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Clowes Developments (UK) Ltd
Brockhampton West Landfill Site
North Of Harts Farm Way
Havant
PO9 1HS
Summary Asbestos Monitoring Plan

Contract Number	86791	Job Number	542768
Compiled by	Adam Bailey BSc (Hons) P402, P403, P404	Version	V1: Amendments to section 1.2 include the volume of soil and the expected duration of the remediation project.
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1. Introduction & Background

1.1 Instruction & Site Description

On the 11th October 2022, Lucion was instructed by Delta Simons on behalf of Clowes Developments (UK) Ltd to develop an Asbestos Monitoring Plan in relation to the upcoming remedial earthworks at the former Brockhampton West Landfill site. This report reviews the pertinent asbestos information provided by the Client and summarises the known asbestos findings, recommended control and protection measures likely needed for the future earthworks, and specifically focuses on the air monitoring procedures that would typically be expected to be carried out in line with the proposed works.

The site is located to the South of Havant Bypass and North of Harts Farm Way and Broadmarsh Coastal Park with the national grid reference 470150, 105700. To the East of the site is a river with commercial properties beyond. The site is currently an area of grassland with a limited amount of hardstanding in the centre which is used as a vehicle turning circle. Historically the site was once part of a wider landfill site, which ceased its operation circa 1987. Shrubbery and trees line the perimeter of the site and access can be gained via a small road off Harts Farm Way.

See Appendix 1 for a site location plan taken from Delta-Simons, Remediation Options Appraisal and Verification Strategy, November 2021.

1.2 Proposed Future Earthworks

Lucion understands that the proposed future development on site will consist of two new units of up to 29,000 sqm which will be used for light industrial use and offices. The proposed remediation works will consist of the removal of redundant land drainage and a large-scale 'cut and fill' exercise, which is likely to last approximately three months (12 weeks) due to the estimated 12,100m³ of material to be excavated and taken off site. As part of the 'cut and fill' exercise, materials that are intended for reuse will be segregated, tested and stored in accordance with an approved materials management plan. In addition, Delta-Simons proposes within their remediation strategy that a watching brief should be carried out to monitor and record any unexpected gross contamination within the cut material.

1.3 Report Limitations

This report is based on third party data, reports and information only. Lucion has not undertaken a site visit. The previous reports and information provided by the client for review herein includes the following:

- Delta-Simons, Executive Summary, Word document, 2022
- Delta-Simons, Remediation Options Appraisal and Verification Strategy, November 2021
- WYG, Brockhampton West, Phase 2 Geo-Environmental Investigation Report, August 2017
- Construction Environmental Management Plan, October 2022
- Brockhampton Wet, Havant, Soil Sample Results (Delta-Simons data only), DS59329, 2021
- Relevant plans which include,
 - Delta-Simons, Borehole & Trial Pit Location Plan (Delta Simons & WYG), Figure 1, October 2022
 - Michael Sparks Associates, Indicative Site Layout Plan, drawing number 31383/PL/203 B, February 2021
 - Burrows Graham, Black Bags Removal, drawing number 21048-BGL-XX-XX-DR-C-00302, September 2022
 - Burrows Graham, Earthworks Plan, drawing number 21048-BGL-XX-XX-DR-C-00301, September 2022



- Burrows Graham, Scope of works and formation levels plan, drawing number 21048-BGL-XX-XX-DR-C-00300, September 2022
- Delta-Simons, Receptor plan.

Following a review of the provided soil sample certificates from both site investigations, Lucion notes that the asbestos screen laboratory certificates of the WYG soil samples shows asbestos content within the positive samples to be <0.1%. Lucion would typically expect to see (gravimetric) quantification results of asbestos positive soil samples to a LOD of 0.001%, as this data would further enable the asbestos risk assessment.

This report does not include Joint Industry Working Group (JWIG) work categories or receptor ranking assessments - it is understood these will be completed by third parties designing and carrying out the earthworks.

It is the responsibility of the contractor carrying out the earthworks to complete an asbestos assessment, which should be included within their plan of works, as well as implementing all the necessary control and protection measures. It is also the contractor's responsibility to assess the licensing status of the proposed works and submit any necessary (HSE) notifications..

This report specifically details the recommended air monitoring which Lucion would typically expect to be carried out during earthworks with known asbestos contamination, in accordance and reference to the control of asbestos regulations 2012 and the 'HSG 248 (second edition) Asbestos: The Analyst guide for sampling, analysis and clearance procedures'.

