

INVESTIGATE



REMEDIATE



REGENERATE

# TECHNICAL REPORT

**REMEDIATION STATEMENT**
**FOR**
**THE BIRDS PUBLIC HOUSE,**
**HALMER GATE, SPALDING,**
**LINCOLNSHIRE**
**FOR**
**LIFE PROPERTY CONSTRUCTION LIMITED**
**(THE GLENHOLME HEALTHCARE GROUP LIMITED)**

**REPORT NO. NE3769C**
**JULY 2019**

**SUB SURFACE NORTH EAST LIMITED**
AHED House
Dewsbury Road
Ossett
West Yorkshire
WF5 9ND
Tel: 01924 278181 Fax: 01924 283455
Email: dsimpson@subsurface.co.uk
Website: www.subsurface.co.uk

**CONTENTS**


| | |
|---|---|
| 1. INTRODUCTION | 1.1 Site Location and Description |
| | 1.2 Proposed Development |
| | 1.3 Summary of the Phase I Walkover Survey and Desk Study |
| | 1.4 Summary of the Phase II Ground Investigation |
| | 1.5 Conceptual Ground Model |
| 2. REMEDIATION | 2.1 Contamination |
| | 2.2 Ground Gas |
| | 2.3 Site Operatives |
| | 2.4 Validation Report |
| | 2.5 General |
| APPENDICES | Figures |




Sub Surface North East Limited
AHED House, Dewsbury Road, Ossett, West Yorkshire, WF5 9ND
Tel: 01924 278181 Fax: 01924 283455 Email: dsimpson@subsurface.co.uk

**REMEDIATION STATEMENT FOR THE BIRDS PUBLIC HOUSE, HALMER GATE, SPALDING, LINCOLNSHIRE**

**CLIENT: LIFE PROPERTY CONSTRUCTION LIMITED (THE GLENHOLME HEALTHCARE GROUP LIMITED)**

**ENGINEER: W A CONSULTING ENGINEERS**

---

## 1. INTRODUCTION

Our brief is to provide a Phase III Remediation Statement in order that the Planning Application for the proposed development can be approved by the Regulator.

We have prepared this Remediation Statement following an email instruction, dated 25 April 2019, from the Architect (DWA Architects (London) Limited), on behalf of the Client.

We have previously prepared and issued reports for this site, as follows:

- Phase I: Walkover Survey & Desk Study Report, ref. NE3769, November 2018.
- Phase II: Ground Investigation Report, ref. NE3769A, March 2019.
- Phase II: Additional GI Report, ref. NE3769B, June 2019.

The above should be read in conjunction with this Phase III Remediation Statement.

### 1.1 Site Location and Description

The site (The Birds Public House) is located to the south south east of the junction of Halmer Gate, Albert Street, Queens Road and Low Road in the eastern part of Spalding, Lincolnshire, as shown on Figure 1. The approximate National Grid Reference of the centre of the site is TF. 2580 2290.

As shown on Figure 2, the near trapezoidal shaped about 0.47 hectare site is bounded to the north west by Halmer Gate with houses beyond, to the north by the road junction with houses and commercial/ industrial premises beyond, to the east by houses and commercial/ industrial premises and to the south and west south west by houses off of Avebury Gardens.

At the time of our last visit to site, in May 2019, the irregular shaped Public House building occupied the central northern two thirds of the site, largely surrounded by bituminous macadam surfaced car parks, with a small square building about 16 metres to the south. Beyond the small square building and a fence the southern third of the site was a grassed beer garden with a childrens play area. The site boundary was marked by fences and hedges with a drainage ditch along the eastern boundary. A small planted area was present on the central northern boundary and contains some semi mature and mature trees and bushes.

### 1.2 Proposed Development

We understand that it is proposed to demolish the existing buildings and to construct a three storey 61 bedroom care home building with surrounding gardens and a car park in the northern part adjoining Halmer Gate, as shown on Figure 3.


Sub Surface North East Limited
AHED House, Dewsbury Road, Ossett, West Yorkshire, WF5 9ND
Tel: 01924 278181 Fax: 01924 283455 Email: dsimpson@subsurface.co.uk

## 1.3. Summary of the Phase I Walkover Survey and Desk Study

### 1.3.1 Historical Appraisal

The earliest available 1887 and 1889 Ordnance surveys of the site show it to be part of a larger field with trees along its north eastern boundary and with a row of terraced houses beyond. The site was bounded to the north by the junction of four roads, including Halmer Gate, which was at this time to the north east of Spalding, Lincolnshire. Apart from houses being built along Halmer Gate there were few changes until the 1932 survey when the trees were removed and a drainage channel was excavated along the eastern site boundary. In the period between 1958 and 1965 roads were established on land to the east and west followed by housing developments. In addition The Birds Public House was constructed in the centre of the site and apparently surrounded by car parking areas with the beer garden established in the southern third of the site. The 2019 ground investigation indicates that the car park surface to the east of the Public House is now about 0.20 metres beneath the paved surface cover and underlying contaminated soils.

### 1.3.2 Geological Appraisal

Beneath any Made Ground that is present from the existing development, the geological appraisal indicated that the site is underlain by Tidal Flats drift deposits, comprising clays and silts, underlain by the Jurassic (Callovian) Oxford Clay Formation, comprising mudstones.

### 1.3.3 Mining Appraisal

There is no evidence of mining beneath the site or its surrounding area.

### 1.3.4 Environmental Appraisal

Our environmental appraisal was based upon a Groundsure EnviroInsight Report for the site. Where potential environmental risks were identified they are listed below (with our assessment in brackets):

- one licensed discharge consent about 332 metres to the east of the site (very low).
- one pollution incident in 2002 about 233 metres to the east of the site which had a minor impact on water (very low).

Under the hydrogeology and hydrology section the drift deposits, comprising clays and silts, were indicated to be an unproductive aquifer due to their low permeability and the underlying Oxford Clay Formation, comprising mudstones, was also indicated to be an unproductive aquifer due its low permeability.

One licensed surface water abstraction point was identified about 923 metres to the south but is unlikely to be affected by any contaminants found on the site. No licensed groundwater abstraction points or licensed potable water abstraction points were present with 1km and 2km of the site boundary respectively.

The site is within Flood Zones 2 and 3, there is a medium risk of flooding and a Flood Risk Assessment has been recommended. There are no flood storages within 250 metres and there is one flood defence present about 249 metres to the east of the site.

