

Our ref: 5823DA

Drainage Assessment Report
for land at
Ley Farm, Chirk

For : Greenspace Architects Limited
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16 March 2015

Drainage Assessment Report for Land at Ley Farm, Chirk

Document Verification

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Document Revision

Report Reference	Date	Description	Prepared	Checked and Approved
5823DA	16 March 2015	Drainage Assessment Report	G Lawton	P R Sykes

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1.0 Brief

The following report has been prepared for Greenspace Architects in support of their proposals for a new housing development at the Ley Farm site, Chirk

The work comprises the following:

- To undertake a site drainage assessment to establish the most viable form of surface water drainage and foul drainage for the proposed development.

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2.0 Introduction

Greenspace Architects are proposing a residential development consisting of approx 73 No. plots, comprising of detached and semi- detached properties which are assumed to be up to 2 storeys in height.

A desk top viability report which has reviewed the findings of previous site investigations undertaken at the site are presented in Coopers Report reference: 4441dtr, dated 24 June 2014.

Information from the viability report has been used in the preparation of the following report and to assess the suitability of the site for infiltration systems for surface water drainage.

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3.0 Site Characteristics

3.1 Site Location

The site is located at OS grid reference SJ 295 391, its location is shown on Drawing No. 5823/L1 in Appendix 4. Site comprises 1 No. irregular shaped parcel of steeply sloping agricultural farmland, approximately 3.88 hectares (9.59 acres) in area, located adjacent Chirk Green Wood and a post war housing estate. There are suspected mine shaft(s) and mine adit on site. Restored opencast pit is present in eastern half of the site. Access onto site was via Sycamore Drive.

3.2 Site Levels

The topographical survey indicates that the site falls to the west by approximately 30m. The layout of the site and levels are shown on Drawing No.5823/SK02 in Appendix 4.

3.3 Development Proposals

Greenspace Architects are proposing a residential development consisting of approx 73 No. plots, comprising of detached and semi- detached properties which are assumed to be up to 2 storeys in height. The proposed layout of the site is shown in Drawing No.5823/103 in Appendix 4.

3.4 Current Site Drainage

A site walkover was undertaken on 11th March 2015. At present there are no surface water features on or around the site boundary where surface water can discharge to. There are no foul or surface water drainage features on the site.

The nearest available drainage network was identified as a combined sewer in Sycamore Drive to the west of the site, close to the site entrance.

Photographs of the site walkover are included in Appendix 1.

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4.0 Surface Water Drainage

4.1 Introduction

The Building Regulations have a set hierarchy of preferred types of surface water drainage, in order these are:

1. Infiltration
2. Discharge to watercourse
3. Discharge to public surface water sewer
4. Discharge to public combined sewer

4.2 Infiltration

The viability report has determined that the site is underlain by clay strata which have low permeability characteristics and are not suitable for SUD's infiltration drainage of surface waters. Background information on the viability of infiltration is contained within Appendix 2.

4.3 Discharge to Watercourse

A site walkover was undertaken on 11th March 2015. At present there are no surface water features on or around the site boundary where surface water can be discharged to.

The nearest surface watercourse is located approximately 291m northwest of the site in a playing field where water discharges from a culvert into a watercourse. The culvert is approximately 900-1000mm in diameter and from the alignment of manholes in the playing fields; it appears to flow in a northerly direction underground from Offa. The assumed location of the culverted watercourse is down gradient of the site entrance on Sycamore Drive and subject to further investigation, could be connected into a new public surface water sewer along Sycamore Drive, Crogen and Offa to connect into the culvert outside the playing field.

A review of Welsh Waters records does not show the exact alignment of the culvert, but shows the locations of where existing public surface water sewers discharge into the culvert. Running parallel with the assumed alignment of the culvert through the playing field is a combined 900mm diameter sewer; this is also shown to discharge at the location of the culvert into the watercourse at the north of the playing field, indicating there is a possible error on the Welsh Water records. The location of the combined sewer is shown on Drawing No.5823/101 in Appendix 4.

A review of historical Ordnance Survey plans has also been undertaken to ascertain the original alignment of the now culverted watercourse. The location of the watercourse is shown on Drawing No.5823/100. The historical alignment of the watercourse is very similar to that of the 900mm diameter combined sewer, possibly indicating that the combined sewer on the Welsh Water plans may be the culverted watercourse, this would need to be confirmed.

The proposed route of new surface water sewer connecting the development to the culvert would be approximately 250m in length; its route is shown on drawing No. 5823/102 in Appendix 4.

Any connection into the culvert would likely require consultation and approval with Wrexham County Borough Council as it would be classified as an 'Ordinary Watercourse'.

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Flows

Surface water flows from the proposed development will be restricted to a greenfield QBAR rate. This has been calculated using ICP SUDS method in Source Control (Windows Module). The discharge of surface water from the site will be restricted to 10.8 l/s before discharging into a new surface water sewer. This discharge would be controlled via a flow control in the last manhole within the proposed development.

Calculations are provided in Appendix 3.

Attenuation

We estimate the proposed impermeable areas from the masterplan to be approx 1.28ha (33% of the developable site area).

WinDes Source Control calculations have been undertaken to determine the attenuation requirements for the site based on a flow restriction. The attenuation volumes have been calculated as approx 420 m³ for the 1 in 30 year and 1 in 100 year plus 30% allowance for climate change event.

Calculations are provided in Appendix 3.

30 Year

For the purpose of this assessment attenuation for the 30year storm event can be accommodated by the construction of a geocellular tank system which measures 18.4m x 18.4m x 1.2m. This could be incorporated in the network and located beneath the proposed green space. The new tank system could be offered to Welsh Water for adoption under a S104 Agreement. The location of the tank is shown on Drawing No. 5823/SK03.

Calculations are provided in Appendix 3.

100 Year

In excess of the 1 in 30year storm event, up to the 100year plus 30% climate change storm event, above ground storage areas could be provided on site. This is subject to water being stored in controlled areas such as landscaped features and car parks, to ensure buildings do not flood. Sufficient attenuation area should be provided within the site for storms in excess of a 1 in 30year storm event but less than 1 in 100year storm event plus a 30% allowance for climate change to ensure there is no flooding of property on or off the site. Overland flow routing during the 1 in 100 year plus 30% climate change storm event should direct flows to a common area within the site having flood depth not exceeding 100mm to ensure access or egress is unrestricted at all times.

We have calculated approx 844cu.m. of storage up to the 100year plus 30% climate change is required. For the purpose of this assessment attenuation could be provided using an attenuation basin. However, site gradients may cause issues for the construction of an attenuation basin and may require retaining features or a buried tank in lieu of a surface feature. Permeable paving may be appropriate in some areas; this would require a tanked system with flow control. Further consideration would be required during detailed design.

Calculations are provided in Appendix 3.

4.4 Discharge to Public Surface Water Sewer

There are no public surface water sewers in the vicinity of the site. The nearest public surface

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water sewer is located approximately 103m away down gradient from the site on Crogen. However, its diameter is only 150mm, therefore without upgrading it to a larger diameter, it would not be suitable for the increased volumes of water associated with the development. The location of the public surface water sewer is shown on Drawing No.5823/101 in Appendix 4.

Subject to further investigation, the public surface water sewers appears to discharge into the culverted watercourse at the same location as proposed connection in for a new surface water sewer described in section 4.3

4.4 Discharge to Public Combined Sewer

An existing 225mm diameter combined sewer is located on Sycamore Drive adjacent the proposed entrance to the development. The combined sewer flows in a westerly direction along Sycamore Drive. A connection into this sewer will only be considered by Welsh Water if all other methods of discharge discussed above can be proved to be unviable. The location of the combined sewer is shown on Drawing No.5823/101 in Appendix 4.

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6.0 Foul Drainage

The nearest available drainage network was identified as a 225mm diameter combined sewer in Sycamore Drive to the west of the site. This combined sewer has an existing manhole (SJ29394101) at the entrance of the proposed development.

Subject to consultation with Welsh Water and an inspection of manhole SJ29394101, foul sewage from the proposed site could be discharged into the existing foul sewer on Sycamore Drive.

The location of the combined sewer is shown on Drawing No.5823/101 in Appendix 4.

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7.0 Summary and Further Considerations

In summary, the proposed surface water drainage strategy will involve the use of the following:

- Subject to further investigation and consultation with Welsh Water and Wrexham Council. The construction of a new public surface water sewer along Sycamore Drive, Crogen and Offa, connecting into the culvert (Ordinary Watercourse) on Offa opposite the playing field.
- There appears to be possible errors in Welsh Waters records regarding the possible alignment of the culvert and that of what was labelled as a combined sewer, this would need to be fully investigated to ascertain the viability of the above new proposed surface water sewer.
- Flows will be restricted to a Greenfield QBAR of 10.8l/s before leaving the site.
- 30year storm event attenuation provided within geocellular tank located under proposed green space. These will be offered to Welsh Water under a Section 104 Agreement.
- To accommodate flows up to a 100year return period with an additional 30% allowance for climate change. This could be provided using an attenuation basin. However, site gradients may cause issues for the construction an attenuation basin and may require retaining features or a buried tank. Permeable paving may be appropriate in some areas; this would require a tanked system with flow control. Further consideration would be required during detailed deign.
- Subject to consultation with Welsh Water and an inspection of manhole SJ29394101, foul sewage from the proposed site could be discharged into the existing foul sewer on Sycamore Drive.

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Appendix 1

Photographs



Plate 1 – Looking west from site entrance on Sycamore Drive



Plate 2 – Looking east towards site entrance on Sycamore Drive



Plate 3 – Looking west on Sycamore Drive towards Crogen



Plate 4 – Looking north on Crogen up gradient of Offa



Plate 5 – Looking west on Crogen towards Offa and playing field on Offa in distance.



Plate 6 – Looking north on Offa into playing field.



Plate 7 – Looking north on playing field towards culvert outfall in distance.



Plate 8 – Culvert outfall.



Plate 9 – Close up of culvert outfall



Plate 10 – Looking south down the culvert

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Appendix 2

Desktop Study Report

Reference: 4441dtr

Search Date: 24 June 2014

Our ref: 4441dtr

Desk Top Study Report
for land at
Ley Farm, Sycamore Drive,
Chirk

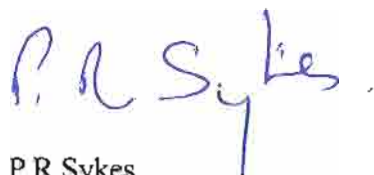
For: Greenspace Architects Ltd
3 Wharf Road,
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24 June 2014

Desk Top Study Report for land at
Ley Farm, Sycamore Drive, Chirk.**Document Verification**

Project Title	Ley Farm, Sycamore Drive, Chirk.
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Document Number	4441dtr
This document is not to be used for contractual or engineering purposes unless the document verification sheet is signed where indicated by the approver of the document.	

Prepared, Checked and Approved by


P R Sykes
BSc(Hons), MSc(Eng), CGeol, FGS

Report Reference	Date	Description	Prepared	Checked and Approved
4441dtr	24 June 2014	Desk Top Study Report for Viability	P R Sykes	P R Sykes

This report has been prepared for and on behalf of our client, in accordance with the terms and conditions of the appointment agreement with Coopers. Other than where specifically allowed for in the said appointment agreement, any other party using this report for any purpose whatsoever does so at their own risk and any duty of care to that party is specifically excluded.

Desk Top Study Report for land at
Ley Farm, Sycamore Drive, Chirk.

1.0 Introduction

- 1.1 This report is a desk top study appraisal of the anticipated ground conditions and contamination regime for a proposed residential development on land adjacent Ley Farm, Sycamore Drive, Chirk. The report was prepared on instructions received from our client, Greenspace Architects Ltd, 3 Wharf Road, Ellesmere, SY12 0EJ, to assist in their viability appraisal.
- 1.2 The copyright of this report and the associated plans/documents prepared by Coopers is solely owned by Coopers. Consequently neither this report nor the associated plans/documents may be reproduced, published or adapted without the express written approval of Coopers. Complete copies of this report may, however, be made and distributed by our client as an expedient in dealing with matters directly related to its commission.
- 1.3 The accuracy of map extracts cannot be guaranteed and it should be recognized that different conditions on site may have existed between and subsequent to the various map surveys.
- 1.4 Where data supplied by others, including that from previous investigations, has been used it has been assumed that the information is correct. No responsibility can be accepted by Cooper Associates for inaccuracies within the data supplied by others. We would advise that our client contacts the Local Authority Planning Department to determine any potential planning constraints which have not been identified within this report.
- 1.5 The results of the trial pit and borehole explorations are based upon the facts established from observations and field tests. It should be recognized that strata may vary considerably from point to point and the groundwater regime may be influenced by seasonal or other factors. While every attempt is made to assess the likelihood and extent of such variations, conditions may nevertheless exist which are undisclosed by this investigation.
- 1.6 This report has been prepared in accordance with the Building Regulations Part C (2004), and complies with the requirements associated with the planning guidance. This report should address some of the conditions placed within the planning conditions regarding the ground conditions and contamination. This report has been prepared in accordance with the requirements of the revised NHBC Standard Chapter 4.1 which was effective from July 2003. The scope of this report complies with the criteria for certification under the Initial Assessment including the Desk Study (D1) and the Walkover Survey (D2). This report constitutes a Phase I report in accordance with CLR 11. The report is also prepared in accordance with BS10175: 2011, and complies with Phase 1 (Preliminary Investigation).
- 1.7 The further actions deemed necessary to be completed prior to development of the proposed site for residential development have been listed in Section 20.0 of this report. The full extent of further actions may not be limited to those issues stated and, during the course of the development; additional further actions may be required.
- 1.8 **The report should be read in its entirety, including all associated drawings and appendices. Coopers cannot be held responsible for any misinterpretations arising from the use of extracts that are taken out of context.**

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- 1.9 Arboricultural Surveys and advice on arboricultural issues are considered to be outside the scope of this report except for their effect on the foundations to the proposed buildings. Where trees and shrubs are present on site, it is the responsibility of the developer to commission a professional Arboricultural Consultant to undertake the relevant survey for amenity and / or foundation design. This report will not generally attempt to identify trees on site. However, where identification of any species is made, especially invasive plants such as Japanese Knotweed, Himalayan Balsam or Giant Hogweed, this should only be considered as a preliminary assessment and subject to confirmation by a professional Arboriculturist. Cooper Associates takes no responsibility for failing to identify or for the incorrect identification of any tree or plant species on site.
- 1.10 This report is prepared and written in the context of the purposes stated above and should not be used in a different context. Furthermore, new information, improved practices and legislation may necessitate an alteration to this report in whole or in part after its submission. Therefore, with any change in circumstances or after the expiry of one year from the date of this report, the report should be referred to Cooper Associates for reappraisal.

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List of Appendices

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Desk Top Study Report for land at Ley Farm, Sycamore Drive, Chirk.

Grid Reference	SJ 295 391
Approximate Site Area	3.88 hectares (9.59 acres)
Exploratory Holes undertaken within the site (Refer to Appendices 5 and 6)	36 No. trial pits by Ian Farmer Associates between 10 and 13 May 2004 (TP1 to TP36) 11 No. cable percussive boreholes drilled by H B Boring Limited between 16 May and 4 June 2004 (BH1 to BH10 and BH4A) (rotary open hole follow on in all boreholes bar BH4 and BH5)
BGS Borehole Data in the vicinity of the site	Black Park Colliery, Denbigh (BGS reference SJ 23 NE 9) drilled to 114m depth, located close to the northern boundary. Recommend purchasing off the BGS.
1. Site Location and Description (Refer to Site Description in Appendix 1, and Site Plan, Drawing No. 4441/01 in Appendix 8)	The site location is shown on Drawing No. 4441/L1 in Appendix 8. Site comprises 1 No. irregular shaped parcel of steeply sloping agricultural farmland, approximately 3.88 hectares (9.59 acres) in area, located adjacent Chirk Green Wood and a post war housing estate. Suspected mine shaft(s) and mine adit on site. Restored opencast pit in eastern half of the site. Access onto site via Sycamore Drive.
2. Site History (Refer to Site Plan and historical Ordnance Survey maps in Appendix 8)	The site is agricultural land with hedgerow boundaries. Chirk Green Wood abuts south western boundary. Surrounding area predominantly farmland. Post World War II housing estate west of the site. Coal mining activity in the vicinity of the site includes 2 No. mine shafts within Chirk Green Wood, a suspected mine adit in the western corner of the site, and a restored opencast coal pit in the eastern half of the site. Recommend obtaining Ordnance Survey maps and historical air photos.
3. Hazardous Installations (Refer to Appendices 2 and 3)	According to the Envirocheck Report there are no COMAH sites, registered waste treatment/disposal sites, licensed waste management facilities or fuel stations within at least a 500m radius of the site. There are no trade directory entries within a 500m radius of the site. Subject to the findings of a search enquiry to Wrexham County Borough Council it is not anticipated that the site will be affected by hazardous installations. However, we would recommend consultation with service providers to obtain service records for the site (i.e. electricity pole adjacent south western site boundary).
4. Landfill Sites and Ground Gases (Refer to Appendices 2 and 3)	There are no current or former landfill sites within a 250m radius of the site. However, information from the British Geological Survey indicates the presence of 1 No. closed opencast coal pit within the site, and a further closed opencast coal pit within 150m north east. No information is available on the date or scope of operation for the on-site pit. The other pit, named Ley Farm, reference 4741 was operated by Bayford Mining Limited. No details on the date or scope of operations on this site. Intrusive investigation on the site undertaken in 2004 by others indicates that the opencast pit was backfilled with up to 9m of reworked clays with lesser amounts of sand, gravel and cobbles which are probably site won and derived from the site stripping operations undertaken prior to coal extraction. Additionally the site is underlain by Productive Coal Measures of Carboniferous age beneath a thin cover of drift, which has been proven to contain workings within one or more shallow coal seams. Gas monitoring standpipes installed in 5 No. boreholes on site. No gas readings have been supplied. Based on the above we would anticipate that Wrexham County Borough Council EHO would request that a ground gas investigation be undertaken before any planning condition relating to contamination and/or ground gas could be discharged. However, full Radon gas precaution measures are required for the development area (refer to Section 9.0). It would be prudent to utilise a membrane in the gas detail that would afford protection against low concentrations of carbon dioxide and methane, which may be passively generated from the in situ fills in the backfilled former opencast pit, as well as the worked coal seams. Adoption of the above may be sufficient to negate the need for a ground gas investigation. We would advise that discussions are held with Wrexham County Borough Council – Planning and Environmental Health Departments at the earliest opportunity to confirm that they concur with the above assessment.

Desk Top Study Report for land at Ley Farm, Sycamore Drive, Chirk.

5. Geology, Hydrology and Hydrogeology (Refer to Appendices 2 and 3, and Site Plan in Appendix 8)	<u>Drift</u> The geological maps show that the western margin of the site is underlain by Glacial Till (recorded as “Boulder Clay”). Drift is noted to be thin or absent over the remainder of the site. 1 No. BGS sourced borehole adjacent the northern boundary. (Log of borehole not provided – recommend obtaining from BGS). <u>Bedrock</u> The geological maps show that the site is underlain by Productive Coal Measures of Carboniferous age. Strata are indicated to dip 10° east in the vicinity of the site. The Main coal seam is noted to subcrop immediately west of the site. A further unnamed seam of coal has been worked by opencast methods in the centre of the site. The conjectured seam subcrop and extent of opencast works are presented on the Site Plan. <u>Geological Faults</u> Based on available geological maps, 1 No. geological fault trending north to south and downfaulted to the west is present within the central area of the site. Due to the known presence of shallow coal workings and thin drift beneath the site, special precautions with regard to foundation design anticipated. (Refer to Section 16.0 for further details). <u>Groundwater Vulnerability</u> The site is designated as a minor aquifer overlain by low leaching potential soils. The site is not located within a Groundwater Source Protection Zone. There are no discharge consents within a 200m radius of the site. The nearest watercourse to the site is the Shropshire Union Canal, greater than 800m west of the site. The water quality is recorded as Grade C (good) for the year 2000. There are no pollution incidents to controlled water higher than Category 3 (minor) within a 700m radius of the site. There are no licensed abstractions within a 900m radius of the site. <u>Flood Risk</u> The Environment Agency (EA) website shows that the site is not within an area of potential flooding or flood warning. <u>Compressible Ground or other Subsidence Hazards</u> No to low hazard based on the Envirocheck Report.
6. Animal Burial Sites (Refer to Appendix 8)	Based on a review of the available historical OS maps, the site is unlikely to be affected by animal burial sites. Recommend obtaining search from the State Veterinary Service to confirm.
7. Environmental Issues (Refer to Appendices 1 to 3)	There are no protected countryside areas or sensitive land uses within a 1km radius of the site. Japanese Knotweed or other invasive species not noted within or abutting the site. Site unlikely to be affected by environmental issues. No special precautions anticipated.
8. Coal Mining (Refer to Appendices 4, 6 and 8)	<u>Findings</u> According to the Coal Authority (CA), Coal Mining Report reference: 10319256-06, dated 8 August 2006, the site is situated within the likely zone of influence on the surface from workings in 4 No. seams of coal at shallow to 130m depth. The last date of working was 1860. The CA advises that the site is not affected by any present underground or currently planned future underground works, nor within 200m of any currently proposed opencast site. However, the site is located within the geological boundary an opencast site from which coal has been extracted by opencast methods (refer to Section 4.0 of the Report for further details). A review of the available geological maps for the area notes the presence of the Main coal seam outside the western site boundary, which dips east beneath the site at an angle of approximately 10°. No information is available as yet to the seam thickness although in Borehole BH1, drilled by H B Boring and Company Limited in 2004, the coal seam is recorded to be 1.90m thick, based on flush returns during rotary open hole drilling. This seam is likely to have been worked, based on the findings of BH4/4A. A further unnamed coal seam has been opencast worked back to a geological fault line in the eastern half of the site (possibly the Quaker or Crank). According to the CA Coal Mining Report there is 1 No. mine entry noted within the site, referenced 329339-056. The stone lined shaft was infilled to an unknown specification at an unknown date.

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8. Coal Mining (Cont'd)	Coal mine entry 329339-023, located close to the site boundary just inside Chirk Green Wood was filled to an unknown specification at an unknown date. Between 1976 and 1984 several occurrences of settlement required the shaft to be topped up. The CA noted that additional mine entries may exist within the locality that they have no knowledge of. Anecdotal information suggests that the mouth to a mine adit is present close to the head of Sycamore Drive in an area of recent earthworks and soil stripping. The mine adit is reported to have suffered fire damage at some time in the past. The Site Plan, Drawing No. 4441/01 contains the conjectured subcrop of the coal seams, recorded mine entries and other geological features/data obtained from the Coal Mining Report, geological maps, anecdotally, and supplied by the client. <u>Discussion</u> A permit must be obtained from the Coal Authority to investigate and treat the workings and shafts ahead of undertaking any stabilisation works. It may be prudent to review the abandoned mine plans held by the Coal Authority, although due to the likely date of workings (i.e. pre 1860), any records may be of limited use. A scheme for the stabilisation of the workings within the Main coal seam, based on treatment by the injection of a cement/pfa grout via boreholes drilled on a diamond grid pattern over the footprints of the proposed plots and possibly roadways should be prepared once the planning layout has been finalised. It is recommended that site work should be carried out to identify and locate the suspected mine entries. The work should comprise a geophysical investigation supplemented by either rotary open boreholes and/or a series of slit trenches scraped to natural strata using a 360° tracked excavator across the conjectured mine entry or evidence of disturbed/reworked ground which may be indicative of a collapsed adit mouth. Once located, treatment will involve drilling the shaft to its base to confirm there are no major voids, stabilising the shaft infill by injection of a cement/pfa grout, and installation of a reinforced concrete cap which should be at least twice the internal diameter of the shaft. The mode of adit treatment largely depends on the depth and dimensions of the mine mouth. If shallow, treatment may comprise excavation and infilling with compacted backfill, or if deeper, plugged to avoid collapse or settlement of the overlying strata. In theory, once treatment has been undertaken, a shaft should no longer represent an instability risk. In practice additional precautions are normally taken to avoid construction in their immediate vicinity. A safe distance of build should consider the depth and dimensions of the feature, the nature of the near surface soils, and the sensitivity of the building and its foundations. Ideally no construction should take place at a distance from the edge of the shaft equal to the depth of the base of the cap below ground level. An additional distance (a "security zone"), typically 2m, is added as a factor of safety to take into consideration the type of foundations of the adjacent buildings and the shaft depth. If development adjacent the shaft is undertaken on strengthened (i.e. reinforced strip) or deepened foundations (i.e. pile or deep reinforced strip/trenchfill foundations), then this could be considered to represent an adequate additional factor of safety. However, if use is made of say traditional strip footings then this security zone would be required. On any site where mining has taken place at shallow depth, there is always a risk of unrecorded features being present. These features could include unrecorded shafts, collapses that have migrated to the surface and subsidence sags that have been infilled with loose mine waste. An allowance for the implications of these conditions should be made in assessing the development costs.
9. Radon Potential (Refer to Appendix 3)	Site potentially affected by radon. Full radon protective measures are required. Recommend obtaining Standard Radon Protective Measures Report off the BGS to clarify.
10. Ground Conditions (Refer to Appendices 5, 6 and 12)	<u>Topsoil/Madeground (similar to topsoil)</u> Natural topsoil or madeground (similar to topsoil) encountered in over 95% of the exploratory holes to depths of between 150mm and 500mm. <u>Existing Structures</u> No above ground structures on site. Suspected mine entry and mine adit present within the site boundary.

Desk Top Study Report for land at Ley Farm, Sycamore Drive, Chirk.

10 Ground Conditions (Cont'd)	<u>Hardstanding</u> None present. <u>Madeground</u> Encountered in approximately 60% of the exploratory holes to depths of between 800mm and 9000mm, being deepest in the former backfilled open cast pit. Madeground predominantly comprises clay containing variable amounts of coal fragments, gravel, cobbles and boulders, with subordinate layers of gravel or sand. The shear strength of the clay madeground is typically described as firm, although it has been recorded as varying between soft to stiff. In situ testing of the clay madeground is restricted to Standard Penetration Testing at 1m intervals within the cable percussive boreholes which recorded a wide range of SPT'N' blows from <4 (i.e. soft/very soft) to >50 (i.e. stiff to very stiff). No laboratory testing or other in situ testing available to determine the susceptibility of the clay madeground to collapse compression on inundation, or long term settlement which non-engineered madeground is prone to. For further details on problems associated with developing sites with deep fills refer to BRE Digest 427 Part 1 – Low Rise Building on Fill (December 1997) and BRE IP5/97 Building on Fill: Collapse Compression on Inundation (March 1997). <u>Natural Strata</u> Firm, firm to stiff and stiff, occasionally soft to firm, glacially derived clay or loose to medium, dense sand and/or gravel. Drift thin or absent in the area of the former opencast pit. <u>Bedrock</u> Productive Coal Measures strata encountered across the site at rockhead levels varying between 0.3m (TP32) and 19.0m (BH4A) deepening east to west (i.e. downslope). 1.9m thick Main coal seam encountered in BH1, which is estimated as dipping at 1 in 3 eastwards beneath the site. A further 0.5m thick coal seam was encountered in BH3, located in the north eastern corner of the site, east of the conjectured north-south trending fault. Zone of loose drilling noted in BH4A along the western margin of the site in an area anecdotally indicated as containing the mouth of an adit. <u>Groundwater</u> Seepages occasionally observed within fill strata at depths varying between 1.5m and 1.6m, or within bedrock at depths greater than 7.9m. Standing water observed at a depth of 2.1m within trial pit TP11, inside the western margin of the former backfilled opencast pit. The adjacent exploratory holes were noted to be dry.
11. Sub-Soil Classification	<u>Frost Susceptibility</u> Clay madeground and Sand Strata – Assume frost susceptible <u>Shrinkage Potential</u> Clay Strata – Assume medium shrinkage potential. <u>Concrete Classification</u> Based upon BRE Special Digest 1 (2005), the Design Sulphate (DS) class, Aggressive Chemical Environment for Concrete (AC) class, and Design Concrete (DC) class <u>assumed</u> for each of the anticipated strata types is given below. Natural Clay and Cohesive Fill Strata – DS-1, AC-1s, DC-1 Natural Sand and Granular Fill Strata – DS-1, AC-2z, DC-2z <u>Combustibility</u> Representative samples of fill and carbonaceous bedrock should be tested to determine their calorific value. Materials with a calorific value of 10MJ/kg or greater would be considered a possible fire hazard, and hence could be potentially combustible.
12. Contamination (Refer to Site Description in Appendix 1, and Site Plan in Appendix 8)	A walkover of the site was undertaken by Cooper Associates on 3 August 2006. No geochemical testing is available for this site. Based on the desk study there are a number of potential sources of contamination however which may exist at the site. These include the madeground associated with the former opencast pit and its subsequent infilling, ground gases derived from the underground coal workings and shaft, radon gas from the underlying bedrock, and combustion by-products from the fire in the adit.

Desk Top Study Report for land at Ley Farm, Sycamore Drive, Chirk.

12. Contamination (Cont'd)	The madeground was probably site won, reworked clays with lesser amounts of sand, gravel and cobbles derived from the site stripping operations undertaken prior to coal extraction. The 2004 intrusive investigation has not encountered any obviously visual contaminated material, although beyond this we are unable to offer any other opinion. The potential pollution linkages relating to ground gases are considered negligible provided mine entries/adits are filled, grouted and capped/plugged; mine workings drilled and grouted; and full radon gas precautions are adopted for all dwellings on the development. No information is available at present regarding the anecdotally recorded mine adit.
13. Trees (Refer to Appendix 1)	Due to the presence of natural clay strata at shallow depth beneath several areas of the site, it is anticipated that the sporadic trees within the site and the numerous trees along the majority of the site boundaries, may have an impact on the proposed slabs and foundations. Tree survey recommended. Search request recommended to the Local Authority to determine if the site is affected by Tree Preservation Orders (TPO's).
14. Basis of Assessment	Our assessment assumes that the site will be redeveloped for traditionally constructed dwellings no greater than 2 storeys in height. Due to the topography of the site and after a review of the supplied layout, it is anticipated that large areas of the site will require regrading. The extent of regrading and retaining structures will be affected by the finalised planning layout and finished floor levels, which are not currently available. Where private drainage is proposed to be laid between adjacent plots, careful consideration must be given to the relative levels of the foundations of the footings and drainage pipework. This information needs to be reviewed to ensure that no footings are being undermined by drainage pipework levels. Extensive areas of the site slope at gradients at or above 1 in 10 (approximately 5°). At this gradient, retaining measures are envisaged between plots. Foundation recommendations are based on the assumption that the site is not affected by unrecorded shafts, adits or surface disturbance by bell pitting, and that recorded mine entries have been filled, grouted and capped/plugged, and shallow mineworkings drilled and pressure grouted.
15. Ground Floor Slab Construction (Refer to Appendix 5)	Subject to site regrading, assume adoption of suspended ground floor slab construction across the entire site area, unless a raft foundation with an integral floor slab is adopted in areas within the conjectured geological fault zone or are affected by trees. <u>Full</u> radon gas precautions are required. If during excavations for foundations coal seams are encountered, the NHBC have previously indicated that the coal should be over excavated for a minimum of 1m from the outside of the foundations and replaced with blinding concrete. Also, within the plot footprint coal should be removed where there is less than 1m cover beneath the underside of the floor slab. These actions should be adequate to seal the coal from the atmosphere to prevent combustion occurring.
16. Anticipated Foundations (Refer to Appendices 5 and 6)	The foundations and floor slabs for the proposed plots should be specifically designed by a Structural Engineer following a structured and phased site investigation. However, following completion of site clearance, regrade works and road/sewer construction, we would conjecture the following options could be adopted: - Nominally Reinforced Strip Foundation – Founded in competent Glacial clay with a variable sand content and containing sand and gravel layers, and Glacial Sand or Gravel with an assumed relative density of loose to medium dense. In areas where the formation level <1250mm. Maximum safe bearing pressure – assume 100kN/m². Piled Foundations – In areas underlain by deep fill and poor bearing strata. Piles could form preferential pathways for contamination migration. For viability purposes assume the areas requiring this foundation type are within and adjacent the former backfilled opencast pit in the eastern half of the site. Pile lengths to be determined by the findings of a cable percussion borehole investigation. However for budget purposes assume piles end bearing into Carboniferous bedrock with an anticipated rockhead less than 10m. Vibro Stone Columns are unlikely to be viable due to the presence of deep clay madeground within the opencast backfill, and the occasional occurrence of oversized material.

Desk Top Study Report for land at
Ley Farm, Sycamore Drive, Chirk.

