South Downs National Park Authority

Shoreham Cement Works, West Sussex

Industrial Archaeology Study

70087636-IAS
March 2022

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Executive summary

WSP has been commissioned by the South Downs National Park Authority (SDNPA) to carry out an Industrial Archaeology Study as part of a series of Evidence Based Studies to support the preparation of an Area Action Plan for the former Shoreham Cement Works in Upper Beeding, West Sussex. The study was commissioned to inform the preparation of the Shoreham Cement Works Area Action Plan (AAP) which will complement the South Downs Local Plan covering the period 2014–2033. The aim of the study is to provide the SDNPA with a comprehensive overall understanding of the heritage significance of the site and the industrial archaeology interest of its buildings and structures. Access to the site area was not permitted by the site owner, therefore all investigations were carried out around the landscape perimeter only.

Shoreham Cement Works is a decommissioned former cement production facility comprising of a number of vacant buildings in dilapidated condition largely constructed in the late-1940s. Cement production ceased at the site in 1991 and since then the buildings have remained dormant. The site is currently owned by Dudman Group Aggregates and is used by a few different businesses who operate out of the site including an aggregate store and a bus storage company.

The history of the site dates back to at least the 18th century when the location was in use as a chalk quarry and contained lime kiln/s. A cement works was constructed at the end of the 19th century and production of Portland cement on an industrial scale commenced. The complex was built in the area comprised between the River Arun and Steyning Road, and raw materials were extracted from the quarry to the east of the road. The plant was reconstructed immediately after the Second World War on the east side of the road, partly concealed within the existing chalk quarry. Designed by cement industry leader Oscar Faber, the new plant was much larger than the previous one and was provided with state-of-the-art machinery, most notably two large rotary kilns for processing the cement.

In the early 1980s, in an attempt to make the then outdated complex more productive, the cement production processes were transitioned from ‘wet process’ to ‘semi-wet process’ which was much more energy efficient. Despite the changes, the plant closed down in 1991 due to decrease in demand and competition from overseas. The site was vacated by the then owner Blue Circle Group which left all the present buildings and machinery on the site. Several attempts have been made following the closure of the plant to turn the site into a meaningful addition to the protected landscape in which it is located, but no plans have yet been finalised.

Shoreham Cement works is a site of medium significance which has a high degree of structural survival despite lying dormant for some years and declining in condition. Shoreham was the first modern cement works constructed following the Second World War and was designed by concrete industry leader and pioneer, Oscar Faber. The design

improved efficiency, production output and employee wellbeing and its success meant it became an exemplar across the UK and Europe.

1 Introduction

1.1 Project background

1.1.1. WSP has been commissioned by South Downs National Park Authority (SDNPA) to carry out an Industrial Archaeology Study of the Shoreham Cement Works abandoned plant located at Upper Beeding in West Sussex (National Grid Reference NGR 520042 108615; **Figure 1**).

1.1.2. The study was commissioned to inform the preparation of the Shoreham Cement Works Area Action Plan (AAP) which will complement the South Downs Local Plan covering the period 2014–2033. The aim of the study is to provide the SDNPA with a comprehensive overall understanding of the heritage significance of the site and the industrial archaeology interest of its buildings and structures. This includes consideration as to what extent setting contributes to its significance. This aim is achieved through four objectives:

- Provide a full, detailed historic background of Shoreham Cement Works including its development over time.
- Understand the context of Shoreham Cement Works in the surrounding area and especially the South Downs National Park.
- Describe the heritage significance of Shoreham Cement Works nationally and internationally and also undertake an analysis of the remaining extant buildings on the site.
- Provide recommendations for further archaeological investigation.

1.2 Statement of liability

1.2.1. This document is for the exclusive benefit of the Client (South Downs National Park Authority). It may not be assigned to or relied upon by a third party without the agreement of WSP UK Limited ('WSP') in writing. WSP retains all copyright and other intellectual property rights in the document and its contents unless transferred by written agreement between WSP and the Client.

1.2.2. The findings and opinions expressed are based on the conditions encountered and/or the information reasonably available at the date of issue of this document (or other date e.g., date of inspection) and shall be applicable only to the circumstances envisaged herein.

1.2.3. No person except the Client shall have the benefit of this document (including publishing of the report, as appropriate) by virtue of the *Contracts (Rights of Third Parties) Act 1999*. This Industrial Archaeology Study report will form part of a core document library which will be accessible through the SDNPA website.

2 Planning framework

2.1 Statutory protection

Scheduled Monuments

2.1.1. The ‘Cross dyke on Beeding Hill, 1100m north-west of New Erringham Farm Cottages’ (NHLE: 1018567) is located on the northern boundary of the site. There are several more scheduled monuments in the surrounding landscape.

2.1.2. Archaeological Notification Areas (ANAs) are areas that indicate the existence, or probable existence, of archaeological heritage assets. They have been created from the information held on the West Sussex Historic Environment Record (HER), a database of all known heritage assets (except those in Chichester district) and mapped to provide an alert system.

2.1.3. The purpose of the ANA’s is to form of early warning system so that appropriate steps can be taken to record and protect heritage assets in advance of development. Each ANA has an alert colour associated with it (either red or amber) to denote the level of likelihood that archaeological remains may survive (West Sussex Council, 2022)

2.1.4. The site falls within an Archaeological Notification Area (Designation Unique Identification: DWS8703) due to it’s the presence of earthwork and cropmark remains at Anchor Bottom, Upper Beeding. The area has been categorised as Red (**Figure 2)**.

2.1.5. Nationally important archaeological sites (both above and below-ground remains) may be identified and protected under the Ancient Monuments and Archaeological Areas Act 1979. An application to the Secretary of State is required for any works affecting a Scheduled Monument. Prior written permission, known as Scheduled Monument Consent (SMC) is required from the Secretary of State for works physically affecting a scheduled monument. SMC is separate from the statutory planning process.

2.1.6. Development affecting the setting of a scheduled monument is dealt with wholly under the planning system and does not require SMC.

2.1.7. Geophysical prospection (including the use of a metal detector) on a scheduled monument requires consent from Historic England.

Listed Buildings and Conservation Areas

2.1.8. There are no listed buildings within the Site. It does not lie within a conservation area. Nevertheless, the setting of these heritage assets, whilst not statutorily protected, is a material consideration in the planning process.

2.1.9. *The Planning (Listed Buildings and Conservation Areas) Act 1990* sets out the legal requirements for the control of development and alterations which affect listed buildings or conservation areas (including buildings of heritage interest which lie within a conservation area). Grade I are buildings of exceptional interest. Grade II* are particularly significant buildings of more than special interest. Grade II are buildings of special interest

National Parks

2.1.10. The National Parks and Access to the Countryside Act 1949 provides the framework for the creation of National Parks and Areas of Outstanding Natural Beauty in UK. The South Downs was designated as the South Downs National Park in 2010. The South Downs National Park Authority became the local planning authority for the National Park in 2011.

2.1.11. The first purpose of the National Parks as stated in The National Parks and Access to the Countryside Act 1949, as amended by the Environment Act 1995, is conservation and enhancement of the natural beauty, wildlife and cultural heritage of the area.

2.2 National Planning Policy Framework

2.2.1. The Department for Environment, Food and Rural Affairs (DEFRA) of Government of UK adopted a Vision and Circular on English National Parks and the Broads in 2010. It provides guidance to National Park authorities on how to achieve their purposes and duty.

2.2.2. The Vision for the English National Parks and the Broads as stated in the above document is -

By 2030 English National Parks and the Broads will be places where:

- There are thriving, living, working landscapes notable for their natural beauty and cultural heritage. They inspire visitors and local communities to live within environmental limits and to tackle climate change. The wide-range of services they provide (from clean water to sustainable food) are in good condition and valued by society.
- Sustainable development can be seen in action. The communities of the National Parks take an active part in decisions about their future. They are known for having been pivotal in the transformation to a low carbon society and sustainable living. Renewable energy, sustainable agriculture, low carbon transport and travel and healthy, prosperous communities have long been the norm.
- Wildlife flourishes and habitats are maintained, restored and expanded and linked effectively to other ecological networks. Woodland cover has increased and all woodlands are sustainably managed, with the right trees in the right places. Landscapes and habitats are managed to create resilience and enable adaptation.
- Everyone can discover the rich variety of England's natural and historic environment and have the chance to value them as places for escape, adventure, enjoyment, inspiration and reflection, and a source of national pride and identity. They will be recognised as fundamental to our prosperity and well-being.

2.2.3. Section 4 of the above document highlights the Priority Outcomes and suggested actions. Section 4.1 talks about a renewed focus on achieving the purposes of the National Park. It states -

Conserving and enhancing the natural beauty, wildlife and cultural heritage of the Parks

20. The Government continues to regard National Park designation (together with that for Areas of Outstanding Natural Beauty ('AONBs')) as conferring the highest status of protection as far as landscape and natural beauty is concerned. The Parks represent an important contribution to the cultural and natural heritage of the nation. The Parks are living and working landscapes and over the centuries their natural beauty has been influenced by human activity such as farming and land management activities. They contain important wildlife species, habitats and geodiversity, many of which have been formally recognised as being part of national and international importance (28% by area of SSSI in England is found in National Parks)

21. In developing and implementing policies for the planning and management of their areas, Authorities should document and clearly express the special qualities of the Park and the status and condition of these qualities. Authorities are expected to continue to seek to ensure the conservation of the natural beauty of the area for which they are responsible. In meeting the conservation purpose, Authorities are expected to work closely with landowners and land managers and with all appropriate bodies including central and local Government and the key public bodies

22. The Parks' assets are affected by many factors which lie outside the direct control of the Authorities, including for example, climate change, farm support payments, terrestrial and marine developments beyond their boundaries and transport. Authorities should assess any external risks and seek to minimise the harmful and maximise the beneficial effects. Supported by the relevant authorities (guided by s11A of the 1949 Act and s17A of the 1988 Act), they are expected to put in place measures which capture opportunities, mitigate and/or resist adverse pressures and which restore and/or recover damaged landscapes and sites from historical and/or ongoing damage. These measures, together with plans for conservation and enhancement of the Park environment, should be included in the Park Management Plans

2.2.4. The Government issued a revised version of the National Planning Policy Framework (NPPF) in July 2021 (MHCLG 2021) and supporting revised Planning Practice Guidance in 2018 (MHCLG 2018).

2.2.5. The purpose of the planning system is to contribute to the achievement of sustainable development, and the NPPF has a presumption in favour of such, where it meets needs of the present without compromising the ability of future generations to meet their own needs. Sustainable development is achieved within the context of economic, social and environmental objectives.

2.2.6. Section 16 of the NPPF deals with 'Conserving and Enhancing the Historic Environment'. The NPPF recognises that heritage assets are an irreplaceable resource which 'should be conserved in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of existing and future generations' (para 189).

2.2.7. The NPPF requires the significance of heritage assets to be considered in the planning process, whether designated or not. NPPF Section 16 is reproduced in full below:

> **189**. Heritage assets range from sites and buildings of local historic value to those of the highest significance, such as World Heritage Sites which are internationally recognised to be of Outstanding Universal Value. These assets are an irreplaceable resource, and should be conserved in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of existing and future generations.
>
> **190**. Plans should set out a positive strategy for the conservation and enjoyment of the historic environment, including heritage assets most at risk through neglect, decay or other threats. This strategy should take into account:
>
> a) the desirability of sustaining and enhancing the significance of heritage assets, and putting them to viable uses consistent with their conservation;
>
> b) the wider social, cultural, economic and environmental benefits that conservation of the historic environment can bring;
>
> c) the desirability of new development making a positive contribution to local character and distinctiveness; and
>
> d) opportunities to draw on the contribution made by the historic environment to the character of a place.
>
> **191**. When considering the designation of conservation areas, local planning authorities should ensure that an area justifies such status because of its special architectural or historic interest, and that the concept of conservation is not devalued through the designation of areas that lack special interest.
>
> **192**. Local planning authorities should maintain or have access to a historic environment record. This should contain up-to-date evidence about the historic environment in their area and be used to:
>
> a) assess the significance of heritage assets and the contribution they make to their environment; and
>
> b) predict the likelihood that currently unidentified heritage assets, particularly sites of historic and archaeological interest, will be discovered in the future.

193. Local planning authorities should make information about the historic environment, gathered as part of policy-making or development management, publicly accessible.

Proposals affecting heritage assets

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

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

196. Where there is evidence of deliberate neglect of, or damage to, a heritage asset, the deteriorated state of the heritage asset should not be taken into account in any decision.

197. In determining applications, local planning authorities should take account of:

a) the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation;

b) the positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality; and

c) the desirability of new development making a positive contribution to local character and distinctiveness.

198. In considering any applications to remove or alter a historic statue, plaque, memorial or monument (whether listed or not), local planning authorities should have regard to the importance of their retention in situ and, where appropriate, of explaining their historic and social context rather than removal.

Considering potential impacts

199. When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation (and the more important the asset, the greater the weight should be). This is

irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance.

200. Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification. Substantial harm to or loss of:

a) grade II listed buildings, or grade II registered parks or gardens, should be exceptional;

b) assets of the highest significance, notably scheduled monuments, protected wreck sites, registered battlefields, grade I and II* listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites, should be wholly exceptional.

201. Where a proposed development will lead to substantial harm to (or total loss of significance of) a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or total loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply:

a) the nature of the heritage asset prevents all reasonable uses of the site; and

b) no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; and

c) conservation by grant-funding or some form of not for profit, charitable or public ownership is demonstrably not possible; and

d) the harm or loss is outweighed by the benefit of bringing the site back into use.

202. Where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal including, where appropriate, securing its optimum viable use.

203. The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.

204. Local planning authorities should not permit the loss of the whole or part of a heritage asset without taking all reasonable steps to ensure the new development will proceed after the loss has occurred.

205. Local planning authorities should require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible69. However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted.

206. Local planning authorities should look for opportunities for new development within Conservation Areas and World Heritage Sites, and within the setting of heritage assets, to enhance or better reveal their significance. Proposals that preserve those elements of the setting that make a positive contribution to the asset (or which better reveal its significance) should be treated favourably.

207. Not all elements of a Conservation Area or World Heritage Site will necessarily contribute to its significance. Loss of a building (or other element) which makes a positive contribution to the significance of the Conservation Area or World Heritage Site should be treated either as substantial harm under paragraph 200 or less than substantial harm under paragraph 201, as appropriate, taking into account the relative significance of the element affected and its contribution to the significance of the Conservation Area or World Heritage Site as a whole.

208. Local planning authorities should assess whether the benefits of a proposal for enabling development, which would otherwise conflict with planning policies but which would secure the future conservation of a heritage asset, outweigh the disbenefits of departing from those policies.

2.2.8. The web-based National Planning Policy Guidance (https://www.gov.uk/government/collections/planning-practice-guidance) provides supporting information in respect of conserving and enhancing the historic environment.

2.3 Local planning policy

2.3.1. Any development at Shoreham Cement Works should comply with the strategic site allocation SD56: Shoreham Cement Works adopted on 2nd July 2019 (2014-33)[1].

Strategic Site Policy SD56: Shoreham Cement Works

1. Shoreham Cement Works, as identified on the Policies Map, is an area of significant opportunity for an exemplar sustainable mixed use development, which delivers a substantially enhanced landscape and uses that are compatible

[1] South Downs National Park, 2020

with the purposes of the National Park. To help achieve this the National Park Authority will prepare an AAP with the overall aims of:

a) Enhancing the visual impact of the site from both the nearby and distant public viewpoints;

b) Conserving, enhancing and providing opportunities for understanding the biodiversity, geodiversity, historic significance and cultural heritage of the site;

c) Ensuring the delivery of ecosystems services; and

d) Ensuring that the design of any development is of the highest quality and appropriate to its setting within a national park.

2. The National Park Authority would support development proposals for the following land uses where it is demonstrated they deliver the environmentally-led restoration of the site:

a) Sustainable tourism/visitor based recreation activities and leisure development directly related to the understanding and enjoyment of the National Park;

b) B2 and B8 business uses to support the local economy, with a focus on environmentally sustainable activities, supporting local communities and providing opportunities for entrepreneurship; and

c) Further types of development, including new homes, including affordable homes and/or Class B1 office development, where necessary to enable redevelopment of the allocation site as whole. Such types of development should be subordinate to the overall mix of uses proposed.

provided that the proposals can clearly demonstrate how they would deliver the key considerations set out in Part 1 of this policy; and

d) Improve accessibility and help to create sustainable patterns of travel;

e) Provide renewable energy generation to serve any development on the site;

f) Provide realistic proposals for the relocation of existing employment and storage uses that are not appropriate to a National Park setting; and

g) Ensure that any adverse impacts (either alone or in combination) are avoided, or, if unavoidable, minimised through mitigation with any residual impacts being compensated for.

3. The National Park Authority will resist more development than is necessary to secure and deliver the environmentally-led restoration of the site.

4. The National Park Authority wants to see a comprehensive redevelopment of the whole site consistent with the AAP. However, if any planning applications come forward separately and prior to the adoption of the AAP, then they would

have to clearly demonstrate how the proposals would accord with the key considerations set out above.

2.3.2. The other relevant built heritage policies of the South Downs Local Plan that need to be complied with are Strategic Policy SD12: Historic Environment, Development Management Policy SD13: Listed Buildings, Development Management Policy SD14: Climate Change Mitigation and Adaptation of Historic Buildings, Development Management Policy SD15: Conservation Areas and Development Management Policy SD16: Archaeology.

