

CORNWALL UNIT
909 COUNTRY HALL, STATION ROAD
TRURO, TR1 3AT

Harvey's Foundry Business Plan

**Contribution by CAU to an Action Plan in production by
Gordon Lewis Associates Ltd**

Cornwall Archaeological Unit

3rd December 1999

1100 1/2180/03

0/08 000000, 1100 11000 010

Acknowledgements

This report was prepared for Gordon Lewis Associates Ltd. as part of a business/action plan for Harvey's Foundry Complex, Hayle.

Within CAU the project staff were N. J. Cahill (freelance consultant, conservation/historic buildings), Jeanette Ratcliffe (Project Manager), Bryn Perry-Tapper (historical researcher, GIS/SMR assistant), and John Smith, the industrial archaeologist responsible for producing previous CAU reports on the site.

List of Contents

- 1.0 Introduction
- 2.0 Archaeological and Historical Summary
 - 2.1 Study area
 - 2.2 Harvey & Co.
 - 2.3 Development of the foundry site
 - 2.4 The site today
 - 2.5 References
- 3.0 Significance of the foundry site - layers of context
 - 3.1 Industrial History - national and international context
 - 3.2 The immediate context - the Harvey 'Empire'
 - 3.3 Hayle - the town
 - 3.4 Cornwall
 - 3.5 Current character - degree of survival
- 4.0 Principles for future use
 - 4.1 Basic principles
 - 4.2 Site access recommendations
 - 4.3 Future uses of the buildings
 - 4.3.1 General principles for adaptive re-use.
 - 4.3.2 Stabilised ruins with partial re-use (Foundry Barn only)
 - 4.3.3 New build and new uses.
 - 4.3.4 Design of new build
 - 4.4 Designations and recommendations
 - 4.4.1 Scheduled Monuments
 - 4.4.2 Listed Buildings
 - 4.4.3 Conservation Areas
- 5.0 Interpretation and presentation
 - 5.1 General principles
 - 5.2 Interpretation themes
- 6.0 Archaeological Recording
 - 6.1 Introduction
 - 6.2 Historical research
 - 6.3 Recording of standing historic buildings and structures
 - 6.4 Evaluation and recording of buried archaeological remains
 - 6.5 Ballpark costs for the archaeological recording

- 7.0 Consolidation and remedial works
 - 7.1 General conditions
 - 7.2 Consolidation and repair of standing structures: outline costs
 - 7.3 Costs spreadsheet
- 8.0 Inventory of standing structures

List of Figures

- 1 Historical phase maps (series of maplets)
- 2 Standing fabric map with existing designations
- 3 Location of key demolished buildings
- 4 Assessment of buried archaeological potential

1.0 Introduction

Cornwall Archaeological Unit was commissioned to provide a report, consisting of both text and draft quality figures, to be included in the business plan/action plan being prepared by Gordon Lewis Associates for the Harvey's Foundry complex in Hayle. This report includes a summary of the history and development of the site, an assessment and inventory of the standing remains and the potential for buried archaeology, and an assessment of the importance of the site in both a local and a wider physical and historic context. Some broad suggestions have also been given for the costs of recording and consolidation of the site.

Owing to the constraints of time and cost, this report is a limited exercise, drawing on the results of survey work currently being undertaken throughout Hayle by CAU as part of an historic settlement assessment, together with collating previous studies and reports on various different elements of the site (see references below). The suggestions for interpretation and presentation, and the various themes that might be explored have been arrived at by discussion between the author and CAU staff. The costings for various works are outline budget figures that may need substantial alteration once detailed survey work has been done on the site.

2.0 Archaeological and historical summary

2.1 Study area

The study area encompasses the whole of the 'island' site bounded by Turnpike Road on the north, Foundry Lane and on the west north of the railway Viaduct, the access lane to Carnsew south of the Viaduct, and by Foundry Hill and Foundry Square on the south and east sides. The area covers the core of the Harvey & Co. sites, including the Foundry, Boring Mill and stores, the Foundry Offices and Shops, Foundry House, the Foundry Farm and wagon houses and the gasworks. It is important to note, however, that critically important elements of the Harvey complex lie outside the study area, especially the Hammer Mill/Old Boring Mill/Grist Mill/Ropewalk complex lying to the south of Foundry Hill. This complex was part of the earliest phase of the foundry, and was as important a part of the whole as those within the study area, certainly up to the building of the new Boring Mill in 1840. Also excluded are the extensive areas of quays, wharves, shipyards and associated buildings that lie to the north of Turnpike Road. These actually represented a much greater investment in purely monetary terms for the Harvey family and the firm, and was probably always the mainstay of the business, even if the foundry was the flagship enterprise of this wide-ranging and highly diversified Company.

2.2 Harvey and Co.

John Harvey (1720-1803) was a blacksmith at Gwinear who moved to Hayle in 1779 (Barton, 1969). He had the vision and commercial instinct to realise that the Cornish mining industry would welcome and benefit from a county-based foundry and engineering works capable of supplying their needs. Although his business remained localised and small-scale for the first few years, by 1800 50 men were employed by Harvey. The early years of the 19th century were characterised by the establishment of many Cornish industrial enterprises set up to serve mining and quarrying, where previously such services had of necessity been sought outside the county. Gunpowder manufacture, fuse-making,

brick-making, engineering and iron-founding all flourished with the great expansion of hard-rock mining as the century progressed.

John Harvey's son, Henry Harvey (1775-1850), expanded the Foundry business and made Harvey's an international and greatly respected firm, largely due to the management and energy of the noted engineer and engine designer Arthur Woolfe. Close family ties with Richard Trevithick and later professional partnerships with great engineers such as William West gave the firm a continued level of expertise unmatched by other engineering works in Cornwall.

By the 1870s the Foundry included a forge and smithy, two machine shops, a boring mill, two fitting shops, hammer mills, pattern shops and stores, and the foundry itself with five cupolas and two air furnaces.

Their reputation was built on the design and manufacture of Cornish beam engines, but these machines were merely the most spectacular and visible portion of a great range of mining machinery and equipment.

The bedrock of the business was not the great engines, splendid though they were, but the wholly mundane though essential import and sale of coal, timber, and building materials through the now rapidly expanding port of Hayle.

Harvey's influence and prosperity peaked from around 1820 to 1870 (Barton 1969, 150), and 460 were employed in the Foundry in 1841, with another 400 engaged in the wharves, building and coal trades. Engines were built for mines in Cornwall, many other metal and coal mines in Britain, Australia, South Africa, South America and Spain; engines were also supplied to waterworks in Britain and Holland (the Haarlem Mere engines). During this period (and especially in the 1840s during the period of the Haarlem Meer contracts) the works in Foundry Square adapted and expanded to cope with an ever-increasing volume of work.

Two years after the death of Henry Harvey in 1850, the firm was divided between his nephews, the Harveys retaining the foundry, shipping and general merchandising business, the Trevithicks taking the milling, baking, farm and grocery business, this change has had a notable impact on the character and appearance of the surviving buildings on site.

Harvey & Co.'s main competitors during this period were the Copperhouse Foundry of Hayle, and the Perran Foundry at Perran Wharf between Truro and Falmouth. By 1880 both of these had gone out of business, victims of the decline in Cornish mining, and Harvey's was also forced to diversify in order to survive. A new shipbuilding yard was constructed with slipways and boilerworks, intended to compete on a national level with other yards producing vessels up to 4000 tons. The foundry was gradually run down as the century ebbed, having been subsidised by the trading branch for many years; final closure came in 1903, and the firm concentrated on the trading and shipping sides of business. The firm of Harvey & Co. continued to act as builder's merchants, and merged with UBM in 1969.

2.3 Development of the foundry site (Fig 1)

The study area covers only a part of a major 19th century industrial complex. Little is known of the early years of the Foundry, from 1779 to 1840. The place chosen by John Harvey for his enterprise was a greenfield site in the late 18th century; the earliest casting foundry was sited in much the same locality as the later Casting Shops (immediately to the south of the later West Cornwall Railway (WCR) viaduct). The Hammer Mills and first Boring Mill south of Foundry Hill also pre-date 1815 and were one of the first

developments, once John Harvey had decided to venture into the manufacture and erection of Cornish engines after 1800. John Phillip's map of 1841 (County Record Office (CRO) DDH 166/11) shows the Foundry in a developed state, before the building of the WCR. The site included the Casting Shops, Stores, Offices, Retail Stores, Pattern Shop, Erecting Shop, Boiler Works, Smith's Shops, Pattern Store, and Transport section (Foundry Farm); across the Helston road to the south were the Hammer Mills, Boring Mill, Grist Mill and millpond; to the east were the White Hart Hotel, stables and dwelling houses also owned by Harvey's.

By the 1880s the works had consolidated on the Foundry site, and expanded to the north with the new Gasworks, Shipyard, Boiler Works, and slipways. Virtually every building, yard and quay at this end of Hayle was either owned or controlled by Harvey & Co.; Hayle's very existence centred around this concern now that the Copperhouse Company had closed.

In 1903 the entire Foundry and engineering works was dismantled and the materials sold off or scrapped. During the succeeding years, the buildings were partly reused by Harvey's for the building trade, but gradually became more derelict. After closure of the Foundry, many of the buildings continued in use as stores and warehouses. Even as late as the 1960s, the majority of the structures associated with Harvey's were intact, although dilapidated and in some cases roofless. After 1970, there ensued a progressive episode of dereliction and demolition, ostensibly to clear areas of the site for re-development. In the 1980s Harvey-UBM sold the site to a firm of developers who demolished many of the structures. The study area has suffered less from this process than other parts of the Foundry, and no features other than the Reservoir [7] have entirely disappeared.

2.4 The site today

Despite this fairly ruthless programme of demolition by previous owners, there remain today Some 25 or so historic structures associated with the foundry still surviving (see Fig 2 and buildings Inventory). These can be grouped under broad headings:- the foundry buildings, the Farm, the office and shop complex fronting Foundry Square, and ancillary structures (although there is naturally considerable overlap between these groups).

Amongst the foundry buildings, at one end of the scale in terms of both size and survival of original floors and roofing are the granary/engine house complex and the roofed but floorless pattern shop. The only foundry building currently in a usable condition and occupied is the Wagon sheds (Plantation Stores), in use for vehicle repairs.

The stable yard complex, although composed of two storey buildings theoretically more easily adapted for re-use, are in an extremely poor state of preservation, and are currently empty and unused; the Foundry farmhouse is in private occupation as a house and is in generally good condition, as is the early 20th century bungalow (2 Foundry Hill) built in its grounds.

The office and shop complex includes the Whites Building, Excaliburs with the Drawing office, and numbers 18-23 Foundry Square. All are currently used or were until recently occupied, and are in reasonably good condition, although all require some degree of repair or re-instatement of original features.

Ancillary structures include number of boundary walls, the enigmatic tunnels cut into the slopes of Carnsew Hill, and the Triumphal arch in Foundry Lane. Use is hard to define in these cases, but all require a degree of remedial work, particularly extensive vegetation clearance.

There are three sets of late 20th century buildings on site, the Rowe building, a large steel framed shed currently used as an auction house, the Bookers cash and Carry warehouse, and the recently completed housing scheme along the southern and eastern sides of the site known as Trevoarn.

The whole site is therefore a complex mix of buildings in use, in decay, or in a stabilised condition, with workshop, warehousing, storage, retail and residential uses on the site.

2.5 References

Primary sources

1840 Tithe Apportionment Survey (microfiche at CAU)

1880 OS 25 inch map (microfiche at CAU)

1907 OS 25 inch map (microfiche at CAU)

CRO H 162/1 Article on early history of the Foundry

CRO H 165/5 Valuation 1841

CRO H 165/6-16 Valuations 1864-1897

CRO H 165/33 Chronology of events 1864-1883

CRO H 215 Photographic Album 1897

CRO WH 2815-2819 Hayle Foundry 1793-1853

CRO H 217 Draft history of Hayle, T R Harris, ca 1950

CRO TM59/TMA 59 Tithe Map St Erth 1842

RIC MMP/51 Map ca 1790

CRO H 166/46 Map of 1815

CRO H 166/20 Map of 1828

CRO H 166/33 Map of 1835

Publications

Anthony G H, 1968, *The Hayle, West Cornwall and Helston Railways*, Oakwood Press

Barton, DB, 1969, *The Cornish Beam Engine*, 149 et seq

Bliss V, 1978, *The History of Hayle*, Penwith DC

Butts, V, 1978, *The History of Hayle*, unpub. manuscript

Ferguson J, 1993, *Hayle Historical Record*, unpub. manuscript

Harris TR, 1937, *Copperhouse Foundry*

Harveys of Hayle Catalogue, 1844, at RIC Truro

Lake, 1872, *Parish Histories of St Erth and Phillack* (vols I and IV)

Minchinton W and Perkins J, 1971, *Tide Mills of Devon and Cornwall*, 14

Noall C, 1984, *The Book of Hayle*, Barracuda Books

Pascoe W H, 1981, *The History of the Cornish Copper Company*, Dyllansow Truran

- Penwith District Council, 1991, Planning Application 1/91/H/0054/F
- Penzance Teacher's Centre, 1978, *Taile of Hayle*, Cornwall Education Committee
- Rolt, LTC, 1965, *Tools For The Job*, 56, 77, et seq
- Smith, JR, 1990, *Perran Foundry*, Cornwall Archaeological Unit
- Smith, JR, 1993, *Foundry Square, Hayle, Archaeological Assessment*, Cornwall Archaeological Unit
- Smith, JR, 1995, *Foundry Square, Hayle, An Archaeological and Historical Assessment*, Cornwall Archaeological Unit
- Smith, JR, 1999, *Foundry Square, Hayle, An Archaeological Assessment*, Cornwall Archaeological Unit
- Vale E, 1966, *The Harveys of Hayle*, Bradford Barton

3.0 Significance of the foundry site - layers of context

3.1 Industrial history - national and international context

Until Boulton and Watt's patent expired in 1800, the Soho (Birmingham) foundry had a monopoly on the market for beam pumping and winding engines installed on Cornish Mines. As the 18th century came to an end, the new Cornish foundries such as Harvey's and Perran Foundry were poised to take advantage of a new period of free competition within the now rapidly expanding market for mining equipment. At first, however, there was neither the skill nor experience available within the county for the building of complete beam engines, and a great deal of work was contracted out to foundries such as the Neath Abbey works in South Wales.