16.: Anticipated Foundations (Cont'd)	Trenchfill/Deep Reinforced Strip Foundations – Founded in competent Glacial strata. In areas of the site where formation level >1.25m depth. Maximum safe bearing pressure – assume 100kN/m² for budget purposes. Trenchfill/Semi Stiff Raft Foundation with Heave Precautions – In areas affected by trees and possibly requiring heave precautions. Semi-Stiff Raft Foundation – In areas within 10m of the conjectured geological fault. Maximum safe bearing pressure limited to 50kN/m². Discussions should be held with the NHBC regarding the foundation options for dwellings which straddle the geological fault or are within 10m of the downthrown side of the fault (i.e. within the backfilled opencast pit). An assessment of the anticipated foundation requirements for each exploratory hole is given in the summary table in Appendix 5, for information purposes only. For further details of the anticipated foundations for the development on an area-by-area basis, refer to our Preliminary Foundation Zone Plan, Drawing No. 4441/PFDZ in Appendix 8. All the above foundation options are subject to the detailed review of the findings of intrusive investigations and the final planning layout and slab/regrade level proposals.
17. Dewatering	We would anticipate that dewatering would not be required for drainage trenches and normal foundation excavations. Dewatering anticipated for service/sewerage/foundation trenches, which intercept perched water within fill strata (i.e. TP11). Dewatering operations need to ensure that the effects of infiltration of groundwater through the fills does not accelerate settlement rates of the fills or leads to localised instances of collapse compression on inundation.
18. Trench Side Stability	It is anticipated that any trenches excavated on site will be required to be fully supported or battered back to the safe angle of repose, especially for foundations and service/sewerage trenches.
19. Road Sub-Grade	Following site clearance, topsoil stripping, and regrade works, the anticipated estate road/parking area subgrade materials are likely to comprise a combination of in situ madeground, variable strength glacial clays, loose to medium dense sands or gravels, and Carboniferous bedrock. Due to the likely variability of the sub-grade materials, no estimate can be made of the likely in-situ CBR values. Due to the non-engineered nature of the opencast pit backfill the final design of the roads and sewers should take into account the possibility of excessive total and/or differential settlement occurring in the fills. We would recommend in situ CBR testing be undertaken prior to pavement design at <u>proposed</u> formation levels.
20. Further Action	Assuming the site is to be redeveloped for residential usage, the further actions, which may be required to take the project up to Basic (D4) Site Investigation Report level, could include, but not necessarily be limited to: • Obtain service records. • Obtain searches from Local Authority, State Veterinary Service, etc. • Obtain BGS borehole record for Black Park Colliery. • Discussions with the Local Authority regarding ground gas precautions. Subject to discussions undertake ground gas investigation utilising if possible existing gas monitoring standpipes. • Obtain Coal Authority forms for permission to investigate/treat mineworkings and shafts/adits. • Review Coal Authority Mine Abandonment Plans. • Purchase early OS maps. • Tree survey. • Trial pitting/slit trenching to delineate fault, and former backfilled opencast pit. • Review aerial photographs to determine date and extent of opencast workings. • Geophysical survey to locate suspected mine adit and mine shaft(s). • Subject to findings of a geophysical investigation, intrusive investigations to delineate mine adit and mine shaft(s). • Discussions with NHBC and Local Authority regarding settlement monitoring and in situ testing of madeground. • Prepare earthworks specification.

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20. Further Action (Cont'd)	• Cable percussive borehole/rotary open hole borehole and trial pit investigations. Specialist piling contractors asked to attend trial pitting. • Geochemical testing, including calorific value. • Geotechnical analysis including earthworks testing. • In situ CBR testing for proposed access roads and parking areas. • Prepare structural design drawings once layout, slab levels and regrade levels finalised. • Prepare updated Foundation Zone Plan or Foundation Plan. • Prepare Site Investigation Report.
---------------------------------------	---

Desk Top Study Report for land at
Ley Farm, Sycamore Drive, Chirk.

REFERENCES

A study of published geological maps, including 1:50,000 Sheet 121 (Wrexham) – solid and drift combined edition.

Inspection of OS map obtained from an internet database.

Enquiries to the British Geological Survey website.

A review of data held in the Coopers archives.

Enquiries to the Environment Agency website.

DOE/ARUP Map of Mining Instability in the North West.

The Law Society's Guidance Notes and Directory for Coal Mining Searches.

EA Groundwater Vulnerability Map – Sheet 16 (West Cheshire).

Landmark Envirocheck Report dated August 2006

Trial Pit No.'s TP1 to TP36 excavated by Ian Farmer in May 2004.

Borehole No.'s BH1 to BH10 and BH4A drilled by HB Boring & Co. Ltd in May and June 2004.

Desk Top Study Report for land at
Ley Farm, Sycamore Drive, Chirk.

Appendix 1

Site Description

Cooper Associates

Date of Walkover: 3 August 2006

Site Description

Project: Ley Farm, Sycamore Drive, Chirk

Project No: 4441

Prepared by: DPC

Date: 3 August 2006

Weather: Sunny and warm

Time on site: 14:30

Engineer: DPC

Time off site: 15:30

Site Description

(All dimensional references are approximate or estimated from visual inspections)

At the time of the walkover survey the site comprised 1 No. irregular shaped parcel of steeply sloping agricultural farmland, approximately 3.88 hectares (9.59 acres) in area, located adjacent Chirk Green Wood and a post war housing estate (Refer to Figure 1).



Figure 1: Panoramic view of site from the south eastern corner. Chirk Green Wood is situated in the left of the frame

The site was bounded along the majority of its length by hawthorn hedgerows containing sporadic to numerous mature deciduous trees, some in excess of 10m in height. 1 No. mature deciduous tree was also present in the north eastern corner adjacent an area of hummocky ground (Refer to Figures 2 and 3).



Figure 2: Panoramic view of the site, including the isolated mature deciduous tree

Site Description

Project: Ley Farm, Sycamore Drive, Chirk

Project No: 4441

Prepared by: DPC

Date: 3 August 2006



Figure 3: Hummocky overgrown ground on the eastern side of the tree

Access into the site was via a set of gates at the head of Sycamore Drive (Refer to Figure 4).



Figure 4: Access into the site. Note poor state of repair

Access into adjacent fields was via gaps in the field boundary, part way along the eastern boundary and in the south western corner.

Anecdotal information indicated the presence of at least 1 No. mine entry within or immediately adjacent Chirk Green Wood (marked by a roughly circular earth mound), and adit in an area of earthworks on the northern side of Chirk Green Wood, and a backfilled opencast pit in the centre of the site (Refer to Figures 5 to 8).



Figure 5: Circular mound within Chirk Green Wood

Site Description

Project: Ley Farm, Sycamore Drive, Chirk

Project No: 4441

Prepared by: DPC

Date: 3 August 2006



Figure 6: Earthworks and stripped ground adjacent Chirk Green Wood



Figure 7: Linear stockpile close to a field access off Sycamore Drive



Figure 8: Panoramic view of concave break of slope in the right mid-ground of the frame in an area suspected to be a backfilled opencast pit

No indication of services within the site were noted during the walkover survey. However, a timber electricity pole was located in the field adjacent the south western corner and the underground cable may cross the site (Refer to Figures 9 and 10).

Site Description

Project: Ley Farm, Sycamore Drive, Chirk

Project No: 4441

Prepared by: DPC

Date: 3 August 2006



Figure 9: Electricity Pole



Figure 10: Electricity cable marker

Site Boundaries

- Northern: This boundary is defined by a hawthorn hedgerow, interspersed with deciduous trees.
- Eastern: The northern section of this boundary is open and provides access into the adjacent field. The remainder comprises a hawthorn hedgerow, interspersed with deciduous trees. Barbed wire was present where there were breaks in the hedgerow.
- Southern: - This boundary is defined by a hawthorn hedgerow interspersed with deciduous trees. A gap in the hedgerow in the south western corner provides access into the adjacent field.
- Western: The southern section of this boundary comprises Chirk Green Wood. The remainder comprises a hawthorn hedgerow interspersed with deciduous trees beyond which is a housing estate. The access point off Sycamore Drive is situated part way along this section of the western boundary.

Desk Top Study Report for land at
Ley Farm, Sycamore Drive, Chirk.

Appendix 2

Documents regarding Hazardous Installations, Landfill Sites and Flooding

Environment Agency (EA)

What's in your backyard-maps

Searches on: Source Protection Zones, Landfill Sites and Flood Potential

Search Date: 10 August 2006

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information.

Search for:

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☐ Postcode

Search

Click on the map to ...

- ☒ Zoom ☐ Learn more



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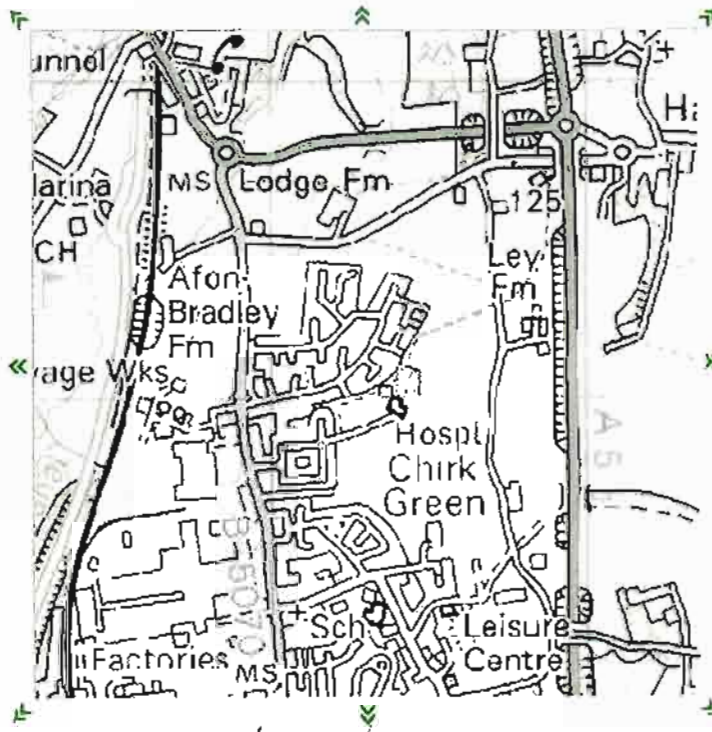
☒ Areas covered by flood warnings.

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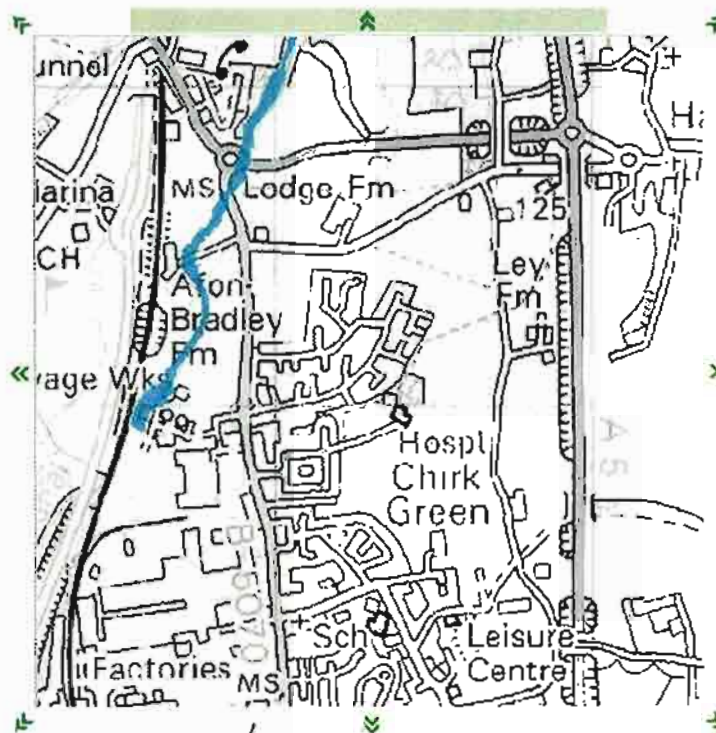
Map of LL14 5RG :

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Flooding from rivers or sea without defences

Extent of extreme flood

Flood defences

Areas benefiting from flood defences

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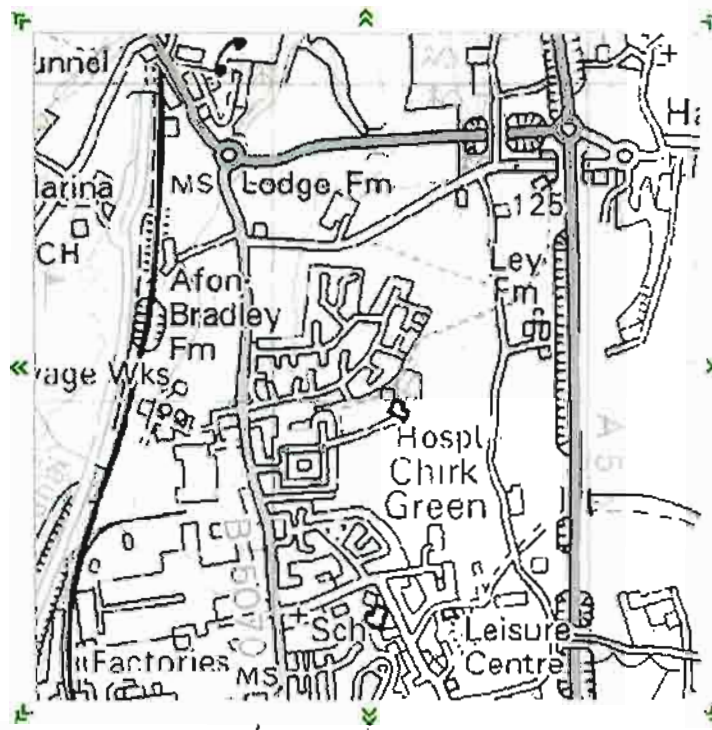
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- ☒ [Landfill sites](#) [more](#)

☐ [Landfill centre](#)

☐ [Landfill boundary](#)

- ☒ [Groundwater source protection zones](#) [more](#)

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Desk Top Study Report for land at
Ley Farm, Sycamore Drive, Chirk.

Appendix 3

Envirocheck Report

Landmark

Datasheet Report Reference: 20277783-1-1

Dated: 10 August 2006

Envirocheck[®] Report

Datasheet

Report on:
Sycamore Drive,
Chirk,
Wrexham

National Grid Reference :
329530, 339140

Site Area (Ha) :
3.79

Prepared For :
Cooper Associates
2 Vicars Lane
Chester
CH1 1QX

Client Details:
George Wimpey North West
Limited, Lichfield House, Gadbrook
Park, Rudheath, Northwich, Cheshire,

Your Reference:
Mr N Reynolds, 4441

Summary

Agency & Hydrological

Waste

Hazardous Substances

Geological

Industrial Land Use

Sensitive Land Use

Data Currency

Data Suppliers & Copyright Statements

Useful Contacts

BGS Borehole Order Form

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination. For this reason, Landmark's Site Sensitivity Datasheet places great emphasis on statutory data provided by the Environment Agency and the Scottish Environment Protection Agency; it also incorporates data from English Nature (and the Scottish and Welsh equivalents), the Environment Agency (and the Scottish equivalent) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the legend database to 1km from a single point or a site boundary provided by the client.

In the attached datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Data Type	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological				
Local Authority Pollution Prevention and Controls				1
Local Authority Pollution Prevention and Control Enforcements				
Contaminated Land Register Entries and Notices				
Discharge Consents		1	1	21
Enforcement and Prohibition Notices				
Integrated Pollution Controls				
Integrated Pollution Prevention And Control				1
Local Authority Integrated Pollution Prevention And Control				1
Nearest Surface Water Feature		Yes		
Pollution Incidents to Controlled Waters				24
Substantiated Pollution Incident Register			2	2
Prosecutions Relating to Authorised Processes				
Prosecutions Relating to Controlled Waters				2
Water Industry Act Referrals				
Registered Radioactive Substances				
River Quality				1
River Quality Biology Sampling Points				
River Quality Chemistry Sampling Points				
Water Abstractions				12 (*7)
Groundwater Vulnerability	Yes			
Source Protection Zones				
Extreme Flooding from Rivers or Sea without Defences				
Flooding from Rivers or Sea without Defences				
Areas Benefiting from Flood Defences				
Flood Water Storage Areas				
Flood Defences				
River Flood Data (Scotland)				

Data Type	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste				
BGS Recorded Landfill Sites				
Integrated Pollution Control Registered Waste Sites				
Licensed Waste Management Facilities (Landfill Boundaries)				
Licensed Waste Management Facilities (Locations)				
Local Authority Recorded Landfill Sites				2
Registered Landfill Sites				
Registered Waste Transfer Sites				
Registered Waste Treatment or Disposal Sites				
Hazardous Substances				
Control of Major Accident Hazards Sites (COMAH)				
Explosive Sites				
Notification of Installations Handling Hazardous Substances (NIHHS)				
Planning Hazardous Substance Consents				
Planning Hazardous Substance Enforcements				
Geological				
BGS Boreholes		3	34	67
BGS Recorded Mineral Sites		1	1	1
BGS 1:625,000 Solid Geology	Yes			
Brine Compensation Areas				
Coal Mining Affected Areas	Yes			
Shallow Mining Hazards	Yes			
Potential for Collapsible Ground Stability Hazards				
Potential for Compressible Ground Stability Hazards				
Potential for Ground Dissolution Stability Hazards				
Potential for Landslide Ground Stability Hazards	Yes			
Potential for Running Sand Ground Stability Hazards	Yes			
Potential for Shrinking or Swelling Clay Ground Stability Hazards	Yes			
Mining Instability	Yes			
Natural and Mining Cavities				
Radon Affected Areas	Yes			
Radon Protection Measures	Yes			
Industrial Land Use				
Contemporary Trade Directory Entries				6
Fuel Station Entries				2

Data Type	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Sensitive Land Uses				
Areas of Adopted Green Belt				
Areas of Unadopted Green Belt				
Areas of Outstanding Natural Beauty				
Environmentally Sensitive Areas				
Forest Parks				
Local Nature Reserves				
Marine Nature Reserves				
National Nature Reserves				
National Parks				
National Scenic Areas				
Nitrate Sensitive Areas				
Nitrate Vulnerable Zones				
Ramsar Sites				
Sites of Special Scientific Interest				
Special Areas of Conservation				
Special Protection Areas				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	Local Authority Pollution Prevention and Controls				
	Name	Berwyn Gargage	SW	629	1 328940
	Location	Holyhead Road, Chirk, WREXHAM, Clwyd, LL14 5HP			338680
	Authority	Wrexham County Borough Council, Environmental Health Department			
	Permit Reference	Wcbb/Pg1/14(5)V1			
	Dated	20th December 2001			
	Process Type	Local Authority Air Pollution Control			
	Description	PG1/14 Petrol filling station			
	Status	Authorised			
	Positional Accuracy	Manually positioned to the address or location			
	Discharge Consents				
	Operator	Dwr Cymru Cyfyngedig	SW	213	2 329230
	Property Type	Sewerage Network - Sewers - Water Company			339010
	Location	Chirk Chapel Lane -Sso			
	Authority	Environment Agency, Welsh Region			
	Catchment Area	River Dee			
	Reference	CM0036501			
	Permit Version	1			
	Effective Date	22nd September 1986			
	Issued Date	22nd September 1986			
	Revocation Date	Not Supplied			
	Discharge Type	Unspecified			
	Discharge	Ditch			
	Environment				
	Receiving Water	Un-Named Ditch Flowing To Brad			
	Status	New Consent, by Application (Water Resources Act 1991, Section 88)			
	Positional Accuracy	Located by supplier to within 100m			
	Discharge Consents				
	Operator	Dwr Cymru Cyfyngedig	W	362	2 329050
	Property Type	Sewerage Network - Sewers - Water Company			339160
	Location	Outside 24 Offa Chirk			
	Authority	Environment Agency, Welsh Region			
	Catchment Area	Not Given			
	Reference	CG0360201			
	Permit Version	1			
	Effective Date	21st July 1994			
	Issued Date	21st July 1994			
	Revocation Date	Not Supplied			
	Discharge Type	Unspecified			
	Discharge	Freshwater Stream/River			
	Environment				
	Receiving Water	River Dee Tributary			
	Status	New Consent, by Application (Water Resources Act 1991, Section 88)			
	Positional Accuracy	Located by supplier to within 100m			
	Discharge Consents				
	Operator	Dwr Cymru Cyfyngedig	S	644	2 329300
	Property Type	Sewerage Network - Sewers - Water Company			338400
	Location	Chirk Chapel Lane/Lloyds Lane			
	Authority	Environment Agency, Welsh Region			
	Catchment Area	River Dee			
	Reference	CM0196701			
	Permit Version	1			
	Effective Date	20th October 1989			
	Issued Date	20th October 1989			
	Revocation Date	4th March 1994			
	Discharge Type	Unspecified			
	Discharge	Freshwater Stream/River			
	Environment				
	Receiving Water	Culvert			
	Status	Consent expired			
	Positional Accuracy	Located by supplier to within 100m			

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Discharge Consents					
Operator	British Coal Opencast	NE	648	2	330230
Property Type	Undefined Or Other				339550
Location	Chirk Halton Opencast Coal Site At, Halton Opencast Coal Site At Ley, Opencast Coal Site At Ley Farm				
Authority	Environment Agency, Welsh Region				
Catchment Area	River Dee				
Reference	Cm0088401				
Permit Version	1				
Effective Date	29th January 1985				
Issued Date	29th January 1985				
Revocation Date	22nd December 1992				
Discharge Type	Unspecified				
Discharge	Into And/Or Watercourse				
Environment					
Receiving Water	Un-Named Trib. Of Ceiriog				
Status	Consent expired				
Positional Accuracy	Located by supplier to within 10m				
Discharge Consents					
Operator	Ceiriog Rural District Council	W	711	2	328700
Property Type	Undefined Or Other				339100
Location	Rhos Y Waun Stw (A)				
Authority	Environment Agency, Welsh Region				
Catchment Area	River Dee				
Reference	Cm0015401				
Permit Version	1				
Effective Date	9th April 1963				
Issued Date	9th April 1963				
Revocation Date	17th February 1986				
Discharge Type	Unspecified				
Discharge	Not Specified				
Environment					
Receiving Water	Bradley				
Status	New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)				
Positional Accuracy	Located by supplier to within 100m				
Discharge Consents					
Operator	Ceiriog Rural District Council	W	711	2	328700
Property Type	Undefined Or Other				339100
Location	Rhos Y Waun Stw (A)				
Authority	Environment Agency, Welsh Region				
Catchment Area	River Dee				
Reference	Cm0015402				
Permit Version	1				
Effective Date	9th April 1963				
Issued Date	9th April 1963				
Revocation Date	17th February 1986				
Discharge Type	Unspecified				
Discharge	Not Specified				
Environment					
Receiving Water	Bradley				
Status	New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)				
Positional Accuracy	Located by supplier to within 100m				
Discharge Consents					
Operator	Ceiriog Rural District Council	W	731	2	328680
Property Type	Undefined Or Other				339100
Location	Rhosywaun Stw				
Authority	Environment Agency, Welsh Region				
Catchment Area	River Dee				
Reference	Cm0028301				
Permit Version	1				
Effective Date	20th March 1965				
Issued Date	20th March 1965				
Revocation Date	17th February 1986				
Discharge Type	Unspecified				
Discharge	Not Specified				
Environment					
Receiving Water	Bradley				
Status	New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)				
Positional Accuracy	Located by supplier to within 10m				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	Discharge Consents Operator Dwr Cymru Cyfyngedig Property Type Sewage Disposal Works - Water Company Location Rhosywaun Stw, Chirk Authority Environment Agency, Welsh Region Catchment Area River Dee Reference Cm0050401 Permit Version 1 Effective Date 25th April 1983 Issued Date 25th April 1983 Revocation Date 9th November 1989 Discharge Type Sewage Discharges - Final/Treated Effluent - Water Company Discharge Not Specified Environment Receiving Water Bradley Status Authorisation revoked Positional Accuracy Located by supplier to within 10m	W	731	2	328680 339090
	Discharge Consents Operator Dwr Cymru Cyfyngedig Property Type Sewage Disposal Works - Water Company Location Rhosywaun Stw, Chirk Authority Environment Agency, Welsh Region Catchment Area River Dee Reference Cm0050401 Permit Version 2 Effective Date 10th November 1989 Issued Date 10th November 1989 Revocation Date 25th October 1995 Discharge Type Sewage Discharges - Final/Treated Effluent - Water Company Discharge Not Specified Environment Receiving Water Bradley Status Consent expired Positional Accuracy Located by supplier to within 10m	W	731	2	328680 339090
	Discharge Consents Operator Dwr Cymru Cyfyngedig Property Type Sewerage Network - Pumping Station - Water Company Location Chirk Ps (Screened Storm) Authority Environment Agency, Welsh Region Catchment Area River Dee Reference CG0329702 Permit Version 1 Effective Date 30th March 1993 Issued Date 30th March 1993 Revocation Date Not Supplied Discharge Type Sewage Discharges - Pumping Station - Water Company Discharge Freshwater Stream/River Environment Receiving Water Afon Bradley Status New Consent, by Application (Water Resources Act 1991, Section 88) Positional Accuracy Located by supplier to within 100m	W	732	2	328680 339070
	Discharge Consents Operator Dwr Cymru Cyfyngedig Property Type Sewerage Network - Pumping Station - Water Company Location Chirk Ps (Screened Storm) Authority Environment Agency, Welsh Region Catchment Area River Dee Reference CG0329701 Permit Version 1 Effective Date 26th March 1993 Issued Date 26th March 1993 Revocation Date Not Supplied Discharge Type Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Freshwater Stream/River Environment Receiving Water Afon Bradley Status New Consent, by Application (Water Resources Act 1991, Section 88) Positional Accuracy Located by supplier to within 10m	W	732	2	328680 339070