2.3.3. The Upper Beeding Parish Neighbourhood Plan 2018-2031 adopted in February 2020, makes a reference to the South Downs Local Plan and the Shoreham Cement Works Strategic Site Policy SD56, as being relevant for Upper Beeding. Section 3.11 of the Plan states that despite being an important part of social and industrial heritage of the area, the site has significant negative visual impact on the National Park. Section 3.12 of the Plan however highlights the opportunity that the site provides to deliver an innovative, exciting and imaginative solution converting it into an asset of the National Park.

3 Methodology and sources

3.1 Desk-based assessment

3.1.1. The assessment has been carried out in accordance with the requirements of the National Planning Policy Framework (NPPF) (MHCLG 2021, MHCLG 2018b) and to standards specified by the Chartered Institute for Archaeologists (CIfA Dec 2014a, 2014b) and Historic England (HE 2016, HE 2017).

3.1.2. In order to determine the full historic environment potential of the site, a broad range of standard documentary and cartographic sources, including results from any archaeological investigations in the site and a 1km radius study area around it were examined in order to determine the likely nature, extent, preservation, and significance of any known or possible heritage assets that may be present within or adjacent to the site.

3.1.3. The table below provides a summary of the key data sources. Occasionally there may be reference to assets beyond this study area, where appropriate, e.g., where such assets are particularly significant and/or where they contribute to current understanding of the historic environment.

Table 3-1 –Data sources consulted

Source	Data	Comment
Historic England	National Heritage List (NHLE) with information on statutorily designated heritage assets	Statutory designations (scheduled monuments; statutorily listed buildings; registered parks and gardens; historic battlefields) can provide a significant constraint to development.
West Sussex Council	Historic Environment Record (HER)	Primary repository of archaeological information. Includes information from past investigations, local knowledge, find spots, and documentary and cartographic sources
Local Planning Authority	Conservation area	An area of special architectural or historic interest the character or appearance of which it is desirable to preserve or enhance.
Local Planning Authority	Locally listed building	Building of local importance designated by the local planning authority due to architectural and/or historic significance and a positive contributor to the character of an area. Whilst not statutorily protected, a building's inclusion on the list means that it is a material consideration in the planning process.

Source	Data	Comment
British Geological Survey (BGS)	Solid and drift geology digital map; online BGS geological borehole record data.	Subsurface deposition, including buried geology and topography, can provide an indication of potential for early human settlement, and potential depth of archaeological remains.
Landmark Information Group	Ordnance Survey maps from the 1st edition (1860–70s) to present day.	Provides a good indication of past land use and impacts which may have compromised archaeological survival. Provides an indication of the possible date of any buildings on the site.
West Sussex Archive	Historic maps (e.g. Tithe, enclosure, estate), published journals and local history	Baseline information on the historic environment
Steyning Museum, West Sussex	Primary research material	Historic photographs of the cement works.
Internet	Web-published local history; Archaeological Data Service	Many key documentary sources, such as the Victoria County History, , and local and specialist studies are now published on the web and can be used to inform the archaeological and historical background. The Archaeological Data Service includes an archive of digital fieldwork reports.
Cement Kilns	Online resource	Website written and managed by Dylan Moore (cement export and former Blue Circle employee) recording the various cement plants and kilns in Britain and Ireland.
Ron Martin	Archive engineering drawings and plans	Ron Martin (former General Secretary of the Sussex Industrial Archaeology Society) provided the original engineering plans and drawings he salvaged from the plant in 2004. These were scanned and archived by WSP before being transferred to West Sussex Archive.

3.1.4. In addition to the above, a useful source of information for this report which deserves specific mention is R Martin's '*The History of Shoreham Cement Works'*, Sussex Industrial History 34, 2004 (http://sias.pastfinder.org.uk/sih_1970_2008/34-2004.pdf).

3.1.5. **Figure 2** shows the location of known historic environment features within the study area, as identified by the sources above, the site visit, or during the course of research for this assessment. These have been allocated a unique 'assessment' reference number (**A1, 2,** etc.), which is listed in a gazetteer at the back of this report and is referred to in the text. Where there are a considerable number of listed buildings in the study area, only those within the vicinity of the site (i.e., within 50m) are included, unless their inclusion is considered relevant to the study. Conservation areas are not shown. Archaeological Priority Zones are shown where appropriate. All distances quoted in the text are approximate (within 5m).

3.2 Consultations

3.2.1. The WSP project team included input from John P H Frearson MA(Oxon) FICT. John has been involved in researching and writing the industrial histories of lime and cement works and other minerals and is an expert in the history of cement production. He has over 40 years' experience of the assessment, production and use of cement, aggregates and concrete and from 2002 to 2010 was Director of John Frearson Limited, undertaking technical consultancy and advisory work and prior to that providing similar services for Rugby Cement. He is author or co-author of some 20 technical publications, and has presented at Conferences and Training Courses, in UK, Europe, the Middle East and the Far East. He is a former Member of BS Committees representing the UK Association of Consulting Engineers, dealing with cements.

3.2.2. To understand the significance of the site in a wider European and International context, consultation emails were sent out to Industrial Heritage bodies from Italy, France, Belgium, Germany and ERIH (a Europe-wide organisation)., However, within the timescales of this project, replies were received only from Associazione Italiana per il Patrimonio Archeologico Industriale who both provided recommended reading material to support the understanding of the sites position compared to Italy.

3.3 Digitisation of engineering drawings

3.3.1. During the baseline research of the report, we identified the existence of a large number of original plans and engineering drawings from the plant which were in possession of Ron Martin, former General Secretary of the Sussex Industrial Archaeology Society. After liaising with Mr Martin, WSP arranged to have the plans signed over to the SDNPA for deposition with the West Sussex Archive where they could be conserved and stored. Before deposition with the archive WSP undertook the digitisation process for the plans which were in good enough condition to be scanned. Suitable scans were then selected to be used in this report. WSP wish to express gratitude to Mr Martin for his assistance and for his advice on the Shoreham Cement Works.

3.4 Site visit

3.4.1. A site visit was undertaken on 28 September 2021 by two members of the WSP Built Heritage team. As no access to the site of Shoreham Cement Works was possible due to lack of access permissions, the site visit was limited to a setting assessment of the surrounding landscape. The purpose of this site visit was to understand the relationship between Shoreham Cement Works and the surrounding landscape, including the quarries, buildings, and views across to and from the South Downs National Park.

3.4.2. On the day of the site visit views of the plant were observed from public footpaths across the surrounding area. The weather was clear and mild. Whilst the limitations of the lack of site access should be recognised, there are on-line sources that include recent drone footage of the site along with video footage of the internal areas of the buildings (youtube.com) These have provided an invaluable insight into the current condition of the structures on site.

3.5 Assessing heritage significance

3.5.1. The NPPF defines significance as 'The value of a heritage asset to this and future generations because of its heritage interest. That interest may be historic, archaeological, architectural or artistic.' The determination of the significance is based on statutory designation and/or professional judgement against these values (they are also identified in Historic England *Conservation Principles* revised consultation draft Nov 2017 and Historic England *Statements of Heritage Significance* (2019).

3.5.2. Historic England's *Conservation Principles* (previously English Heritage, 2008) identifies four high level values: evidential, historic, aesthetic and communal. The determination of the significance of these assets is based on statutory designation and/or professional judgment against the following values referred to in Historic England's *Conservation Principles* (2008):

- *Evidential value*: the potential of physical remains to yield evidence about past human activity. This might consider date; rarity; state of preservation; diversity/complexity; contribution to published priorities; supporting documentation; collective value and comparative potential.
- *Historical value*: the ways in which past people, events and aspects of life can be connected through a place and/or heritage asset to the present. This tends to be illustrative or associative.
- *Aesthetic value*: the ways in which people draw sensory and intellectual stimulation from a place and or heritage asset, considering what other people have said or written.
- *Communal value*: the meanings of a place for the people who relate to it, or for whom it figures in their collective experience or memory.

3.5.3. These values encompass the criteria that Historic England are obliged to consider when statutorily designating heritage assets. Each asset is evaluated against the range of criteria listed above on a case-by-case basis. Unless the nature and exact extent of buried

archaeological remains within any given area has been determined through prior investigation, significance is often uncertain.

3.5.4. This assessment also took into account Historic England's *Industrial Buildings: Listing Selection Guide* published in 2017 which provides a guide for analysing an industrial sites potential significance.

3.5.5. The table below gives examples of the significance of designated and non-designated heritage assets.

Table 3-2 – Significance of heritage assets

Heritage asset description	Significance
World heritage sites Scheduled monuments Grade I and II* listed buildings Grade I and II* registered parks and gardens Designated historic battlefields Protected Wrecks Undesignated heritage assets of high national importance	Very High
Grade II listed buildings Grade II registered parks and gardens Conservation areas Burial grounds Protected heritage landscapes (e.g. ancient woodland or historic hedgerows) Undesignated heritage assets of lower national, regional or county importance	High
Heritage assets with a district value or interest for education or cultural appreciation Locally listed buildings	Medium
Heritage assets with a local (i.e. parish) value or interest for education or cultural appreciation	Low
Item with no significant value or interest	Negligible
Heritage assets that have a clear potential, but for which current knowledge is insufficient to allow significance to be determined	Uncertain

3.6 Assessing the contribution of setting

3.6.1. Setting is the way in which the asset is understood (i.e., evidential and historical values) and experienced (aesthetic and communal values). It is not an asset in itself. It differs from curtilage (historic/present property boundary); context (association with other assets irrespective of distance) and historic character (sum of all historic attributes, including setting, associations, and visual aspects).

3.6.2. Guidance produced by Historic England (HE 2016) and the Landscape Institute and Institute of Environmental Management, and Assessment (2013) has been used to adopt a stepped approach for settings assessment. The former sets out five steps, or which the first four are relevant:

- *Step 1: asset identification*. The NPPF requires an approach that is proportional to the significance of the asset, and for this reason only the settings of the most sensitive (i.e. designated) heritage assets are considered in this assessment. A scoping exercise filters out those assets which would be unaffected, typically where there are no views to/from the site.
- *Step 2: assess the contribution of setting*. This stage assesses how setting contributes to the overall significance of a designated asset.
- *Step 3: assess change*. This considers the effect of the proposals on asset significance. It is noted however that it can be difficult to quantify such change to the overall significance of a designated heritage asset (for example, significance would rarely be downgraded from 'high' to 'medium' due to changes in setting). For this reason, the impact is reported in this assessment in terms of the extent to which the proposals would change how the asset is understood and experienced (in terms of no harm, less than substantial harm, substantial harm or total loss of significance).
- *Step 4: mitigation*. This explores the way to maximise enhancement and avoid or minimise harm. This is typically considered at the design stage (i.e. embedded design mitigation).
- *Step 5: reporting*. Making and documenting decisions and outcomes. This reports the assessment of effects.

3.6.3. The assessment has considered the physical surroundings of the asset, including topography and intervening development and vegetation. It also considers how the asset is currently experienced and understood through its setting, in particular views to and from the asset and the site, along with key views, and the extent to which setting may have already been compromised.

4 Site context

4.1 Site location

4.1.1. Shoreham Cement Works is located between Shoreham-by-Sea to the south and Upper Beeding to the north, along the north-south oriented A283 road (NGR 520042 108606; **Figure 1**). The site is bounded to the west by the A283 and surrounded to the east, north and south by agricultural land located within the boundaries of the South Downs National Park (SDNP).

4.1.2. The site is split between the two districts of Adur and Horsham. It is located entirely within the county of West Sussex.

South Downs National Park

4.1.3. The South Downs was designated as a National Park in 2010 following decades of campaigning as the tenth National Park in England. At the time of its designation, the National Park covered an area comprising over 600 sq. miles of countryside characterised natural beauty and a diverse and complex landscape.[2] The SDNP, replacing the East Hampshire Area of Outstanding Natural Beauty (AONB) (designated in 1962) and Sussex Downs AONB (designated in 1966), stretches between the Hampshire Downs in the west and Beachy Head in East Sussex and comprises an east-west oriented chalk ridge with a southerly slope and gently rolling hills. The ridge ends along the coast with chalk cliffs.

4.1.4. The landscape of the National Park is formed by an extensive chalk ridge and gently sloping chalk downland which has a rich cultural history and is home to a variety of wildlife and habitats. To the north of Worthing, where the Shoreham Cement Works site is located, the large chalk ridge is dissected into separate blocks by the River Adur and River Arun draining from the Low Weald area towards the sea on the south coast. A large aquifer, fed through the porous chalk layer, is present in the area and provides drinking water to a large number of residents in and around the South Downs.[3]

4.2 Topography

4.2.1. The site at Shoreham Cement Works is located on the east and west sides of Steyning Road (A283) and falls within two Landscape Character Areas as described in the South Downs National Park Landscape Character Assessment (South Downs National Park, 2020)

[2] https://www.nationalparks.uk/park/south-downs/
[3] https://learning.southdowns.gov.uk/geology-landscapes/geology/

4.2.2. The area is located within the Adur Floodplain Landscape Character Area F3. Area F3 defines a narrow north-south oriented strip of land crossing the National Park and reaching its southern and northern boundaries.

4.2.3. The area is defined by the course of the River Adur and the surrounding floodplain. The river meanders through the floodplain following its natural layout characterized by wide bends; owing to the moveable nature of the river, areas of the floodplain formerly occupied by water are now in use for agriculture and pasture and support a large number of birds. The floodplain landscape is characterised by alluvial clay soil sand periodical waterlogging (Stoneless clayey, fine and silty soils typically found in river deposits).

4.2.4. The Adur floodplain has been pivotal in linking the Weald with the South Downs as an important transport corridor, offering ease of navigation as well as long views. Steyning Road runs along the River Adur floodplain linking the area to the north with Shoreham-by-Sea in the south.

4.2.5. The site also falls within the Adur Valley Sides Landscape Character Area G3. Area G3 defines a long and narrow strip of land bordering the River Adur floodplain to the east and west. The area is characterised by steepness of the valley sides enclosing the floodplain displaying chalk layers within its steep cliffs; the valley in fact most likely expanded as a consequence of periglacial erosion leaving steep slopes.

4.2.6. The Adur Valley cuts through the chalk beds of the South Downs and its boundary adjoining the floodplain is clearly visible. The abrupt edge between the valley and floodplain is marked by narrows strips of sinuous woodland located along the lower edges of the valley side and providing the setting to the floodplain. Geometrical fields enclosed during the 20th century are mostly classified as Grade 3 in the Defra Agricultural Land Classification as having good-moderate quality soils.

4.3 Geology

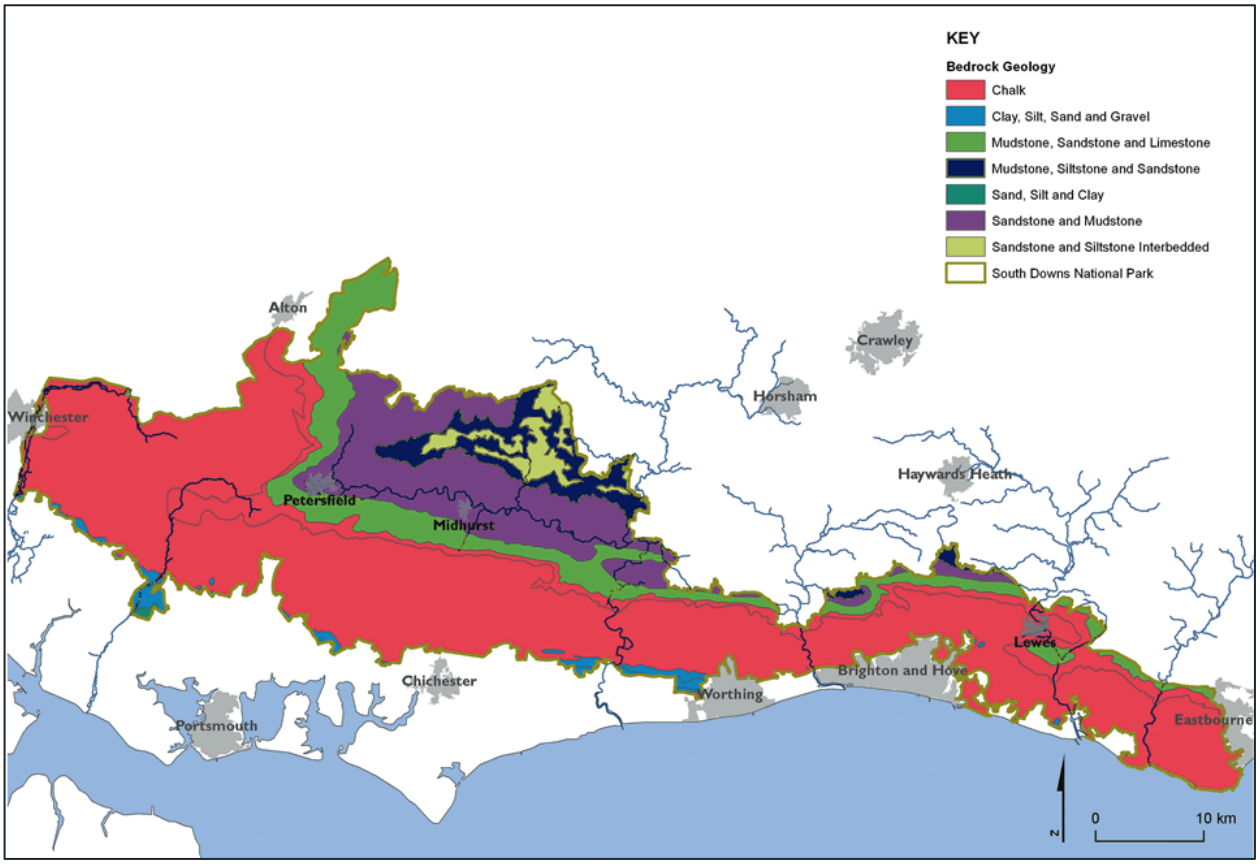
4.3.1. Sussex is thought to sit on a huge chalk rock wave, with its ‘trough’ tucked away below the Channel and its ‘crest’ long since eroded away by the weather, exposing its clay and sand core forming the Weald and leaving two ridges now known as the North and South Downs. During the Cretaceous period the layers of chalk were slowly pushed upward to form a dome shaped geological feature caused by the Alpine Orogeny (the dome is known as the Weald-Artois Anticline). The dome was eroded during the Tertiary (2.6–66 million years ago).