By 1830 the three leading Cornish foundries (Harvey's, Perran, and Copperhouse) were producing work equal to that anywhere in Britain (Barton 1969, 148), and in another ten years were pre-eminent in their field:

"Not only did they supply virtually every one of the very numerous engines used on the Cornish mines from about 1820 onwards, but they supplied collieries and ironworks in South Wales, the Midlands and the North, waterworks in London and elsewhere, metal mines in Ireland, Wales and Derbyshire as well as Spain, France, South America, Mexico, Australia, the West Indies, South Africa and all other countries abroad where deep mining was carried on." (Barton 1969, 149).

The Cornish foundries were known and respected by engineers and miners throughout the world; their stature was on a par with the great railway workshops of Swindon and Crewe, or the shipbuilding yards on the Clyde. Harvey's stood among the top three, and was arguably the greatest, with its close association with Trevithick and other engineers such as William West. The decline and dissolution of the Cornish foundries was due solely to the collapse of Cornish mining in the later years of the century, and did not represent a loss of workmanship or skill. The scant remains of Harvey's in Foundry Square are thus doubly significant. They are a monument to Cornish skill and enterprise in the heat of the Industrial Revolution that was, for some fifty years, pre-eminent in the world; they also represent the very reason for Hayle's existence.

3.2 The immediate context - the Harvey 'Empire'

The foundry site is only a small part of the Harvey influence in the western half of Hayle. While it is the core of the whole business, there are actually much more extensive remains of the other parts of the enterprise. A simple list will show how extensive this was.

- Quays and wharves. The extensive area of quays to the north of Turnpike Road , including Carnsew Quay and South Quay, Carnsew Pool, the shipyards (now buried under recently dumped waste material). Many listed structures. Griggs Quay at the head of the estuary was also a Harvey business.
- Millpond Avenue industrial site. Includes the hammer mills, boring mill, grist mills, ropewalk and Millpond. Mellanear smelter at the south end of the avenue was built on Harvey land, Harvey's having an interest in the undertaking at a later date.
- The large houses along Millpond Avenue; all built for John and Henry Harvey and housed many of the notable figures in the history of the firm, as were many of the surviving villas along Foundry Hill and Trellisick Road.
- Cottages built Harvey's for Harvey's in Millpond Avenue and Foundry Hill (Drivers Row - for their wagon teamsters).
- Large houses on the surrounding hills and other cottage rows. Even in those not built by Harvey's (especially Tremeadow Row and Penpol Avenue), the occupants were mostly employed by Harvey's or were members of the extensive family group from whom the directors and senior officers were drawn. More remotely connected with Harvey's was Penpol Terrace, yet it only existed here because of the pull of the foundry, the population of workers and shipping; many of its early inhabitants were mariners, teachers, shopkeepers and professional people.
- Public buildings. Harvey's built the two standing white Hart buildings, the market hall/public rooms (Lloyds Bank), the school building in Foundry Hill, as well buildings now demolished, like the drill hall (on the site of Sorting Office) and the Institute (demolished). Further afield, they donated the site of the Passmore Edwards Institute in Commercial Road.
- Landscaping. The somewhat eccentric activities of Henry Harvey in the 1840s have left a legacy of structures and landscaping in the area of Carnsew fort, Foundry Hill walled gardens, and the Plantation and walks along Turnpike Road that rival any similar group in the country - there is certainly little to compare with them in Cornwall.

3.3 Hayle - the town

Harvey's eventually managed to outlast their rivals, and often implacable enemies, the Cornish Copper Company, and by the 1870s had acquired most of that company's holdings, including all the quays in the town. However they continued to have most influence only in the western part of the town indeed, it must be said that the Copper company built up the bigger settlement focus at Copperhouse, and were probably more influential in the creation of the settlement of Hayle. Many alternative sources of employment were available to the inhabitants of the town, including mining, the metal works of J. F. Pool, and in the early 20th century explosives, the latter being the largest local employer just before W.W.I. Hayle was not really a single 'Company Town' and although the prosperity of the town did rely heavily on the success of the Harvey

enterprises, and particularly on the shipbuilding and quayside activities, it did not do so exclusively, and for much of its history it was not the major player by any means.

There are thus many extremely important and significant buildings in other parts of Hayle, which would be worthy of notice even without the interest of the Foundry site, especially the great extent of quays built for 18th century trading companies (Merchant Cumow's Quay by St Elwyn's church), the Copperhouse quays, lock gates and canal, the Black Road and bridge. A prominent landmark at the east end of Hayle is large industrial sheds which now occupy the site of the Copperhouse foundry; more interesting historically and scenically is the Loggans Mill complex of the Hosken family, who later merged with Trevithick to form HTP (see [17] and [23]). There are fine individual buildings and within the town, such as the Passmore Edwards institute, the old Cinema in Copperhouse, St. Elwyn's church and church hall, and on the north side of the river, Phillack Church and churchtown, Riviere house and Riviere Farm.

3.4 Cornwall

Apart from the importance of the foundry outlined above, Harvey's played a crucial role in many aspects of industrial and commercial activities in Cornwall. The fundamental role of the business was to supply the mining industry - the bulk of its business, literally and figuratively, was in supplying coal and timber in vast quantities. The iron founding business was originally set up to make pump parts and general equipment for the mines, and only after 1816 did it concentrate on steam engines, although it never lost its general trade. Grocery, drapery, ironmongery, bread and hardware all figured in the trade and retail side of the business. In addition Harvey's had shares in many mines - a standard feature of the merchants who could push their own goods on the mines in lieu of dividend payment, often keeping unprofitable mines going to their own profit. The Harvey interest in the great Wheal Vor mine near Godolphin not only provided most of its business, and led to a short-lived excursion into tin smelting at the foundry (1816-20), but probably allowed the family to ride the lean years in the early 19th century. The company had extensive shipping interest, being major builders and owners by the second half of the 19th century, and controlling much of the steam packet trade between Hayle and Bristol. This side of the business also led to extensive activities in other Cornish ports (especially Porthleven), and the largest ship built in a Cornish yard came from Harvey's yards in Hayle (the SS Ramleh, 4000 tons, launched in 1891).

3.5 Current character - degree of survival

Despite the diversity of interests of the Harvey family, and the greater significance of rivals in the early history of Hayle, the surviving buildings at the Foundry site have attained a great significance by their mere survival. Little survives of the Copperhouse complex, the quays and wharves have been largely cleared, and are anyway scattered over too large an area to be appreciated as a single group, despite their outstanding importance. Although the foundry buildings have been sadly depleted in number and scale in the last 2-3 decades, they still present the most coherent group of industrial monuments in the town, and one of the best in Cornwall, and they still have a dominant role in the local townscape. Herein lies much of their quality and potential. The recent Guinness Trust housing development, whatever its merits as a housing scheme may be, has introduced into the site a use that is at odds with its history and character, and has set up conflicts in layout, use, circulation and control that compromise the understanding, presentation and management of the remainder of the industrial site.

In any development or interpretation of the site, these various levels or aspects of context must be borne in mind.

4.0 Principles for future use

4.1 Basic principles

There are some basic principles that must underscore the future use of the foundry site.

- Future use, management and development of the area must be led by the requirements of the need to stabilise and repair the existing buildings, and
- by the needs of archaeological investigation and recording.
- The recommendations for archaeological investigation, recording and consolidation works set out in sections 6 and 7 should be adopted as a matter of urgency, and should not be delayed while waiting for decisions on the future use or development of the site.
- Ongoing monitoring of condition and stability of structures is required through and beyond the lifetime of the current project.
- Archaeological recording and excavation strategies will take account of opportunities for interpretation and display as well as achieving preservation by record.

4.2 Site access recommendations

The building of the Guinness Trust housing has led to the freezing of a large part of the site, making public access, shared spaces, overlooking, unneighbourliness all potential problems in the site. This reinforces the desirability of a low-key use of the Granary building, since large-scale re-development of this building would have to be accessed and serviced through the stable courtyard, probably destroying that space in the process. Access is therefore most likely from the north, where the major potential threat is to the character of Foundry Lane. This is a quiet, enclosed and well-defined space and route bounded by important buildings and walls that should be preserved and protected, and perhaps closed off to all but access traffic. It seems clear that the greatest potential for access and car-parking is on the gasworks site, therefore. However, pedestrian access is feasible from a number of different points, for instance via the old entrance by 18 Foundry Square, where part of the massive gatepiers survive. Use of these entry points should be encouraged as an aspect of interpretation of the site.

4.3 Future uses of the buildings

4.3.1 General principles for adaptive re-use.

While future uses of individual buildings is a matter for others to consider, from an historical and archaeological perspective, the careful conservation of all the surviving structures, with a minimum of alterations, and the reinstatement of historic plan forms, materials and details is a priority, especially those redundant or underused buildings most directly associated with the foundry (items [1-15], [17-19], [24], [25] and [28]). The importance not only of individual buildings but of the group as a whole is such that these qualities cannot be sacrificed to a 'big hit' scheme with major alterations that might attract major investment, and see all the buildings re-used, but would destroy the very character that has led to the current interest in the site. The nature of some of the buildings is such

that they contain fairly large open interior spaces that should be seen as an opportunity, not a constraint, allowing a great flexibility of use (buildings [6], [13-14]). Those buildings, like the stables buildings [8-12], which have difficult interiors to re-use should be adapted for low-key uses that preserve as much of the interior as possible. This is likely to mean that in strictly financial terms, they will be an uneconomic prospect, but that is precisely why they should attract substantial grant aid, and they should be seen as part of a wider grant and management scheme, where the overall benefits of a conservation-led approach outweigh the cost of individual elements.

4.3.2 Stabilised ruins with partial re-use (Foundry Barn only)

The granary/engine house complex [13-15] is so important an industrial monument and physical element in the site and wider townscape, that it should be regarded as an historic object in its own right, rather than as a site ready for re-development. It is certainly possible to use part of the building for the setting and display of major historic artefacts, such as a steam engine, but these should be limited in scope. Problems of access, floor levels and loading, fire proofing and means of escape, especially with multiple use, all mean that an exact or acceptable reinstatement of the original floor plans and layouts could/would be difficult. If historical accuracy in both general and detailed design can be achieved, then complete re-use may be acceptable, but a more conservation-guided approach may be to accept the current condition of the building, turn this into an asset, and have the building basically preserved as a monumental centrepiece to the area, with an interpretative and display element incorporated.

4.3.3 New build and new uses.

From a purely historical point of view, both the Booker's building and the Rowe building are perfectly acceptable in both their use and their appearance, as unpretentious industrial buildings within an industrial site, as are the other uses in Foundry lane. While this is no constraint to their removal, the use and character of the site should not be lost or given over to either overriding residential use, or gimmick theme park retail outlets.

Suitable areas for redevelopment are:

- The Gasworks and yard. Redevelopment potential includes the whole of the gasworks site, with the major proviso that there is likely to be ground contamination, especially in the immediate area of the old gasworks, so that surface works only are recommended (i.e. car parking).
- The Rowe building. Although there is no archaeological (below ground) constraint to re-development, since this area was always an open area within the foundry site (and may have had a storage function, or be related to the use of the farm and wagon stores), from an historical point of view, there is an equally valid argument to be made for keeping this area open and free of development if the setting of the surviving historic buildings is to be reinstated.
- Bookers/Boring Mill/car park. Although this is a large area that on the face of it seems suitable for re-development, this is also the key archaeological site within the complex, and much may survive below the deposited layers on which the current buildings stand. This may be one of the principal areas where suitable archaeological remains exist for retention and presentation. The extent and location of any new development should therefore be determined following below-ground investigation.

4.3.4 Design of new build

Even if current uses on site change, and the existing 20th century buildings are removed (Rowes and Bookers), new build should take its cue in matters of materials, scale, massing,

etc. from the industrial aesthetic that so strongly underlies the whole site. The Guinness Trust houses, whilst they attempt to achieve the correct scale for the site, fail in almost every other regard (materials, design, layout, use, landscaping) to enhance the historical character and potential for public presentation of this nationally important industrial site, and should not be seen as a precedent for future development.

4.4 Designations and recommendations

4.4.2 Scheduled Monuments

There are no Scheduled Monuments within the study area. It is recommended that the Monuments Protection Programme fieldworker should access the site, particularly after any below-ground archaeological investigation, in order to assess the need for any statutory designations.

4.4.2 Listed Buildings

Structures [1], [5], [6], [8], [13], [14], [15], [17], [18], [19], [20], [21], [22], [23], [25] are Listed Buildings, Grade II. Consideration should be given to extending the listing to include the rest of the stable yard, in particular items [10] and [11]. Although much altered on the exterior, an internal inspection of the Foundry Farmhouse [27] may just reveal sufficient early character to warrant listing. Also worth considering are the tunnels [3] and [4], and the various walls on site [12], [24], [28]. All these buildings are important historic buildings, which survive more or less intact and predate 1840, making them worthy of consideration at least. Some, like the tunnels, are unique structures, particularly within this context.