The site is within a Nitrate Vulnerable zone.


Sub Surface North East Limited
AHED House, Dewsbury Road, Ossett, West Yorkshire, WF5 9ND
Tel: 01924 278181 Fax: 01924 283455 Email: dsimpson@subsurface.co.uk

## 1.4 Summary of Phase II Ground Investigation

### 1.4.1 Ground Conditions

The main ground investigation in December 2018 and January 2019 (see appended NE3769A Figure 4), found granular and/ or cohesive Made Ground to up to 1.90 metres depth in the northern two thirds of the site and none, except paving flags, in the southern third of the site. Underlying the Made Ground and from the surface where no Made Ground is present, were extremely low to low strength cohesive drift deposits to between 2.70 and 2.90 metres depth, apparent very loose granular drift deposits to between 7.20 and 9.80 metres depth and generally extremely low strength cohesive drift deposits to between 12.00 and 12.80 metres depth. Medium dense to very dense granular drift deposits were then found to between 14.80 and 15.00 metres depth and underlain by medium to high strength cohesive drift deposits to 16.50 metres depth and very high strength cohesive drift deposits to 22.45 metres depth.

An additional investigation in May 2019 (see appended NE3769B Figure 4), was undertaken in the area to the east of the Public House building. The 0.05 metre thick paving slabs were generally underlain by brown silty sands and in parts slightly gravelly silty sands, the gravel sized fragments comprising bituminous macadam. A 0.06 to 0.18 metre thick bituminous macadam layer was then found, this apparently being a buried former car park surface, but was absent adjacent to the building. The bituminous macadam was underlain, where penetrated, by a sub-base layer of compact light cream brown gravel sized fragments of limestone and locally by light brown silty sand. Beyond the paving slabs and footpath 0.30 metres of slightly gravelly sandy silt, the gravel sized fragments comprising plastic, was underlain by compact light cream brown gravel sized fragments of limestone (as found elsewhere) to 0.40 metres depth.

### 1.4.2 Groundwater

A groundwater seepage was recorded at 1.10 metres depth in the north western part of the site whilst elsewhere low and medium groundwater inflows were recorded at greater than 2.70 metres depth. Fast groundwater inflows at 12.00 to 13.00 metres depth did, however, rise to between 2.50 and 2.70 metres depth in 20 minutes.

### 1.4.3 Contamination (Soil)

As part of the main ground investigation five soil samples were analysed for a standard suite of determinants, in accordance with the Phase I Conceptual Ground Model, and the assessment determined that in the area to the east of the Public House Building a number of speciated poly-nuclear aromatic hydrocarbons (PAHs) were elevated and in addition total petroleum hydrocarbons (TPHs) were raised indicating that there may be volatile organics present. An additional ground investigation was subsequently undertaken and eight soil samples were analysed for a more comprehensive suite of determinants. The assessment again found speciated poly-nuclear aromatic hydrocarbons (PAHs) were elevated but volatile organics were proven to be negligible. Our review determined that in the area to the east of the Public House building, where a no hard cover is provided, a clean cover system should be placed. Alternatively the source of the contamination could be removed.


Sub Surface North East Limited
AHED House, Dewsbury Road, Ossett, West Yorkshire, WF5 9ND
Tel: 01924 278181 Fax: 01924 283455 Email: dsimpson@subsurface.co.uk

1.4.4 Contamination (Groundwater)

Groundwater was sampled and analysed, in accordance with the Phase I Conceptual Ground Model, and found to be contaminated and represents a risk to "controlled waters" where a pathway is present. Our review determined that the open drain running along the eastern site boundary is the only "controlled water" at risk and hence care will need to be taken to ensure that during development water from the site is not allowed to discharge to the open drain.

1.4.5 Ground Gas

The Phase I Report determined that infilled ponds, about 216 and 240 metres to the east of the site boundary, are potential sources of ground gas. As the site is within 250 metres of the source the site would normally be considered to be at risk from migrating ground gases from the source. However, our review concluded that as the site and surrounding area is underlain by impermeable soils and rocks, the possibility of migrating ground gas entering the site from the source is negligible. No standpipes or ground gas monitoring has therefore been undertaken.

## 1.5 Conceptual Ground Model

The conceptual ground model of a site has been updated with regards to contamination sources, pathways and receptors, following the ground investigation, as follows:

TABLE 1 CONCEPTUAL GROUND MODEL

| Potential Source | Nature of Hazard | Contaminants Associated with the Source | Pathway | Receptor | Mitigation Action |
|---|---|---|---|---|---|
| Made Ground | Contaminants in Made Ground | Poly-nuclear Aromatic Hydrocarbons (PAH) | Ingestion of soil<br>Ingestion of dust<br>Dermal contact | Site Operatives | Limit contact with soil by adequate clothing and PPE. |
| | | | Inhalation of dust<br>Inhalation of vapours | End User | Provide clean blanket of topsoil/ subsoil |
| | | | Uptake via contaminated groundwater | Vegetation | Provide clean blanket of topsoil/ subsoil. |
| Made Ground | Contaminants in Made Ground | Sulphate<br>Arsenic<br>Boron<br>Mercury<br>Nickel<br>Selenium<br>Zinc<br>Total Petroleum Hydrocarbons (TPH) | Vertical and lateral movement of mobile contaminants to surface water and groundwater | Controlled Waters | Prevent surface run-off to open drain along eastern site boundary and collect and dispose groundwater at a licensed discharge point. |


Sub Surface North East Limited
AHED House, Dewsbury Road, Ossett, West Yorkshire, WF5 9ND
Tel: 01924 278181 Fax: 01924 283455 Email: dsimpson@subsurface.co.uk

## 2. REMEDIATION

### 2.1 Contamination

#### 2.1.1 Preparatory Works

Preparations for remedial works need to address issues of health and safety, pollution and nuisance in relation to site operatives, visitors to the site and associated plant, surrounding residents and the general public who may be affected by on-site works.

The site area should be made secure to prevent unauthorised access during site remediation works when contaminated materials are to be exposed. Access to site should be regulated by the site manager with records kept of on-site personnel and visitors, lorry movements, materials imported and exported from the site etc. This information should be made available for the Phase IV Validation Report.

Prior to undertaking remediation a bund should be formed along the eastern site boundary to prevent any surface water runoff discharging to the open drain.