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	Discharge Consents				
	Operator Kronospan Ltd	SW	794	2	328800
	Property Type Pulp, Paper & Board				338600
	Location Hoythead Road Chirk				
	Authority Environment Agency, Welsh Region				
	Catchment Area River Dee				
	Reference Cm0098901				
	Permit Version 1				
	Effective Date 1st June 1985				
	Issued Date 1st June 1985				
	Revocation Date 8th August 1994				
	Discharge Type Trade Effluent				
	Discharge Freshwater Stream/River				
	Environment				
	Receiving Water Afon Bradley				
	Status Revoked and replaced by IPC Authorisation				
	Positional Accuracy Located by supplier to within 100m				
	Discharge Consents				
	Operator British Coal Opencast	E	795	2	330430
	Property Type Undefined Or Other				339120
	Location Chirk Halton Opencast Coal Site At, Halton Opencast Coal Site At Ley, Opencast Coal Site At Ley Farm				
	Authority Environment Agency, Welsh Region				
	Catchment Area River Dee				
	Reference Cm0098402				
	Permit Version 1				
	Effective Date 29th January 1985				
	Issued Date 29th January 1985				
	Revocation Date 22nd December 1992				
	Discharge Type Unspecified				
	Discharge Into And/Or Watercourse				
	Environment				
	Receiving Water Un-Named Trib. Of Ceiriog				
	Status Consent expired				
	Positional Accuracy Located by supplier to within 10m				
	Discharge Consents				
	Operator Dwr Cymru Cyfyngedig	W	821	2	328800
	Property Type Sewerage Network - Pumping Station - Water Company				338990
	Location Chirk Ps				
	Authority Environment Agency, Welsh Region				
	Catchment Area River Dee				
	Reference CG0329703				
	Permit Version 1				
	Effective Date 26th March 1993				
	Issued Date 26th March 1993				
	Revocation Date Not Supplied				
	Discharge Type Unspecified				
	Discharge Freshwater Stream/River				
	Environment				
	Receiving Water Afon Bradley				
	Status New Consent, by Application (Water Resources Act 1991, Section 88)				
	Positional Accuracy Located by supplier to within 100m				
	Discharge Consents				
	Operator Dwr Cymru Cyfyngedig	W	841	2	328600
	Property Type Sewerage Network - Pumping Station - Water Company				338990
	Location Chirk Station Ind Estate				
	Authority Environment Agency, Welsh Region				
	Catchment Area River Dee				
	Reference CMC091501				
	Permit Version 1				
	Effective Date 15th July 1981				
	Issued Date 15th July 1981				
	Revocation Date Not Supplied				
	Discharge Type Unspecified				
	Discharge Freshwater Stream/River				
	Environment				
	Receiving Water Bradley				
	Status New Consent, by Application (Water Resources Act 1991, Section 88)				
	Positional Accuracy Located by supplier to within 100m				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	Discharge Consents				
	Operator: Cadbury Ltd	W	851	2	328570
	Property Type: Ice-Cream, Cocoa, Chocolate				338990
	Location: Cadbury Ltd Station Avenue Chirk Wt, Station Avenue Chirk, Wrexham				
	Authority: Environment Agency, Welsh Region				
	Catchment Area: River Dee				
	Reference: Cm0043801				
	Permit Version: 1				
	Effective Date: 30th September 1985				
	Issued Date: 30th September 1985				
	Revocation Date: 25th April 1993				
	Discharge Type: Unspecified				
	Discharge: Freshwater Stream/River				
	Environment:				
	Receiving Water: Afon Bradley				
	Status: Authorisation revoked				
	Positional Accuracy: Located by supplier to within 10m				
	Discharge Consents				
	Operator: Kronospan Ltd	W	864	2	328560
	Property Type: Pulp, Paper & Board				338970
	Location: Chirk Wrexham				
	Authority: Environment Agency, Welsh Region				
	Catchment Area: River Dee				
	Reference: CM0098001				
	Permit Version: 2				
	Effective Date: 9th September 1994				
	Issued Date: 9th September 1994				
	Revocation Date: 1st November 2004				
	Discharge Type: Trade Effluent				
	Discharge: Freshwater Stream/River				
	Environment:				
	Receiving Water: Afon Bradley				
	Status: Revoked (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)				
	Positional Accuracy: Located by supplier to within 100m				
	Discharge Consents				
	Operator: Kronospan Ltd	W	868	2	328560
	Property Type: Pulp, Paper & Board				338950
	Location: Chirk Wrexham				
	Authority: Environment Agency, Welsh Region				
	Catchment Area: River Dee				
	Reference: Cm0098001				
	Permit Version: 1				
	Effective Date: 16th October 1984				
	Issued Date: 16th October 1984				
	Revocation Date: 8th September 1994				
	Discharge Type: Unspecified				
	Discharge: Freshwater Stream/River				
	Environment:				
	Receiving Water: Afon Bradley				
	Status: - Authorisation revoked				
	Positional Accuracy: Located by supplier to within 10m				
	Discharge Consents				
	Operator: The Owner/Occupier	W	871	2	328550
	Property Type: Undefined Or Other				338990
	Location: Chirk Station Ind Estate				
	Authority: Environment Agency, Welsh Region				
	Catchment Area: River Dee				
	Reference: Cm0091801				
	Permit Version: 1				
	Effective Date: 16th September 1981				
	Issued Date: 16th September 1981				
	Revocation Date: 28th April 1993				
	Discharge Type: Unspecified				
	Discharge: Freshwater Stream/River				
	Environment:				
	Receiving Water: Bradley Brook				
	Status: Consent expired				
	Positional Accuracy: Located by supplier to within 10m				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	Discharge Consents				
	Operator Cadbury Trebor Bassett	W	903	2	328550
	Property Type Ice-Cream, Cocoa, Chocolate				338850
	Location Cadbury Ltd Station Avenue Chirk Wt. Station Avenue Chirk Wrexham				
	Authority Environment Agency, Welsh Region				
	Catchment Area River Dee				
	Reference CM0043801				
	Permit Version 2				
	Effective Date 26th April 1993				
	Issued Date 26th April 1993				
	Revocation Date Not Supplied				
	Discharge Type Trade Discharges - Site Drainage				
	Discharge Freshwater Stream/River				
	Environment				
	Receiving Water Afon Bradley				
	Status New Consent, by Application (Water Resources Act 1991, Section 88)				
	Positional Accuracy Located by supplier to within 100m				
	Discharge Consents				
	Operator Dwr Cymru Cyfyngedig	NW	908	2	329050
	Property Type Sewage Disposal Works - Water Company				340030
	Location Whitehurst Stw				
	Authority Environment Agency, Welsh Region				
	Catchment Area River Dee				
	Reference CM0094201				
	Permit Version 3				
	Effective Date 28th April 1988				
	Issued Date 28th April 1988				
	Revocation Date Not Supplied				
	Discharge Type Sewage Discharges - Final/Treated Effluent - Water Company				
	Discharge Freshwater Stream/River				
	Environment				
	Receiving Water Afon Bradley				
	Status New Consent, by Application (Water Resources Act 1991, Section 88)				
	Positional Accuracy Located by supplier to within 100m				
	Discharge Consents				
	Operator Dwr Cymru Cyfyngedig	NW	908	2	329050
	Property Type Sewage Disposal Works - Water Company				340030
	Location Whitehurst Stw				
	Authority Environment Agency, Welsh Region				
	Catchment Area River Dee				
	Reference Cm0094201				
	Permit Version 1				
	Effective Date 24th February 1983				
	Issued Date 24th February 1983				
	Revocation Date 29th January 1985				
	Discharge Type Unspecified				
	Discharge Freshwater Stream/River				
	Environment				
	Receiving Water Afon Bradley				
	Status Authorisation revoked				
	Positional Accuracy Located by supplier to within 10m				
	Discharge Consents				
	Operator Dwr Cymru Cyfyngedig	NW	908	2	329050
	Property Type Sewage Disposal Works - Water Company				340030
	Location Whitehurst Stw				
	Authority Environment Agency, Welsh Region				
	Catchment Area River Dee				
	Reference Cm0094201				
	Permit Version 2				
	Effective Date 30th January 1985				
	Issued Date 30th January 1985				
	Revocation Date 27th April 1988				
	Discharge Type Unspecified				
	Discharge Freshwater Stream/River				
	Environment				
	Receiving Water Afon Bradley				
	Status Authorisation revoked				
	Positional Accuracy Located by supplier to within 10m				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Integrated Pollution Prevention And Control					
Name	Kronospan Holdings Ltd	SW	872	2	328890 338370
Location	Hollyhead Road, Chirk, Wrexham, Clwyd, LL14 5nt				
Authority	Environment Agency, Welsh Region				
Permit Reference	Br7194				
Original Permit	Br7194				
Reference					
Effective Date	Not Supplied				
Status	Agency Withdrawn				
Application Type	Not Supplied				
Application Sub Type	Not Supplied				
Positional Accuracy	Manually positioned to the address or location				
Activity Code	4.1 A(1) (A) (II)				
Activity Description	Organic Chemicals; Oxygen Containing Compounds Eg Alcohols				
Primary Activity	Not Supplied				
Local Authority Integrated Pollution Prevention And Control					
Name	Kronospan Ltd	SW	960	1	328720 338430
Location	Maesgwyn Farm, Hollyhead Road, Chirk, Wrexham, LL14 5nt				
Authority	Wrexham County Borough Council, Environmental Health Department				
Permit Reference	WCBC/PPC/03/KR				
Dated	20th February 2004				
Process Type	Other Activities				
Description	Manufacture of MDF and wood products				
Status	Permit Issued				
Positional Accuracy	Manually positioned to the address or location				
Nearest Surface Water Feature					
		NW	201	-	329270 339280
Pollution Incidents to Controlled Waters					
Property Type	Not Given	S	624	2	329400 338400
Location	Chirk Primary School				
Authority	Environment Agency, Welsh Region				
Pollutant	Sewage - Septic Tank Effluent				
Note	Not Supplied				
Incident Date	18th April 1996				
Incident Reference	28183				
Catchment Area	Not Given				
Receiving Water	Not Given				
Cause of Incident	Unknown				
Severity of Incident	Category 3 - Minor Incident				
Positional Accuracy	Located by supplier to within 100m				
Pollution Incidents to Controlled Waters					
Property Type	Not Given	S	629	2	329400 338400
Location	Chirk Primary School, CHIRK				
Authority	Environment Agency, Welsh Region				
Pollutant	Sewage - Septic Tank Effluent				
Note	Not Supplied				
Incident Date	18th April 1996				
Incident Reference	28183				
Catchment Area	Not Given				
Receiving Water	Not Given				
Cause of Incident	Unknown				
Severity of Incident	Category 3 - Minor Incident				
Positional Accuracy	Located by supplier to within 100m				
Pollution Incidents to Controlled Waters					
Property Type	Not Given	NE	630	2	329900 339850
Location	A483 Road, Junction 48 M4 (All Along), CHIRK				
Authority	Environment Agency, Welsh Region				
Pollutant	Miscellaneous - Fire water / Foam				
Note	Accidental Spillage/Leakage				
Incident Date	19th April 1996				
Incident Reference	28140				
Catchment Area	Not Given				
Receiving Water	Not Given				
Cause of Incident	Leakage				
Severity of Incident	Category 3 - Minor Incident				
Positional Accuracy	Located by supplier to within 100m				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	Pollution Incidents to Controlled Waters				
	Property Type Road (Lost Load)	NE	635	2	329900
	Location A483 Junction, A5, CHIRK				339850
	Authority Environment Agency, Welsh Region				
	Pollutant Miscellaneous - Fire water / Foam				
	Note Accidental Spillage/Leakage				
	Incident Date 18th April 1996				
	Incident Reference 28140				
	Catchment Area Not Given				
	Receiving Water Not Given				
	Cause of Incident Leakage				
	Severity of Incident Category 3 - Minor Incident				
	Positional Accuracy Located by supplier to within 100m				
	Pollution Incidents to Controlled Waters				
	Property Type Water Company Sewage: Sewage Treatment Works	W	672	2	328760
	Location Location Description Not Available				339250
	Authority Environment Agency, Welsh Region				
	Pollutant Unknown				
	Note Emergency Overflow				
	Incident Date 22nd February 1992				
	Incident Reference 3338				
	Catchment Area Not Given				
	Receiving Water Not Given				
	Cause of Incident Overflow				
	Severity of Incident Category 3 - Minor Incident				
	Positional Accuracy Located by supplier to within 100m				
	Pollution Incidents to Controlled Waters				
	Property Type Water Company Sewage: Sewage Treatment Works	W	714	2	328700
	Location Chirk Sdw, CHIRK				339050
	Authority Environment Agency, Welsh Region				
	Pollutant Cement/Mortar				
	Note Blocked Sewer				
	Incident Date 30th September 1991				
	Incident Reference 3439				
	Catchment Area Not Given				
	Receiving Water Not Given				
	Cause of Incident Effluent Discharge				
	Severity of Incident Category 2 - Significant Incident				
	Positional Accuracy Located by supplier to within 100m				
	Pollution Incidents to Controlled Waters				
	Property Type Water Company Sewage: Surface Water Outfall	W	721	2	328700
	Location Chirk Sewage Treatment Works, CHIRK				339000
	Authority Environment Agency, Welsh Region				
	Pollutant Mud/Clay/Soil				
	Note Poor Operational Practise				
	Incident Date 21st December 1994				
	Incident Reference 22031				
	Catchment Area Not Given				
	Receiving Water Not Given				
	Cause of Incident Bypass Of Treatment Facilities				
	Severity of Incident Category 2 - Significant Incident				
	Positional Accuracy Located by supplier to within 100m				
	Pollution Incidents to Controlled Waters				
	Property Type Not Given	NE	725	2	330000
	Location A483 Holton Roundabout, CHIRK				339900
	Authority Environment Agency, Welsh Region				
	Pollutant Miscellaneous - Fire water / Foam				
	Note Accident: River Dee				
	Incident Date 18th July 1998				
	Incident Reference 36234				
	Catchment Area Not Given				
	Receiving Water Not Given				
	Cause of Incident Runoff				
	Severity of Incident Category 3 - Minor Incident				
	Positional Accuracy Located by supplier to within 100m				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	Pollution Incidents to Controlled Waters				
	Property Type: Process	W	774	2	328650
	Location: Afon Bradley Farm				338980
	Authority: Environment Agency, Welsh Region				
	Pollutant: Light Oil				
	Note: Neglect				
	Incident Date: 2nd December 1991				
	Incident Reference: 419				
	Catchment Area: Not Given				
	Receiving Water: Not Given				
	Cause of Incident: Bypass Of Treatment Facilities				
	Severity of Incident: Category 2 - Significant Incident				
	Positional Accuracy: Located by supplier to within 100m				
	Pollution Incidents to Controlled Waters				
	Property Type: Process	W	780	2	328650
	Location: Kronospan Chirk				338950
	Authority: Environment Agency, Welsh Region				
	Pollutant: Light Oil				
	Note: Accidental Spillage/Leakage				
	Incident Date: 10th April 1991				
	Incident Reference: 6				
	Catchment Area: Not Given				
	Receiving Water: Not Given				
	Cause of Incident: Unknown				
	Severity of Incident: Category 3 - Minor Incident				
	Positional Accuracy: Located by supplier to within 100m				
	Pollution Incidents to Controlled Waters				
	Property Type: Not Given	W	816	2	328610
	Location: Kronospan Outfall				339000
	Authority: Environment Agency, Welsh Region				
	Pollutant: Light Oil				
	Note: Inadequate Design/Capacity				
	Incident Date: 21st February 1996				
	Incident Reference: 27904				
	Catchment Area: Not Given				
	Receiving Water: Not Given				
	Cause of Incident: Runoff				
	Severity of Incident: Category 3 - Minor Incident				
	Positional Accuracy: Located by supplier to within 100m				
	Pollution Incidents to Controlled Waters				
	Property Type: Water Company Sewage: Surface Water Outfall	W	820	2	328600
	Location: Cadburys				339000
	Authority: Environment Agency, Welsh Region				
	Pollutant: Light Oil				
	Note: Not Supplied				
	Incident Date: 14th February 1996				
	Incident Reference: 27897				
	Catchment Area: Not Given				
	Receiving Water: Not Given				
	Cause of Incident: Unknown				
	Severity of Incident: Category 3 - Minor Incident				
	Positional Accuracy: Located by supplier to within 100m				
	Pollution Incidents to Controlled Waters				
	Property Type: Not Given	W	821	2	328600
	Location: Cadburys Outfall				339000
	Authority: Environment Agency, Welsh Region				
	Pollutant: Light Oil				
	Note: Not Supplied				
	Incident Date: 14th February 1996				
	Incident Reference: 27897				
	Catchment Area: Not Given				
	Receiving Water: Not Given				
	Cause of Incident: Unknown				
	Severity of Incident: Category 3 - Minor Incident				
	Positional Accuracy: Located by supplier to within 100m				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	Pollution Incidents to Controlled Waters				
	Property Type: Not Given	NW	832	2	328920
	Location: Whitehurst Sewage Treatment Works				339850
	Authority: Environment Agency, Welsh Region				
	Pollutant: Sewage - Treated Effluent				
	Note: Afon Bradley, Effluent Quality				
	Incident Date: 22nd December 1997				
	Incident Reference: 34414				
	Catchment Area: Not Given				
	Receiving Water: Not Given				
	Cause of Incident: Mechanical/Electrical Plant Failure				
	Severity of Incident: Category 3 - Minor Incident				
	Positional Accuracy: Located by supplier to within 100m				
	Pollution Incidents to Controlled Waters				
	Property Type: Process	W	868	2	328580
	Location: Kronospan				339850
	Authority: Environment Agency, Welsh Region				
	Pollutant: Mud/Clay/Soil				
	Note: Weather				
	Incident Date: 9th December 1991				
	Incident Reference: 3341				
	Catchment Area: Not Given				
	Receiving Water: Not Given				
	Cause of Incident: Effluent Discharge				
	Severity of Incident: Category 2 - Significant Incident				
	Positional Accuracy: Located by supplier to within 100m				
	Pollution Incidents to Controlled Waters				
	Property Type: Not Given	W	869	2	328580
	Location: Kronospan Factory				339850
	Authority: Environment Agency, Welsh Region				
	Pollutant: Miscellaneous - Fire water / Foam				
	Note: Unknown; Burst				
	Incident Date: 25th November 1997				
	Incident Reference: 34291				
	Catchment Area: Not Given				
	Receiving Water: Not Given				
	Cause of Incident: Accidental Spillage/Leakage				
	Severity of Incident: Category 3 - Minor Incident				
	Positional Accuracy: Located by supplier to within 100m				
	Pollution Incidents to Controlled Waters				
	Property Type: Not Given	NW	875	2	328850
	Location: Whitehurst, CHIRK				339850
	Authority: Environment Agency, Welsh Region				
	Pollutant: Oils - Petrol				
	Note: Inadequate Design/Capacity				
	Incident Date: 15th April 1996				
	Incident Reference: 28191				
	Catchment Area: Not Given				
	Receiving Water: Not Given				
	Cause of Incident: Runoff				
	Severity of Incident: Category 3 - Minor Incident				
	Positional Accuracy: Located by supplier to within 100m				
	Pollution Incidents to Controlled Waters				
	Property Type: Not Given	NW	876	2	328800
	Location: Whitehurst, CHIRK				339800
	Authority: Environment Agency, Welsh Region				
	Pollutant: Mining Water				
	Note: Not Supplied				
	Incident Date: 15th April 1996				
	Incident Reference: 28291				
	Catchment Area: Not Given				
	Receiving Water: Not Given				
	Cause of Incident: Unknown				
	Severity of Incident: Category 3 - Minor Incident				
	Positional Accuracy: Located by supplier to within 100m				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	Pollution Incidents to Controlled Waters				
	Property Type Water Company Sewage: Surface Water Outfall	NW	879	2	328850
	Location Whitehurst Chir				339850
	Authority Environment Agency, Welsh Region				
	Pollutant Oils - Petrol				
	Note Inadequate Design/Capacity				
	Incident Date 15th April 1996				
	Incident Reference 28191				
	Catchment Area Not Given				
	Receiving Water Not Given				
	Cause of Incident Runoff				
	Severity of Incident Category 3 - Minor Incident				
	Positional Accuracy Located by supplier to within 100m				
	Pollution Incidents to Controlled Waters				
	Property Type Not Given	NW	880	2	328800
	Location Whitehurst, CHIRK				339800
	Authority Environment Agency, Welsh Region				
	Pollutant Mining Water				
	Note Not Supplied				
	Incident Date 15th April 1996				
	Incident Reference 28291				
	Catchment Area Not Given				
	Receiving Water Not Given				
	Cause of Incident Unknown				
	Severity of Incident Category 3 - Minor Incident				
	Positional Accuracy Located by supplier to within 100m				
	Pollution Incidents to Controlled Waters				
	Property Type Not Given	W	899	2	328530
	Location Kronospan				338970
	Authority Environment Agency, Welsh Region				
	Pollutant Road Run-Off				
	Note Unknown; Afon Bradley				
	Incident Date 27th October 1998				
	Incident Reference 37283				
	Catchment Area Not Given				
	Receiving Water Not Given				
	Cause of Incident Effluent Discharge				
	Severity of Incident Category 3 - Minor Incident				
	Positional Accuracy Located by supplier to within 100m				
	Pollution Incidents to Controlled Waters				
	Property Type Not Given	W	904	2	328520
	Location Manley Hall & , Bangor On Dee				338970
	Authority Environment Agency, Welsh Region				
	Pollutant Oils - Diesel (including Agricultural)				
	Note Unknown; Afon Bradley				
	Incident Date 24th November 1998				
	Incident Reference 37149				
	Catchment Area Not Given				
	Receiving Water Not Given				
	Cause of Incident Unknown				
	Severity of Incident Category 1 - Major Incident				
	Positional Accuracy Located by supplier to within 100m				
	Pollution Incidents to Controlled Waters				
	Property Type Not Given	W	904	2	328520
	Location Kronospan				338970
	Authority Environment Agency, Welsh Region				
	Pollutant Light Oil				
	Note Unknown; Afon Bradley				
	Incident Date 27th October 1998				
	Incident Reference 37283				
	Catchment Area Not Given				
	Receiving Water Not Given				
	Cause of Incident Effluent Discharge				
	Severity of Incident Category 3 - Minor Incident				
	Positional Accuracy Located by supplier to within 100m				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	Pollution Incidents to Controlled Waters				
	Property Type Cattle Beef Farming: Yards	NE	972	2	330150
	Location Down Stream Of Pen-Y-Parc Farm,HATTON				340100
	Authority Environment Agency, Welsh Region				
	Pollutant Farm Effluent/Slurry				
	Note Weather:				
	Incident Date 19th September 1994				
	Incident Reference 21079				
	Catchment Area Not Given				
	Receiving Water Not Given				
	Cause of Incident Runoff				
	Severity of Incident Category 3 - Minor Incident				
	Positional Accuracy Located by supplier to within 100m				
	Substantiated Pollution Incident Register				
	Authority Environment Agency - Welsh Region, Northern Area	NE	273	2	329920
	Incident Date 26th June 2001				339310
	Incident Reference 11709				
	Water Impact Category 4 - No Impact				
	Air Impact Category 2 - Significant Incident				
	Land Impact Category 3 - Minor Incident				
	Positional Accuracy Located by supplier to within 10m				
	Pollutant General Biodegradable : Other				
	Substantiated Pollution Incident Register				
	Authority Environment Agency - Welsh Region, Northern Area	E	399	2	330040
	Incident Date 3rd May 2003				339220
	Incident Reference 155825				
	Water Impact Category 4 - No Impact				
	Air Impact Category 3 - Minor Incident				
	Land Impact Category 2 - Significant Incident				
	Positional Accuracy Located by supplier to within 10m				
	Pollutant Atmospheric Pollutants And Effects: Smoke				
	Pollutant General Biodegradable : Other				
	Pollutant Asbestos Waste				
	Substantiated Pollution Incident Register				
	Authority Environment Agency - Welsh Region, Northern Area	W	711	2	328700
	Incident Date 23rd July 2002				339100
	Incident Reference 96063				
	Water Impact Category 2 - Significant Incident				
	Air Impact Category 4 - No Impact				
	Land Impact Category 4 - No Impact				
	Positional Accuracy Located by supplier to within 100m				
	Pollutant Crude Sewage				
	Substantiated Pollution Incident Register				
	Authority Environment Agency - Welsh Region, Northern Area	W	732	2	328680
	Incident Date 28th April 2003				339070
	Incident Reference 154393				
	Water Impact Category 2 - Significant Incident				
	Air Impact Category 4 - No Impact				
	Land Impact Category 4 - No Impact				
	Positional Accuracy Located by supplier to within 10m				
	Pollutant Contaminated Water: Other Contaminated Water				
	Prosecutions Relating to Controlled Waters				
	Location Afon Bradley,Afon Bradley,Chirk,Wrexham,Ciwyd,LL14 5NB	NW	840	-	328920
	Prosecution Text Contravention Of Conditions Of Its Consent To Discharge Effluent Into The Afon Bradley At Its Plant In Chirk.				339860
	Prosecution Act Wra 91				
	Hearing Date 10th January 2002				
	Verdict Guilty				
	Fine 60000				
	Cost 300				
	Positional Accuracy Manually positioned within the geographical locality				
	Prosecutions Relating to Controlled Waters				
	Location Chirk ,Wrexham,Ciwyd,LL14 5nt	SW	869	-	328880
	Prosecution Text Over-Abstraction Occured At The Companies Licensed Abstraction Point				336380
	Prosecution Act Wra91 S24(1a)				
	Hearing Date 13th September 2002				
	Verdict Guilty				
	Fine 6000				
	Cost 1965				
	Positional Accuracy Manually positioned to the address or location				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	River Quality Name Shropshire Union C GOA Grade River Quality C Reach St Martin's Moor - Llantysilio Estimated Distance of Reach (km) 20 Flow Rate Flow greater than 80 cumecs Flow Type Canal Year 2000	W	826	2	328580 339140
	Water Abstractions Operator British Waterways Board Licence Number 24/67/5/0081 Permit Version 1 Location Point A On Llangollen Canal Authority Environment Agency, Welsh Region Abstraction Other Industrial/Commercial/Public Services: Evaporative Cooling Abstraction Type Water may be abstracted from a single point Source Surface Daily Rate (m3) Not Supplied Yearly Rate (m3) Not Supplied Details Llangollen Canal Authorised Start 01 January Authorised End 31 December Permit Start Date 1st April 2006 Permit End Date Not Supplied Positional Accuracy Located by supplier to within 10m	W	889	2	328530 339000
	Water Abstractions Operator British Waterways Board Licence Number 24/67/5/0081 Permit Version 1 Location Point A On Llangollen Canal Authority Environment Agency, Welsh Region Abstraction Other Industrial/Commercial/Public Services: Process Water Abstraction Type Water may be abstracted from a single point Source Surface Daily Rate (m3) Not Supplied Yearly Rate (m3) Not Supplied Details Llangollen Canal Authorised Start 01 January Authorised End 31 December Permit Start Date 1st April 2006 Permit End Date Not Supplied Positional Accuracy Located by supplier to within 10m	W	889	2	328530 339000
	Water Abstractions Operator Kronospan Ltd Licence Number 24/67/5/0080 Permit Version 1 Location 33m Deep, 250mm Dia. St. Steel Casing, Borehole Authority Environment Agency, Welsh Region Abstraction Other Industrial/Commercial/Public Services: Evaporative Cooling Abstraction Type Water may be abstracted from a single point Source Groundwater Daily Rate (m3) Not Supplied Yearly Rate (m3) Not Supplied Details Registered Address Authorised Start 01 January Authorised End 31 December Permit Start Date 1st April 2006 Permit End Date Not Supplied Positional Accuracy Located by supplier to within 10m	SW	903	2	328680 338590

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Water Abstractions					
Operator	Kronospan Ltd	SW	903	2	328580 338590
Licence Number	24/67/5/0080				
Permit Version	1				
Location	33m Deep, 250mm Dia. St.Steel Casing, Borehole				
Authority	Environment Agency, Welsh Region				
Abstraction	Other Industrial/Commercial/Public Services: Process Water				
Abstraction Type	Water may be abstracted from a single point				
Source	Groundwater				
Daily Rate (m3)	Not Supplied				
Yearly Rate (m3)	Not Supplied				
Details	Registered Address				
Authorised Start	01 January				
Authorised End	31 December				
Permit Start Date	1st April 2006				
Permit End Date	Not Supplied				
Positional Accuracy	Located by supplier to within 10m				
Water Abstractions					
Operator	Kronospan Ltd	SW	905	2	328680 338590
Licence Number	24/67/5/0066				
Permit Version	100				
Location	33m Deep, 250mm Dia. St.Steel Casing, Borehole				
Authority	Environment Agency, Welsh Region				
Abstraction	Other Industrial/Commercial/Public Services: Process Water				
Abstraction Type	Water may be abstracted from a single point				
Source	Groundwater				
Daily Rate (m3)	Not Supplied				
Yearly Rate (m3)	Not Supplied				
Details	33M Deep; 250Mm Dia. St.Steel Casing; Borehole				
Authorised Start	01 January				
Authorised End	31 December				
Permit Start Date	7th July 1995				
Permit End Date	Not Supplied				
Positional Accuracy	Located by supplier to within 100m				
Water Abstractions					
Operator	Kronospan Ltd	SW	912	2	328650 338620
Licence Number	24/67/5/0066				
Permit Version	100				
Location	Borehole				
Authority	Environment Agency, Welsh Region				
Abstraction	Other Industrial/Commercial/Public Services: Process Water				
Abstraction Type	Water may be abstracted from a single point				
Source	Groundwater				
Daily Rate (m3)	Not Supplied				
Yearly Rate (m3)	Not Supplied				
Details	Not Supplied				
Authorised Start	01 January				
Authorised End	31 December				
Permit Start Date	7th July 1995				
Permit End Date	Not Supplied				
Positional Accuracy	Located by supplier to within 100m				
Water Abstractions					
Operator	British Waterways Board	W	947	2	328490 338900
Licence Number	24/67/5/0081				
Permit Version	1				
Location	Point B On Llangollen Canal				
Authority	Environment Agency, Welsh Region				
Abstraction	Other Industrial/Commercial/Public Services: Evaporative Cooling				
Abstraction Type	Water may be abstracted from a single point				
Source	Surface				
Daily Rate (m3)	Not Supplied				
Yearly Rate (m3)	Not Supplied				
Details	Llangollen Canal				
Authorised Start	01 January				
Authorised End	31 December				
Permit Start Date	1st April 2006				
Permit End Date	Not Supplied				
Positional Accuracy	Located by supplier to within 10m				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Water Abstractions					
Operator	British Waterways Board	W	947	2	328490 338900
Licence Number	24/67/5/0081				
Permit Version	1				
Location	Point B On Llangollen Canal				
Authority	Environment Agency, Welsh Region				
Abstraction	Other Industrial/Commercial/Public Services: Process Water				
Abstraction Type	Water may be abstracted from a single point				
Source	Surface				
Daily Rate (m3)	Not Supplied				
Yearly Rate (m3)	Not Supplied				
Details	Llangollen Canal				
Authorised Start	01 January				
Authorised End	31 December				
Permit Start Date	1st April 2006				
Permit End Date	Not Supplied				
Positional Accuracy	Located by supplier to within 10m				
Water Abstractions					
Operator	Kronospan Ltd	SW	983	2	328980 338170
Licence Number	24/67/5/0077				
Permit Version	100				
Location	55m Deep, 300mm Dia Borehole				
Authority	Environment Agency, Welsh Region				
Abstraction	Other Industrial/Commercial/Public Services: Process Water				
Abstraction Type	Water may be abstracted from a single point				
Source	Groundwater				
Daily Rate (m3)	Not Supplied				
Yearly Rate (m3)	Not Supplied				
Details	55m Deep, 300mm Diameter Borehole				
Authorised Start	01 January				
Authorised End	31 December				
Permit Start Date	26th May 1998				
Permit End Date	Not Supplied				
Positional Accuracy	Located by supplier to within 100m				
Water Abstractions					
Operator	Kronospan Ltd	SW	983	2	328980 338170
Licence Number	24/67/5/0079				
Permit Version	1				
Location	55m Deep, 300mm Dia Borehole				
Authority	Environment Agency, Welsh Region				
Abstraction	Other Industrial/Commercial/Public Services: Process Water				
Abstraction Type	Water may be abstracted from a single point				
Source	Groundwater				
Daily Rate (m3)	Not Supplied				
Yearly Rate (m3)	Not Supplied				
Details	Not Supplied				
Authorised Start	01 January				
Authorised End	31 December				
Permit Start Date	1st April 2003				
Permit End Date	Not Supplied				
Positional Accuracy	Located by supplier to within 10m				
Water Abstractions					
Operator	Kronospan Ltd	SW	983	2	328980 338170
Licence Number	24/67/5/0082				
Permit Version	1				
Location	55m Deep, 300mm Dia Borehole				
Authority	Environment Agency, Welsh Region				
Abstraction	Other Industrial/Commercial/Public Services: Evaporative Cooling				
Abstraction Type	Water may be abstracted from a single point				
Source	Groundwater				
Daily Rate (m3)	Not Supplied				
Yearly Rate (m3)	Not Supplied				
Details	Kronospan Ltd., Chirk				
Authorised Start	01 January				
Authorised End	31 December				
Permit Start Date	1st April 2006				
Permit End Date	Not Supplied				
Positional Accuracy	Located by supplier to within 10m				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Water Abstractions					
Operator	Kronospan Ltd	SW	983	2	328980 338170
Licence Number	24/67/5/0082				
Permit Version	1				
Location	55m Deep, 300mm Dia Borehole				
Authority	Environment Agency, Welsh Region				
Abstraction	Other Industrial/Commercial/Public Services: Process Water				
Abstraction Type	Water may be abstracted from a single point				
Source	Groundwater				
Daily Rate (m3)	Not Supplied				
Yearly Rate (m3)	Not Supplied				
Details	Kronospan Ltd., Chirk				
Authorised Start	01 January				
Authorised End	31 December				
Permit Start Date	1st April 2006				
Permit End Date	Not Supplied				
Positional Accuracy	Located by supplier to within 10m				
Water Abstractions					
Operator	Mr G Myddleton	W	1230	2	328180 339120
Licence Number	24/67/5/0067				
Permit Version	100				
Location	Chirk Castle Pool And Outlet Stream				
Authority	Environment Agency, Welsh Region				
Abstraction	General Agriculture: Spray Irrigation - Direct				
Abstraction Type	Water may be abstracted from a single point				
Source	Surface				
Daily Rate (m3)	Not Supplied				
Yearly Rate (m3)	Not Supplied				
Details	Chirk Castle Pool And Outlet Stream				
Authorised Start	01 January				
Authorised End	31 December				
Permit Start Date	20th January 1993				
Permit End Date	Not Supplied				
Positional Accuracy	Located by supplier to within 100m				
Water Abstractions					
Operator	Chirk Golf Centre Ltd	W	1230	2	328180 339120
Licence Number	24/67/5/0067				
Permit Version	101				
Location	Chirk Castle Pool And Outlet Stream				
Authority	Environment Agency, Welsh Region				
Abstraction	General Agriculture: Spray Irrigation - Direct				
Abstraction Type	Water may be abstracted from a single point				
Source	Surface				
Daily Rate (m3)	Not Supplied				
Yearly Rate (m3)	Not Supplied				
Details	Not Supplied				
Authorised Start	01 January				
Authorised End	31 December				
Permit Start Date	6th April 2001				
Permit End Date	Not Supplied				
Positional Accuracy	Located by supplier to within 10m				
Water Abstractions					
Operator	Chirk Golf Centre Ltd	W	1230	2	328180 339120
Licence Number	24/67/5/0067				
Permit Version	102				
Location	Chirk Castle Pool And Outlet Stream				
Authority	Environment Agency, Welsh Region				
Abstraction	Golf Courses: Spray Irrigation - Direct				
Abstraction Type	Water may be abstracted from a single point				
Source	Surface				
Daily Rate (m3)	Not Supplied				
Yearly Rate (m3)	Not Supplied				
Details	Not Supplied				
Authorised Start	01 April				
Authorised End	30 September				
Permit Start Date	31st January 2003				
Permit End Date	Not Supplied				
Positional Accuracy	Located by supplier to within 10m				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Water Abstractions					
Operator	Mr G Myddleton	W	1731	2	327680
Licence Number	24/67/5/0067				339080
Permit Version	100				
Location	Chirk Castle Pool And Outlet Stream				
Authority	Environment Agency, Welsh Region				
Abstraction	General Agriculture: Spray Irrigation - Direct				
Abstraction Type	Water may be abstracted from a single point				
Source	Surface				
Daily Rate (m3)	Not Supplied				
Yearly Rate (m3)	Not Supplied				
Details	Chirk Castle Pool And Outlet Stream				
Authorised Start	01 January				
Authorised End	31 December				
Permit Start Date	20th January 1993				
Permit End Date	Not Supplied				
Positional Accuracy	Located by supplier to within 100m				
Water Abstractions					
Operator	Chirk Golf Centre Ltd	W	1731	2	327680
Licence Number	24/67/5/0067				339080
Permit Version	101				
Location	Chirk Castle Pool And Outlet Stream				
Authority	Environment Agency, Welsh Region				
Abstraction	General Agriculture: Spray Irrigation - Direct				
Abstraction Type	Water may be abstracted from a single point				
Source	Surface				
Daily Rate (m3)	Not Supplied				
Yearly Rate (m3)	Not Supplied				
Details	Not Supplied				
Authorised Start	01 January				
Authorised End	31 December				
Permit Start Date	6th April 2001				
Permit End Date	Not Supplied				
Positional Accuracy	Located by supplier to within 10m				
Water Abstractions					
Operator	D.F Myddleton	W	1979	2	327500
Licence Number	24/67/5/0035				339640
Permit Version	100				
Location	Spring				
Authority	Environment Agency, Welsh Region				
Abstraction	General Farming And Domestic				
Abstraction Type	Water may be abstracted from a single point				
Source	Surface				
Daily Rate (m3)	Not Supplied				
Yearly Rate (m3)	Not Supplied				
Details	Not Supplied				
Authorised Start	01 January				
Authorised End	31 December				
Permit Start Date	14th June 1968				
Permit End Date	Not Supplied				
Positional Accuracy	Located by supplier to within 100m				
Water Abstractions					
Operator	Dee Valley Water Plc	W	1979	2	327450
Licence Number	24/67/5/0024				338850
Permit Version	100				
Location	Newhallspring				
Authority	Environment Agency, Welsh Region				
Abstraction	Public Water Supply: Potable Water Supply - Direct				
Abstraction Type	Water may be abstracted from a single point				
Source	Surface				
Daily Rate (m3)	Not Supplied				
Yearly Rate (m3)	Not Supplied				
Details	Newhallspring				
Authorised Start	01 January				
Authorised End	31 December				
Permit Start Date	19th May 1982				
Permit End Date	Not Supplied				
Positional Accuracy	Located by supplier to within 100m				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Groundwater Vulnerability					
Geological Classification	Minor Aquifer (Variably permeable) - These can be fractured or potentially fractured rocks, which do not have a high primary permeability, or other formations of variable permeability including unconsolidated deposits. Although not producing large quantities of water for abstraction, they are important for local supplies and in supplying base flow to rivers	-	0	2	329530 339140
Soil Classification	Soils of Low Leaching Potential - Soils in which pollutants are unlikely to penetrate the soil layer because water movement is largely horizontal or they have large ability to attenuate diffuse pollutants. Lateral flow from these soils contribute to groundwater recharge elsewhere in the catchment				
Map Sheet Scale	Sheet 21 West Shropshire 1:100,000				
Drift Deposits					
Description	None	-	-	-	-
Extreme Flooding from Rivers or Sea without Defences					
Description	None	-	-	-	-
Flooding from Rivers or Sea without Defences					
Description	None	-	-	-	-
Areas Benefiting from Flood Defences					
Description	None	-	-	-	-
Flood Water Storage Areas					
Description	None	-	-	-	-
Flood Defences					
Description	None	-	-	-	-
River Flood Data (Scotland)					
Description	None	-	-	-	-