4.4.3 Conservation Area

Although most of the standing historic structures on site are within the existing the Hayle Town Conservation Area, much of the core of the site lies outside - especially the Bookers building and the gasworks site. This is not acceptable, since there are some structures within this area worthy of protection ([28], [29], parts of [14], investigation may reveal more remains, and since any development in those areas would clearly affect the conservation area and the setting of listed buildings, it would make sense to include it within the designation, rather than leaving such a development doughnut. Moreover, since conservation area designation carries with it a duty to propose enhancement measures, and attracts special areas of grant aid, such an extension of the conservation area could have beneficial financial consequences. Recommendations for a general extension of conservation area designations throughout Hayle are being considered as part of the Hayle Historic Town Assessment currently being undertaken by CAU.

5.0 Interpretation and presentation

5.1 General principles

A large number of artefacts are on offer for this site, including at least two full sized Cornish Beam Engines. Rather than merely encase these artefacts in a small part of the site, an incident in the whole, it would be a better approach to regard the whole site as the visitor centre, to be able to experience a working historic environment with a mixture of monuments (the Granary/Engine House?), semi-private work spaces (the Foundry lane properties?), semi-public area with a mix of private uses, perhaps on the upper floors, and public access to interpretation, craft or retail areas on the ground floor (the stables?). A comparable experience might be that of Charlestown. The artefacts would thus relate to

different aspects of the site, developing linked themes related to the buildings themselves. All retail outlets should be closely linked to activities on the site, and related to the history and character of the Foundry complex.

A low-key presentation of the buildings and artefacts themselves is preferable from a conservation point of view, since it causes less impact on the buildings and the site. This would in effect create a 'Harvey's Trail'. The artefacts, and the site as a whole, would then be a focal point for a wider exploration of the area, both physically, and in terms of understanding its history, leading to a revised town trail, or a series of themed trails. As a starting point for both local and wider exploration of various aspects of Cornish history and life, few places have the potential of the Foundry site. Some of the various themes that might then be explored are set out below. The remarkable network of paths and lanes that feed into the site and into the Station/Foundry Square area is a prime resource for transferring interest out from the site.

The key to presentation and interpretation is therefore a viable research, visitor, archive, education and information base at the Foundry site, from which the more specialist or adventurous visitor could explore the foundry and the wider environment. A mass market should probably not be aimed at, although suggestions for a backpacker's centre, and/or field studies centre would fit in with this approach. In this context, it is worth noting that the only other similar site in Cornwall, Perran Foundry, between Truro and Falmouth, has an extant permission for a large museum/visitor attraction, with associated shops and a hotel. Not only are two such sites unlikely to succeed in Cornwall, leading to potentially disastrous competition for materials, funding and visitors, but such large schemes have long pre-development negotiations and funding rounds, long lead-in times to construction, and generally an overbearing impact on the buildings, if for no other reason the requirements of health, safety, fire, access and circulation of large numbers of visitors. In the meantime, the sensitive and already decaying buildings on site could suffer irreversible decay.

5.2 Interpretation themes

The value of the surviving complex and the artefacts that may be displayed on site, is that they could act as a physical trigger for visitors to explore wider themes and wider areas, drawing the Foundry site into the town as a whole, and stimulating interest in the wider attractions of Hayle, not just confining it to the foundry. The exact detail of the interpretation and presentation of the site needs to be the subject of a detailed and expert plan by specialists in the field, based on detailed historical, access, commercial and managerial studies. This current report can only suggest a number of broad themes that have arisen from existing assessments of the foundry and the town.

The Foundry - industrial history

The site, itself, and the development of the foundry industry is the prime historic theme. Given the association of figures like Richard Trevithick, Arthur Woolfe and the West family, this is a key industrial heritage site. The steam engines Harvey's built for the Haarlem meer project are amongst the best known and most visited industrial monuments in Europe, the place where they were built should have a similar interest. Exploring this theme would lead on to the neighbouring Hammer Mills and Ropewalk site, and could link beyond to the Copperhouse Foundry site, and to Angarrack and Wheal Alfred mine remains to the south.

The Harvey family.

The large family has already been touched upon, but they are one of the key families in 19th century Cornish industrial history, and some of the most notable names of the period were connected - foremost amongst them Richard Trevithick. The 'heroic' period of Cornish engineering in the early 19th century weaves in and out of the family history, as does the eccentricity of Henry Harvey (including a reputed large illegitimate family kept in good circumstance on the edge of the town), and the epic struggle with the Cornish Copper Company.

Rails and roads.

The most obvious monument in the foundry area is actually the railway viaduct. Less obvious is the story of the Hayle Railway, one of the first in Cornwall, and indeed the world. This had a terminus at Foundry Square, and linked into the tramway network in the foundry and the wharves, elements of which can still be traced. The route, and various structures, can be traced along Penpol Terrace, across the Copperhouse creek (swing bridge/piers), along King George V Memorial Walk. The foundry farm, stables, wagon sheds and cart sheds remain together with the cottages (Drivers Row) built for the teamsters, in effect a complete early 19th century transport depot, on a scale that rarely survives; perhaps the only similar monument in Cornwall is the Cornish Copper Company's farm and stables, which fortunately survive in Hayle, across the river at Riviere. One of the unwritten histories of the industrial revolution in Cornwall is the critical role of roads, and new turnpike roads in particular, one of the finest engineering monuments in Cornwall is the Causeway across the Hayle Estuary which link the Foundry to St Ives and Penzance.

Shipping and harbours.

Just to the north of the Foundry site are some of the best and most extensive 18th and early 19th century commercial quays, certainly in Cornwall, perhaps in Britain. Sadly neglected and partially dumped over, they are potentially an important resource. All the produce, and in the early years even the boats themselves originally lay at the Foundry site, which is a starting option for exploring the wider area. Beyond the west end of the town, the extensive quays of Copperhouse can be explored. Beyond those, are the major works Harvey's undertook at Porthleven.

Urban development.

Closely bound up with the commercial aspects of Harvey's business, is the creation of an urban centre around the Foundry. There are two aspects to this that can be developed. The first is the straightforward history of development of the area, with its worker's housing, with the unusual number of large and fine villas, particularly along Millpond Avenue and Trellissick Avenue, built for all the various members of the extended Harvey/Trevithick family. Building on this was the gradual provision of public buildings by Harvey's - a school, market house and public rooms, Hotel, Literary Institute, and the transformation of the new settlement by the late 19th century into an Urban District. The second theme is the extraordinary parallel development of a separate urban centre based on Copperhouse, which became a separate Urban District, again with schools, market House, public rooms and hotels.

Social history

An extension of the urban history and family history related to the Harveys, the lives and conditions of the workers could be explored. While Harvey's, and the Copper Company were providing the buildings and subsidising schools, Literary Institutes, Churches and providing housing, the relationship of these companies to the workers who were

dependant upon the vagaries and fluctuations of company fortune has not been explored. There were workers who rose up through the ranks to become directors, on the other hand there were strikes, disease and poverty. In the late 18th and early 19th century, during the heyday of the copper smelter at Copperhouse, Hayle had a reputation for being one of the worst places in Cornwall for health and life expectancy, with the labouring in the smelter (as perhaps also in the tin smelter and foundry at Harvey's?) seen as a form of wage slavery to which the mining population of Cornwall was not accustomed.

Commercial history.

Despite the glamour of the steam engines and the ships that transported the across the world, the bulk of Harvey's business was in merchandising. The most public buildings associated with the site, as they must always have been, are the shops, stores and offices in Foundry Square. The Local authority is set to pursue a programme of shopfront restoration, and some element of presentation of the range and style of presentation of Harvey's goods in their heyday may be appropriate.

Natural environment

Despite the industrial heritage of Hayle, it is also set in one of the most complex and valuable natural environments in the county. A sheltered estuary location, it has important wildlife (bird) reserves, SSSI designations on the mudflats and on the Towans (the extensive sand dunes), all easily accessible. These are in themselves a major attraction of the area, as is, of course, the sea and its beaches. Access to open countryside via paths and roads is easy and quick. The low hills around the estuary on which Hayle and Phillack are built give extensive and often breathtaking views to the west overlooking the estuary to Lelant, Trencom and St Ives, and inland to the hills around Godolphin and Carn Brea. The sensitive nature of the natural environment and the need to promote bio-diversity is not only an area of interest to explore, but could generate potential conflicts with development proposals, and even with historical or archaeological conservation proposals.

Landscape.

Not only is there the obvious attraction of the natural setting of Hayle, beyond the dereliction of much of the quayside areas, but there is a curious, unique and extremely important manmade landscape in the extraordinary activities of Henry Harvey in the 1840s. He transformed the Hillfort of Carnsew into a heroic fortified landscape complete with high walls, and triumphal arches. Ornamental walks were laid out on ramped embankments, and avenues cut across the landscape, stone reverted ponds and huge walled gardens were built - parts of this are accessible, and afford outstanding views across the estuary to the western hills.. The study and restoration of many of these features would be a fascinating project, particularly important given the current fashionable vogue for garden restoration . Just beyond this curious landscape lies one of the most important mid 19th century gardens in Cornwall, designed 1867-8 by the leading Arts and Crafts Architect J. D. Sedding for one of the partners in Harvey & Co.

The walks.

The key to most of these themes is the availability of easy access to and from the foundry site in order to draw the visitor through and out of the site, see something else of related interest, and then back to the starting point. There are already many roads, lanes and public rights of way enabling access to all the other sites mentioned, and enhancement or completion of other routes such be a priority of the wider management of the area, if it is beyond the scope of the Foundry management plan itself. Critical in this is the enhancement of the Station area, which has a number of interesting and accessible pedestrian routes to it, and on to key parts of the rest of Hayle (such as the quays), but is a

poor place in itself. The restraint of Henry Harvey's landscape and circular walks, which would involve bridging the railway, should be a long-term aim. Signposting is at present inadequate or non-existent, and this simple measure would bring the foundry site into the existing network. The particular topography of Hayle makes the use of bicycles particularly attractive, and there are proposals already to link into the Sustrans network.

6.0 Archaeological recording

6.1 Introduction

Archaeological recording falls into three main categories.

- Historical research
- Recording of standing historic buildings and structures
- Evaluation and recording of buried archaeological remains.

Such research and recording is an absolute requirement prior to repair, reinstatement or conversion, and should be undertaken by specialist contractors and supervisors, experienced in the recording of archaeological, architectural and historic detail.

6.2 Historical research

Although historical research has been carried out by various individuals/organisations in the past (eg CAU, Harvey Foundry Trust, local historians), there is a need for systematic examination of all surviving historic records. The purpose of this is to gain a comprehensive and detailed understanding of the history and physical development of the site in order to correlate this information with the evidence preserved in the standing historic structures and buried archaeological features. This research is also an essential precursor to effective interpretation and presentation of the site.

6.3 Recording of standing historic buildings and structures (Fig 2)

The standing buildings have had limited historic description. Ground plans and elevation drawings were produced in 1998 of the Foundry Barn and surrounding buildings (Buildings 8, 10, 11, 13, 14, and 15 in Fig 2 and section 8). However, these drawings are an incomplete (and in places inaccurate) record.

Acquisition of all the major relevant buildings, and an integrated approach to development and management will remove a major obstacle to such recording; the aim should be to produce an archive of all the surviving historic structures within the area, whether occupied or ruinous. Co-ordination with the privately owned properties in the study area will be required.

Precise specifications for each of the surviving structures will vary, with some requiring greater detail than others, and with the use of different techniques. A recording brief for each of the buildings should be drawn up before any works are undertaken which will affect the buildings, and an archaeological Buildings Record should be made by a qualified archaeological consultant working with a professional survey team. The record should be based on the following outline methodology:

- Collating all historical data available for each building to aid understanding of its phasing, ownership and function, etc.
- Photographic record, phase 1 (before clearance) – general views of the exterior and interior of structures.
- Vegetation clearance. This will include careful clearance of vegetation from some of the walls, and in some cases, removal of debris from interiors. Such preparatory work should only be carried out under archaeological supervision.
- Photographic record, phase 2 (after clearance). This should include external and internal elevations of all structures and close-ups of architectural/historic detail. Photographs should be archive quality black and white prints. This work will require the use of scaffolding or some other means of accessing upper levels.
- All surviving historic buildings should be surveyed in detail, in plan and elevation, to be reproduced at a general scale of 1:50, although the external elevations of the Barn/Engine House complex capable of reproduction at 1:20 in order to illustrate the complex construction phases (photogrammetric survey may be appropriate). Such measured surveys should include all external and internal details of the structures. The measured survey of the structures should show all archaeological/historic detail. This work will require the use of scaffolding or some other means of accessing upper levels.
- Condition/dilapidation schedules to assess the consolidation/repair requirements of each building.
- Archives to be produced for deposit with interested bodies/management organization.
- Report(s) presenting result of archaeological/architectural recording with a separate report for each building or group of buildings combining historical data, plans, Interpretation, and recommendations)

See the site inventory in section 8 and Fig 2 for details of the structures that require recording.

6.4 Evaluation and recording of buried archaeological remains (Figs 3,4)

The Foundry site in its entirety has a long history of development and redevelopment over a period of 124 years and those areas not already considered (CAU, 1993/1995) include the earliest parts of the site and the core functional areas (i.e. the foundry/casting shops themselves), and are the site of the most complex changes and phasing. Also now included is the gasworks site. Many of these buildings date from the rebuilding of the foundry in 1816 - subsequent alteration and expansion added ranges, or re-arranged internal layouts and organisation of the various activities in the foundry site.

