



PHASE I GEO-ENVIRONMENTAL SITE ASSESSMENT

62 Moor Lane,
Clitheroe

Prepared for:

Stanton Andrews
Architects

Report Ref: 11-597
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E3P

Heliport Business Park,
Liverpool Road,
Eccles,
Manchester,
M30 7RU

Tel : + 00 (0) 161 707 9612
<http://www.e3p.co.uk>

Registered in England
No.: 807255262

QUALITY ASSURANCE

REMARKS	FINAL
DATE	December 2016
PREPARED BY	S Ellis
QUALIFICATIONS	BSc (Hons), FGS
SIGNATURE	
CHECKED BY	A. Edgar
QUALIFICATIONS	BSc, MSc, AIEMA, MEnvSc, CEnv
SIGNATURE	
AUTHORISED BY	M Dyer
QUALIFICATIONS	BSc, FGS, AIEMA, MEnvSc, CEnv
SIGNATURE	
PROJECT NUMBER	11-597

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EXECUTIVE SUMMARY

Site Address	Land North of Holmes Mill, Clitheroe, Lancashire, BB7 1AW	
Grid Reference	374242E,441464N	
Site Area	0.19 Hectares	
Current Site Use	The subject site is an irregular shaped parcel of land north of the former Holmes Mill, Clitheroe. The site is in a mixed residential and commercial area. A garage occupies the site, with a single storey building in the south sector and associated external hardstanding for car parking in the north and east sectors of the site. The garage building has corrugated sheet roof; asbestos containing material (ACM) may be present within the fabric of the building. A stream runs along the eastern boundary of the site, with a retaining wall either side. Residential properties with gardens are present immediately west of the site. Retail premises on Moor Lane to the east and Woode Lane to the west are adjacent to the site.	
Proposed Development	E3P understands that Stanton Andrews Architects propose to develop as a car park. A proposed plot development layout has not been made available, but it is assumed the development will comprise hardstanding across the site.	
Environmental Setting	<i>Drift Geology</i>	Alluvium in the east sector and Glacial Till in the west sector.
	<i>Bedrock Geology</i>	Clitheroe Limestone Formation and Hodder Mudstone Formation.
	<i>Hydrogeology</i>	Unproductive strata overlying a Secondary A Aquifer (Bedrock Geology).
	<i>Hydrology</i>	Mearley Brook flows along the eastern boundary of the site.
	<i>Flood Risk</i>	The site is located within a defined Flood Zone 3 and Flood Zone 2 relating to Mearley Brook. The site is within an area benefitting from flood defences.
	<i>Ecology</i>	Mearley Brook and existing building on site may provide habitat for wildlife.
	<i>Subsidence Hazards</i>	There is a moderate risk of compressible deposits.
Site History	The site was historically occupied by mill buildings then terraced housing, before being cleared and the existing garage constructed circa the 1970's. The site is immediately north of Holmes Mill, which included a gasometer, boiler room and gas house up to the end of the 1800's. Holmes Mill has been identified as a cotton mill, cotton and rayon mill and a works during its mapped history. Electrical substations are on the adjacent Holmes Mill site. Various other mills and works are identified on historical mapping in the vicinity of the site.	
Utility Locations	A formal drainage survey has not been completed, is assumed the nearest utility locations will be beneath the surrounding roads.	
Landfill Sites & Ground Gases	There are no landfills within 500m of the site. There is a historical landfill identified 549m southwest. Made Ground associated with historical demolition and construction activities is anticipated on the site.	

EXECUTIVE SUMMARY

Invasive Plant Species	No invasive plant species were identified during the site walkover, however, their presence cannot be ruled out. A Habitat Survey may be required.
Radon	The site is situated in an area affected by Radon; between 10% and 30% of homes are above the action level. Considering that the proposed development does not include the development of new buildings, no special measures will be required.
Coal Mining / Land Stability	The site is not located within an area that may be affected by coal mining.

Geotechnical Risk

Based on the desk study information, the following geotechnical assessment has been made:

-  Made Ground and obstructions, associated with historical development, are anticipated. Existing buildings will require demolition. Relic foundations may require grubbing out, prior to the laying the car park;
-  A retaining wall is present on the southeast boundary and its stability may need to be assessed;
-  Mearley Brook flows along the eastern boundary of the site;
-  The site lies within a defined flood risk zone;
-  There is a moderate risk of compressible ground.

Contaminated Land Risk Assessment

Human Health

Historical industrial land uses and anticipated Made Ground represent potential sources of heavy metal, polycyclic aromatic hydrocarbon (PAH), petroleum hydrocarbon, asbestos and ground gas. Considering the proposed car park development with hard-standing across the site, no viable pollutant linkage with respect to future commercial end users is identified.

Asbestos may be present in the fabric on the existing building, which will require identification and specialist removal prior to demolition.

Controlled Waters

Historical industrial land uses represent potential sources of mobile contaminants. Proposed hardstanding and low permeability drift deposits reduce the potential for infiltration and migration of mobile contaminants, if present. Considering the proximity of Mearley Brook and the underlying Secondary A Aquifer there is a moderate risk to controlled waters. A watching brief during the enabling works is recommended.

Ground Gas

Made Ground represents a potential source of ground gas. However, no buildings are proposed, reducing the potential for accumulation of ground gas, mitigating the potential risk to commercial end users.

Recommendations

-  A watching brief should be maintained during the demolition and construction works on-site;
-  An asbestos survey within existing building will be required, prior to demolition;
-  A habitat survey may be required;
-  A flood risk assessment may be required.

Table of Contents

1. INTRODUCTION.....	5
1.1 Background	5
1.2 Proposed Development	5
1.3 Objectives.....	5
1.4 Limitations	5
1.5 Sources of Information.....	5
1.6 Confidentiality	6
1.7 Risk Classification	Error! Bookmark not defined.
2. SITE SETTING.....	7
2.1 Site Details	7
2.2 Current Site Use	7
2.3 Surrounding Area	8
3. SITE HISTORY	9
3.1 On-Site Historical Development.....	9
3.2 Off-Site Historical Development.....	11
3.3 Planning History	11
4. ENVIRONMENTAL SETTING	12
4.1 Geology and Hydrogeology	12
4.2 Geotechnical Data	12
4.3 Coal Mining	12
4.4 Hydrology	13
4.5 Radon Risk Potential	13
4.6 Industrial Land Uses.....	13
4.7 Agricultural Land Classification.....	Error! Bookmark not defined.
4.8 Sensitive Land Uses.....	13
4.9 Site Sensitivity Assessment.....	13
4.10 Preliminary Geotechnical Assessment.....	14
4.1 Unexploded Ordnance.....	14
5. CONSULTATIONS.....	15
5.1 Contaminated Land Officer	15
5.2 Landfill Sites and Waste Treatment Sites	15
5.3 Regulatory Database	15
6. INITIAL CONCEPTUAL SITE MODEL	16
6.1 Initial CSM	16
7. CONCLUSIONS AND RECOMMENDATIONS.....	18

APPENDICES

- Appendix I** Limitations
Appendix II Glossary
Appendix III Drawings
Drawing No 11-597-001 – Site Location Plan
Drawing No 11-597-002 – Site Features Plan
Drawing No 11-597-003 – Historical Features Plan
Appendix IV Photographs
Appendix V Historical Maps



1. INTRODUCTION

1.1 Background

E3P Ltd has been commissioned by Stanton Andrews Architects to undertake a Phase I Geo-Environmental Site Assessment at 62 Moor Lane/ land north of Holmes Mill, Clitheroe.

This report is required to determine potential contaminated land and geotechnical liabilities associated with a proposed car park development.

1.2 Proposed Development

E3P understands that Stanton Andrews Architects propose to develop the site for a car park. A proposed development layout has not been made available, but it is assumed the development will comprise hardstanding across the site.

1.3 Objectives

The objectives of the Geo-Environmental Investigation are to:

-  Review historical plans, geology, hydrogeology, site sensitivity, flood-plain issues, mining records and any local authority information available in order to complete a Desk Study in line with Environment Agency (EA) document Model Procedures for the Management of Contaminated Land (Contaminated Land Report 11 (CLR11));
-  Assess the implications of any potential environmental risks, liabilities and development constraints associated with the site in relation to the future use of the site and in relation to off-site receptors;
-  Assess the desk study information and where possible, provide preliminary recommendations in relation to foundations, pavement construction and floor slabs; and,
-  Provide recommendations regarding future works required and undertake a preliminary pre-construction cost appraisal.

1.4 Limitations

The limitations of this report are presented in Appendix I.

1.5 Sources of Information

Background information was sought from the following sources:

-  Envirocheck Search;
-  Historical mapping dated 1847 to 2014. A selection of historical maps are reproduced in Appendix V;
-  On-line planning records held by Ribble Valley Borough Council;
-  Consultations with representatives of the Ribble Valley Borough Council;
-  Environment Agency Groundwater Vulnerability Map (www.environment-agency.gov.uk/wiyby);
-  Radon: Guidance on protective measures for new buildings (BRE Document BR 211, 2007); and,
-  British Geological Survey Map.