#### 2.1.2 Cover System

Elevated levels of speciated poly-nuclear aromatic hydrocarbons have been found in the area to the east of the Public House building where it appears that that the former car park surface has been covered by contaminated soils and hence precautions and remedial measures are required, as follows:

Where buildings or permanent hard surface cover is present (excluding paved footpaths areas) no other surface protection will be required as the contamination pathway will be broken from the source to the target.

Two remediation options are available and we recommend that each option is costed. The options are as follows:

- Option A: In order to break the pathway from the contaminated soils (source) to the end users of the development (receptors) a 450mm blanket of imported clean topsoil/ subsoil should be placed in proposed gardens and vegetated borders. In addition deeper rooted bushes and trees should be pit planted on and in clean topsoil/ subsoil.

- Option B: Remove the former bituminous macadam car park surface and contaminated material above and immediately below it, validate that the remaining surface is clean and place a nominal thickness of imported clean topsoil.

It should be noted that Option B would remove the need to consider contaminated ground if further development is undertaken at a later date.

It should be noted that the Regulator may require that an appropriately qualified and experienced person should have a “watching brief” during the remediation and the observations of this person should be made available for the Phase IV Validation Report.


Sub Surface North East Limited
AHED House, Dewsbury Road, Ossett, West Yorkshire, WF5 9ND
Tel: 01924 278181 Fax: 01924 283455 Email: dsimpson@subsurface.co.uk

For Option A the thickness of clean topsoil/ subsoil placed will have to be checked by taking out an appropriate number of hand dug trial pits. We have indicated where we consider that the hand dug trial pits should be located on Figure 5, but the view of the Regulator should be sought prior to initiating these works. A photographic record should also be made during placement of the topsoil/ subsoil or during the trial pitting. The above information should form part of the Phase IV Validation Report.

For Option B the surface exposed following the removal of the contaminated soils, the former bituminous macadam car park surface and say 0.10 metres of the underlying sub-base an appropriate number of surface samples will need to be taken and submitted for contamination analysis prior to placing the nominal thickness of topsoil. We have indicated where we consider that the surface samples should be located on Figure 5, but the view of the Regulator should be sought prior to initiating these works. A photographic record should also be made and the above information should form part of the Phase IV Validation Report.

Contamination analysis certificates for the proposed imported clean topsoil/ subsoil should be obtained and assessed by an independent appropriately qualified and experienced person to determine whether the imported material is suitable for use as a cover system for the proposed development.

With regard to published guidance we currently use Land Quality Management (LQM) Suitable for Use Levels (S4ULs) for a comprehensive suite of determinants. Guideline values for the assessment can be supplied directly to the Regulator, if requested.

In addition samples from each load of imported clean topsoil/ subsoil should be taken and submitted for contamination analysis and assessment. It is recommended that the imported clean topsoil/ subsoil is stockpiled and protected/ covered until the analysis is received and assessed.

With regard to the number of samples to be taken for contamination analyses, subject to the approval of the Regulator, the following should be taken:

Samples from a “Greenfield” source: A minimum 3 No. samples or 1 No. sample per 250$m^3$ imported, whichever is the greater.
Samples from a “Brownfield” source: A minimum 6 No. samples or 1 No. sample per 100$m^3$ imported, whichever is the greater.

Transfer documentation for each load of clean topsoil/ subsoil imported and contaminated material exported from the site should be obtained and made available for the Phase IV Validation Report.


Sub Surface North East Limited
AHED House, Dewsbury Road, Ossett, West Yorkshire, WF5 9ND
Tel: 01924 278181 Fax: 01924 283455 Email: dsimpson@subsurface.co.uk

2.1.3 Waste Disposal

Classification of the waste should be undertaken prior to removing it to a licensed waste disposal facility. All vehicles carrying contaminated material should be securely sheeted and the wheels and undercarriages cleaned before leaving site to ensure that hazardous materials are not dropped onto public roads.

Transfer documentation for each load of contaminated material exported from the site should be obtained and made available for the Phase IV Validation Report.

The contamination analysis for groundwater to be disposed should be submitted to the appropriate authority or a waste disposal operator to determine the most cost effective method of disposal. Groundwater should not be discharged to a sewer without firstly obtaining a discharge consent from the appropriate authority.

Discharge consents and/or transfer documentation for groundwater exported from the site should be obtained and made available for the Phase IV Validation Report.

## 2.2 Ground Gas

No precautions or remedial measures were considered to be necessary for this development.

## 2.3 Site Operatives

Measures need to be put in place to prevent site operatives coming into direct contact with contaminated materials either by skin contact or by breathing in dust or vapours due to the elevated levels of hydrocarbons.

Site personnel involved in earthworks and excavations should be made aware of the hazards of working with contaminated materials found on site. Strict personal hygiene should be observed and gloves, overalls and boots should be worn. Washing and messing facilitates should be made available on site and smoking should be prohibited.

Consideration needs to be given to site operatives who may be at risk from elevated levels of methane and/or carbon dioxide and/or depleted levels of oxygen in confined spaces below ground. All excavations of greater than 1.20 metres depth should be routinely checked for air quality prior to man entry and appropriate precautions taken. Any manholes, inspection chambers or other void spaces formed beneath the sites ground surface are potential ground gas traps. Precautions, as per the excavations above, should be taken.

## 2.4 Validation Report

On completion of the remedial works a Phase IV Validation Report should be produced by the independent suitably qualified person. The report should include records of on-site observations together with contamination analysis certificates, transfer notes, discharge consents, specifications etc.


Sub Surface North East Limited
AHED House, Dewsbury Road, Ossett, West Yorkshire, WF5 9ND
Tel: 01924 278181 Fax: 01924 283455 Email: dsimpson@subsurface.co.uk

## 2.5 General

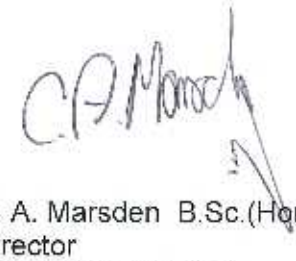
Following receipt of an instruction, we would be happy to validate the remedial works and prepare a Phase IV Validation Report on completion of the actions contained within the Phase III Remediation Statement. Should the proposed development of the site be undertaken in stages a Phase IV Validation Report could be produced at each stage of the development.

We trust that this report fulfils your present requirements but if you have any queries or we can be of further assistance please contact the undersigned or Mr David Simpson at our Ossett office.