Archaeological investigation and trenching has been limited to the southern part of the site - that area covered by the Guinness Trust development. Evaluation trenching is therefore required to establish the character and extent of any below ground archaeological deposits over the whole of the remainder of the area in order to achieve the following goals.

- Establish the opportunities for interpretation and display.
- Guide future redevelopment of the site.
- Assess the impact of proposed development.

- Establish the level of archaeological recording that is required in advance/during development.

Note that contaminated land may be a constraint to trenching in some parts of the site, in particular on the gasworks site.

On the basis of original function, primarily in terms of whether the original structures would have had below ground elements (eg casting pits, furnace bases, machine and crane bases), it is possible to indicate those areas of the site where significant buried archaeology may be found. Evaluation trenching will reveal the extent to which these features have survived or been removed by later activities on the site.

Figure 3 shows the location of the main buildings that have been demolished, and the buried archaeological potential of the different areas of the site is described below and mapped in Figure 4.

Area A – Bookers site and surrounding areas

This is an area of high archaeological potential.

The foundry/casting house stood on the site of the current Bookers building. It remained in the same part of the site throughout its history from 1780 to 1903. Rebuilt in 1816, there were several further phases of alteration and extension, particularly to the west of the old core, and on the north end of the original building where a series of furnaces was added in the 1840s, parts of which are still visible attached to the rear of the White's building.

The 1839-1840 boring mill stood to the south west of Bookers. There may be important sub-surface archaeological remains within the footprint of this building (the walls of which partially survive – item [15] in the inventory), and preservation of the floor area of this structure is likely to be good. There are many unanswered technical questions relating to this important mill that can only be resolved by close examination of the remains.

The site of the 1840 New Boring Mill and the area to the north was previously occupied by an erecting shop. This was part of the major expansion of 1816, which transformed Harvey's from a relatively small foundry into a major manufacturing centre. It was here that the steam engines/boilers, etc. cast at the foundry were assembled.

To the east of the Bookers building is the site of the short-lived limekiln built in 1780 as part of the first phase of the foundry. This was overlain in 1816 by a pattern shop and a stores building. The tramway of c.1852 ran between these buildings and the rear of the surviving offices/shops to the east, and evidence of it may survive here as it does further south in the site.

There are extant building remains attached to the north side of the standing pattern stores, and to the north end of the wagon shed and below the viaduct itself. These structures were apparently added after the building of the first viaduct across the site in 1852. Investigation is required to establish the history of these buildings and their relationship to standing structures, including the viaduct. They appear to predate the main pattern stores building.

West of Bookers is the site of the reservoir (the eastern retaining wall of which is visible above ground – inventory item [7]). Although the reservoir is now filled in, nothing is known of the infill material, its stability or potential toxicity, and evaluation trenching is required in order to determine if the structure/fabric of the reservoir survives beneath the infill. If this is the case, it may be appropriate to totally excavate the fill in order to reveal and display this feature. The expansion of the Harvey's complex in about 1843-5 saw the creation of Foundry Lane, the building of the pattern stores and the wagon house, and the creation of the reservoir. Part of the retaining wall for this is the natural bedrock - all this

development being achieved by extensive quarrying and levelling of the western part of the area. The Cunaide stone now set up on Carnsew Hill fort was found at the same time in this area, and the opportunity to establish any surviving pre-industrial layers could be taken as part of the investigation of the reservoir area.

Area B – Gasworks site

This is an area of medium archaeological potential.

The gasworks were designed in 1830, but not built until 1843, and this area presents a rare opportunity to study a single phase, single use industrial complex of this sort. Harvey's, in conjunction with William Brunton of the Eagle Foundry in Birmingham, designed and built gasworks at the same period for Falmouth and Penzance, so that investigation of this site could have wider implications for understanding this class of site elsewhere in the County. The adjacent area to the east may retain evidence of 'Mr Ellis's House', part of the mid 18th century development of Carnsew quay that was the earliest of all developments in this part of Hayle. There was also a copper smiths on this site. The site is complicated, however, by the potential for contaminated land associated with the gasworks.

Area C – Foundry Farm/Foundry Lane

This is an area of low archaeological potential.

Virtually all the original buildings recorded in this area survive today, and the historic maps show no evidence for these having replaced any earlier structures. There is some limited potential for buried archaeological remains – the foundations of a structure previously attached to the western end of one of the stable blocks (inventory item [8]) may survive below ground, as may the remains of early surfacing (eg cobbling), drains, and other external features.

Area D – site of Rowe building

This is an area of very low archaeological potential.

From the available map evidence the site currently occupied by the Rowe building appears never to have been previously built on. It seems historically to have always been an open space. However, although there is no potential for early buildings to survive, the fact that it is named as a yard on the 1879 map suggests there may be the remains of an early surfacing (such as cobbling).

In all those parts of the site where evaluation trenching is not carried out, future management programmes, planning applications and clearance and development work must make provision for a qualified archaeological consultant to be present during the digging of foundation trenches, removal of ground, or laying of main services, in order to carry out a watching brief and record any features of archaeological significance which are exposed as a result of such work.

6.5 Ballpark costs for the archaeological recording

The costs provided below are ballpark figures designed to give a general idea of the financial provision that will need to be made for archaeological recording. Estimates have been made as to the time needed to complete each task, and salary costs have been calculated at a daily rate of £200. Some of the costs may be over estimates. For example, for the recording of standing buildings the average cost per building is based on what it is likely to cost to record a large complex building, and small/less complex structures may in

fact cost less to record. It is difficult to be specific about the cost of the evaluation trenching until a detailed strategy for this work has been drawn up. The costs below assume 20 trenches averaging 5m x 2m. The time and resources required for the watching brief will depend on the nature and extent of the ground works being carried out. For the purpose of these costs it has been assumed that an archaeological consultant will be required on site for 20 person days.

Historical research	20 person days	£5000
Recording standing buildings	Recording of 17 buildings, based on the following average costs per building.	£170,000
	Collating historical data – 5 person days - £1000	
	Photo record, phase 1 – 1 person day - £200	
	Vegetation clearance – 1 person day - £200	
	Photo record, phase 2 – 1 person day - £200	
	Survey - £5000	
	Conditions survey – 1 person day - £200	
	Archiving – 2 person days - £400	
	Report – 10 person days - £2000	
	Recording materials/report reproduction £750	
	Travel - £250	
	TOTAL COST PER BUILDING - £10,000	
Evaluation trenching	20 trenches, based on the following average costs per trench.	£58,000
	Fieldwork – 4 person days - £800	
	Archiving – 1 person day - £200	
	Report – 5 person days - £1000	
	Mechanical digger - £600	
	Recording materials/report reproduction - £200	
	Travel - £100	
	TOTAL COST PER TRENCH - £2,900	
Watching brief	Based on the following breakdown of costs.	£8,500
	Fieldwork – 20 person days - £4,000	
	Archiving – 5 person days - £1000	
	Report – 10 person days - £2,000	
	Recording materials/report reproduction - £500	
	Travel - £1000	
TOTAL COST		£241,500

7.0 Consolidation and remedial works

7.1 General conditions

The standing buildings on site can be divided into five broad groups requiring different levels of intervention. Detailed condition surveys and recommendations are required for all these structures.

- **In use and in good condition.** These include 18-23 Foundry Square [20], [22], [23], the Foundry Farmhouse [27] and 2 Foundry Hill [26]. Generally only limited repair and reinstatement of historic features is required, and could be covered by small sums of grant aid and the exercise of existing statutory controls. Access for survey work could be difficult.
- **In use and in fair condition** (Wagon sheds [1]). Although generally sound and requiring little repair works, restoration of the principal elevation with its 5 large arched openings should be sought, and this may or may not require new uses. Since there appears to be little deterioration likely, immediate work is not necessary, and the long-term aim of reinstatement could be achieved by either grant aid or the conditioning of planning permissions, or a combination of both.
- **Empty and in fair condition, requiring some structural repairs.** This includes White's store [17] and Excaliburs [18] with the Foundry drawing office [21]. Although in a usable condition, extensive work is required for repairs and to reinstate historic character and detail, but extensive structural works and major reinstatement are unlikely (although the interior of Excaliburs needs major refurbishment works). Works should be carried out before re-use of the building, however, and could be financed by either grant aid or the conditioning of planning permissions, or a combination of both.
- **Empty and in poor condition, requiring extensive remedial works.** The stable complex and yards [8-12], cart sheds [5] and pattern shop [6]. These buildings are becoming increasingly dilapidated, and immediate repair is necessary. Since any re-use should be low-key and carefully controlled so as to retain most surviving features and details, such repair could go ahead without fear of prejudicing future re-use. The use of grant aid to effect the repairs is more likely to achieve retention of important features and character than conditioning planning permissions. Despite the existing planning permissions, a firm contract with an end user is not currently available, and repairs must be put in hand on the basis of the existing condition of these buildings.
- **Empty in poor condition requiring stabilisation** - the Barn/engine house complex [13-15], cattle houses [2], tunnels [3 & 4]. Although much remedial work has been carried out, there are still severe problems with this building, particularly on the elevations into the stable yard. Consolidation of these structures is required to prevent further decay. Since the end use is preferably either as a consolidated ruin, or as a limited display/interpretation area, grant aid will be essential in carrying out these works. Despite the existing planning permissions, a firm contract with an end user is not currently available, and repairs must be put into hand on the basis of the existing condition of these buildings. In addition there are a series of walls and structures that require vegetation clearance and stabilisation [24], [25], [28].

7.2 Consolidation and repair of standing structures: outline costs.

An extensive package of grant aid is currently being put together by the local authority to bring forward a programme of repairs and enhancement in this area.

The costings given here are to be considered as allowances for budget purposes only. They are not based on detailed survey, nor has interior inspection been possible in any of the properties concerned. It is understood that there have been some more detailed surveys and costing of repairs and other works to some of the buildings on site, but these have not been available for CAU to use in the preparation of this report.

Only the principal buildings and archaeological sites have been selected. The costs given are for consolidation and repair and some element of restoration and reinstatement of historic features and elevations is included where appropriate. No costs for alterations for adaptation or new uses of the buildings have been allowed for.

The figures in all cases do not include VAT, which while generally payable on repairs to historic buildings, may be recoverable to certain owners and for certain works. The suggested level for fees (20%) should allow for professional fees (Architect, Structural Engineer, Quantity Surveyor) and for Planning and Building Regulation fees. Only specialist conservation, building and archaeological contractors and professionals should be used.

In all cases, the unpredictability of the structural problems associated with historic buildings, and the specialist nature of many of the works, suggests that relatively large contingency sums should also be built into the costings.

The cost of monitoring the works must also be borne in mind; the complexity of the site and the special requirements of the work mean that a large professional and building team is unlikely to carry out major works in a single phase, so that both survey, recording and consolidation works may have to be phased. On site co-ordination is therefore essential, and should be costed into the works programme.

7.3 Costs spreadsheet - (budget costings, Harvey's Foundry complex - selected buildings)

Consolidation and Repair of Standing structures

Assume a degree of structural or cladding work is necessary in all cases

Site no.	Costs ex. VAT	Fees @ 20%	Total ex VAT	VAT @17.5%	Total inc VAT
[1] Stores/Wagon shed	£ 40,000.00	£ 8,000.00	£ 48,000.00	£ 8,400.00	£ 56,400.00
[5] Cartshed	£ 30,000.00	£ 6,000.00	£ 36,000.00	£ 6,300.00	£ 42,300.00
[6] Pattern Store	£ 85,000.00	£ 17,000.00	£ 102,000.00	£ 17,850.00	£ 119,850.00
[8-12] Stable Complex	£ 200,000.00	£ 40,000.00	£ 240,000.00	£ 42,000.00	£ 282,000.00
[13-14] Granary/Engine House	£ 50,000.00	£ 10,000.00	£ 60,000.00	£ 10,500.00	£ 70,500.00
[17] Whites Building	£ 65,000.00	£ 13,000.00	£ 78,000.00	£ 13,650.00	£ 91,650.00
[18] Excaliburs	£ 80,000.00	£ 16,000.00	£ 96,000.00	£ 16,800.00	£ 112,800.00
[19] Furnace bases	£ 10,000.00	£ 2,000.00	£ 12,000.00	£ 2,100.00	£ 14,100.00
[21] Drawing Office	£ 20,000.00	£ 4,000.00	£ 24,000.00	£ 4,200.00	£ 28,200.00
Totals	£ 580,000.00	£ 116,000.00	£ 696,000.00	£ 121,800.00	£ 817,800.00
Total			£ 696,000.00		£ 817,800.00

8.0 Inventory of standing structures

This inventory gives a brief description and historical background, as well as suggesting conservation based works (consolidation, repair, and reinstatement) and the likely impact future use or adaptation may have on the structures

[1] Stores/Wagon shed

SW 5572 3711 storehouse Listed Grade II 10/171

Now occupied as a garage and workshop by Ford Spares, Hayle. Built as part of the extension of the foundry in 1843-5 (when Foundry Lane and its large boundary walls were built). Identified as a store on the plan of 1864. The structure is rectangular in plan, aligned roughly NW - SE, and is of rubble masonry under a hipped asbestos slate roof. Details include dressed granite quoins and a series of seven arches to the front at ground level. Of these, five are in-filled and two are open with wooden doors. A series of window openings at first floor level is irregular in size and pattern, suggesting alterations in the past. The northern end of the building has a similar in-filled brick arch to those in the roadside elevation. The rear wall of the structure appears at one time to have continued to the north, but it is now truncated and represented by a ragged edge of unbonded masonry. Interior not inspected.

Recommendations

The building appears to be in a sound basic condition. Conservation work should include repair of the fenestration and reinstatement of all the arches in the front elevation. Adaptive re-use should ensure re-instatement and retention of historic features and plan form.