1.6 Confidentiality

E3P has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from E3P; a charge may be levied against such approval.

2. SITE SETTING

2.1 Site Details

Site Address	Land North of Holmes Mill, Clitheroe, Lancashire, BB7 1AW
National Grid Reference	374242E,441464N
Site Area	0.19 Hectares

All acronyms used within this report are defined in the Glossary presented in Appendix II.

A site location map is presented in Appendix III as Drawing 10-566-001.

2.2 Current Site Use

E3P has undertaken a site walkover of the entire site and a description of the key findings is summarised in Table 2.1.

Table 2.1 Site Description

Occupancy/use	The subject site is an irregular shaped parcel of land north of the former Holmes Mill, Clitheroe. A garage occupies the site, with a single storey building in the south sector and associated external hardstanding for car parking in the north and east, adjacent to Moor Lane. A stream flows along the eastern boundary of the site, with a retaining wall either side. Residential properties with gardens are present immediately west of the site. Retail premises on Moor Lane and Woode Lane to the east and west are adjacent to the site.	
Structures	The site occupied by a single storey commercial building in the south sector, which has a corrugated sheet roof; asbestos containing material (ACM) may be present within the fabric of the building.	
Access	Vehicular access is made via existing hardstanding off Moor Lane to the east.	
Slope	The site is topographically level. There is a slight down-gradient from north to south in the surrounding area.	
Retaining structures	A retaining wall forms the east boundary with the adjacent stream.	
Surface Cover (%)	Buildings:	30%
	Hardstand:	70%
	Soft cover:	0%
Vegetation/Ecology	The existing building on site and Mearly Brook may support protected species such as bats and amphibians. A Habitat Survey may be required to support the planning application.	
Hazardous Material Storage	No Above Ground Storage Tanks (AST) or Underground Storage Tanks (UST) were observed at the site during the preliminary site walkover. Due to the garage and commercial land use on site, hazardous materials storage may have occurred on the site.	
Asbestos Containing Material (ACM)	No evidence of ACM was noted across the site during the site walkover, however, ACM may be present in the fabric of the existing building. A pre-demolition asbestos survey will be required within the existing building.	

Polychlorinated Biphenyls (PCBs)	Electrical substations are located on the Holmes Mill site, immediately south. No evidence of damage or spillages from these substations is evident.
Waste Storage	Potentially hazardous waste streams are unlikely to be generated at the site and none were observed during the preliminary site inspection.
Drainage	A formal drainage survey has not been completed, is assumed the nearest utility locations will be beneath the surrounding roads.

2.3 Surrounding Area

The surrounding area land uses are summarised in Table 2.2.

Table 2.2 *Surrounding Land Uses*

DIRECTION	LAND USE
North	Residential properties and retail premises.
East	Moor Lane and car park beyond.
South	Commercial buildings and hardstanding associated with former Holmes Mill.
West	Residential properties.

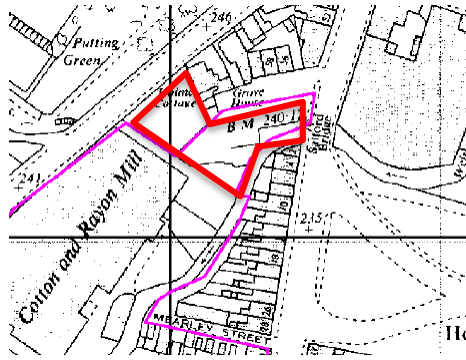
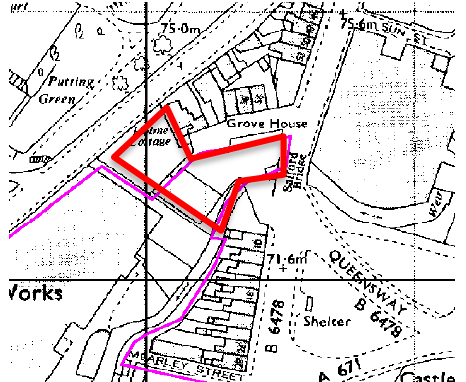
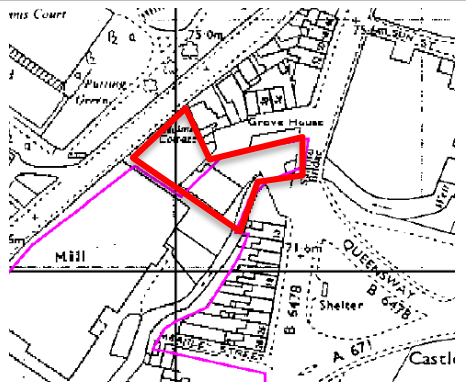
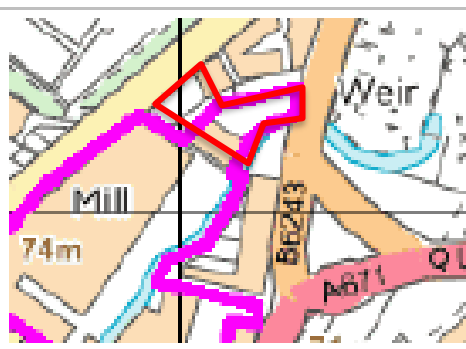
3. SITE HISTORY

3.1 On-Site Historical Development

A review of historical mapping pertinent to the site is summarised in Table 3.1 below. In addition, historical site features are presented on Drawing No 11-597-003 in Appendix III.

Table 3.1 Site Historical Development

MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1849 1:1,062	A single commercial building, identified as Salford Bridge Cotton Mill is identified in the north and central sectors of the site. Associated mill buildings are beyond Moor Lane, immediately east of the site. Holmes Mill is approximately 60m south of the site, comprising two mill buildings, with a gasometer, gas house and boiler house between the mill buildings. Residential properties are in the immediate vicinity.	
1886 1:2,500	A series of smaller buildings, possibly residential, are shown in place of the mill, in the central and north sectors of the site. Holmes Mill has expanded up to the southern boundary. The gasometer, gas house and boiler house are no longer.	
1912 1:2,500	Terraced residential properties are identified on the site.	

MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1964-65 1:2,500	Buildings on site have been removed indicating demolition activities. Residential properties to the southeast have been replaced by a 'Home for Aged', indicating demolition and construction activities in the vicinity. Salford Bridge Mill to the northwest is now identified as an engineering works and Holmes Mill to the south, is now identified as 'Cotton and Rayon Mill'.	
1977 1:2,500	A single commercial building has been built in the south sector of the site. The mill to the south, is now identified as 'Works'.	
1990 1:2,500	No significant changes	
2014	The site remains occupied by a single commercial building in the south sector. Buildings associated with the former mill / works beyond Moor Lane to the east have been removed.	



3.2 Off-Site Historical Development

A review of potentially contaminative uses identified on historical Ordnance Survey maps within a 250m radius of the site is summarised below in Table 3.2.

Table 3.2 Surrounding Potentially Contaminative Land Uses.

SURROUNDING FEATURE	DISTANCE	DATES	DIRECTION
Holmes Mill (cotton mill) / works	Adjacent	Pre 1846 - Present	South
Salford Bridge Mill (cotton mill) Then engineering works / works	15m	Pre 1846 – Pre 1964 Pre 1964 - Present	East
Gasometer, gas house and boiler house Then part of Holmes Mill (cotton mill)	60m	Pre 1846 – Pre 1886 Pre 1886 - Present	Southwest
Laundry Then demolished	100m	Pre 1912 to Pre 1964 Pre 1964 to Present	Southeast
Commercial unit	130m	Pre 1977 to Present	south
Victoria / Carlton Cotton Mill Then Electrical depot	190m	Pre 1886 - Pre 1964 Pre 1964 - Present	Northeast
Railway	225m	Pre 1886 - Present	West
Garage Then Works	230m	Pre 1964 to Pre 1995 1995 to Present	West

3.3 Planning History

E3P has undertaken a review of Ribble Valley Borough Council planning portal which has identified no planning information pertaining to the subject site.

4. ENVIRONMENTAL SETTING

4.1 Geology and Hydrogeology

The British Geological Survey (BGS) map for the site, (1:50,000, Solid & Drift edition) and online records indicates the site is underlain by the geological sequence presented in Table 4.1.

Table 4.1 Summary of Underlying Geology

GEOLOGICAL UNIT	CLASSIFICATION	DESCRIPTION	AQUIFER CLASSIFICATION
Drift – West sector	Glacial Till	Diamicton	Unproductive
Drift – East sector	Alluvium	Clay, Silt, Sand and Gravel	Unproductive
Solid	Clitheroe Limestone Formation And Hodder Mudstone Formation	Mudstone	Secondary A Aquifer

The Envirocheck Report indicates that the site is not located within a Groundwater Source Protection Zone. Furthermore, there are no groundwater / potable abstractions within 1km of the site.