4.3.2. Chalk is a fine-grained type of Limestone normally found in a variety of white-to-grey shades and is formed over time from thick chalk muds becoming the receptacle for dead creatures at the bottom of a sea or similar body of water. Chalk is in fact mainly composed by calcium carbonate derived from the skeletons – or shells – of minute algae following their deposition and accumulation in water over a long period of time.

4.3.3. The South Downs are characterised by a surface chalk top layer containing flint nodules which then joins to a middle chalk layer which is rich in fossils (**Plate 4-1)**. The roughly 200ft

thick middle chalk layer then terminates in hard chalk rock formed by splintery chalk with wavy bedding and partings of grey marl (Beeding and Bramber local history society, 1998). The chalk layer is deposited on top of an earlier marine deposit of greensand and clay, laid during the late Jurassic (145–201.3 million years ago). The lower layer of Greensand was formed was also formed from deposited sands and clay formed during the same period (https://learning.southdowns.gov.uk/geology-landscapes/geology/).

Plate 4-1 - Geology of the South Downs (South Downs Learning Zone)



5 Historic background

5.1 A brief history of cement production in the UK

5.1.1. The history of lime-based cement production and use dates back to the ancient Romans and Greeks, but the first step in the development of the material in the UK can be ascribed to engineer John Smeaton (1724–92).[4] Whilst working on the reconstruction of the Eddystone Lighthouse off the coast of Plymouth in 1756, Smeaton undertook a series of experiments which led to the discovery of hydraulic lime.[5] By mixing limestone with a high proportion of clay Smeaton created the first type of concrete which was quick-drying and could set under water.[6]

5.1.2. Smeaton's work was further developed by Joseph Aspdin (1778–1855) who had trained as a bricklayer and plasterer.[7] Whilst experimenting, Aspdin discovered that by heating clay and limestone at a very high temperature in a kiln, then cooling, grinding and mixing it with gypsum he could create a very strong cement.[8] Aspdin patented his new discovery as 'Portland Cement' in 1824 (GB 5022) after its similarity in appearance and colour to the existing Portland Stone which was an established construction material at the time. Joseph Aspdin set up a factory in Wakefield and worked in partnership with his sons who continued alongside him to perfect the production system and set up additional factories.

5.1.3. Aspdin's Portland Cement was successful but widely considered to be expensive by his competitors who continued to produce different cements products (such as 'Roman Cement and 'Artificial Cement') for the construction market and were unable to reproduce his unique formula due to the protective patent and secretive process.[9] Isaac Charles Johnson (1811-1911) was an experienced cement manufacturer who was determined to discover the secret and after two years of experimentation had formulated a new and highly improved version of Portland Cement ready to be launched onto the market.[10] The process of studying and re-formulating Portland Cement is thoroughly described by Johnson himself in an article written by him and published in *The Building News* in 1880.[11] Johnson's attitude and self-promoting qualities are the reason why he is now considered, by the vast majority of sources, to be the

[4] Mason, T. (2018). *Cement.* Encyclopaedia Britannica. [online] available at: https://www.britannica.com/technology/cement-building-material/History-of-cement
[5] Encyclopaedia Britannica (2021). *John Smeaton: British Engineer.* [online] available at: https://www.britannica.com/biography/John-Smeaton
[6] Encyclopaedia Britannica (2021)
[7] Mason, T. (2018).
[8] Mason, T. (2018).
[9] Mason, T. (2018)
[10] Mason, T. (2018)
[11] Moore, D. (2010). *I C Johnson's experiments on Portland Cement.* [online] available at: https://www.cementkilns.co.uk/cemkilndoc010.html

forefather of Portland Cement. His reputation surpassed Aspdin's during the 20th century possibly due to Johnson's *Autobiography* written and published in 1912 and convincingly celebrating his professional successes.[12]

5.1.4. Johnson began the production of his cement at John Bazeley White's cement plant in Swanscombe, Kent where he had been working since 1833 as the manager. The new production prompted the plant to grow into the largest British Portland Cement factory in the UK. By the end of the 19th century the use of Portland Cement across the UK was widespread: from the construction of railroads and roadways to docks, harbours, embankments, aqueducts, bridges, sewers, pavements, fortifications and conduits, the white-grey cement was suitable for all types of construction.[13]

5.1.5. In 1900, John Bazeley White became the preeminent member in the formation of the Associated Portland Cement Manufacturers Ltd (APCM) which was created from the amalgamation of a number of companies across the UK and retained, at least initially, 60% of the British Cement Manufacturing capacity.[14] In 1911 a subsidiary to Associated Portland Cement Manufacturing was formed and named British Portland Cement Manufacturers Ltd (BPCM), among the companies included in the new venture was Sussex Portland Cement Co. Ltd which owned the plant at Shoreham.

5.1.6. Some of the plants in the ownership of APCM and subsidiary company BPCM were operated as a single organisation by the 1920s under the main, but still unofficial brand, of Blue Circle. The two companies were merged under the name officially in 1965 and Blue Circle became specialised in the low-cost manufacturing of cement in the post-war period, constructing several new plants between 1950-70. Shoreham was not absorbed into Blue Circle until 1978, the same year the company was rebranded as Blue Circle Industries PLC. In 2001, Blue Circle, which had become the sixth largest manufacturer in the world, was bought by Lafarge but retained its original brand name within the UK market.

5.2 The exploitation of chalk at Shoreham and the establishment of the plant

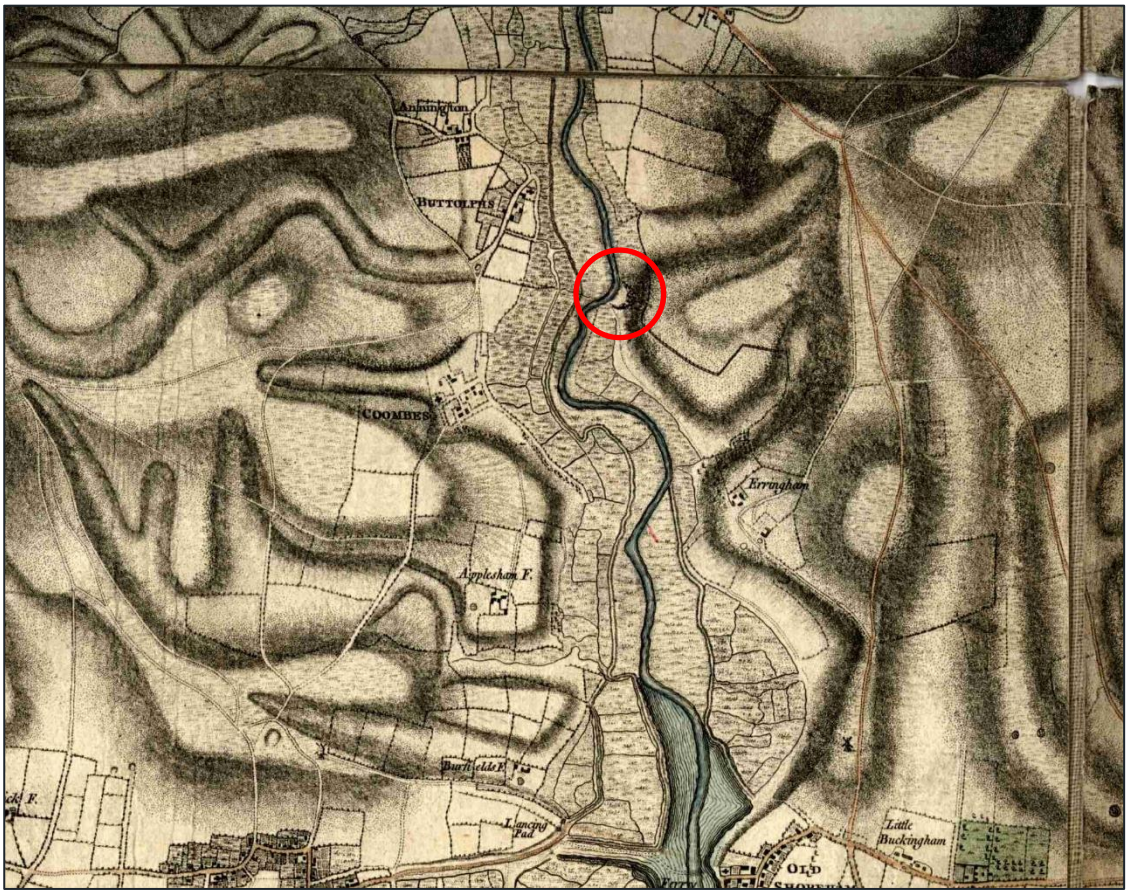
5.2.1. Chalk and flint have been an important resource in the South Downs for thousands of years, both used for the manufacturing of lime and the construction of buildings respectively.

5.2.2. Records indicate that a chalk pit existed in the area of the present-day Shoreham Cement Works since at least 1725, although it is likely that chalk was being extracted in the area long before this date. The Yeakell and Gardner map of 1780 **(Plate 5-1)** shows a large dent

[12] Moore, D. (2010).
[13] Moore, D. (2010).
[14] Grace's Guide, (2020). *Associated Portland Cement Manufacturers.* [online] available at: https://www.gracesguide.co.uk/Associated_Portland_Cement_Manufacturers

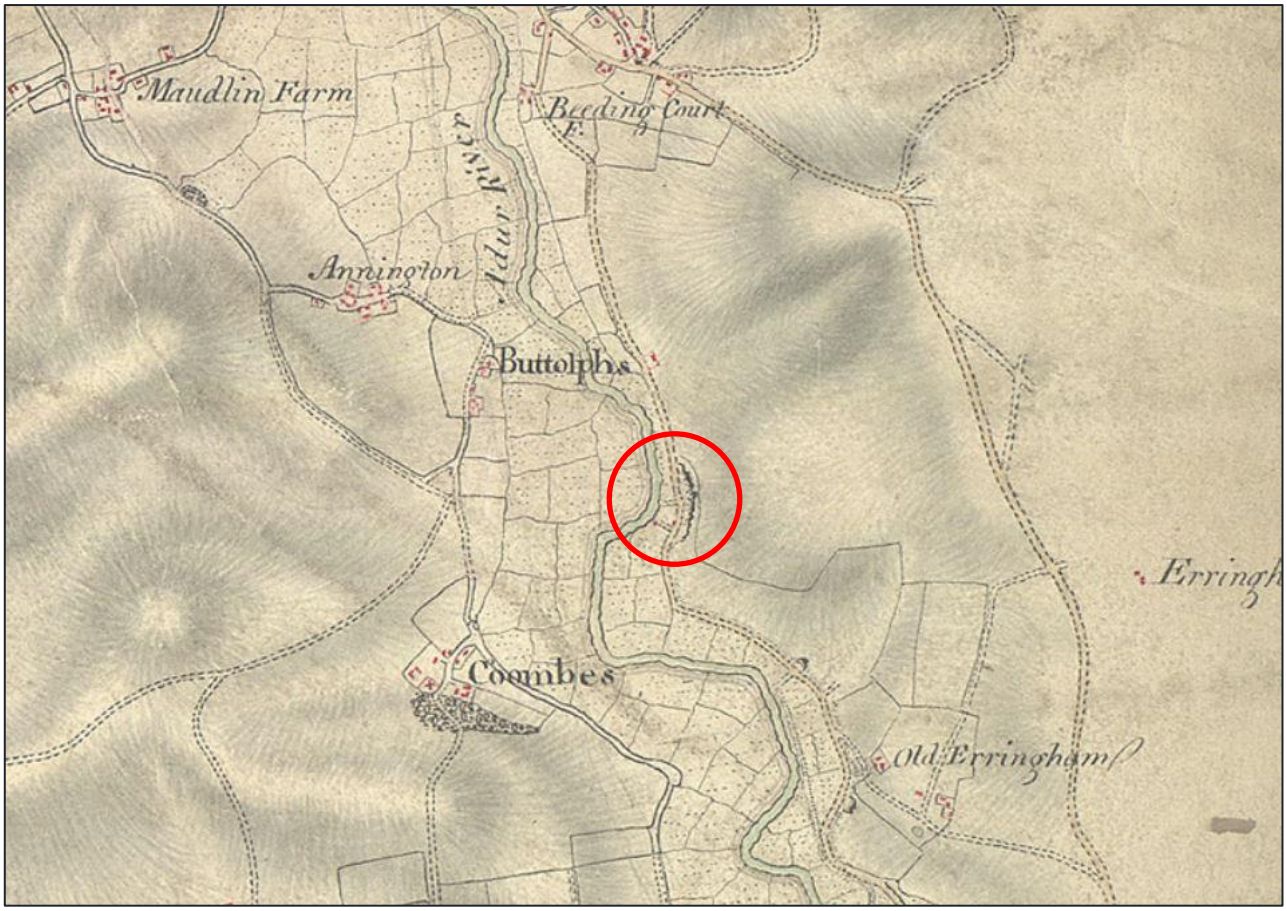
on the face of the hill overlooking the River Adur, the discernible size of the dent appears altogether similar to the size of the quarry pits shown in the slightly later Steyning Map of 1806 **(Plate 5-2)**. [15, 16]

Plate 5-1 - Yeakel and Gardner Map of 1780, the small quarry by the River Adur is highlighted in red (British Library)



[15] Yeakell and Gardner's Map of Sussex, 1778-1783, [online] available at: http://www.envf.port.ac.uk/geo/research/historical/webmap/sussexmap/Yeakell_36.htm
[16] Budgen, 1806 [online] Available at: http://britishlibrary.georeferencer.com

Plate 5-2 - Ordnance Survey Map of Steyning, 1806. Site location shown in red. (Wikimedia Commons)



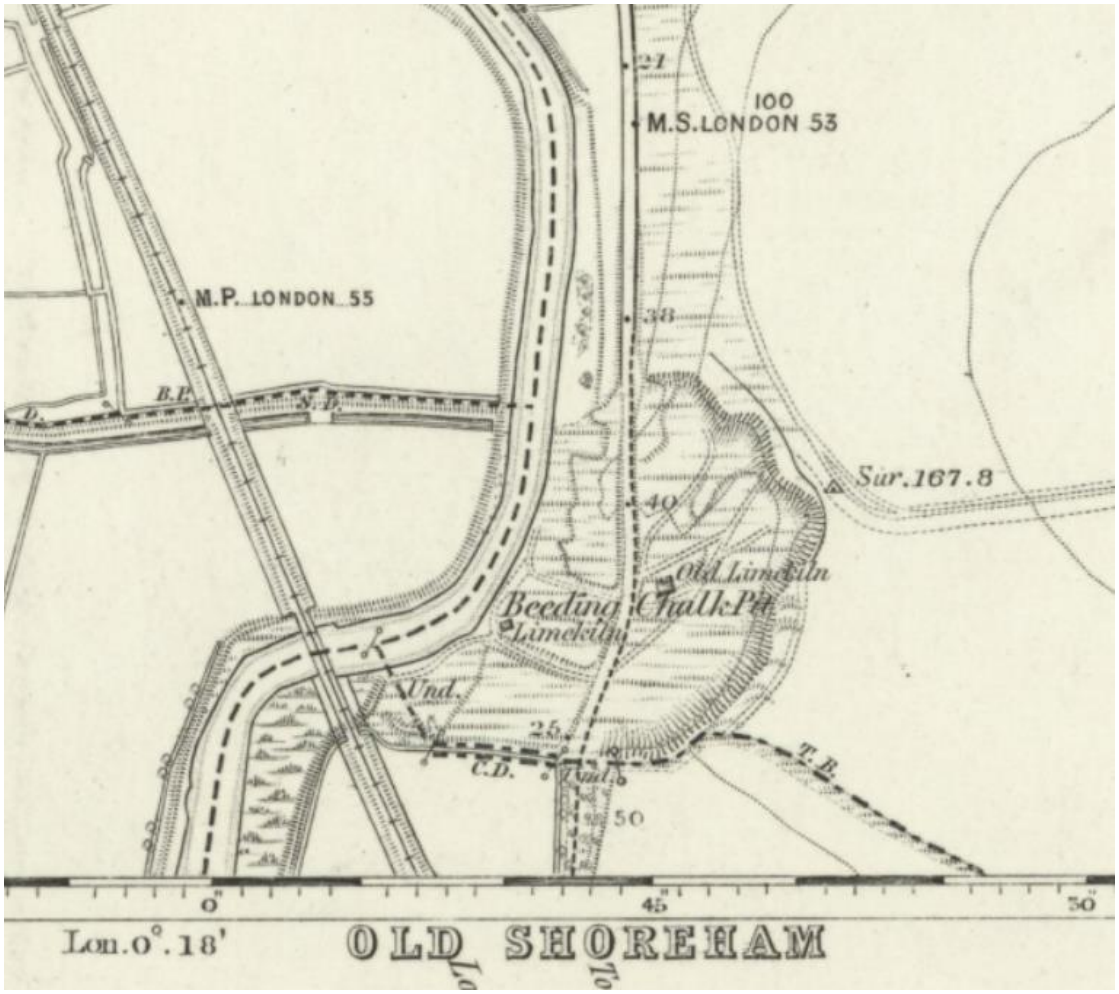
5.2.3. Lime kilns situated between the quarry and the River Adur were established in the Beeding Chalk Pit from at least 1814 onwards, while quarrying began in earnest in 1851.[17] The Ordnance Survey 1st edition 6" map of 1873 **(Plate 5-3)** shows that the site extended to the east and west of the main road, with two small limekilns located along a series of small roads radiating off the main thoroughfare now known as Steyning Road. During this period, the clay was sourced from the company's own pit at Horton a few miles along the river to the north. [18]

5.2.4. The site was located in easy reach of the River Adur, which was a great advantage as it allowed the company to transport manufactured cement and receive supplies of coke and

[17] Bateman, R. (2015). *CHALK – A History of Shoreham (Beeding) Cement Works.* [online], available at: https://www.shorehambysea.com/chalk-history-shoreham-beeding-cement-works/
[18] Moore, D. (2010).

coal by water on barges. The unloading and loading of the goods were accomplished by means of a steam crane which carried the materials from the wharf stores to the barges.

