

Client	KEM Trust
Job Title	King Edwards Mine Museum Redevelopment
PROPOSED	



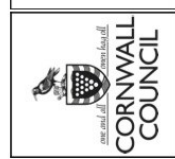

Drawing Title	Stamps Engine House Proposed Works Northeast Elevation
Scale	1:100
Date	28.05.14
Drawn	KB
J14-008	4512 B

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Figure 22 North east elevation of the proposed works to the Stamps engine house (Pdp Green Cons. Ltd Dwg No. 4512B)



Prefer larger scale drawings. Prefer figured dimensions to scaled dimensions. Check all relevant dimensions, lines and levels on site before proceeding with the work. Take site measurements and photographs. Refer all discrepancies to the architect for his/her decision before putting work in hand. Copyright in this drawing and in the work executed from it remains the property of the architect.

Certificate No FS 21557

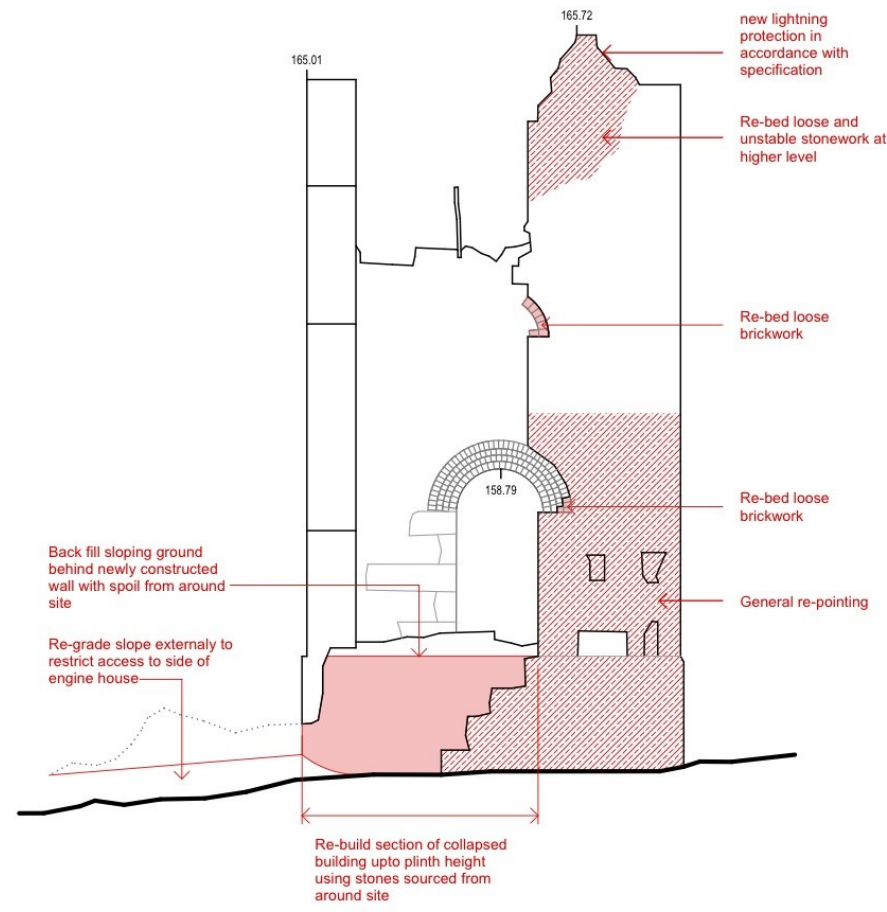
Revisions:	Project Leader	Designer	Assistant
* - First issue - 01.04.14 A - Additional details added - 01.04.14 B - Issue for HLF 04.08.14	CN	DB	CN
By:	DB	KB	CN
G.A.:	CN	RG	CN

Client	KEM Trust
Job Title	King Edwards Mine Museum Redevelopment

Drawing Title	Stamps Engine House Proposed Works Southwest Elevation
Scale	1:100
Date	28.05.14
Drawn	KB
Drawn	KB
J14-008	4514 B

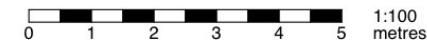
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Figure 23 South west elevation of the proposed works to the Stamps engine house (PdP Green Cons. Ltd Dwg No. 4514B)



Datum 145.00m

Proposed North West Elevation
(Stamps Engine House)



Prefer larger scale drawings. Prefer figured dimensions to scaled dimensions. Check all relevant dimensions, lines and levels on site before proceeding with the work. Take site photographs and measurements for comparison with drawings. Refer all discrepancies to the architect for his/her decision before putting work in hand. Copyright in this drawing and in the work executed from it remains the property of the architect.