There are 3no. surface water abstractions identified within 250m of the site; the closest is 22m south at Mearley Brook for commercial use.

Mearley Brook flow along the eastern boundary of the site. It is considered likely that shallow groundwater, if present, will flow towards Mearley Brook.

4.2 Geotechnical Data

Geotechnical Data presented within a commercially available environmental database is summarised within Table 4.2.

Table 4.2 Summary of Geotechnical Data

HAZARD	DESIGNATION
Shrink-Swell Clay	Very Low Risk
Landslides	Very Low to Low Risk
Ground Dissolution	Very Low Risk
Compressible Ground	Moderate Risk
Collapsible Deposits	Very Low Risk
Running Sand	Very Low to Low Risk

4.3 Coal Mining

The Envirocheck Report states the site is not located within an area that may be affected by coal mining.

4.4 Hydrology

Mearley Brook is located on the eastern boundary of the site. The Envirocheck report indicates a River Quality B (Good) for Mearley Brook.

The site is located within a defined Flood Zone 3 and Flood Zone 2 relation to Mearley Brook adjacent to the southeast boundary of the site. The site is within an area benefitting from flood defences.

4.5 Radon Risk Potential

The Envirocheck Report indicates the site is situated in an area affected by Radon; between 10% and 30% of homes are above the action level. The BGS reports that full radon protective measures are necessary in the construction of new dwellings. However, as the proposed commercial development does not include new buildings, no special measures will be necessary.

4.6 Industrial Land Uses

Reflecting the location of the site within a predominantly commercial area, entries on the Contemporary Trade Directory for industrial land uses are identified on and in the vicinity. Greenacre Garage is identified on the site and manufacturing at Holmes Mill is immediately south.

Retail and equipment services are identified in the wider vicinity, including sites associated with hardware 16m east, and cabinet makers 30m northeast.

4.7 Sensitive Land Uses

The closest residential properties are located adjacent to the west boundary of the site.

No other environmentally sensitive land uses have been identified within close proximity to the site.

4.8 Site Sensitivity Assessment

The site is assessed to be located within a **High** sensitivity setting as discussed within Table 4.5.

Table 4.5 Site Sensitivity Assessment

SENSITIVITY PROFILE	DISCUSSION	RATING
Sensitive land uses within close proximity (e.g. residential, school, nursery, local nature reserves etc.)	Residential properties with gardens are immediately west.	HIGH
Groundwater Source Protection Zone or Drinking Water Safeguard Zone	The site is not within a Groundwater Source Protection Zone.	LOW
Distance to the closest groundwater abstraction point.	None within 1km.	LOW
Aquifer Classification in Superficial Drift Deposits.	The underlying superficial deposits are classified as an unproductive aquifer.	LOW

SESITIVITY PROFILE	DISCUSSION	RATING
Aquifer classification in Bedrock.	Secondary A Aquifer.	MODERATE
Is the site underlain by low permeability Drift to depths of more than 10.0m?	BGS boreholes records indicate shallow limestone at 3.30m bgl.	MODERATE
Is the site located within 50m of a surface watercourse?	Mearley Brook is located on the eastern boundary.	HIGH
Overall Site Environmental Sensitivity		MODERATE/ HIGH

4.9 Preliminary Geotechnical Assessment

Based on the desk study information, the following geotechnical assessment has been made:

-  Made Ground and obstructions, associated with historical development, are anticipated. Existing buildings will require demolition. Relic foundations may require grubbing out, prior to the laying the car park;
-  A retaining wall is present on the southeast boundary and its stability may need to be assessed;
-  Mearley Brook flows along the eastern boundary of the site;
-  The site lies within a defined flood risk zone;

There is a moderate risk of compressible ground.

4.1 Unexploded Ordnance

The regional unexploded bomb risk map from Zetica indicates that the site is in an area at low risk from possible Unexploded Ordnance (UXO) resulting from the Second World War. (Zetica, 2014).

5. CONSULTATIONS

5.1 Contaminated Land Officer

E3P contacted the Environmental Health Department at Ribble Valley Borough Council who have been unable to respond within the reporting timescales. Upon receipt of the search information, E3P will issue any pertinent information and / or use the information to inform the development of any intrusive investigation proposals.

5.2 Landfill Sites and Waste Treatment Sites

There are no landfills within 500m of the site. There is a historical landfill identified 549m southwest.

5.3 Regulatory Database

The information summarised in Table 5.1 has been obtained from a commercially available environmental database. The summary table only includes records from within 250m of the subject site and not otherwise detailed in the report.

Table 5.1 *Summary of Environmental Data*

RECORD	ENTRIES WITHIN 250m	DETAILS
Contaminated Land Register Entries and Notices	0	None Identified (N/A).
Authorised industrial processes (IPC/IPPC/LAPPC).	4	IPPCs are 40m northeast for timber and wood products; 43m and 119m northeast for coating processes; and 238m south for vehicle respraying.
Fuel Stations Entries	1	An obsolete fuel station is 64m northeast.
Licensed radioactive substances	0	N/A
Enforcements, prohibitions or prosecutions	0	N/A
Discharge Consents	0	N/A
Pollution Incidents	7	Two incidents recorded in 1993 on site, at Mearley Brook involved oils. Two incidents recorded in 1999, at Mearley Brook, 26m south, involved inert subsoil. In 1992 an incident involving chicken entrails was recorded at Mearley Brook, 121m south. In 1994 an incident involving chemicals was recorded 154m east. An incident involving oils was recorded in 1998, 179m northwest.
Consents issued under the Planning (Hazardous Substances) Act 1990	0	N/A
Control of Major Accident Hazard (COMAH) sites	0	N/A

6. INITIAL CONCEPTUAL SITE MODEL

6.1 Initial CSM

In accordance with Environment Agency, CLR 11 (2004) and BSI 10175 (Code of Practice for Investigation of Potentially Contaminated Land), E3P Ltd has developed an initial CSM to identify potential contamination sources, migration pathways and receptors within the study area. This is summarised within Table 6.1.

Table 6.1 Initial Conceptual Site Model

SOURCE	EXPOSURE	POTENTIAL PATHWAY
Human Health		
Heavy metals / Semi Volatile Organic Compounds (SVOC) associated within Made Ground and historical site use as a cotton mill	Dermal Contact and Ingestion	Construction Workers Commercial End Users
Discussion: Historical industrial land uses on and in the vicinity, including mills and works, are potential sources of heavy metals and PAHs. Made Ground associated with historical development and demolition activities is anticipated and may contain ash deposits, a source of heavy metals and PAHs. Heavy metals and non-volatile PAHs may pose a short-term risk to construction workers who may be exposed to impacted soils during earthworks. Construction works must be undertaken using the appropriate Personal Protective Equipment (PPE) to remove this potential risk. The proposed car park development, comprising hardstanding across the site, reduces the potential for future commercial end users to be exposed to impacted soils. If areas of soft landscaping are proposed, a 300mm clean cover system may be required to break the pathway.		
Hydrocarbon Compounds, volatile PAHs, Volatile Organic Compounds (VOC)	Volatilisation / Accumulation, Vapour Inhalation	Construction Workers, Commercial End Users
Discussion: Potential sources of hydrocarbon and volatile PAHs such as naphthalene are identified on and in the vicinity of the site, associated with historical commercial land uses, including a garage on the site, a gasometer and boiler to the south, mills, and works. A rayon works to the south may have utilised volatile organic compounds (acetone, carbon disulphide. Made Ground is anticipated across the site resulting from historic development and demolition activities.). Hydrocarbon compounds, SVOCs and VOCs may pose a risk to construction workers if they encounter impacted soils during earthworks, however, appropriate PPE will ensure they are at no unacceptable risk. The proposed car park, with no buildings or landscaping, mitigates the potential for accumulation of vapours within indoor spaces and exposure to impacted soils; the risk to commercial end users is therefore low.		
Asbestos Containing Materials (ACM) within Made Ground and existing buildings	Fibre / Dust Inhalation	Construction Workers Commercial End Users Third Party Property
Discussion: ACM may be present within the fabric of the existing building and Made Ground deposits. Disturbance of ACMs within the fabric of the existing buildings and asbestos impacted Made Ground soils, if present, may give rise to dust generation and asbestos fibres migrating from the subject site to third party property, posing a risk to construction workers and future end users. The site is likely to be overlain by hard-standing or floor slab thus breaking the pathway, and reducing the risk to commercial end users.		

