

**ARCHAEOLOGICAL DESK
BASED ASSESSMENT**

**TESCO STORE
WATERMILL LANE
HORNCastle
LINCOLNSHIRE**



PAUL CHADWICK BA FSA MIFA

APRIL 2004

**ARCHAEOLOGICAL DESK
BASED ASSESSMENT**

**TESCO STORE
WATERMILL LANE
HORNCastle
LINCOLNSHIRE**

**LOCAL PLANNING AUTHORITY:
EAST LINDSEY DISTRICT COUNCIL**

SITE CENTRED AT: TF 258 698

PAUL CHADWICK BA FSA MIFA

APRIL 2004

CONTENTS

- 1.0 Introduction and Scope of Study
- 2.0 Planning and Development Plan Background
- 3.0 Geology and Topography
- 4.0 Archaeological and Historical Background,
including map regression exercise
- 5.0 Site Conditions and the Proposed Development
- 6.0 Summary and Conclusions

Sources Consulted

Appendix 1:

Site investigation logs

LIST OF ILLUSTRATIONS

- Fig. 1 Site location
- Fig. 2 Site details
- Fig. 3 Extract from Lincolnshire Sites and Monuments Record
- Fig. 4 Roman Horncastle
- Fig. 5 1889 Ordnance Survey 1st edition 25in scale
- Fig. 6 1906 Ordnance Survey 2nd edition 25in scale
- Fig. 7 1969 Ordnance Survey 1:2,500 scale
- Fig. 8 The Proposed Development

1.0 INTRODUCTION AND SCOPE OF STUDY

- 1.1 This archaeological desk-based assessment has been researched and prepared by Paul Chadwick of CgMs Consulting on behalf of Tesco Stores Ltd and their planning advisors, Cunnane town planning' (Manchester).
- 1.2 The assessment examines a site, also referred to as the study site, off Watermill Lane, Horncastle, Lincolnshire that is essentially an island bounded by the River Bain to the east and an unnamed tributary stream to the west.
- 1.2.1 The study site is approximately 1.5 hectares in extent and is irregular in shape. It is bounded by a flood defence bank along the River Bain to the east, to the south and west by an existing car park access road (which enters the site on a bridge over the Bain and runs along the western site boundary bordering an unnamed stream), and to the north by an unmarked alignment through unmanaged scrub on the west bank of the River Bain. The site is centred at TF 258 698 (Figs 1 and 2).
- 1.3 A planning application for a new Foodstore, sited to the north of an existing store, has been submitted to East Lindsey District Council (reference S/086/1716/03) and in advising the local planning authority, the Archaeological Officer of Lincolnshire County Council, Dr Beryl Lott, has requested that more information is provided by the applicant before the planning application is determined.
- 1.4 In the first instance, in accordance with the guidance in PPG 16, the applicant has commissioned an archaeological desk assessment of the site in order to establish the possible extent and importance of any archaeological deposits on the site, to identify the potential impact of development and to provide guidance on ways to accommodate any archaeological constraint identified on the site.

- 1.5 As a result, discussions have been held with the Lincolnshire County Archaeological Officer. This desk-based assessment results from these discussions and comprises an examination of evidence on the County Sites and Monuments Record (SMR), various published and unpublished sources, a map regression exercise and site visit (18th March 2004).
- 1.6 The Assessment thus enables relevant parties to assess the archaeological potential of the site and to consider the need for design, civil engineering or archaeological solutions to the archaeological potential identified.

2.0 PLANNING AND DEVELOPMENT PLAN BACKGROUND

2.1 In November 1990 the Department of the Environment issued Planning Policy Guidance Note 16 (PPG16) "Archaeology and Planning", providing guidance for planning authorities, property owners, developers and others on the preservation and investigation of archaeological remains.

2.1.1 In short, government policies provide a framework which:

- Protect Scheduled Ancient Monuments
- Protect the settings of these sites
- Protect nationally important un-scheduled ancient monuments
- Has a presumption in favour of the in situ preservation of nationally important remains
- In appropriate circumstances, requires adequate information (from field evaluation) to enable informed decisions
- Provides for the excavation and investigation of sites not important enough to merit in situ preservation.

2.2 In considering any planning application for development, the local planning authority will be mindful of the policy framework set by government guidance, in this instance PPG16, by current Development Plan Policy and by other material considerations.

2.3 The relevant Development Plan framework is provided by the Lincolnshire Deposit Draft Structure Plan, incorporating 'Agreed Proposed Modifications'. The Plan contains the following policy that provides a framework for the consideration of development proposals affecting archaeological and heritage features:

"POLICY 63

DEVELOPMENT ADVERSELY AFFECTING AN ARCHAEOLOGICAL SITE OF NATIONAL IMPORTANCE (WHETHER SCHEDULED OR NOT) OR ITS SETTING WILL NOT BE PERMITTED.

DEVELOPMENT PROPOSALS WHICH WOULD AFFECT KNOWN OR SUSPECTED ARCHAEOLOGICAL SITES WILL BE THE SUBJECT OF AN ARCHAEOLOGICAL ASSESSMENT, AND SHOULD BE CONSIDERED WITHIN THIS CONTEXT HAVING REGARD TO OTHER MATERIAL CONSIDERATIONS.

WHERE DEVELOPMENT IS PERMITTED, SATISFACTORY ARRANGEMENTS FOR THE PRESERVATION IN SITU OF ARCHAEOLOGY WITHIN THE DEVELOPMENT OR, AS APPROPRIATE, THE EXCAVATION AND RECORDING OF THE ARCHAEOLOGICAL REMAINS AND THE RESULTS PUBLISHED AS APPROPRIATE.

2.4 The Local Plan framework is provided by the East Lindsey District Local Plan, adopted in August 1995, with a Local Plan Alteration published in 1999.

2.4.1 The Local Plan contains the following policies which provide a framework for the consideration of development proposals affecting archaeological features:

POLICY C6 ARCHAEOLOGY

A PLANNING APPLICATION FOR DEVELOPMENT ON, OR AFFECTING, A KNOWN OR SUSPECTED SITE OF ARCHAEOLOGICAL INTEREST MUST BE ACCOMPANIED BY A SITE EVALUATION SUFFICIENT TO ALLOW THE COUNCIL TO DETERMINE THE SITE'S ARCHAEOLOGICAL SIGNIFICANCE.

THE COUNCIL WILL NOT PERMIT DEVELOPMENT WHICH WOULD HARM THE SITE OR SETTING OF: -

- **A SCHEDULED ANCIENT MONUMENT;**
- **ANY UNSCHEDULED NATIONALLY IMPORTANT ARCHAEOLOGICAL SITE; OR ANY LOCALLY IMPORTANT ARCHAEOLOGICAL SITE DEEMED WORTHY OF PRESERVATION IN SITU.**

ON OTHER ARCHAEOLOGICAL SITES WHERE PRESERVATION IN SITU IS NOT WARRANTED, DEVELOPMENT WILL BE PERMITTED PROVIDED: -

- a) **ANY DISTURBANCE IS KEPT TO A MINIMUM OR AVOIDED ALTOGETHER;**
- b) **THE DEVELOPER MAKES SATISFACTORY PROVISION FOR THE EXCAVATION, RECORDING, ARCHIVING AND PUBLICATION OF ANY ARCHAEOLOGICAL REMAINS WHICH WILL BE AFFECTED BY THE DEVELOPMENT; AND**

c) ITS FORM, SCALE, PROPORTIONS, SITING, MATERIALS, BOUNDARY TREATMENT AND ASSOCIATED LANDSCAPING RESPECT AND COMPLEMENT THE SETTING OR ARCHAEOLOGICAL SETTING OF THE SITE.

2.5 Planning permission has already been granted for an extension to the existing Foodstore on the site (local authority reference S/086/01866/99) without any conditions relating to archaeology. However, during the implementation of this permission during 2003, foundation trenching resulted in the discovery of an archaeological find (a human jaw bone) and details of this find have subsequently been entered on the County Sites and Monuments Record (SMR reference LI 4489).

2.6 Because a valid planning permission exists for development on the northern part of the study site (including the location of the archaeological find) planning law establishes that unless the existing planning permission is revoked (and compensation paid), in situ preservation of the findspot is not now achievable. Indeed, such a radical approach appears inappropriate since examination of the foundation trench where the findspot was made (which remains open), suggests that the jaw bone may have been imported to the site with bulk fill to consolidate the existing Store footprint and Service Yard.

2.6.1 In these circumstances, whilst it is recognised that the context of the human jawbone and any associated evidence needs to be clarified, in accordance with development plan policy it appears more appropriate for the developer to make provision for the excavation, recording, archiving and publication of any archaeological remains affected by the new Foodstore proposal. Such safeguards can be adequately secured by the inclusion of a planning condition based on the model in PPG 16 and Circular 11/95.

- 2.7 Accordingly, in these unusual planning and archaeological circumstances, rather than this desk-based assessment identifying the need for pre-determination archaeological field evaluation, it aims to review the archaeological potential of the site and identify the scope of post-planning investigations required to mitigate the impact of the proposed development.

3.0 GEOLOGY AND TOPOGRAPHY

3.1 Geology

- 3.1.1 The study site occupies part of an extensive outcrop of Corallian Limestone and Ampthill/Kimmeridge Clays that outcrop in a broad band from Huntingdonshire, through The Wash to Market Rasen and the Humber.
- 3.1.2 Further detail is provided by the more recent 1:50,000 series Geological Survey (Sheet 115) which shows that the study site occupies an area where Alluvial deposits, River Terrace Gravel and Glacial Tills overlie the Upper Jurassic Kimmeridge Clay Formation.
- 3.1.3 A Site Investigation (SI), comprising 5 trial pits, 6 boreholes and 5 window samples, was undertaken during 2003 and the logs are reproduced at Appendix 1.
- 3.1.4 In short, the SI established a sequence comprising Topsoil/Made Ground over Alluvium, over Glacial Till, in turn resting on Kimmeridge Clay. In landscaped parts of the site (TPs 2 and 3 on the toe of the flood protection bank), topsoil was between 0.20m and 0.30m thick. Made Ground was encountered extensively across the remainder of the site (TPs 1, 3, 4, 5, BH 1, 2, 3, 4 and 5), with the depth of Made Ground varying from 0.50m to 2.20m deep. Made Ground deposits comprised brown clayey sandy gravels and soft brown gravelly clays with occasional cobbles. The gravel and cobble content includes brick, concrete and flint.
- 3.1.5 The SI report concludes that ground levels appear to have been raised across the site as part of the development of the existing store and car park. The Fill/Made Ground material in Boreholes 3, 4 and 5, described by the SI driller as 'Dolomite',

is visible in the 2003 foundation trench (where it appears as an angular creamy-yellow limestone) and it is in this material that the human jawbone was found (no other deposits are visible in the trench).

3.1.6 Below the topsoil/Made Ground alluvial deposits were located and were from 0.50m to in excess of 3.00m thick (although the SI suggests that elements of this sequence may have been redeposited as Made Ground). The alluvium varies in character, but is predominantly slightly clayey and clayey, very sandy gravely sand.

3.1.7 The underlying Glacial Till (BH 1-3, TPsl and 3) was 0.50m to 1.90m thick. Till was absent in BH 4, 5 and WS2, where the Kimmeridge Clay was directly overlain by Alluvium. Kimmeridge Clay, a firm, stiff dark grey-fissured clay with some fossil shell fragments, was located at depths between 2.70m and 5.20m.

3.2 Topography

3.2.1 The study site lies some 250m north of the historic (Roman and Medieval) core of Horncastle. This historic core developed on a spur of land standing well above the Rivers Bain and Waring, where the Bain Valley flattens out into the Fenland surrounding The Wash.

3.2.2 Within this wider topographic setting, the study site lies on the historic floodplain of the River Bain and within this historic floodplain, the site essentially occupies an island formed by the River Bain to the east and a small, unnamed water course to the west, which join to the south of the site. The River Bain then continues southwards to a confluence with the River Waring some 500m south-west of the study site.

3.2.3 As indicated above, levels within the study site were raised during the 1990's to raise the site off the floodplain in order to facilitate the development of a Coop store on the site. Currently, levels within the site are at approximately 34m AOD (Above Ordnance Datum), although a raised riverbank bounding the River Bain extends down the eastern side of the site and is about 1.25m above the remainder of the site. Within the study site, although minor undulations are noted to facilitate drainage across the car park, the remainder of the site, is essentially level.

4.0 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND INCLUDING MAP REGRESSION EXERCISE

4.1 Timescales used in this report.

Prehistoric

Palaeolithic	450,000 - 12,000 BC
Mesolithic	12,000 - 4,000 BC
Neolithic	4,000 - 1,800 BC
Bronze Age	1,800 - 600 BC
Iron Age	600 - AD 43

Historic

Roman	AD 43 - 410
Saxon/Early Medieval	AD 410 - 1066
Medieval	AD 1066 - 1485
Post Medieval	AD 1486 - 1750
Modern	AD 1750 - Present

4.2 An inspection of the Lincolnshire County Sites and Monuments Record (SMR) indicates that no Scheduled Ancient Monuments occur on or near the site. The SMR also records that the boundary of the Horncastle Conservation Area extends to include the River Bain and abuts the current planning application boundary.

4.2.1 For the reasons outlined above (paragraphs 2.5-2.7), this assessment provides a general assessment of the archaeological potential of the site and, since the historic core of Horncastle lies some 250m to the south, does not attempt to chart the Roman and Medieval development of the town.