[2] Cattle Houses

SW 5573 3707 cow house

Built 1843-5, extended 1850s. Identified from the plan of 1864 as cattle houses, the structure is now represented by roofless upstanding walls to a height of ca 2 to 3 metres. Construction is of rubble masonry, with evidence for door and window openings with brick detail on the eastern side. The interior of the structure is open to the lane on the west.

Recommendations

Remove vegetation and assess condition. Stabilise and repair as required.

[3] Tunnel

SW 5571 3710 tunnel

Encroaching vegetation prevented examination of the tunnel during the fieldwork and this description is therefore based on a previous site visit. At the rear of [1] a tunnel has been driven into the hillside. It has an impressive brick and masonry entrance, and is now obscured by debris and vegetation. Inside, the tunnel is clearly unfinished rather than blocked or collapsed and terminates in solid rock, with a heading continuing for a further few metres. Access to this feature would have been through the end arch of the Store and a similar blocked arch in the rear wall of the building. The intended purpose of the tunnel is unknown.

Recommendations

The tunnels associated with the Foundry site are still unexplained in terms of their intended function. They are one of the mysteries of Hayle. Clear vegetation at the rear of [1] and around the tunnel entrance to permit a full condition assessment.

[4] Tunnel

SW 5574 3706 tunnel

This tunnel has been constructed beneath the cattle houses [2] but does not seem to be associated with it. Constructed 1843-5, the tunnel is a cut-and-fill construction. A structure is shown on an 1835 plan of the Foundry standing in a small quarry at this point. A brick-arched entrance leads into a tunnel which descends on a gentle slope for ca 10 metres. The tunnel then levels out and increases in width; this chamber is terminated by an end wall containing two smaller tunnels which run on into blind ends. Again, there is no clear indication of an original function or purpose.

Recommendations

Clear vegetation from the portal and tipped rubbish from the interior. Assess condition and consolidate as required. Gate the entrance to prevent further fly-tipping.

[5] Cart Shed

SW 5572 3712 cart shed Listed Grade II 10/172

Abuts [6] and shares its roof. Of rubble masonry with a corrugated asbestos roof. The elevation facing the road is open-fronted with the roof supported on octagonal wooden pillars standing on granite blocks, forming a series of bays where the carts were once stored. These openings are now closed by wooden doors which are a later addition and of modern design. Inside there is an upper floor, supported by wooden joists. South end is a curved granite wall.

Recommendations

The condition of the roof above this elevation is fair. The wooden pillars to the front have rotted at the base and their condition is suspect; as they support the roof, this must give cause for concern. Inside, there are decay problems at the ends of the joists, on the front wall plate and in the boarding of the upper floor. Remedial works should include vegetation removal, a thorough condition assessment, and conservation works which would preserve the character of the structure. In this regard it will be essential to safeguard the design and material of the supporting pillars.

[6] Pattern Store

SW 5573 3713 pattern shop Listed Grade II 10/172

A large hipped-roof structure, built in the 1840s and constructed of rubble masonry with granite quoins and brick detailing to some openings. The roof is covered in corrugated asbestos sheets, and at the southern end these have failed leaving the building open to the elements. The south hip end has failed, and there is evidence of some damage to the roof structure. The interior has also suffered localised fire damage (Interior not inspected, but visible through upper windows). The remains of possibly earlier structures are attached at the north end.

Recommendations

Urgent remedial works are required to repair the roof. Vegetation should be removed from the walls and a full condition survey will be required prior to repair and consolidation.

[7] Reservoir

SW 5575 3710 reservoir

A reservoir was built between 1842 and 1853 (map evidence) which presumably supplied the boilers of the engine working the Boring Mill [15], constructed 1839-40, and other steam engines on the Foundry site. This area is now occupied by abandoned vehicles and debris, and it is assumed that the reservoir was in-filled after the Foundry closed in 1903. The most substantial remains of the reservoir today are on the east, where a massive granite retaining wall defines the structure as it abuts Booker's yard, with natural rock butting the pattern stores [6] (built on quarried out land).

Recommendations

Two evaluation trenches should be made under the supervision of a qualified archaeologist, to determine if the reservoir survives beneath the infill. If this is the case, consider excavation of the fill to reveal and display this feature. The retaining wall on the east should have vegetation removed.

[8] Stables

SW 5577 3706 stable Listed Grade II 10/10001

This building abuts the Foundry Barn at right angles, and is of brick and stone construction, with a rag-slate hipped roof. It is a typical late 18th/early 19th century purpose-built range for the accommodation of horses and displays some excellent architectural detailing to the south, with arched openings. Inside, the wooden partitions, mangers, cupboards and fittings survive. At the front, a crude wood and galvanised iron lean-to has been added. The buildings around the Yard would have accommodated the Foundry's numerous draught horses, which each working day delivered goods from Harvey's to the whole of West and Central Cornwall. Huge engine beams and boilers were transported in this fashion to mines in the area, and to the harbour for shipment overseas.

Recommendations

The building has suffered fire damage in the past, and as a result is partly unroofed. Water penetration has led to further damage within the structure, and the wall facing onto the yard is close to collapse at the top. Clear vegetation, remove the lean-to, assess condition and produce a scheme for conservation which will preserve as much as possible of the interior fittings.

[9] Farm Yard and buildings

SW 5576 3704 yard

The late 18th/early 19th century yard retains its cobbled surface in the eastern area and is enclosed on the south by a stone wall which incorporates some scoria block and the late 18th century gateway into the yard (now blocked). Around the yard are a number of structures not separately listed here, many of which are 20th century additions. The eastern part of the yard is overlain with concrete.

Recommendations

Preserve the cobbled surface in any scheme for adaptive re-use. All the later buildings which might not be retained.

[10] Stables

SW 5576 3702 stable

Built of rubble and brick with granite quoins and galvanised iron roofs, and cement-washed slate roof to north wing (limewashed rubble and dressed granite). These stables are L-shaped in plan and pre-date 1828 (map evidence).

Recommendations

Condition appears reasonable at present, although the slate roofed section is in poor condition. Remove vegetation and assess condition.

[11] Fire Engine House

SW 5577 3704 fire engine house

A stone-built single-bay shed, originally with a slate roof and wood-boarded gable end, these have now collapsed. May date to the early 19th century expansion of the stable yard. The building is now covered in ivy and other vegetation. The interior was not inspected.

Recommendations

Clear vegetation and produce a full condition assessment. The building is of great historic significance to the Harvey's site and merits a full restoration.

[12] Wall, yard and outhouses

SW55733702 wall and yard

This wall is a surviving component of the Foundry Farm Yard complex. It forms in part the abutment of the 1843 Arch [25]. Built in two stages in rubble stone, two small outhouses with scantle slate roofs are within the yard.

Recommendations

The wall is heavily overgrown with ivy and vegetation, and the roofs of the small buildings are in poor condition. Historical research is needed to establish the age and use of this part of the Foundry Farm complex. The site is not suitable for conversion.

[13] Granary (Foundry Barn)

SW 5579 3706 barn Listed Grade II 10/10001

This building is impressive for its height and typical late 18th or early 19th century industrial design. It is of rubble masonry construction, with dressed granite quoins and brick detailing to door and window openings. The building is now unroofed. At ground level there are two arched openings which lead into vaulted chambers, whose function is unclear at present. The structure appears from map evidence to date from ca 1825 (but possibly with an earlier core). The upper floors were used to store provender (oats, hay, and straw) for the Foundry horse teams, and there is access from the Farm Yard and Stables at the rear. Line-shafts on the upper floors probably provided power for sack hoists.

Recommendations

Although there has been some consolidation and re-pointing of the eastern elevations as part of the Guinness Trust housing scheme, the south elevations and those facing the stable yard are in very poor condition, with vegetation growth, loss of slate hanging and general decay, and some structural cracking in the south walls of the associated outbuildings in the stable yard. Requires detailed measured survey, full archaeological/historical analysis, perhaps using photogrammetry, and full dilapidation survey.

[14] Engine and Boiler House

SW 5579 3708

engine house

Listed Grade II 10/10001

Now forms the northern end of the building known as the Foundry Barn. Originally this was part of the Boring Mill and former Erecting Shop, and should be interpreted as part of that structure. 1839-40, although there were already buildings here in 1816 (erecting sheds?). Construction is of rubble masonry with dressed granite quoins. There is a fine arched window to the front of the Engine House, another arch at ground level giving access to the boiler house and inside clear evidence of the flywheel position, supporting cross beam for the Bob, and the flue of the boiler house leading to an external chimney stack, of which the base survives at the rear. The floor above the boiler house may have provided office space; there are line-shafts to convey power from the engine on the upper floors. The power from the beam engine was transmitted from here directly to the Boring Mill and via line-shafts to lathes, drills, and milling machines throughout the works. The engine would appear to have been larger than was necessarily required for this purpose, and it is assumed that it formed a Foundry showpiece to be shown to potential customers.

Recommendations

The structure has recently been consolidated and re-pointed as part of the Guinness Trust housing scheme and is currently in sound condition.

[15] Boring Mill

SW 5578 3709

boring mill

Listed Grade II 10/10001

The south wall survives with one massive buttress representing the beginning of the eastern elevation, as does the stub of the rear wall. 1839-40. The walls are of rubble masonry with ashlar granite blocks in the quoins and openings. The floor space of the original building is now tarmac and in use as a car-park. This building was the second and larger Boring Mill on the Foundry site, the earlier being the water-powered Boring Mill in the Hammer Mill complex. Here large cylinders (up to 144 inches) were bored to finished size.

Recommendations

The upstanding remains of the Boring Mill have been consolidated and re-pointed as part of the Guinness Trust housing scheme.

[16] Rowe Building

SW 5576 3709

warehouse

A post-1945 sectional building which has been inserted into an area of the site which was previously a yard. The structure is steel-framed and clad with corrugated asbestos, and is currently occupied by a firm of auctioneers and a car spares business.

Recommendations

The structure is not part of the Harvey's Foundry complex and has no historic significance. Map evidence suggests that this area was always an open space during the Foundry's operation.

[17] Whites Building

SW55803717

warehouse

Listed Grade II (No. 10/101)

A late 19th century rebuild of the original stores of about 1828, this building is constructed of mixed rubble and brick dressings with moulded details. The roof is of Delabole slate with gabled ends and crested clay ridge tiles and finials. It is of a large rectangular plan with doorways at the front for each floor. Original windows with fixed casements and pivoting top lights with smaller panes. The rear elevation has the remains of furnaces added to the adjoining foundry in the 1840s (see [19]). From 1852 onwards part of the J.H.Trevivthick holdings separated from the foundry. The forecourt area contains good areas of granite paving and setts, and a boundary stone marked GWR (Great Western Railway) adjacent to the viaduct. The similarity in materials and detailing between the Whites Building and 22-23 Foundry Square is directly related to their ownership by J.H.Trevivthick rather than Harveys (although the two companies remain linked). By 1890, the firm had merged with the other major Hayle based milling firm of W. Hosken & Son to form HTP, one of the largest milling, grocery and shipping businesses west of Bristol in the early 20th century. Their house style is shown in buildings in Truro and consisted of bright red brick or teracotta detailing in an early Northern Renaissance style. The noted Cornish architect Sylvanus Trevail was employed in Truro, it would be intriguing to know if he was involved with the re-building of the Hayle buildings too.

Recommendations

In generally good condition, the building requires localised stone, roof and fenestraion repair, and reinstatement of details.. The open plan of the interior will allow flexibility in re-use. The forecourt materials should be retained and enhanced.

[18] Excaliburs

SW55823716

Offices and shop

Listed Grade II (No. 10/100).

Early 19th century alteration and extension of original offices of 1780; built as part of the headquarters of Harvey and Co. They have stuccoed walls and a hipped, grouted scantle slate roof. Slate-hung clock turret left of middle with moulded eaves cornice to pyramidal roof with gablet over each clock face. It is an L-shaped plan with a shop on ground floor left, a store in the middle and a carriage entrance on the right.

Recommendations

In good condition, apart from the rear roofscape and the clock tower, all in need of substantial repair. A number of poor and inappropriate accretions on the rear elevations require removal or alteration. Last used as a 'medieval experience' restaurant, work may be required to reinstate original character.

[19] Furnace Base

SW55803716

furnace base

Listed Grade II (No. 10/101)

This site comprises of part of a wall, furnace base and arch of the foundry as extended in the 1840s. Some remains here, and slightly further to the east to the rear of Excaliburs, may preserve elements of the original foundry of 1780.

Recommendations

In relatively good condition, vegetation removal is urgently needed, with some localised consolidation work..

[20] 22-23 Foundry Square

SW55833714

shops and offices

Listed Grade II (No. 10/99).

Former emporium. Early 19th century extension and alteration of 1780 block, this was built for the Harvey family. Stucco over a granite ashlar plinth with scantle slate roof, hipped at the left-hand end and adjoining 24 Foundry Square. Plan of main part has been remodelled as a bank. Classical style. This building is part of the former Harvey's Emporium, the sales element of Harvey & Co. The similarity in materials and detailing between the Whites Building and 22-23 Foundry Square is directly related to their ownership by J.H.Trevithick rather than Harveys (although the two companies remain linked). By 1890, the firm had merged with the other great Hayle based milling firm of W. Hosken & Son to form HTP, one of the largest milling, grocery and shipping businesses west of Bristol in the early 20th century. Their house style is shown in buildings in Truro and consisted of bright red brick or terracotta detailing in an early Northern Renaissance style. The noted Cornish architect Sylvanus Trevail was employed in Truro, it would be intriguing to know if he was involved with the re-building of the Hayle buildings too.