SOURCE	EXPOSURE	POTENTIAL PATHWAY
Polychlorinated Biphenyls (PCBs)	Dermal Contact and Ingestion	Construction Workers Commercial End Users
Discussion: Electricity substations located on the adjacent Holmes Mill site are potential sources of PCBs, which may have impacted soil in the vicinity. PCBs pose a risk through dermal contact; considering the proposed car park development will comprise hard-standing across the site, no viable pollutant linkage with respect to future commercial end users is identified. Construction workers may be exposed to impacted soil via direct exposure; appropriate PPE will reduce the potential risk.		
Hazardous Ground Gases		
Methane and Carbon Dioxide associated with made ground	Inhalation Accumulation	Construction Workers Commercial End Users
Discussion: Made Ground is anticipated on the site associated with historical demolition and development activities, which represents a potential source of hazardous ground gases, such as carbon dioxide and methane that are associated with asphyxiation and explosive risks. However, no buildings are proposed, reducing the potential for accumulation of ground gas, mitigating the potential risk to commercial end users.		
Controlled Waters		
Hydrocarbon compounds associated within vehicle repair facilities	Vertical / Lateral Migration	Secondary A Aquifer Mearley Brook
Discussion: Historical industrial land uses, including mills and garage, on and in the vicinity of the site, represent potential sources of mobile hydrocarbon contamination. Historic and current hardstanding reduces the potential for infiltration and migration of contaminants. However, considering underlying Secondary A Aquifer and the proximity of Mearley Brook, a moderate risk to controlled waters is identified. A watching brief during the enabling works is recommended.		
Buildings and Infrastructure		
pH & Sulphate	Corrosion of Concrete	Foundations / Concrete
Discussion The presence of pH and sulphate within made ground may result in corrosion of buried concrete within the proposed development. Intrusive investigation with chemical analysis of soil samples is recommended to confirm the levels of pH and sulphate within Made Ground and thus determine the concrete classification.		
Ecology		
None Identified	N/A	N/A
Discussion In the absence of any potential receptors, no unacceptable risk to ecology has been identified.		

7. CONCLUSIONS AND RECOMMENDATIONS

Site Summary

The site is occupied by a garage with a single building in the south sector and hardstanding in the central and north sectors. Prior to the garage being built circa 1970's, a mill, then terraced housing was present in the north sector of the site. Holmes Mill, with electrical substations and historical gas works is immediately south. Mills and works are identified in the vicinity. Made Ground associated with historical development and demolition activities is anticipated across the site and in the vicinity.

The historical industrial land uses, as well as Made Ground, represent potential sources of heavy metal, polycyclic aromatic hydrocarbon (PAH), PCBs, petroleum hydrocarbon, asbestos and ground gas.

The site is within an area at risk from flooding and a flood risk assessment may be required prior to development.

Contamination Issues

Human Health	Historical industrial land uses and anticipated Made Ground represent potential sources of heavy metal, polycyclic aromatic hydrocarbon (PAH), petroleum hydrocarbon, PCBs, asbestos and ground gas. Considering the proposed car park development with hard-standing across the site, no viable pollutant linkage with respect to future commercial end users is identified. Asbestos may be present in the fabric on the existing building, which will require identification and specialist removal prior to demolition. Anticipated Made Ground represents a potential source of ground gas. Proposed hardstanding and underlying low permeability drift deposits reduces the potential for migration of ground gases, if present.
Controlled Waters	Historical industrial land uses represent potential sources of mobile contaminants. Proposed hardstanding and low permeability drift deposits reduce the potential for infiltration and migration of mobile contaminants, if present. Considering the proximity of Mearley Brook and the underlying Secondary A Aquifer there is a moderate risk to controlled waters. A watching brief during the enabling works is recommended.
Ground Gas	Anticipated made ground represents a potential source of ground gas. However, no buildings are proposed, reducing the potential for accumulation of ground gas, mitigating the potential risk to commercial end users.
Potable Waters	Based on existing information, it is considered the site will be suitable for PE water supply pipework.

Geotechnical Issues

Based on the desk study information, the following geotechnical assessment has been made:

-  Made Ground and obstructions, associated with historical development, are anticipated. Existing buildings will require demolition. Relic foundations may require grubbing out, prior to the laying the car park;
-  A retaining wall is present on the southeast boundary and its stability may need to be assessed;
-  Mearley Brook flows along the eastern boundary of the site;
-  The site lies within a defined flood risk zone;
-  There is a moderate risk of compressible ground.

END OF REPORT

APPENDIX I LIMITATIONS



1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between E3P and the Client as indicated in Section 1.2.
2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed it is correct. No attempt has been made to verify the information.
3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.
4. During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.
5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.
6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials this is for indicative purposes only and do not constitute or replace full and proper surveys.
8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
9. E3P cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by E3P is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by E3P in this connection without their explicit written agreement there to by E3P.
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APPENDIX II GLOSSARY