4.3 Prehistoric

- 4.3.1 Although the Witham Valley and its tributary valleys, including the River Bain, are reasonably well known for the variety and, in places, density of prehistoric settlement and landscape exploitation, Horncastle itself has produced relatively little early prehistoric evidence. Archaeological excavations in the historic core of Horncastle have recovered quantities of Neolithic worked and waste flint (SMR 42691: 27 High Street and SMR 42711: 3-5 Bridge Street) and, closer to the study site, Neolithic flints were recovered from archaeological evaluation trenching in Conging Street (SMR 43091: see Fig 3). However, all these prehistoric finds have come from locations above the floodplain, in flood-free and better-drained locations.
- 4.3.2 From the Late Neolithic and Bronze Age onwards, in a pattern of land-use encountered widely across lowland Britain, river valley landscapes were extensively cleared of their natural woodland cover with a more settled, farming regime developed (evidenced by, for instance, the stone axe from an area north of the centre of Horncastle: Fig 3 SMR 42222). By the later prehistoric period, it is evident that the terraces bordering the River Bain had been cleared and were settled and farmed. Indeed, some of the cropmarks to the south of Horncastle (see cropmarks shown on Figure 4) probably belong to this period.
- 4.3.3 In short, prehistoric evidence has come from better-drained areas bordering the River Bain, rather than from floodplain locations. Within the study site, there is no evidence from the geotechnical data to suggest that gravel 'islands' (which might have attracted prehistoric settlement) are present within or beneath the alluvium. No prehistoric lithic or other artefactual material has been found on the site and, even if present, would be buried at depth, within the alluvial silty clay deposits in a derived context.

- 4.3.4 Accordingly, in this instance, given the distribution of existing archaeological evidence and the floodplain location of the study site, at best, the site has a moderate/poor potential for isolated flint artefacts and a nil potential for features, structures or other remains of prehistoric settlement.

4.4 **Roman**

- 4.4.1 The extent of the Roman settlement, which developed on the gravel terrace deposits to the south of the study site, is shown on Figure 4. In the 3rd and 4th centuries, a walled town (Fig 3: SMR 41872) developed on the spur of land created by the Bain and the Waring. However, as Figures 3 and 4 show, settlement and related artefactual evidence avoid the immediate zone along the Rivers Bain and Waring and their floodplains.
- 4.4.2 Various archaeological studies (Field & Hurst 1983, Hall & Coles 1994) indicate that the current topography of the Fens and their surrounding drainage pattern are not a particularly reliable indicator of ancient topography. The current topographic model of The Wash and Fens in the Roman period suggests that Horncastle was significantly closer to the sea than it is today. Estuarine-type silts have been located extending at least as far as Coningsby, some 9km south-west of Horncastle and by the late Roman period, whilst Horncastle was not coastal, it certainly enjoyed easy access, via the Bain estuary, to the sea. In this context, rising sea levels will have resulted in a backponding of river systems flowing into The Wash and the deposition of silt-load across river floodplains. As a result, it is suggested that significant elements of the alluvial deposits on the study site would have accumulated during the Roman period.
- 4.4.3 Accordingly, a low potential for Roman remains or artefactual evidence on the site is identified.

4.5 Saxon/Early Medieval

4.5.1 Anglo-Saxon occupation and burial is evidenced in the area to the east of the walled Roman town (Fig 3: SMR 42214) and archaeological evaluation trenching of a site in Conging Street (Fig 3: SMR 43886-8 and SMR Event No 1458) located a boundary or drainage ditch with 9th-11th century pottery and animal bone suggesting that during the late Saxon/early Medieval period, a suburb grew north from the historic core of Horncastle around High Street, up North Street to include Conging Street.

4.5.2 However, there is no evidence to suggest that the study site formed part of the urban settlement of Horncastle. Indeed, as later maps show (see below) the site lay in fields and remained as pasture because of the regular possibility of flooding. A low potential is therefore identified on the study site for this period.

4.6 Post Medieval and Modern

4.6.1 In this period cartographic evidence supplements the available SMR evidence, but because the study site remains virtually unaltered into the late 1990's only selected historic maps have been examined.

4.6.2 The 1st edition Ordnance Survey (Fig 5: 1889) shows the study site within a large irregularly shaped island formed by the River Bain to the east and an unnamed stream to the west. To the east of the site, across the River Bain, the Horncastle Steam Mill is shown, with its mill wheel, related dam and sluices extend out into the river, and an enclosure on the west bank. An archaeological watching brief during the construction of a replacement weir in 1998 did not locate any significant archaeological features (SMR Event No 4325).

4.6.3 Figure 6 (1906) shows the study site with a new building, apparently associated with the Victoria Mill, sited within the earlier enclosure. The Mill appears, on cartographic evidence, to have remained in use into the 1950's (shown as disused on the 1956 OS 1:10,560 edition), but later editions (Fig 7: 1969) show the building has been demolished and the 'island' returned to its pre-1900 condition.

4.6.4 During the 1990's planning permission was granted for the development of a Coop Store on the site and this was constructed by 2000 (Fig 2).

4.7 Undated

4.7.1 As indicated above (paragraph 2.5) the SMR contains reference to a human mandible uncovered by workmen in a 20-foot long trench dug during 2003 (Fig 3: SMR 4489). This trench, excavated in order to begin the implementation of a planning permission for a store extension, remains open and it is evident from an inspection of the trench and related geotechnical data (at Appendix 1) that the mandible must have been imported to the site in the 1990's in crushed material used as bulk fill to raise the site of the Coop Store off the floodplain.

5.0 SITE CONDITIONS AND THE PROPOSED DEVELOPMENT IMPACT ON THE BURIED ARCHAEOLOGICAL DEPOSITS

5.1 Site Conditions

5.1.1 As described above, the study site is approximately 1.5 hectares in extent, is irregular in shape and is bounded by a flood defence bank along the River Bain to the east. To the south and west the site is bounded by an existing car park access road that runs along the western site boundary bordering an unnamed stream, with an unmarked boundary to the north.

5.1.2 The southern half of the site is occupied by a car park with a Tesco Store, converted from the 1990's Coop Store, occupying the central part of the site. To the north of the Store, is a large rough surfaced area forming the Service Yard and staff car park. It is within this area that planning permission for a Store extension exists and an open trench indicates the site of the find of human bone. To the north of the Service Yard, lies an area of unmanaged grass and scrub with, in places, newly planted trees. Along the eastern site boundary is a raised earthen bank forming a flood defence for the River Bain.

5.2 The Proposed Development

5.2.1 Figure 8 shows the configuration of the proposed new Foodstore with vehicular customer car park to the south and a Service Yard to the north.

5.2.2 The development involves the demolition of the existing Store and the remarking/reconfiguration of the existing customer car park. Accordingly, across the central and southern parts of the site there will be no new impacts on zones not already impacted by the existing development.

5.2.3 To the north of the existing Store, in the area currently occupied by the Service Yard and unmanaged scrub, a new Store is proposed with a Service Yard to the north. Although the foundation type has yet to be determined it appears that, in view of the alluvial ground conditions, a piled or vibro-compaction approach will be adopted. In either circumstance, it can be anticipated that groundworks for the new Store and Service Yard will impact alluvial deposits in areas currently undisturbed by Made Ground or other 1990's related construction activity.

3.5.1 Although the item of archaeological interest (a human mandible) is thought to have been imported to the site in bulk fill and thus is not a valid indicator of the archaeological potential of the site, this remains to be proven. In these circumstances, it appears reasonable for the planning authority to include a planning condition, based on the model in PPG 16 and Circular 11/95. This states:

No development shall take place within the area indicated (the area north of the existing Store) until the applicant, or their agents or successors in title, has secured the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted by the applicant and approved by the planning authority.

The condition would, in due course, be discharged by a modest programme of archaeological work comprising the excavation of a number of trial trenches and the detailed examination of the existing foundation trench in order to fully establish the context of the human mandible and any associated evidence.

6.0 SUMMARY AND CONCLUSIONS

- 6.1 In considering a planning application (reference S/086/1716/03) for a new Foodstore, off Watermill Lane, Horncastle, Lincolnshire, the local planning authority's archaeological advisor has requested additional information in order that an informed planning decision can be made.
- 6.2 The application site lies on the floodplain of the River Bain and is essentially on an island bounded by the River Bain to the east and an unnamed tributary stream to the west.
- 6.3 The site has a complicated planning history since planning permission already exists for an extension to the existing Foodstore on the site (local authority reference S/086/01866/99) without any conditions relating to archaeology.
- 6.3.1 However, during the implementation of this permission during 2003, foundation trenching resulted in the discovery of an archaeological find (a human jaw bone) and details of this find have subsequently been entered on the County Sites and Monuments Record (SMR reference LI 4489).
- 6.4 This desk based assessment of the site has considered the archaeological evidence for the study site (the human mandible) and for the surrounding area, and has concluded that although the higher ground to the east and south of the site is clearly of high potential, its floodplain location has made it unsuitable for past human settlement or other forms of occupation other than seasonal stock grazing. During a site inspection (18th March 2004) the foundation trench dug in 2003 which produced the human mandible was examined, leading to the conclusion that the human bone was imported to the site with bulk fill used to raise the site of the

Coop Store off the floodplain and provide a consolidated base for the Store construction.

- 6.5 As a result, the human bone recorded in the SMR is not a valid indicator of the archaeological potential of the application site and in these circumstances, rather than a programme of pre-application evaluation trenching, it appears reasonable for the planning authority to include a planning condition, based on the model in PPG 16 and Circular 11/95. This states:

No development shall take place within the area indicated (the area north of the existing Store) until the applicant, or their agents or successors in title, has secured the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted by the applicant and approved by the planning authority.

- 6.5.1 The condition would, in due course, be discharged by a modest programme of archaeological work comprising the excavation of a number of trial trenches and the detailed examination of the existing foundation trench in order to full establish the context of the human mandible and any associated evidence.

SOURCES CONSULTED

1. General

Lincolnshire County Sites and Monuments Record

Lincolnshire County Archives

Lincoln Local Studies Library

Society of Antiquaries, London

2. Bibliographic

- | | | |
|---------------------|------|--|
| Brown A E | 1995 | Roman Small Towns in Eastern England and Beyond |
| Field, N & Hurst, H | 1983 | Roman Horncastle
Lincolnshire History and Archaeology Vol 18
pp47-90 |
| Heighway, C.M. | 1972 | The Erosion of History Archaeology and Planning in Towns |
| Hall, D & Coles, J | 1994 | Fenland Survey An essay in landscape and persistence |
| Leahy, K | 1993 | The Anglo-Saxon Settlement of Lindsey
(in Vince 1993) |
| Vince, A | 1993 | Pre-Viking Lindsey |

3. Cartographic

1828	Bryants Survey of Lincolnshire
1889	Ordnance Survey 25" scale Sheet 073.10/11
1890	Ordnance Survey 1:10,560 scale Sheet 073 NE, SE
1891	Ordnance Survey 1:10,560 scale Sheet 073 NW, SW
1906	Ordnance Survey 25" scale Sheet 073.10/11
1906	Ordnance Survey 1:10,560 scale Sheet 73 NE, NW, SE, SW
1951	Ordnance Survey 1:10,560 scale sheet 073 NW, NE, SE, SW
1956	Ordnance Survey 1:10,560 scale sheet 073 NW, NE, SE, SW
1969	Ordnance Survey 1:2500 TF 2569, TF 2570, TF 2669, TF 2670
1971	Ordnance Survey 1:10,000 scale sheet 073 NW, NE, SE, SW
2000	Ordnance Survey 1:10,560 scale sheet 073 NW, NE, SE, SW