Recommendations

In good condition and full use. Recording is likely to be difficult given its use as a bank, but investigation of the interior, and an understanding of the development of the site should be sought.

[21] Drawing Office

SW55823715

Drawing Office

Listed Grade II (No. 10/99).

This is a wooden office, possibly the drawing office for Foundry. Mid 19th century. Timber framed and weather boarded with glazing bar sashes and with slate hipped roof, the building is raised on cast iron column supports. The office was built over the old main entrance into the yard, through which in 1852 a tramway was run to link it to the quays. It is not clear if the office was built before or after the tramway.

Recommendations

In good condition, limited repair work is likely. The ground floor needs to be cleared and a full and detailed investigation is required.

[22] 21 Foundry Square

SW55833713

shop/office

Listed Grade II (No. 10/98).

Possibly part of the original 1780 office range, it has a stuccoed front over granite ashlar plinth. A grouted scantle slate roof with projecting eaves at the front, adjoining taller party walls at left and right.

Recommendations

In good condition and occupied, unlikely to require much repair or remedial work. Survey and recording may be difficult given occupation, but should be investigated, as this may prove to be an early element of the foundry complex.

[23] 18-20 Foundry Square

SW55853712

offices/shop/bakery

Listed Grade II (No. 10/97).

Foundry offices and shop, part of the general trading side of Harvey & Co's business which passed to J.H.Trevithick in 1852. In 1895 converted to the Cornubia biscuit factory, the building as it now stands (especially the front elevation) is largely of that date, though it may incorporate an earlier structure. Constructed of granite rubble with brick dressings and stucco details. Dry Delabole slate roof with gable ends and crested clay ridge tiles. Attached to the south end is a granite gate pier with pin hinge, one of the main entrances to the Foundry.

Recommendations

In good condition and full use, some elements of the architectural detailing on the main elevation require reinstatement, and the rear elevation has been poorly altered during insertion of fenestration, requiring remedial works to the stonework.

[24] Wall

SW55783701 wall

This early 19th century wall is a surviving component of the Foundry Farm Yard complex and also delineates a pathway that ran from the Yard to Foundry Hill (the dressed granite quoins of the entrance to the yard survive). It was associated with the Foundry House (1790-1885). Built of rubble stone and granite, capped with pale buff coloured bricks, it is about 2-3 metres high.

Recommendations

In good condition, the wall appears to require little work.

[25] Arch

SW55733701 arch Listed Grade II (No.10/90).

This triumphal arch was built in 1843 for Harvey and Company reputedly to celebrate the Leeghwater Engine contract for draining the Haarlemmer Meer in Holland. It is constructed of granite ashlar with rectangular-plan abutments on either side of a fairly wide carriageway. Plinth, rusticated and vermiculated quoins and voussoirs, double impost bands, elliptical arch with projecting keystone, moulded cornice and tall ashlar blocking course.

Recommendations

In good condition, but in urgent need of vegetation clearance and associated repair work.

[26] 2 Foundry Hill

SW house

House, early 20th century. Rock-faced granite with rendered return elevations and slate roof, with red and white brick stacks. Single storey with hipped roof and stacks to left and to right. Large windows to left and right and central door in gabled porch with bargeboards. Stands in the former grounds of the Foundry Farmhouse. Its relationship to Harvey's is not known.

Recommendations

In good condition and full use. Historical research into its relationship, if any, with Harvey's should be undertaken.

[27] Foundry Farmhouse

SW farmhouse

Farmhouse. Late 18th/early 19th century. Rendered stonework with slate roof. Two storied, hipped symmetrical house with boundary walls related to the rest of the Foundry Lane complex (outside the immediate study area, on the west side of Foundry Lane). A house is represented here on the 1791-6 map of Hayle, and seems never to have been extensively altered or extended.

Recommendations.

Although in private ownership, the building has an intimate and integral relationship with the foundry site, and its history should be more fully explored. Late 20th century alterations have not been appropriate (PVCu windows, timber porch), and reinstatement of original character should be sought. Generally appears to be in good condition, the boundary walls require vegetation clearance and associated repair.

[28] Wall, Turnpike Road & Foundry Lane

SW55683720 wall

Built of rubble with dressed granite detail, and with pale buff brick coping (the typical style of all the walls associated with the foundry in the early-mid 19th century). Probably dating from 1843 and the building of the gasworks, the site of which it encloses. The wall along Turnpike Road stands only to about a metre high, but that to Foundry Lane is 2 metres or more in height. The south end, adjacent to the railway viaduct, appears to incorporate other structures.

Recommendations

In generally good condition, some vegetation clearance is needed. Further investigation of the area near the viaduct is necessary.

[29] Railway Viaduct

SW 55853721 viaduct

Built of hammer dressed granite, reinforced and partly encased with dark engineering brick, carrying a cast iron viaduct. The original viaduct built in 1852 was of timber, and between 1871 and 1899 was reconstructed - the piecemeal progress of the reconstruction is reflected in the different sizes of some of the piers, and the use of brick in the westernmost piers.

[30] Bookers Cash and Carry

SW retail warehouse

A late C20 group of masonry and steel-framed buildings of no interest. In good condition and occupied.

Recommendations

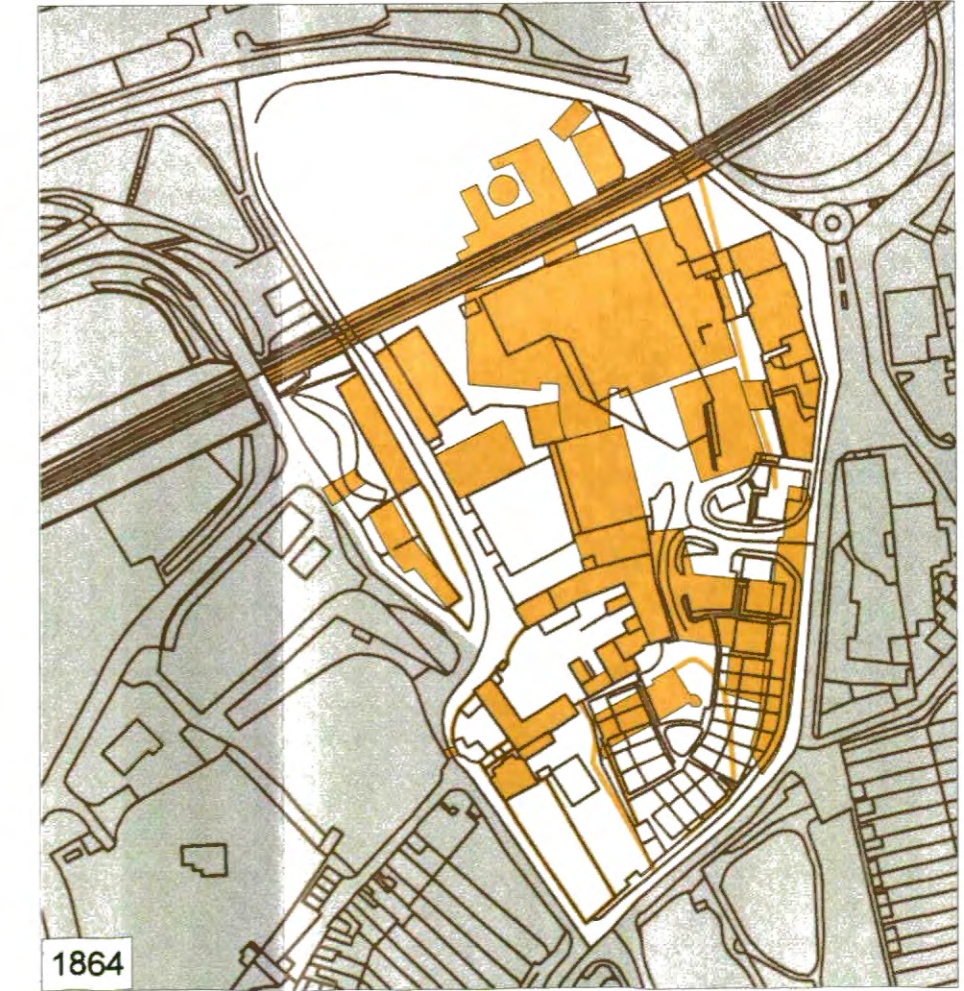
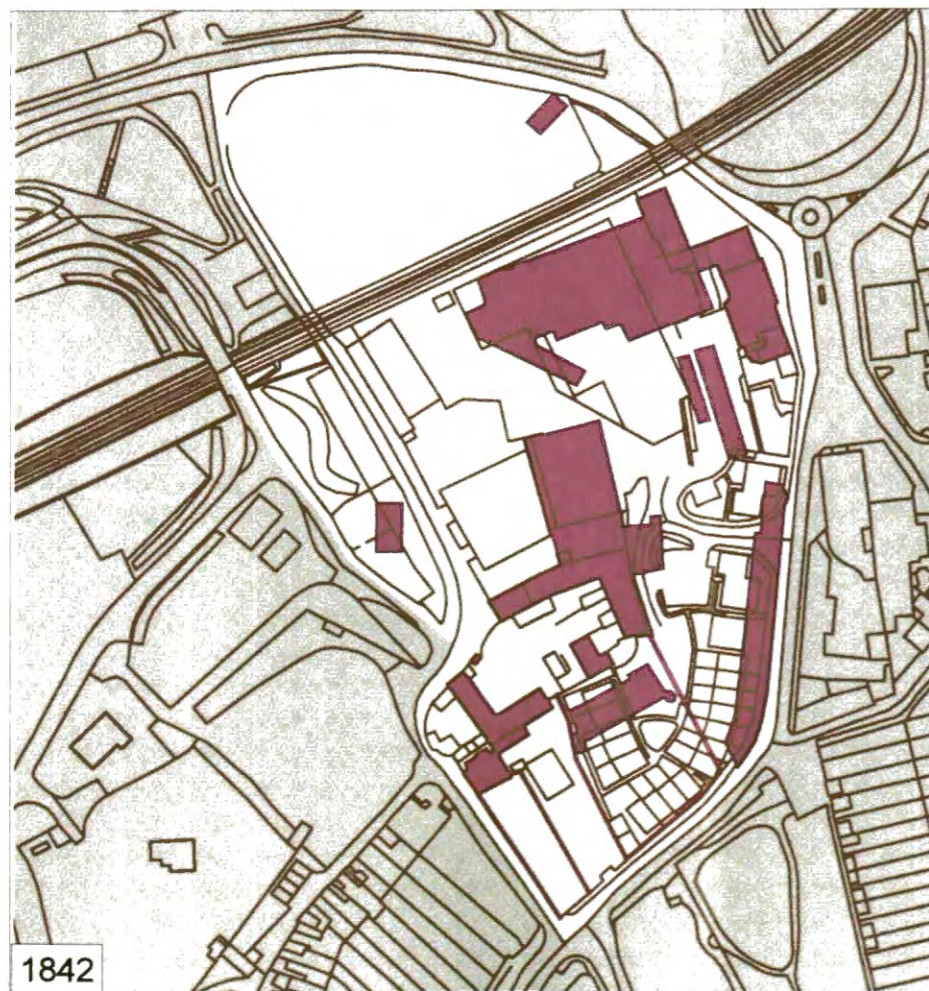
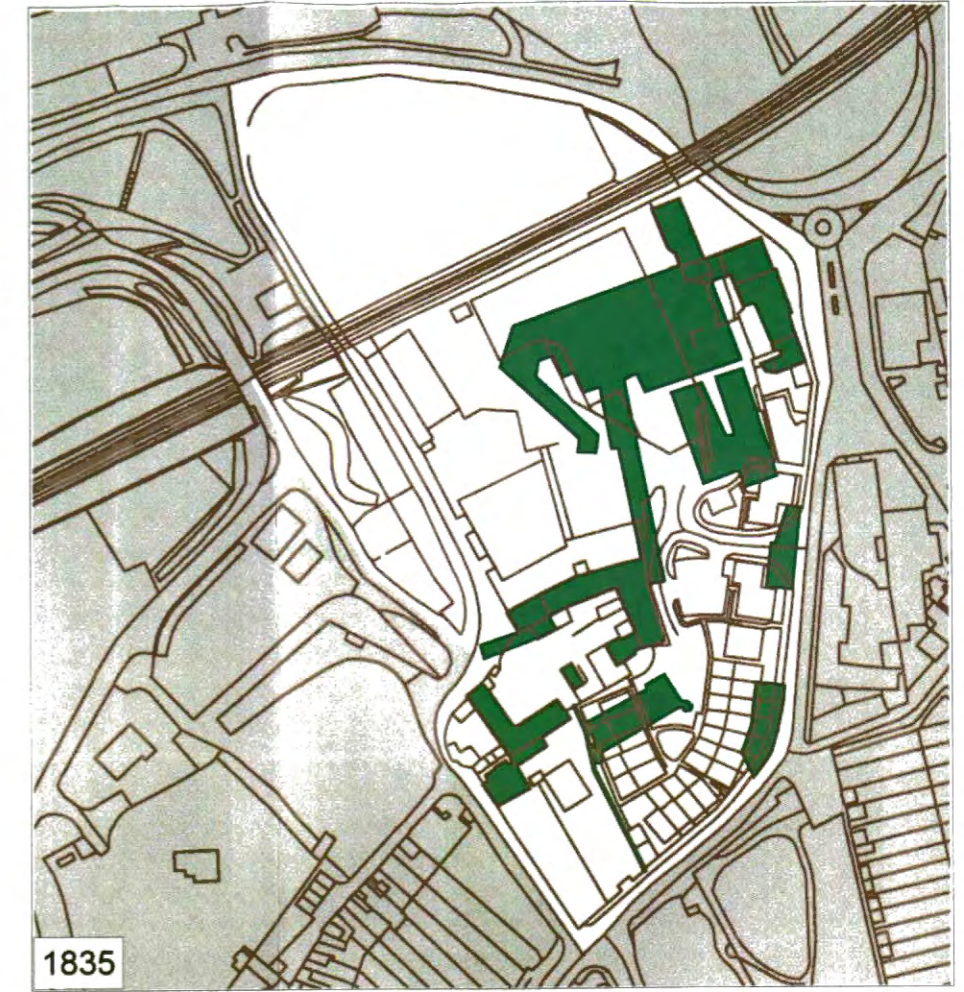
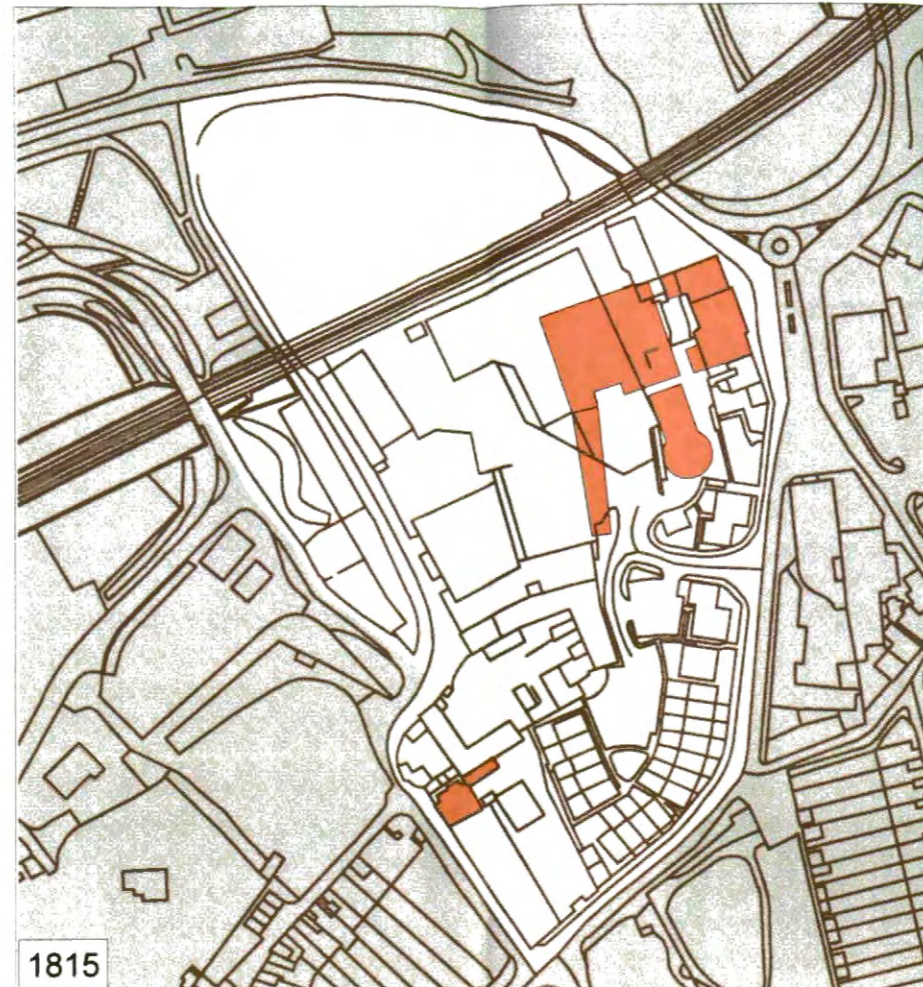
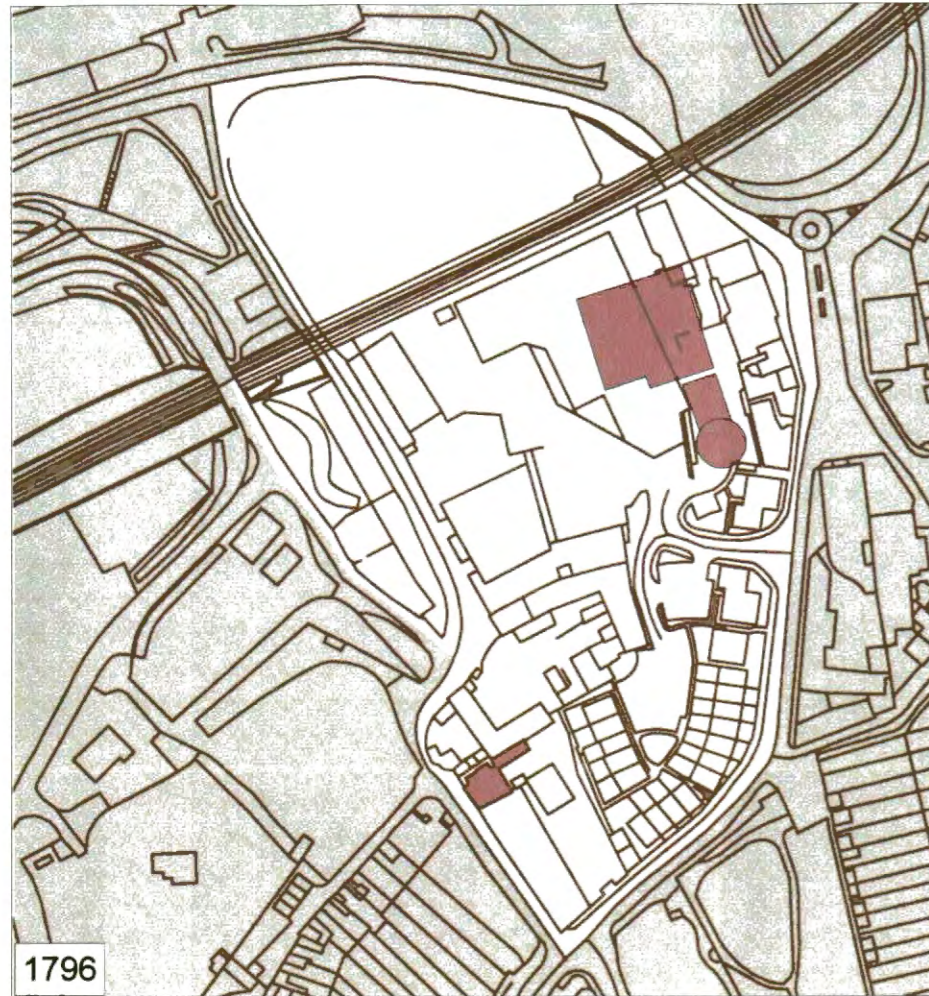
Although there is a viable use here, and it is in keeping with the historic uses of the site (which were always as much retail as industrial), the precise location of this building is a problem for the complete understanding and future interpretation of the site, since it stands over the foundry itself, and its car park overlays the sites of most of the important and early ancillary buildings of the foundry. Its removal may well free up exploitation of the whole site, and will certainly allow the most important aspects of archaeological investigation to take place.