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Local Authority Landfill Coverage					
Name	Wrexham County Borough Council - Has supplied landfill data	-	0	3	329530 339140
Local Authority Recorded Landfill Sites					
Location	Pen Y Parc, Halton, Chirk, Wrexham	N	584	3	329700 339850
Reference	6955/0048				
Authority	Wrexham County Borough Council				
Last Reported Status	Closed				
Types of Waste	Not Supplied				
Date of Closure	Not Supplied				
Positional accuracy	Positioned by the supplier				
Boundary Quality	Good				
Local Authority Recorded Landfill Sites					
Location	Halton Landfill, Chirk, Wrexham	E	969	3	330610 339170
Reference	6955/0031				
Authority	Wrexham County Borough Council				
Last Reported Status	Closed				
Types of Waste	Not Supplied				
Date of Closure	Not Supplied				
Positional accuracy	Positioned by the supplier				
Boundary Quality	Good				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	BGS Boreholes				
	BGS Reference Sj23ne9	NE	1	4	329600
	Drilled Length (m) 114				339260
	Borehole Name Black Park Colliery, Denbigh				
	BGS Boreholes				
	BGS Reference Sj23ne242	NE	130	4	329780
	Drilled Length (m) 2				339260
	Borehole Name Ley Farm Bh4				
	BGS Boreholes				
	BGS Reference Sj23ne241	NE	178	4	329780
	Drilled Length (m) 2				339380
	Borehole Name Ley Farm Bh3				
	BGS Boreholes				
	BGS Reference Sj23ne239	NE	253	4	329750
	Drilled Length (m) 7				339500
	Borehole Name Ley Farm Bh1				
	BGS Boreholes				
	BGS Reference Sj23ne8	W	274	4	329160
	Drilled Length (m) 108.8				339030
	Borehole Name Wharf Field Black Park Denbigh				
	BGS Boreholes				
	BGS Reference Sj23ne240	NE	292	4	329830
	Drilled Length (m) 5				339500
	Borehole Name Ley Farm Bh2				
	BGS Boreholes				
	BGS Reference Sj23ne121	E	315	4	329960
	Drilled Length (m) 30				339190
	Borehole Name Ruabon Bypass Bh 41				
	BGS Boreholes				
	BGS Reference Sj23ne120	NE	339	4	329940
	Drilled Length (m) 30				339440
	Borehole Name Ruabon Bypass Bh 40				
	BGS Boreholes				
	BGS Reference Sj23ne122	E	351	4	329990
	Drilled Length (m) 40				339190
	Borehole Name Ruabon Bypass Bh 62				
	BGS Boreholes				
	BGS Reference Sj23ne260	SE	371	4	329950
	Drilled Length (m) 4				338910
	Borehole Name Newbridge-Chirk Section Bha362				
	BGS Boreholes				
	BGS Reference Sj23ne297	SE	378	4	329950
	Drilled Length (m) Not Supplied				338890
	Borehole Name Overton To Chirk Gas Pipeline Shropshire Bh 2				
	BGS Boreholes				
	BGS Reference Sj23ne259	NE	381	4	329970
	Drilled Length (m) 6				339470
	Borehole Name Newbridge-Chirk Section Bha361				
	BGS Boreholes				
	BGS Reference Sj23ne123	E	387	4	330030
	Drilled Length (m) 9				339020
	Borehole Name Ruabon Bypass Bh 42				
	BGS Boreholes				
	BGS Reference Sj23ne119	NE	395	4	329930
	Drilled Length (m) 20.7				339540
	Borehole Name Ruabon Bypass Bh 65				
	BGS Boreholes				
	BGS Reference Sj23ne182	NE	400	4	329920
	Drilled Length (m) Not Supplied				339560
	Borehole Name Ruabon Newbridge Chirk Bypasses 516				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	BGS Boreholes				
	BGS Reference Sj23ne138/A	NE	404	4	329980
	Drilled Length (m) Not Supplied				339490
	Borehole Name Ruabon Bypass Bh 364				
	BGS Boreholes				
	BGS Reference Sj23ne153	SE	411	4	329940
	Drilled Length (m) 4				339800
	Borehole Name Ruabon Bypass Bh 363				
	BGS Boreholes				
	BGS Reference Sj33nw43	E	414	4	330060
	Drilled Length (m) 5				339260
	Borehole Name Ley Farm Bh8				
	BGS Boreholes				
	BGS Reference Sj33nw44	E	419	4	330030
	Drilled Length (m) 15.5				339030
	Borehole Name Ley Farm Bh9				
	BGS Boreholes				
	BGS Reference Sj23ne152	NE	421	4	329760
	Drilled Length (m) 47				339670
	Borehole Name Ruabon Bypass Bh 349				
	BGS Boreholes				
	BGS Reference Sj23ne296	SE	423	4	329990
	Drilled Length (m) Not Supplied				336670
	Borehole Name Overton To Chirk Gas Pipeline Shropshire Bh 3				
	BGS Boreholes				
	BGS Reference Sj23ne110	N	427	4	329630
	Drilled Length (m) 6				339690
	Borehole Name Ruabon Bypass Bh 57				
	BGS Boreholes				
	BGS Reference Sj23ne149	N	427	4	329720
	Drilled Length (m) 45				339690
	Borehole Name Ruabon Bypass Bh 351				
	BGS Boreholes				
	BGS Reference Sj23ne150	N	427	4	329720
	Drilled Length (m) 6				339690
	Borehole Name Ruabon Bypass Bh 351a				
	BGS Boreholes				
	BGS Reference Sj23ne181	NE	434	4	329810
	Drilled Length (m) Not Supplied				339670
	Borehole Name Ruabon Newbridge Chirk Bypasses 515				
	BGS Boreholes				
	BGS Reference Sj33nw39	E	445	4	330090
	Drilled Length (m) 12				339350
	Borehole Name Ley Farm Bh5				
	BGS Boreholes				
	BGS Reference Sj23ne151	N	453	4	329740
	Drilled Length (m) 13				339710
	Borehole Name Ruabon Bypass Bh 350				
	BGS Boreholes				
	BGS Reference Sj23ne189	N	454	4	329690
	Drilled Length (m) Not Supplied				339720
	Borehole Name Ruabon Newbridge Chirk Bypasses Tp 564				
	BGS Boreholes				
	BGS Reference Sj23ne187	N	457	4	329710
	Drilled Length (m) Not Supplied				339720
	Borehole Name Ruabon Newbridge Chirk Bypasses Tp 561				
	BGS Boreholes				
	BGS Reference Sj33nw45	E	464	4	330090
	Drilled Length (m) 10.8				339100
	Borehole Name Ley Farm Bh10				



Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	BGS Boreholes				
	BGS Reference Sj33nw51	NE	471	4	330060
	Drilled Length (m) 18				339500
	Borehole Name Ley Farm Bh16				
	BGS Boreholes				
	BGS Reference Sj33nw15	NE	472	4	330100
	Drilled Length (m) 280.29				339400
	Borehole Name Black Park Colliery				
	BGS Boreholes				
	BGS Reference Sj33nw41	E	478	4	330130
	Drilled Length (m) 11				339250
	Borehole Name Ley Farm Bh7				
	BGS Boreholes				
	BGS Reference Sj33nw42	E	479	4	330130
	Drilled Length (m) 19				339250
	Borehole Name Ley Farm Bh7a				
	BGS Boreholes				
	BGS Reference Sj23ne154	SE	487	4	329960
	Drilled Length (m) 4				338710
	Borehole Name Ruabon Bypass Bh 365				
	BGS Boreholes				
	BGS Reference Sj23ne137	NE	493	4	329960
	Drilled Length (m) 32.7				339650
	Borehole Name Ruabon Bypass Bh 344				
	BGS Boreholes				
	BGS Reference Sj33nw21	NE	499	4	330000
	Drilled Length (m) Not Supplied				339620
	Borehole Name Ruabon Newbridge Chirk Bypasses 517				
	BGS Boreholes				
	BGS Reference Sj23ne147	N	504	4	329590
	Drilled Length (m) 59				339770
	Borehole Name Ruabon Bypass Bh 353				
	BGS Boreholes				
	BGS Reference Sj33nw46	E	504	4	330120
	Drilled Length (m) 5				339020
	Borehole Name Ley Farm Bh11				
	BGS Boreholes				
	BGS Reference Sj33nw40	E	505	4	330140
	Drilled Length (m) 15.19				339370
	Borehole Name Ley Farm Bh6				
	BGS Boreholes				
	BGS Reference Sj23ne258	NE	514	4	329940
	Drilled Length (m) 14.19				339690
	Borehole Name Newbridge-Chirk Section Bha343				
	BGS Boreholes				
	BGS Reference Sj23ne124	SE	526	4	330000
	Drilled Length (m) 20				338690
	Borehole Name Ruabon Bypass Bh 43				
	BGS Boreholes				
	BGS Reference Sj23ne118	SE	529	4	329980
	Drilled Length (m) 19.39				338670
	Borehole Name Ruabon Bypass Bh 63				
	BGS Boreholes				
	BGS Reference Sj23ne299	S	534	4	329560
	Drilled Length (m) Not Supplied				338490
	Borehole Name Overton To Chirk Gas Pipeline Tp13				
	BGS Boreholes				
	BGS Reference Sj23ne146	N	549	4	329520
	Drilled Length (m) 68.09				339800
	Borehole Name Ruabon Bypass Bh 354				

Map ID	Details		Compass Direction	Estimated Distance From Site	Contact	NGR
	BGS Boreholes					
	BGS Reference	Sj23ne148	N	550	4	329860
	Drilled Length (m)	56				339820
	Borehole Name	Ruabon Bypass Bh 352				
	BGS Boreholes					
	BGS Reference	Sj23ne203	NE	558	4	329940
	Drilled Length (m)	19.89				339740
	Borehole Name	A5 Chirk Bypass Bh 702				
	BGS Boreholes					
	BGS Reference	Sj33nw48	E	558	4	330150
	Drilled Length (m)	5				338920
	Borehole Name	Ley Farm Bh13				
	BGS Boreholes					
	BGS Reference	Sj33nw49	E	559	4	330190
	Drilled Length (m)	10.3				339130
	Borehole Name	Ley Farm Bh14				
	BGS Boreholes					
	BGS Reference	Sj23ne202	NE	564	4	329930
	Drilled Length (m)	20.25				339760
	Borehole Name	A5 Chirk Bypass Bh 701				
	BGS Boreholes					
	BGS Reference	Sj23ne111	N	579	4	329590
	Drilled Length (m)	35				339840
	Borehole Name	Ruabon Bypass Bh 58				
	BGS Boreholes					
	BGS Reference	Sj23ne115	NE	582	4	329940
	Drilled Length (m)	13				339770
	Borehole Name	Ruabon Bypass Bh 61				
	BGS Boreholes					
	BGS Reference	Sj23ne114	NE	590	4	329920
	Drilled Length (m)	15.5				339790
	Borehole Name	Ruabon Bypass Bh 60				
	BGS Boreholes					
	BGS Reference	Sj23ne145	N	594	4	329420
	Drilled Length (m)	3				339820
	Borehole Name	Ruabon Bypass Bh 355				
	BGS Boreholes					
	BGS Reference	Sj33nw47	E	594	4	330210
	Drilled Length (m)	12.5				339010
	Borehole Name	Ley Farm Bh12				
	BGS Boreholes					
	BGS Reference	Sj23ne295	NW	594	4	328930
	Drilled Length (m)	Not Supplied				339490
	Borehole Name	Overton To Chirk Gas Pipeline Shropshire Bh 1				
	BGS Boreholes					
	BGS Reference	Sj23ne117	NE	595	4	329970
	Drilled Length (m)	39.4				339770
	Borehole Name	Ruabon Bypass Bh 39				
	BGS Boreholes					
	BGS Reference	Sj23ne155	SE	599	4	329940
	Drilled Length (m)	4				338540
	Borehole Name	Ruabon Bypass Bh 386				
	BGS Boreholes					
	BGS Reference	Sj23ne113	NE	601	4	329880
	Drilled Length (m)	15				339820
	Borehole Name	Ruabon Bypass Bh 36a				
	BGS Boreholes					
	BGS Reference	Sj23ne116	NE	617	4	329960
	Drilled Length (m)	35				339800
	Borehole Name	Ruabon Bypass Bh 59				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	BGS Boreholes				
	BGS Reference Sj23ne112	N	626	4	329710
	Drilled Length (m) 30				339890
	Borehole Name Ruabon Bypass Bh 36				
	BGS Boreholes				
	BGS Reference Sj23ne144	N	632	4	329290
	Drilled Length (m) 11				339830
	Borehole Name Ruabon Bypass Bh 37				
	BGS Boreholes				
	BGS Reference Sj23ne143	NW	642	4	329150
	Drilled Length (m) 7				339780
	Borehole Name Ruabon Bypass Bh 356				
	BGS Boreholes				
	BGS Reference Sj33nw50	E	642	4	330270
	Drilled Length (m) 5				339080
	Borehole Name Ley Farm Bh15				
	BGS Boreholes				
	BGS Reference Sj23ne296	NW	643	4	328890
	Drilled Length (m) Not Supplied				339500
	Borehole Name Overton To Chirk Gas Pipeline Shropshire Bh 1a				
	BGS Boreholes				
	BGS Reference Sj23ne291	NW	645	4	329110
	Drilled Length (m) 41.09				339760
	Borehole Name Wills No. 1, Chirk				
	BGS Boreholes				
	BGS Reference Sj23ne257	NE	647	4	329930
	Drilled Length (m) 7				339850
	Borehole Name Newbridge-Chirk Section Bha342				
	BGS Boreholes				
	BGS Reference Sj23ne142	NW	682	4	329070
	Drilled Length (m) 8				339780
	Borehole Name Ruabon Bypass Bh 357				
	BGS Boreholes				
	BGS Reference Sj23ne285	SW	691	4	328800
	Drilled Length (m) 9				338800
	Borehole Name Oxy-Metal Finishings, Chirk, No 1				
	BGS Boreholes				
	BGS Reference Sj23ne286	SW	691	4	328800
	Drilled Length (m) 9				338800
	Borehole Name Oxy-Metal Finishings No. 2				
	BGS Boreholes				
	BGS Reference Sj23ne288	SW	691	4	328800
	Drilled Length (m) 12.5				338800
	Borehole Name Oxy-Metal Finishings No. 4				
	BGS Boreholes				
	BGS Reference Sj23ne289	SW	691	4	328800
	Drilled Length (m) 17				338800
	Borehole Name Oxy-Metal Finishings No. 5				
	BGS Boreholes				
	BGS Reference Sj23ne290	SW	691	4	328800
	Drilled Length (m) 10				338800
	Borehole Name Oxy-Metal Finishings No. 6				
	BGS Boreholes				
	BGS Reference Sj23ne287	SW	691	4	328800
	Drilled Length (m) 9				338800
	Borehole Name Oxy-Metal Finishings No. 3				
	BGS Boreholes				
	BGS Reference Sj23ne141	NW	729	4	328970
	Drilled Length (m) 5				339760
	Borehole Name Ruabon Bypass Bh 358				

Map ID	Details		Compass Direction	Estimated Distance From Site	Contact	NGR
BGS Boreholes						
BGS Reference	Sj23ne186		NW	744	4	328940
Drilled Length (m)	Not Supplied					339750
Borehole Name	Ruabon Newbridge Chirk Bypasses Tp 558					
BGS Boreholes						
BGS Reference	Sj23ne136		NE	745	4	329920
Drilled Length (m)	17					339960
Borehole Name	Ruabon Bypass Bh 341					
BGS Boreholes						
BGS Reference	Sj23ne180		NW	758	4	328920
Drilled Length (m)	Not Supplied					339750
Borehole Name	Ruabon Newbridge Chirk Bypasses 514					
BGS Boreholes						
BGS Reference	Sj23ne188		NW	759	4	328890
Drilled Length (m)	Not Supplied					339720
Borehole Name	Ruabon Newbridge Chirk Bypasses Tp 562					
BGS Boreholes						
BGS Reference	Sj23ne139		NW	763	4	328860
Drilled Length (m)	6					339690
Borehole Name	Ruabon Bypass Bh 359					
BGS Boreholes						
BGS Reference	Sj23ne156		SE	763	4	329940
Drilled Length (m)	9					338350
Borehole Name	Ruabon Bypass Bh 367					
BGS Boreholes						
BGS Reference	Sj23ne195		NW	775	4	328860
Drilled Length (m)	Not Supplied					339710
Borehole Name	Ruabon Newbridge Chirk Bypasses Tp 557					
BGS Boreholes						
BGS Reference	Sj23ne140		NW	785	4	328930
Drilled Length (m)	20					339790
Borehole Name	Ruabon Bypass Bh 38					
BGS Boreholes						
BGS Reference	Sj23ne179		NW	787	4	328890
Drilled Length (m)	Not Supplied					339760
Borehole Name	Ruabon Newbridge Chirk Bypasses 513					
BGS Boreholes						
BGS Reference	Sj23ne184		NW	808	4	328670
Drilled Length (m)	Not Supplied					339770
Borehole Name	Ruabon Newbridge Chirk Bypasses Tp 556					
BGS Boreholes						
BGS Reference	Sj24se449		NE	817	4	329950
Drilled Length (m)	18					340030
Borehole Name	Ruabon Bypass Bh 35					
BGS Boreholes						
BGS Reference	Sj24se497		NE	835	4	329940
Drilled Length (m)	Not Supplied					340050
Borehole Name	Ruabon Newbridge Chirk Bypasses Tp 563					
BGS Boreholes						
BGS Reference	Sj23ne157		SE	847	4	329940
Drilled Length (m)	10					338260
Borehole Name	Ruabon Bypass Bh 368					
BGS Boreholes						
BGS Reference	Sj23ne183		NW	851	4	328820
Drilled Length (m)	Not Supplied					339780
Borehole Name	Ruabon Newbridge Chirk Bypasses Tp 555					
BGS Boreholes						
BGS Reference	Sj23ne206		SE	857	4	329930
Drilled Length (m)	20.5					338250
Borehole Name	A5 Chirk Bypass Bh 705					



Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	BGS Boreholes				
	BGS Reference Sj23ne205	SE	866	4	329950
	Drilled Length (m) 20				338240
	Borehole Name A5 Chirk Bypass Bh 704				
	BGS Boreholes				
	BGS Reference Sj23ne138/B	NW	874	4	328810
	Drilled Length (m) 5				339800
	Borehole Name Ruabon Bypass Bh 360				
	BGS Boreholes				
	BGS Reference Sj23ne204	SE	874	4	329970
	Drilled Length (m) 20				338250
	Borehole Name A5 Chirk Bypass Bh 703				
	BGS Boreholes				
	BGS Reference Sj23ne190	SW	894	4	328640
	Drilled Length (m) 34				338670
	Borehole Name Kronospan Limited Chirk				
	BGS Boreholes				
	BGS Reference Sj24se576	N	901	4	329910
	Drilled Length (m) 13				340130
	Borehole Name Newbridge-Chirk Bypass Bh340				
	BGS Boreholes				
	BGS Reference Sj23ne191	SW	903	4	328680
	Drilled Length (m) 33				338590
	Borehole Name Kronospan Limited Chirk				
	BGS Boreholes				
	BGS Reference Sj23ne125	SE	906	4	329970
	Drilled Length (m) 18.7				338210
	Borehole Name Ruabon Bypass Bh 44				
	BGS Boreholes				
	BGS Reference Sj23ne126	SE	909	4	330000
	Drilled Length (m) 34.79				338220
	Borehole Name Ruabon Bypass 64				
	BGS Boreholes				
	BGS Reference Sj23ne10	S	936	4	329660
	Drilled Length (m) 222.19				338100
	Borehole Name Brynkinalt Colliery, Denbigh				
	BGS Boreholes				
	BGS Reference Sj33nw28	SE	954	4	330110
	Drilled Length (m) 6.9				338230
	Borehole Name A5 Chirk Bypass Bh 726				
	BGS Boreholes				
	BGS Reference Sj23ne158	SE	963	4	329970
	Drilled Length (m) 12				338150
	Borehole Name Ruabon Bypass Bh 369				
	BGS Boreholes				
	BGS Reference Sj24se496	N	971	4	329920
	Drilled Length (m) Not Supplied				340200
	Borehole Name Ruabon Newbridge Chirk By Passes Tp 560				
	BGS Boreholes				
	BGS Reference Sj24se575	N	980	4	329950
	Drilled Length (m) 22				340200
	Borehole Name Newbridge-Chirk Bypass Bh339b				
	BGS Boreholes				
	BGS Reference Sj24se448	N	988	4	329870
	Drilled Length (m) 19.5				340230
	Borehole Name Ruabon Bypass Bh 34				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
BGS Recorded Mineral Sites					
Site Name	Ley Farm Occs	NE	154	4	329800
Location	Chirk, Wrexham, Denbighshire				339280
Source	British Geological Survey, National Geoscience Information Service				
Reference	4741				
Type	Opencast				
Status	Ceased				
Operator	Bayford Mining Ltd				
Operator Location	Not Supplied				
Periodic Type	Carboniferous				
Geology	Pennine Coal Measures Group				
Commodity	Coal - Opencast				
Positional Accuracy	Located by supplier to within 10m				
BGS Recorded Mineral Sites					
Site Name	Black Park Colliery	E	402	4	330040
Location	Chirk, Wrexham, Clwyd				339350
Source	British Geological Survey, National Geoscience Information Service				
Reference	14100				
Type	Underground				
Status	Ceased				
Operator	Unknown Operator				
Operator Location	Not Supplied				
Periodic Type	Carboniferous				
Geology	Pennine Lower Coal Measures Formation				
Commodity	Coal - Deep				
Positional Accuracy	Located by supplier to within 10m				
BGS Recorded Mineral Sites					
Site Name	Brynkinhalt Colliery	S	934	4	329860
Location	Chirk, Wrexham, Clwyd				338100
Source	British Geological Survey, National Geoscience Information Service				
Reference	14101				
Type	Underground				
Status	Ceased				
Operator	Unknown Operator				
Operator Location	Not Supplied				
Periodic Type	Carboniferous				
Geology	Pennine Lower Coal Measures Formation				
Commodity	Coal - Deep				
Positional Accuracy	Located by supplier to within 10m				
BGS 1:625,000 Solid Geology					
Description	Lower Westphalian (mainly Productive Coal Measures)	-	0	4	329530
					339140
Coal Mining Affected Areas					
Description	In an area which may be affected by coal mining activity. It is recommended that a coal mining report is obtained from the Coal Authority. Contact details are included in the Useful Contacts section of this report.	-	0	5	329530
					339140
Shallow Mining Hazards					
Risk	Low	-	0	4	329530
Source	British Geological Survey, National Geoscience Information Service				339140
Potential for Collapsible Ground Stability Hazards					
Description	No Hazard	-	-	-	-
Potential for Compressible Ground Stability Hazards					
Hazard Potential:	No Hazard	-	0	4	329530
Source:	British Geological Survey, National Geoscience Information Service				339140
Potential for Ground Dissolution Stability Hazards					
Description	No Hazard	-	-	-	-
Potential for Landslide Ground Stability Hazards					
Hazard Potential:	Low	-	0	4	329530
Source:	British Geological Survey, National Geoscience Information Service				339140
Potential for Landslide Ground Stability Hazards					
Hazard Potential:	Very Low	NW	0	4	329480
Source:	British Geological Survey, National Geoscience Information Service				339180

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	Potential for Running Sand Ground Stability Hazards				
	Hazard Potential: Very Low	W	0	4	329450
	Source: British Geological Survey, National Geoscience Information Service				339140
	Potential for Running Sand Ground Stability Hazards				
	Hazard Potential: No Hazard	-	0	4	329530
	Source: British Geological Survey, National Geoscience Information Service				339140
	Potential for Shrinking or Swelling Clay Ground Stability Hazards				
	Hazard Potential: Very Low	-	0	4	329530
	Source: British Geological Survey, National Geoscience Information Service				339140
	Mining Instability				
	Mining Evidence: Inconclusive Coal Mining	-	0	-	329530
	Source: Ove Arup & Partners				339140
	Boundary Quality: As Supplied				
	Radon Affected Areas				
	Description: Between 5% and 10% of homes are above the Action Level	-	0	6	329530
	Source: Health Protection Agency				339140
	Radon Protection Measures				
	Type: Full radon protective measures are necessary in the construction of new dwellings or extensions	-	0	4	329530
	Source: British Geological Survey, National Geoscience Information Service				339140

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Contemporary Trade Directory Entries					
Name	S L P	SW	604	-	329040 338600
Location	23, West View, Chirk, Wrexham, Clwyd, LL14 5HL				
Classification	Printers				
Status	Active				
Positional Accuracy	Automatically positioned to the address				
Contemporary Trade Directory Entries					
Name	Berwyn Garage	SW	613	-	328940 338720
Location	Westfield, Holyhead Road, Chirk, Wrexham, Clwyd, LL14 5HG				
Classification	Garage Services				
Status	Inactive				
Positional Accuracy	Automatically positioned to the address				
Contemporary Trade Directory Entries					
Name	Chirk Service Station	SW	626	-	328940 338660
Location	Holyhead Road, Chirk, Wrexham, Clwyd, LL14 5NA				
Classification	Garage Services				
Status	Active				
Positional Accuracy	Automatically positioned to the address				
Contemporary Trade Directory Entries					
Name	J A Roberts & Sons	SW	665	-	329220 338410
Location	Coal Yard, Chapel La, Wrexham, Clwyd, LL14 5NF				
Classification	Coal & Smokeless Fuel Merchants & Distributors				
Status	Active				
Positional Accuracy	Manually positioned to the road within the address or location				
Contemporary Trade Directory Entries					
Name	Auto Gas	S	752	-	329570 338270
Location	Chirk Green, Chirk, Wrexham, Clwyd, LL14 5PU				
Classification	Vehicle Conversions				
Status	Inactive				
Positional Accuracy	Manually positioned within the geographical locality				
Contemporary Trade Directory Entries					
Name	Edwards Dairies	NE	999	-	330190 340110
Location	The Old Shop, Maes y Parc, Chirk, Wrexham, Clwyd, LL14 5BB				
Classification	Dairies				
Status	Active				
Positional Accuracy	Automatically positioned to the address				
Fuel Station Entries					
Name	Berwyn Garage	W	539	-	328910 338930
Location	Holyhead Road, Chirk, WREXHAM, Clwyd, LL14 5HP				
Brand	Q8				
Premises Type	Petrol Station				
Status	Closed				
Positional Accuracy	Unknown				
Fuel Station Entries					
Name	The Garage	SW	630	-	328950 338680
Location	Holyhead Road, Chirk, WREXHAM, Clwyd, LL14 5HP				
Brand	Anglo				
Premises Type	Not Applicable				
Status	Closed				
Positional Accuracy	Manually positioned to the address or location				

Data Type	Version	Update Cycle
Agency & Hydrological		
Local Authority Pollution Prevention and Controls Wrexham County Borough Council Environmental Health Department	September-2005	Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements Wrexham County Borough Council Environmental Health Department	September-2005	Annual Rolling Update
Discharge Consents Environment Agency Welsh Region	April-2006	Quarterly
Integrated Pollution Controls Environment Agency Welsh Region	April-2006	Quarterly
Integrated Pollution Prevention And Control Environment Agency Welsh Region	April-2006	Quarterly
Local Authority Integrated Pollution Prevention And Control Wrexham County Borough Council Environmental Health Department	September-2005	Annual Rolling Update
Nearest Surface Water Feature Ordnance Survey	April-2006	Quarterly
Pollution Incidents to Controlled Waters Environment Agency Welsh Region	December-1998	Not Applicable
Substantiated Pollution Incident Register Environment Agency - Welsh Region Northern Area	April-2006	Quarterly
Water Industry Act Referrals Environment Agency Welsh Region	April-2006	Quarterly
Registered Radioactive Substances Environment Agency Welsh Region	April-2006	Quarterly
River Quality Environment Agency Head Office	November-2001	Not Applicable
River Quality Biology Sampling Points Environment Agency Head Office	February-2006	Annually
River Quality Chemistry Sampling Points Environment Agency Head Office	January-2006	Annually
Water Abstractions Environment Agency Welsh Region	April-2006	Quarterly
Groundwater Vulnerability Environment Agency Head Office	January-1999	Not Applicable
Drift Deposits Environment Agency Head Office	January-1999	Not Applicable
Source Protection Zones Environment Agency Head Office	April-2005	Variable

Data Type	Version	Update Cycle
Agency & Hydrological		
Extreme Flooding from Rivers or Sea without Defences Environment Agency Head Office	April-2006	Quarterly
Flooding from Rivers or Sea without Defences Environment Agency Head Office	April-2006	Quarterly
Areas Benefiting from Flood Defences Environment Agency Head Office	April-2006	Quarterly
Flood Water Storage Areas Environment Agency Head Office	April-2006	Quarterly
Flood Defences Environment Agency Head Office	April-2006	Quarterly
River Flood Data (Scotland) Centre for Ecology and Hydrology	September-1999	Not Applicable

Data Type	Version	Update Cycle
Waste		
BGS Recorded Landfill Sites British Geological Survey National Geoscience Information Service	June-1996	Not Applicable
Integrated Pollution Control Registered Waste Sites Environment Agency Welsh Region	April-2006	Quarterly
Licensed Waste Management Facilities (Landfill Boundaries) Environment Agency - Welsh Region Northern Area	May-2006	Quarterly
Licensed Waste Management Facilities (Locations) Environment Agency - Welsh Region Northern Area	May-2006	Quarterly
Local Authority Landfill Coverage Wrexham County Borough Council	May-2000	Not Applicable
Local Authority Recorded Landfill Sites Wrexham County Borough Council	February-2005	Not Applicable
Registered Landfill Sites Environment Agency - Welsh Region Northern Area	March-2003	Variable
Registered Waste Transfer Sites Environment Agency - Welsh Region Northern Area	March-2003	Variable
Registered Waste Treatment or Disposal Sites Environment Agency - Welsh Region Northern Area	March-2003	Variable

Data Type	Version	Update Cycle
Hazardous Substances		
Control of Major Accident Hazards Sites (COMAH) Health and Safety Executive	May-2006	Variable
Explosive Sites Health and Safety Executive	March-2006	Bi-Annually
Notification of Installations Handling Hazardous Substances (NIHHS) Health and Safety Executive	November-2000	Not Applicable
Planning Hazardous Substance Consents Wrexham County Borough Council Planning Department	July-2006	Annual Rolling Update
Planning Hazardous Substance Enforcements Wrexham County Borough Council Planning Department	August-2006	Annual Rolling Update

Data Type	Version	Update Cycle
Geological		
BGS Boreholes British Geological Survey National Geoscience Information Service	July-2006	Quarterly
BGS Recorded Mineral Sites British Geological Survey National Geoscience Information Service	April-2006	Bi-Annually
BGS 1:625,000 Solid Geology British Geological Survey National Geoscience Information Service	August-1996	Not Applicable
Coal Mining Affected Areas The Coal Authority Mining Report Service	January-2006	As notified
Shallow Mining Hazards British Geological Survey National Geoscience Information Service	August-2002	Variable
Potential for Collapsible Ground Stability Hazards British Geological Survey National Geoscience Information Service	May-2005	Annually
Potential for Compressible Ground Stability Hazards British Geological Survey National Geoscience Information Service	November-2005	Annually
Potential for Ground Dissolution Stability Hazards British Geological Survey National Geoscience Information Service	May-2005	Annually
Potential for Landslide Ground Stability Hazards British Geological Survey National Geoscience Information Service	May-2005	Annually
Potential for Running Sand Ground Stability Hazards British Geological Survey National Geoscience Information Service	May-2005	Annually
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey National Geoscience Information Service	May-2005	Annually
Mining Instability Ove Arup & Partners	October-2000	Not Applicable
Natural and Mining Cavities Peter Brett Associates	December-2005	Variable
Radon Affected Areas Health Protection Agency	January-2003	Not Applicable
Radon Protection Measures British Geological Survey National Geoscience Information Service	August-2002	Variable