2. Summary Of Known Asbestos On Site

2.1 Pertinent Information Following Delta-Simons & WYG Ground Investigations

Lucion has been provided with a summary of the asbestos findings from Delta-Simons. The data has been collected from two site investigations previously carried out by Delta-Simons (June 2021) and WYG (August 2017). The known asbestos findings are summarised in Table 1 below.

It is understood, a total of 84No. soil samples were collected and analysed for the presence of asbestos over two site investigations carried out by Delta-Simons and WYG. Of the 84No. soil samples 16No. were determined positive for asbestos following testing at UKAS accredited laboratories. Predominantly the asbestos containing soil samples were located within the Landfill Waste strata, sampled between 2m and 9.5mbgl, however, two samples were identified within the re-engineered cover system at a depth between 0.4m and 0.5mbgl containing fibre bundles and insulating board.

Amosite and Chrysotile fibres have been identified by the laboratory in the form of fibre bundles and insulating board debris within the re-engineered cover system, as well as Amosite and Chrysotile fibres in the form of fibre bundles, insulation and cement debris within the Landfill Waste.

Due to the findings, Delta-Simons' states in their summary document (which was provided to Lucion for review) that it would be prudent to assume asbestos containing materials are present within both stratas across the whole of the site. Following a review of the supplied data, Lucion notes that there does not appear to have been a targeted asbestos survey previously carried out on site whereby a qualified P402 asbestos surveyor visually assess soil arisings for suspected visible ACMs.



Table 1 - Summary Of Known Asbestos Findings

Sample Location	Depth (mbgl)	Asbestos Type	Laboratory Description	Strata
WYG Investigation (August 2017)				
CP02A	4.5	Chrysotile and Amosite	Fibre bundles	Landfill Waste
	7.0	Chrysotile	Fibre bundles	Landfill Waste
CP04	0.5	Chrysotile	Fibre bundles	Re-Engineered Cover System
	4.5	Chrysotile	Fibre bundles	Landfill Waste
CP05	4.2	Chrysotile	Fibre bundles	Landfill Waste
	9.5	Chrysotile	Fibre bundles	Landfill Waste
CP06	2.5	Chrysotile	Asbestos cement debris	Landfill Waste
TP01	3.4	Chrysotile	Fibre bundles	Landfill Waste
TP03	0.4	Chrysotile and Amosite	Fibre bundles / insulating board debris	Re-Engineered Cover System
TP06	2.0	Chrysotile	Fibre bundles	Landfill Waste
	3.1	Chrysotile	Fibre bundles / Insulation debris	Landfill Waste
TP08	2.3	Chrysotile	Fibre bundles / Asbestos cement debris	Landfill Waste
	3.2	Chrysotile	Fibre bundles	Landfill Waste
TP10	3.3	Chrysotile	Fibre bundles	Landfill Waste
TP11	2.5	Chrysotile	Fibre bundles	Landfill Waste
Delta-Simons Investigation (June 2021)				
TP116	2.0 – 2.5	Amosite	Amosite loose fibres	Landfill Waste



*It is important to note that Lucion has not received any gravimetric quantification data for the positive asbestos soil samples, however it has been highlighted by the laboratory certification that within the asbestos screen of the WYG soil samples, the asbestos content within the positive samples were <0.1%.

2.2 Asbestos Risk Receptors

Due to the identification of asbestos containing materials within the soil on site, Delta-Simons highlights that there is a high risk that construction workers will be exposed to asbestos fibres during the redevelopment works. The main exposure pathways are likely to be direct contact and inhalation.

Delta-Simons have also identified that there is a low to moderate risk for neighbors of the site, due to the potential release and exposure of asbestos during the redevelopment works. Areas of risk identified are users of the local footpaths adjacent the site, users of the business park East of the site and residents to the North of the site. The main exposure pathway is likely to be inhalation.

See Appendix 2 for the supplied Delta-Simons receptor plan.

3 Working With Asbestos in Soils

3.1 Regulations, Guidance and Legislation

The future contractor must produce their own Plan of Work, method statement and asbestos risk assessment. The Plan of Work should also include a section on what to do if unforeseen/unexpected asbestos is discovered.

The Contractor shall carry out the works in accordance with the following regulations, guidance and legislation including, but not limited to:

- The Health and Safety at Work Act 1974.
- The Construction (Design and Management) Regulations 2015 including site specific pre-construction information (PCI).
- The Control of Asbestos Regulations 2012.
- The Control of Substances Hazardous to Health Regulations 2002.
- CAR-SOIL™, JIWG/CL:AIRE, Control of Asbestos Regulations, Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials, Industry Guidance, 2016.
- CIRIA, Asbestos in soil and made ground: a guide to understanding and managing risks (C733).
- CIRIA, Asbestos in soil and made ground good practice site guide (C765).