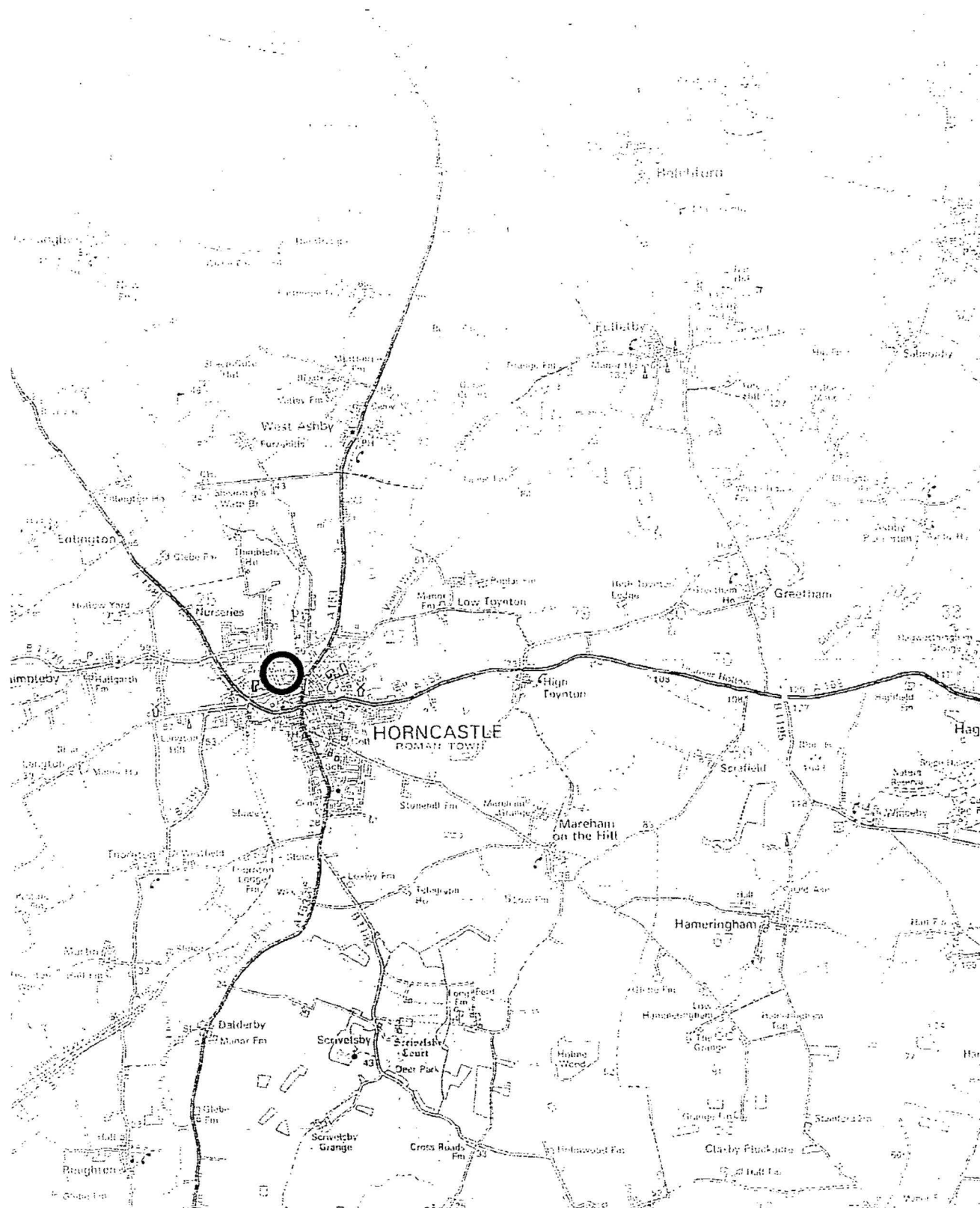


Figure 1 Site Location

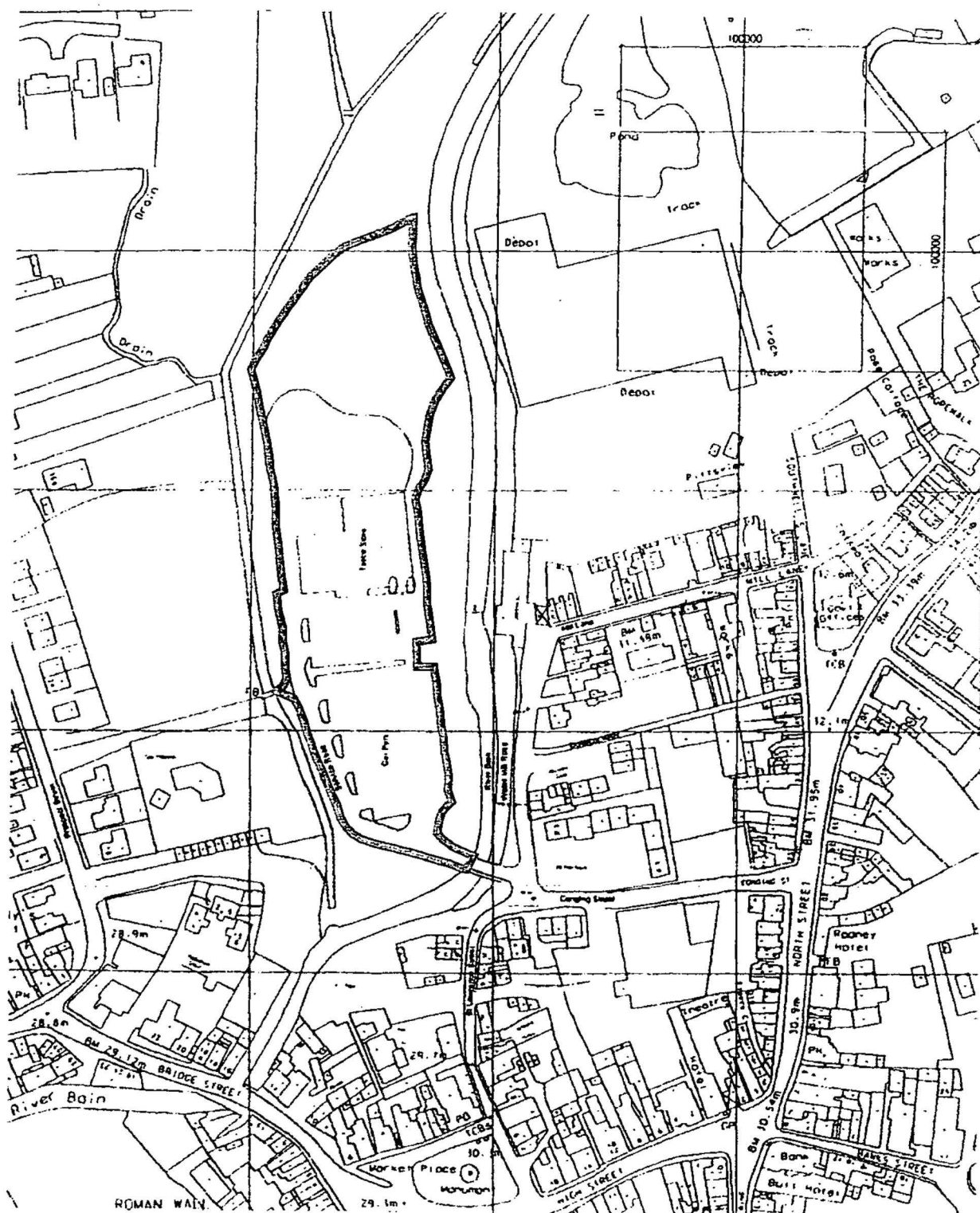


Figure 2
Site Details



© CgMs Limited
© Ordnance Survey maps reproduced with the sanction of the controller of HM Stationery Office.
Licence No: AL 100014723

Figure 3
Extract from Lincolnshire Sites and Monuments

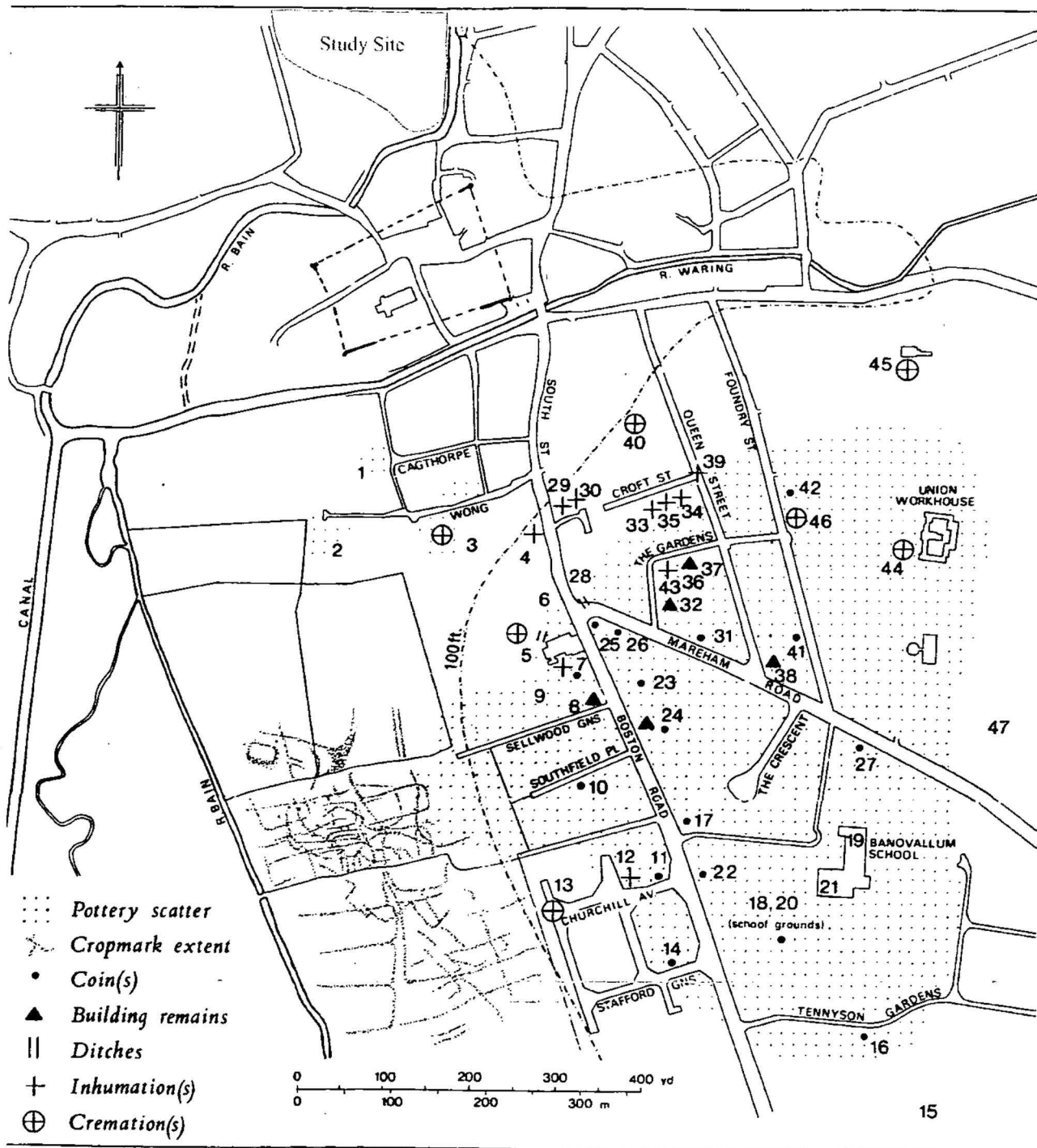
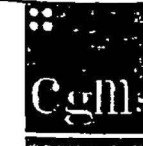


Figure 4: Roman Horncastle



CLIENT DETAILS Envirocheck Order No. EC1339161_1_1
Customer Ref: MR R Bourn, 4718
CGMS CONSULTING
Newspaper House 8-16 Great New Street
London
EC4A 3BN

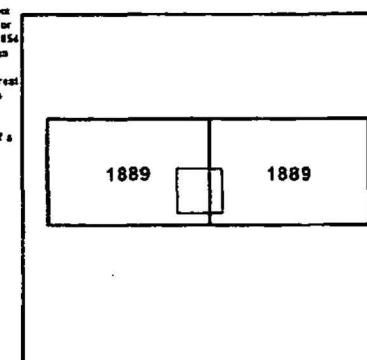
SITE DETAILS Grid Reference 525850 369850
Watermill Road
Horncastle
LN9 5DS

Historical Map Legend			
Quarry	Sand Pit	Marsh	Reeds
Gravel Pit	Clay Pit	Rough Pasture	Furze
Refuse Heap	Shingle	Osiers	Ford
Railway crossing River or Canal	Railway crossing Road	Level Crossing	
Embankment	Cutting	Road crossing Railway	
Road over single Stream	Road over River or Canal	Arrow denotes flow of Water	

LINCOLNSHIRE

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1891 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in setting areas.

Source map scale - 1:2,500



Date(s) of Publication

Figure 5
1889 Ordnance Survey 1st edition 25in scale



Produced by Landmark Information Group Limited. Tel: 01392 441702 Fax: 01392 441708



Cgms
CONSULTING

CLIENT DETAILS

Envirocheck Order No. EC1339161_1_1

Customer Ref: MR R Bourn, 4718
CGMS CONSULTING
Newspaper House 8-15 Great New Street
London
EC4A 3BN

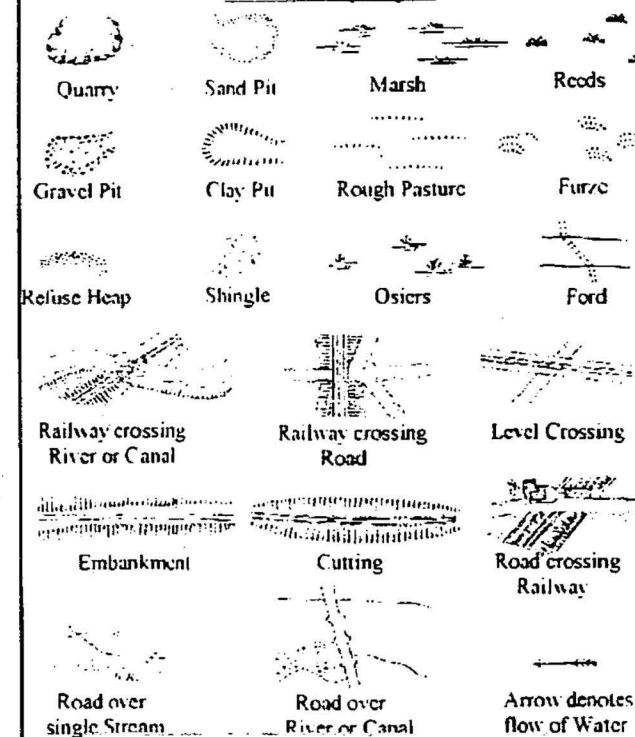
SITE DETAILS

Grid Reference 525850 369850

Watermill Road

Horncastle
LN9 5DS

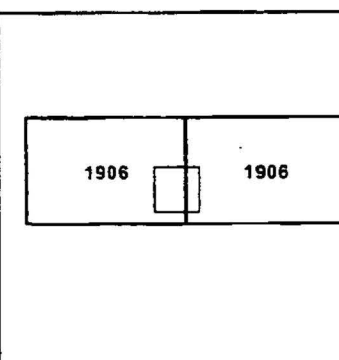
Historical Map Legend



LINCOLNSHIRE

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1954 the 1:2500 scale was adopted for mapping urban areas and by 1960 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published data given on the right is often some years later than the surveyed data. Before 1935, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Source map scale: 1:2,500



Date(s) of Publication

Figure 6
1906 Ordnance Survey 2nd edition 25in scale

OS Ordnance Survey
I know the way.