SUB SURFACE CONSULTANTS LIMITED
REPORT No. NE3769C
JULY 2019



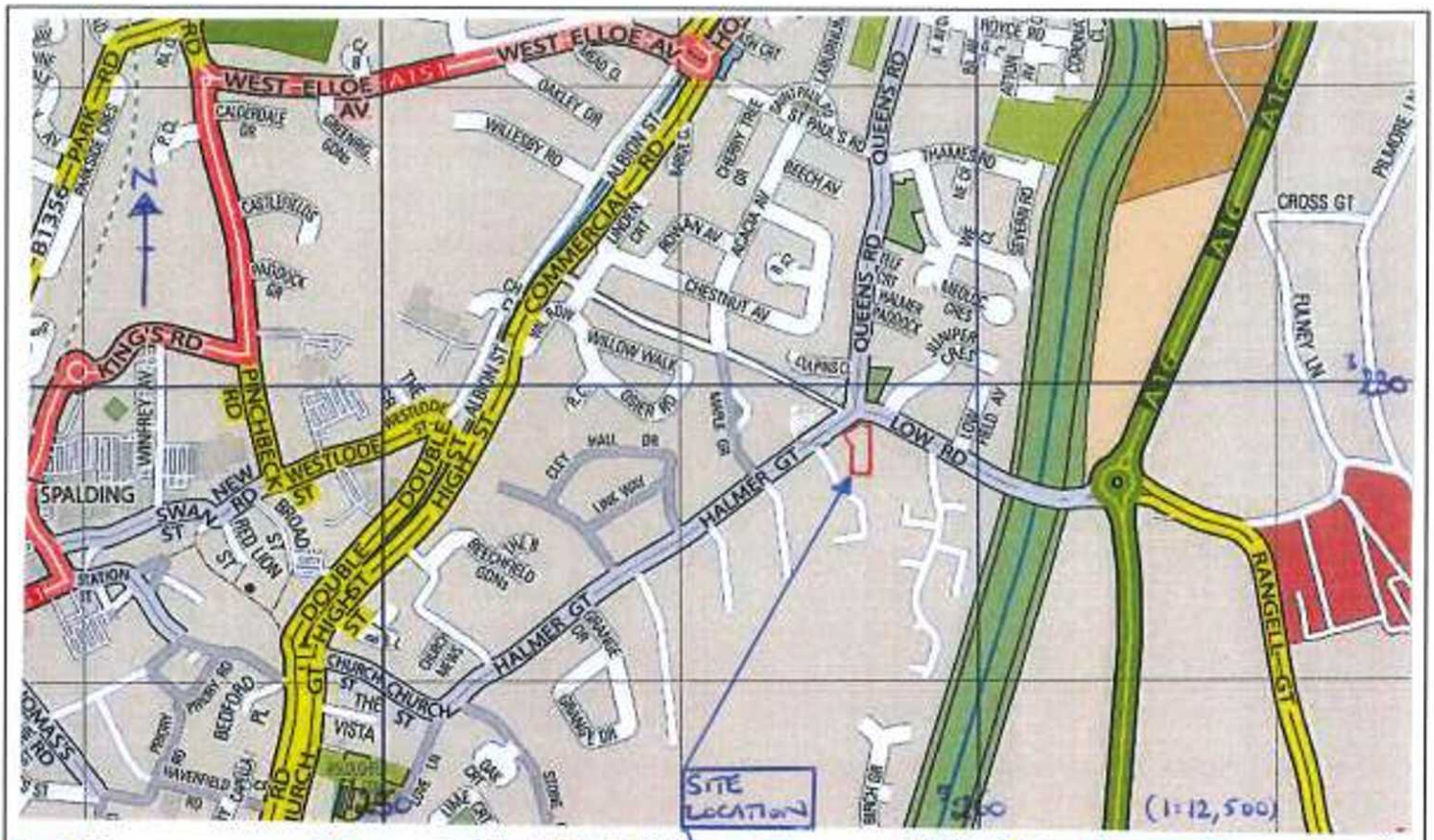
A. J. Parker B.Sc.(Hons.), C.Geol., F.G.S.
Principal Geotechnical Engineer
For and on behalf of
Sub Surface Consultants Limited