Future contractors and subcontractors must be informed of the presence of asbestos impacted soils prior to undertaking groundworks in order to take necessary health and safety precautions. It is recommended that this report and the associated laboratory results are provided to future ground workers.



4 Recommendations & Air Monitoring Plan

4.1 Control and Protection Measures

Lucion recommends that an Asbestos Management Plan is produced with reference to CAR 2012 and CAR-SOIL™ (2016) asbestos in soil industry guidance, which should include an asbestos risk assessment to determine the licensing status of future earthworks and to outline the necessary control and protection measures required to reduce potential exposure of asbestos fibres.

In addition, a suitably trained and competent future contractor is required to produce a Plan of Work, asbestos risk assessment, licensing status (i.e. NLW, NNLW or LW) and method statements, which should include the necessary control and protection measures to be implemented. Emergency procedures should also be outlined and implemented should any unforeseen or gross contamination be discovered.

The necessary control and protection measures should be appropriate to the asbestos assessment and work category licensing status. Generally when working with asbestos contaminated soils, the control and protection measures will typically include, but are not limited to, the following:

- Plan of Work / RAMS / SSOW
- Designated area(s)
- Asbestos training
- Record keeping
- Notifications (required for NNLW and LW)
- Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE)
- Dust suppression
- Decontamination facilities / equipment
- Cleaning of plant and equipment
- Management of asbestos waste
- Asbestos air monitoring. With regards to occupational health and safety, Phase Contrast Microscopy (PCM) air monitoring can be used for detection of $0.01\text{f}/\text{cm}^3$ to ensure the Control Limit of $0.1\text{f}/\text{cm}^3$ is not exceeded as specified within the Control of Asbestos Regulation 2012.

Section 4.2 provides further details regarding asbestos air monitoring.



4.2 Asbestos Air Monitoring Throughout The Project

Throughout the remediation project, where works involving asbestos contaminated soils are being carried out (understood to be approximately 12 weeks in duration), Lucion would typically expect the Principal Contractor to employ a UKAS accredited company to carry out regular air monitoring using Phase Contrast Microscopy (PCM).

PCM air monitoring is typically implemented during works to monitor and assess the suitability of the controls to ensure the contractor does not exceed the control Limit of $0.1\text{f}/\text{cm}^3$ and short term exposure limit of $0.6\text{f}/\text{cm}^3$ in the air measured over a ten-minute period. These control limits are set out within the Control Of Asbestos Regulations 2012 (CAR 2012). It is important to note that the control limit is not a safe level of exposure from work activities and it must be reduced as low as reasonably practicable (ALARP).

Lucion would typically expect the frequency of PCM air monitoring to be carried out on a daily basis throughout the duration of the remedial earthworks project. Lucion recommends that consistent evidence of air test results below the limit of detection or limits of quantification of $0.01\text{f}/\text{m}^3$ (ten times less than the control limit) (also stated in the CEMP) be available.

Expected duration of the project would be 12 weeks, daily PCM monitoring.

It is important to note that where different stratas of contaminated soils are worked on (ie. Landfill Waste / Re-engineered Cover System), air monitoring should be carried out due to the variable levels of asbestos contamination that may be present.

Each day of attendance would include up to 12No. air tests depending on weather conditions and would typically include the following air sampling procedures in accordance with 'HSG 248 (second edition) Asbestos: The Analyst guide for sampling, analysis and clearance procedures':

Background Sampling - air sampling typically used prior to the start of the earthworks to establish a baseline fibre level. Backgrounds sampled over a longer period of time are likely to be more representative and improve the limit of quantification (LOQ) of $0.010\text{f}/\text{ml}$.

Near-source Static Sampling - air sampling typically used to assess the potential fibre release from very dusty operations and known outdoor sources in the localised work areas where asbestos contamination is known to be present. The sampling points would be expected to be located in the vicinity of the excavation works and include upwind and downwind points to assess the release due to variable wind direction. This form of sampling will also assess whether the controls and respiratory protection is adequate for the task. Generally, for near-source static sampling a minimum volume of 480 litres should be collected to achieve a LOQ of $0.010\text{f}/\text{ml}$. Where possible, larger sampling volumes should be collected to improve the analytical sensitivity.