LANDMARK
Information Group

Produced by Landmark Information Group Limited. Tel: 01392 441702 Fax: 01392 441709



CLIENT DETAILS

Envirocheck Order No. EC1339161_1_1

Customer Ref: MR R Bourn, 4715
COMS CONSULTING
Newspaper House 5-15 Great New Street
London
EC4A 3BN

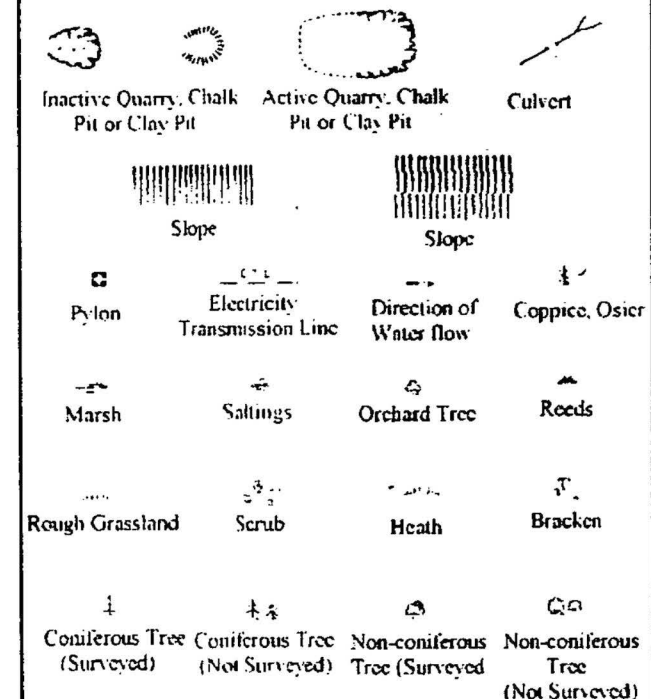
SITE DETAILS

Grid Reference **525850** **369850**

Watermill Road

Horncastle
LN9 5DS

Historical Map Legend



ORDNANCE SURVEY PLAN

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:50,000 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1931, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in existing areas.

Source map scale = 1:2,500

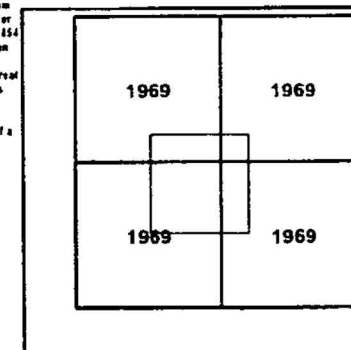
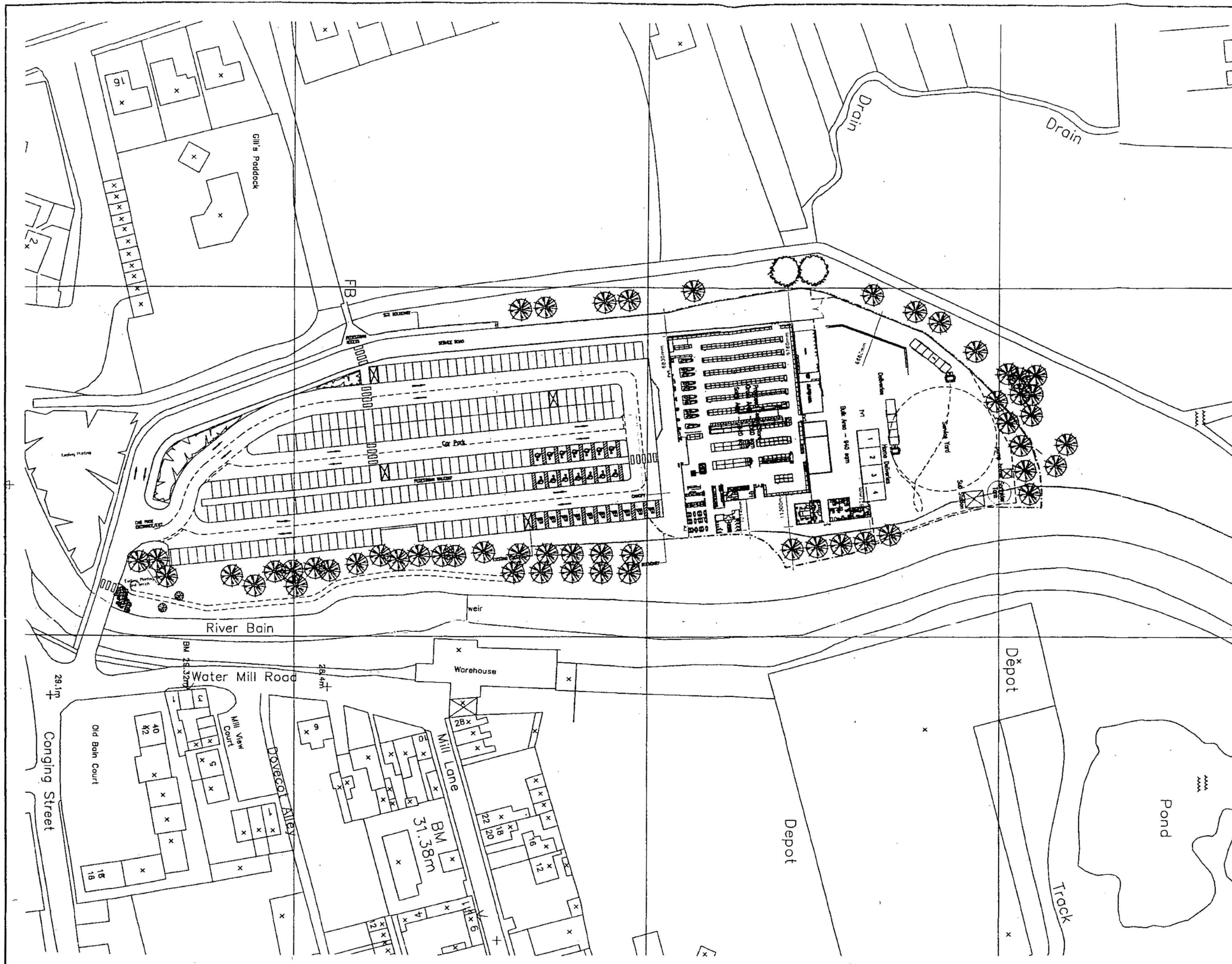
**Date(s) of Publication**

Figure 7
1969 Ordnance Survey 1:2,500 scale



LANDMARK
Information Group

Produced by Landmark Information Group Limited, Tel: 01392 441702 Fax: 01392 441709



NOTES

CAR PARK SPACES:
STANDARD - 206
DISABLED - 14
P&E - 10
TOTAL - 230

GROSS STORE AREA - 2675 sqm
STANDARD + P&E + RAIN - 1:11.2

--- NO. OF GRASS EMBANKMENT
--- SITE BOUNDARY

Figure 8
Proposed Development

TESCO
STORES

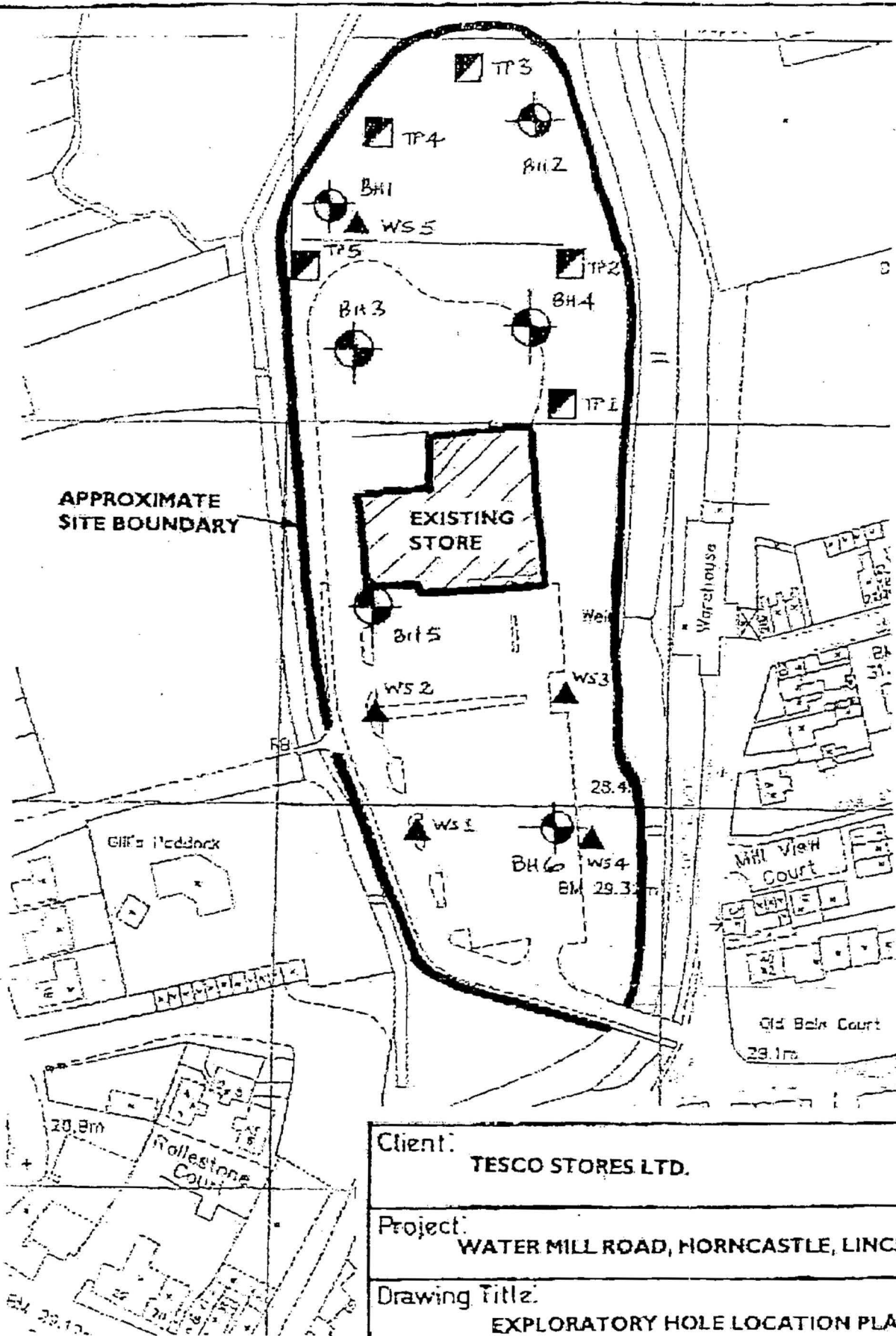


Building Design Partnership
Architects, Engineers & Cost Consultants
Sunlight House
PO Box 85, Quay Street
Manchester M60 3JA
Telephone + 44 (0)161 834 8441
Fax + 44 (0)161 832 4280

PROPOSED TESCO STORE HORNCastle

PROPOSED SITE PLAN	1:500
	12.11.0
1009396/0-1A009	C

Appendix 1:
Site Investigation logs



Client:

TESCO STORES LTD.

Project:

WATER MILL ROAD, HORNCASTLE, Lincs.

Drawing Title:

EXPLORATORY HOLE LOCATION PLAN.

Scale:

NTS

Date:

DEC 2002.

geotechnics

Project No.

PC020100

Figure No.

TRIAL PIT RECORD

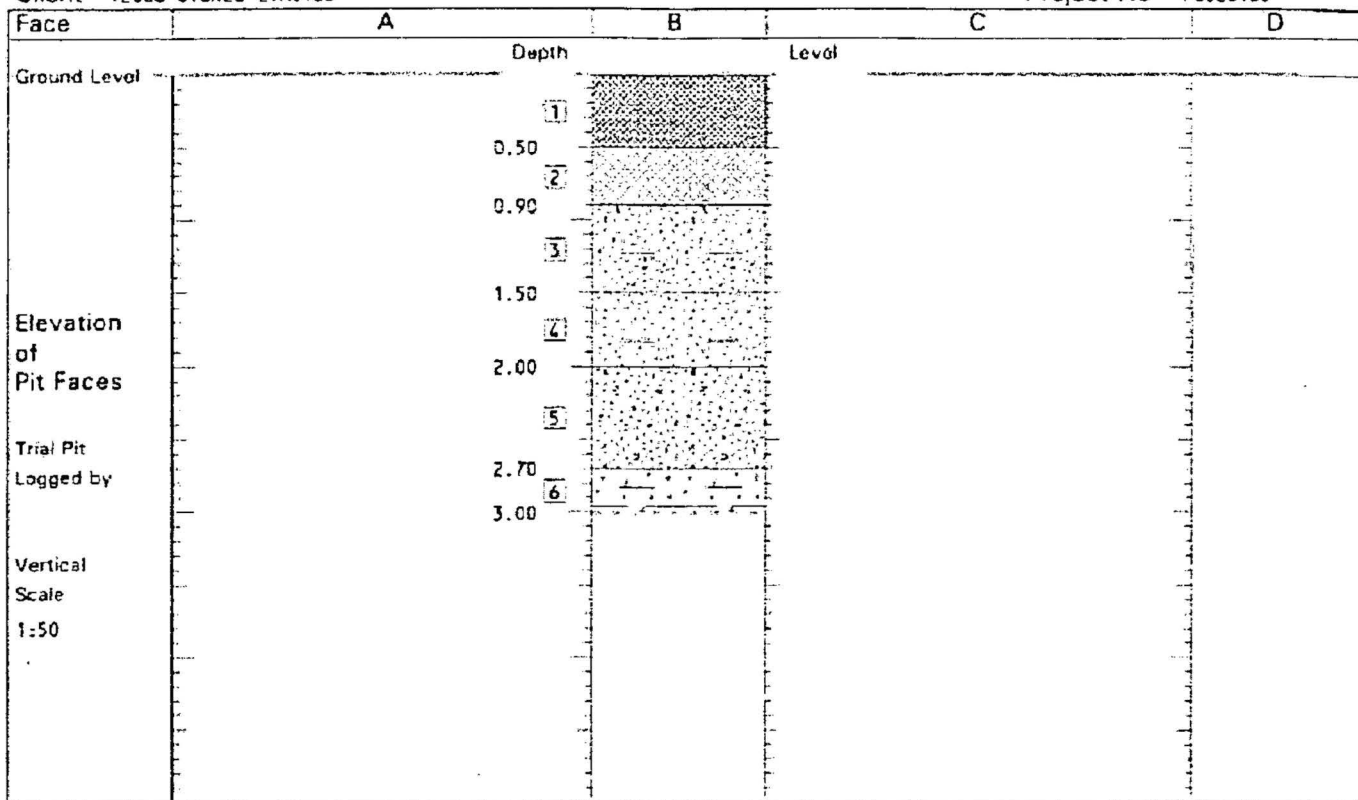
Project WATER MILL ROAD, HORNCastle, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

Trial Pit TP1
Coordinates

Client TESCO STORES LIMITED

Project No PC020100



Samples and Tests			Strata				Geological Classification
Depth	Type	Strength kN/m ²	Face B Depth	Stratum Number	Description		
0.00 - 0.50 0.50 0.50	B J SV	70.0	0.50	1	Grass over dark brown clay with fine to medium flint gravel and red brick fragments.	MADE GROUND.	
0.90	J		0.90	2	Firm brown slightly gravelly clay. Gravel is fine to medium subangular to subrounded flint.	Probable MADE GROUND	
1.50	J		1.50	3	Pale brown clayey gravelly SAND. Gravel is fine to very coarse subangular to subrounded flint.	ALLUVIUM.	
2.00	J		2.00	4	Pale blue grey mottled pale brown slightly clayey fine to medium SAND with occasional fine to medium subangular to subrounded flint gravel.	ALLUVIUM.	
2.70	J		2.70	5	Pale brown fine to medium SAND and GRAVEL. Gravel is fine to coarse subangular to subrounded flint. Becoming clayey below 2.30m.	ALLUVIUM.	
			3.00	6	Stiff dark grey gravelly CLAY with very occasional fossil fragments. Gravel is fine to medium subangular to subrounded chalk.	GLACIAL TILL.	