Plate 5-3 - Ordnance Survey 6" Map of 1873n (NLS, 2022)



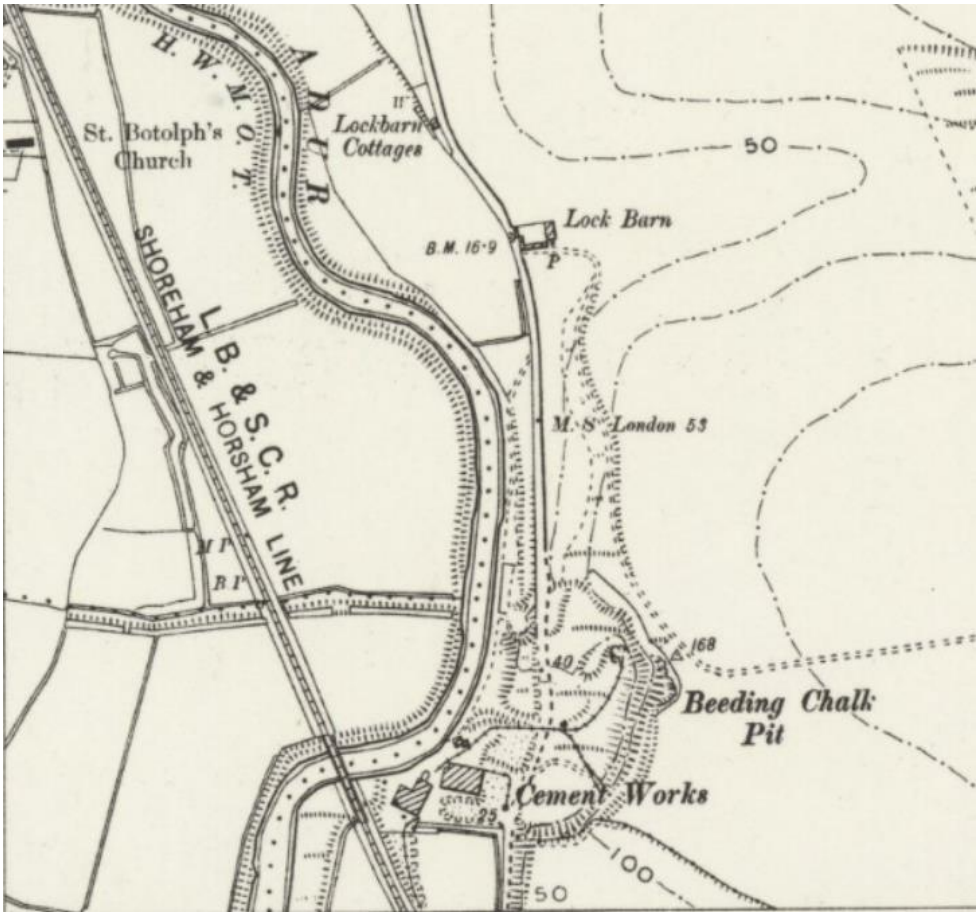
5.2.5. Although the river provided suitable transportation in the early development of the plant, it soon benefitted from the construction of the Steyning Branch Line of the London Brighton South Coast Railway which had opened in July 1861.[19] The line connected the market town of Horsham with the coastal port of Shoreham-by-Sea, with a station at Steyning. With a journey from Steyning to Shoreham-by-Sea only taking 13 minutes, the line offered perfect import and export method and a freight spur was constructed into the cement works.[20] The factory imported gypsum from Robertsbridge and coal from Dover via train and once a week

[19] Buckman, J. (2002). *The Steyning Line and its closure.* Seaford, East Sussex: SB Publications
[20] Buckman, J. (2002).

it transported cement to the British Portland Cement depot in Southampton via Shoreham and the South Coast Main Line.

5.2.6. The Beeding Portland Cement Company was formed at Shoreham Cement Works in 1878 but there is no indication that the production of Portland Cement had begun on the site until 1883.[21] By 1890, six 'Johnson chamber kilns' were constructed on the western side of the site. The works were eventually taken over by the Sussex company in 1897 who increased the capacity of the works through the addition of eight 'Michele' chamber kilns, two 'Schneider' kilns which were used to burn the excess dried slurry of the Michele kilns, and in 1899 two rotary kilns installed in 1899.[22] The extent of the plant at the end of the 19th century can be seen on the Ordnance Survey 2nd edition 25" map of 1896 **(Plate 5-4)**.

Plate 5-4 - Ordnance Survey 6" Map of 1896 (NLS, 2022)

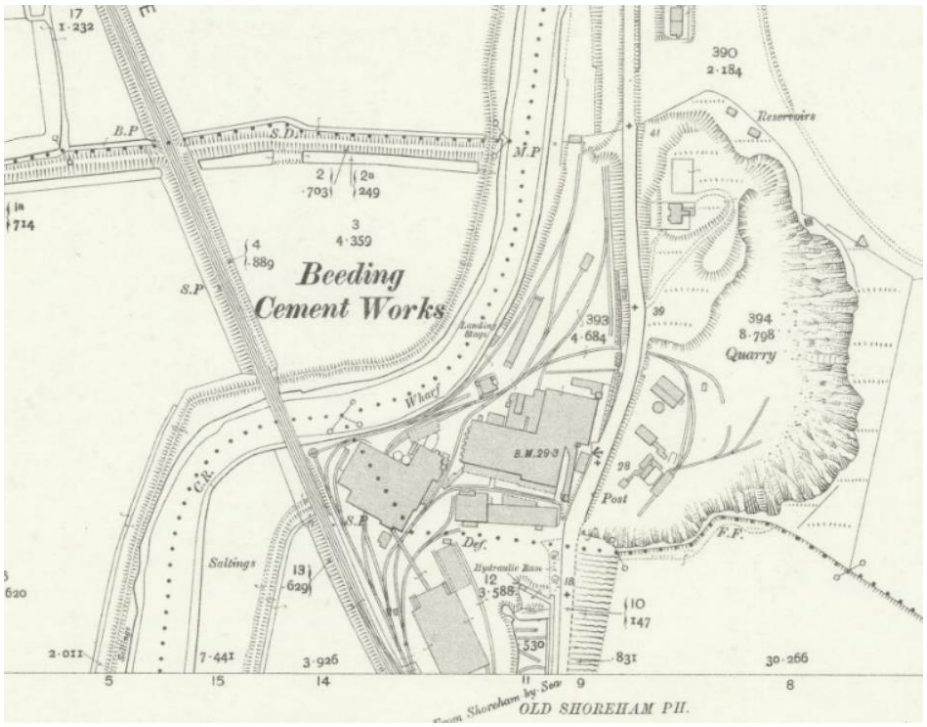


[21] Moore, Dylan (2021) Shoreham [online] available at: https://www.cementkilns.co.uk/cement_kiln_shoreham.html
[22] Op. cit. 37

5.2.7. The wharf and steam crane were still present at Shoreham Cement Works in the early 20th century along with a tramway. The site also comprised state-of-the-art equipment, such as plant for the on-site production of gas (needed for the engines), two washmills, two mixers (to avoid interruptions in the continuous production of cement), a wet mill, and innovative German Schneider continuous kilns. The industrial equipment and processes enabled the complete manufacture of cement within 2 ½ hours.

5.2.8. The plant was operated using electricity and according to a newspaper article in the *Sussex Daily News* in 1902*,* the plant was the first in the country to use Schneider Kilns for the innovative system allowing the continuous process and uninterrupted production of cement.[23] A 100 horsepower gas engine was also installed at the plant to drive the coal grinding drying machine and the wet and dry mills. Cement stores with a capacity of 9,000 tons served the end of the production process entailing the packing and dispatch of the finished product. The plant was also provided with a fitting shop, laboratory, testing room and a team of chemists.[24] The full extent of the plant in the early-20th century can be seen in the Ordnance Survey 3rd edition 25" map of 1912 **(Plate 5-5)** and the aerial photo in **Plate 5-6**.

Plate 5-5 – Aerial photo of Shoreham Cement Works around 1911 (copyright: Steyning Museum Trust). The photo shows the site viewed looking south-west.



[23] Sussex Daily News, 1902
[24] Moore, D. (2010).

Plate 5-6 – Aerial photo of Shoreham Cement Works around 1911 (copyright: Steyning Museum Trust). The photo shows the site viewed looking south-west.

Cement production in the pre-war plant (1890s–1930s)

5.2.9. The production of cement at the original pre-war plant followed a three-step process of washing, drying and then finishing before being dispatched, this process is described below. A detailed plan of the pre-war plant can be viewed in Figure 6.

The washing process

5.2.10. The first step in the production of the cement was the processing the raw chalk which was quarried on site at Shoreham, adjacent to the plant. In order to separate chalk from its typical 5% content of flint, the raw material would be processed within gas driven washmills.[25] The mixers were provided with 20” diameter sumps with rotating paddles located below ground level; and could operate uninterruptedly for 18 hours.[26]

[25] Moore, D. (2010).
[26] Moore, D. (2010).

The drying process

5.2.11. Historically, the first kilns used in the production of cement were static and their process was based on the treatment of batches of material. While lime kilns were used in a continuous cycle entailing the gradual removal of small amounts of product and the slow topping up, kilns burning cement required a different process, mainly due to the formation of a rigid mass of material.

5.2.12. At Shoreham, the latest technology was applied: six Johnson chamber kilns were in operation by 1890 and altogether contributed to a total output of 144t/week.[27] By 1897–8, the plant was provided with 8 Michele chamber kilns and 2 Schneider kilns. Michele chamber kilns were similar to the Johnson kilns but were provided with a lower chamber roof and had space for the resting of the slurry both within the chamber as well as on top of the arched roof. The advantages of their innovative design included a shorter chamber, but the operation was labour intensive and made more difficult by the cramped access. The kilns were protected from the weather by an outer structure.

5.2.13. Schneider kilns were an innovative feature marketed by F.L. Smith; an engineering consultancy based in Copenhagen supplying cement making equipment. The kilns, producing on average 70–100 tonnes per week, had a single shaft measuring on average 8 to 10 ft. in diameter and 40 to 50 ft. in height; the shaft was topped by a stack providing ventilation and the chamber was loaded from the top. Fuel (only coke could be used) and rawmix were fed together and clinker, was removed from an unloading door located at the bottom of the shaft.[28]

5.2.14. In 1899, state-of-the-art rotary kilns were installed at Shoreham. These kilns were the first to be installed in the UK and only the 3rd and 4th in the world and would dramatically increase the efficiency of the plant. The two rotary kilns installed had sloping rotating horizontal cylinders burning fuel and slurry at their lower ends in a continuous process. The dynamic method of combustion, entailing the constant turning over of the raw mix, and the presence of air enabled the use of coal to power the combustion. The rotary kilns were fed through long pipes connected with the tanks (the operation was overseen by one man) and produced homogenously fired clinker in small lumps the size of a bean, while previously clinker lumps were large. After exiting the kilns, clinker was transported in an elevator to the mills to be ground. The kilns were operated by Danish workers hired by the company due to their manual experience with the technology. This gave the Shoreham Cement Works plant an advantage over its competitors.

[27] *Ibid*
[28] https://www.cementkilns.co.uk/early_kilns.html#schneider

The finishing and despatching of cement

5.2.15. A finishing flat-stone mill was constructed as part of the original plant, alongside the first chamber kilns. The early expansion of the plant required the installation of four ball-and-tube mill sets which used balls to grind the material. These remained in operation until 1933.

5.2.16. The finishing mills provided some storage space for the finished product. A dispatch store was built nearby with central bins and a central overhead conveyor belt for the transportation of cement. From the bins, cement was extracted manually with a shovel and packed into sacks and then loaded into rail cars and/or trucks. This process was later updated to become semi-automated using bag fillers with screw extractors placed in the bins.

Workers Housing

5.2.17. To the north of Shoreham Cement Works on the western side of Steyning Road is a cluster of residential houses which were constructed by the Sussex Portland Cement Company to house workers from the plant. The practice of constructing workmen's housing had grown through necessity from the mid-19th century to both attract workers to work at the plant and improve living conditions.[29]. Large plant such as cement works, food factories, and other large scale production sites soon realised that through the provision of social amenities in site, workers were more likely to remain and be more productive. Historic plans of the Shoreham Cement Works show that the site included canteens and mess halls for the works, and throughout the 20th century these were seen to be improved upon.

5.2.18. The houses built for the workers at Shoreham Cement Works are the only surviving structures from the original plant and provide an interesting social connection to the workmen and their families and illustrates the company's wealth during the various periods of construction.

Dacre Gardens

5.2.19. Between 1898 and 1903 the Sussex Portland Cement Company Co Ltd built Dacre Gardens to the north of the plant, on the eastern side of what is now Steyning Road **(Plate 5-7)**. The terraces were built to house some of the workers to the north of the site, and to the west of the River Adur. A total of 42 houses were constructed.

5.2.20. The houses were comprised of two storey and constructed of brown brick laid in a stretcher bond. Queen closers and headers were seen to be present around the first floor fenestration. The buildings consisted of two projecting ground floor bays with sloping front gardens and small roof demarcating the top of the ground floor.

5.2.21. Internally, a regular plan comprised two rooms on the ground and first floor with a central staircase. A projecting rear was used to house utilities at the back. While the back of the

[29] Ashworth, W. (1951). 'British Industrial Villages in the Nineteenth Century'. *The Economic History Review.* 3(3), pp.378-387

terraces originally opened onto the sloping fields to the east, fenced gardens up to 40m in length now occupy the space to the east.

5.2.22. The census records indicate that in the early years these houses were generally occupied by single male workers from the plant, with often a large number of men living in one property. There was an average of 5.4 people per house after they were first built which increased to 6.4 by 1911.[30] A number of workers were also identified as living with their partners at the properties.[31]

Dacre Villas

5.2.23. Two semi-detached houses named Dacre Villas are located to the south of Dacre Gardens **(Plate 5-8)**. The buildings were built in red brick, with projecting bays to the front ground and first floors and provided more space than Dacre Gardens to the north. The houses are noticeably detached from the terraced housing to the north and were designed for those in higher positions at the plant such as foremen and specialised workers.

Cliff House

5.2.24. A detached villa known as ‘Cliff House’ was constructed south of Dacre Villas and closer to Shoreham Cement Works, up on the cliff. The house was not assessed on the site visit as it is not visible from the road. The house was constructed as the residence of the Chief Foreman/Manager of the Cement Works.

[30] Moore, D. (2010).
[31] Moore, D. (2010).

Plate 5-7 - Dacre Gardens terraced housing (WSP, 2021)

Plate 5-8 - Dacre Villas at the southern end of Dacre Gardens (WSP, 2021)

5.3 Post-war reconstruction of Shoreham Cement Works

Design and development

5.3.1. Following a period of intermittent activity during and the war (1939–45), negotiations started in October 1946 for the complete reconstruction of the Beeding Cement Works by British Portland Cement Manufacturers Ltd.[32]

5.3.2. According to an article published in *The Shoreham Herald*, a meeting organised to discuss details of the reconstruction of the plant was held in October 1947 at Chanctonbury Rural District Council; the stakeholders in attendance were Chanctonbury Rural District Council, the Ministry of Town and Country Planning, West Sussex County Council and the cement company.[33]

5.3.3. During the event, support from the authorities involved was sought by the manufacturers who, keen to expand production at the site, demanded the "exchange of certain boundary land" to help them open up a considerable area for quarrying.[34] During the meeting it was also decided that the old plant would be demolished and rebuilt in a way that would make the cement factory less visible from the public highway and the surrounding fields, as the site was already deemed to be an eye-sore in the South Downs landscape.

5.3.4. Overall, the local authorities requested the new complex to be more respectful of the beauty of the surrounding environment In response to the request, Mr H.G.P. Taylor, the works manager, promised, with the support of the rest of the firm, to build a suitable complex partly hidden from sight.[35] The decision was therefore made to locate the new plant within the pre-existing quarry in the east side, the location was thought to be the best option as the buildings would thus be concealed from the west, north and south.

5.3.5. Construction of the new plant began in 1948 to a design by Oscar Faber & Partners, led by renowned engineer Oscar Faber for Associated Portland Cement Manufacturers Ltd. Shoreham was the first new factory built in the post-WWII era.[36]

Dr Oscar Faber (1886–1956).

5.3.6. Oscar Faber, C.B.E., D.Sc., D.C.L.(Hon.), was born in London on the 5th July 1886, died on the 7th May, 1956. Faber was educated at St Dunstan's College, Catford, and undertook his

[32] Bateman, R. (2012).
[33] The Shoreham Herald, (1947) '£1,000,000 cement works will be "invisible"', *The Shoreham Herald,* July 1947.
[34] The Shoreham Herald, (1947).
[35] The Shoreham Herald, (1947).
[36] http://www.engineering-timelines.com/scripts/engineeringItem.asp?id=1268

engineering training at the City and Guilds Engineering College where he studied civil, mechanical, and electrical engineering [37].