[31] Trevoarn

SW housing

Guinness Housing Trust development. No appropriate description or recommendations, although as part of the historical phasing of the site, the buildings need recording in the archive.

Fig.1 - Historical Phase Maps



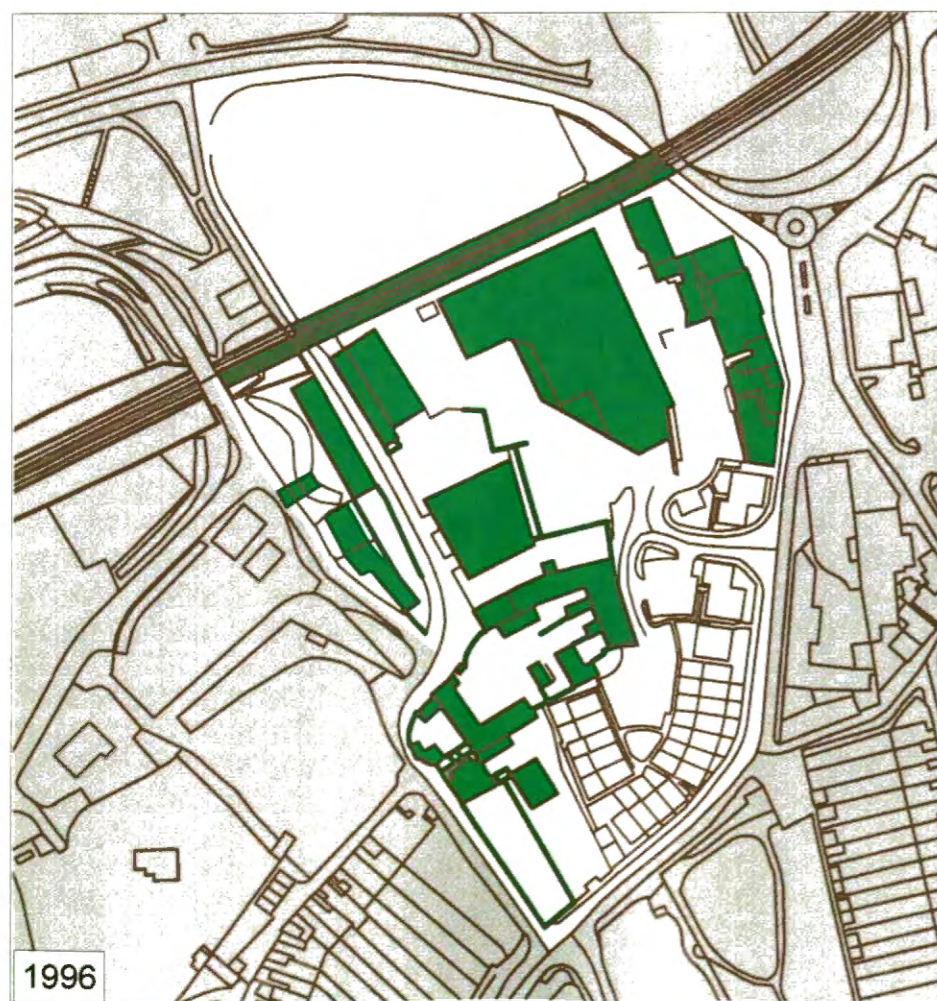
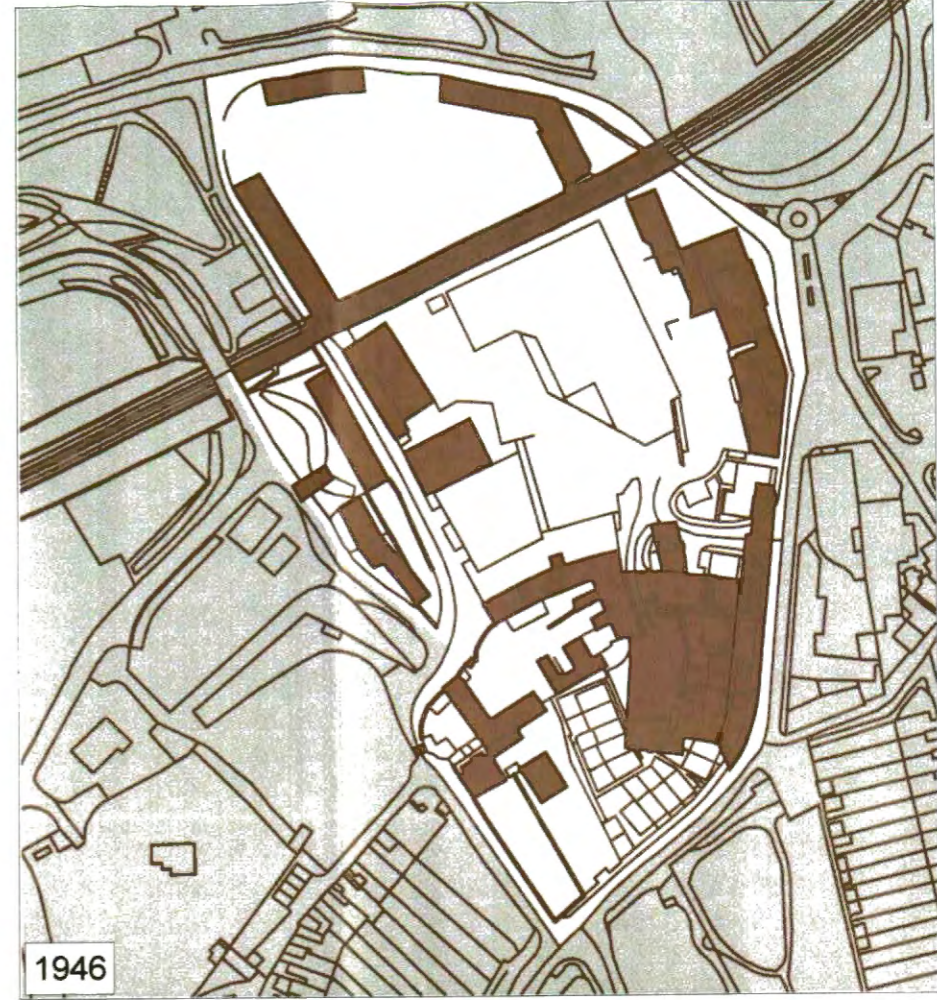
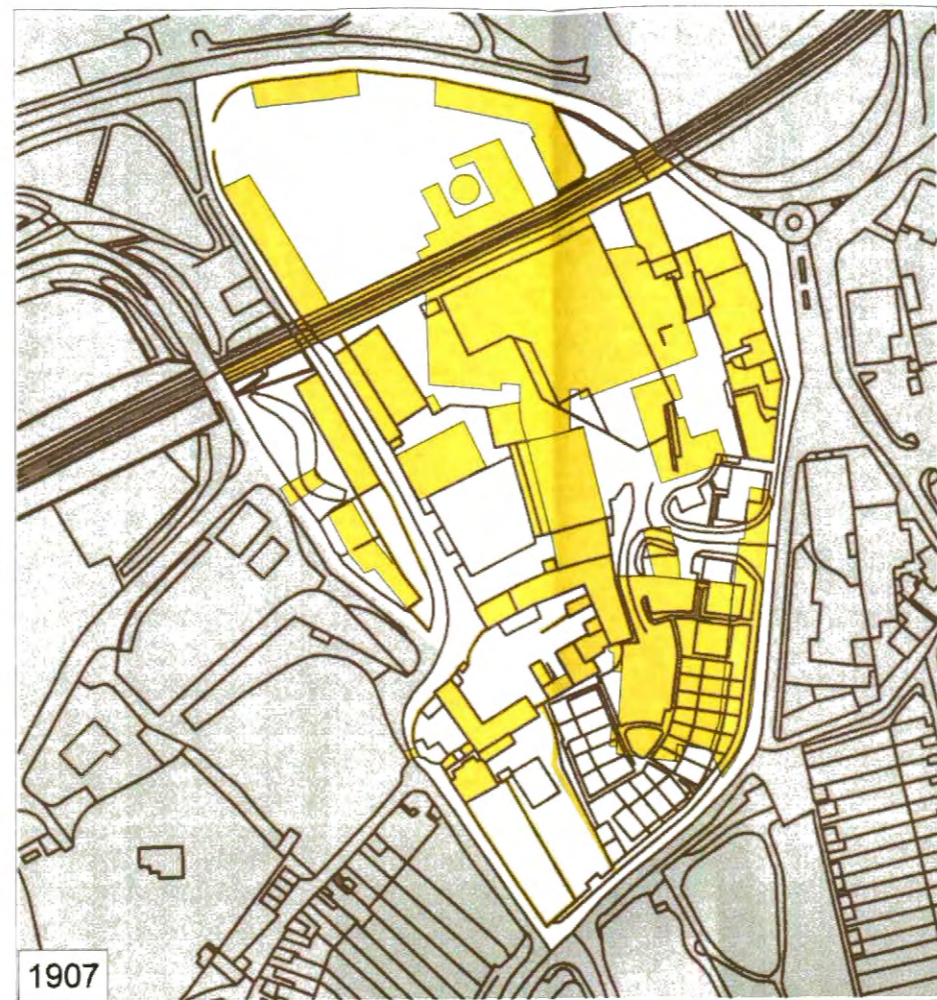
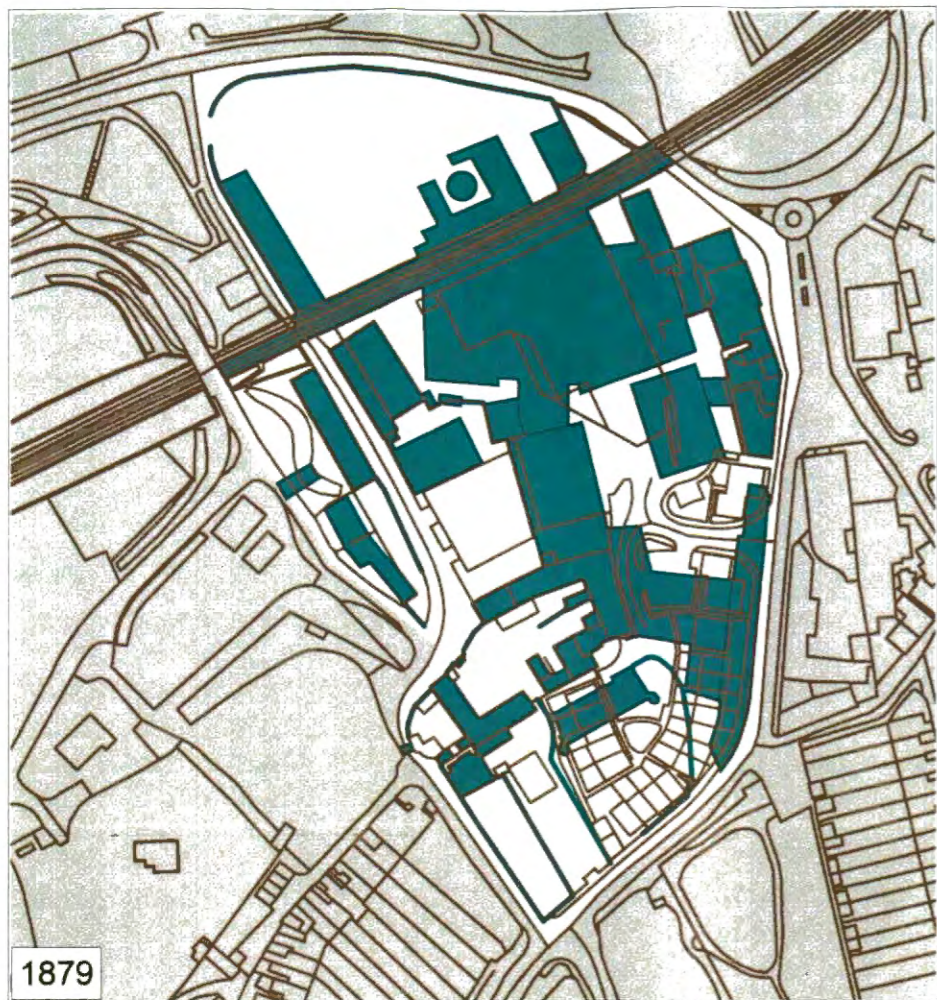