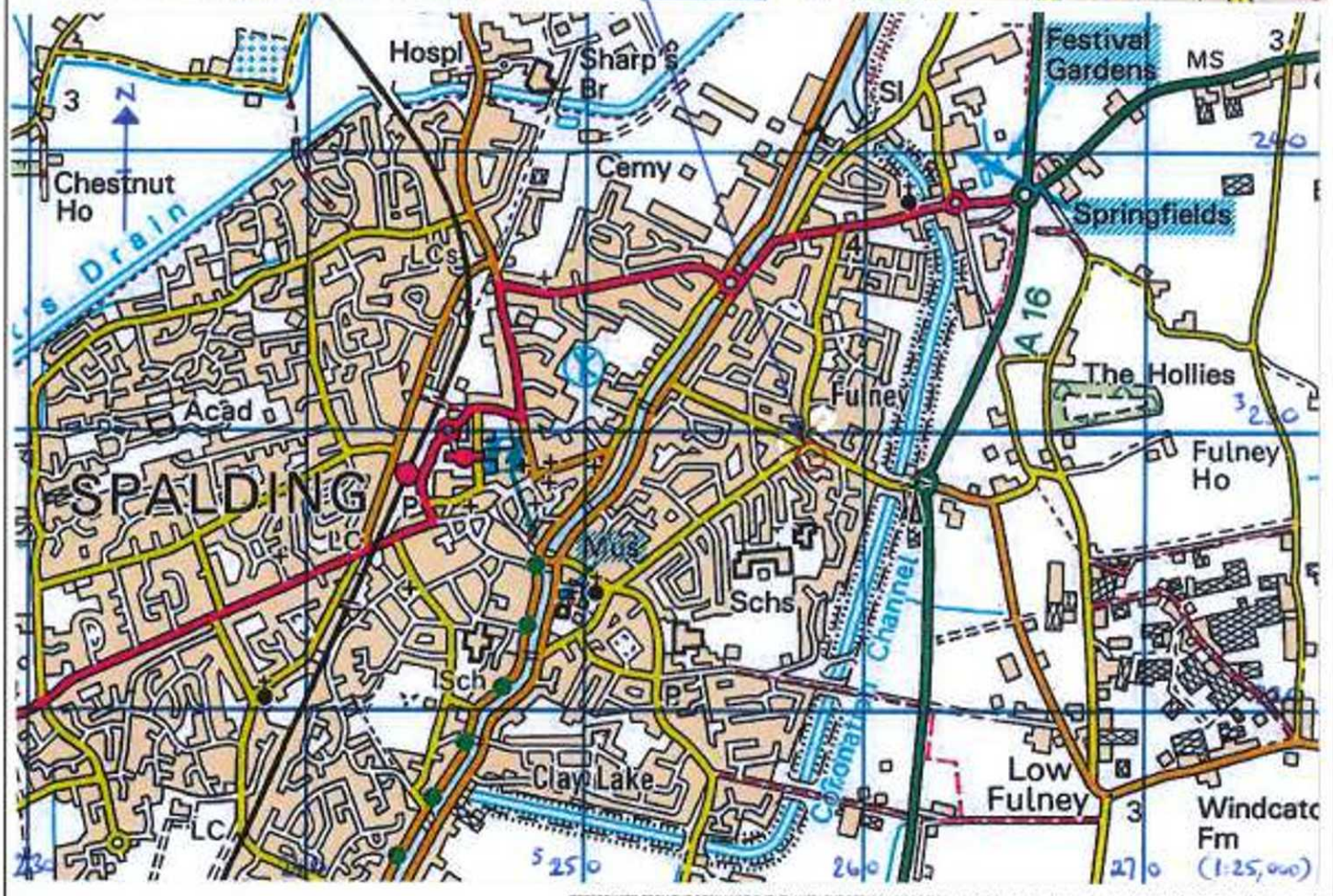


C. A. Marsden B.Sc.(Hons.), C.Eng., M.I.C.E.
Director
For and on behalf of
Sub Surface Consultants Limited.


Sub Surface North East Limited
AHED House, Dewsbury Road, Ossett, West Yorkshire, WF5 9ND
Tel: 01924 278181 Fax: 01924 283455 Email: dsimpson@subsurface.co.uk

**FIGURES**



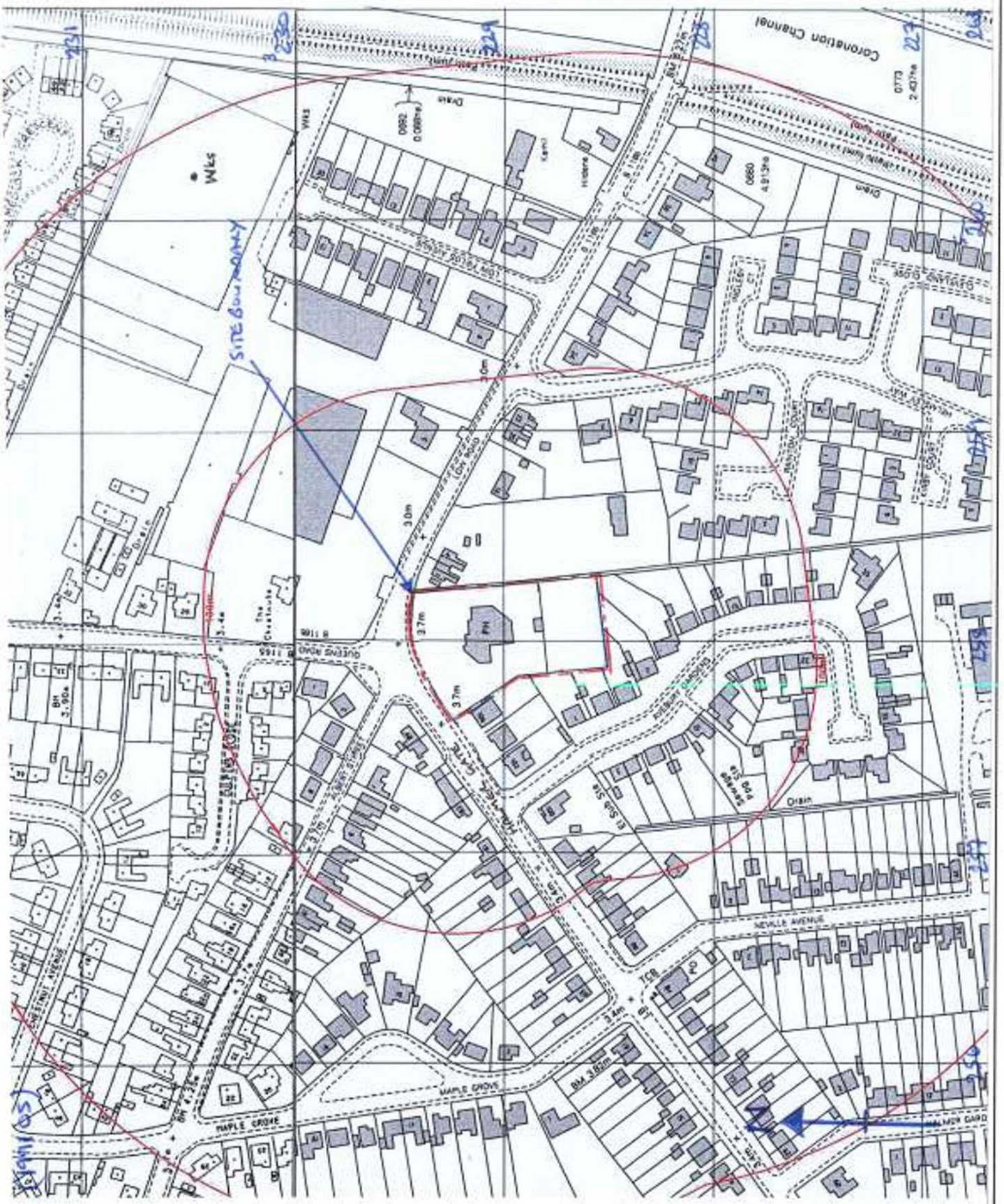




REPRODUCED FROM THE ORDNANCE SURVEY WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONARY OFFICE (LICENCE NO. 100035484)

SUB SURFACE
SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135. Fax (01772) 204907