5.3.7. He played an influential role in the early development and use of reinforced concrete in the UK and was awarded the DSc degree for his original research on “Reinforced concrete beams in bending and shear” in 1909.[38] Faber authored several other technical books and his Reinforced concrete design which was co-authored with P.G Bowie (published 1922) became an essential work. He also presented papers on structural design and heating and ventilation problems and was awarded a Telford Gold Medal for his paper *on Plastic yield, shrinkage, and other problems of concrete*, *and their effect on design,* and a Baker Gold Medal and for his *Aesthetics of engineering structures*.

5.3.8. Oscar Faber began his professional career in 1909 as Assistant Engineer with the Associated Portland Cement Manufacturers. Between 1909 and 1911 Oscar was employed as Assistant Engineer to the Indented Bar Engineering Co. and designed a reinforced concrete factory and bridges. Following this in 1911 he was appointed Chief Engineer for Trollope & Collis Ltd where he was responsible for the design and construction of a variety of office buildings, bridges, and reservoirs, both in England and in Shanghai[39].

5.3.9. Faber served in Admiralty during the First World War and was awarded the title of Officer of the Most Excellent Order of the British Empire. From 1921 he began his own private practice as Consultant Engineer, which he continued for the rest of his life. During this period, he was appointed Consulting Engineer to the Bank of England, and was conffered the honorary degree of D.C.L by The University of Durham for his work in the underpinning of Durham Castle.

5.3.10. His more notable works include the Menin Gate, Ypres, the rebuilding of the Bank of England, Church House in Westminster, South Africa House, and India House in London in addition to many factories during the inter-war years and during the Second World War. During the latter period he travelled to America to advise Sir Winston Churchill on the Mulberry Harbour project and assisted in its construction[40]. Further accolades followed for Dr Faber, as he was created a Commander of the British Empire in 1951 for his involvement in the rebuilding of the House of Commons[41].

5.3.11. Many of Faber’s innovations became industry standard and he was keen advocate for the need to integrate aesthetics and engineering and liked to show that practical buildings could

[37] ICE Publishing (2022) Oscar Faber Obituary, Downloaded on 10thFebruary 2022 (https://www.icevirtuallibrary.com/doi/pdf/10.1680/iicep.1957.12402)
[38] Monson, J. (n.d.) *Oscar Faber: Engineering Biography.* Engineering Timelines [online] available at: http://www.engineering-timelines.com/who/faber_O/faberOscar.asp
[39] Op.Cit 39
[40] Op.Cit 39
[41] Op.Cit 39

be beautiful. He was president of two professional bodies, the Institution of Structural Engineers (1935) and the Institution of Heating & Ventilating Engineers (1944-45), and was awarded an OBE and CBE for his work.[42] Faber's own practice later became Oscar Faber & Partners in 1948 and continued after his death eventually merging with G. Maunsell & Partners in 2001 to become Faber Maunsell which was eventually bought by AECOM in 2009.[43]

Construction

5.3.12. The construction of the new cement works started swiftly in 1948 with an intention to complete the site by the end of 1949, this was however delayed by a year with construction completed at the end of 1950.[44]

5.3.13. The new plant was designed to produce 6000 tonnes of cement weekly, four times the quantity of cement produced by the pre-existing complex.[45] The workers at the new factory increased from 100 to 200, making the cement works one of the largest employers in the area. The new plant would also provide better working conditions by modernising the production processes and providing more recreation facilities.

5.3.14. The increase in production also prompted the construction of two new rail sidings to the existing spur off of the main line. The increase in production is demonstrated by the records of delivery and transport in 1960: the cement works received 7000 coal wagons, 2300 gypsum wagons and 100 wagons of general stores and in return sent out 7670 cement wagons and 240 flints wagons.[46]

5.3.15. The previous plant was widely regarded to have had a large impact on the surrounding natural environment of the South Downs, which despite not being designated as a National Park until 2010 had long been recognised for its outstanding beauty. The South Downs National Park replaced two Areas of Outstanding Natural Beauty (AONB): East Hampshire AONB (designated in 1962) and Sussex Downs AONB (designated in 1966). In a bid to reduce the impact on the landscape, as well as siting most of the structures within the existing quarry, an effort was made to make the buildings looking pleasant from Steyning Road. This included both the architectural design of the buildings themselves as well as landscaping around the front of the plant (Plate 5-5). Although the aim was to build the new plant fully within the old quarry to the west of Steyning Road this ended up not being

[42] Monson, J. (n.d.)
[43] Monson, J. (n.d.)
[44] The Shoreham Herald (1950)
[45] Moore, D. (2010).
[46] Buckman, J. (2002).

possible with part of the new plant constructed on the site of the old plant on the east side.[47]

Plate 5-9 - Front facade of Shoreham Cement Works from Steyning Road (WSP, 2021)

5.3.16. The construction of the plant started with the erection of the 300ft chimney shaft and continued with the construction of the new buildings on the eastern side of Steyning Road, the installation of the new kilns and machinery and finally with the removal of the older grey buildings on the western side of the site.[48]

5.3.17. All aspects of the new plant were completely modernised from the cement processing right through to employee facilities. Improvements to the design and the increased size of the buildings were not only required in order to increase production, but the aim was also to improve working conditions for the workers as the company had a strong interest in the welfare of its workforce. The design carefully took into account the layout of the plant

[47] Pugh, 1988
[48] The Herald, 1947

ensuring that it was easy to navigate, and buildings were situated next to each other to improve production. Complex dust-collecting machinery was installed at the plant which not only improved conditions for the workers but also prevented waste and minimised the impact of dumping dust in the local area, a problem for locals often raised through the local newspapers.

5.3.18. After becoming fully operational in 1951, Shoreham launched into cement production quickly becoming a successful plant. By 1968 the plant employed 250 people and the innovative and modern processes at the plant were becoming an exemplar in the industry.

5.3.19. In the 1960s, the prominence of the plant was reflected through its frequent reception of school children on school trips from both primary and secondary schools across Sussex and Surrey. Coaches used to bring pupils to the plant where they would be welcomed at the visitor centre; and engineer would then chaperone them around the plant to illustrate cement production processes, the large pieces of equipment and machinery. Special attention would be paid to the wash-mills where fish were kept in the water, a showpiece to demonstrate how clean the production processes were.[49]

5.3.20. By the early 1970s the number of employees had increased to 315 and the plant was producing 392,000 tonnes of cement a year. The success of the state-of-the-art plant became an exemplar across Europe and numerous overseas delegations from the Commonwealth and even one from the Soviet Union were given tours.

5.3.21. As well as having a large commercial influence, the Portland Cement Manufacturers Ltd were actively engaged in the local community and also provided a range of social and recreational facilities for their employees and their families. The company funded the construction of a new Scout Hut, contributed carnivals at the village hall and provided on average 40 meals a week for their Meals on Wheels service in the district. Sports and social club activities were very well subscribed and included: angling, bowls, photography, football, tennis, horticultural, rifle shooting and bingo and in addition there were annual events such as the children party, family day outing and the work social and dance.

5.3.22. By the early 1980s the plant employed some 330 people and had a capacity to produce 370,000 tonnes of cement per year which is when it peaked. The process was still mainly a wet process meaning that the raw chalk and clay were mixed together in water prior to being pumped to the kilns. In the kiln's high temperatures (approximately 1400^{o}c) drove off the moisture and brought about the chemical change which produced cement clinker. In the next step of the process the large lumps of clinker cement were ground down to a very fine powder.[50] Chalk was at the time sourced from the works own quarry while clay was brought

[49] M. Wilkes (2021). Personal communication, September 2021.
[50] Hedges, B. (1981)

in by lorry from the nearby town of Horton. Shoreham was eventually supplying cement for commercial and domestic sale all over the south-east of England.

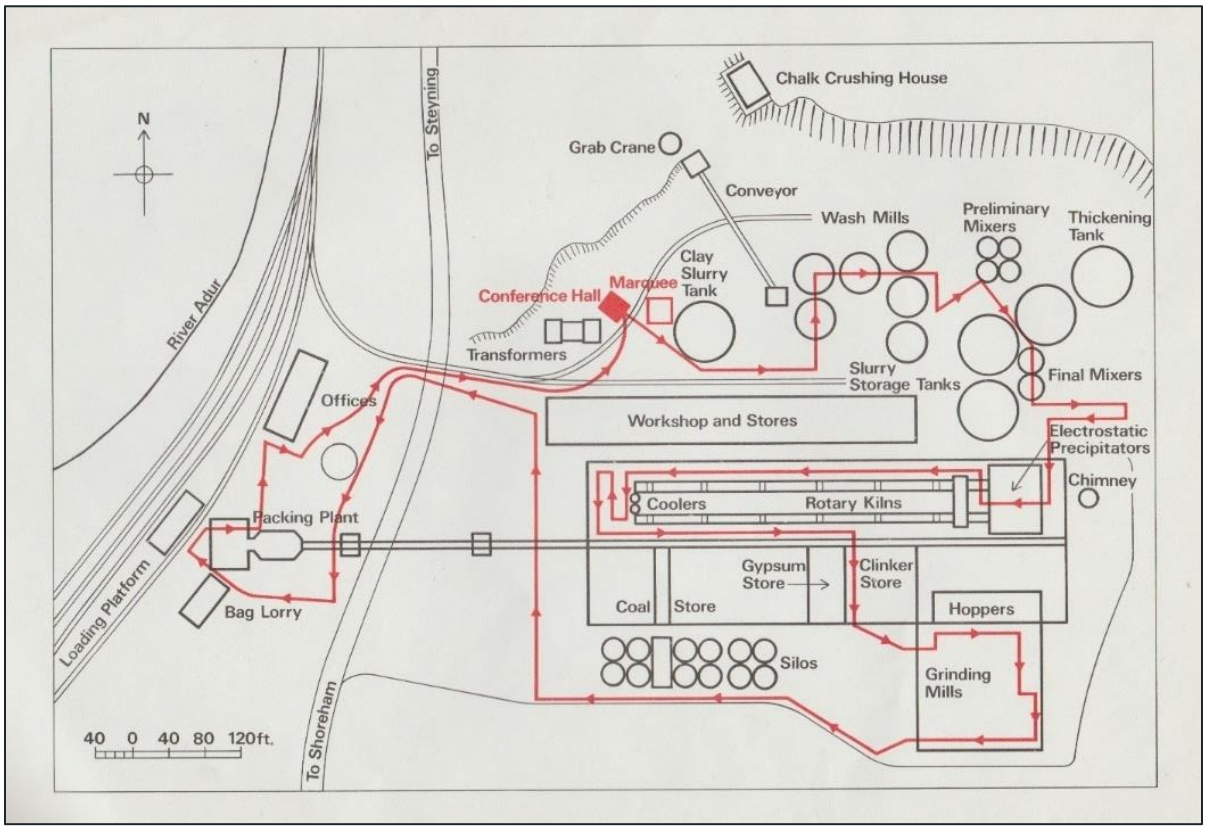
5.3.23. In 1982 the two 1950s kilns were modified from the existing wet process with slurry at 38% moisture to the newly developed semi wet process with cake at 19% moisture. The alteration was made possible by the installation of two large philtre presses to force the moisture out of the choke and clay slurry to form a crumbly philtre cake, this then reduced the amount of coal required to burn off the excess water.[51]

5.4 Cement production in the post-war plant (1950s–1990s)

5.4.1. Although the production of cement in the post-war plant followed the same basic principles as in the previous plant, the processes were more complex and were undertaken across a larger site comprising a number of tailor-built buildings. The structure of the plant was created around a flowing production process starting at the with the extraction of raw materials at the quarry and ending with the packing and dispatch facilities. The production process at Shoreham has been broken down into stages detailed below. **Plate 5-10** shows an approximate flow chart of the production process at Shoreham. It appears that this flow chat actually follows the route of a guided tour of Shoreham (as it begins and ends at a conference hall and marquee) however it does follow the route of production which can be used to understand the layout of the site.

[51] Taylor, (1994)

Plate 5-10 - Rough flow chart of the production process at Shoreham from a 1970s Blue Circle brochure



Chalk crusher house

5.4.2. Located by the old chalk quarry, a chalk crusher house was located on the solid face of the quarry and was provided with twin-roll claw crusher. This building was for processing the raw chalk from the quarry which was then taken down into the main plant via a conveyor belt. The equipment could process 300 tons of chalk per hour, reducing the chalk to lumps of less of 10 in. across and discharged them onto a stockpile served by an electric jib crane linked to a feeder and 30 ft. conveyor belt.

Roughing washmills

5.4.3. Chalk was then washed and screened in three sets of washmills set at different levels. The mixture was first broken up into a slurry by two rough mills working intermittingly and then a single mill fed by gravity continued the same process. Three screening mills operated as sieves for the mixture.

5.4.4. Each of the washmills was designed with a circular tank 35ft. in diameter with a revolving fixed king-post and a steel structure carrying harrows or splash plates. The rough mills were driven by 350-h.p. Metropolitan-Vickers slip-ring motors along with the secondary mills. A 100-h.p. motor drove the screening mills. The motor was mounted on an upper bridge and

the length of the mill connected to a combined bevel double-reduction gearbox. The pinion shaft bearing was mounted on a lower bridge across the mill.

5.4.5. Vertical gratings with an annular trough were present around the circumference of the mills. The size of the gratings slots decreased gradually to enable the crushing and sieving of the slurry to a small size.

Mixers

5.4.6. After having been processed by the screening mills, the slurry was transported towards four preliminary mixers where the slurry was mixed by the blowing of air executed through valves. The mixture was then pumped to the final mixers of similar design but larger the previous ones. The slurry is then deposited into three reinforced concrete storage tanks fitted with stirring and air-agitation equipment.

Rotary kilns

5.4.7. The slurry was then fed from the storage tanks into the rotary kilns for processing **(Plate 5-11)**. The slurry was fed into the kilns from the west end of the main works building, moving downwards towards the kilns. Four coal hoppers are also located at the western end of the kilns.

5.4.8. Calcination of the slurry was obtained in two Vickers-Armstrong rotary kilns located within a 500ft long and 67ft wide building steel-framed building, at a height of 65ft. The clockwise rotating kilns were 350ft long, 10ft in diameter and were set at a slope of around 45^{o}. The kilns were constructed in sections at the Vickers-Armstrong works and transported to site in sections, the sections were made with plate joints welded by the union-melt process and riveted on site with butt straps. High-alumina bricks lined the interior of the kilns. A system to catch escaping dust produced in the process comprised curtain chains which would also act as heat exchangers between the gas and the slurry.

5.4.9. Six alloy steel tyres (45-ton) each running on two large rollers, supported each kiln; the rollers supporting the kilns were provided with water-cooled self-aligning bearings fitted with integral oil lifters used to distribute oil onto the surfaces and minimise friction. The bearings were themselves supported on cast-iron bedplates. H-section reinforced concrete piers supported the kiln and each bore a weight of 200 tons.

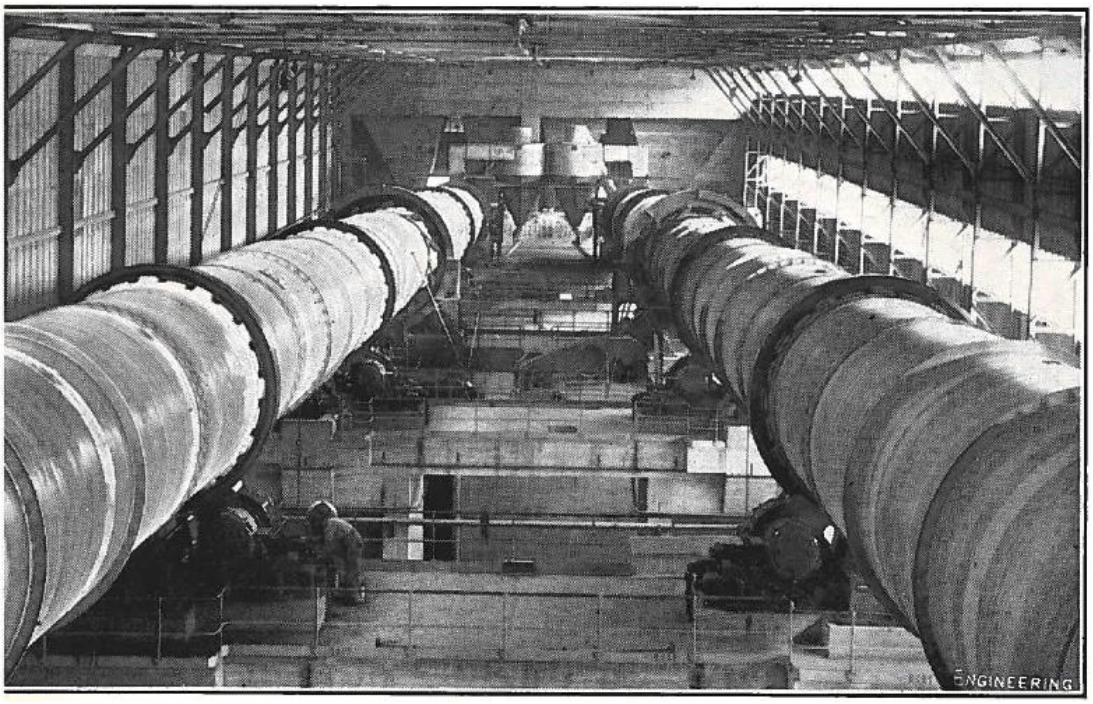
5.4.10. In order to resist the downwards thrust of the kilns, an innovative system had been introduced at Shoreham entailing the installation of a further thrust roller mounted on an adjacent bedplate on a counterbalanced slide. The function of the roller was to follow the movement of the kiln and take a share of the thrust. Another fixed roller was installed to limit the tendency of the kiln to creep uphill.