Fig. 2 - Standing Fabric map with existing designations

Harvey's Foundry Study Area

- Significant Building
- Listed Building
- Scheduled Monument
- Other Gazetteer Site
- No Data
- Conservation Area

10 0 10 20 Meters

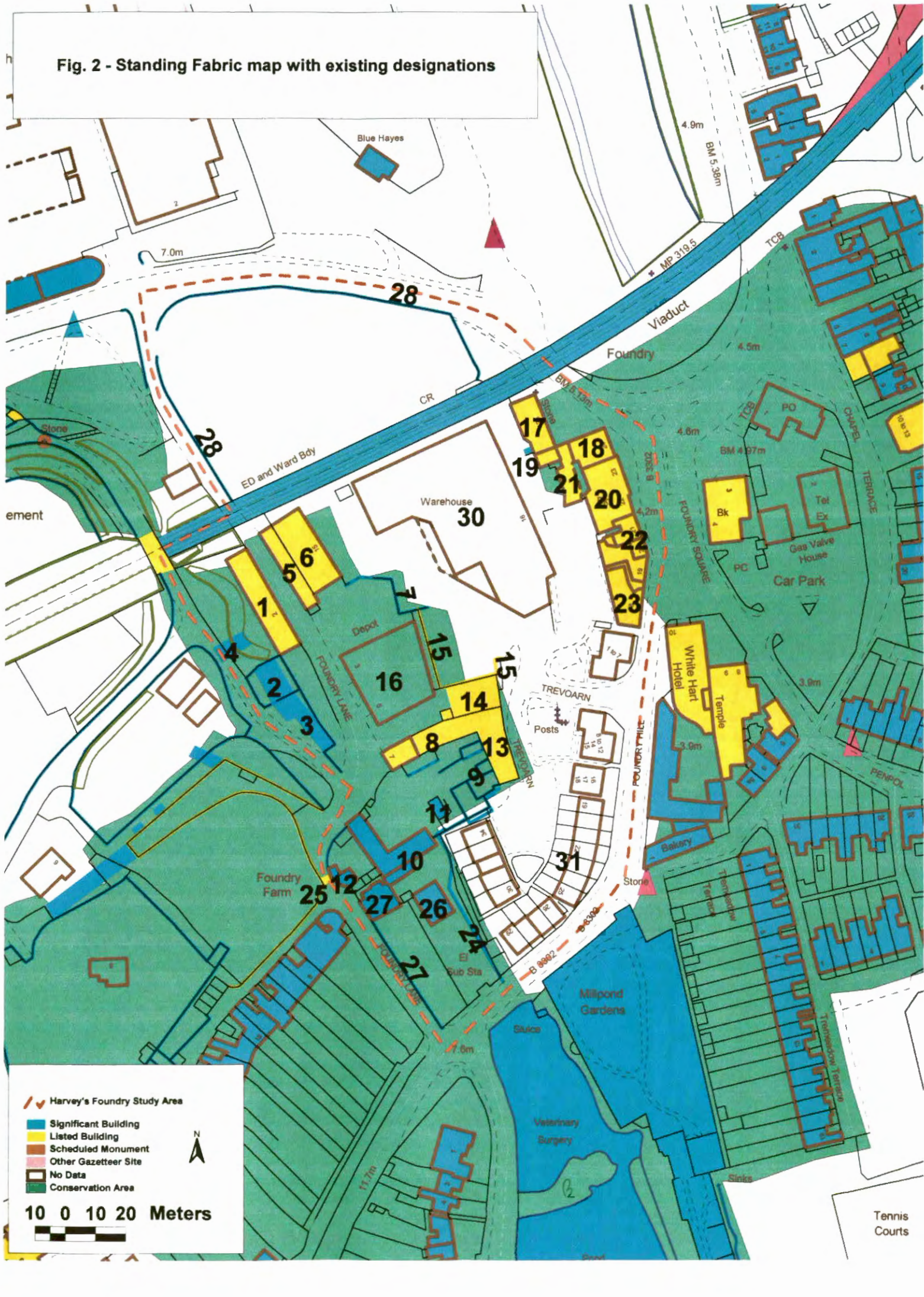


Fig.3 - Location of key demolished buildings

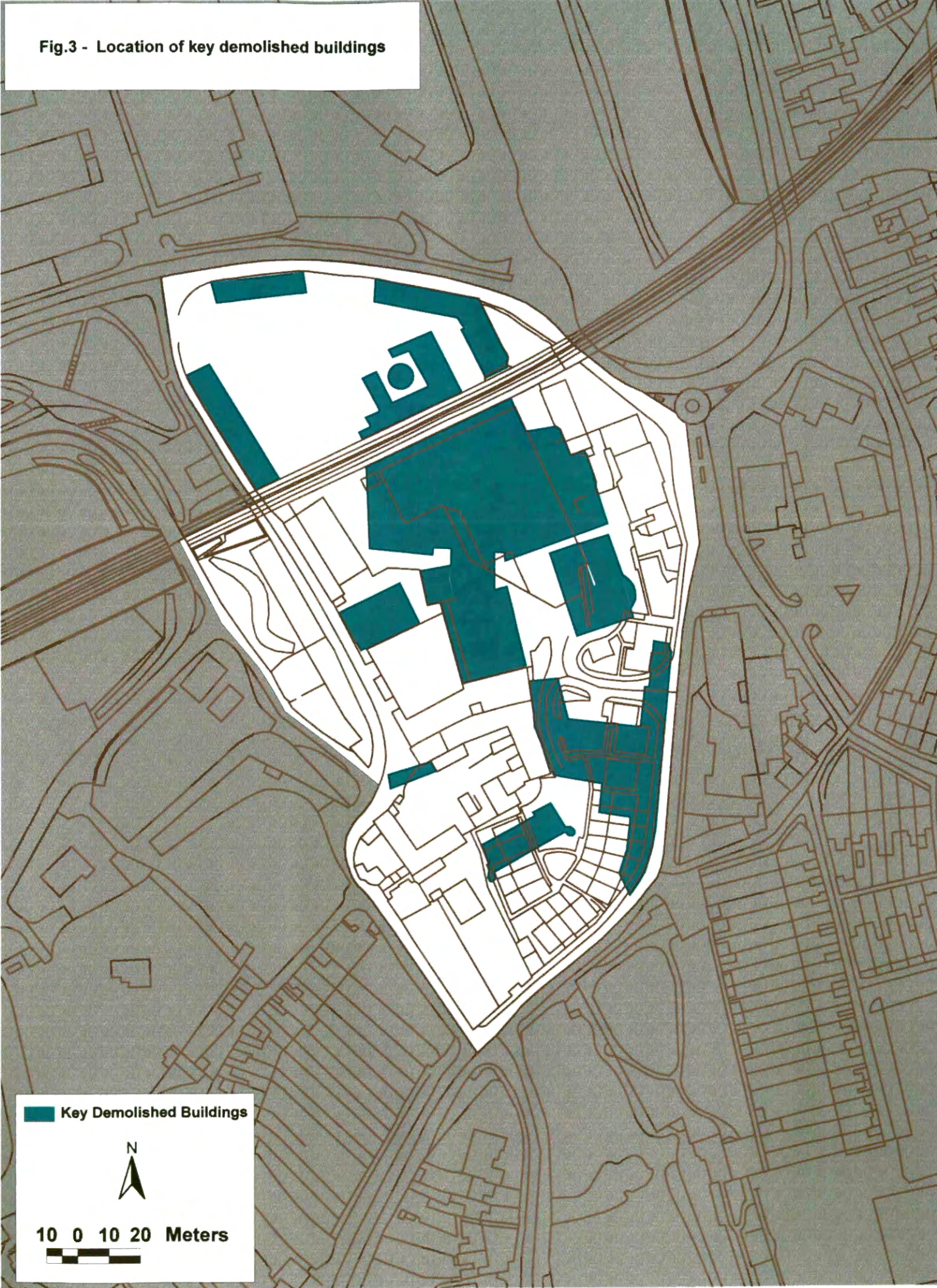


Fig. 4 - Assessment of archaeological potential