Excavation			Dimensions		Groundwater
Date Excavated	05/12/02	Date Backfilled	05/12/02		Seepages at 0.50m and 2.00m.
Plant	JCB 3CX				
Shoring	None.				
Stability	Caving at 1.00m and below.				

Remarks Trial pit abandoned due to caving.

geotechnics

Symbols and abbreviations are explained on the accompanying key. All linear dimensions are in metres.

TRIAL PIT RECORD

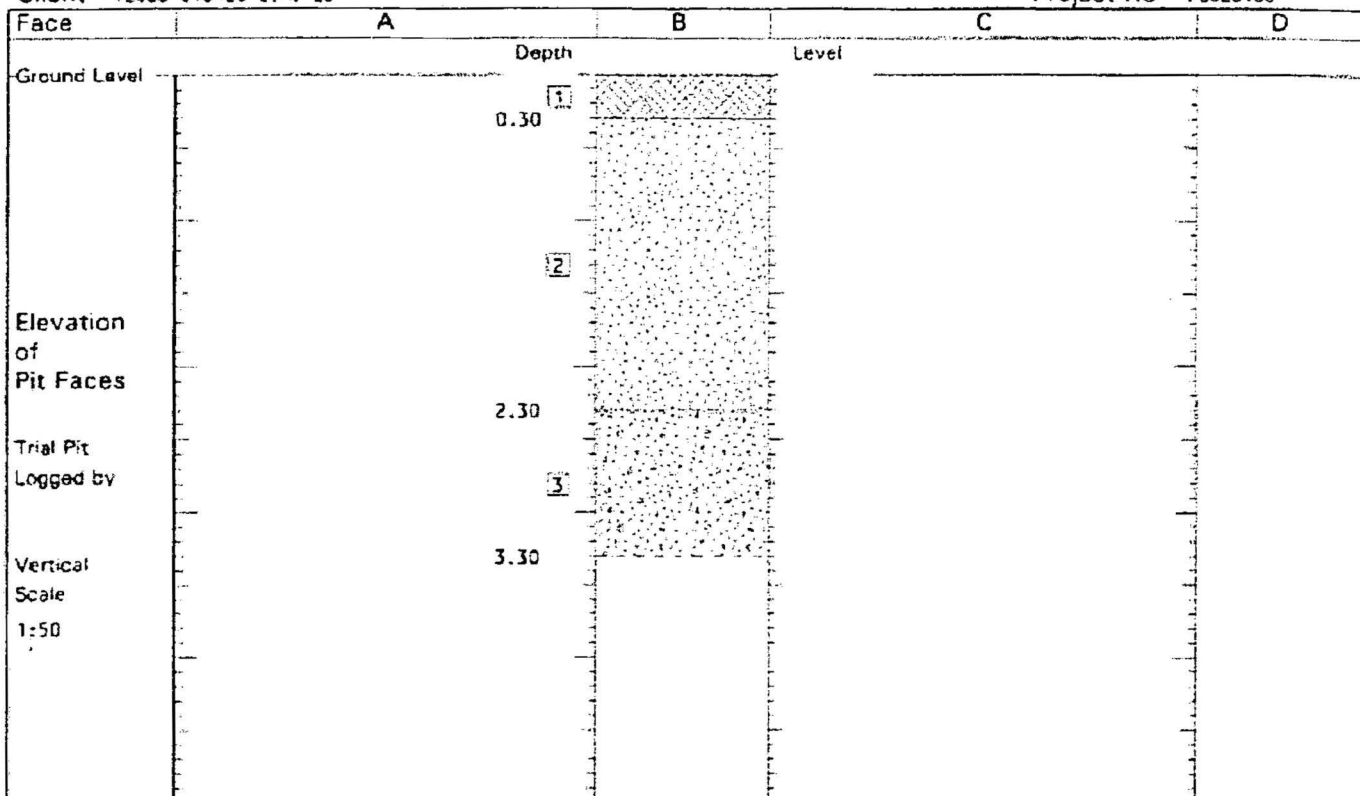
Project WATER MILL ROAD, HORNCASTLE, LINES.

Engineer PINNACLE CONSULTING ENGINEERS

Trial Pit TP2
Coordinates

Client TESCO STORES LIMITED

Project No PC020100



Samples and Tests			Strata				Geological Classification
Depth	Type	Strength kN/m ²	Face B Depth	Stratum Number	Description		
0.30	J		0.30	1	Grass over dark brown clayey TOPSOIL with occasional thin rootlets.	TOPSOIL.	
1.30 2.30	J J		2.30	2	Orange brown occasional mottled grey fine to medium SAND with a little fine to medium subangular to subrounded flint and gravel. Locally slightly clayey and very gravelly. At 2.10m, horizon of bright yellow sand.	ALLUVIUM.	
3.30	J		3.30	3	Grey and brown fine to medium SAND and GRAVEL. Gravel is fine to coarse subangular flint. Below 3.00m, becoming dark grey with very coarse occasional cobble size flint gravel.	ALLUVIUM.	

Excavation			Dimensions		Groundwater
Date Excavated	05/12/02	Date Backfilled	05/12/02		None encountered during excavation.
Plant	JCB 3CX				
Shoring	None.				
Stability	Substantial caving below 0.30m.				

Remarks Trial pit abandoned due to substantial caving below 0.30m.

geotechnics

Symbols and abbreviations are explained on the accompanying key. All linear dimensions are in metres.

TRIAL PIT RECORD

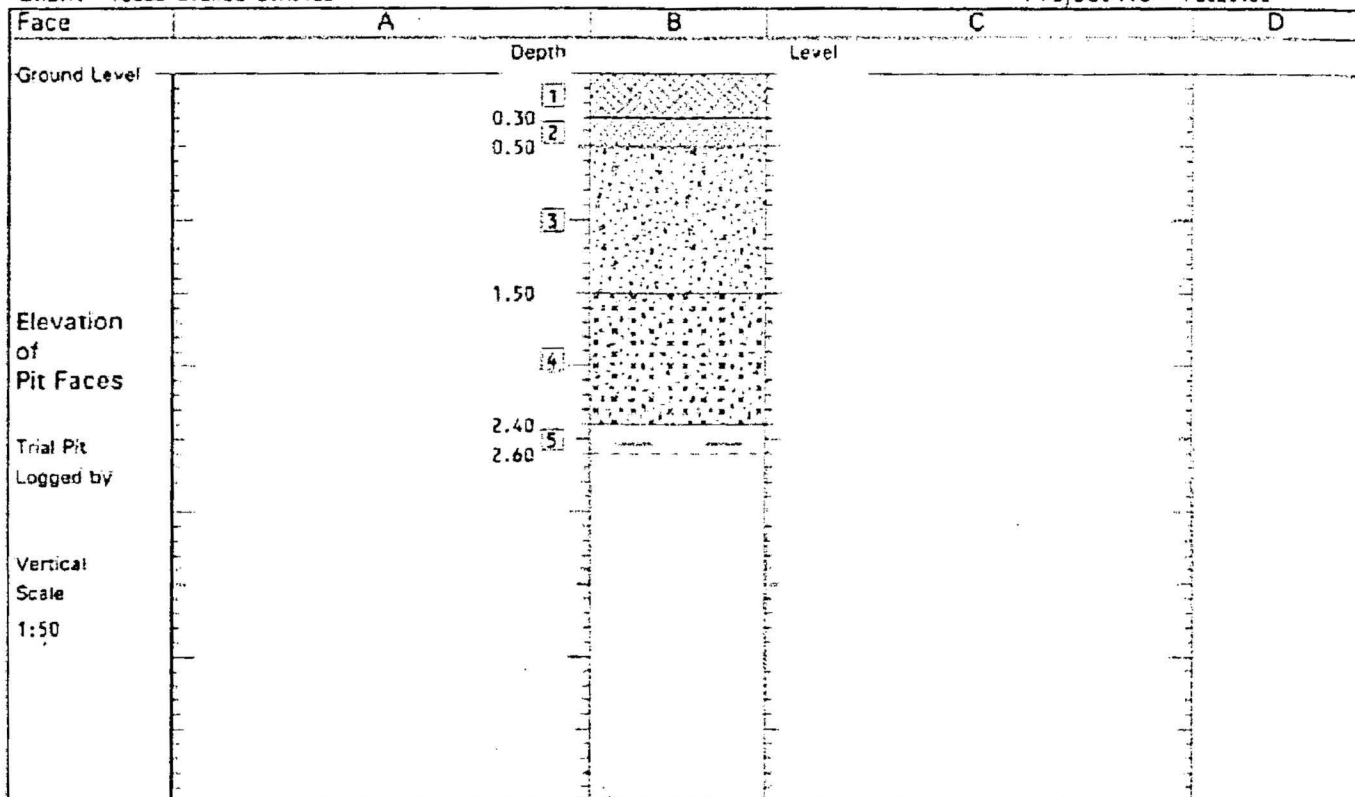
Project WATER MILL ROAD, HORNCASTLE, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

Trial Pit TP3
Coordinates

Client TESCO STORES LIMITED

Project No PC020100



Samples and Tests			Strata			
Depth	Type	Strength kN/m ²	Face B Depth	Stratum Number	Description	Geological Classification
0.30	SV	35.0	0.30	1	Dark brown clayey slightly gravelly TOPSOIL with thin rootlets. Gravel is fine to medium subangular flint.	TOPSOIL.
0.50	J		0.50	2	Pale brown clay with a trace of sand and very occasional thin rootlets.	Probable MADE GROUND.
1.50	J		1.50	3	Pale brown fine to medium SAND and GRAVEL with some clay. Gravel is fine to very coarse occasional cobble subangular flint.	ALLUVIUM.
2.40	J		2.40	4	Dark grey very sandy very gravelly SILT. Gravel is fine to very coarse occasional cobble subangular flint.	ALLUVIUM.
2.40 - 2.60	B		2.60	5	Stiff dark grey CLAY with very occasional fine to medium subrounded chalk gravel.	GLACIAL TILL.

Excavation				Dimensions	Groundwater
Date Excavated	05/12/02	Date Backfilled	05/12/02		Seepages at 0.30 and 2.00m.
Plant	JCB 3CX				
Shoring	None.				
Stability	Heavy caving between 0.50 to 2.40m.				

Remarks Trial pit abandoned due to heavy caving between 0.50 and 2.40m.

geotechnics

Symbols and Abbreviations are explained on the accompanying key. All linear dimensions are in metres.