Far-source / Perimeter Sampling - air sampling typically used around the edge/perimeter of contaminated waste and soil remediation work sites, where the asbestos is being actively disturbed or removed. Considerations should be made to collect samples either upwind or downwind on the site boundary. As the concentrations are likely to be low using this sampling method, Lucion would expect an increased volume of air to be sampled to increase the LOQ. An example of this would be a collection of 960 litres in order to achieve a LOQ of $0.005\text{f}/\text{ml}$.

Personal Sampling - for many situations the immediate exposure to the person disturbing the soil is the most relevant measurement and personal sampling should be used. The lower volume of air and the limitations of PCM will restrict the LOQ and personal samples taken from the control limit will generally only give reliable LOQ down to $0.04\text{f}/\text{ml}$. Lucion would expect to run pumps for the duration of the task / shift or up to 4 hours (if at 1 litre per minute). The minimum requirements are 40 litres, although the more air taken the lower the LOQ. This form of sampling will assess whether the controls and respiratory protection is adequate for the task.

If in any instance during the works, air monitoring results exceed the control limits set out in CAR2012, or $0.01\text{f}/\text{m}^3$ as stated within the Construction Environmental Management Plan (CEMP), then the works would be expected to stop, until the risk



assessments and the Plan of Works are revised and updated with adequate control and protection measures needed for the task. The licensing status of the works may also need updating if not already deemed Licensed works.

CAR-SOIL™ guidance states that according to the HSE, “*there is now significant monitoring evidence available within the ground investigation and remediation industry to suggest that significant visible quantities of bound ACMs will need to be present to give rise to exposures above 0.01 f/ml, equivalent to one tenth of the control limit, unless they are being subject to highly energetic processes (e.g. crushing, power screening and grading of demolition waste and made ground or soil).*”

Scanning Electron Microscopy (SEM) can be carried out in addition to PCM in order to achieve a lower limit of detection and fibre discrimination to 0.0005 f/cm³. Lucion would recommend the use of SEM testing to be carried out over four rounds, which would include an initial round of boundary monitoring up and down wind prior to any excavation works to establish a baseline reading. Then two rounds to be conducted during the excavation works and a fourth at the end of the project. This data would furthermore ensure that the control and protection measures implemented are effective.

Lucion suggests that each round of SEM testing would include two tests, in the direction of up and downwind. A total of 8No. SEM tests over four rounds.

If gross asbestos contamination is discovered during the earthworks and is greater or significantly different to what has previously been identified, then works should stop and emergency procedures followed within the PoW such as leave the immediate work area, dampen down, cover with 1,000 gauge polythene, decontamination of operatives, plant and equipment and localised segregation within the working area. Near - source air sampling would also be expected to monitor the immediate risk.

At present, Lucion is not aware of the licensing status proposed by the future contractor for the future proposed remedial works and due to the limited amount of asbestos data (ie. no quantifications of asbestos detected soil samples / bulk fragments) Lucion has not carried out an initial JIWG assessment as part of this asbestos monitoring summary report. Therefore, this air monitoring plan is what lucion would typically expect in relation to earthwork projects involving asbestos contaminated soils and may be subject to change depending on:

- The licensing status of the works - Non Licensed (NLW), Notifiable Non Licensed (NNLW) or Licensed works (LW).
- The types of site control and protection measures implemented
- Unforeseen gross asbestos contamination during earthwork
- Earthwork Strategy - works programme