5.4.11. Each of the kilns could process 23 tons of clinker per hour which was discharged at the low end of the kiln to two rotating coolers 90 ft. long and 9 ft. in diameter allowing the temperature to be lowered to 230 degrees Fahrenheit. Cooling was achieved through cascading the clinker off lifters and through the air. The first coolers were made of heat

resisting cast-steel and lined with fire bricks while the others were made of cast iron and mild steel.

5.4.12. When the plant was built, it was common practise to position coolers underneath the kilns resulting in the fact that at Shoreham there were very high piers located in a correspondingly high kiln building. In later works the coolers were located external to the kilns saving on the cost of piers construction and lowering the height of the kiln buildings.

Plate 5-11 - Shoreham rotary kilns, taken from the eastern end of the main works building (The Engineering Magazine, 27th July, 1951)



Shaker conveyors

5.4.13. Following the cooling process, the clinker proceeded on two shaker conveyors to be separated according to the size of the material. The smaller lumps of clinker were delivered through a travelling shuttle belt conveyor on rails to the store bunkers though cylindrical chutes with dust extractors.

5.4.14. The belt conveyor linked to a Redler conveyor through a chute directly onto the store hoppers. The conveyor heads to the grinding mills. Oversized lumps are transferred via crane to a jaw-type crusher where they were processed and redirected towards the grinding mills.

Grinding Mills

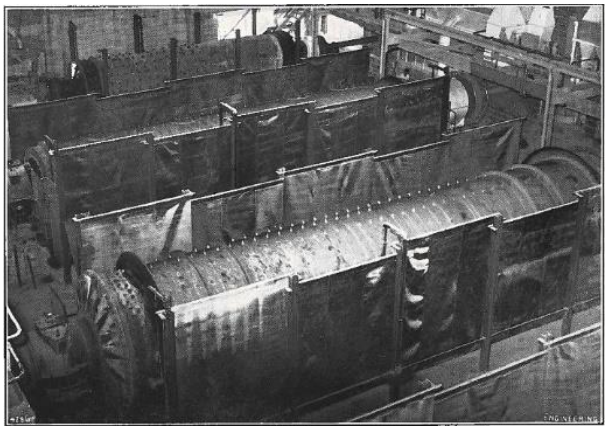
5.4.15. The clinker was delivered into the tube-shaped grinding mills in order to be ground by different sized steel balls **(Plate 5-12)**. The grinding process created a considerable amount off heat which required the tubular shells to be cooled down frequently with water sprays to

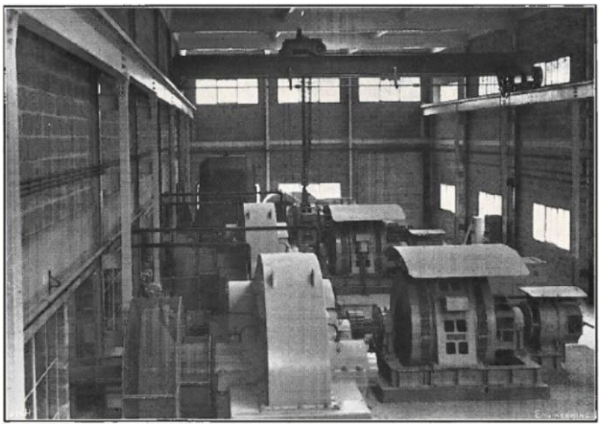
maintain the optimal temperature of the cement. An air-extraction and filtering system was present within the mills and ensured the vapor and dust were extracted during the grinding process. The motor and reduction gearing were located in a separate area called the Grinding Mills Powerhouse. There were four grinding mills in total:

- Two 1200 h.p. Vickers-Armstrong grinding mills with 45ft. long and 8ft. 4 ½ in diameter shell formed of four compartments of those the first two were made of hard alloy iron while the remaining two were made of hard white cast iron. 76 tons of steel balls are placed inside the mills which rotates at 20 – 5rpm.
- One Newell 800-h.p. mill, made of three sections, shells are 40ft long and rotated at 21rpm.
- One Newell 400-h.p. mill from the old plant; made of three sections and 29ft 4in long and rotating at 21rpm

5.4.16. From the grinding mills the cement was then transferred on conveyors into the area below the coal bunkers in the Store Building, from there the cement was carried to the packing silos and subdivided into two categories: ordinary cement and rapid hardening.

Plate 5-12 – Left: the grinding mills, right: grinding mills power house (The Engineering Magazine, 27th July, 1951)





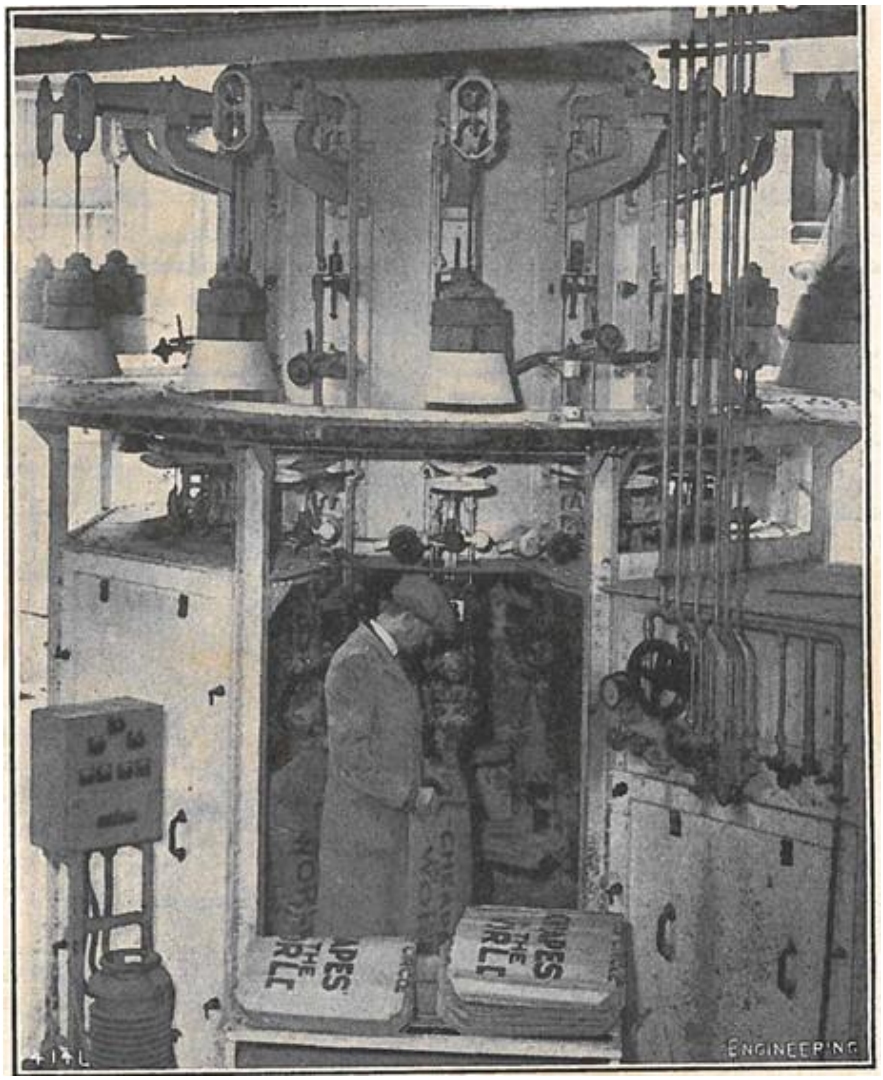
Packing plant

5.4.17. The cement is transferred to the silos at the packing plant on the western side of Steyning Road via conveyors from the main building which travelled over the road. From the silos, cement was transferred through fabric-wrapped perforated tubes where the air flow was used to move cement along. From the ducts, cement was transferred onto two 24 in. screw conveyors ending each in an elevator with a capacity of 125 tons per hour. Two revolving screens, helping with the final sifting of cement, were each connected to a 12-spout Fluxo packer **(Plate 5-13)**. Each Fluxo packer comprised a central rotating hopper into which cement flows. Flexible tubes connected the hopper with 12 symmetrically placed spouts supported on cradles themselves suspended on weighbeams. Weighbeams, provided with adjustable balance weights, were pre-set to the desired weight to which the bags are to be filled.

5.4.18. A machine operated by a single worker fed paper bags onto moving spouts, as each bag moved away from the operator, a roller on the cradle engaged with a fixed cam and released the clamp holding the bag in place. Once the bag was filled to the pre-set weight, an automatic system connected to the weigbeam stopped the cement flow. A beating mechanism ensured even filling. Below the Fluxo machines a hopper collected cement spillage resulting from the filling of bags. Dust was extracted carefully from the packing plant by means of a fan an air-filtering system.

5.4.19. Bags were then dispatched by road within three lorry loading bays served by retractable - boom conveyors linked to permanent conveyors; filled bags were also dispatched by rail through a turntable feeding rail-wagons hand-filled by workers using hand barrows. The packing and loading systems processed on average 100 tons per hour.

Plate 5-13 - Fluxo Packer at the packing plant (The Engineering Magazine, 27th July, 1951)



5.5 The plant's decline and partial decommission

5.5.1. Despite the continued high production of the plant in the early-1980s, Blue Circle Group stated that the closure of the plant was already a possibility by 1988. At the time Blue Circle was the biggest employer in the Horsham area with a total of 210 employees.[52] Despite production reaching over 300,000 tonnes of cement in 1990, the outdated equipment at the plant was making production costs soar and therefore it wasn't viable nor economical to keep the complex in operation. Shoreham, given the size of the plant and high production costs, did not have economy of scale either. In 1990 Blue Circle stated again it was going to cease production of cement at Shoreham by the end of April, the move would have caused the loss of approximately 135 jobs, but a decision wasn't reached.

5.5.2. It was not until 1991 that Blue Circle Group Ltd stated they would close the plant due to a decrease in demand, decreasing costs, and competition from overseas which meant they were unable to continue operating on the market. Existing local customers were directed towards Blue Circle's Northfleet Works which was Big Blue Circle's largest plant with an annual capacity approaching to one million tonnes and could easily meet the demands of customers in the Shoreham area. A depot was run at the old works until 1993 with a reduced staff of only 20 which could manage cement deliveries to the local area which was shipped from Northfleet.

5.5.3. When the plant was closed by Blue Circle Group Ltd in 1991 it was still operating under its planning approval granted in 1976 which did not include any provision for the company to restore the site or implement any remedial measures on the landscape following potential closure.[53] This meant that once Blue Circle Group Ltd departed and sold the plant, they left all the buildings and their contents for the new owner. The majority of the buildings and structures were kept and mothballed. The main structure that was demolished was the 38-tonne conveyor bridge over Steyning Road which was removed in May 1992.[54]

5.5.4. Proposed plans for the site emerged as early as 1998 when an application was submitted for the redevelopment of the site into a landscaped science and business park and a national winter sports centre covering 24ha. Later proposals for the site were put forward for West Sussex County Council including the construction of an incinerator but this was met by opposition from local residents and the plans were dropped.[55]

[52] Hollebone, 1988
[53] Amski Ltd, Callstone Ltd, 1998
[54] Ollieff, 1992
[55] West Sussex county times Friday 9th March 2001

6 Assessment of heritage significance

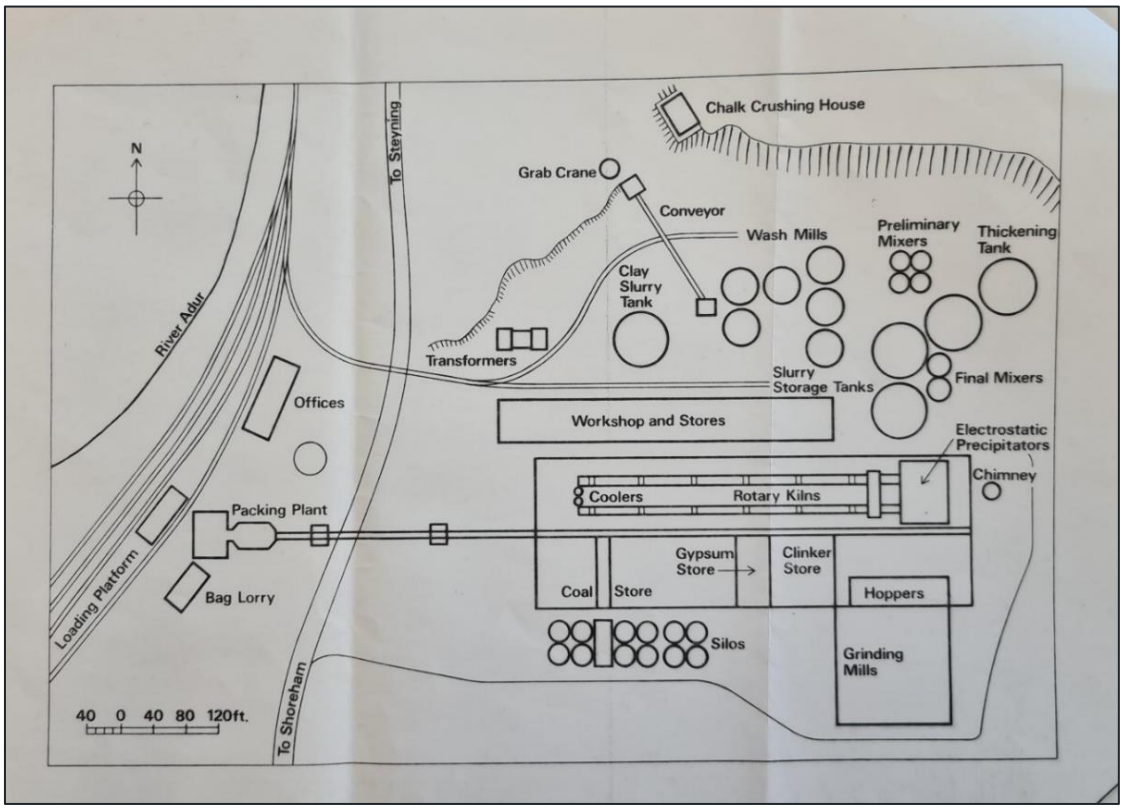
6.1 Introduction

6.1.1. This section considers the significance of the former Shoreham Cement Works in three different contexts. First the individual structures that remain on site will be analysed individually, considering their significance within the site based on Historic England's Conservation Principles and Historic England's Industrial Buildings – Listing Selection Guide (2011) as a guide. This section will also examine the contribution of setting to the significance of the site, especially in the context of the National Park. Then the significance of the site as a whole will then be considered on a national scale.

6.2 Structure's analysis

6.2.1. **Plate 6-1** is a plan of Shoreham Cement Works from a Blue Circle Pamphlet, likely from the 1980s. The plan shows the complete layout of the plant during this period with all the buildings and structures identified, which was shortly before it closed down in 1991. In comparison with modern aerial photography, an analysis has been undertaken on what structures still remain on site and what their likely significance is based on a remote assessment.

Plate 6-1 - Plan of Shoreham Cement Works from a Blue Circle pamphlet, likely from the 1980s (West Sussex Archives, ref: MP1833)



Structures no longer extant

6.2.2. Despite many of the original buildings and structures remaining extant at Shoreham, some have been removed. These include:

- **Steyning Road conveyor.** Formerly carried the cement over Steyning Road from the main plant to the packing plant, this was demolished in 1992.
- **Tanks, mixers and mills.** These structures processed the raw materials before there processing in the main plant and were based to the north of the main works building. They included the clay slurry tank, wash mills, preliminary mixers, thickening tank, slurry storage tanks and final mixers. They were demolished sometime between 2001 and 2007 as evidenced through aerial photography.
- **Explosive's store.** This small building was located further north from the chalk crushing house. It housed the explosives that were used for quarrying chalk. It was position away from the main structures to prevent damage from accidental explosions.

Main Works Building

6.2.3. The 'Main Works Building' comprises the central, main structure on the site which houses the rotary kilns, coolers, electrostatic precipitators, coal store, gypsum store, clinker store, hoppers, grinding mills, conveyors and also the chimney.

6.2.4. This building contains the rooms, storage, machinery and processes where the main manufacturing for the cement took place. The structure is comprised on building made of two distinct linear structures which run parallel to each other. The front of the building faces onto Steyning Road and has a monumental decorative front which holds a dominating presence from the roadside. From the front façade the buildings run eastwards.

6.2.5. Whilst the design of the rest of the plant is strictly utilitarianist, the front façade which faces onto Steyning Road has a monumental decorative front which has subtle elements from Modernism and Art Deco. The façade appears to be constructed from cement bricks and comprises of two sections int the same style, the northern one being seven storeys and six bays wide and the southern six storeys and six bays wide. The bays are divided by minimalist engaged columns and each roof is surmounted by a parapet with central pediment with decorative vertical slits cut out.

6.2.6. The building housed several different departments, machines and buildings central to the works. These included:

- **Rotary kilns and coolers.** The main works building contains two rotary kilns used for the burning of the cement. These also include coolers.
- **Electrostatic precipitators.** Located at the eastern end of the rotary kilns, the precipitators collect and remove soot, ash and exhaust fumes from the air steam before it is expelled through the chimney.
- **Chimney.** The chimney is located at the eastern end of the main works building and would have expelled the cleaned fumes from the rotary kilns.
- **Coal, gypsum and clinker store.** Storage for raw materials.

- **Grinding mills.** For grinding the processed clinker from the rotary kilns.