Data Type	Version	Update Cycle
Industrial Land Use		
Contemporary Trade Directory Entries Thomson Directories	May-2006	Bi-Annually
Fuel Station Entries Catalist Ltd (Fuel Station Data)	May-2006	Quarterly

Data Type	Version	Update Cycle
Sensitive Land Uses		
Areas of Outstanding Natural Beauty		
Countryside Council for Wales	February-2005	Annually
The Countryside Agency	October-2004	Annually
Environmentally Sensitive Areas		
Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	June-2006	Annually
The National Assembly for Wales GI Services (Department of Planning & Countryside)	June-2006	Annually
Forest Parks		
Forestry Commission	April-1997	Not Applicable
Local Nature Reserves		
Denbighshire County Council	February-2005	Annually
Wrexham County Borough Council	February-2005	Annually
Marine Nature Reserves		
Countryside Council for Wales	February-2005	Annually
English Nature	May-2006	Annually
National Nature Reserves		
Countryside Council for Wales	February-2005	Annually
English Nature	May-2006	Annually
National Parks		
The National Assembly for Wales GI Services (Department of Planning & Countryside)	June-2006	Annually
The Countryside Agency	October-2004	Annually
Nitrate Sensitive Areas		
Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	December-2003	Not Applicable
Nitrate Vulnerable Zones		
Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	May-2006	Annually
The National Assembly for Wales GI Services (Department of Planning & Countryside)	October-2005	Annually
Ramsar Sites		
Countryside Council for Wales	February-2005	Annually
English Nature	May-2006	Annually
Sites of Special Scientific Interest		
Countryside Council for Wales	February-2005	Annually
English Nature	May-2006	Annually
Special Areas of Conservation		
Countryside Council for Wales	February-2005	Annually
English Nature	May-2006	Annually

Data Type	Version	Update Cycle
Sensitive Land Uses		
Special Protection Areas Countryside Council for Wales English Nature	February-2005 May-2006	Annually Annually

Some of the organisations who provide data which is used within the report

Ordinance Survey	 Ordinance Survey [®] Licensed Partner
Environment Agency	 Environment Agency
Scottish Environment Protection Agency	 SEPA Scottish Environment Protection Agency
The Coal Authority	THE COAL AUTHORITY
British Geological Survey	 British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL
Centre for Ecology and Hydrology	 Centre for Ecology & Hydrology NATURAL ENVIRONMENT RESEARCH COUNCIL
Countryside Council for Wales	 CYNGOR CEFN GWLAD CYMRU COUNTRYSIDE COUNCIL FOR WALES
Scottish Natural Heritage	SCOTTISH NATURAL HERITAGE 
English Nature Site of Special Scientific Interest, National Nature Reserve, Ramsar, Special Protection Area, Special Conservation Area, Marine Nature Reserve data (derived from Ordnance Survey 1:10000 raster) is provided by, and used with the permission of, English Nature who retain the copyright and Intellectual Property Rights for the data	 ENGLISH NATURE
Health Protection Agency	
Ove Arup The Data provided above was obtained on Licence from Ove Arup & Partners Limited (for further information, contact mining.review@arup.com). No reproduction or further use of such Data is to be made without the prior written consent of Ove Arup & Partners Limited. The information and data supplied in the product are derived from publicly available records and other third party sources and neither Ove Arup & Partners nor Landmark warrant the accuracy or completeness of such information or data.	ARUP
Peter Brett Associates The cavity data presented has been extracted from the PBA enhanced version of the original DEFRA national cavity databases. PBA/DEFRA retain the copyright & intellectual property rights in the data. Whilst all reasonable efforts are made to check that the information contained in the cavity databases is accurate we do not warrant that the data is complete or error free. The information is based upon our own researches and those collated from a number of external sources and is continually being augmented and updated by PBA. In no event shall PBA/DEFRA or Landmark be liable for any loss or damage including, without limitation, indirect or consequential loss or damage arising from the use of this data.	pba

Contact Name and Address

1	Wrexham County Borough Council Environmental Health Department Crown Buildings P O Box 1297 Wrexham Clwyd LL13 8ZE www.wrexham.gov.uk	Telephone 01978 297038 Fax 01978 292502
2	Environment Agency National Customer Contact Centre (NCCC) PO Box 544 Templeborough Rotherham S60 1BY enquiries@environment-agency.gov.uk	Telephone 08708 506 506
3	Wrexham County Borough Council Lampet Street Guildhall Wrexham Clwyd LL11 1WL www.wrexham.gov.uk	Telephone 01978 292000 Fax 01978 292502
4	British Geological Survey Enquiry Service British Geological Survey Kingsley Dunham Centre Keyworth Nottingham Nottinghamshire NG12 5GG enquiries@bgs.ac.uk www.bgs.ac.uk	Telephone 0115 936 3143 Fax 0115 936 3276
5	The Coal Authority Mining Report Service 200 Lichfield Lane Mansfield Nottinghamshire NG18 4RG thecoalauthority@coal.gov.uk	Telephone 0845 7626848 DX 716176 Mansfield 5

Contact Name and Address

6	Health Protection Agency Chilton Didcot Oxfordshire OX11 0RQ Catalist Ltd (Fuel Station Data) Richmond House 22 Richmond Hill Clifton Bristol Avon BS8 1BA Mark@catalist-uk.com	Telephone 01235 831600 Fax 01235 833891
	Landmark Information Group Limited The Smith Centre Henley On Thames Oxfordshire RG9 6AB customerservices@landmarkinfo.co.uk www.landmark-information.co.uk	Telephone 0117 923 7113 Fax 0117 923 7166
		Telephone 0870 850 6670 Fax 0870 850 6671

Please note that the Environment Agency/SEPA have a charging policy in place for enquiries


**British
Geological Survey**
NATURAL ENVIRONMENT RESEARCH COUNCIL

Borehole Records Order Form

Name: Company: Address: Postcode:	Your Ref/Order no: Our Ref: ISGR/ Tel: Fax:
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Quarter Sheet (eg. SE5ONE)	Number (eg. 21)	Suffix (if given) (eg. A-Z)	Name (eg. Bentley Village Sewer TP 1)

Please note: More than 10 records can be ordered, but it is advisable to discuss your requirements first with NGIS staff, as interpreted geological reports are also available.

RESPONSE TIMES MAY VARY DUE TO CUSTOMER DEMAND AND STAFF AVAILABILITY

Level of Service: (Please tick)

☐ Standard Service (variable within 5 days)

☐ Premium Service (24 hour response, £30 additional charge)

Delivery Method: (Please tick) Post ☐ Special Delivery £4.25 ☐ Fax 50p (per sheet) ☐ Digital CD £2 (per CD) ☐

Borehole unit price is £13 + VAT, Minimum charge £26 + VAT (includes 1st class postage).

Special Requirements or comments:

Please return form to: Records & Data Enquiries, British Geological Survey, Keyworth, Nottingham NG12 5GG.
 Tel: 01159363143 Fax: 01159363276 E-mail: enquiries@bgs.ac.uk

LANDMARK TERMS AND CONDITIONS

Definitions

"Authorised Reseller" means an agent or reseller of Landmark whom Landmark has duly appointed to resell its Reports and Services.

"Content" means any data, computing and information services and software, and other content and documentation or support materials and updates included in and/or supplied by or through the Websites, in Reports or Services or in any other way by Landmark and shall include Landmark developed and Third Party Content.

"First Purchaser" means the first person, or legal entity to purchase the Property Site following provision of a Report. "First Purchaser's Lender" means the funding provider for the First Purchaser.

"Information Pack" means a pack compiled by or on behalf of the owner or prospective buyer of the Property Site, designed to aid the marketing or purchase of the Property Site and containing information provided by or on behalf of the owner or prospective buyer of the Property Site.

"Intellectual Property Rights" means copyright, patent, design right (registered or unregistered), service or trade mark (registered or unregistered), database right or other data right, moral right or know how or any other intellectual property right.

"Order" means the request for Services from Landmark by You.

"Property Site" means a land site on which Landmark provides a Service.

References to "We", "Us" and "Our" are references to Landmark Information Group Limited ("Landmark"), whose registered office is 7 Abbey Court, Eagle Way, Exeter, EX2 7HY. Where You are not ordering the Services directly from Landmark, but from an Authorised Reseller, references to "Landmark" or "We", "Us" and "Our" shall be construed so as to mean either Landmark and/or the Authorised Reseller as the context shall indicate.

References to "You/your/yourself" refer to the contracting party who accesses the Website or places an Order with Landmark.

"Report" includes any information that Landmark supplies to You including all reports, services, datasets, software or information contained in them.

"Services" means the provision of any service by Landmark pursuant to these Terms, including without limitation, any Report.

"Landmark Fees" means any charges levied by Landmark for Services provided to You.

"Suppliers" means any organisation who provides data or information of any form to Landmark.

"Terms" means these Terms & Conditions.

"Third Party Content" means the services, software, information and other content or functionality provided by third parties and linked to or contained in the Services.

"Websites" means websites hosted by Landmark and includes the Content and any report, service, document, data-set, software or information contained therein, derived there from or thereby.

1. Terms & Conditions

a. These Terms govern the relationship between You and Landmark whether You are an unregistered visitor to the Website or are purchasing Services. Where these Terms are not expressly accepted by You they will be deemed to have been accepted by You, and You agree to be bound by these Terms when You place any Order, or pay for any Services provided.

b. If the person communicating with Landmark is an Authorised Reseller, they must ensure that You agree to these Terms.

c. The headings in these Terms are for convenience only and shall not affect the meaning or interpretation of any part of these Terms.

d. Landmark may modify these Terms, and may discontinue or revise any or all other aspects of the Services at our sole discretion, with immediate effect and without prior notice, including without limitation changing the Services available at any given time. Any amendment or variation to these Terms shall be posted on our Websites. Continued use of the Services by You shall be deemed an acceptance by You to be bound by any such amendments to the Terms.

e. These Terms, together with the prices and delivery details set out on our Websites, Landmark's Privacy Policy and Your Order comprise the whole agreement relating to the supply of Services to You by Landmark. No prior stipulation, agreement, promotional material or statement whether written or oral made by any sales or other person or representative on our behalf should be understood as a variation of these Terms. Save for fraud or misrepresentation, Landmark shall have no liability for any such representation being untrue or misleading.

f. These Terms shall prevail at all times to the exclusion of all other terms and conditions including any terms and conditions which You may purport to apply even if such other provisions are submitted in a later document or purport to exclude or override these Terms and neither the course of conduct between parties nor trade practice shall act to modify these Terms.

2. Services

a. Landmark will use reasonable care and skill in providing the Services to You, however, the Services are provided on the express basis that the information and data

supplied in the Services are derived from third party sources and Landmark does not warrant the accuracy or completeness of such information or data. Such information is derived solely from those sources specifically cited in the Services and Landmark does not claim that these sources represent an exhaustive or comprehensive list of all sources that might be consulted.

3. Intellectual Property

a. You acknowledge that all Intellectual Property Rights in the Services are and shall remain owned by either Landmark or our Suppliers and nothing in these Terms purports to transfer, assign or grant any rights to You in respect of the Intellectual Property Rights.

b. Subject always to these Terms You may, without further charge, make the Services available to:

i. the owner of the Property at the date of the Report,
ii. any person who purchases the whole of the Property Site,
iii. any person who provides funding secured on the whole of the Property Site.

iv. any person for whom You act in a professional or commercial capacity,
v. any person who acts for You in a professional or commercial capacity; and

vi. prospective buyers of the Property Site as part of an Information Pack but for the avoidance of doubt, Landmark shall have no liability to such prospective buyer unless the prospective buyer subsequently purchases the Property Site, and the prospective (or actual) buyer shall not be entitled to make the Service available to any other third party.

Accordingly Landmark shall have the same duties and obligations to those persons in respect of the Services as it has to You.

c. Each of those persons referred to in clause 3.b. shall have the benefit and the burden of Your rights and obligations under these Terms. The limitations of Landmark's liability as set out in clause 6 shall apply to all users of the Service in question in aggregate and Landmark shall not be liable to any other person.

d. All parties given access to the Services agree that they will treat as strictly private and confidential the Services and all information which they obtain from the Services and shall restrict any disclosure to employees or professional advisors to enable the relevant party to conduct its internal business. The requirement in this clause to treat the Services as confidential shall include a requirement to maintain adequate security measures to safeguard the Services from unauthorised access, use or copying.

e. Each recipient of the Services agrees (and agrees it will cause its employees, agents or contractors who may from time to time have access to the Services to agree) it will not, except as permitted herein or by separate agreement with Landmark:

i. effect or attempt to effect any modification, merger or change to the Service, nor permit any other person to do so; or

ii. copy, use, market, re-sell, distribute, merge, alter, add to or carry on any redistribution, reproduction, translation, publication, reduction to any electronic medium or machine readable form or commercially exploit or in any other way deal with or utilise or (except as expressly permitted by applicable law) reverse engineer, decompile or disassemble the Services, Content or Website; or

iii. remove, alter or in any way change any trademark or proprietary marking in any element of the Services and You shall acknowledge the ownership of the Content, where such Content is incorporated or used into Your own documents, reports, systems or services whether or not these are supplied to any third party.

iv. create any product which is derived directly or indirectly from the data contained in the Services.

f. The mapping contained in any Services is protected by Crown Copyright and must not be used for any purpose outside the context of the Services or as specifically provided by these Terms.

4. Charges

a. VAT at the prevailing rate shall be payable in addition to the Landmark Fees. You shall pay any other applicable indirect taxes related to Your use of the Services.

b. An individual or a monthly invoice showing all Orders created by You will be generated subject to these Terms. You will pay the Landmark Fees at the rates set out in Landmark's or its Authorised Reseller's invoice. The Landmark Fees are payable in full within 30 days without deduction, counterclaim or set off. You acknowledge that time is of the essence with respect to the payment of such invoices. Landmark reserve the right to amend the Landmark Fees from time to time and the Services will be charged at the Landmark Fee applicable at the date on which the Service is ordered.

c. We may charge interest on late payment at a rate equal to 3% per annum above the base lending rate of National Westminster Bank plc.

d. Landmark or its Authorised Reseller shall not be obliged to invoice any party other than You for the provision of

Services, but where Landmark or its Authorised Reseller does so invoice any third party at Your request, and such invoice is not accepted or remains unpaid, Landmark or its Authorised Reseller shall have the option at any time to cancel such invoice and invoice You direct for such Services. Where Your order comprises a number of Services or severable elements within any one or more Services, any failure by Landmark or its Authorised Reseller to provide an element or elements of the Services shall not prejudice Landmark's or its Authorised Reseller's ability to require payment in respect of the Services delivered to You.

5. Termination

a. Landmark may suspend or terminate Your rights under these Terms without any liability to You with immediate effect if at any time:-

i. You fail to make any payment due in accordance with clause 4,

ii. You repeatedly breach or commit or cause to be committed any material breach of these Terms; or

iii. You commit a breach and You fail to remedy the breach within 7 days of receipt of a written notice to do so, additionally, without prejudice to the foregoing, Landmark may remedy the breach and recover the costs thereof from You.

b. If Your rights are terminated under this clause and You have made an advance payment We will refund You a reasonable proportion of the balance as determined by Us in relation to the value of Services previously purchased.

c. Landmark reserves the right to refuse to supply any or all Services to You without notice or reason.

6. Liability

a. We provide warranties and accept liability only to the extent stated in this clause 6 and clause 7.

b. Nothing in these Terms excludes either party's liability for death or personal injury caused by that party's negligence or willful default, and the remainder of this clause 6 is subject to this provision and Your statutory rights.

c. As most of the information contained in the Services is provided to Landmark by others, Landmark cannot control its accuracy or completeness, nor is it within the scope of Landmark's Services to check the information on the ground. Accordingly, Landmark will only be liable to You for any loss or damage caused by its negligence or willful default and neither Landmark nor any person providing information contained in any Services shall in any other circumstances be liable for any inaccuracies, faults or omissions in the Services nor shall Landmark have any liability if the Services are used otherwise than in accordance with these Terms.

Save as precluded by law, Landmark shall not be liable for any indirect or consequential loss, damage or expenses (including loss of profits, loss of contracts, business or goodwill) howsoever arising out of any problem, event, action or default by Landmark.

In any event, and notwithstanding anything contained in these Terms, Landmark's liability in contract, tort (including negligence or breach of statutory duty) or otherwise howsoever arising by reason or in connection with this Contract (except in relation to death or personal injury) shall be limited to an aggregate amount not exceeding £1 million if the complaint is in relation to a Report on residential property and an aggregate amount not exceeding £10 million in respect of any other Report or Service purchased from Landmark.

Landmark will not be liable for any defect, failure or omission relating to Services that is not notified to Landmark within six months of the date of the issue becoming apparent and in any event, within twelve years of the date of the Service.

g. You acknowledge that:-

i. You shall have no claim or recourse against any Third Party Content supplier nor any of our other Suppliers. You will not in any way hold us responsible for any selection or retention of, or the acts or omissions of Third Party Content suppliers or other Suppliers (including those with whom We have contracted to operate various aspects or parts of the Service) in connection with the Services (for the avoidance of doubt Landmark is not a Third Party Content supplier). Landmark does not promise that the supply of the Services will be uninterrupted or error free or provide any particular facilities or functions, or that the Content will always be complete, accurate, precise, free from defects of any other kind, computer viruses, software locks or other similar code although Landmark will use reasonable efforts to correct any inaccuracies within a reasonable period of them becoming known to us.

ii. Landmark's only obligation is to exercise reasonable skill and care in providing environmental property risk information to persons acting in a professional or commercial capacity who are skilled in the use of property and environmental information and You hereby acknowledge that You are such a person;

iii. no physical inspection of any Property Site reported on is carried out as part of any Services offered by Landmark and Landmark do not warrant that all land

- uses or features whether past or current will be identified in the Services. The Services do not include any information relating to the actual state or condition of any Property Site nor should they be used or taken to indicate or exclude actual fitness or unfitness of a Property Site for any particular purpose nor should it be relied upon for determining suitability or value or used as a substitute for any physical investigation or inspection. Landmark recommends that You inspect and take other advice in relation to the Property Site and not rely exclusively on the Services.
- iv. Landmark shall not be responsible for error or corruption in the Services resulting from inaccuracy or omission in primary or secondary information and data, inaccurate processing of information and data by third parties, computer malfunction or corruption of data whilst in the course of conversion, geo-coding, processing by computer or electronic means, or in the course of transmission by telephone or other communication link, or printing.
 - v. Landmark will not be held liable in any way if a Report on residential property is used for commercial property or more than the one residential property for which it was ordered.
 - vi. the Services have not been prepared to meet Your or anyone else's individual requirements; that You assume the entire risk as to the suitability of the Services and waive any claim of detrimental reliance upon the same; and You confirm You are solely responsible for the selection or omission of any specific part of the Content;
 - vii. Landmark offer no warranty for the performance of any linked internet service not operated by Landmark;
 - viii. You will on using the Services make a reasonable inspection of any results to satisfy Yourself that there are no defects or failures. In the event that there is a material defect You will notify us in writing of such defect within seven days of its discovery;
 - ix. Any support or assistance provided to You in connection with these Terms is at Your risk;
 - h. All liability for any insurance products purchased by You rests solely with the insurer. Landmark does not endorse any particular product or insurer and no information contained within the Services should be deemed to imply otherwise. You acknowledge that if You Order any such insurance Landmark will deem such as Your consent to forward a copy of the Report to the insurers. Where such policy is purchased, all liability remains with the insurers and You are entirely responsible for ensuring that the insurance policy offered is suitable for Your needs and should seek independent advice. Landmark does not guarantee that an insurance policy will be available on a Property Site. All decisions with regard to the offer of insurance policies for any premises will be made solely at the discretion of the insurers and Landmark accepts no liability in this regard. The provision of a Report does not constitute any indication by Landmark that insurance will be available on the property.
 - i. If Landmark provides You with any additional service obtained from a third party, including but not limited to any professional opinion, interpretation or conclusion, risk assessment or environmental report or search carried out in relation to a Report on Your Property Site, Landmark will not be liable in any way for any information contained therein or any issues arising out of the provision of those additional services to You. Landmark will be deemed to have acted as an agent in these circumstances and the supply of these additional services will be governed by the terms and conditions of those Third Parties. For the avoidance of doubt, those parties providing assessments or professional opinions on Landmark products include RPS Plc & Wilbourn Associates Limited. Copies of their terms and conditions are available on request from Landmark.
 - j. In any event no person may rely on a Service more than 12 months after its original date.
 - k. If You wish to vary any limitation of liability as set out in these Terms, You must request such variation prior to ordering the Service. Landmark shall use its reasonable endeavours to agree such variation but shall not be obliged to do so.
 - l. Time shall not be of the essence with respect to the provision of the Services.
 - m. Ordnance Survey have undertaken a positional accuracy improvement programme which may result in discrepancies between the positioning of features used in datasets in the Services and the updated Ordnance Survey mapping. Landmark and its Suppliers exclude all and any liability incurred as a result of the implementation of such positional accuracy improvement programme.
 - n. Where Landmark provides its own risk assessment in connection with any Report, Landmark shall carry out such assessment with all reasonable skill and care but shall have no liability for any such risk assessment conclusion which is provided for information only, save where Landmark conducted the same negligently. In which case the provisions of clause 6 shall apply. Notwithstanding the provision of any such risk assessment conclusion you should carefully examine the remainder of the Report and should not take or refrain from taking any action based solely on the basis of the risk assessment. For the avoidance of doubt, the provisions of this clause 6n apply solely to risk assessments conducted by Landmark, and the provision of any other risk assessment by a third party shall be governed by such third party's terms in accordance with the provisions of clause 6l above.
 7. Contribution
 - a. Save where expressly provided, this clause 7 shall apply solely to Envirosearch Residential Reports (regardless of the result of such Report). Nothing in this clause 7 shall operate to override or vary the provisions of clause 6.
 - b. Landmark are prepared to offer, at their sole discretion, and without any admission or inference of liability a contribution towards the costs of any remediation works required under a Notice (as defined below) on the terms of this clause 7 ("the Contribution")
 - c. In the event that a Remediation Notice is served on the First Purchaser or First Purchaser's Lender of a Property Site under Part II(A) of the Environmental Protection Act 1990 ("the Notice") Landmark will contribute to the cost of such works as either the First Purchaser or First Purchaser's Lender (but not both) are required to carry out under the Notice subject to the provisions of this clause 7 and on the following terms.
 - i. the Contribution shall only apply to contamination or a pollution incident present or having occurred prior to the date of the Report,
 - ii. the Contribution shall only apply where the Property Site is a single residential dwelling house or a single residential flat within a block of flats. For the avoidance of doubt, this obligation does not apply to any commercial property, nor to any Property Site being developed or redeveloped whether for residential purposes or otherwise;
 - iii. the Contribution is strictly limited to the cost of works at the Property Site and at no other site.
 - iv. the Contribution will not be paid in respect of any of the following.
 - Radioactive contamination of whatsoever nature, directly or indirectly caused by or contributed to or arising from ionising radiations or contamination by radioactivity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel or the radioactive toxic explosive or other hazardous properties of any explosive nuclear assembly or nuclear component thereof.
 - Asbestos arising out of or related in any way to asbestos or asbestos-containing materials on or in structures or services serving the structures. Naturally occurring materials arising from the presence or required removal of naturally occurring materials except in circumstances where such materials are present in concentrations which are in excess of their natural concentration.
 - Intentional non-compliance arising from the intentional disregard of or knowing wilful or deliberate non-compliance by any owner or occupier of the Property Site with any statute, regulation, administrative complaint, notice of violation, or notice letter of any Regulatory Authority.
 - Any condition which is known or ought reasonably to have been known to the First Purchaser or the First Purchaser's Lender prior to the purchase of the Report.
 - Any condition which is caused by acts of War or an Act of Terrorism.
 - Any property belonging to or in the custody or control of the First Purchaser which does not form a fixed part of the Property Site or the structure.
 - Any fines liquidated damages punitive or exemplary damages.
 - Any bodily injury including without limitation, death, illness or disease, mental injury, anguish or nervous shock.
 - Any financial loss in respect of any loss of any rental, profit, revenue, savings or business or any consequential indirect or economic loss damage or expense including the cost of rent of temporary premises or business interruption.
 - Any losses incurred following a material change in use of, alteration or development of the Property Site.
 - d. The maximum sum that shall be contributed by Landmark in respect of any Contribution shall be limited to £50,000. In the event that more than one Report is purchased on the Property Site the Contribution will only be payable under the first Report purchased by or on behalf of any First Purchaser or First Purchaser's Lender and no Contribution will be made in respect of subsequent Reports purchased by or on behalf of such First Purchaser, First Purchaser's Lender or any person connected to them.
 - a. Landmark shall only pay a Contribution where the Notice is served within 36 months of the date of the Report.
 - i. Any rights to a Contribution under this Clause 7 are not assignable in the event of a sale of the Property Site and Landmark will not make any Contribution after the date of completion of such sale.
 - g. In the event the First Purchaser or First Purchaser's Lender wishes to claim any Contribution, it shall notify Landmark in writing within 2 months of the date of the Notice. The First Purchaser or First Purchaser's Lender (as applicable) shall comply with all reasonable requirements of Landmark with regard to the commission and conduct of the remediation works to be carried out under the Notice, and in the event the First Purchaser or First Purchaser's Lender (as applicable) does not do so, including without limitation, obtaining Landmark's prior written consent to any estimates for such works or complying with any other reasonable request by Landmark. Landmark shall not be required to pay any Contribution. Notwithstanding the payment of the Contribution by Landmark the First Purchaser or First Purchaser's Lender as applicable shall take all reasonable steps to mitigate any costs incurred in connection with the conduct of works required under the terms of any Notice.
 - h. In the event that the First Purchaser or First Purchaser's Lender receives any communication from a statutory authority to the effect that there is an intent to serve a notice received under Part II(A) of the Environmental Protection Act 1990 they will advise Landmark within a maximum period of two months from receipt of such communication. This clause 7h and the service of any notice under it shall not affect the provisions of clauses 7 a and g, and any such communications, even if advised to Landmark will not operate as notice under clause 7e. Landmark reserve the right at any time prior to a claim for Contribution being made in accordance with clause 7 g) above, to withdraw the offer of payment of Contributions without further notice.
 8. Events Beyond Our Control
 - a. You acknowledge that Landmark shall not be liable for any delay, interruption or failure in the provision of the Services which are caused or contributed to by any circumstance which is outside our reasonable control including but not limited to, lack of power, telecommunications failure or overload, computer malfunction, inaccurate processing of data, or delays in receiving, loading or checking data, corruption of data whilst in the course of conversion, geo-coding, processing by computer in the course of electronic communication, or printing.
 9. Sovereignty
 - a. If any provision of these Terms are found by either a court or other competent authority to be void, invalid, illegal or unenforceable, that provision shall be deemed to be deleted from these Terms and never to have formed part of these Terms and the remaining provisions shall continue in full force and effect.
 10. Governing Law
 - a. These terms shall be governed by and construed in accordance with English law and each party agrees irrevocably submit to the exclusive jurisdiction of the English courts. If any dispute arises out of or in connection with this agreement (a "Dispute") the parties undertake that, prior to the commencement of Court proceedings, they will seek to have the Dispute resolved amicably by use of an alternative dispute resolution procedure acceptable to both parties with the assistance of the Centre for Dispute Resolution (CEDR) if required, by written notice initiating that procedure. If the Dispute has not been resolved to the satisfaction of either party within 60 days of initiation of the procedure or if either party fails or refuses to participate in or withdraws from participating in the procedure then either party may refer the Dispute to the Court.
 11. General
 - a. Landmark may assign its rights and obligations under these Terms without prior notice or any limitation.
 - b. Landmark may authorise or allow our contractors and other third parties to provide to Landmark and/or to You services necessary or related to the Services and to perform Landmark's obligations and exercise Landmark's rights under these Terms, which may include collecting payment on Landmark's behalf.
 - c. No waiver on Landmark's part to exercise, and no delay in exercising, any right, power or provision hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any right, power or provision hereunder preclude the exercise of that or any other right, power or provision.
 - d. Unless otherwise stated in these Terms, all notices from You to Landmark must be in writing and sent to the Landmark registered office (or in the case of an Authorised Reseller, to its registered office address) and all notices from Landmark to You will be displayed on our Websites from time to time.
 - e. A person who is not a party to any contract made pursuant to these Terms shall have no right under the Contract (Right of Third Parties) Act 1999 to enforce any terms of such contract and Landmark shall not be liable to any such third party in respect of any Services supplied.
 - f. Landmark's Privacy Policy as displayed on the Website governs the use made of any information You supply to Landmark.

Desk Top Study Report for land at
Ley Farm, Sycamore Drive, Chirk.

Appendix 4

Coal Mining Report

Coal Authority (CA)

Reference: 10319256-06

Dated: 8 August 2006

SEARCHFLOW,
NEPICAR HOUSE,
LONDON ROAD,
WROTHAM HEATH,
SEVENOAKS,
KENT,
TN15 7RS

This matter is being dealt with by Simon Leeming

Our Ref: 10319256-06

Your Ref: SF2960975000

Electronic Ref:

RRUID: 007.00013360040001

Date: 08 August 2006

Dear Sir,

Coal Mining Report

LEY FARM, GREEN LANE, HALTON, CHIRK, WREXHAM, CLWYD, LL14 5BG

I refer to the enquiry dated 08th August 2006, received 08th August 2006, in connection with the above.

This report is based on and limited to the records in the possession of The Coal Authority at the time the search is answered.

Ordnance Survey (O.S.) is undertaking a Positional Accuracy Improvement Programme of its mapping data. The Coal Authority (CA) has no control over the timing of issue of Positionally Improved mapping data by O.S. or over users of that data. In some instances the relative position between surface features and coal mining features may alter as a consequence of this programme. The CA will ensure that the integrity of its database is maintained by replotting some mining information to sustain the relationship between that mining information and the improved O.S. surface positions, some of which are now being released. However, mining reports are currently being produced against pre improved O.S. mapping whilst the Authority updates its database in line with the O.S. changes.

Past Underground Mining

The property is within the likely zone of influence on the surface from workings in 4 seams of coal at shallow to 130m depth, the last date of working being 1860.

Present Underground Mining

The property is not within the zone of likely physical influence on the surface from any present underground coal workings.

Future Underground Mining

The property is not within a geographical area for which a licence to extract coal by underground methods is awaiting determination by the Coal Authority.

The property is not within a geographical area for which a licence to extract coal by underground methods has been granted.

The property is not within the zone of likely physical influence at the surface from plans of future workings in our possession.

However reserves of coal exist in the locality which could be worked at some time in the future subject to feasibility, licences, and planning consents.

We have no record of any notice of the risk of the land being affected by subsidence being given under S.46 of the Coal Mining Subsidence Act 1991.

Shafts and Adits

Within or within 20 metres of the property there are 2 mine entries, the approximate positions of which are shown on the attached plan. Your attention is drawn to the statements made on that plan.

Our records disclose the following information:

329339-056. The stone lined shaft was filled to an unknown specification at an unknown date. .

329339-023. The shaft was filled to an unknown specification at an unknown date. Between 1976 and 1984 several occurrences of fill settlement required the shaft to be topped up. .

The records held by the Coal Authority may be incomplete. Consequently, there may exist in this locality mine entries of which we have no knowledge.

Surface Geology

Records in our possession do not disclose any fault or other line of weakness at the surface as having affected the stability of the property.

Past Opencast Mining

The property is located within the geographical boundary of an opencast site from which coal has been extracted by opencast methods.

Present Opencast Mining

The property does not lie within 200 metres of the geographical boundary of an opencast site within which coal is being extracted by opencast methods.

Future Opencast Mining

The property is not within 800 metres of the geographical boundary of an opencast site for which a licence to extract coal by opencast methods is awaiting determination.

The property is not within 800 metres of the geographical site boundary of an opencast site for which a licence to extract coal by opencast methods has been granted.

Subsidence

The records in our possession do not disclose any damage notice or claim having been given, made or pursued in respect of the property since 1 January 1984.

The records in our possession do not disclose any current "Stop Notice" affecting the property.

The records in our possession do not show any request having been made to execute preventative works under S.33 of the Coal Mining Subsidence Act 1991.

Withdrawal of Support

The property does not lie within a geographical area in respect of which a notice of entitlement to withdraw support has been published.

The property does not lie within a geographical area in respect of which a notice has been given under S.41 of the Coal Industry Act 1994, revoking the entitlement to withdraw support.