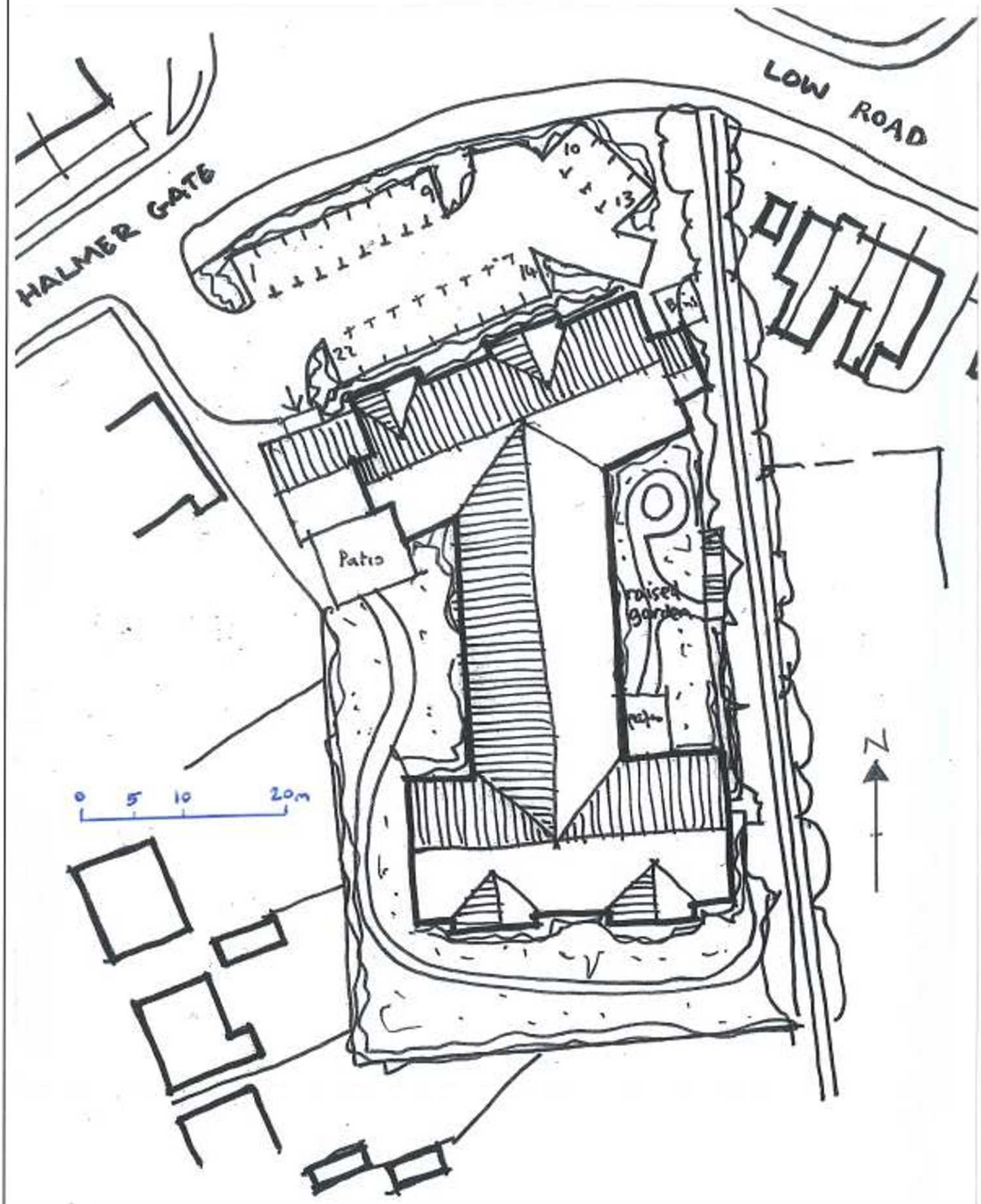
Site Location Plan

| Site | Date Drawn | Date Checked | Sheet | Job No. |
|---|---|---|---|---|
| THE BIRDS PUBLIC HOUSE, HALMER GATE, SPALDING, LINCOLNSHIRE | 27-Feb-19 | | 1 / 1 | NE3769A |
| **Client** | **Drawn By** | **Checked By** | **Scale** | **Figure No.** |
| LIFE PROPERTY CONSTRUCTION LIMITED | AJP | | As shown (at A4) | 1 |