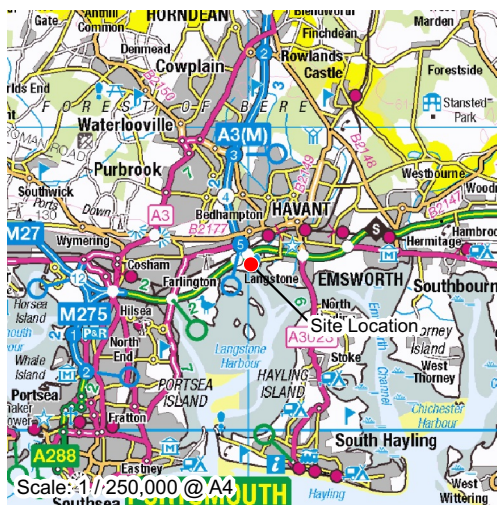


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Appendix 1

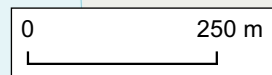
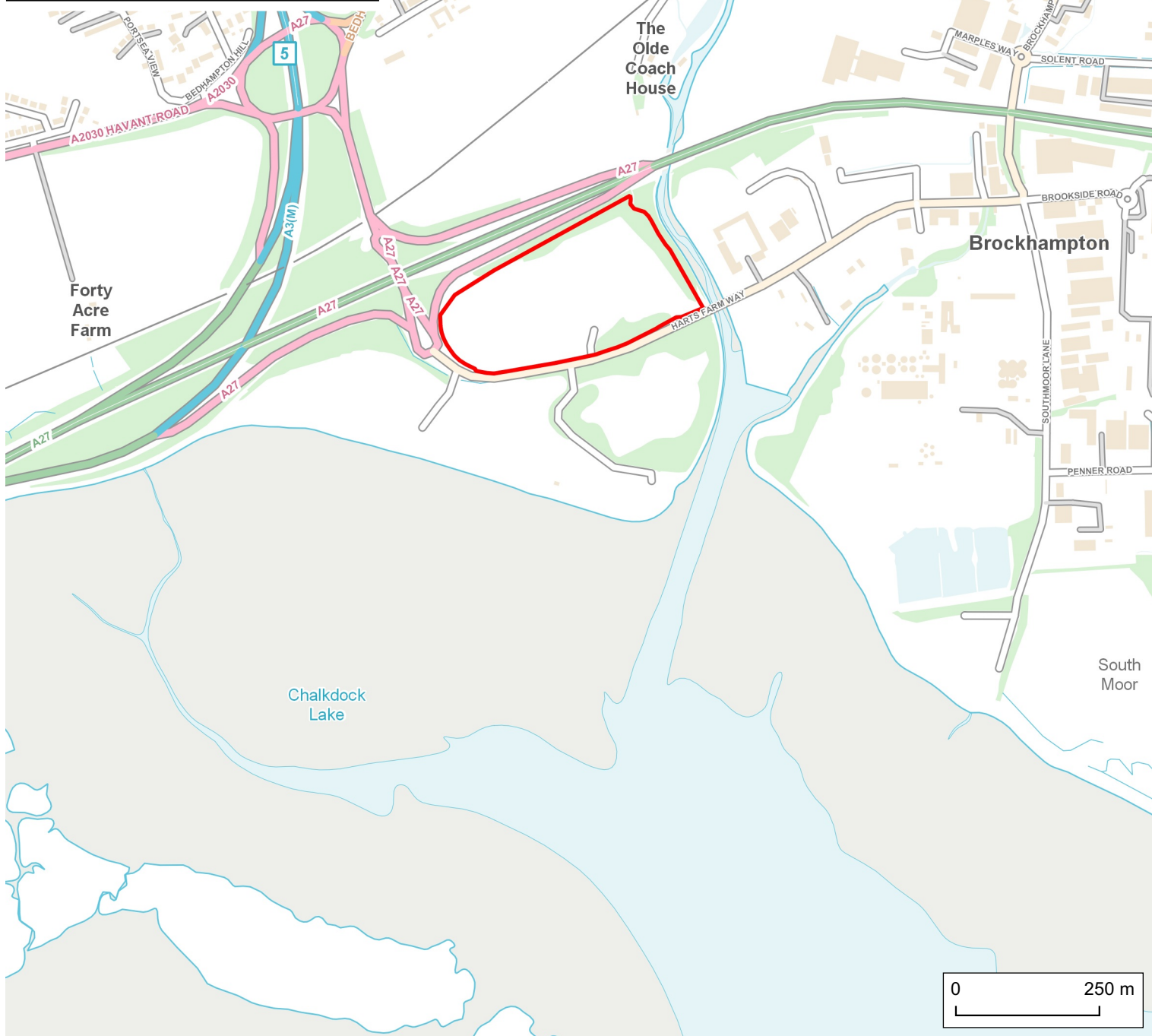
Delta-Simons, Site Location Map, Project Number 19-2099.04, June 2021



LEGEND



Site Boundary



Scale: 1:10000 @ A4

Service Layer Credits: Contains OS data @ Crown Copyright and Database Right 2019



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Appendix 2

Delta-Simons, Receptor Plan



United Kingdom • England

Premier Inn
Portsmouth Havant ...

Residential
Property

FatFace Customer
Services

Toolstation

Brockhampton

Hermitage
Stream

Business Park

The Windowmakers

Widen Electronic
Solutions

Harts Farm Way

Physique Management Co.

Public
Footpaths

Boating Club

Langstone

Harbour SAC/SPA