Working Facilities Orders

The property is not within a geographical area that is the subject of an Order made under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

Payments to Owners of Former Copyhold Land

The property is not within an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Additional Remarks

In view of the mining circumstances a prudent developer would seek appropriate technical advice before works are undertaken on site. All proposals should have regard to good engineering practice in mining areas as identified in authoritative publications on mining stability problems. In any event, no activities should be undertaken that intersect, disturb, or interfere with any coal or mines of coal without permission of the Coal Authority.

These replies are prepared in accordance with the 2003 editions of the Coal Authority's Terms and Conditions, User Guide and the Law Society's Guidance Notes.

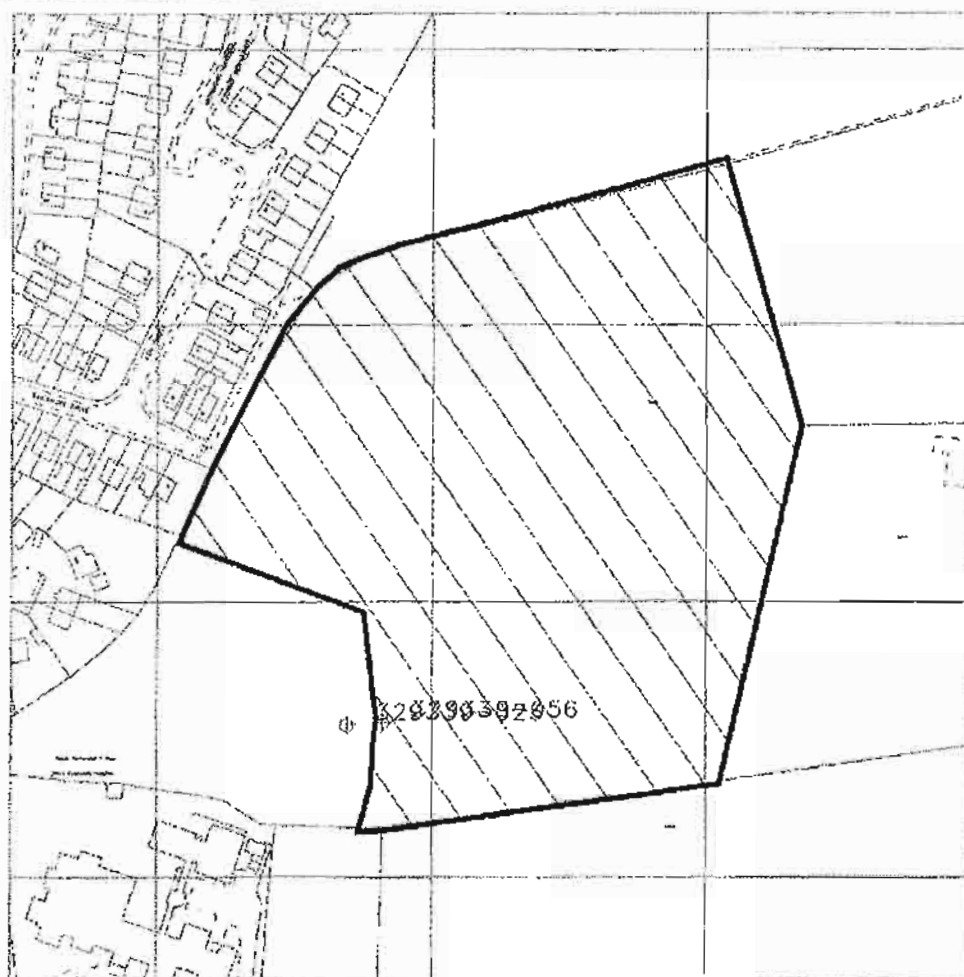
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Yours faithfully



Stephen Pennell

Director of Mining Information and Services



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PLAN NOT TO SCALE

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This is a plan of the boundaries of the property in respect of which this report has been prepared. It is the responsibility of the user to ensure that the boundaries shown correspond with those of the property.

APPROXIMATE POSITION OF ENQUIRY BOUNDARY SHOWN



APPROXIMATE POSITION OF DISUSED MINE SHAFTS SHOWN



This plan shows the approximate location of the disused mine entry/entries referred to in the attached mining report. For reasons of clarity, mine entry symbols may not be drawn to the same scale as the plan. Property owners have the benefit of statutory protection (under the Coal Mining Subsidence Act 1991). This contains provision for the making good, to the reasonable satisfaction of the owner, of physical damage from disused coal mine workings including disused coal mine entries. A DfI leaflet setting out the rights and the obligations of either the Coal Authority or other responsible persons under the 1991 Act can be obtained by telephoning 0845 762 6848. If you wish to discuss the relevance of any of the information contained in the attached report you should seek the advice of a qualified mining engineer or surveyor. If you or your adviser wish to examine the source plans from which the information has been taken these are available at our Mansfield office, free of charge, by prior appointment, telephone 01623 637235. Should you or your adviser wish to carry out any physical investigations that may enter, disturb or interfere with any disused mine entry the prior permission of the owner must be sought. For coal mine entries the owner will normally be the Coal Authority. The Coal Authority, regardless of responsibility and in conjunction with other public bodies, provide an emergency call out facility in coalfield areas to assess the public safety implications of mining features (including disused mine entries). Our emergency telephone number at all times is 01623 646333.

Desk Top Study Report for land at
Ley Farm, Sycamore Drive, Chirk.

Appendix 5

Summary of Exploratory Hole Findings and Anticipated Foundations

Cooper Associates

Table Reference: EHS4441

Table Dated: 14 August 2006



Trial Pit Logs

Ian Farmer Associates

Trial Pit No.'s: TP1 to TP36

Excavated: 10 to 13 May 2004

Project: Leg Fane, Sycamore Drive, Clark
 Prepared by: D P Cox
 Checked by: P R Sykes

Project No: 4441
 Date: 14 August 2006

SUMMARY OF EXPLORATORY HOLE FINDINGS & ANTICIPATED FOUNDATIONS

Trial pits excavated by Ian Farmer Associates between 10 and 13 May 2004 (TP1 to TP36)
 Cable percussion/rotary open hole boreholes drilled by B B Boring and Company Limited between 16 May and 4 June 2004 (BH1 to BH10)

EXP HOLE REF	DEPTH TO BEARING STRATA (mm)	FOUNDATION BEARING STRATA	DEPTH OF TOPSOIL (mm)	THICKNESS OF FILL (mm)	DEPTH TO FORMATION LEVEL (mm)	DEPTH TO ROCKHEAD (A ROCK TYPE) (mm)	TOP WATER LEVEL Max (mm)	ANTICIPATED FOUNDATION TYPE	SAFE BEARING PRESSURE kN/m ²	ANTICIPATED GROUND FLOOR SLAB CONSTRUCTION	PIPE STABILITY	ANTICIPATED ROAD SUB-GRADE
TP1	100	Firm CLAY	300	-	900	-	-	Ts	100	Groundbearing	Stable	Firm CLAY
TP2	1800	Firm CLAY	300(1)	1500	1800	-	-	TEDpRs	100	Suspended	Stable	Firm clay FILL
TP3	1300	Weak SANDSTONE	400	-	1300	1100 [SANDSTONE]	-	TEDpRs	250	Suspended	Stable	Soft CLAY
TP4	>3400	Not Encountered	300(1)	>3100	>3400	-	-	P	TBC	Suspended	Stable	Gravel FILL
TP5	1500	Loose to medium dense GRAVEL(2)	350	-	1500	-	1500(s)	TEDpRs	100	Suspended	Stable	Soft CLAY
TP6	300	Firm CLAY(3)	300	-	900	-	-	Ts	100	Groundbearing	Stable	Firm CLAY
TP7	>1400	Not Encountered	300(1)	>3100	>3400	-	-	P	TBC	Suspended	Stable	Soft clay FILL
TP8	1400	Firm to stiff CLAY	300(1)	800	1100	1800 [SILTSTONE]	-	Ts	125	Suspended	Stable	Stiff clay FILL
TP9	900	Loose to medium dense GRAVEL(2)	300	-	900	-	-	Rn	100	Suspended	Stable	Soft CLAY
TP10	900	Soft CLAY	300(1)	600(4)	900	-	-	Ts	150	Suspended	Stable	Sand & Gravel FILL
TP11	>2400	Not Encountered	300(1)	>2100	>2400	-	2100	P	TBC	Suspended	Spalling below 2100	Firm to stiff clay FILL
TP12	>3400	Not Encountered	400(1)	>3000	>3400	-	-	P	TBC	Suspended	Stable	Soft to firm clay FILL
TP13	300	Firm to stiff CLAY	300	-	900	1700 [SANDSTONE]	-	Ts	125	Groundbearing	Stable	Firm to stiff CLAY
TP14	800	Loose to medium dense GRAVEL(2)	300(1)	500(5)	800	-	1600(s)	Rn	100	Suspended	Unstable below 1200	Soft to firm clay FILL
TP15	300	Loose to medium dense SAND(2)	300	-	600	-	-	Rn	100	Groundbearing	Stable	SAND(2)
TP16	300	Firm CLAY	300	-	900	2800 [SANDSTONE]	-	Ts	100	Groundbearing	Stable	Firm CLAY
TP17	>1300	Not Encountered	300(1)	>3000	>3300	-	-	P	TBC	Suspended	Stable	Soft clay FILL
TP18	300	Loose to medium dense SAND(2)	300(1)	-	600	1500 [SANDSTONE]	-	Rn	100	Groundbearing	Stable	SAND(2)
TP19	300	Firm CLAY	300	-	900	-	-	Rn(6)	100	Groundbearing	Stable	Firm CLAY
TP20	1500	Soft CLAY	400(1)	1100	1500	-	1000(d)	TEDpRs	150	Suspended	Stable	Sand FILL
TP21	>1200	Not Encountered	300(1)	>2500	>3200	-	-	P	TBC	Suspended	Stable	Firm clay FILL
TP22	>1200	Not Encountered	400(1)	1700	>1200	-	-	P	TBC	Suspended	Stable	Firm clay FILL
TP23	1700	Loose to medium dense SAND & GRAVEL(7)	300(1)	1400(5)	1700	-	-	TEDpRs	100	Suspended	Stable	Firm clay FILL
TP24	2350	Firm to stiff CLAY	300(1)	2050	2350	-	-	TEDpRs	125	Suspended	Stable	Stiff clay FILL
TP25	>1100	Not Encountered	300(1)	>2800	>3100	-	-	P	TBC	Suspended	Stable	Firm to stiff clay FILL
TP26	1500	Moderately weak SILTSTONE	300(1)	1200	1500	1500 [SILTSTONE]	-	TEDpRs	250	Suspended	Stable	Stiff clay FILL
TP27	2200	Soft CLAY	300(1)	1900	2200	-	-	TEDpRs	150	Suspended	Stable	Firm clay FILL
TP28	2800	SANDSTONE	300(1)	2100	2800	2800 [SANDSTONE]	-	TEDpRs or P	250 or TBC	Suspended	Stable	Firm clay FILL
TP29	450	Firm CLAY	450	-	900	1400 [SANDSTONE]	-	Ts	100	Groundbearing	Stable	Firm CLAY
TP30	800	Loose to medium dense SAND & GRAVEL	250	-	800	-	-	Rn	100	Suspended	Stable	Soft to firm CLAY
TP31	2300	Moderately weak SANDSTONE(8)	250(1)	2050(9)	2300	2300 [SANDSTONE]	-	TEDpRs	250	Suspended	Stable	Firm clay FILL
TP32	300	Very weak SANDSTONE	300	-	600	500 [SANDSTONE]	-	Rn	250	Groundbearing	Stable	Very weak SANDSTONE
TP33	1150	Loose to medium dense SAND & GRAVEL	350	-	1150	2700 [SILTSTONE]	-	Rn	100	Suspended	Stable	Soft to firm CLAY
TP34	>3200	Not Encountered	300(1)	>2900	>3200	-	-	P	TBC	Suspended	Stable	Firm clay FILL
TP35	1700	Soft CLAY(7)	300(1)	1400	1700	-	-	TEDpRs	150	Suspended	Stable	Stiff clay FILL
TP36	1400	Soft CLAY	150(1)	1250	1400	2000 [SILTSTONE]	-	TEDpRs	150	Suspended	Stable	Soft clay FILL
BH1	0	Firm to stiff CLAY	-	-	900	20m [MUDSTONE]	-	Ts	125	Groundbearing	Cased	Firm to stiff CLAY
BH2	1400	Firm to stiff CLAY	200	-	1600	24m [SANDSTONE]	24.5m(s)	TEDpRs	125	Suspended	Cased	Soft to firm CLAY
BH3	2800	Very weak MUDSTONE	400(1)	2400	2800	2800 [MUDSTONE]	-	TEDpRs or P	250 or TBC	Suspended	Cased	Soft to firm clay FILL
BH4/4A	1400	Soft CLAY	-	1400	1400	0m [SANDSTONE]	18.1m(s)	TEDpRs	150	Suspended	Cased	Clay FILL
BH5	3500	Firm CLAY	300(1)	8200	3500	-	9.0m(s)	P	TBC	Suspended	Cased	Soft to firm clay FILL
BH6	2000	Very weak SILTSTONE	200(1)	900	2000	2000 [SILTSTONE]	-	TEDpRs	250	Suspended	Cased	Clay FILL
BH7	500	Very weak SILTSTONE	500	-	600	500 [SILTSTONE]	-	Rn	250	Groundbearing	Cased	Very weak SILTSTONE(10)
BH8	9000	Very weak MUDSTONE	300(1)	8900	9000	9m [MUDSTONE]	2.9m(s)	P	TBC	Suspended	Cased	Soft to firm clay FILL
BH9	300	CLAY(11)	300	-	900	2600 [SILTSTONE]	-	Ls	100	Groundbearing	Cased	CLAY(11)
BH10	9000	Very weak MUDSTONE	300(1)	8700	9000	9m [MUDSTONE]	-	P	TBC	Suspended	Cased	Soft to firm clay FILL

KEY:

- (1) made ground (similar to topsoil)
- (2) no relative density indicated, assume dense to medium dense
- (3) clay contains soft band, if present deepen footings to 1200mm
- (4) sand and gravel assumed to be fill
- (5) clay assumed to be fill
- (6) clay contains sand band and underlain by gravel
- (7) assumed to be natural, if fill, pile foundation to be adopted
- (8) rockhead possibly a boulder
- (9) gravel below 1800mm assumed to be fill
- (10) soil formation level > 850mm depth
- (11) clay assumed to be compacted
- (s) denotes sand drain (ds)
- (d) denotes deep drainage

ANTICIPATED FOUNDATIONS:

- Ts denotes traditional strip foundation
- TEDpRs denotes trenchless foundation
- DpRs denotes deep reinforced strip foundation
- P denotes piled foundation
- Rn denotes mechanically reinforced strip foundation

NOTES:

- (1) All depths are approximately measured from ground levels according to the terms of the site investigation
- (2) The above recommendations do not take into account any resulting of the site, contamination issues, mining issues, or the potential effects of the existing uses

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IAN FARMER ASSOCIATES					Site Lay Farm, Chrk		Trial Pit Number TP2		
Excavation Method JCB 3CX		Dimensions 2.10m x 0.60m x 3.40m		Ground Level (mOD)		Client		Job Number 4473	
		Location		Dates 11/05/2004		Engineer Capita Symonds		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20	D				(0.30)	Grass over brown clayey sandy TOPSOIL.			
0.80	J B				0.30	MADE GROUND: Firm locally soft brown grey mottled black sandy gravelly CLAY. Gravel is angular to subangular, fine to coarse including coal and sandstone and carbonaceous material. (Reworked)			
1.50	D				(1.50)				
2.30	B				1.80	Firm grey mottled brown sandy gravelly CLAY with cobbles of coal and gravel pockets. Gravel is angular to subangular, fine to coarse including coal.			
3.00	D				(1.60)				
					3.40	Complete at 3.40m			
Plan					Remarks Trial pit remained dry and stable.				
					Scale (approx) 1:25		Logged By IJ		Figure No. 4473.TP2

IAN FARMER ASSOCIATES					Site Lay Farm, Chlrk		Trial Pit Number TP3		
Excavation Method JCB 3CX		Dimensions 2.20m x 0.60m x 1.90m		Ground Level (mOD)		Client		Job Number 4473	
		Location		Dates 11/05/2004		Engineer Capita Symonds		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20	D				0.40	Grass over brown clayey sandy TOPSOIL with occasional angular to subangular fine to coarse gravel of sandstone.			
0.80	B				0.40	Soft brown very sandy CLAY with occasional angular to subangular, fine to coarse gravel of sandstone.			
1.50	D				0.90				
1.80	B				1.30	Weak to moderately weak brown fine to medium grained SANDSTONE with siltstone bands.			
					1.90	Complete at 1.90m			
Plan					Remarks Trial pit remained dry and stable.				
					Scale (approx) 1:25		Logged By IJ		Figure No. 4473.TP3

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 IAN FARMER ASSOCIATES						Site Lay Farm, Chirk		Trial Pit Number TP5	
Excavation Method JCB 3CX		Dimensions 2.20m x 0.70m x 3.00m		Ground Level (mOD)		Client		Job Number 4473	
		Location		Dates 11/05/2004		Engineer Capita Symonds		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20	J				(0.35)	Grass over brown clayey, sandy TOPSOIL.			
0.60	D				0.35	Soft brown sandy, gravelly CLAY. Gravel is angular to rounded, fine to coarse including sandstone and coal with sand and gravel bands.			
1.20	S				(1.15)				
1.90	D		Seepage(1) at 1.50m.		1.50	Brown very clayey, sandy angular to rounded, fine to coarse GRAVEL including sandstone with clay pockets.			
2.40	B				(0.80)				
3.00	D				2.30	Stiff brown sandy, gravelly CLAY. Gravel is angular to subangular, fine to coarse including sandstone and coal.			
3.00	B				(0.70)				
					3.00	Complete at 3.00m			
Plan						Remarks Water seepage at 1.50m. Trial pit remained stable.			
						Scale (approx) 1:25			
						Logged By IJ		Figure No. 4473.TP5	

 IAN FARMER ASSOCIATES						Site Lay Farm, Chlrik		Trial Pit Number TP6
Excavation Method JOB 3CX		Dimensions 2.00m x 0.70m x 3.20m		Ground Level (mOD)		Client		Job Number 4473
		Location		Dates 11/05/2004		Engineer Capita Symonds		Sheet 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	J				(0.30)	Grass over brown clayey sandy TOPSOIL.		
0.60	B				0.30 (0.90)	Firm locally soft light brown mottled grey sandy fissured CLAY with occasional angular to subangular, fine to coarse gravel of sandstone with sand bands.		
1.30	O				1.20	Stiff brown sandy, gravelly CLAY, locally with gravelly pockets. Gravel is angular to subangular, fine to coarse including coal, sandstone mudstone.		
2.10	B				(2.00)			
2.80	O				3.20	Complete at 3.20m		
Plan						Remarks Trial pit remained dry and stable.		
						Scale (approx) 1:25		
						Logged By IJ		Figure No. 4473.TP6

IAN FARMER ASSOCIATES						Site Lay Farm, Chirk		Trial Pit Number TP7			
Excavation Method JCB 3CX		Dimensions 2.20m x 0.70m x 3.40m		Ground Level (mOD)		Client		Job Number 4473			
		Location		Dates 12/05/2004		Engineer Capita Symonds		Sheet 1/1			
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water		
0.20	J				(0.30)	Grass over brown clayey, sandy TOPSOIL.					
					0.30 (0.55)	MADE GROUND: Soft dark brown mottled black sandy gravelly CLAY. Gravel is angular to subangular, fine to coarse including coal, siltstone, sandstone with sand and gravel bands.					
0.80	D				0.85	MADE GROUND: Firm gray mottled brown, black sandy gravelly CLAY. Gravel is angular to subangular, fine to coarse including coal and sandstone.					
1.20	B										
1.70	D										
2.40 2.40	J B				(2.55)	From 2.00m: organic odour present.					
					3.40	Complete at 3.40m					
Plan 						Remarks Trial pit remained dry and stable.					
						Scale (approx)		Logged By		Figure No.	
						1:25		IJ		4473 TP7	

Excavation Method
JCB 3CXDimensions
2.10m x 0.70m x 2.50m

Ground Level (mOD)

Client

Job
Number
4473

Location

Dates
12/05/2004Engineer
Capita SymondsSheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	D				(0.30)	Grass over brown clayey sandy TOPSOIL.		
0.80	B D				0.30 (0.80)	MADE GROUND: Stiff light brown mottled black sandy CLAY.		
1.40	B				1.10 (0.70)	Firm to stiff, light brown mottled blue grey sandy fissures, gravelly CLAY. Gravel is angular to subangular, fine to coarse occasionally tabular including sandstone and siltstone.		
2.00	D				1.80 (0.70)	Moderately weak, moderately weathered brown SILTSTONE with sandstone bands.		
2.40	B				2.50	Complete at 2.50m		

Plan

Remarks

Trial pit remained dry and stable.

Scale (approx)

1:25

Logged By

IJ

Figure No.

4473.TP8

Excavation Method
JCB 3CX

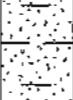
Dimensions
2.10m x 0.70m x 3.00m

Ground Level (mOD)
Client
**Job
Number**
4473

Location
Dates
11/05/2004

Engineer
Capita Symonds

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	D				(0.30)	Grass over brown clayey sandy TOPSOIL.		
0.70 0.70	D B				0.30 (0.60)	Soft brown sandy, gravelly CLAY. Gravel is subrounded to rounded, fine to coarse of various lithologies.		
1.20	B				0.90 (1.10)	Brown mottled grey clayey, sandy angular to rounded, fine to coarse GRAVEL including sandstone. Clay and sand bands.		
1.90	D				2.00	Red brown clayey, local very clayey SAND and angular to subangular fine to coarse GRAVEL including sandstone.		
2.50	B				(1.00)			
3.00	D				3.00	Complete at 3.00m		

Plan
Remarks

Trial pit remained dry and stable.

Scale (approx)

1:25

Logged By

LJ

Figure No.

4473, TP9

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 IAN FARMER ASSOCIATES						Site Lay Farm, Chirk		Trial Pit Number TP11	
Excavation Method JCB 3CX		Dimensions 0.80m x 2.40m		Ground Level (mOD)		Client		Job Number 4473	
		Location		Dates 11/05/2004		Engineer Capita Symonds		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.20	D				(0.30)	Grass over brown clayey, sandy TOPSOIL with occasional angular to subangular, fine to coarse gravel of siltstone.			
0.80	D				0.30	MADE GROUND: Firm to stiff brown mottled grey, black sandy, gravelly CLAY. Gravel is angular to subangular, fine to coarse with occasional tabular including coal pockets and sandstone. Cobbles of coal (Reworked)			
0.80	B					From 0.85m: cobbles and boulders			
1.30	D				(2.10)				
2.10	W		Very rapid(1) at 2.10m.						
2.10	B								
2.40					2.40	Complete at 2.40m			
Plan						Remarks Very rapid water flow at 2.10m. Water level remaining at 2.10m. Spalling below 2.10m due to water. Trail pit stopped at 2.40m.			
						Scale (approx) 1:25		Logged By U	
								Figure No. 4473.TP11	



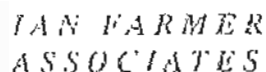
Excavation Method JCB 3CX	Dimensions 2.00m x 0.70m x 3.40m	Ground Level (mOD)	Client	Job Number 4473
	Location	Dates 11/05/2004	Engineer Capita Symonds	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	D				(0.40) 0.40	Grass over brown clayey, sandy TOPSOIL.		
0.80	J 8					MADE GROUND: Soft to firm brown mottled black grey light brown sandy, gravelly CLAY with regular coal bands / pockets. Gravel is angular to subangular, fine to coarse including sandstone, coal and carbonaceous material.		
1.40	D				(3.00)			
2.30	B							
2.70	D							
3.40	B				3.40	Between 0.40m and 3.40m: predominantly grey with cobble sized coal present with depth.		
						Complete at 3.40m		

Plan 	Remarks Trial pit remained dry and stable.		
	Scale (approx) 1:25	Logged By IJ	Figure No. 4473.TP12

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	J				(0.30)	Grass over brown clayey, sandy TOPSOIL.		
0.60	B				0.30 (1.40)	Firm to stiff light brown mottled grey sandy, gravelly CLAY. Gravel is angular to rounded, fine to coarse including coal and sandstone boulders.		
1.20	D							
1.40	J					At 1.40m, coal band.		
2.00	B				1.70 (0.70)	Moderately weak brown discoloured / weathered SANDSTONE with siltstone bands.		
2.40	D				2.40	Complete at 2.40m		

Plan	Remarks		
	Trial pit remained dry and stable.		
	Scale (approx)	Logged By	Figure No.
	1.25	IJ	4473.TP13



Site
Lay Farm, Chirk

Trial Pit
Number
TP14

Excavation Method
JCB 3CX

Dimensions
2.00m x 0.70m x 3.50m

Ground Level (mOD)

Client	
--------	--

Job
Number
4473

Location

Dates	10/05/2004
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Engineer
Capita Symonds

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	J				(0.30)	Grass over brown clayey, sandy, gravelly TOPSOIL. Gravel is angular to subangular, fine to medium, occasional coarse.		
0.70	D				0.30 (0.50)	Soft to firm brown sandy, gravelly CLAY. Gravel is angular to subangular, fine to coarse including coal and sandstone with sandy gravel bands. (Possible MADE GROUND)		
1.50	B		Seepage(1) at 1.60m.		0.80	Brown mottled light brown clayey, sandy subrounded to rounded, fine to coarse GRAVEL including sandstone, siltstone and occasional coal.		
2.10	D				(2.70)			
2.60	B							
3.10	D							
					3.50	Complete at 3.50m		

Plan

Remarks

Water seepage at 1.60m.
Trail pit collapsed at 1.20m.

Scale (approx)

1:25

Logged By

W

Figure No.

4473.TP14



IAN FARMER
ASSOCIATES

Site
Lay Farm, Chirk

Trial Pit
Number
TP15

Excavation Method
JCB 3CX

Dimensions
2.00m x 0.60m x 3.00m

Ground Level (mOD)

Client

Job
Number
4473

Location

Dates
10/05/2004

Engineer
Capita Symonds

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	J				(0.30)	Grass over brown clayey, sandy TOPSOIL		
0.70					0.30	Brown clayey gravelly fine to coarse SAND. Gravel is angular to subrounded, fine to coarse of various lithologies.		
0.70					(0.60)			
1.30	D				0.90	Firm locally stiff light brown mottled orange, sandy gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone. Cobbles present.		
1.90	B				(1.40)			
2.50	D				2.30	Stiff locally firm, brown sandy gravelly CLAY. Gravel is subangular to rounded, fine to coarse including sandstone and siltstone		
3.00	B				(0.70)	At 2.80m; locally moist. Cobbles present		
					3.00	Complete at 3.50m		

Plan

Remarks

Trial pit remains dry and stable..

Scale (approx)

1:25

Logged By

IJ

Figure No.

4473.TP15

 IAN FARMER ASSOCIATES						Site Lay Farm, Chirk		Trial Pit Number TP16	
Excavation Method JCB 3CX		Dimensions 2.10m x 0.60m x 3.20m		Ground Level (mOD)		Client		Job Number 4473	
		Location		Dates 12/05/2004				Engineer Capita Symonds	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20	J				(0.30)	Grass over brown clayey, sandy TOPSOIL with occasional angular to subangular, fine to coarse gravel or siltstone.			
					0.30	Firm light brown mottled grey sandy, slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse including sandstone.			
0.80	B				(0.90)				
					1.20	Stiff brown mottled blue grey sandy fissures, gravelly CLAY. Gravel is angular to rounded, fine to coarse including sandstone, siltstone, coal and cobbles.			
1.60 1.70	D S				(1.60)				
2.10	D								
2.50	D								
2.90	B				2.80	Moderately weak, brown moderately weathered fine to medium grained SANDSTONE with siltstone bands.			
3.10	D				(0.40)				
					3.20	Complete at 3.20m			
Plan						Remarks Trial pit remained dry and stable.			
						Scale (approx) 1:25	Logged By IJ	Figure No. 4473.TP16	



Excavation Method
JCB 3CX

Dimensions
2.10m x 0.70m x 3.30m

Ground Level (mOD)

Client

Job
Number
4473

Location

Dates
12/05/2004

Engineer
Capita Symonds

Sheet
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Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	D				(0.30)	Grass over brown clayey, sandy TOPSOIL with occasional angular to subangular, fine to coarse gravel of sandstone.		
0.60	B				0.30	MADE GROUND: Stiff brown mottled grey sandy, gravelly CLAY. Gravel is angular to subangular, fine to coarse including coal and sandstone.		
0.90	D				(1.10)			
1.70	B				1.40	MADE GROUND: Firm grey brown sandy, gravelly CLAY with gravel pockets. Gravel is angular to subangular, fine to coarse including coal, siltstone and carbonaceous material. Faint organic odour.		
2.40	D				(1.90)			
3.10	B				3.30	Complete at 3.30m		

Plan

Remarks

Trial pit remained dry and stable.

Scale (approx)

1:25

Logged By

IJ

Figure No.

4473.TP17



Excavation Method JCB 3CX	Dimensions 2.10m x 0.70m x 2.40m	Ground Level (mOD)	Client	Job Number 4473
	Location	Dates 12/05/2004	Engineer Capita Symonds	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend
0.20	D				(0.30)	Grass over brown clayey, sandy gravelly TOPSOIL. Gravel is angular to subangular, fine to coarse including siltstone and sandstone.	
					0.30	Brown very clayey, gravelly fine to coarse SAND with clay pockets. Gravel is angular to rounded, fine to coarse including sandstone.	
					(0.50)		
0.70	B				0.80	Stiff light brown sandy CLAY with silty sand bands.	
					(1.10)		
1.10	D					Moderately weak light brown weathered fine to coarse grained SANDSTONE with siltstone bands	
					1.50		
1.70	B				(0.50)	Complete at 2.40m	
2.00	D				2.40		
2.30	B						

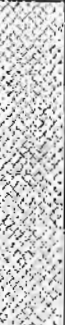
Plan	Remarks
	Trial pit remained dry and stable.
	Scale (approx) 1:25
	Logged By IJ
	Figure No. 4473.TP18



Excavation Method JCB 3CX	Dimensions 2.10m x 0.70m x 3.50m	Ground Level (mOD)	Client	Job Number 4473
	Location	Dates 10/05/2004	Engineer Capita Symonds	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend
0.20	D				(0.30)	Grass over brown clayey sandy TOPSOIL.	
					0.30 (0.45)	Firm light brown sandy CLAY with local sand bands and roots.	
0.70 0.70	D B				0.75 (0.85)	Brown clayey sandy angular to subrounded, fine to coarse GRAVEL including sandstone, siltstone and clay pockets.	
1.90 1.90	D B				1.60	Firm brown sandy, gravelly locally very gravelly CLAY. Gravel is subangular to rounded, fine to coarse including coal, mudstone and sandstone with cobbles and boulders present	
2.30	D				(1.90)		
2.70	B						
3.10	D				3.50	Complete at 3.50m	

Plan	Remarks											
	Trial pit remains dry and stable.											
	Scale (approx)				Logged By				Figure No.			
	1:25				IJ				4473.TP19			

 IAN FARMER ASSOCIATES					Site Lay Farm, Chirk		Trial Pit Number TP20		
Excavation Method JCB 3CX		Dimensions 2.00m x 0.70m x 3.00m		Ground Level (mOD)		Client		Job Number 4473	
		Location		Dates 10/05/2004		Engineer Capita Symonds		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20	D				(0.40)	Grass over brown clayey sandy TOPSOIL.			
					0.40	MADE GROUND: Brown clayey very gravelly fine to coarse SAND. Gravel is angular to rounded, fine to coarse including sandstone.			
0.80 0.80	D B				(1.10)				
1.70	B				1.50 (0.40)	Stiff red brown sandy, gravelly CLAY. Gravel is angular to subangular, fine to coarse including sandstone, occasional coal and carbonaceous mudstone.			
2.00	D				1.90	Firm light brown mottled grey sandy fissures CLAY with local silty sand lenses.			
2.50	B				(1.10)				
3.00	D				3.00	Complete at 3.00m			
Plan					Remarks Trial pit remains dry and stable. Land drain hit at 1.00m.				
					Scale (approx) 1:25		Logged By IJ		Figure No. 4473.TP20

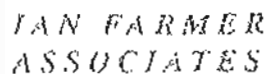


Excavation Method JCB 3CX		Dimensions 2.20m x 0.70m x 3.20m		Ground Level (mOD)		Client		Job Number 4473	
		Location		Dates 12/05/2004		Engineer Capita Symonds		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20	D				(0.40)	Grass over brown clayey, sandy TOPSOIL with occasional angular to subangular, fine to coarse gravel.			
0.70	J				0.40	MADE GROUND: Firm brown mottled black sandy, gravelly CLAY. Gravel is angular to subangular, fine to coarse including coal and sandstone. At 0.70m: coal bands.			
1.30	B				(1.70)				
2.00	D				2.10	Soft to firm light brown sandy, gravelly CLAY. Gravel is angular to subangular, occasionally tabular, fine to coarse including siltstone and sandstone.			
2.60	B				(1.10)				
					3.20	Complete at 3.20m			
Plan						Remarks Trial pit remained dry and stable.			
						Scale (approx) 1:25			
						Logged By U			
						Figure No. 4473.TP22			

Excavation Method JC8 3CX	Dimensions 2.10m x 0.60m x 3.30m	Ground Level (mOD)	Client	Job Number 4473
	Location	Dates 10/05/2004	Engineer Capita Symonds	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20 0.20	J D				(0.30)	Grass over dark brown clayey slightly sandy, gravelly TOPSOIL. Gravel is angular to subrounded, fine to medium including siltstone.		
0.70 0	O B				0.30	Firm brown mottled orange, light brown sandy, gravelly CLAY. Gravel is angular to subangular, fine to coarse occasional tabular including sandstone, siltstone, occasional coal and sand bands. (Possible MADE GROUND)		
1.30	O				(1.40)			
2.30	B				1.70	Brown clayey SAND and angular to subrounded, fine to coarse GRAVEL including sandstone and carbonaceous material. (Possible MADE GROUND)		
					(1.60)	At 2.60m: band of firm sandy gravelly clay.		
					3.30	Complete at 3.30m		

Plan	Remarks Trial pit remains dry and stable.
	Scale (approx) 1:25
	Logged By IJ
	Figure No. 4473.TP23



Site
Lay Farm, Chirk

Trial Pit
Number
TP24

Excavation Method
JCB 3CX

Dimensions
2.10m x 0.70m x 3.10m

Ground Level (mOD)

Client

Job
Number
4473

Location

Dates
10/05/2004

Engineer

Capita Symonds

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend
0.20	D				(0.30)	Grass over brown clayey sandy TOPSOIL.	[Pattern]
0.80 0.80	J D				0.30 (2.05)	MADE GROUND: Stiff brown mottled black grey sandy, gravelly CLAY. Gravel is angular to subangular, fine to coarse including coal, mudstone and pockets of coal.	[Pattern]
1.70	B						[Pattern]
2.30	D				2.35	Firm to stiff brown mottled grey and black, sandy fissures, gravelly CLAY. Gravel is angular to subangular, fine to coarse including mudstone and coal pockets.	[Pattern]
2.90 2.90	B D				(0.75)		[Pattern]
					3.10	Complete at 3.10m	

Plan

Remarks

Trial pit remains dry and stable.