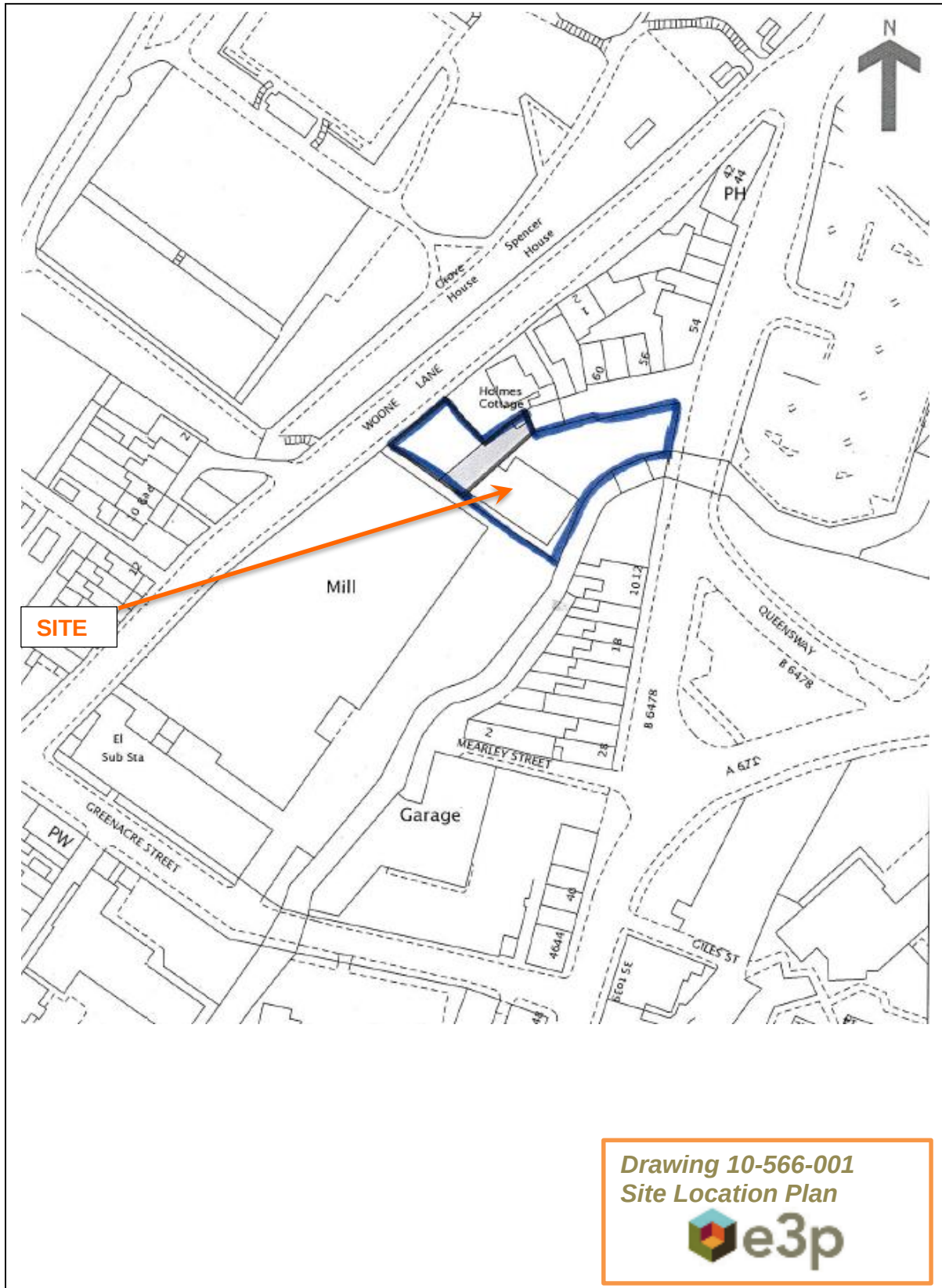


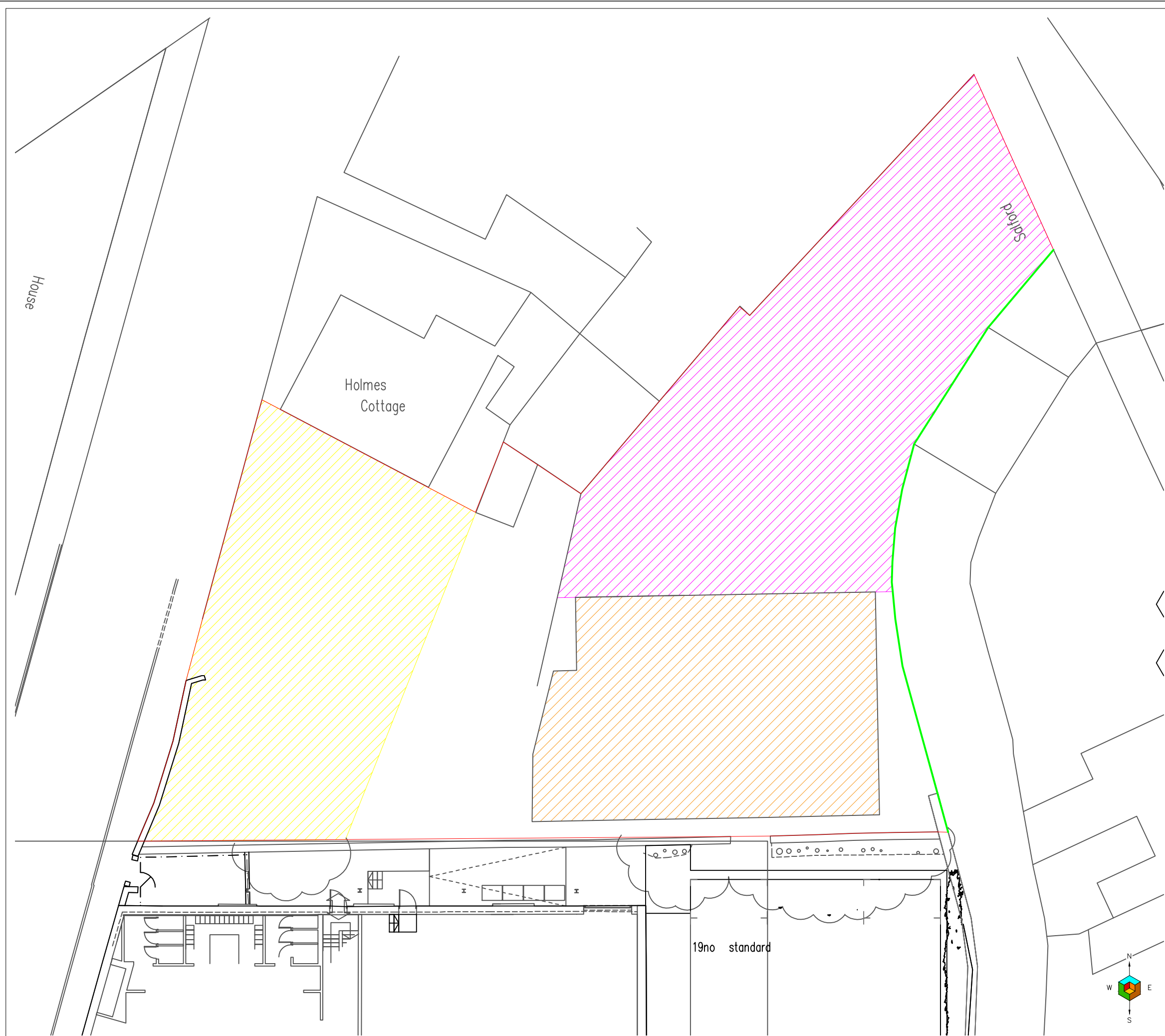
TERMS

AST	Above Ground Storage Tank	SGV	Soil Guideline Value
BGS	British Geological Survey	SPH	Separate Phase Hydrocarbon
BSI	British Standards Institute	TPH CWG	Total Petroleum Hydrocarbon (Criteria Working Group)
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes	SPT	Standard Penetration Test
CIEH	Chartered Institute of Environmental Health	SVOC	Semi Volatile Organic Compound
CIRIA	Construction Industry Research Association	UST	Underground Storage Tank
CLEA	Contaminated Land Exposure Assessment	VCCs	Vibro Concrete Columns
CSM	Conceptual Site Model	VOC	Volatile Organic Compound
DNAPL	Dense Non-Aqueous Phase Liquid (chlorinated solvents, PCB)	WTE	Water Table Elevation
DWS	Drinking Water Standard	m	Metres
EA	Environment Agency	km	Kilometres
EQS	Environmental Quality Standard	%	Percent
GAC	General Assessment Criteria	%v/v	Percent volume in air
GL	Ground Level	mb	Milli Bars (atmospheric pressure)
GSV	Gas Screening Value	l/hr	Litres per hour
HCV	Health Criteria Value	µg/l	Micrograms per Litre (parts per billion)
ICSM	Initial Conceptual Site Model	ppb	Parts Per Billion
LNAPL	Light Non-Aqueous Phase Liquid (petrol, diesel, kerosene)	mg/kg	Milligrams per kilogram (parts per million)
ND	Not Detected	ppm	Parts Per Million
LMRL	Lower Method Reporting Limit	mg/m³	Milligram per metre cubed
NR	Not Recorded	m bgl	Metres Below Ground Level
PAH	Polycyclic Aromatic Hydrocarbon	m bcl	Metre Below Cover Level
PCB	Poly-Chlorinated Biphenyl	mAOD	Metres Above Ordnance Datum (sea level)
PID	Photo Ionisation Detector	kN/m²	Kilo Newtons per metre squared
QA	Quality Assurance	µm	Micro metre
SGV	Soil Guideline Value		

APPENDIX III DRAWINGS







Key:

Site Features

-  Car Park
-  Car Service Center
-  Soft Landscaping and Driveway
-  Retaining Wall On Eastern Boundary of the Site

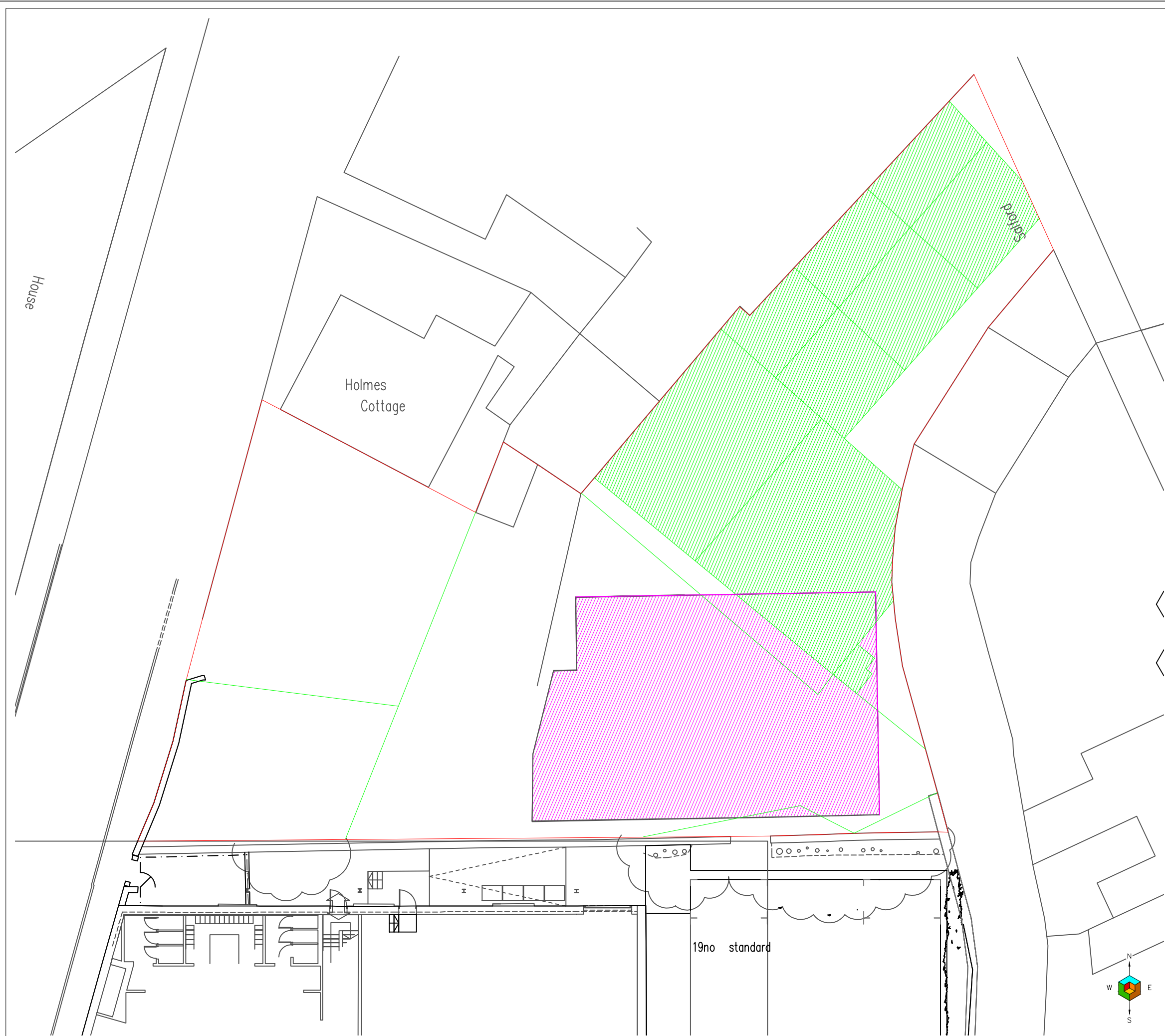
Notes:

P1	-	07-12-2016	DRAFT	JN	MD
Phase	Revision	Date	Issue	Drawn	Authorised
Client:			Job No:	Date:	
Stanton Andrews Architects			11-597	07-12-2016	
			Drawing No:	Scale:	
			002	1:1000 @ A3	
Job Title:			Drawing Title:		
62 Moor Lane			Site Features Plan		



Environmental Energy Engineering Partnerships Ltd
City Heliport & Business Centre
Eccles, Manchester, M30 7RU
Tel: 0161 707 9612
E-mail: info@e3p.co.uk
Website: www.e3p.co.uk

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Key:

Historical Features

- Former Outbuildings (Pre 1886 - Pre 1932)
- Former Field Boundaries (Pre 1886 - Pre 1932)
- Former Car Service Center (Pre 1977 - Present)

Notes:

P1	-	08-12-2016	DRAFT	JN	MD
Phase	Revision	Date	Issue	Drawn	Authorised
Client: Stanton Andrews Architects			Job No: 11-597	Date: 08-12-2016	
			Drawing No: 003	Scale: 1:1000 @ A3	
Job Title: 62 Moor Lane			Drawing Title: Historical Features Plan		



Environmental Energy Engineering Partnerships Ltd
City Heliport & Business Centre
Eccles, Manchester, M30 7RU
Tel: 0161 707 9612
E-mail: info@e3p.co.uk
Website: www.e3p.co.uk

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APPENDIX IV PHOTOGRAPHS





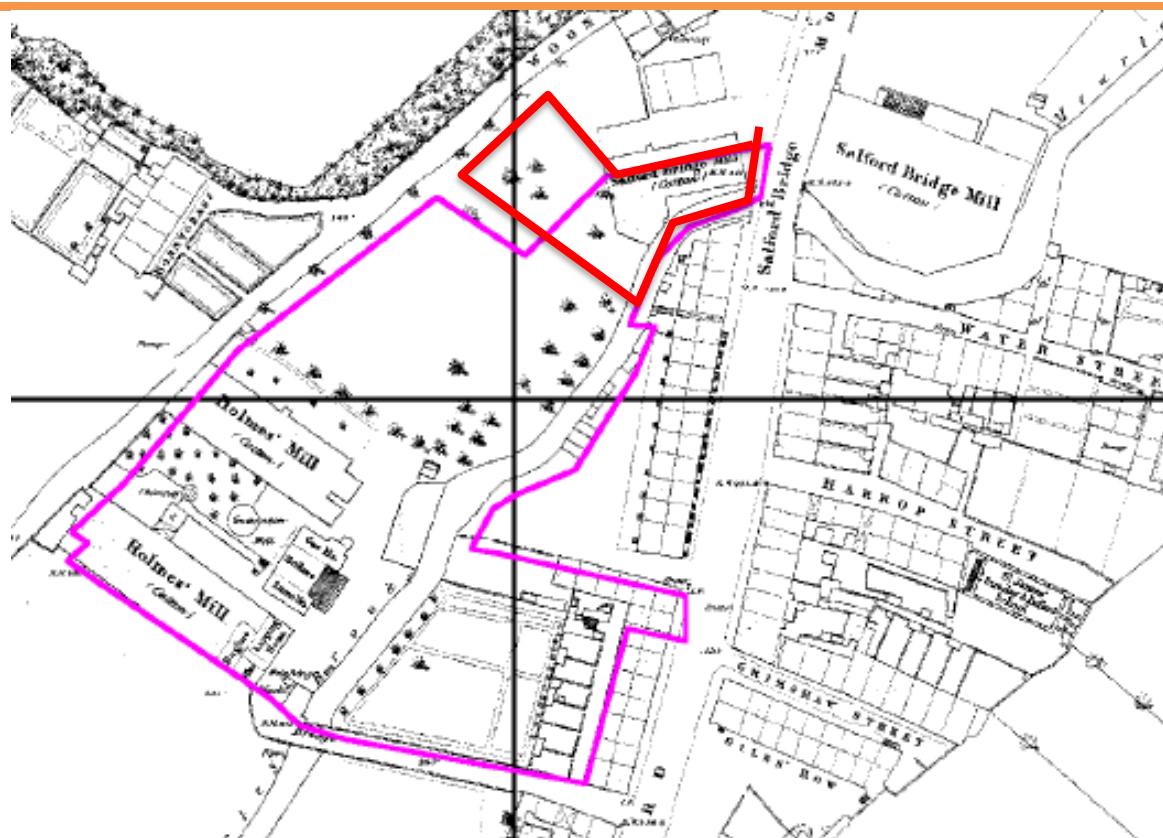
PLATE 1 – SHOWING THE SOUTH WESTERN SECTOR OF THE SITE



PLATE 2 – LOOKING AT THE NORTH EASTERN SECTOR OF THE SITE

APPENDIX V HISTORICAL MAPS





Historical Map

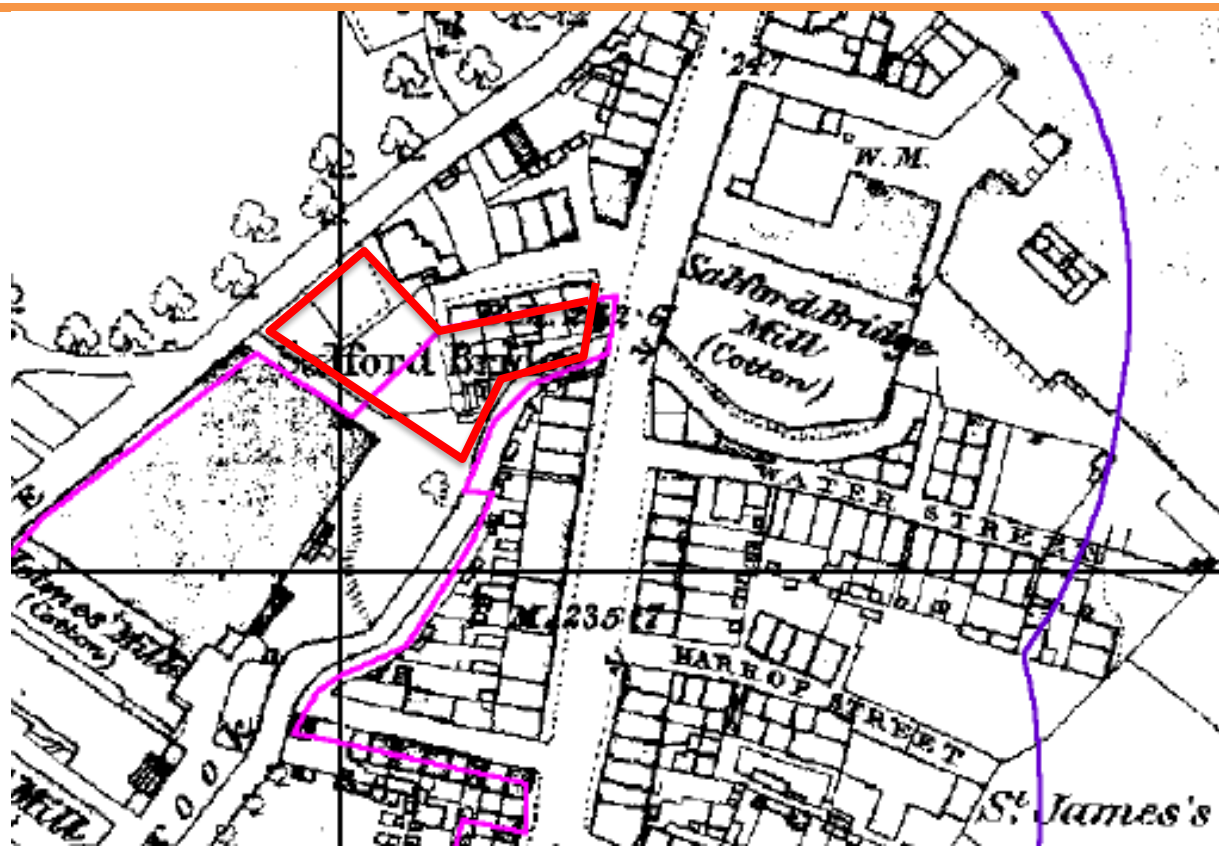
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North