LOTTERY FUNDED

Certificate No FS 21557

Revisions:	Project Leader	Designer	Assistant
- First Issue - 01.04.14	CN	DB	CN
A - Additional details added - 01.04.14			
B - Issue for HLF 04.08.14			
By:	DB	KB	CN
Q.A.:	CN	CN	RG

Client KEM Trust
Job Title King Edwards Mine Museum Redevelopment

Drawing Title	Date	Drawn	KB
Stamps Engine House Proposed Works Northwest Elevation	28.05.14		
Scale	1:100		
J14-008		4511 B	

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Figure 24 North west elevation of the proposed works to the Stamps engine house (PdP Green Cons. Ltd Dwg No. 4511B)

6.6.2 Impact mitigation recommendations

Reduction of impact measures and residual impact mitigation has been described in Section 5.2.1. Site impacts; visually, physically and to the overall site's character have been mitigated as part of a consultancy process by the project's conservation architect (Claire Newman, Pdp Cons. Ltd) with KEM Ltd (primarily Tony Brooks), EH (Rhiannon Rhys), the area Conservation Officer (Nina Paternoster), and CAU (Colin Buck), whilst drawing up the design and producing the project specifications.

The impact mitigation strategy for the project is fully described in Section 7. These details informed the design process, as an archaeological/historical constraint.

It is recommended that a necessary prerequisite (and a planning condition) for statutory and Listed Building Consent should be:

- An archive photographic survey of the interior and exterior walls of the engine house and loadings will be undertaken before any works are started (exterior and interior).
- Archaeological recording during works to be undertaken.
- Production of an archaeological report detailing the results of the above archaeological recording interventions, accompanied by 'as-built' survey drawings.

6.7 Residual impacts

With the exception of the proposed new Assay Café extension building and adaption of the former boiler house, most of the short-term residual impacts relate to the visual component – this will be mainly focussed on the core buildings, where the existing asbestos corrugated profile roofing material will be replaced with a cement based equivalent. Corrugated steel sheet walls will be re-painted and flat roofs replaced where necessary and timber ship-lap cladding repainted to match the colour and finish of works ongoing to the Carpenters Shop (KEM Workspace Project 2014). Window frames will be repaired, repainted and re-puttied. Longer term residual impacts relate specifically to the first substantial build since the 1960s on this site (the new Café extension), although its careful siting will not be immediately visible from the main core site, and the boiler house adaption for exhibition space.

There will be changes of functional use (Assay complex to Assay Café and Winding engine boiler house to exhibition space), but with minimal and reversible physical impacts to the internal layouts and specifications of each site.

However, given the nationally important statutory designation of these buildings, the adaptive reuse scheme is also to a large extent repairing and conserving these historically important buildings. There is the positive residual impact that the buildings will be conserved for at least another generation. Structurally, both the assay and the boiler house sites will both benefit from re-use and heating; they have previously been used only for storage but dampness has caused damage through neglect for some time.

6.8 Assessment of impact on historic building character

As described in the Significance section of this report (Section 3.2), KEM has International, National and Local significance attributes, as well as its statutory designations of Listed Building Grade II*. Therefore, the importance of production of a Conservation Management Plan (Buck 2013), that sets out clear principles and policies of significance and character, which underlies a clear Conservation Philosophy; to inform and guide project development, as well as the production of detailed specifications, cannot be understated.

The Conservation Philosophy's main tenets of utilising archive information to guide specifications for repair, alteration and rebuild have been followed. Generic conservation principles following principles of reversibility, minimising impacts upon original features – and adapting the design to each site's constraints have also been followed. In addition, the scheme is proposed to include the reversing of mid to late 20th century building work undertaken on the Counthouse that included pebble dashing the exterior, and re-roofing the complex with corrugated asbestos sheeting. Again, this is positive – the site's character should be enhanced rather than diminished by the sustainable regeneration project. Where new build has had to be accommodated, their design has been based on replicating an industrial feel and character, in line with the function of the site.

The overall impact of these proposed works on the site can be defined as '**Moderate positive**' (Site restored as far as possible respecting its original function, but its use is altered). The scheme will restore the buildings as far as possible respecting their original function, but their use in some specified instances will be altered. It should be noted that as a result of these proposed works, both the Assay Complex and the Winding engine boiler house will be able to be removed from the EH Buildings at Risk Register 2013.