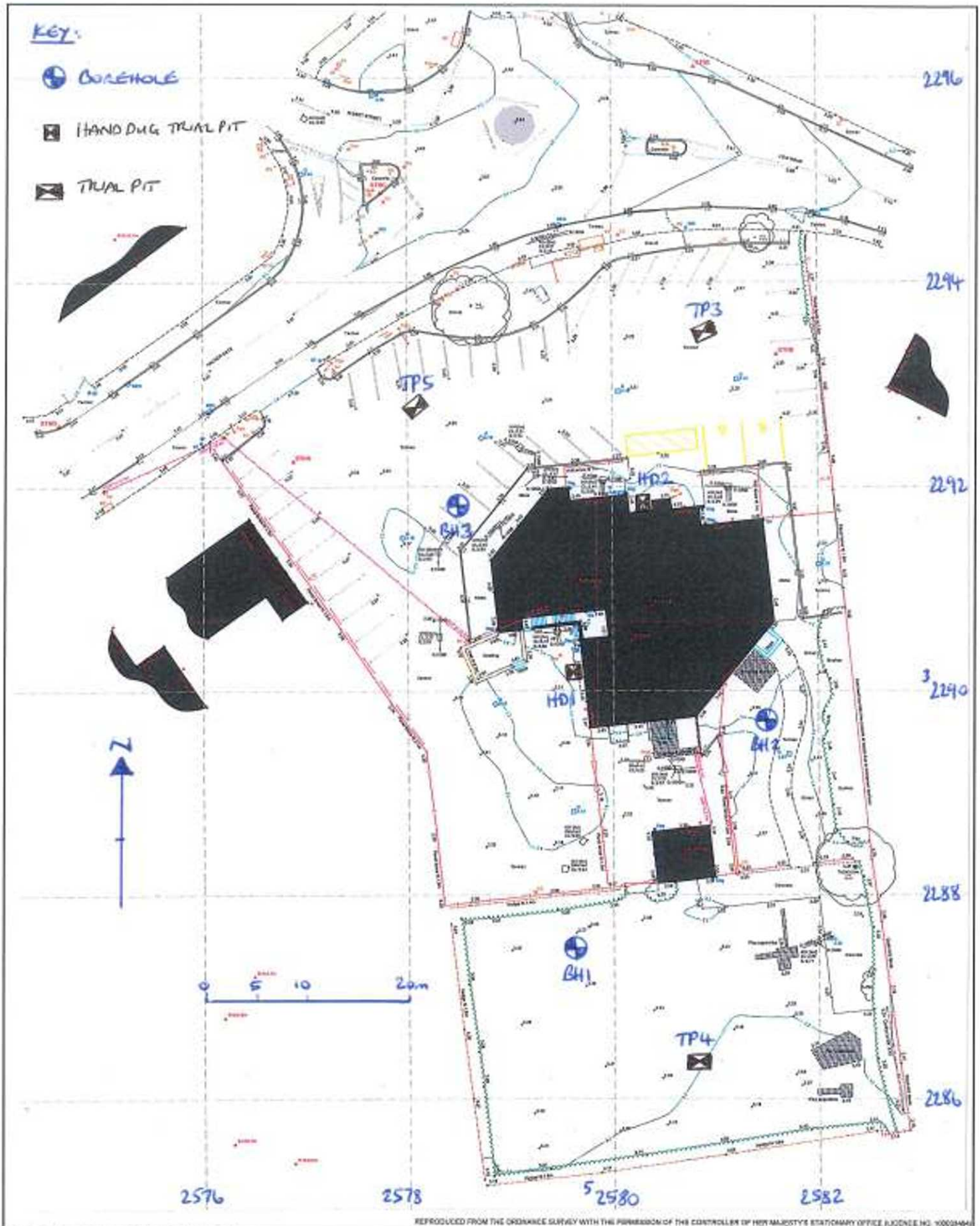



REPRODUCED FROM THE ORDNANCE SURVEY WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONARY OFFICE (LICENCE NO. 100033464)

| | | | | |
|---|---|---|---|---|
| SUB SURFACE<br>SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS<br>3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907 | Site Boundary Plan | | | |
| Site<br>THE BIRDS PUBLIC HOUSE, HALMER GATE, SPALDING, LINCOLNSHIRE | Date Drawn<br>27-Feb-19 | Date Checked | Sheet<br>1 / 1 | Job No.<br>NE3769A |
| Client<br>LIFE PROPERTY CONSTRUCTION LIMITED | Drawn By<br>AJP | Checked By | Scale<br>1:2,500 | Figure No.<br>2 |




| | | | | |
|---|---|---|---|---|
| SUB SURFACE<br>SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS<br>3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907 | Proposed Development Layout Plan | | | |
| Site<br>THE BIRDS PUBLIC HOUSE, HALMER GATE, SPALDING, LINCOLNSHIRE | Date Drawn<br>27-Feb-19 | Date Checked | Sheet<br>1 / 1 | Job No.<br>NE3769A |
| Client<br>LIFE PROPERTY CONSTRUCTION LIMITED | Drawn By<br>AJP | Checked By | Scale<br>1:500 | Figure No.<br>3 |

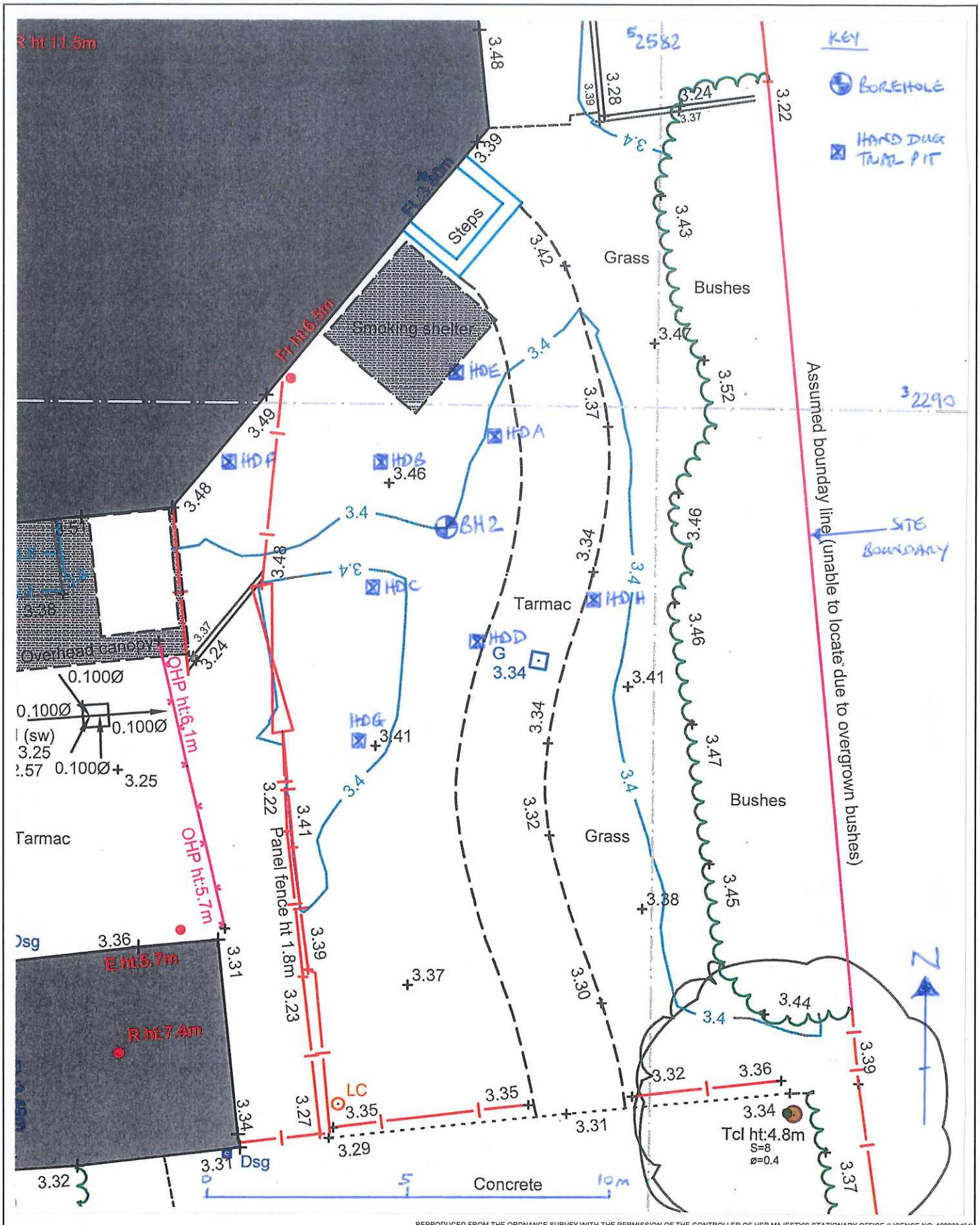



REPRODUCED FROM THE ORDNANCE SURVEY WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONARY OFFICE (LICENCE NO. 100039464)