Historical Map

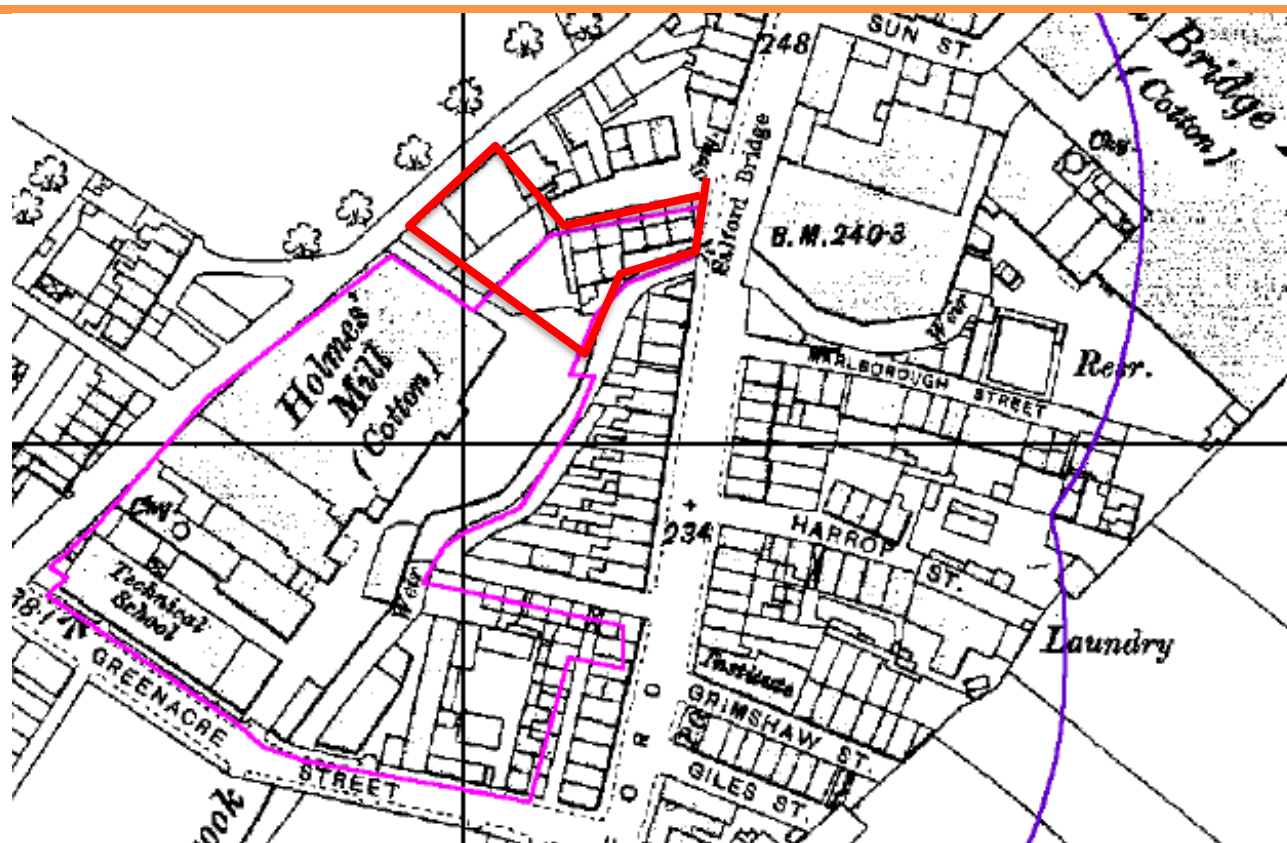
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North