TRIAL PIT RECORD

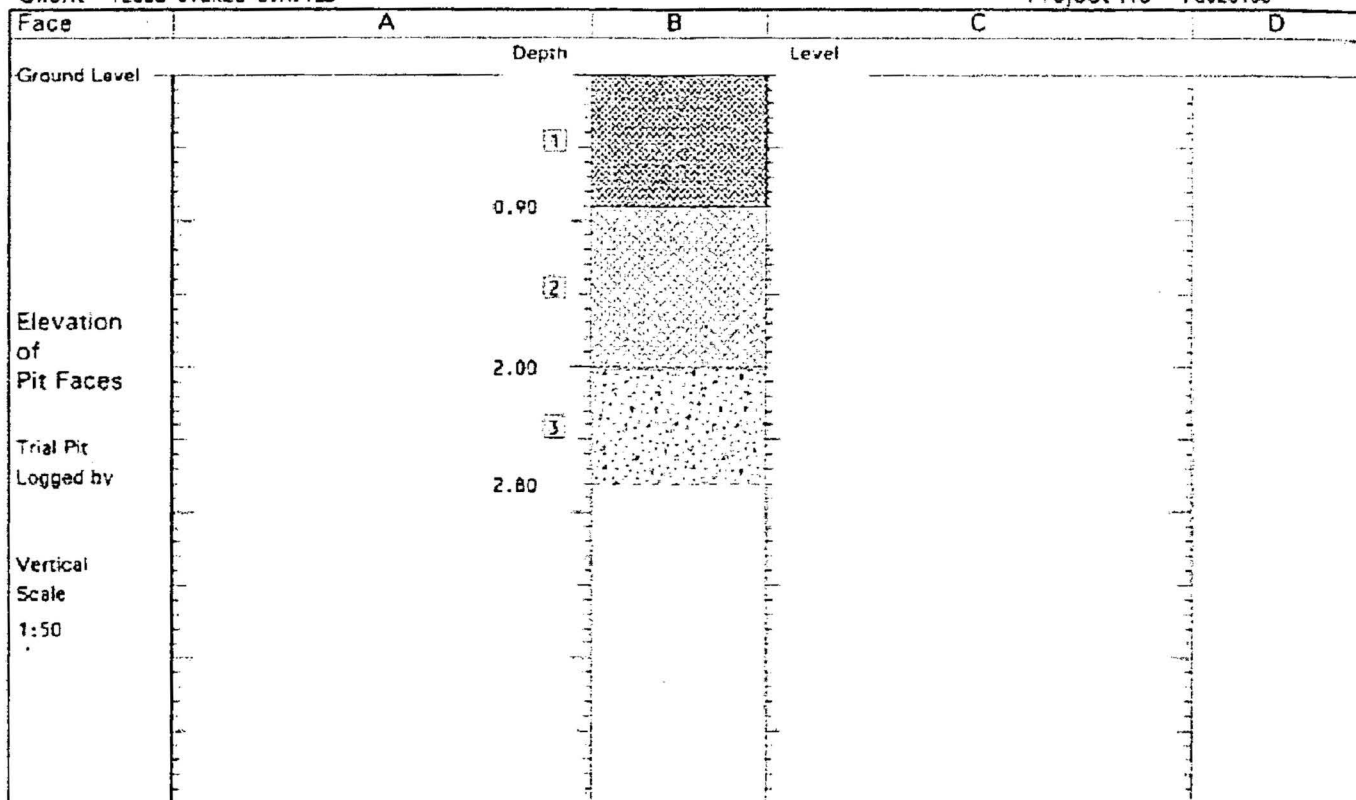
Project WATER MILL ROAD, HORNCASTLE, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

Trial Pit TP4
Coordinates

Client TESCO STORES LIMITED

Project No PC020100



Samples and Tests			Strata			Geological Classification
Depth	Type	Strength kN/m ²	Face B Depth	Stratum Number	Description	
0.90	J		0.90	1	Dark brown clayey topsoil with red brick gravel, concrete fragments and occasional rootlets.	MADE GROUND
1.50 2.00	SV J	28.0	2.00	2	Soft pale brown clay with occasional thin rootlets.	Probable MADE GROUND
2.80	J		2.80	3	Pale brown occasional dark grey fine to medium SAND and GRAVEL. Gravel is fine to very coarse occasional cobble subangular flint. Fine to coarse subrounded chalk gravel with depth.	ALLUVIUM

Excavation				Dimensions	Groundwater
Date Excavated	05/12/02	Date Backfilled	05/12/02		Seepages at 1.50m.
Plant	JCB 3CX				
Shoring	None.				
Stability	Heavy caving below 2.00m depth.				

Remarks Trial pit abandoned at 2.80m due to heavy caving.

geotechnics

Symbols and abbreviations are explained on the accompanying key. All linear dimensions are in metres.

TRIAL PIT RECORD

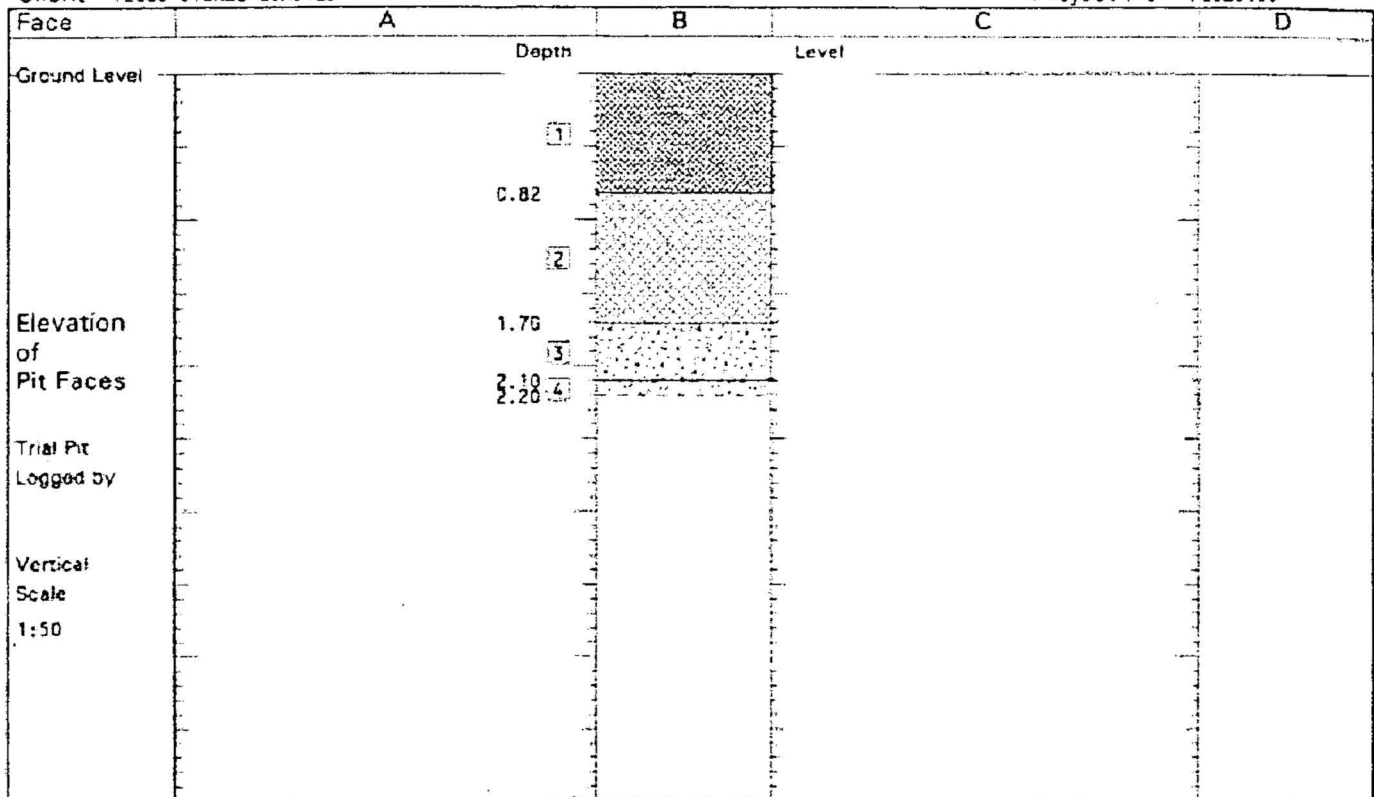
Project WATER MILL ROAD, HORNCastle, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

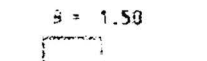
Trial Pit TP5
Coordinates

Client TESCO STORES LIMITED

Project No PC020100



Samples and Tests			Strata				Geological Classification
Depth	Type	Strength (kN/m ²)	Face B Depth	Stratum Number	Description		
0.82	J		0.82	1	Dark brown clayey topsoil with red brick fragments and concrete rubble.	MADE GROUND	
1.20 1.70	SV J	40.0	1.70	2	Soft to firm pale brown clay with occasional thin rootlets.	Probable MADE GROUND	
			2.10	3	Pale brown fine to medium SAND and GRAVEL. Gravel is fine to coarse occasional very coarse to cobble subangular flint.	ALLUVIUM.	
2.20	J		2.20	4	Dark grey fine to medium SAND and GRAVEL. Gravel is fine to very coarse occasional cobble subangular to subrounded chalk and flint.	ALLUVIUM.	

Excavation				Dimensions	Groundwater
Date Excavated	05/12/02	Date Backfilled	05/12/02		Seepages at 0.60m.
Plant	JCB 3CX				
Shoring	None.				
Stability	Heavy caving below 1.70m.				

Remarks Trial pit abandoned at 2.20m due to heavy caving.

geotechnics

Symbols and abbreviations are explained on the accompanying key. All linear dimensions are in metres.

BOREHOLE RECORD - Cable Percussion

Sheet 1 of 2

Project WATER MILL ROAD, HORNCASTLE, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

Borehole BH1
Coordinates

Client TESCO STORES LIMITED

Project No PC020100

Sampling				Properties			Strata			
Depth	Sample Type	Depth Cased	Depth to Water	Strength kN/m ²	w %	SPT N	Description	Depth	Legend	Level
0.30 0.50 - 0.90	J B						Brown clayey slightly sandy gravel with occasional rootlets. Gravel is fine to coarse subangular to subrounded red brick, concrete and flint. MADE GROUND.			
1.00 1.20 - 1.50	J B						Soft pale brown clay with predominantly fine subangular red brick gravel and a trace of sand. Probable MADE GROUND.	0.90		
1.50 - 1.95	J									
1.50 - 1.95	B									
1.50 - 1.95	S	1.50	DRY			4				
2.10 2.20 - 2.50	J B						Loose pale brown occasionally grey brown slightly clayey very sandy GRAVEL. Gravel is fine to coarse, subangular flint. ALLUVIUM. Below 2.50m, grading to a slightly sandy gravel.	1.90		
2.50 - 2.95	B									
2.50 - 2.95	C	2.50	2.30			7				
3.40 3.50 - 3.95	J J				24.0		Firm dark blue grey slightly fissured CLAY with very occasional fine subrounded chalk gravel. GLACIAL TILL.	3.30		
3.50 - 3.95	B									
3.50 - 3.95	S	3.50	DRY		30.0	10				
4.10 4.20 - 4.50	J B									
4.50 - 5.00	USO	3.95	DRY	63	25.0					
5.00	J						Stiff very dark grey fissured CLAY with fossil shell fragments. KIMMERIDGE CLAY.	5.00		
5.50 - 5.95	J									
5.50 - 5.95	B									
5.50 - 5.95	S	3.95	DRY			13				
7.00 - 7.45	J				28.0					
7.00 - 7.45	B									
7.00 - 7.45	S	3.95	DRY			16				
8.00										

Boring				Progress				Groundwater				Remarks on Groundwater
Depth	Dia	Technique	Crew	Depth of R/Ls	Depth Cased	Depth to Water	as (A) Date pm (P)	Depth Struck	Depth Cased	Depth after 20 mins	Depth Sealed	
1.20 10.00	150mm	Inspection Pit. Cable Percussion.	WHD WHD	Start 10.00 End	3.95	DRY	26/11/02 26/11/02 26/11/02	2.50	2.50	2.50	3.50	Medium seepage.

Remarks Inspection pit hand excavated to 1.20m. Standpipe inserted to 5.00m., with gravel response zone from 1.00-5.00m.

geotechnics

BOREHOLE RECORD - Cable Percussion

Sheet 2 of 2


Project WATER MILL ROAD, HORNCastle, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

Borehole BH1
Coordinates

Client TESCO STORES LIMITED

Project No PC020100

Sampling				Properties			Strata			
Depth	Sample Type	Depth Cased	Depth to Water	Strength kN/m ²	W %	SPT N	Description	Depth	Legend	Level
8.50 - 8.95	J				23.0		As on preceding sheet	8.00		
8.50 - 8.95	B									
8.50 - 8.95	S	3.95	DRY			17				
10.00	J				27.0			10.00		

Boring				Progress				Groundwater				
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	W (%) Date	Depth Struck	Depth Cased	Depth after 20 mins	Depth Sealed	Remarks on Groundwater
1.20 10.00	150mm	Inspection Pit. Cable Percussion.	WHD WHD	Start 10.00 End	3.95	DRY	26/11/02 26/11/02 26/11/02	2.50	2.50	2.50	3.50	Medium seepage.

Remarks Inspection pit hand excavated to 1.20m. Standpipe inserted to 5.00m., with gravel response zone from 1.00-5.00m.

geotechnics

Logged by: PL

Symbols and abbreviations are explained on the accompanying key. All linear dimensions are in metres.

Scale: 1:50

BOREHOLE RECORD - Cable Percussion

Sheet 1 of 2

Project WATER MILL ROAD, MORNCASTLE, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

Borehole BH2
Coordinates

Client TESCO STORES LIMITED

Project No PC020100

Sampling				Properties			Strata		
Depth	Sample Type	Depth Cased	Depth to water	Strength kN/m ²	W %	SPT N	Description	Depth	Log No
0.20 - 0.70	J B						Soft dark brown gravelly clay. Gravel is fine to medium occasionally coarse subangular to subrounded flint and red brick. MADE GROUND.		
1.00 - 1.30	J B						Pale light brown mottled dark brown slightly sandy clay with very occasional fine subangular flint gravel and a trace of fine to medium subangular red brick gravel. Probable MADE GROUND.	0.90	
1.50 - 1.95	B			24.0			Loose light brown clayey gravelly fine to medium SAND. Gravel is fine to coarse subangular flint. ALLUVIUM.	1.40	
1.50 - 1.95	C	1.50	DRY			5	Medium dense grey brown very sandy GRAVEL. Gravel is fine to medium occasionally coarse, subangular to subrounded chalk and flint. A little grey brown clay noted. ALLUVIUM.	2.00	
2.10 - 2.50	J B								
2.50 - 2.95	B					12			
2.50 - 2.95	C								
3.50 - 3.95	J			22.0			Firm becoming stiff very dark grey slightly fissured CLAY with very occasional fine subangular to subrounded chalk and flint gravel. GLACIAL TILL.	3.30	
3.50 - 3.95	B					11			
3.50 - 3.95	S								
4.10 - 4.50	J B								
4.20 - 4.50	B								
4.50 - 5.00	U20	3.95	DRY	180V	24.0				
5.20	J								
5.50 - 5.95	J			24.0			Firm becoming stiff dark grey slightly fissured CLAY with some fossil shell fragments. KIMMERIDGE CLAY.	5.20	
5.50 - 5.95	B								
5.50 - 5.95	S	3.95	DRY			13			
7.00 - 7.50	U45	3.95	DRY	67	25.0				
7.50	J								

Boring				Progress				Groundwater				
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to water	as (A) or (B) Date	Depth Struck	Depth Cased	Depth after 20 mins	Depth Sealed	Remarks on Groundwater
1.20 15.00	150mm	Inspection Pit. Cable Percussion.	WHD WHD	Start 4.50 15.00 End	3.95 3.95	DRY	26/11/02 P26/11/02 P27/11/02 27/11/02	2.50	2.50	2.50	3.50	Medium seepage.