6.2.7. The buildings were not inspected internally during this study, but it is understood that a large amount of the original machinery is still present inside. Of particular significance are the two rotary kilns and the grinding mills which were integral to the plant. The Main Works Building is the central and most important building on site where the main processing for the cement was undertaken. Its visual prominence makes it the defining building on the site, especially with its impressive monumental frontage onto Steyning Road.

Workshop and Stores

6.2.8. The Workshop and Stores are located to the north of the Main Works Building. This area would have acted as primarily a main engineer's workshop for maintaining the running of the plant. The building is comprised of a long linear building with an additional block on its western end likely used for administration and welfare for the engineers on site.

Silos

6.2.9. The Silos are located to the south of the Main Works Building. These twelve silos were used for storing finished cement before they were transported to the packing plant for final preparation and distribution. They had a combined total capacity of 15,000 tons.

Packing Plant

6.2.10. The Packing Plant is located on the western side of Steyning Road. This area was originally connected to the main plant by a conveyor which travelled over Steyning Road and would have been used for packaging the cement into bags ready for distribution. Some cement would have likely been loaded directly into tankers for bulk supply to construction sites. The newly bagged cement would have been transported from site directly by rail or lorry. It is unknown whether any of the original machinery inside the packing plant survives.

Offices

6.2.11. The Offices were located on the western side of Steyning Road and comprised the main office block for the site for management and administration staff. The building was three storeys high and was constructed in an interesting shape which represents an 'r' from above. One linear block was aligned north to south with a shorter curved block attached to the northern end. The main entrance was located on the southern side of the curved block and comprised a floating concrete staircase up to the second floor.

Chalk Crushing House

6.2.12. The Chalk Crushing House (and ancillary structures) are located on the northern edge of the chalk quarry and comprises of two structures steel framed and corrugated iron buildings with a small section of the conveyor surviving. This area was used for crushing newly quarried chalk which was transported down to the main plant via the conveyor and was the first step in the process of cement production on site.

6.3 Assessment of significance

6.3.1. Shoreham Cement Works is a site of **medium significance**, derived from its historic and aesthetic values. The significance of the site has been analysed against the key principles of industrial sites according to Historic England's *Industrial Buildings: Listing Selection Guide* (2017).

6.3.2. Shoreham Cement Works is a large cement processing plant constructed in the late 1940s replacing an earlier plant on the site from the late-19th century. The site ceased production in 1991 and since then the structures and buildings on site have been abandoned and have deteriorated. The majority of the structures on site remain despite their poor condition, however the demolition of some ancillary structures has taken place. The key buildings on site which comprised the production core of the works have been preserved. This is a key aspect of the works significance as an integrated site, with many of the buildings, machinery and processes still intact, the works can be understood fully for how it used to function.

6.3.3. Shoreham Cement Works was the first cement works to be modernised and reconstructed after the end of the Second World War and was completed by 1950. Using a state-of-the-art design, innovative machinery, new processes and an efficient layout it became an exemplar site and produced cement which was transported over the south-east of England. Its connection to Oscar Faber, a leader in the concrete construction industry, is also an important historic value and adds weight to Shoreham's status. As the first of the new 'modern' cement works Shoreham has historical significance and its early date and influence across the region meant it played a pivotal role in post-war rebuilding and redevelopment. Its status as a model cement works is reflected in its influence overseas where it was used as an example for replication in the industry. Shoreham is the oldest post-war site of its kind still preserved, especially with the increasing demolition of similar sites such as Blue Circle's largest site in Northfleet, Kent.

6.3.4. The design and aesthetic qualities of the works also contribute to its significance. Most of the plant has been designed following the principles of utilitarianism, meaning the design is purely based on the purpose it serves, in this case to produce cement. The architecture and engineering of the plant itself was state-of-the-art, using design to improve efficiency, production output and employee wellbeing. However, there are noticeable elements of the works where care has been taken in their design, these are mostly the public facing areas such as the facades onto Steyning Road and the main office building. Care was taken in the design so it would have less of an impact on the natural landscape, and also likely from the main designer Oscar Faber who was an advocate for engineering and architecture to work together. This is also reflected in the landscaping design of the plant which was noticeably well-kept and presentable during its operational period.

Contribution of setting

6.3.5. *As there was no access inside the site during this study an assessment of setting from inside the site was not taken into account and has been omitted.*

6.3.6. Shoreham sits in the centre of the South Downs National Park, an area characterised by rolling chalk downland with a mixture of agriculturally managed fields and dry valleys designated for its unique natural, biological and historic significance. Although the appearance of the South Downs has been shaped by millennia of human intervention, it still largely retains is natural qualities and appearance. A heavy industrial site, Shoreham Cement Works sits in its large quarry on the banks of the River Adur at a great contrast to the surrounding landscape.

6.3.7. The site is most predominately experienced along Steyning Road which runs through the middle of the eastern and western parts of the site. Looking east on the road, the site is visually dominating, rising high above the road with a commanding presence and sitting within the vast chalk quarry **(Plate 6-2)**. The packing plant and offices on the western side of the road are less visually dominant and site at a lower ground level.

6.3.8. Despite the size and scale of Shoreham cement works, in the wider landscape views of the site vary due to its low position in the chalk quarry and the surrounding topography of the area which is characterised by rolling hills. For the study, several local publicly accessible key views were visited to assess the visual presence of the cement works on the landscape, those where the cement works can be seen are detailed below.

Plate 6-2 – Views of Shoreham cement works from Steyning Road (WSP, 2021)

Mill Hill

6.3.9. Located along a ridge to the east of the site Mill Hill is a long byway running north to south past the site and is also home to Mill Hill Nature Reserve, an area of preserved chalk grassland and diverse habitat.

6.3.10. As Mill Hill sits above the cement works which itself sits within a quarry, the only part of the site visible from the areas along Mill Hill is the chimney and some views of the quarries. From the northern edges of Mill Hill Nature Reserve, the chimney can be seen standing prominently above a rising area of land **(Plate 6-3)**. The chimney can similarly be seen from

the main byway of Mill Hill and the public footpath which leads off of Mill Hill towards Old Erringham Farm **(Plate 6-4)**.

6.3.11. The topography of the landscape and situation of the site within the quarry means that despite the proximity to the site, the cement works has very little impact on the views from the east of the site. The chimney, although visible, has very little impact on the preservation of the natural views across the downs, and stands as a testimony of the then modern cement works. The presence of the chimney is considered an iconic part of the landscape it towers over, with glimpses of it visible from a long way off, thus forming an important local distinctive feature of the area.

Plate 6-3 - View of the Shoreham chimney from Mill Hill Nature Reserve, looking north-west (WSP, 2021)

Plate 6-4 - View of the Shoreham chimney from Mill Hill public footpath, looking west (WSP, 2021)

South Downs Way

6.3.12. The South Downs Way is a National Trail following the old routes and driveways along the chalk hills of the South Downs. The route travels east to west around 500m to the north of Shoreham Cement Works before travelling over the River Adur.

6.3.13. Along the section of the route which travels along the north of the site only the chimney of the cement works is visible. This is due to the higher land and situation of the works within the quarry. Here the chimney has little impact on the vast views across the rolling hills of the North Downs and towards the coastline of Shoreham-by-Sea to the south (Plate 6-5).

6.3.14. As the South Downs Way travels down the hill and reaches the footbridge over the River Adur, the cement works becomes more visible the landscape opens up around the river and the quarry falls away. The chimney is still the most prominent feature, but more structures are now visible as well, although these still manage to nestle into the landscape and surrounding vegetation despite being prominent on the landscape **(Plate 6-6)**.

Plate 6-5 - View of Shoreham Chimney from the South Downs Way, looking south-west (WSP, 2021)

Plate 6-6 - View of Shoreham Cement Works from the South Downs Way River Adur footbridge, looking south (WSP, 2021)

Coombes Road

6.3.15. Coombes Road runs north to south along the western side of the River Adur, from Shoreham Bypass in the south to the hamlet of Botolph's. The cement works is visible from two locations along the road, a public footpath leading to the River Adur **(Plate 6-7)** and further north up the road **(Plate 6-8)**.

6.3.16. As can be seen from the two photos, the cement works is much more visible from the west. The flat open landscape along the River Adur allows for a full view of the cement works, its position in the large quarry and its surrounding context with the wider landscape. From these views the scale of the site, its impact on the landscape and contrast with the natural surroundings is apparent.

Plate 6-7 – View of Shoreham from Coombes Road/River Adur footpath, looking east (WSP, 2021)

Plate 6-8 – View of Shoreham Cement Works from Coombes Road, looking east (WSP, 2021)

7 Conclusion

7.1.1. This Industrial Archaeology Study of the former Shoreham Cement Works in Upper Beeding in West Sussex has been produced for the South Downs National Park Authority to inform the preparation of an Area Action Plan for the site.

7.1.2. This study has provided a detailed historic background of the site, from its early development, through the establishment of the plant, its reconstruction following the Second World War and eventual decline and decommission. This information was used to inform an assessment of the sites significance and undertake an analysis of the remaining buildings on the site. This assessment also considered the contribution of the assets setting and especially its context within the South Downs National Park. This report has concluded that Shoreham Cement Works is of **medium significance**, derived from its historic and aesthetic values, as guided by *Industrial Buildings: Listing Selection Guide* (2017).

7.2 Recommendations

7.2.1. The information and conclusions gathered in this report have been compiled to put forward several recommendations and suggestions for further work and why these would be beneficial. These have been outlined below.

Building Recording

7.2.2. A full historic building recording of the site is recommended before any intrusive works takes place. This will ensure that an accurate record is made of the site, its structures and its history to preserve it for future research and appreciation.

7.2.3. Additionally, it is recommended that a site inventory takes place. This would record all ‘loose’ items on site which may be of historic interest to determine whether anything needs to be preserved either off or on site in the future.

Social and oral history

7.2.4. Shoreham Cement Works was a large, dominating and influential site in both the local area and further afield. As well as its industrial history, the social history of the plant is also of interest and should be considered an important element of the national Parks cultural heritage. Although not explored in depth in this report, this is certainly something that should be explored in a future study. It is understood that many people who used to work at the plant are still interested in sharing their stories and experiences and this could be supported by local perspectives on the site as well. A social history study supported by an oral history project would be encouraged for future data collection, this could also eventually feed into community engagement, archived histories and future placemaking.

Appendix A

Historic Environment gazetteer

The table below represents a gazetteer of known historic environment sites and finds within the study area. Each entry has an assessment (A) reference number. The gazetteer should be read in conjunction with the historic environment features map.

Abbreviations:

HER - Historic Environment Record

NHLE - National Heritage List

NRHE - National Record for the Historic Environment

Table A-1 - Gazetteer of known historic environment assets

Assess. (A) ref.	Description	Period	HER ref / NHLE ref. / site code
1a	**Shoreham Cement Works, Upper Beeding** *Remains of Shoreham Cement Works. The existing works were built between 1946 and 1952, and it was finally closed in 1991.*	Post-medieval	MWS12077
1b	**Limekilns – Dacre Gardens, Upper Beeding** *Limekilns are shown South of Dacre Gardens, Upper Beeding by the OS in 1873-5.*	Post-medieval	MWS292
1c	**Human and animal bones – Anchor Bottom** *A collection of human and animal bones were found by the Portland Cement Company at their works at Upper Beeding on the 15th September 1976.* *The human bones, probably but not certainly of one skeleton, comprised one complete left tibia 37.5cm long, and fragments of a right tibia, right femur, humerus and two radii. Bones suggest those of a male around 1.73m in height. The animal bones included part of a pelvis and long bones and appear to be of a sheep.*	Unknown	MWS534
1d	**Site of a possible Iron Age Cross Dyke on Anchor Bottom, Upper Beeding**	Iron Age	MWS11610

Assess. (A) ref.	Description	Period	HER ref / NHLE ref. / site code
	A possible Iron Age cross-dyke visible as a cropmark and mapped from historical aerial photographs. Destroyed by quarrying in 1965.		
1e	**Cross Dyke on Beeding Hill, Upper Beeding** *This Scheduled Monument includes part of a roughly north west-south east aligned cross dyke constructed across a chalk spur which projects to the west from Beeding Hill, part of the Sussex Downs. Survives as bank with ditch, excavated by Sussex Archaeological Field Unit in 1976.*	Iron Age	MWS533 1018567
1f	**Two possible ditches or geological marks to the south of Anchor Bottom, Upper Beeding** *Two possible ditches or geological marks visible as cropmarks and mapped from historical aerial photographs. Two parallel linear features which appear as ragged ditches but are most likely to be natural features. Mostly destroyed by large chalk quarry established in the 1960's.*	Unknown	MWS11612
2	**Cross Dyke on Beeding Hill, 1100m North West of New Erringham Farm Cottages** *Scheduled Monument. The monument includes part of a roughly north west-south east aligned cross dyke constructed across a chalk spur which projects to the west from Beeding Hill, part of the Sussex Downs.* *The 76m long earthwork originally extended further 150m to the south, but this section has been destroyed by 20th century chalk quarrying. Investigations in 1976, in advance of quarrying, revealed that the earthwork has a ditch up to 4.5m wide, which survives up to a depth of 1.4m below ground. The ditch is flanked to the west by a bank up to about 7m wide and 0.4m high. Finds recovered during the excavations included fragments of Early Iron Age pottery. To the north, the earthworks gradually fade out as the ground falls away.*	Iron Age	DSW280 1018567

Assess. (A) ref.	Description	Period	HER ref / NHLE ref. / site code
3	**Cropmark remains of possible trackway of uncertain date on Anchor Bottom, Upper Beeding** *A ditch, possibly a trackway of uncertain date visible as a cropmark and mapped from historical aerial photographs. The whole feature can be traced for c.325m, but it cut off at its southern end by a large quarry.*	Unknown	MWS11609
4	**Group of possible ditches or geological features to the South of Anchor Bottom, Upper Beeding** *Four parallel linear features which appear as ragged ditches but are most likely to be natural features which follow the line of the contours of the western edge of the chalk escarpment. Amongst these linear features, the cropmark traces of two plough-levelled mounds, possibly Bronze Age round barrows are also recorded.*	Unknown	MWS11613
5	**Cropmark remains of a trackway of uncertain date on Anchor Bottom, Upper Beeding** *Cropmark remains of a possible trackway of uncertain date, was visible as a broken broad ditch. This feature can be trace for c.265m, cutting up the slope out of the coomb of Anchor Bottom.*	Unknown	MWS11608
6	**Earthwork remains of two lynchets of prehistoric or medieval date on Anchor Bottom, Upper Beeding** *Earthwork remains of two parallel lynchet banks of uncertain date were seen contouring for c.115m around the northern side of Anchor Bottom coombe. A shorter section of probable lynchet was also recorded to the west. A single ditch was recorded extending north from the NE extent of the lynchets which would be a trackway.*	Lower Palaeolithic to medieval	MWS11607

Assess. (A) ref.	Description	Period	HER ref / NHLE ref. / site code
7	**Earthworks remains of a prehistoric or medieval enclosure bank on Anchor Bottom, Upper Beeding** *The earthwork remains of a broad curving bank were seen on historical aerial photographs curving around the slope to the north of Anchor Bottom. This was a substantial bank which could be the remains of an enclosure of uncertain date or perhaps a medieval lynchet or boundary.*	Unknown	MWS11605
8	**Cropmark of a ditch or trackway of uncertain date on Anchor Bottom, Upper Beeding** *A probable ditch or trackway of uncertain date leading down into Anchor Bottom on a south facing slope. This feature can be traced for c.165m, mapped from aerial photographs.*	Unknown	MWS11606
9	**Shoreham-Horsham (Christ's Hospital) Railway** *Route of disused railway line from Christ's Hospital Station to Shoreham. Opened in 1861 and closed in 1965. This railway line was vital to Southwater Brickworks industry and for people to travel to London and the coast. The railway line is now a footpath.*	Post-medieval	MWS5508
10	**Site of former Beeding Railway Bridge, Shoreham by Sea and Coombes** *Site of former Beeding railway bridge. The bridge opened in 1861 with the opening of the Shoreham-Christ Hospital Branch Line and closed in 1964. The Bridge crossed the River Adur to the west of the Beeding Cement Works.*	Post-medieval	MWS11489
11	**Rampion Offshore Wind Farm – Archaeological Investigations** *Geophysical survey and archaeological investigations undertaken along the proposed onshore cable route for the proposed Offshore Rampion Wind Farm development.*	Prehistoric to modern	EWS1639

Assess. (A) ref.	Description	Period	HER ref / NHLE ref. / site code
	Despite the fairly rich archaeological landscape the evaluation revealed a low to moderate potential for remains, with only 21 of the trenches containing archaeological features. *Neolithic-Bronze Age: five sherds of Bronze Age pottery were found, as well as a prehistoric feature.* *Later prehistoric to Romano-British: possible features from this period were identified and thought to be gullies running parallel/perpendicular to each other forming small square enclosures.* *Medieval: the majority of the dated features were encountered north of the Downs and are evidence for landscape divisions, comprising hedgerows and associated drainage ditches.* *Post-medieval: Post-med and undated ditches, many of which are likely to be maintained boundaries from earlier landscape division.*		
12	**Possible prehistoric field system to the north of Old Erringham Farm, Shoreham-by-Sea and Southwick** *Possible remains of a fragmented group of linear banks, ditches and a rectilinear enclosure thought to be the remains of a field system of uncertain date on the eastern bank of the River Adur.*	Lower Palaeolithic to Roman	MWS11634
13	**Medieval cultivation terraces on Beeding Hill, Upper Beeding** *A series of four medieval cultivation terraces surviving as earthworks on a steep, north-facing slope which have been mapped from historical aerial photographs.*	Medieval	MWS1345
14	**Barrow and Anglo-Saxon burial on Beeding Hill** *Tumulus shown on Beeding Hill by the OS map in 1873-75.*	Early Middle Ages	MWS99 EWS82