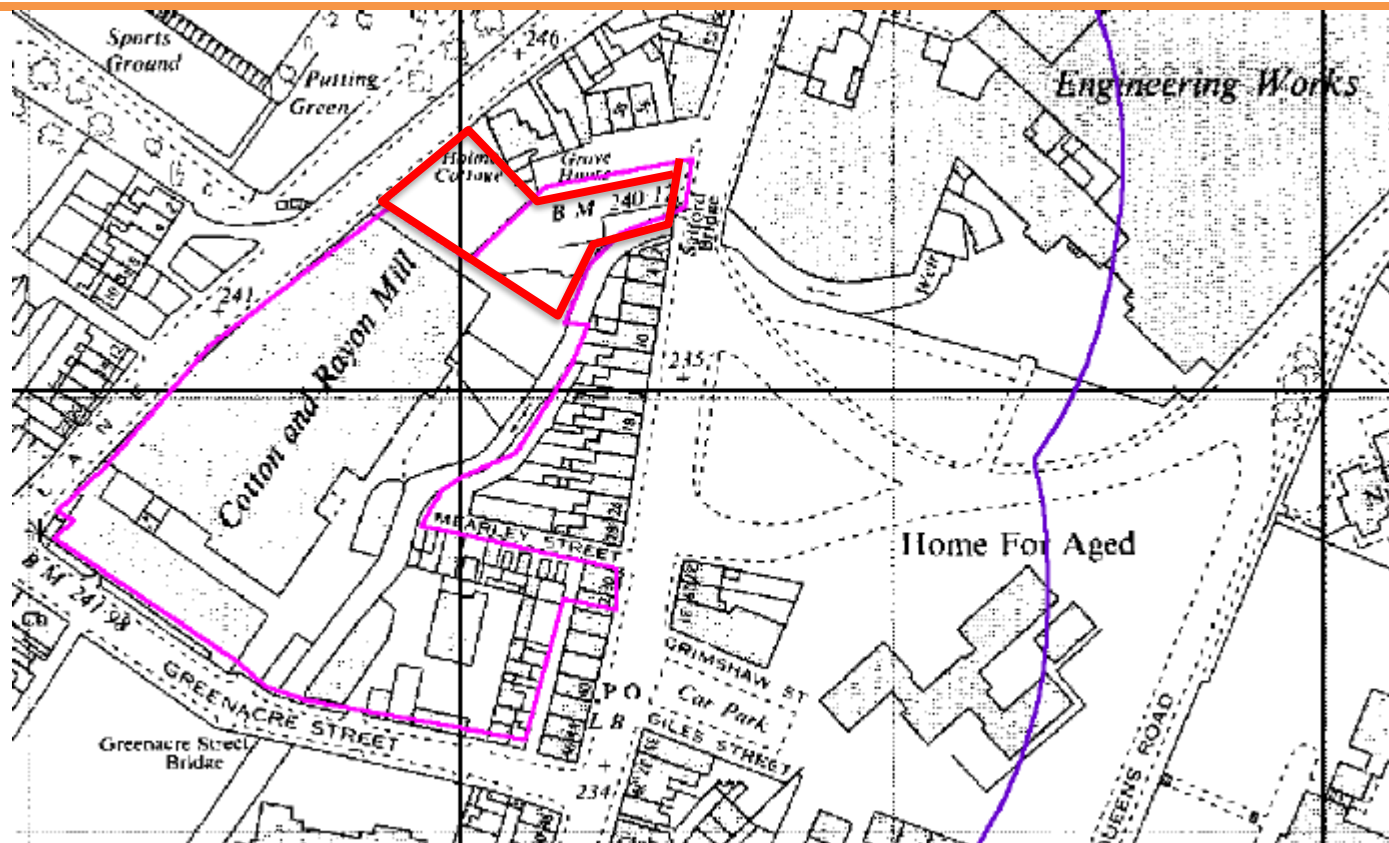


Historical Map

Dated: 1912

Original Scale: 1:2,500





Historical Map

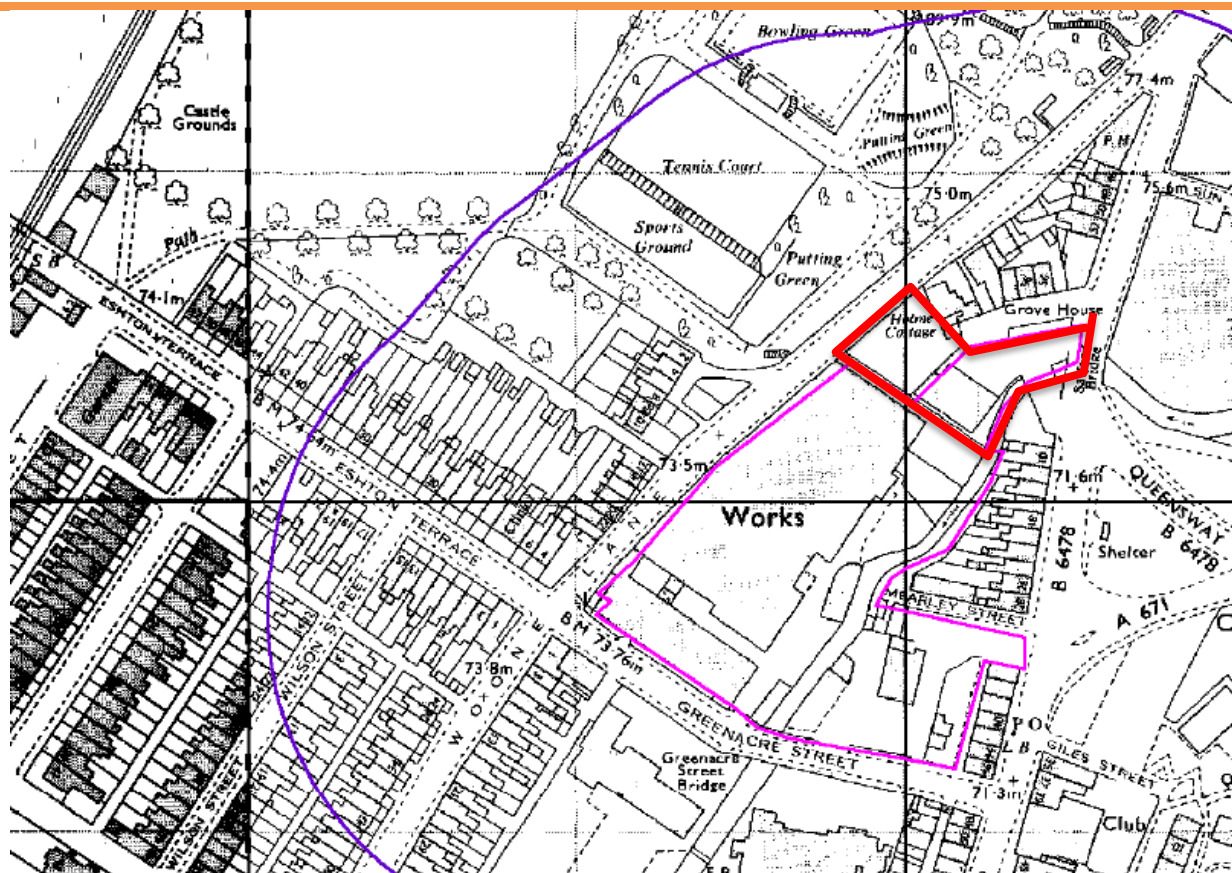
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North



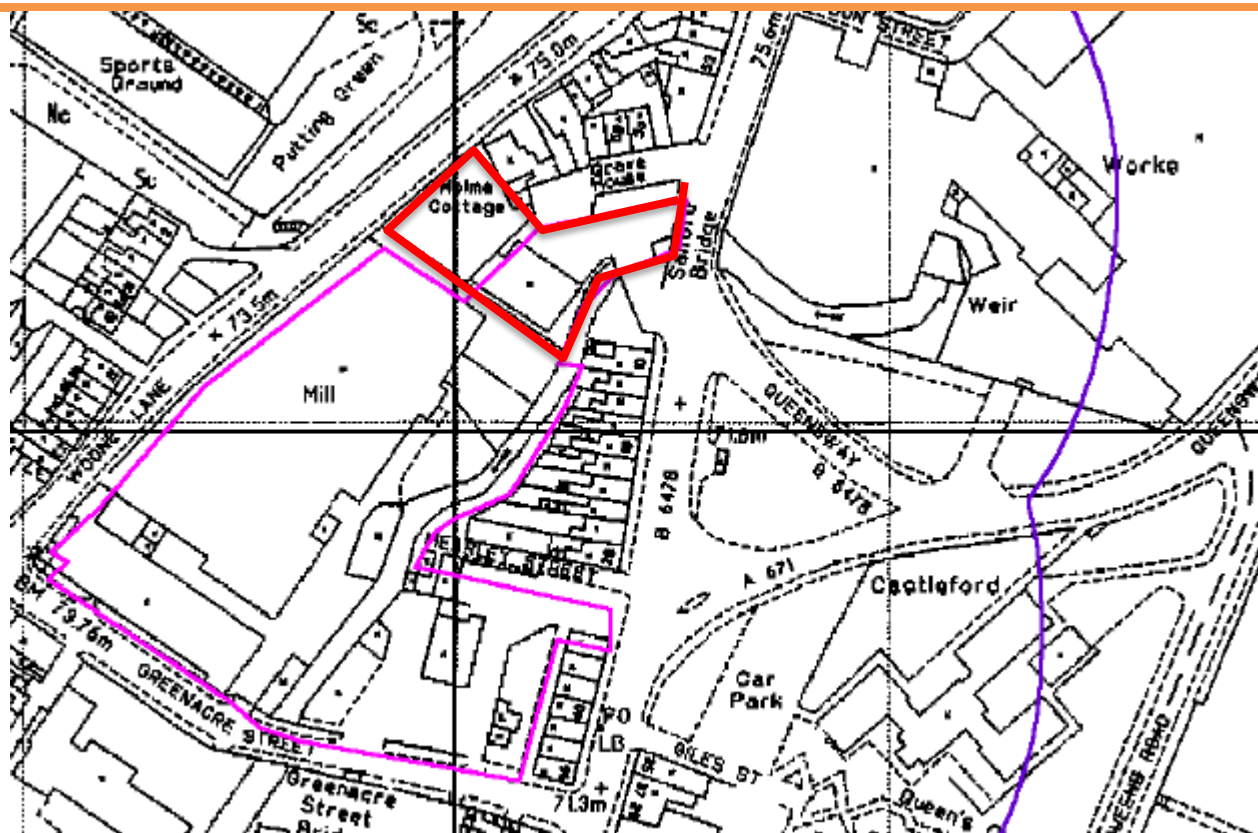


Historical Map

Dated: 1977

Original Scale: 1:2,500





Historical Map

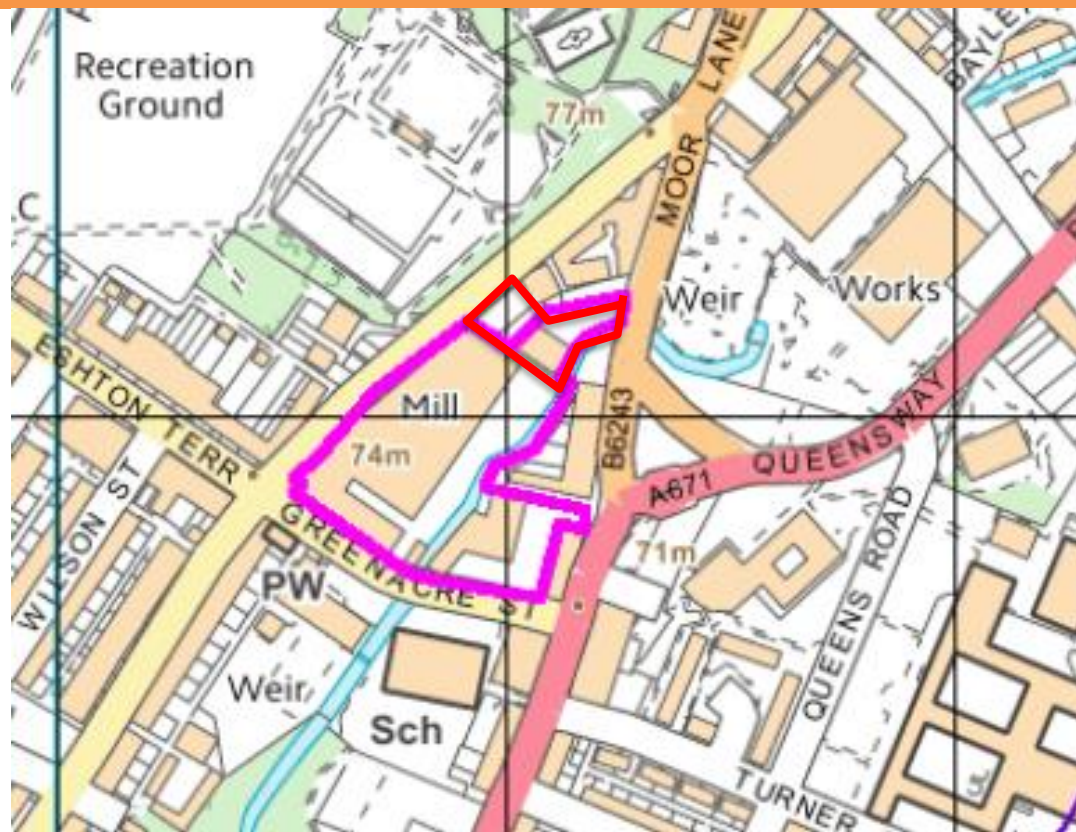
Dated: 1993

Original Scale: 1:2,500



North





Historical Map

Dated: 2014

Original Scale: 1:10,000



North