Remarks Inspection pit hand excavated to 1.20m. Standpipe inserted to 5.00m., with gravel response zone from 1.00-5.00m.

geotechnics

Logged by: PL Symbols and abbreviations are explained on the accompanying key

All linear dimensions are in metres.

Scale: 1:50

BOREHOLE RECORD - Cable Percussion

Sheet 2 of 2

Project WATER MILL ROAD, HORNCASTLE, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

Borehole BH2
Coordinates

Client TESCO STORES LIMITED

Project No PC020100

Sampling				Properties			Strata			
Depth	Sample Type	Depth Cased	Depth to water	Strength kg/cm^2	N	SPT N	Description	Depth	Legend	Level
8.50 - 8.95	J				23.0		As on preceding sheet	8.00		
8.50 - 8.95	B									
8.50 - 8.95	S	3.95	DRY			14				
10.00 - 10.50	U40	3.95	DRY	200V	22.0					
10.50	J									
11.50 - 11.95	J				21.0					
11.50 - 11.95	B									
11.50 - 11.95	S					19				
13.00 - 13.50	U40	3.95	DRY		23.0					
13.50	J									
14.50 - 14.95	J				23.0					
14.50 - 15.00	B									
14.50 - 14.95	S	3.95	DRY			27				
								15.00		

Boring				Progress				Groundwater				
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to water	SS (A) Date	Depth Struck	Depth Cased	Depth after 24 hrs	Depth Sealed	Remarks on Groundwater
1.20 15.00	150mm	Inspection Pit. Cable Percussion.	WHD WHD	Start 4.50 15.00 End	3.95 3.95	DRY	26/11/02 P26/11/02 P27/11/02 27/11/02	2.50	2.50	2.50	3.50	Medium seepage.

Remarks Inspection pit hand excavated to 1.20m. Standpipe inserted to 5.00m., with gravel response zone from 1.00-5.00m.

geotechnics

Logged by: PL

Symbols and abbreviations are explained on the accompanying key.

All linear dimensions are in metres.

Scale: 1:50

BOREHOLE RECORD - Cable Percussion

Sheet 1 of 2

Project WATER MILL ROAD, NORWICH, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

Borehole BH3
Coordinates

Client TESCO STORES LIMITED

Project No PC020100

Sampling				Properties			Strata			
Depth	Sample Type	Depth Cased	Depth to water	Strength σ_{vm}^2	σ_v	SPT N	Description	Depth	Legend	Level (m)
0.80 0.80 - 1.20	J B						Dolomite. MADE GROUND.**	0.50		
1.50 - 1.95	D	1.50	DRY				Soft pale light brown mottled dark brown clay with rare fine subangular flint gravel. Possible MADE GROUND.	1.60		
1.50 - 1.95	B						Loose to medium dense becoming medium dense pale brown fine to medium SAND and GRAVEL with a little clay. Gravel is fine to coarse angular to subangular flint. ALLUVIUM.			
2.10 - 2.50	J B				17.0					
2.50 - 2.95	B				18.0					
2.50 - 2.95	C	2.50	2.30			17				
3.10 - 3.40	B				11.0		Firm very dark grey gravelly CLAY. Gravel is fine to medium subrounded chalk. GLACIAL TILL.	3.60		
3.50 - 3.95	B									
3.50 - 3.95	C	3.40	3.40			10				
4.10 - 4.50	J B				24.0 30.0			4.10		
4.50 - 4.95	J D B	3.95	DRY		25.0		Firm becoming stiff very dark grey slightly fissured CLAY with some fossil shell fragments. KIMMERIDGE CLAY.			
5.10 - 5.50	J B									
5.50 - 6.00	USO			84	25.0					
6.00	J									
6.30 - 6.80	J B									
7.00 - 7.45	J				28.0					
7.00 - 7.45	B									
7.00 - 7.45	S	3.95	DRY			13				
7.70	J									
7.90 - 8.30	B							8.00		

Boring				Progress				Groundwater				
Depth	Dia	Technique	Crew	Depth of hole	Depth Cased	Depth to water	ss (A) Date	Depth Struck	Depth Cased	Depth after 20 mins	Depth Sealed	Remarks on Groundwater
1.20 10.00	150mm	Inspection Pit. Cable Percussion.	WHD WHD	Start 10.00 End	3.95	DRY	25/11/02 25/11/02 25/11/02	2.50	2.50	2.50	3.50	Medium seepage.

Remarks

Inspection pit hand excavated to 1.20m.
** Driller Description.
Standpipe inserted to 5.00m., with gravel response zone from 1.00-5.00m.



Logged by: PL

Symbols and abbreviations are explained on the accompanying key

All linear dimensions are in metres.

Scale: 1:50

BOREHOLE RECORD - Cable Percussion

Sheet 2 of 2


Project WATER MILL ROAD, HORNCastle, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

Borehole BH3
Coordinates

Client TESCO STORES LIMITED

Project No PC020100

Sampling				Properties			Strata			
Depth	Sample Type	Depth Cased	Depth to water	Strength kN/m ²	W (%)	SPT N	Description	Depth	Legend	Level OD
8.50 - 9.00	U45			73	27.0		As on preceding sheet	8.00		
9.20 - 9.60	B									
10.00	J							10.00		

Boring				Progress				Groundwater				
Depth	Sha	Technique	Crew	Depth of Hole	Depth Cased	Depth to Motor	as (A) Date	Depth Struck	Depth Cased	Depth after 23 mins	Depth Sealed	Remarks on Groundwater
1.20 10.00	150mm	Inspection Pit. Cable Percussion.	WHD WHD	Start 10.00 End	3.95	DRY	25/11/02 25/11/02 25/11/02	2.50	2.50	2.50	3.50	Medium seepage.

Remarks
Inspection pit hand excavated to 1.20m.
Driller Description:
Standpipe inserted to 5.00m., with gravel response zone from 1.00-5.00m.

geotechnics

BOREHOLE RECORD - Cable Percussion

Sheet 1 of 2

Project WATER MILL ROAD, HORNCASTLE, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

Borehole BH4
Coordinates

Client TESCO STORES LIMITED

Project No PC020100

Sampling				Properties			Strata			
Depth	Sample Type	Depth Cased	Depth to Water	Strength (kN/m ²)	W	SPT	Description	Depth	Legend	Level
0.60	J						Dolomite. MADE GROUND.**			
1.30	J						Soft pale brown sandy gravelly clay. Gravel is fine to coarse subangular flint and concrete. MADE GROUND.	0.50		
1.50 - 1.95	B							1.20		
1.50 - 1.95	C	1.50	DRY			5	Loose pale brown mottled dark brown clayey very gravelly fine to medium SAND. Gravel is fine to coarse subangular flint. ALLUVIUM.			
2.10	J									
2.20 - 2.50	B			14.0						
2.50 - 2.95	B									
2.50 - 2.95	C	2.50	DRY			7	Firm becoming stiff dark grey slightly fissured CLAY with very occasional fossil shell fragments. KIMMERIDGE CLAY.	2.70		
3.10	J									
3.20 - 3.50	B									
3.50 - 4.00	U50	3.50	DRY	49	25.0					
4.00	J									
4.10	J									
4.20 - 4.50	B									
4.50 - 4.95	J			27.0						
4.50 - 4.95	B									
4.50 - 4.95	S	3.96	DRY			12				
5.10	J									
5.20 - 5.50	B									
5.50 - 6.00	U50	3.96	DRY	180V	25.0					
6.00	J									
6.20	J									
6.30 - 6.70	B									
7.00 - 7.45	J			25.0						
7.00 - 7.45	B									
7.00 - 7.45	S	3.96	DRY			13				
7.70	J									
8.00 - 8.40	B									

Boring				Progress				Groundwater			
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	as at Date	Depth Struck	Depth Cased	Depth after 24 hrs	Depth Sealed
1.20 10.00	150mm	Inspection Pit. Cable Percussion.	WHD WHD	Start 10.00 End	3.96	DRY	22/11/02 22/11/02				

Remarks Inspection pit hand excavated to 1.20m.
** Drillers Description.
Standpipe inserted to 5.00m., with gravel response zone from 1.00-5.00m.

geotechnics

Logged by: PL

Symbols and abbreviations are explained on the accompanying key.

All linear dimensions are in metres.

Scale: 1:50

BOREHOLE RECORD - Cable Percussion

Sheet 2 of 2

Project WATER MILL ROAD, HORNCastle, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

Borehole BH4
Coordinates

Client TESCO STORES LIMITED

Project No PC020100

Sampling				Properties			Strata			
Depth	Sample Type	Depth Cased	Depth to Water	Strength kN/m^2	γ t	SPT N	Description	Depth	Legend	Level
8.50 - 9.00	U50			62	25.0		As on preceding sheet	8.00		100
9.00	J									
9.30 - 9.70	B									
10.00	J				25.0			10.00		

Boring				Progress				Groundwater			
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	As (A) or (B) Date	Depth Struck	Depth Cased	Depth after 20 mins	Depth Sealed
1.20 10.00	150mm	Inspection Pit. Cable Percussion	WHD WHD	Start 10.00 End	3.96	DRY	22/11/02 22/11/02 22/11/02				

Remarks
Inspection pit hand excavated to 1.20m.
** Drillers Description.
Standpipe inserted to 5.00m., with gravel response zone from 1.00-5.00m.

geotechnics

Logged by: PL Symbols and abbreviations are explained on the accompanying key. All linear dimensions are in metres.

Scale: 1:50

BOREHOLE RECORD - Cable Percussion

Sheet 1 of 2

Project WATER MILL ROAD, HORNCastle, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

Borehole BH5
Coordinates

Client TESCO STORES LIMITED

Project No PC020100

Sampling				Properties			Strata			
Depth	Sample Type	Depth Cased	Depth to water	Strength kN/m ²	u	SPT	Description	Depth	Legend	Level
0.60	J						Tarmac. MADE GROUND.**	0.10		
0.80 - 1.20	B						Dolomite. MADE GROUND.**	0.50		
1.50 - 1.95	J				21.0		Soft grey brown clay with occasional fine to medium subangular assorted gravel and a little fine sand. Probable MADE GROUND.			
1.50 - 1.95	B									
1.50 - 1.95	S	1.50	DRY			6				
2.30	J						Medium dense pale grey brown clayey very sandy GRAVEL. Gravel is fine to coarse subangular flint. ALLUVIUM.	2.20		
2.50 - 2.95	B				12.0					
2.50 - 2.95	C	2.50	2.40			12				
3.20	J						Firm becoming stiff dark grey fissured CLAY with occasional fossil shell fragments. KIMMERIDGE CLAY.	3.20		
3.20 - 3.50	B				24.0					
3.50 - 3.95	J									
3.50 - 3.95	B									
3.50 - 3.95	S	3.50	DRY			11				
4.50 - 5.00	U45	3.95	DRY	45	27.0					
5.00	J									
5.50 - 5.95	J									
5.50 - 5.95	B									
5.50 - 5.95	S	3.95	DRY			16				
7.00 - 7.50	U40	3.95	DRY	73	25.0					
7.50	J									

Boring				Progress				Groundwater				
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	on (A) Date	Depth Static	Depth Cased	Depth after 22 mins	Depth Sealed	Remarks on Groundwater
1.20 10.00	150mm	Inspection Pit. Cable Percussion.	WHO WHO	Start 3.50 End 10.00	3.50 3.95	DRY	28/11/02 P28/11/02 P29/11/02 29/11/02	2.50	2.50	2.40	3.40	Medium seepage.

Remarks
Inspection pit hand excavated to 1.20m.
** Drillers Description.
Standpipe inserted to 5.00m., with gravel response zone from 1.00-5.00m.

geotechnics

Logged by: PL Symbols and abbreviations are explained on the accompanying key. All linear dimensions are in metres.

Scale: 1:50

BOREHOLE RECORD - Cable Percussion

Sheet 2 of 2

Project WATER MILL ROAD, HORNCastle, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

Borehole BH5
Coordinates

Client TESCO STORES LIMITED

Project No PC020100

Sampling				Properties			Strata			
Depth	Sample Type	Depth Cased	Depth to Water	Strength MPa 2	N 1	SPT 4	Description	Depth	Legend	Level 00
8.50 - 8.95	J						As on preceding sheet	8.00		
8.50 - 8.95	B									
8.50 - 8.95	S	3.95	DRY			17				
9.50 - 10.00	B				28.0			10.00		

Boring				Progress				Groundwater				
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Log (AS) Date	Depth Struck	Depth Cased	Depth after 20 mins	Depth Sealed	Remarks on Groundwater
1.20 10.00	150mm	Inspection Pit. Cable Percussion.	VHD VHD	Start 3.50 End 10.00	3.50 3.95	DRY	28/11/02 P28/11/02 P29/11/02 29/11/02	2.50	2.50	2.40	3.40	Medium seepage.

Remarks Inspection pit hand excavated to 1.20m.
** Drillers Description.
Standpipe inserted to 5.00m., with gravel response zone from 1.00-5.00m.

geotechnics

Logged by: PL

Symbols and abbreviations are explained on the accompanying key.

All linear dimensions are in metres.