SUB SURFACE
SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Topographical & Exploratory Hole Location Plan

| Site | Date Drawn | Date Checked | Sheet | Job No. |
|---|---|---|---|---|
| THE BIRDS PUBLIC HOUSE, HALMER GATE, SPALDING, LINCOLNSHIRE | 27-Feb-19 | | 1 / 1 | NE3769A |
| **Client** | **Drawn By** | **Checked By** | **Scale** | **Figure No.** |
| LIFE PROPERTY CONSTRUCTION LIMITED | AJP | | 1:500 | 4 |

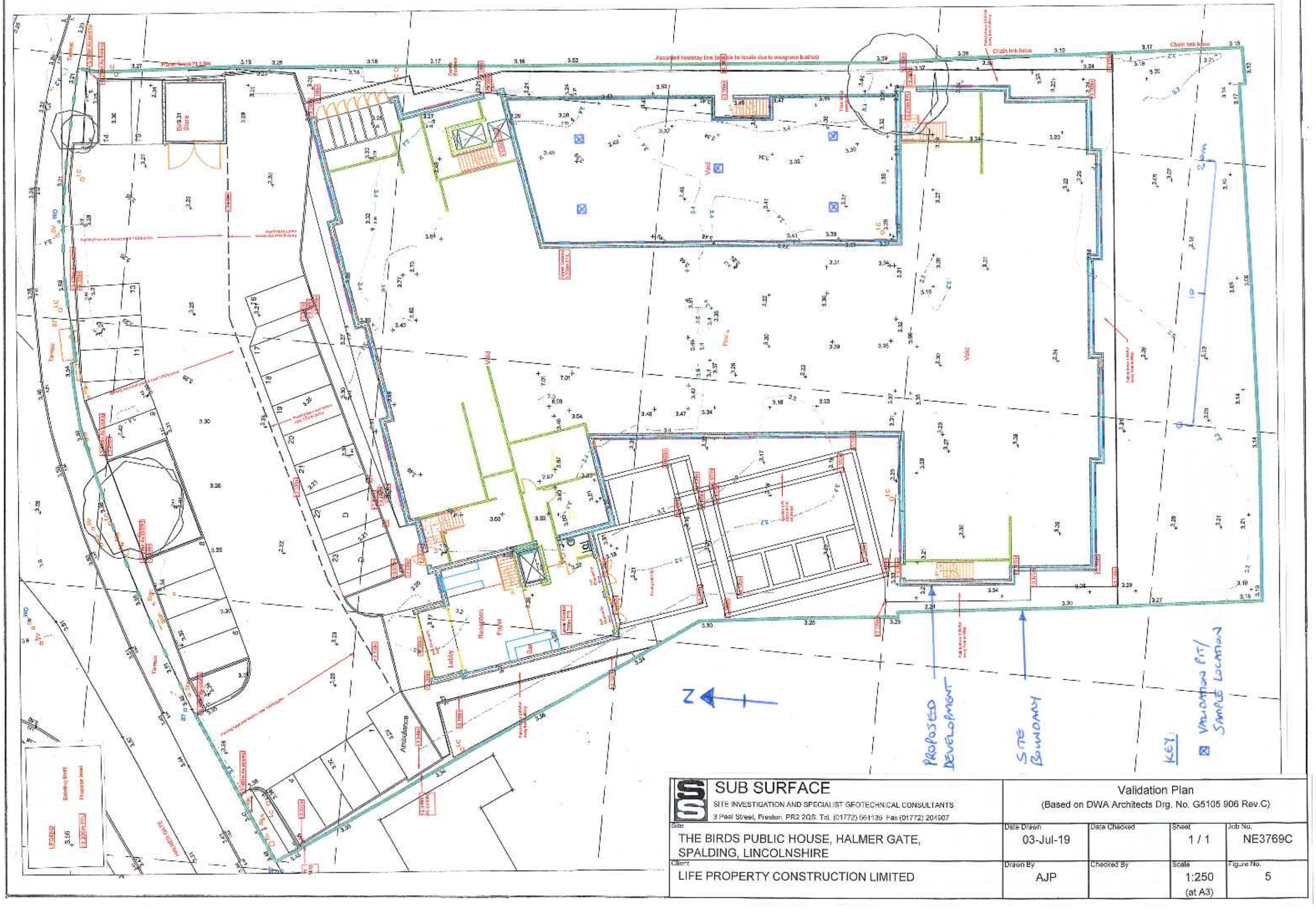



REPRODUCED FROM THE ORDNANCE SURVEY WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONARY OFFICE (LICENCE NO. 100033464)

SUB SURFACE
SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

# Topographical & Exploratory Hole Location Plan

| Site | Date Drawn | Date Checked | Sheet | Job No. |
|---|---|---|---|---|
| THE BIRDS PUBLIC HOUSE, HALMER GATE, SPALDING, LINCOLNSHIRE | 21-Jun-19 | | 1 / 1 | NE3769B |
| **Client** | **Drawn By** | **Checked By** | **Scale** | **Figure No.** |
| LIFE PROPERTY CONSTRUCTION LIMITED | AJP | | 1:125 | 4 |




| | | | | |
|---|---|---|---|---|
| **SUB SURFACE**<br>SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS<br>3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907 | | | Validation Plan<br>(Based on DWA Architects Drg. No. G5105 906 Rev.C) | |
| Site<br>THE BIRDS PUBLIC HOUSE, HALMER GATE, SPALDING, LINCOLNSHIRE | Date Drawn<br>03-Jul-19 | Date Checked | Sheet<br>1 / 1 | Job No.<br>NE3769C |
| Client<br>LIFE PROPERTY CONSTRUCTION LIMITED | Drawn By<br>AJP | Checked By | Scale<br>1:250 (at A3) | Figure No.<br>5 |