7 Impact mitigation strategy

The impact mitigation strategy methodology is described below in three main stages: The pre-works consultancy, site supervision during works and the archaeological recording record (during and after works). This mechanism demonstrates the steps that have been taken to avoid or minimise adverse impacts, and confirms that the proposed works have been designed in close liaison with the relevant statutory (and non-statutory) historic environment and conservation officers. This is based on a clear understanding of the significance of the site using appropriate methods and techniques for site monitoring and recording.

7.1 Pre-works consultancy

Cornwall Council Culture Team tendered and commissioned a Design Team to facilitate production of plans and specifications for the adaptive reuse of both the Assay Complex and winding engine boiler house sites. Pre-works consultancy throughout this formative design period has occurred, leading to general compromise and agreement.

Detailed liaison with the project's conservation architect (Pdp Green Cons. Ltd) and appropriate statutory officers (EH, Conservation Officers and County Planners), non-statutory advisers (Cornwall Archaeological Unit and KEM Ltd), and public consultation throughout the design and specification process, have ensured that the impacts have been reduced as much as possible, and the scheme accords with the general conservation philosophy produced in the Conservation Management Plan.

However, it should be noted that although many of the impacts have been foreseen through the design and consultation process, it may be the case that others will occur during site works, and cannot therefore be commented upon in detail nor mitigation discussed. This report should therefore be viewed as a generic impact assessment for the project at this stage.

7.2 Site supervision

A Conservation Accredited architect will also be appointed for the implementation phase. This will be undertaken with other statutory officers (for example English Heritage and the area Conservation Officer).

The Conservation Management Plan should be a useful resource to inform and guide policy and conservation/repair work decisions that will need to be made during ongoing site works.

7.3 Programmes of archaeological recording

Listed Building Consent from English Heritage and Cornwall Council will be necessary for these works. This report is a pre-requisite for planning consent.

This report makes the following archaeological impact mitigation recommendations:

- An archive (Black and White) photographic survey of all buildings and rooms should be undertaken that will be impacted by the scheme (internally and externally), before any works are started.
- Archaeological recording during works (particularly excavation impact sites for example below ground services/drain routes and the site of the new build Assay Café extension).
- Production of an archaeological report detailing the results of the above three archaeological recording interventions. The archaeological recording report will include detailed 'before and after' site photographs as well as a descriptive text of the general works.

It is likely that a detailed brief will be supplied for the nature and extent of the archaeological recording.

8 References

8.1 Primary sources

King Edward Mine:

Archive photographs held by Tony Brooks

Cornwall Council:

Aerial photograph (oblique) of King Edward Mine

Ordnance Survey, 2007. *Mastermap Digital Mapping*

Survey drawings:

Assay Complex/Boiler House/Stamps-Mill buildings/Other core buildings/Stamps Engine House proposed plans and elevations (pdp Green Cons. Architect drawings 2014)

8.2 Publications

Brooks, T and Watton, J., 2002, *King Edward Mine 2001, An illustrated account of underground and surface operations 1897- 2001*, Cornish Hillside Publications

Buck, C., 2013, *King Edward Mine, Camborne, Conservation Management Plan*, HE Projects (Report No 2012R086)

Buck, C., 1999, *Contract 9B, Mitigation recording*, CAU (Report No 1999R011)

WHS, 2007. *The Outstanding Universal Value of the Cornwall and West Devon Mining Landscape*

WHS, 2013. *Cornwall and West Devon Mining Landscape - World Heritage Site Management Plan 2013-2018*

8.3 Websites

<http://lbonline.english-heritage.org.uk> The Listed building database of English Heritage and the Department of Culture, Media and Sport

<http://www.cornish-mining.org.uk> The Cornwall and West Devon Mining Landscape World Heritage Site website

<http://www.stastier.co.uk> A particularly useful website by the manufacturers of St. Astier brand lime products detailing methodologies for their application.

<http://www.cornishlime.com> The website of the Cornish Lime Company

9 Project archive

The HES project numbers are **146380/146381** (King Edward Mine: Heritage Impact Assessment)

The project's documentary, digital, photographic and drawn archive is maintained by Cornwall Archaeological Unit, Cornwall Council, Fal Building, County Hall, Treyew Road, Truro, TR1 3AY. A project file containing site records and notes, project correspondence and administration (File No. **146380/146381**).

1. This report is held in digital form at HE CC as: G:\Historic Environment (Documents)\HE Projects\Sites\Sites K-L\King Edward Mine\KEM Museum HIA 146380\King Edward Mine HIA Report 2014R068
2. English Heritage/ADS OASIS online reference: cornwall2-190474