Scale: 1:50

BOREHOLE RECORD - Cable Percussion

Sheet 1 of 2

Project WATER MILL ROAD, HORNCastle, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

Borehole BH6
Coordinates

Client TESCO STORES LIMITED

Project No PC020100

Sampling				Properties			Strata		
Depth	Sample Type	Depth Cased	Depth to Water	Strength kN/m ²	N	SPT	Description	Depth	Level
0.50	J						Tarmac. MADE GROUND.**	0.20	
0.70 - 1.20	B						Dolomite. MADE GROUND.**	0.40	
1.50 - 1.95	B						Soft dark grey brown slightly gravelly clay with occasional thin rootlets. Gravel is fine to medium subangular to subrounded flint, chalk and red brick. Probable MADE GROUND.	1.40	
1.50 - 1.95	C	1.50	DRY			6	Loose becoming medium dense grey very gravelly fine to medium SAND with a little clay. gravel is fine to coarse subangular flint. ALLUVIUM.		
2.10	J								
2.20 - 2.50	B								
2.50 - 2.95	B				16.0				
2.50 - 2.95	C	2.50	2.30			16			
3.10	J								
3.20 - 3.50	B				16.0		Firm grey brown very gravelly CLAY with a trace of sand. Gravel is fine to medium occasionally coarse subangular to subrounded flint and chalk. Locally sandy. GLACIAL TILL.	3.00	
3.50 - 3.95	J								
3.50 - 3.95	S	3.50	DRY			11			
4.10	J				26.0				
4.20 - 4.50	B						Firm becoming stiff dark grey slightly fissured CLAY with occasional fine subrounded chalk gravel. GLACIAL TILL.	4.10	
4.50 - 5.00	U100	3.95	DRY	175V	25.0		Firm becoming stiff dark grey slightly fissured CLAY with occasional fossil shell fragments. KIMMERIDGE CLAY.		
5.00	J								
5.50 - 5.95	J								
5.50 - 5.95	B	3.95	DRY			13			
5.50 - 5.95	S								
7.00 - 7.15	U100	3.95	DRY						
7.00 - 7.15	B								
7.15 - 7.50	B						Below 7.00m, becoming stiff to very stiff.		
								8.00	

Boring				Progress				Groundwater			
Depth	Size	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	as (A) Date	Depth Struck	Depth Cased	Depth after 24 hrs	Depth Sealed
1.20 15.00	150mm	Inspection Pit. Cable Percussion.	WHD WHD	Start 5.00 End 15.00	3.95 3.95	DRY	27/11/02 27/11/02 28/11/02 28/11/02	2.00	2.00	2.00	3.50

Remarks

Inspection pit hand excavated to 1.20m.
** Drillers Description.
Standpipe inserted to 5.00m., with gravel response zone from 1.00-5.00m.
Chiselling 9.10-9.50m for 1 hr.

geotechnics

Logged by: PL

Symbols and abbreviations are explained on the accompanying key. All linear dimensions are in metres.

Scale: 1:50

BOREHOLE RECORD - Cable Percussion

Sheet 2 of 2

Project WATER MILL ROAD, HORNCASTLE, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

Borehole BH6
Coordinates

Client TESCO STORES LIMITED

Project No PC020100

Sampling				Properties			Strata			
Depth	Sample Type	Depth Cased	Depth to Water	Strength kN/m ²	W	SPT N	Description	Depth	Legend	Level
8.50 - 8.95	J				23.0		As on preceding sheet	8.00		00
8.50 - 8.95	B									
8.50 - 8.95	S	3.95	DRY			16				
10.00 - 10.50	U100	3.95	DRY	170V	24.0					
10.50	J									
11.50 - 11.95	J									
11.50 - 11.95	B									
11.50 - 11.95	S	3.95	DRY			27				
13.00 - 13.50	U100	3.95	DRY							
13.50	J									
14.50 - 14.95	J				23.0					15.00
14.50 - 15.00	B									
14.50 - 14.95	S	3.95	DRY			40				

Boring				Progress				Groundwater				
Depth	Dia	Technique	Time	Depth of Hole	Depth Cased	Depth to Water	At (A) Date (B)	Depth Struck	Depth Cased	Depth after 20 mins	Depth Sealed	Remarks on Groundwater
1.20 15.00	150mm	Inspection Pit. Cable Percussion.	WHD WHD	Start 5.00 15.00 End	3.95 3.95	DRY	27/11/02 P27/11/02 P28/11/02 28/11/02	2.00	2.00	2.00	3.50	Medium seepage.

Remarks
Inspection pit hand excavated to 1.20m.
** Drillers Description.
Standpipe inserted to 5.00m., with gravel response zone from 1.00-5.00m.
Chiselling 9.10-9.50m for 1 hr.

geotechnics

Logged by: PL Symbols and abbreviations are explained on the accompanying key. All linear dimensions are in metres.

Scale: 1:50

BOREHOLE RECORD - Window Sampling

Sheet 1 of 1

Project WATER MILL ROAD, HORNCASTLE, LINES.

Engineer PINNACLE CONSULTING ENGINEERS

Borehole WS1
Coordinates

Client TESCO STORES LIMITED

Project No PC020100

Sampling			Properties		Strata			
Depth	Sample Type	Sample Dia	Strength N/m^2	M	Description	Depth	Legend	Level
0.00 - 1.20	B				Dark brown gravelly clay with cobble size red brick fragments. Gravel is fine to coarse red brick and concrete. MADE GROUND.			
1.20 - 1.70	J		64.0		Pale grey green mottled pale brown slightly organic SILT with a trace of fine sand and a little clay. ALLUVIUM.	1.20		
1.70 - 2.20	J		44.0					
2.20 - 3.07	J				Below 2.00m, becoming very dark grey. Below 2.20m, becoming increasingly sandy.			
3.07 - 3.10	J				Pale brown fine to medium SAND and GRAVEL. Gravel is fine to coarse occasional cobble subangular to subrounded quartz and flint.	3.07 3.10		

Boring				Progress		Groundwater		
Depth	Dia	Technique	Crew	Date	Depth Cased	Depth Struck	Depth on Completion	Remarks on Groundwater
1.20		Inspection Pit.	PS	P05/12/02				None encountered during excavation.
2.20	66mm	Window Sample.	PS					
3.20	66mm	Window Sample.	PS					

Remarks

Inspection pit to 1.20m - no services found.
Refusal at 3.10m.



Logged by: PL

Symbols and abbreviations are explained on the accompanying key. All linear dimensions are in metres.

Scale: 1:50

BOREHOLE RECORD - Window Sampling

Sheet 1 of 1

Project WATER MILL ROAD, HORNCASTLE, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

Borehole WS2
Coordinates

Client TESCO STORES LIMITED

Project No PC020100

Sampling			Properties		Strata			
Depth	Sample Type	Sample Dia	Strength KN/m^2	M	Description	Depth	Legend	Level
0.00 - 1.20	B				Grass over dark brown clayey TOPSOIL with occasional rootlets. Firm light brown occasional mottled pale grey clay. Probable MADE GROUND.	0.20		
1.20 - 1.78	J							
1.78 - 2.20	J			102.0	Green grey becoming dark grey organic SILT with occasional thin root traces. ALLUVIUM.	1.78		
2.20 - 2.66	J			75.0				
2.66 - 3.20	J				Dark grey becoming pale brown with depth fine to medium SAND and GRAVEL. Gravel is fine to medium subangular to subrounded flint and chalk. ALLUVIUM.	2.66		
3.20 - 3.41	J			14.0				
3.41 - 3.60	J				Firm becoming stiff very thinly laminated dark grey CLAY. POSSIBLE KIMMERIDGE CLAY.	3.41		
3.60	PP		2	4		3.60		

Boring				Progress		Groundwater		
Depth	Dia	Test type	Crew	Date	Depth Cased	Depth Struck	Depth on Completion	Remarks on Groundwater
1.20	56mm	Inspection Pit.	PS	P05/12/02				None encountered during excavation.
2.20	46mm	Window Sample.	PS					
3.20	46mm	Window Sample.	PS					
4.20	46mm	Window Sample.	PS					

Remarks

Inspection pit to 1.20m - no services found.
Refusal at 3.60m depth.

geotechnics

Logged by: PL

Symbols and abbreviations are explained on the accompanying key.

All linear dimensions are in metres.

Scale: 1:50

BOREHOLE RECORD - Window Sampling

Sheet 1 of 1

Project WATER MILL ROAD, HORNCASTLE, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

Borehole WS3
Coordinates

Client TESCO STORES LIMITED

Project No PC020100

Sampling			Properties		Strata			
Depth	Sample Type	Sample Dia	Strength kPa/2	W %	Description	Depth	Legend	Level DC
0.00 - 1.20	B				Grass over dark brown clay with fine to coarse, subangular red brick gravel and occasional cobbles. Occasional rootlets. MADE GROUND.			
1.20 - 1.30	J		1		Brown clayey slightly gravelly fine to medium SAND. Gravel is predominantly fine occasionally medium subangular flint. ALLUVIUM. Brown becoming black with depth slightly organic CLAY with a trace of medium sand, very occasionally fine subangular flint, gravel and very occasional fossil shell fragments. ALLUVIUM. Below 1.60m becoming very sandy. Pale brown fine to medium SAND and GRAVEL. Gravel is fine to coarse subangular flint, locally grading to a gravelly fine to medium sand. ALLUVIUM.	1.10		
1.30 - 1.60	PP		1	39.0		1.30		
1.60 - 1.90	J		1	56.0				
1.90 - 2.20	PP		1			1.90		
2.20 - 2.70	J			19.0				
2.70 - 3.20	J							
3.20 - 4.10	J					4.10		

Boring				Progress		Groundwater		
Depth	Dia	Technique	Crew	Date	Depth Cased	Depth Struck	Depth on Completion	Remarks on Groundwater
1.20		Inspection Pit.	PS	P05/12/02				None encountered during sampling.
2.20	66mm	Window Sample.	PS					
3.20	56mm	Window Sample.	PS					
4.20	46mm	Window Sample.	PS					

Remarks

Inspection pit hand excavated to 1.20m - no services found.
Window Sample refused at 4.10m depth.



Logged by: PL

Symbols and abbreviations are explained on the accompanying key. All linear dimensions are in metres.

Scale: 1:50

BOREHOLE RECORD - Window Sampling

Sheet 1 of 1

Project WATER MILL ROAD, HORNCASTLE, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

Borehole WS4
Coordinates

Client TESCO STORES LIMITED

Project No PC020100

Sampling			Properties		Strata		
Depth	Sample Type	Sample Dia	Strength kN/m ²	N	Description	Depth	Legend
0.00 - 1.20	B				Orange brown gravelly slightly clayey fine to medium sand with occasional thin rootlets. Gravel is fine to coarse subangular flint and red brick. MADE GROUND.		
1.20 - 1.32	J			24.0	Soft to firm dark brown becoming pale light brown clay with a trace of sand, rare fine subangular flint gravel and occasional thin rootlets. Probable MADE GROUND.	1.32	
1.32 - 1.60	J						
1.60 - 1.96	J						
1.70	PP			1			
1.96 - 2.20	J			27.0	Below 1.80m, becoming dark green grey and slightly silty. Pale grey brown slightly silty gravelly fine to medium SAND. Gravel is fine to medium subangular flint. ALLUVIUM.	1.96	
2.65 - 2.83	J					2.65	
2.83 - 3.00	J				Pale brown fine to coarse SAND and GRAVEL. Gravel is fine to medium subangular to subrounded flint and chalk. ALLUVIUM.	2.83	
3.00 - 3.10	J				Very dark grey slightly sandy SILT with occasional thin rootlets. ALLUVIUM.	3.00	
					Very dark grey brown fine to coarse SAND and GRAVEL. Gravel is fine to coarse subangular predominantly flint. ALLUVIUM.	3.10	

Boring				Progress		Groundwater		
Depth	Dia	Technique	Crew	Date	Depth Bored	Depth Struck	Depth on Completion	Remarks on Groundwater
1.20		Inspection Pit.	PS	P05/12/02				None encountered during sampling.
2.20	66mm	Window Sample.	PS					
3.20	56mm	Window Sample.	PS					

Remarks

Inspection pit hand excavated to 1.20m - no services found.
Window Sample refused at 3.10m depth.

geotechnics

Logged by: PL

Symbols and abbreviations are explained on the accompanying key.

All linear dimensions are in metres.

Scale: 1:50

BOREHOLE RECORD - Window Sampling

Sheet 1 of 1

Project WATER MILL ROAD, HORNCASTLE, Lincs.

Engineer PINNACLE CONSULTING ENGINEERS

Borehole WS5
Coordinates

Client TESCO STORES LIMITED

Project No PC020100

Sampling			Properties		Strata		
Depth	Sample Type	Sample Dia	Strength kN/m ²	μ %	Description	Depth	Level m
0.00 - 0.50	B				Dark brown clayey gravel with occasional cobble size red brick fragments. Gravel is fine to coarse assorted. MADE GROUND.		
1.40 - 1.80	J			46.0	Soft pale brown clay with very rare fine subrounded chalk gravel. Probable MADE GROUND.	1.40	
1.40	PP						
1.80 - 1.90	J				Pale brown fine to medium SAND and GRAVEL with a trace of clay. Gravel is fine to coarse subangular flint. ALLUVIUM.	1.80 1.90	

Boring				Progress		Groundwater		
Depth	Dia	Technique	Crew	Date	Depth Cased	Depth Struck	Depth on Completion	Remarks on Groundwater
1.00 2.00	66mm	Inspection Pit. Window Sample.	PS PS	P05/12/02				None encountered during sampling.

Remarks

Inspection pit hand excavated to 1.00m - no services found.
Window Sample refused at 1.90m depth.

geotechnics

Logged by: PL

Symbols and abbreviations are explained on the accompanying key.

All linear dimensions are in metres.

Scale: 1:50