Assess. (A) ref.	Description	Period	HER ref / NHLE ref. / site code
	In 1874 the barrow was excavated with the remains of an adult male skeleton found with a knife, the remains are now in the Natural History Museum.		
15	**Saxo-Norman Pit on Beeding Hill, Upper Beeding** *A single pit, G61, was identified on Beeding Hill during the Rampion Offshore Windfarm Onshore Cable Route. Contained three sherds of a single shell-tempered vessel of Saxo-Norman date.*	Anglo-Saxon to Norman	MWS1526
16	**Possible Iron Age/Romano-British Enclosure Beeding Hill, Upper Beeding** *Soil marks shown on aerial photographs of Beeding Hill suggesting rectangular enclosures and a possible track with ditches. Site visit in 1972 noted nothing of archaeological interest.*	Early Iron Age to Roman	MWS3339
17	**Possible barrows on Beeding Hill** *Group of three possible barrows on Beeding Hill appearing on aerial photographs, no evidence found on ground.*	Bronze Age	MWS6674 MWS3407 MWS3406
18	**Site of Erringham Valley Historic Outfarm, Upper Beeding** *Site of Historic Outfarm identified through the 'Historic Farmsteads and Landscape Character in West Sussex' Project. Erringham Valley was a 19th century regular courtyard outfarm or field barn. Now demolished.*	Post-medieval	MWS10189
19	**Erringham Valley Fabricator** *Find spot. Composition and distribution of Neolithic flint assemblages.*	Prehistoric	MWS5299
20	**New Erringham Farm** *Find spot. Chance find of a polished axe and a rechipped polished axe.*	Prehistoric	MWS5301

Assess. (A) ref.	Description	Period	HER ref / NHLE ref. / site code
21	**Site of New Erringham Farm Historic Farmsted, Shoreham-by-Sea, Southwick** *Site of New Erringham Farm identified through the 'Historic Farmsteads and Landscape Character in West Sussex' Project. New Erringham Farm was a 19th century regular courtyard farmstead with additional detached elements to the main plan. Now demolished.*	Post-medieval	MWS12570
22	**Neolithic Axe – Old Erringham Valley** *Neolithic chipped flint axe, found on the Old Erringham Valley Golf Links, on display in Marlipins Museum.*	Neolithic	MWS530
23	**Shrunken Medieval Settlement of Old Erringham** *Scheduled Monument. Shrunken medieval settlement including a ringwork, manorial settlement, chapel-of-ease and earthworks representing the tofts and crofts of homesteads.*	Medieval	1015126 DWS210 MWS5302 EWS363 EWS364 EWS365
24	**Church Farmhouse** *17th century (or earlier) timber-framed building with plaster infill and curved braces, enlarged in 19th century.*	Post-medieval	1027887
25	**Barn 40yds South of Old Erringham Hall** *Former church chancel, now barn. Probably r 12th century. Flint with stone dressings and steep corrugated concrete roof.*	Medieval	1366107 MWS5304
26	**Old Erringham Geophysical and Contour Survey** *A resistivity, magnetometry and contour survey were carried out on the outlying earthworks at Old Erringham Farm. A number of earthworks and anomalies were identified including linear features, lynchets, pits, post holes, structures and trackways.*	Multi	EWS1998 MWS15044

Assess. (A) ref.	Description	Period	HER ref / NHLE ref. / site code
27	**Old Erringham Farm Historic Farmsted, Shoreham-on-Sea and Southwick** *Old Erringham Farm was identified through the 'Historic Farmsteads and Landscape Character in West Sussex' Project. It is a medieval U-plan regular courtyard farmstead with a detached farmhouse set away from the yard.*	Medieval	MWS12695
28	**Old Erringham Hall** *Grade II listed former hall house, now farmhouse. Probably 16th century, flint with some stone and red brick dressings.* *Archaeological watching brief carried out during the construction of a new garage. No archaeological features were encountered. A small amount of 20th century glassware was recovered from the soil.*	Post-medieval	EWS1654 MWS12997
29	**Medieval Limekiln – Old Erringham** *Medieval limekiln found about 200yds N of the Saxon weaving hut site at Old Erringham. 4ft in diameter and originally 6-7ft high. Dated by Holden to between 1250 and 1450.*	Medieval	MWS527
30	**Medieval Ringwork and Saxon Pennies at Old Erringham** *Medieval ringwork around Old Erringham, constructed during the 11th century. Artificially raised platform defined by a low, curving edge which survives for a length of c.20m.* *Two pennies of Aethelred II, minted 992-8. Found sealed beneath the bank of the medieval ringwork at Old Erringham.*	Medieval	MWS5305 MWS5305
31	**Roman coin – Old Erringham Farm, Shoreham-by-Sea and Southwick** *Find spot. 3rd century Roman coin found at Old Erringham Farm in 1956.*	Roman	MWS858
32	**Erringham Tranchet**	Prehistoric	MWS5300

Assess. (A) ref.	Description	Period	HER ref / NHLE ref. / site code
	Find spot. A chance find of a prehistoric tranchet.		
33	**Medieval salt working site – Old Erringham** *Medieval salt working site comprising at least one mound.*	Medieval	MWS5547
34	**Milestone – Erringham** *Site of milestone removed to the Weald and Downland Museum.*	Post-medieval	MWS8539
35	**Anglo-Saxon Weaving Hut, Old Erringham** *Traces of weaving hut dating to between 750-950 AD, found 180m SW of the later ringwork. Excavated in 1960s, mostly destroyed during improvements to A283 road. Finds included loom weights, pottery, and a bronze Dutch type brooch.*	Anglo-Saxon	MWS8506 EWS119
36	**Auxiliary unit operational base – Small Dole Patrol** *Base and membership location of auxiliary unit during WWII.*	Post-medieval	MWS8189
37	**Medieval Saltern Mounds to the East of Applesham Farm, Coombes** *Medieval salt mounds located on the west side of the River Adur to the east of Applesham Farm. Visible as cropmarks and mapped from aerial photographs. Comprising ten mounds.*	Medieval	MWS3752
38	**Medieval Salt Working Site to the East of Coombes Farm, Coombes** *Two groups of medieval salt mounds, visible as cropmarks and mapped from aerial photographs. First group includes 19 with the second of around 10.*	Medieval	MWS4292
39	**The Parish Church**	Norman	1353728 MWS1078

Assess. (A) ref.	Description	Period	HER ref / NHLE ref. / site code
	Grade I listed. Norman with later extensions and adaptations, 12th century wall paintings, unknown dedication. Flint and slate.		
40	**The Old Rectory** *Grade II listed. Pre-reformation clergy-house, 15th century timber-framed and closed studded building with some plaster infilling.*	Post-medieval	1027888 MWS289
41	**Church Farmhouse** *Grade II listed. 17th century or earlier, enlarged in mid-19th century. Timber-framed with plaster infill.*	Post-medieval	1027887
42	**Ox Brook Cottage** *Grade II listed, 18th century or earlier cottage. Flint and red brick and slate roof.*	Post-medieval	1353729
43	**K6 Telephone Kiosk** *Grade II listed, K6 telephone box. Designed 1935 by Sir Giles Gilbert Scott.*	Post-medieval	1353784
44	**Coombes Historic Farmstead, Coombes** *Coombes was identified through the 'Historic Farmsteads and Landscape Character in West Sussex' Project. It is a medieval U-plan regular courtyard farmstead with the presence of a second yard with one main yard evident. More than 50% lost with large modern sheds on the site of the historic farm.*	Medieval	MWS9903
45	**Coombes Deserted Medieval Village** *Deserted medieval village, period of desertion not known.*	Medieval	MWS1079
46	**Coombe Gun Placement** *Site of WWII gun placement facing south-east to cover the railway crossing over the River Arun.*	Post-medieval	MWS5278
47	**Steyning to Beeding New EDF Cable Route: Archaeological Watching Brief**	Multi	MWS12094

Assess. (A) ref.	Description	Period	HER ref / NHLE ref. / site code
	Archaeological watching brief undertaken ahead of the laying of a new electric cable between Steyning and Beeding. Number of archaeological features were identified however no firm dating evidence was recovered from any of these. Many of the features were associated to the former railway which ran from Shoreham-Christ's Hospital via Steyning.		
48	**Medieval Hearths, Steyning – Upper Beeding Cable Link** *Three medieval hearths identified during archaeological watching brief along the line of the Beeding-Steyning transmission link. Recorded close to medieval salt-workings and likely associated.*	Medieval	MWS4451 EWS180
49	**Medieval Salt Working Site at Botolphs on the River Adur at Upper Beeding** *found near Lock Barn and Dacre Gardens, now destroyed. Visible as earthworks and mapped from historic aerial photographs.*	Medieval	MWS3930 MWS1286
50	**Site of Lock Barn Historic Outfarm, Upper Beeding** *Site of Lock Barn Historic Outfarm, was identified through the 'Historic Farmsteads and Landscape Character in West Sussex' Project. 19th century 3-sided L-Plan loose courtyard outfarm or field barn. Now demolished.*	Post-medieval	MWS12152
51	**St Botolph's** *Grade II listed. Originally four cottages, now two. 17th century or earlier timber-framed building refaced in the 18th with flints and red brick dressings.*	Post-medieval	1191899
52	**Historic Outfarm North East of Old Barn Cottage, Bramber** *Historic Outfarm, identified through the 'Historic Farmsteads and Landscape Character in West Sussex' Project. 19th century L-plan regular*	Post-medieval	MWS13023

Assess. (A) ref.	Description	Period	HER ref / NHLE ref. / site code
	courtyard outfarm or field barn with additional detached elements to the main plan. More than 50% loss of original farm.		
53	**Historic Outfarm North West of Old Barn Cottage, Bramber** *Historic Outfarm, identified through the 'Historic Farmsteads and Landscape Character in West Sussex' Project. 19th century double sided loose courtyard outfarm or field barn. Demolished*	Post-medieval	MWS13207
54	**Saxon Settlement site at St Botolph's, Bramber** *Trial excavation carried out in field to the south of St Botolph's Church, prior to its use as a graveyard. Two Anglo-Saxon sunken featured buildings were found and excavated. These contained large quantities of animal bone and decorated pottery. Likely abandoned in late-5th or early-6th century.*	Anglo-Saxon	MWS6387 EWS339
55	**Vicarage Cottage** *Grade II listed. L-shaped timber-framed cottage, said to be 14th century and probably pre-reformation clergy-house.*	Post-medieval	1027460
56	**Possible site of Botolph's Deserted Medieval Village, Bramber** *Possible site of Botolph's Deserted Medieval Village, Bramber. Resettled c.1800-1918. No evidence of settlement on ground.*	Medieval	MWS1065
57	**Church of St Botolph's** *Grade I listed. Saxon church of flint and rubble with 19th century porch.*	Anglo-Saxon	1191927 MWS1083
58	**Pottery – Botolph's (Ladsandi)** *Find spot. Pottery found during renovation of house in 1993. Included pottery from 950-1100 AD, a male jawbone and two pieces of west country slate.*	Middle Ages	MWS3931

Assess. (A) ref.	Description	Period	HER ref / NHLE ref. / site code
59	**Greek Coin – Botolph's, Bramber** *Find spot. Greek coin of Alexander found in stream in 1956.*	Iron Age	MWS273
60	**Medieval Salt Mounds with later Medieval Ridge and Furrow on the west side of the River Adur, Botolph's, Bramber** *25 low salt mounds common to the area. Some were demolished in the 1960s which contained fragments of pottery, flints and a whetstone. The earthwork traces or later Medieval ridge and furrow are noted over the top of some of the salterns.*	Medieval	MWS1066
61	**Medieval pottery, Upper Beeding** *Find spot. Scatter of medieval pottery presumed to be from old village of Botolph.*	Medieval	MWS290
62	**Annington Farm Historic Farmstead** *Annington Farm, identified through the 'Historic Farmsteads and Landscape Character in West Sussex' Project. 17th century dispersed multi-yard farmstead. Partial loss.*	Post-medieval.	MWS9288
ANA1	**Earthwork and cropmark remains at Anchor Bottom, Upper Beeding** *Earthwork remains of a prehistoric cross-dyke at Old Erringham Farm, partially destroyed by chalk quarrying, broad curving banks, lynchets, ditches and a fragmented group of linear banks, ditches and a rectilinear enclosure though to be the remains of a field system of uncertain date have been identified at Anchor Bottom. The cross-dyke ditch was excavated and found to be 4.5m wide and 1.4m deep with a bank of 7m wide and 0.4m high. Finds recovered included a small collection of Iron Age potsherds. The surviving part is scheduled (SM 1018567).*	Prehistoric	DWS8703
ANA2	**Neolithic Flint Working, Bronze Age Barrow Cemetery and Iron Age and Romano-British**	Prehistoric	DWS8195

Assess. (A) ref.	Description	Period	HER ref / NHLE ref. / site code
	Settlement Site, Beeding Hill and Truleigh Hill, Upper Beeding *The area includes a Neolithic flint working site, A Bronze Age Barrow Cemetery, and Iron Age - Romano-British Occupation and enclosure. There are also possible Roman burials and an Early Medieval burial within a Bronze Age barrow and Truleigh Hill Radar Station.*		
ANA3	**Medieval Features and Old Erringham Shrunken Medieval Settlement, Shoreham and Southwick** *Medieval features including a salt working site, a lime kiln, the site of a weaving hut, a Medieval ringwork at Old Erringham and the shrunken medieval village of Old Erringham (Scheduled Monument 1015126). At the centre of the area is a rectangular building interpreted as the chancel of a now disused chapel-of-ease at Old Erringham, the Chancel remains within the ringwork and the churchyard surrounds the site. There is also an Auxiliary Unit Operational Base dating to the Second World War.*	Medieval	DWS8177
ANA4	**Multi-period features on Slonk Hill, Shoreham-by-Sea and Southwick** *Multi-period site consisting of a possible Mesolithic to Bronze Age flint working site, Neolithic flint mine and occupation site including a Neolithic to Bronze Age midden or rubbish pit, Bronze Age Beaker burials, Bronze Age Barrows, Iron Age occupation with a possible associated burial, Roman settlements, Roman copper coin hoard, and a ritual site, an Early Medieval cemetery and World War One and Two army activity including a Camp and training trenches and a signal station.*	Prehistoric-modern	DSW8178
ANA5	**Early Medieval Settlement and Medieval Saltworking, Deserted Medieval Village and St Botolph's Church, Bramber**	Medieval	DWS8196

Assess. (A) ref.	Description	Period	HER ref / NHLE ref. / site code
	Site contains early Medieval settlement site with associated pottery, medieval salt manufacturing features including hearths, the site of the Deserted Medieval Village of Bramber and the Church of St Botolph, probably pre-conquest in origin. There are also two historic farmsteads, one dating to the 17th century and the other to the 18th century.		
ANA6	**Multi-period features in the Parish of Coombes and on Annington Hill, Bramber and Coombes** *Multi-period features consist of a Bronze Age Barrow, two Iron Age - Romano-British field systems, Spearheads and a knife dating to the Saxon period, medieval salters and mounds associated with salt manufacturing, the Parish Church of Coombes with a possibly associated deserted medieval village and Rectory Cottage, dating to the 13th century. Applesham Farm historic farmstead is dated to the 18th century.*	Prehistoric-post-medieval	DWS8176

Appendix B

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CARTOGRAPHIC SOURCES

Yeakel and Gardner map of 1780

Ordnance Survey mapping from the 1st edition to the present day.

Appendix C

Figures

Date Modified:

Drawn By:

File:

A2037

Castle Town

A2037

Henfield R

Annington Road

Botolphs

Tinpots Cottage

South Lockbarn Cottage

Anchor Bottom

The Warren

168 Beeding Hill

Winding Bottom

Cliff House

Steyning Road

Coombes Road

Coombes

Steyning Road

Mill Hill

6 Erringham Farm

Mossy Both

The Den

Little Den

Old Erringham Farm

Valley Barn

0 0.125 0.25 0.5 0.75 1 Kilometres

wsp

TITLE:

Shoreham Cement Works Industrial Archaeology Study: Location Plan

FIGURE No:

FIGURE 1

Date modified: 02/03/2022

Drawn by: Alice Agarwal

Document Path: \\uk.wspgroup.com\UKcentral\Environmental\ARCHAEOLOGY\WSUS\Shoreham Cement Works 70087636\C GIS\shoreham.mxd

A2037

Castle Town

Henfield

Annington Road

Botolphs

Tinpots Cottage

South Lockham Cottage

Anchor Bottom

Beeding Hill

The Warren

Winding Bottom

Cliff House

Coombes Road

Coombes

The Den

Little Den

Erringham Farm

Valley Barn

ANA1

ANA2

ANA3

ANA5

ANA6

61 60 60 59 58 57 56 55 53 52 51 48 50 47 46 1e 1 10 1 14 17 16 15 19 18 20 21 22 36 31 30 28 35 32 33 34 23 29 27 63 25 43 42 44 45 41 39 40

Key

- Scheduled monuments
- Listed buildings
- Archaeological Notification Areas (ANAs)
- Archaeological features/findspot (point)
- Archaeological features/findspot (area)
- Site
- 1km buffer

NOTE: CA and APA not shown

0 0.125 0.25 0.5 0.75 1 Kilometres

wsp

TITLE:

Shoreham Cement Works
Historic environment features map

FIGURE No:

FIGURE 2

4th Floor
6 Devonshire Square
London
EC2M 4YE

wsp.com