Scale (approx)

1:25

Logged By

U

Figure No.

4473.TP24

Excavation Method JCB 3CX		Dimensions 2.30m x 0.70m x 3.10m		Ground Level (mOD)		Client		Job Number 4473	
		Location		Dates 12/05/2004		Engineer Capita Symonds		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.20	J				(0.30)	Grass over brown clayey, sandy TOPSOIL.			
0.50	B				0.30	MADE GROUND: Firm to stiff brown mottled grey black, sandy gravelly CLAY. Gravel is angular to subangular, fine to coarse including coal and siltstone with pockets of coal.			
1.00	D								
1.70	B				(2.80)				
2.20	D								
3.00	B				3.10				
						Complete at 3.10m			
Plan						Remarks			
						Trial pit remained dry and stable.			
						Scale (approx)		Logged By	
						1:25		IJ	
								Figure No.	
								4473.TP25	

Excavation Method JCB 3CX		Dimensions 2.00m x 0.70m x 2.40m		Ground Level (mOD)		Client		Job Number 4473	
		Location		Dates 12/05/2004		Engineer Capita Symonds		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.20	D				(0.30)	Grass over brown clayey, sandy TOPSOIL with occasional angular to subangular, fine to coarse gravel.			
0.50	B				0.30	MADE GROUND: Stiff brown mottled grey black sandy gravelly CLAY. Gravel is angular to subangular, fine to coarse including coal, siltstone and sandstone with coal pockets.			
1.10	D				(1.20)				
1.70	B				1.50	Moderately weak brown moderately weathered SILTSTONE with sandstone bands.			
2.00	D				(0.90)				
					2.40	Complete at 2.40m			
Plan						Remarks			
						Trial pit remained dry and stable.			
						Scale (approx)		Logged By	
						1:25		IJ	
								Figure No.	
								4473 TP26	

IAN FARMER ASSOCIATES					Site Lay Farm, Chirk		Trial Pit Number TP27		
Excavation Method JCB 3CX		Dimensions 2.10m x 0.70m x 3.10m		Ground Level (mOD)		Client		Job Number 4473	
		Location		Dates 10/05/2004		Engineer Capita Symonds		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20	D				0.30	Grass over brown clayey sandy gravelly TOPSOIL. Gravel is subangular to rounded, fine to coarse of various lithologies.			
0.70	J				0.30	MADE GROUND. Firm locally stiff brown grey black sandy, gravelly CLAY. Gravel is angular to subangular, fine to coarse, occasional tabular including coal, mudstone and sandstone. (Reworked coal)			
1.30	B				(1.90)				
1.90	D								
2.30	B				2.20	Stiff grey slightly sandy, gravelly CLAY. Gravel is angular to subangular, fine to coarse including mudstone and coal pockets.			
2.60	J				(0.90)				
3.00	B								
3.00	D				3.10	Complete at 3.10m			
Plan						Remarks Trial pit remains dry and stable.			
						Scale (approx) 1:25			
						Logged By IJ		Figure No. 4473.TP27	

Excavation Method JCB 3CX		Dimensions 2.10m x 0.70m x 3.10m		Ground Level (mOD)		Client		Job Number 4473	
		Location		Dates 13/05/2004		Engineer Capita Symonds		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.20	D				0.30	Grass over brown clayey, sandy TOPSOIL.			
0.60	J				0.30	MADE GROUND: Firm brown mottled blue grey sandy, fissured, gravelly CLAY with frequent pockets of black angular to subangular, fine to coarse gravel of coal			
1.20 1.20	D B				(2.30)				
2.00 2.00	J B								
2.70	D				2.60 (0.20)	Soft light brown sandy, gravelly CLAY. Gravel is angular to subangular, fine to coarse including sandstone.			
3.00	B				2.80 (0.30)	Light brown moderately weathered fine to medium grained SANDSTONE.			
					3.10	Complete at 3.10m			
Plan						Remarks			
						Trial pit remained dry and stable.			
						Scale (approx)		Logged By	
						1:25		UJ	
								Figure No.	
								4473.TP28	



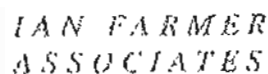
Excavation Method JCB 3CX	Dimensions 2.10m x 0.70m x 2.40m	Ground Level (mOD)	Client	Job Number 4473
	Location	Dates 13/05/2004	Engineer Capita Symonds	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	D				(0.45)	Grass over brown clayey, sandy gravelly TOPSOIL. Gravel is angular to subangular, fine to coarse including sandstone.		
					0.45	Firm light brown sandy, gravelly, CLAY. Gravel is angular to subangular, fine to coarse including siltstone and sandstone.		
1.00 1.00	B D				(0.95)			
1.50	C				1.40	Very weak light brown fine to medium grained SANDSTONE with siltstone bands recovered as sandy gravel sized fragments.		
					(1.00)			
2.30	B				2.40	Complete at 2.40m		

Plan	Remarks Trial pit remained dry and stable.		
	Scale (approx) 1:25	Logged By IJ	Figure No. 4473.TP29

IAN FARMER ASSOCIATES						Site Lay Farm, Chirk		Job Number TP30	
Excavation Method JCB 3CX		Dimensions 2.10m x 0.70m x 3.00m		Ground Level (mOD)		Client		Job Number 4473	
		Location		Dates 10/05/2004		Engineer Capita Symonds		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20	D				(0.25)	Grass over brown clayey, sandy TOPSOIL.			
0.70	D				0.25	Soft to firm light brown sandy, gravelly CLAY. Gravel is angular to subangular, fine to coarse including sandstone.			
0.70	B				(0.55)				
1.40	B				0.80	Brown locally clayey SAND and subangular to rounded, fine to coarse GRAVEL including sandstone.			
1.60	D				(0.70)				
1.90	B				1.50	Firm becoming stiff brown mottled orange brown sandy, gravelly CLAY. Gravelly angular to rounded fine to coarse including sandstone and carbonaceous material.			
2.50	D				(1.50)				
					3.00	Complete at 3.00m			
Plan 						Remarks Trial pit remains dry and stable.			
						Scale (approx) 1:25		Logged By IJ	

IAN FARMER ASSOCIATES						Site Lay Farm, Chirk		Trial Pit Number TP31	
Excavation Method JCB 3CX		Dimensions 2.10m x 0.70m x 2.50m		Ground Level (mOD)		Client		Job Number 4473	
		Location		Dates 13/05/2004		Engineer Capita Symonds		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.20	D				(0.25)	Grass over brown clayey, sandy gravelly TOPSOIL. Gravel is angular to subangular, fine to coarse of various lithologies.			
0.60	B				0.25	MADE GROUND: Firm brown mottled light grey brown sandy, gravelly CLAY. Gravel is angular to subangular, fine to coarse including sandstone, mudstone, siltstone and coal with gravel bands and boulders.			
1.30	D				(1.55)				
1.30	B								
2.00	D				1.80	Grey brown very clayey, sandy, angular to subangular, fine to coarse GRAVEL of mudstone and sandstone. (Possible made ground)			
					(0.50)				
2.40	B				2.30	Moderately weak grey brown slightly clayey matrix, sandy, moderately weathered fine to medium grained SANDSTONE / SILTSTONE. (Possible boulder)			
					(0.20)				
					2.50	Complete at 2.50m			
Plan 						Remarks Trial pit remained dry and stable.			
						Scale (approx) 1:25		Logged By IJ	



Site	Lay Farm, Chirk
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Trial Pit
Number
TP32

Excavation Method
JCB 3CX

Dimensions
2.10m x 0.70m x 1.30m

Ground Level (mOD)

Client	
--------	--

Job
Number
4473

Location

Dates	13/05/2004
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Engineer
Capita Symonds

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Depth
(m)

Sample / Tests

Water
Depth
(m)

Field Records

Level
(mOD) Depth (m) (Thickness) |

Description

Legend

Water

0.20

4

{0.30}

Grass over brown clayey, sandy TOPSOIL

0.30

Very weak becoming weak, light brown fine to coarse grained SANDSTONE recovered as very sandy gravel sized fragments.

(1.00)

1.20

D.

1.30

Complete at 1.30m

Plan

Remarks

Trial pit remained dry and stable.

Scale (approx)

1:25

Logged By

U

Figure No.

4473.TP32



Excavation Method JCB 3CX	Dimensions 2.10m x 0.60m x 3.10m	Ground Level (mOD)	Client	Job Number 4473
	Location	Dates 10/05/2004	Engineer Capita Symonds	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	J				(0.35)	Grass over brown clayey, sandy TOPSOIL		
0.70	D B				0.35 (0.80)	Soft to firm light brown sandy, gravelly CLAY. Gravel is subangular to rounded, fine to coarse of various lithologies		
1.20	D				1.15 (1.05)	Light brown SAND and angular to subangular, fine to coarse GRAVEL including sandstone and carbonaceous material.		
1.90	B				2.20	Light brown clayey gravelly fine to coarse SAND. Gravel is angular to rounded, fine to coarse of various lithologies.		
2.40	D				(0.50)			
2.90	B				2.70 (0.40)	Very weak brown moderately weathered discoloured SILTSTONE recovered as sandy, angular to subangular, fine to coarse gravel. (Possible reworked, no evidence of structure in pit)		
					3.10	Complete at 3.10m		

Plan	Remarks Trial pit remains dry and stable.
	Scale (approx) 1:25

Logged By

Figure No.

1:25

U

4473.TP33

IAN FARMER ASSOCIATES					Site Lay Farm, Chirk		Trial Pit Number TP34			
Excavation Method JCB 3CX		Dimensions 2.40m x 0.70m x 3.20m		Ground Level (mOD)		Client		Job Number 4473		
		Location		Dates 12/05/2004		Engineer Capita Symonds		Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water	
0.20	D				(0.30)	Grass over brown clayey, sandy TOPSOIL with occasional subangular to rounded, fine to medium gravel.				
1.0	B				0.30	MADE GROUND: firm grey black sandy, gravelly CLAY. Gravel is angular to subangular, fine to coarse, tabular including coal, sandstone, siltstone. Cobbles and boulders present.				
1.30	D				(1.90)					
2.00	B				2.20	MADE GROUND: Very weak grey very clayey matrix, highly weathered discoloured brown MUDSTONE with occasional coal seams / bands, recovered as clayey gravel and cobbles sized fragments.				
2.50	D				(1.00)					
3.00	B				3.20					
3.20	D					Complete at 3.20m				
Plan					Remarks Trial pit remained dry and stable.					
					Scale (approx)		Logged By		Figure No.	
					1:25		IJ		4473.TP34	

Excavation Method
JCB 3CXDimensions
2.10m x 0.70m x 2.40m

Ground Level (mOD)

Client

Job
Number
4473

Location

Dates
13/05/2004Engineer
Capita SymondsSheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	J				(0.30)	Grass over brown clayey, sandy TOPSOIL.		
0.60	B				0.30	MADE GROUND Stiff brown mottled grey light brown sandy, gravelly CLAY. Gravel is of various lithologies.		
1.10	D				(1.40)			
1.50	B				1.70	Stiff grey sandy, gravelly locally very gravelly CLAY. Gravel is angular to subangular, fine to coarse occasionally tabular, including mudstone and coal. (Possible top of very weak rockhead) (Possible made ground)		
1.90	D				(0.70)			
2.40	B				2.40	Complete at 2.40m		

Plan

Remarks

Trial pit remained dry and stable.
Trial pit terminated at 2.40m - JCB unable to progress further.

Scale (approx)

1:25

Logged By

IJ

Figure No.

4473.TP35



IAN FARMER
ASSOCIATES

Site
Lay Farm, Chirk

Trial Pit
Number
TP36

Excavation Method
JCB 3CX

Dimensions
2.10m x 0.70m x 2.40m

Ground Level (mOD)

Client

Job
Number
4473

Location

Dates
13/05/2004

Engineer
Capita Symonds

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D				(0.15) 0.15	Grass over brown clayey, sandy TOPSOIL with roots.		
0.50	J				(1.25)	MADE GROUND. Stiff brown mottled black sandy, gravelly CLAY. Gravel is angular to subangular, fine to coarse including coal and coal bands.		
1.10	B				1.40	Stiff light brown mottled light grey sandy, gravelly CLAY. Gravel is angular to subangular, fine to coarse including siltstone with sand lenses.		
1.50	D				(0.60)			
1.90	B				2.00	Very weak light brown mottled light grey SILTSTONE / SANDSTONE recovered as very sandy gravel sized fragments.		
2.30	B				(0.40) 2.40	Complete at 2.40m		

Plan

Remarks

Trial pit remained dry and stable.

Scale (approx)

1:25

Logged By

IJ

Figure No.

4473.TP36

Desk Top Study Report for land at
Ley Farm, Sycamore Drive, Chirk.

Appendix 6

Cable Percussive and Rotary Open Hole Borehole Logs

H B Boring and Company Limited

Borehole No.'s: BH1 to BH10 and BH4A

Drilled: 16 May to 4 June 2004

(Rotary open hole follow on in boreholes BH1 to BH3, BH4A and BH6 to BH10)

(Gas standpipes installed in boreholes BH1, BH3, BH5, BH9 and BH10)

(includes Standard Penetration Test Results)

H.B. BORING & COMPANY LTD. SITE INVESTIGATION SPECIALISTS							Site Ley Farm, Chirk		Borehole Number 1	
Boring Method Shell and Auger Rotary Open Hole		Diameter 150mm Cased to 20.20m 125mm Cased to 21.00m		Ground Level (mOD)		Client		Job Number MCS4834		
Location 5 N		Dates 25/05/04 - 04/06/04		Engineer Roscoe Capita Environmental		Sheet 1/4				
Depth m	Samples /Tests	Casing Depth m	Water Depth m	Field Records	Level (mOD)	Depth m (Thickness)	Description	Legend	Water	Inst.
0.00-0.50	D						Firm to firm/stiff brown silty sandy gravelly CLAY with occasional cobbles			
1.00-1.45 1.00-1.45	SPT N=13 D			3,3/3,3,3,4						
2.00-2.45 2.00-2.45	SPT N=11 D			2,2/1,2,4,4		(4.60)				
3.00-3.45 3.00-3.45	SPT N=14 D			2,3/3,3,4,4						
4.00-4.45 4.00-4.45	SPT N=16 D			3,3/4,3,4,5						
5.00-5.45 5.00-5.45	SPT N=38 D			2,5/5,16,5,12		4.60	Stiff becoming very stiff brown silty sandy gravelly CLAY with occasional cobbles			
6.50-6.95 6.50-6.95	SPT N=30 D			4,8/5,6,9,10						
8.00-8.45 8.00-8.45	SPT N=44 D			8,8/9,10,12,12		(5.80)				
9.50-9.95 9.50-9.95	SPT N=116 D			11,15/17,25,30,44						
Remarks Service pit to 1.20m Shell and auger to 31.20m, Rotary Open Hole to base. * - denotes drillers descriptions of strata encountered. Chiselling from 3.60m to 3.80m for 0.50 hours. Chiselling from 5.90m to 6.20m for 0.75 hours.								Scale (approx) 1:50	Logged By Eng	Figure No. MCS4834.1

H.B. BORING & COMPANY LTD.

SITE INVESTIGATION SPECIALISTS

Site Lay Farm, Chizk	Borehole Number 1
Client	Job Number MCS4834
Engineer Roscoe Capita Environmental	Sheet 2/4

Coring Method Shell and Auger Rotary Open Hole	Diameter 150mm Cased to 20.20m 125mm Cased to 21.00m	Ground Level (mOD)
Location E N	Dates 25/05/04 - 04/06/04	

Depth m	Samples / Tests	Casing Depth m	Water Depth m	Field Records	Level (mOD)	Depth m (Thickness)	Description	Legend	Water	Inst.
11.00-11.20 11.00-11.45	CPT 50*/50 D			11, 18/50		10.40	Very dense brown coarse SAND and fine to coarse sub-rounded GRAVEL with occasional bands of firm brown silty sandy clay and/or claybound in parts			
12.50-12.95	CPT 50*/60 D 0*/0			50/						
14.00-14.45	CPT 78*/130 D 0*/0			28, 50/						
15.50-15.79 15.40-15.95	CPT 60*/140 D			14, 26/30, 50		(9.60)				
17.00-17.45	CPT N=43 D			10, 8/7, 9, 11, 16						
18.50-18.95	CPT N=16 D			2, 3/3, 4, 5, 4						
20.00-20.45	CPT N=61			4, 6/9, 14, 17, 21		20.00				

Remarks
Chiselling from 10.10m to 10.40m for 0.75 hours. Chiselling from 13.00m to 13.20m for 0.33 hours. Chiselling from 14.50m to 14.80m for 0.75 hours. Chiselling from 16.20m to 16.50m for 0.75 hours. Chiselling from 17.70m to 18.00m for 0.50 hours.

See key sheet for symbols and abbreviations

Scale
(approx)
1:50
Logged
By
Sng
Figure No.
MCS4834.1

H.B. BORING & COMPANY LTD. SITE INVESTIGATION SPECIALISTS						Site Ley Farm, Chirk		Borehole Number 1		
Boring Method Shell and Auger Rotary Open Hole		Diameter 150mm Cased to 20.20m 125mm Cased to 21.00m		Ground Level (mOD)		Client		Job Number MCS4834		
Location 8 N		Dates 25/05/04 - 04/06/04		Engineer Roscoe Capita Environmental		Sheet 3/4				
Depth m	Samples / Tests	Casing Depth m	Water Depth m	Field Records	Level (mOD)	Depth m (Thickness)	Description	Legend	Water	Inst.
20.00-20.45	D					(1.20)	Very weak grey MUDDSTONE and SILTSTONE			
21.00 21.00-21.45	SPT 75+/120 D 0*/0			25,50/		21.20	Moderately strong light brown and grey sandy SILTSTONE *			
						(7.20)				
						28.40	COAL, solid (thin shale parting) *			
						(1.90)				
Remarks Chiselling from 21.00m to 21.20m for 1.00 hour.								Scale (approx) 1:50		Logged By Bng
See key sheet for symbols and abbreviations								Figure No. MCS4834.1		

H.B. BORING & COMPANY LTD.

SITE INVESTIGATION SPECIALISTS

Site
Ley Farm, Chirk

Borehole
Number
1

Boring Method
Shell and Auger
Rotary Open Hole

Diameter
150mm Cased to 20.20m
125mm Cased to 21.00m

Ground Level (mOD)

Client

Job
Number
MCS4834

Location
E N

Dates
25/05/04 -
04/06/04

Engineer
Roscoe Capita Environmental

Sheet
4/4

Depth m	Samples / Tests	Casing Depth m	Water Depth m	Field Records	Level (mOD)	Depth m (Thickness)	Description	Legend	Water	Inst.
						30.30	Moderately weak dark grey SEAT EARTH			
						(0.60)				
						30.90	Moderately strong light brown and grey SANDSTONE *			
						(5.10)				
						36.00	Borehole completed at 36.00m			

Remarks

Scale
(approx)
1:50

Logged
By
Eng

Figure No.

MCS4834.1

See key sheet for symbols and abbreviations

SITE INVESTIGATION SPECIALISTS

Borehole Number	1
-----------------	---

Internal Diameter of Tube (A) = 50 mm
Diameter of Filter Zone = 150 mm

Client	
Engineer	Roscoe Capita Environmental

Job Number MC34834	
--------------------------	--

Location	
E	N

Ground Level (mOD)

Engineer
Roscoe Capita Environmental

Sheet
1/1

[illegible]

Remarks

H.B. BORING & COMPANY LTD. SITE INVESTIGATION SPECIALISTS						Site Ley Farm, Chirk		Borehole Number 2	
Boring Method Shell and Auger Rotary Open Hole		Diameter 125mm Cased to 7.50m 150mm Cased to 7.80m		Ground Level (mOD)		Client		Job Number MCS4834	
Location E N		Dates 27/05/04 - 25/05/04		Engineer Roscoe Capita Environmental		Sheet 1/3			
Depth m	Samples / Tests	Casing Depth m	Water Depth m	Field Records	Level (mOD)	Depth m (Thickness)	Description	Legend	Water inst.
0.30-1.00	B					(0.20) 0.20	TOPSOIL soft/firm to firm yellow/brown silty sandy gravelly CLAY		
1.00-1.45 1.00-1.50 1.00-1.45	SPT N=12 B D			1, 1/2, 3, 3, 4		(1.40)			
1.70-2.15 1.70-2.20 70	CPT N=14 E D			2, 2/3, 3, 4, 4		1.60	Firm to firm/stiff brown silty slightly sandy gravelly CLAY with occasional cobbles		
2.50	D								
3.00-3.45 3.00-3.50	CPT N=18 B			2, 2/4, 4, 4, 6					
4.20-4.70	B					(5.00)			
4.70-5.15	CPT N=32			3, 6/6, 7, 7, 12					
5.60-6.05 5.60-6.10	CPT N=46 B			4, 7/8, 12, 13, 13					
6.60	CPT 50*/50 0*/0			50/		6.60	OBSTRUCTION - large cobble		
7.50-7.70	CPT 50*/50			18, 20/50		(0.80) 7.40 (0.40) 7.80	Hard grey/brown SANDSTONE *		
							Moderately strong light brown sandy SILTSTONE with some light grey bands *		

Remarks
Service pit to 1.20m.
Shell and Auger to 7.80m, Rotary Open Hole to base.
* - denotes drillers descriptions of strata encountered.
Borehole grouted from 26.00 - 5.00m.
Chiselling from 2.70m to 3.00m for 0.50 hours. Chiselling from 4.00m to 4.20m for 0.50 hours. Chiselling from 6.90m to 7.40m for 1.00 hour. Chiselling from 7.50m to 7.80m for 0.50 hours.
See key sheet for symbols and abbreviations

Scale (approx)
1:50
Figure No.
MCS4834.2

Logged
By
Eng

Site Ley Farm, Chirk	Borshole Number 2
Client	Job Number HCS4834
Engineer Roscoe Capita Environmental	Sheet 2/3

[illegible]

Remarks

Scale (approx)	Logged 8y
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1:50	Eng
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Figure No.

See key sheet for symbols and abbreviations

MCS4B34.2

Site Ley Farm, Chirk	Borehole Number 2
Client:	Job Number MCS4874
Engineer Roscoe Capita Environmental	Sheet 3/3

Remarks	Scale (approx)	Logged by
	1:50	Eng
	Figure No. MCS4834.2	

H.B. BORING & COMPANY LTD. SITE INVESTIGATION SPECIALISTS							Site Ley Farm, Chirk		Borehole Number 3	
Boring Method Shell and Auger Rotary Open Hole		Diameter 125mm Cased to 6.50m 150mm Cased to 6.50m		Ground Level (mOD)		Client		Job Number MCS4834		
Location B N		Dates 20/05/04 - 21/05/04		Engineer Roscoe Capita Environmental		Sheet 1/3				
Depth m	Samples / Tests	Casing Depth m	Water Depth m	Field Records	Level (mOD)	Depth m (Thickness)	Description	Legend	Water	Inst.
0.40-1.20	B					(0.40)	TOPSOIL			
1.20-1.65	SPT N=7			1, 1/1, 2, 2, 2		0.40	MADE GROUND : soft/firm to firm grey/ brown clayey mudstone and black shaley mudstone fill			
1.20-1.70	B									
1.20-1.65	D					(2.40)				
2.20-2.65	SPT N=15			2, 3/3, 4, 4, 4						
2.20-2.65	D									
3.00-3.45	CPT N=42			4, 8/8, 10, 10, 14		2.80	Very weak grey/black laminated SHALE and MUDSTONE			
3.00-2.50	B									
4.00-4.45	CPT N=62			3, 7/10, 14, 18, 20						
4.00-4.50	B					(2.80)				
4.70	D									
5.10-5.55	CPT N=45			3, 4/7, 7, 11, 20						
5.20	D									
5.60-6.10	SPT 93/350			2, 4/10, 10, 23, 50		5.60	Very weak completely broken black COAL			
5.60-6.10	B					(0.50)				
5.60-6.05	D					6.10	Very weak grey MUDSTONE			
6.30	D					(0.40)				
						6.50	Weak light grey SHALE *			
						(0.70)				
						7.20	Moderately strong light grey and brown silty SANDSTONE *			
						(3.60)				

Remarks
Service pit to 1.20m
Shell and Auger to 6.50m, Rotary Open Hole to base.
* - denotes drillers descriptions of strata encountered.
Chiselling from 6.30m to 6.50m for 1.00 hour.

Scale (approx)
1:50

Logged By
ENG

Figure No.
MCS4834.3

Sec key sheet for symbols and abbreviations

Site Ley Farm, Chirk		Borehole Number 3	
Client		Job Number MCS4834	
Engineer Roscoe Capita Environmental		Sheet 2/3	
Description	Legend	Water	Inst.
Strong light grey SANDSTONE *			
Moderately strong light grey and brown sandy SILTSTONE *			
	Scale (approx) 1:50	Logged By Eng	
	Figure No. MCS4834.3		

Site	Batch/lot Number
Ley Farm, Chirk	3

Boring Method	Diameter	Ground Level (mGD)	Client	Job Number
Shell and Auger Rotary Open Hole	125mm Cased to 6.50m 150mm Cased to 6.50m			MCS4834
	Location	Dates	Engineer	Sheet
	E N	20/05/04 - 21/05/04	Roscoe Capita Environmental	3/3

Depth m	Samples /Tests	Casing Depth m	Water Depth m	Field Records	Level (mOD)	Depth m (Thickness)	Description	Legend	Water	Inst.
						(17.90)				
						30.00				

Remarks	Scale (approx)	1:50
	Logged By	Eng
	Figure No.	MCS4834.3
See key sheet for symbols and abbreviations		

Site	Borehole Number
Ley Farm, Chirk	3

Internal Diameter of Tube [A] = 50 mm
Diameter of Filter Zone = 150 mm

Client	
Engineer	Roscoe Capita Environmental

Job Number	MCS4834
Sheet	1/1

Legend	Water	Inst. [A]	Level (mOD)	Depth (m)	Description	Groundwater Strikes during Drilling																						
						Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings				Depth Sealed (m)													
5 min	10 min	15 min	20 min																									
		Inst. [A]	Level (mOD)	0.20	Concrete	Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	5 min	10 min	15 min	20 min	Depth Sealed (m)													
				1.00	Bentonite Seal																							
					Gravel Filter																							
				5.00	Bentonite Seal																							
				6.00																								
				Groundwater Observations During Drilling																								
				Date	Start of Shift											End of Shift												
					Time											Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)				
				Instrument Groundwater Observations																								
				Inst. (A) Type : Monitoring well																								
				Date	Instrument (A)											Remarks												
					Time												Depth (m)	Level (mOD)										
				21/05/04														Installed										

Remarks

H.B. BORING & COMPANY LTD.

SITE INVESTIGATION SPECIALISTS

Site
Ley Farm, Chirk

Borehole
Number
4

Boring Method
Cable Percussion

Diameter
150mm Cased to 16.00m

Ground Level (mOD)

Client

Job
Number
MCS4824

Location
E N

Dates
18/05/04 -
19/05/04

Engineer
Roscoe Capita Snvironmental

Sheet
1/2

Depth m	Samples / Tests	Casing Depth m	Water Depth m	Field Records	Level (mOD)	Depth m (Thickness)	Description	Logcode	Water	Inst.
0.30-0.80	B					(0.30) 0.30	MADE GROUND : stone fill (Drillers description)			
						(0.50)	MADE GROUND : brown clay and stone fill (Drillers description)			
0.80-1.25	SPT N=22			3,4/5,5,6,6		0.80	MADE GROUND : stiff brown/grey silty clay fill			
0.80-1.25	B					(0.30)				
0.80-1.30	D					1.10	MADE GROUND : very weak grey mudstone fill			
						(0.30)				
						1.40	Stiff brown silty sandy gravelly CLAY with cobbles			
1.90-2.35	SPT N=22			3,3/4,5,6,7						
1.90-2.25	D									
2.90-3.35	CPT N=43			4,6/7,9,12,15		(3.20)				
2.90	D									
4.00-4.45	CPT N=31			3,6/6,7,7,11						
4.00	D									
4.70-5.15	CPT N=45			6,8/10,10,12,13		4.60	Dense brown slightly clayey coarse SAND and fine to coarse sub-rounded GRAVEL with cobbles			
4.70	D					(0.40) 5.00	Very stiff brown silty sandy CLAY with occasional fine sub-rounded gravel			
6.00-6.45	CPT N=49			4,9/10,12,13,14						
6.00	D					(3.70)				
7.50-7.95	CPT N=28			3,4/5,5,7,11						
7.50	D									
8.50	CPT 0*/0			26,50/						
8.50	D					8.70				
9.00-9.45	SPT N=23			1,2/4,6,6,7		(0.30)	OBSTRUCTION - large cobbles (Drillers description)			
9.00-9.45	D					9.00	Medium dense brown coarse SAND and fine to coarse sub-rounded GRAVEL			
9.50	D									
10.00-10.45	SPT N=18			3,3/4,4,5,5						

Remarks

Water added to sand and gravel horizons to assist drilling.
Borehole terminated and redrilled as BH 4A.
Chiselling from 5.60m to 6.00m for 1.00 hour. Chiselling from 7.30m to 7.50m for 0.75 hours. Chiselling from 8.50m to 8.70m for 1.00 hour. Chiselling from 8.70m to 9.00m for 1.00 hour.

Scale
(approx)
1:50

Logged
By
Eng

Figure No.

MCS4824.4

See key sheet for symbols and abbreviations

H.B. BORING & COMPANY LTD.

SITE INVESTIGATION SPECIALISTS

Site: Ley Farm, Chirk

Borehole Number
4

Boring Method Cable Percussion	Diameter 150mm Cased to 16.00m	Ground Level (mOD)	Client	Job Number MCS4834
	Location E N	Dates 18/05/04 - 19/05/04	Engineer Roscoe Capita Environmental	Sheet 2/2

Depth m	Samples / Tests	Casing Depth m	Water Depth m	Field Records	Level (mOD)	Depth m (Thickness)	Description	Legend	Water	Inst.
10.00-10.45	D					(3.30)				
11.00	D									
11.50-11.95	SPT N=29			3, 6/6, 7, 7, 9						
11.50-11.95	D									
12.50-12.95	CPT N=76			6, 10/12, 18, 20, 25		12.30	Very dense brown sandy fine to coarse sub-rounded GRAVEL with cobbles			
12.50-13.00	B					(1.50)				
13.80	D					13.80	Moderately strong brown medium grained SANDSTONE			
						(0.80)				
14.60-15.05	CPT N=34			2, 7/7, 9, 9, 9		14.60	Medium dense brown clayey sandy fine to coarse sub-rounded / sub-angular GRAVEL with cobbles			
14.60-15.10	B					(0.80)				
15.40	D					15.40	Moderately strong brown laminated SILTSTONE and fine grained SANDSTONE			
						(0.40)				
16.00-16.45	CPT N=28			4, 4/4, 6, 7, 11		15.80	Stiff brown claybound GRAVEL (Drillers description)			
16.00	D					(0.70)				
						16.50	Borehole completed at 16.50m			

Remarks

Chiselling from 12.30m to 12.50m for 0.80 hours. Chiselling from 14.10m to 14.60m for 1.00 hour. Chiselling from 15.40m to 15.80m for 0.50 hours.

Scale (approx) 1:50
Logged by Eng

Figure No.
MCS4834.4

See key sheet for symbols and abbreviations

H.B. BORING & COMPANY LTD.

SITE INVESTIGATION SPECIALISTS

Site:
Ley Farm, Chirk

Borehole
Number:
4A

Boring Method
Shell and Auger
Rotary Open Hole

Diameter
150mm Cased to 22.40m
125mm Cased to 22.50m

Ground Level (mOD)

Client

Job
Number
MCS4834

Location
S N

Dates
27/05/04 -
04/06/04

Engineer
Roscoe Capita Environmental

Sheet
1/4

Depth m	Samples / Tests	Casing Depth m	Water Depth m	Field Records	Level (mOD)	Depth m (Thickness)	Description	Legend	Water	Inst.
1.00	D					(0.30) 0.30	TOPSOIL Soft brown silty very sandy gravelly CLAY			
2.00	D					(2.40)				
3.00	D					2.70	Stiff/very stiff brown silty sandy gravelly CLAY with cobbles. Becoming more gravelly with depth.			
4.00	D					(2.50)				
5.00	D					5.20 (0.30) 5.50	OBSTRUCTION - large cobble (Drillers description)			
6.00	D						Stiff/very stiff brown silty sandy gravelly CLAY with cobbles			
7.00	D					(3.40)				
8.00	D									
9.00	D					8.90	Brown slightly silty fine to coarse SAND and fine to coarse sub-angular GRAVEL			
10.00	D					(1.60)				

Remarks

Service pit to 1.20m
Shell and Auger to 22.40m, Rotary Open Hole to base.
* - denotes drillers descriptions of strata encountered.
Borehole grouted from 33.00 - 22.00m.
Approx. 70% loss of air at 23.00m.
Chiselling from 3.20m to 3.40m for 0.50 hours. Chiselling from 5.20m to 5.50m for 0.75 hours. Chiselling
See key sheet for symbols and abbreviations

Scale
(approx)
By

1:50 Eng

Figure No.

MCS4834.4A

H.B. BORING & COMPANY LTD.

SITE INVESTIGATION SPECIALISTS

Site
Ley Farm, Chirk

Borehole
Number
4A

Boring Method
Shell and Auger
Rotary Open Hole

Diameter
150mm Cased to 22.40m
125mm Cased to 22.50m

Ground Level (mOD)

Client

Job
Number
MCS4834

Location
S N

Dates
27/05/04 -
04/06/04

Engineer
Roscoe Capita Environmental

Sheet
2/4

Depth m	Samples / Tests	Casing Depth m	Water Depth m	Field Records	Level (mOD)	Depth m (Thickness)	Description	Legend	Water	Inst.
11.00	D					10.50	Brown claybound fine to coarse SAND and fine to coarse sub-angular GRAVEL			
12.00	D									
13.00	D									
14.00	D									
15.00	D					(8.50)				
16.00	D									
17.00	D									
18.00	D			Slow(1) at 18.00m, rose to 18.00m in 20 mins.						
19.00	D					19.00	SANDSTONE *			
20.00	CPT 50*/50			50/						

Remarks:
Chiselling from 10.20m to 10.40m for 0.50 hours. Chiselling from 11.30m to 11.50m for 0.50 hours. Chiselling from 12.10m to 12.40m for 0.50 hours. Chiselling from 13.60m to 14.00m for 0.75 hours. Chiselling from 18.80m to 20.00m for 1.00 hour.

Scale
(approx)
1:50

Logged
By
Eng

Figure No.

MCS4834.4A

See key sheet for symbols and abbreviations

Site	Barcode Number
Ley Farm, Chirk	4A

[illegible]

Scale (approx)	Logged 8y
1:50	Eng

Figure No.

MCS4834.4A

H.B. BORING & COMPANY LTD.
SITE INVESTIGATION SPECIALISTS

Site
Ley Farm, Chirk

Barohole
Number
4A

Boring Method *

Shell and Auger
Rotary Open Hole

Diameter

150mm	Cased to 22.40m
125mm	Cased to 22.50m

Ground Level (mOD)

Client

Job
Number
MCS4834

Location	g	N
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Dates .
27/05/04 -
04/06/04

Engineer
Roscoe Capita Environmental

Sheet
4/4

[illegible]

Remarks

Scale (approx)	Logged 8y
1:50	Eng

Figure No.

MCS4234, 4A

See key sheet for symbols and abbreviations

H.B. BORING & COMPANY LTD.

SITE INVESTIGATION SPECIALISTS

Site
Lay Farm, Chirk

Borehole
Number
5

Boring Method Cable Percussion	Diameter 150mm Cased to 9.50m	Ground Level (mOD)	Client	Job Number MCS4834
	Location B N	Dates 26/05/04 - 26/05/04	Engineer Roscoe Capita Environmental	Sheet 1/1

Depth m	Samples /Tests	Casing Depth m	Water Depth m	Field Records	Level (mOD)	Depth m (Thickness)	Description	Legend	Water	Inst.
0.30-1.00	B					(0.30) 0.30	TORSOIL			
1.00-1.45 1.00-1.50 1.00-1.45	SPT N=4 B D			1,0/1,1,1,1			MADE GROUND : soft/firm to firm grey/ brown/black clay, broken mudstone, siltstone and shale fill			
2.00-2.45 2.00-2.45	SPT N=2 D			1,0/1,0,1,0						
2.80-3.25 2.80-3.30 2.80	CPT N=13 B D			2,2/3,3,3,4						
3.90-4.35 3.90-4.40	CPT N=10 B			3,3/2,2,2,4		(8.20)				
5.00-5.45 5.00-5.50	CPT N=11 B			1,2/2,3,3,3						
6.00-6.45 6.00-6.50	CPT N=26 B			1,4/6,6,7,7						
6.50	D									
7.20-7.65 7.20-7.70	CPT N=9 B			1,2/2,2,2,3						
8.00	D									
9.50-8.95 8.50-9.00	CPT N=18 B			3,3/4,4,5,5		8.50	Firm to firm/stiff grey/brown silty CLAY becoming very weak grey/brown MUDSTONES			
				Slow(1) at 9.00m, rose to 9.00m in 20 mins.		(1.50)				
9.80 9.80	CPT 50+/50 D 0*/0			50/		10.00				

Remarks
Service pit to 1.00m
Chiselling from 9.50m to 9.80m for 0.75 hours.

Scale
(approx)
1:50
Logged
By
Eng

Figure No.
MCS4834.5

See key sheet for symbols and abbreviations

I.B. BORING & COMPANY LTD. SITE INVESTIGATION SPECIALISTS					Site Ley Farm, Chirk					Borehole Number 5			
Installation Type Monitoring well		Dimensions Internal Diameter of Tube (A) = 50 mm Diameter of Filter Zone = 150 mm			Client Roscoe Capita Environmental					Job Number MCS4834			
		Location E N			Ground Level (mOD)		Engineer					Sheet 1/1	

Legend	Water	Inst. (A)	Level (mOD)	Depth (m)	Description	Groundwater Strikes during Drilling										
						Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings				Depth Sealed (m)	
				0.50	Concrete											
				1.00	Bentonite Seal	26/05/04		9.00		Slow					9.00	
						Groundwater Observations During Drilling										
						Start of Shift					End of Shift					
						Date	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)
					Gravel Filter	Instrument Groundwater Observations										
						Inst. (A) Type : Monitoring well										
						Instrument (A)			Remarks							
						Date	Time	Depth (m)							Level (mOD)	
				8.50		26/05/04					Installed					
				10.00	Bentonite Seal											
Remarks																

I.B. BORING & COMPANY LTD. SITE INVESTIGATION SPECIALISTS						Site Ley Parna, Chirk		Borehole Number 6		
Boring Method Shell and Auger Rotary Open Hole		Diameter 125mm Cased to 6.50m 150mm Cased to 6.50m		Ground Level (mOD)		Client		Job Number MCS4834		
Location S N		Dates 20/05/04 - 24/05/04		Engineer Roscoe Capita Environmental		Sheet 1/3				
Depth m	Samples / Tests	Casing Depth m	Water Depth m	Field Records	Level (mOD)	Depth m (Thickness)	Description	Legend	Water	Inst.
0.20-1.00	B					(0.20) 0.20	TOPSOIL			
						(0.90)	MADE GROUND : brown clay and broken mudstone fill			
1.10 1.20-1.65 1.20-1.65	D SPT N=9 D			1,1/2,2,2,3		1.10	Firm brown SILT / very silty CLAY			
						(0.90)				
2.20-2.65 2.20-2.70	CPT N=49 B			8,10/10,12,13,14		2.00	Stiff grey SILT with fragments / pieces of very weak grey laminated siltstone and cobbles			
						(2.00)				
3.00 3.20-3.65 3.20-3.65	D SPT N=66 D			10,12/10,14,20,22						
3.70 4.00-4.45 4.00-4.50 4.00	D CPT N=97 B D			7,10/20,21,26,30		4.00	Very weak grey/yellow laminated SILTSTONES / fine grained SANDSTONE			
						(0.60)				
4.50-5.05 4.50-5.10 4.60	CPT N=39 B D			3,7/7,9,10,13		4.60	Very weak grey/yellow MUDSTONE			
						(1.50)				
5.60-6.05 5.60-6.10	CPT N=78 B			6,11/14,16,18,30		6.10	Very weak grey/brown laminated MUDSTONE / SILTSTONES			
						(0.40)				
6.30 6.30	CPT 50*/50 D 0*/0			50/		6.50	Moderately strong light brown sandy SILTSTONE *			

Remarks
Service pit to 1.20m
Water added to assist drilling
Shell and Auger to 6.50m, Rotary Open Hole to base.
* - denotes drillers descriptions of strata encountered.
Borehole grouted from 25.00 - 6.50m.
Chiselling from 3.20m to 3.60m for 1.00 hour. Chiselling from 6.30m to 6.50m for 1.00 hour.
See key sheet for symbols and abbreviations

Scale
(approx)
1:50
Figure No.
MCS4834.6

Logged
By
Eng

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I.B. BORING & COMPANY LTD. SITE INVESTIGATION SPECIALISTS							Site Lay Farm, Chirk		Borehole Number 7	
Boring Method Shell and Auger Rotary Open Hole		Diameter 150mm Cased to 3.50m 125mm Cased to 4.00m		Ground Level (mOD)		Client		Job Number MCS4834		
Location B N		Dates 21/05/04 - 21/05/04		Engineer Roscoe Capita Environmental		Sheet 1/3				
Depth m	Samples / Tests	Casing Depth m	Water Depth m	Field Records	Level (mOD)	Depth m (Thickness)	Description	Legend	Water	Inst.
0.50-1.00	B					(0.50)	TOPSOIL			
1.00-1.45 1.00-1.50	CPT N=32 B			6, 6/7, 7, 8, 10		0.50	Dense yellow SILT with laminae of very weak yellow laminated SILTSTONE	XXXXXX		
1.50	D					(2.30)		XXXXXX		
2.00-2.45 2.00-2.50 2.00	CPT N=61 B D			7, 7/11, 12, 18, 20		2.80	Very weak grey/yellow laminated SILTSTONE	XXXXXX		
3.00-3.27 3.00	CPT 70*/120 D			10, 18/20, 50		(0.70)		XXXXXX		
						3.50	Moderately strong brown silty SANDSTONE *	XXXXXX		
						(2.00)		XXXXXX		
						5.50	Strong light grey SANDSTONE *	XXXXXX		
						(0.40)		XXXXXX		
						5.90	Moderately strong light grey and brown bands of sandy SILTSTONE *	XXXXXX		
						(2.10)		XXXXXX		
						8.00	Moderately strong light grey sandy SILTSTONE *	XXXXXX		
								XXXXXX		
Remarks Service pit to 1.20m Shell and Auger to 3.50m, Rotary Open Hole to base. Borehole grouted from 25.00 - GL. * - denotes drillers descriptions of strata encountered. Chiselling from 3.30m to 3.50m for 0.75 hours. See key sheet for symbols and abbreviations								Scale (approx) 1:50	Logged By Eng	
								Figure No. MCS4834.7		

Borehole Number	7
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Boring Method
Shell and Auger
Rotary Open Hole

Diameter	
150mm	Cased to 3.50m
125mm	Cased to 4.00m

Ground Level (mOD)

Clients

Job Number MCS4834

Location	
E	N

Dates:
21/05/04 -
21/05/04

Engineer
Roscoe Capita Environmental

Sheet
2/3

[illegible]

Remarks

Scale (approx)	Logged By
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1:50	Eng
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Figure No.

MC54934.7

See key sheet for symbols and abbreviations

F.B. BORING & COMPANY LTD.
SITE INVESTIGATION SPECIALISTS

Site
Ley Farm, Chirk

Borehole
Number
7

Boring Method
Shell and Auger
Rotary Open Hole

Diameter	
150mm	Cased to 3.50m
125mm	Cased to 4.00m

Ground Level (mOD)

Client

Job Number	MCS4834
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Location	E	N
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Dates
21/05/04 -
21/05/04

Engineer
Roscoe Capita Environmental

Sheet
3/3

[illegible]

Remarks

[illegible]

1:50	Eng
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Figure No.

MCS4834.7

See key sheet for symbols and abbreviations

F.B. BORING & COMPANY LTD.

SITE INVESTIGATION SPECIALISTS

Site
Ley Farm, Chirk

Borehole
Number
8

Boring Method
Cable Percussion

Diameter
150mm Cased to 9.30m

Ground Level (mOD)

Client

Job
Number
MCS4834

Location
S N

Date
26/05/04 -
26/05/04

Engineer
Roscoe Capita Environmental

Sheet
1/1

Depth m	Samples / Tests	Casing Depth m	Water Depth m	Field Records	Level (mOD)	Depth m (Thickness)	Description	Legend	Water	Inst.
0.30-1.00	B					(0.30) 0.30	TOPSOIL			
1.00-1.45 1.00-1.45 1.00	SPT N=9 D D			1,1/2,2,2,3			MADE GROUND : soft/firm to firm grey/ brown, clay, broken mudstone and shale fill			
2.00	D									
2.20-2.65 2.20-2.65	SPT N=7 D			1,1/1,2,2,2						
2.70-3.20	B					(5.10)				
3.20-3.65 3.20-3.65	SPT N=6 DB			1,0/1,1,2,2						
4.30-4.75 4.30-4.80	CPT N=16 B			2,3/4,6,3,3						
5.40-5.85 5.40-5.90	CPT N=18 B			2,4/4,4,5,5		5.40	MADE GROUND : loose/medium dense black coal, mudstone, shale and siltstone fill			
6.70-7.15 6.70-8.20	CPT N=17 B			3,3/4,4,4,5		(2.50)				
7.90-8.35 7.90-8.40	CPT N=22 B			2,4/5,5,6,6 Slow(1) at 7.90m, rose to 7.90m in 20 mins.		7.90 (1.10)	MADE GROUND : firm grey/brown clay and broken mudstone fill			
9.10 9.10	CPT 80*/20 D 0*/0			30,50/		9.00 (1.00) 10.00	Very weak/weak grey MUDSTONE / SILTSTONE			

Remarks
Service pit to 1.20m
Chiselling from 9.50m to 10.00m for 1.00 hour.

Scale
(approx) By

1:50 Eng

Figure No.

MCS4834.8

See key sheet for symbols and abbreviations

I.B. BORING & COMPANY LTD.

SITE INVESTIGATION SPECIALISTS

Site :
Ley Farm, Chirk

Borehole
Number
9

Machine : Hards England
Flush : Air
Bit Size : 125.00mm
Method : Open Hole

Diameter
125mm Cased to 2.00m

Ground Level (mOD)

Client

Job
Number
MCS4834

Location
E N

Dates
24/05/04 -
24/05/04

Engineer
Roscoe Capita Environmental

Sheet
1/3

Depth m	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth m (Thickness)	Description	Legend	Water	Inst.
							(0.30) 0.30	TOPSOIL *			
								Brown sandy stoney CLAY *			
							(1.60) 1.90				
							(0.70) 2.60	Red brown sandy CLAY *			
							(3.30) 5.90	Moderately strong light brown sandy SILTSTONE *			
								Moderately strong light grey sandy SILTSTONE with light brown bands *			

Remarks

* - denotes drillers descriptions of strata encountered.

Scale
(approx)
1:50

Logged
By
Crew

Figure No.

MCS4834.9

See key sheet for symbols and abbreviations

H.B. BORING & COMPANY LTD.

SITE INVESTIGATION SPECIALISTS

Site
Lay Farm, Chick

Borehole Number	9
--------------------	---

Machine : Hands England
Flush : Air
Bit Size : 125.00mm
Method : Open Hole

Diameter
125mm Cased to 2.00m

Ground Level (mOD)

Client

Job Number
MCS-1834

Location	E	N
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Datos

24/05/04 -
24/05/04

Engineer
Roscoe Capita Environmental

Sheets
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H.B. BORING & COMPANY LTD.

SITE INVESTIGATION SPECIALISTS

Site
Ley Farm, Chirk

Borehole
Number
9

Installation Type
Monitoring well

Dimensions
Internal Diameter of Tube (A) = 50 mm
Diameter of Filter Zone = 125 mm

Client

Job
Number
MCS4834

Location
S N

Ground Level (mOD)

Engineer
Roscoe Capita Environmental

Sheet
1/1

Legend	Water	Inst. (A)	Level (mOD)	Depth (m)	Description	Groundwater Strikes during Drilling										
						Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings				Depth Sealed (m)	
						5 min	10 min	15 min	20 min							
				0.30	Concrete											
				1.00	Bentonite Seal											
					Gravel Filter											
				4.50												
				5.50	Bentonite Seal											
						Groundwater Observations During Drilling										
						Start of Shift					End of Shift					
						Date	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)
						Instrument Groundwater Observations										
						Inst. (A) Type : Monitoring well										
						Date	Instrument (A)			Remarks						
							Time	Depth (m)	Level (mOD)							
						24/05/04				Installed						
				25.00	Cement/Bentonite Seal											

Remarks

H.B. BORING & COMPANY LTD. SITE INVESTIGATION SPECIALISTS						Site Ley Farm, Chirk		Borehole Number 10		
Boring Method Shell and Auger Rotary Open Hole		Diameter 150mm Cased to 9.30m 125mm Cased to 9.50m		Ground Level (mOD)		Client		Job Number MCS4834		
Location E N		Dates 21/05/04 - 24/05/04		Engineer Roscoe Capita Environmental		Sheet 1/3				
Depth m	Samples / Tests	Casing Depth m	Water Depth m	Field Records	Level (mOD)	Depth m (Thickness)	Description	Legend	Water	Inst.
0.30-1.00	B					(0.30) 0.30	TOPSOIL			
1.00-1.45 1.00-1.50	SPT N=7 B			1, 1/1, 2, 2, 2			MADE GROUND : soft/firm to firm grey/ brown clayey mudstone fill			
1.50	D									
2.00-2.45 2.00-2.50 2.00-2.45	SPT N=11 B D			1, 2/2, 3, 3, 3						
3.10-3.55 3.10-3.60 3.10-3.55	SPT N=9 B D			1, 1/2, 2, 2, 3						
4.20-4.65 4.20-4.70 4.20-4.65	SPT N=10 B D			1, 1/2, 2, 3, 3		(3.70)				
5.60-6.05 5.60-6.10	CPT N=14 B			1, 3/6, 4, 2, 2						
7.00-7.45 7.00-7.50	CPT N=5 B			1, 0/1, 1, 1, 2						
8.50-8.95 8.50-9.00	CPT N=22 B			2, 3/5, 5, 6, 6		9.00	Very weak grey MUDSTONE			
9.30 9.30-9.50	CPT 80*/120 B 0*/0			30, 50/		(0.50) 9.50	Moderately strong light grey sandy SILTSTONE *			
Remarks Service pit to 1.20m. Shell and Auger to 9.50m, Rotary Open Hole to base. * - denotes drillers descriptions of strata encountered. Chiselling from 9.30m to 9.50m for 1.00 hour.								Scale (approx) 1:50	Logged By Eng	Figures No. MCS4834.10
See key sheet for symbols and abbreviations										

See key sheet for symbols and abbreviations

See key sheet for symbols and abbreviations

H.B. BORING & COMPANY LTD.
SITE INVESTIGATION SPECIALISTS

Site
Ley Farm, Chirk

Borehole Number	10
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Installation Type
Monitoring well

Dimensions

Internal Diameter of Tube (A) = 50 mm
Diameter of Filter Zone = 150/125 mm

Client _____

Engineer _____

Roscoe Capita Environmental

Job Number	MCS4834
------------	---------

Location	
E	N

Ground Level (mOD)

Sheet
1/1

Legend	Water	Inst. (A)	Level (mOD)	Depth (m)	Description	Groundwater Strikes during Drilling									
						Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings				Depth Sealed (m)
5 min	10 min	15 min	20 min												
				0.30	Concrete										
				1.00	Bentonite Seal										
					Gravel Filter										
															
				10.00	Bentonite Seal										
				11.00											
															
															
															
															
															
															

Remarks

H.B. BORING & COMPANY LTD.

SITE INVESTIGATION SPECIALISTS

Standard Penetration Test Results

Site : Ley Farm, Chirk

Client :

Engineer : Roscoe Capital Environmental

Job Number

MCS491

Sheet

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Borehole Number	Base of Borehole (m)	End of Seating Drive (m)	End of Test Drive (m)	Test Type	Seating Blows per 75mm		Blows for each successive 75mm penetration				Result	Comments
					1	2	1	2	3	4		
1	1.000	1.150	1.450	SPT	3	3	3	3	3	4	N=13	
1	2.000	2.150	2.450	SPT	2	2	1	2	4	4	N=11	
1	3.000	3.150	3.450	SPT	2	3	3	3	4	4	N=14	
1	4.000	4.150	4.450	SPT	3	3	4	3	4	5	N=16	
1	5.000	5.150	5.450	SPT	3	5	5	16	5	12	N=38	
1	6.500	6.650	6.950	SPT	4	8	5	16	9	10	N=20	
1	8.000	8.150	8.450	SPT	8	8	9	10	12	13	N=44	
1	9.500	9.650	9.950	SPT	11	15	17	25	30	44	N=116	
1	11.000	11.150	11.200	CPT	11	18	50				50*/50mm	Refusal
1	12.500	12.560		CPT	50						50*/60mm	Refusal
1	14.000	14.130		CPT	28	50					78*/130mm	Refusal
1	15.500	15.650	15.790	CPT	14	26	30	50			80*/140mm	Refusal
1	17.000	17.150	17.450	CPT	10	8	7	9	11	16	N=43	
1	18.500	18.650	18.950	CPT	2	3	3	4	5	4	N=16	
1	20.000	20.150	20.450	CPT	4	6	9	14	17	21	N=61	
1	21.000	21.120		SPT	25	50					75*/120mm	Refusal
2	1.000	1.150	1.450	SPT	1	1	2	3	3	4	N=12	
2	1.700	1.850	2.150	CPT	2	2	3	3	4	4	N=14	
2	3.000	3.150	3.450	CPT	2	2	4	4	4	6	N=18	
2	4.700	4.850	5.150	CPT	3	6	6	7	7	12	N=32	
2	5.600	5.750	6.050	CPT	4	7	8	12	13	13	N=46	
2	6.600	6.650		CPT	50						50*/50mm	Refusal
2	7.500	7.650	7.700	CPT	18	20	50				50*/50mm	Refusal
3	1.200	1.350	1.650	SPT	1	1	1	2	2	2	N=7	
3	2.200	2.350	2.650	SPT	2	3	3	4	4	4	N=15	
3	3.000	3.150	3.450	CPT	4	8	8	10	10	14	N=42	
3	4.000	4.150	4.450	CPT	3	7	10	14	18	20	N=62	
3	5.100	5.250	5.550	CPT	3	4	7	7	11	20	N=45	
3	5.600	5.750	6.100	SPT	2	4	10	10	23	50	93/350mm	
4	0.800	0.950	1.250	SPT	3	4	5	5	6	6	N=22	
4	1.900	2.050	2.350	SPT	3	3	4	5	6	7	N=22	
4	2.900	3.050	3.350	CPT	4	6	7	9	12	15	N=43	
4	4.000	4.150	4.450	CPT	3	6	6	7	7	11	N=31	
4	4.700	4.850	5.150	CPT	6	8	10	10	12	13	N=45	
4	6.000	6.150	6.450	CPT	4	9	10	12	13	14	N=49	
4	7.500	7.650	7.950	CPT	3	4	5	5	7	11	N=28	
4	8.500	8.650		CPT	26	50						Refusal
4	9.000	9.150	9.450	SPT	1	2	4	6	6	7	N=23	
4	10.000	10.150	10.450	SPT	3	3	4	4	5	5	N=18	

I.B. BORING & COMPANY LTD.

SITE INVESTIGATION SPECIALISTS

Standard Penetration Test Results

Site : Ley Farm, Chirk
 Client :
 Engineer : Roscoe Capita Environmental

Job Number

MCS493

Sheet

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Borehole Number	Base of Borehole (m)	End of Seating Drive (m)	End of Test Drive (m)	Test Type	Seating Blows per 75mm		Blows for each successive 75mm penetration				Result	Comments
					1	2	1	2	3	4		
4	11.500	11.650	11.950	SPT	3	6	6	7	7	9	N=29	
4	12.500	12.650	12.950	CPT	6	10	12	18	20	26	N=76	
4	14.600	14.750	15.050	CPT	2	7	7	9	9	9	N=34	
4	16.000	16.150	16.450	CPT	4	4	4	6	7	11	N=28	
4A	20.000	20.050		CPT	50						50*/50mm	Refusal
5	1.000	1.150	1.450	SPT	1	0	1	1	1	1	N=4	
5	2.000	2.150	2.450	SPT	1	0	1	0	1	0	N=2	
5	2.800	2.950	3.250	CPT	2	2	3	3	3	4	N=13	
5	3.900	4.050	4.350	CPT	3	3	2	2	2	4	N=10	
5	5.000	5.150	5.450	CPT	1	2	2	3	3	3	N=11	
5	6.000	6.150	6.450	CPT	1	4	6	6	7	7	N=26	
5	7.200	7.350	7.650	CPT	1	2	2	2	2	2	N=9	
5	8.500	8.650	8.950	CPT	3	3	4	4	5	5	N=18	
5	9.800	9.850		CPT	50						50*/50mm	Refusal
6	1.200	1.350	1.650	SPT	1	1	2	2	2	3	N=9	
6	2.200	2.350	2.650	CPT	8	10	10	12	13	14	N=49	
6	3.200	3.350	3.650	SPT	10	12	10	14	20	22	N=66	
6	4.000	4.150	4.450	CPT	7	10	20	21	26	30	N=97	
6	4.600	4.750	5.050	CPT	3	7	7	9	10	13	N=39	
6	5.600	5.750	6.050	CPT	6	11	14	16	18	30	N=78	
6	6.300	6.350		CPT	50						50*/50mm	Refusal
7	1.000	1.150	1.450	CPT	6	6	7	7	9	10	N=32	
7	2.000	2.150	2.450	CPT	7	7	11	12	18	20	N=61	
7	3.000	3.150	3.270	CPT	10	18	20	30			70*/120mm	Refusal
8	1.000	1.150	1.450	SPT	1	1	2	2	2	3	N=9	
8	2.200	2.350	2.650	SPT	1	1	1	2	2	2	N=7	
8	3.200	3.350	3.650	SPT	1	0	1	1	2	2	N=6	
8	4.300	4.450	4.750	CPT	2	3	4	6	3	3	N=16	
8	5.400	5.550	5.850	CPT	2	4	4	4	5	5	N=18	
8	6.700	6.850	7.150	CPT	3	3	4	4	4	5	N=17	
8	7.900	8.050	8.350	CPT	2	4	5	5	6	6	N=22	
8	9.100	9.120		CPT	30	50					30*/20mm	Refusal
10	1.000	1.150	1.450	SPT	1	1	1	2	2	2	N=7	
10	2.000	2.150	2.450	SPT	1	2	2	3	3	3	N=11	
10	3.100	3.250	3.550	SPT	1	1	2	2	2	3	N=9	
10	4.200	4.350	4.650	SPT	1	1	2	2	3	3	N=10	

I.B. BORING & COMPANY LTD.

SITE INVESTIGATION SPECIALISTS

Standard Penetration Test Results

Site : Ley Farm, Chirk
 Client :
 Engineer : Roscoe Capital Environmental

Job Number
 MCS483
 Sheet
 3/3

Borehole Number	Bgsa of Borehole (m)	End of Seating Drive (m)	End of Test Drive (m)	Test Type	Seating Blows per 75mm		Blows for each successive 75mm penetration				Result	Comments
					1	2	1	2	3	4		
10	5.600	5.750	6.050	CPT	1	3	6	4	2	2	N=14	Refusal
10	7.000	7.150	7.450	CPT	1	0	1	1	1	2	N=5	
10	8.500	8.650	8.950	CPT	2	3	5	5	6	6	N=22	
10	9.300	9.420		CPT	30	50					80*/120mm	

Desk Top Study Report for land at
Ley Farm, Sycamore Drive, Chirk.

Appendix 7

CDM Information

Coopers

Design Risk Assessment for Typical Foundation Options

Reference: 4441Riskassessment



Cooper Associates

Method Statement for Installation of Claymaster/Polystyrene Sheets



British Board of Agrément

Clayboard Mark 2 KN30 void system

Agrément Certificate No.: 98/3528 (Third issue)

Dated: 30 January 2002

GENERAL DESIGN RISK ASSESSMENTS FOR TYPICAL FOUNDATION OPTIONS

ACTIVITY/ELEMENT OF DESIGN	HAZARD (ie slips, trips, falls, manual handling, use of mobile plant, chemicals etc.)	RISK ASSESSMENT								HAZARD AVOIDANCE MEASURES (specify measures required to avoid or minimize risk using hierarchy of controls)
		Construction Phase				Operational/Maintenance Phase				
		High	Med	Low	N/A	High	Med	Low	N/A	
<u>Foundations</u> <u><1200mm deep and</u> <u>House Drainage</u>	Falls/slips/trips		✓						✓	Provide information and training on working in excavations. Use daily inspections by competent person prior to entry into trench and recording on Excavation Register
(ie Traditional & Nominally Reinforced Strip Footings)	Trench Collapse			✓					✓	Ensure excavation sides battered back to a safe angle of repose. Provide information and training on working in excavations. Use daily inspections by competent person.
Breaking out existing foundations	Noise /vibration		✓						✓	Identify existing foundations and dig out using mechanical excavator. If not possible break out using hand held breakers. Minimise vibration in breakers by maintenance. Ensure use of thick gloves/appropriate PPE
	Contamination			✓					✓	Removal of contaminated material to a licensed landfill site or use of inert cover over contaminated strata . Use of PPE by groundworkers. Enforcement of good hygiene rules and provision of welfare facilities.
Handling of blocks/bricks and steel mesh	Musculo-Skeletal Injury		✓						✓	Use of mechanical handling plus manual handling risk assessment. Certificate required for mechanical handling. Designer to specify use of blocks/bricks and mesh of suitable unit weight for manual handling. Contractor to ensure mesh lengths take into account manual handling. Mechanical handling where possible.
Concrete pouring/mortars	Skin Irritation/Eczema		✓						✓	Contractor to ensure proper use of barrier cream/PPE. Designer to ensure suitable mortar additives. Contractor to carry out COSHH assessments.
	Existing services		✓						✓	Contact utilities management companies to confirm existence or absence of live services. Provide utilities plans to Contractor. Use of Cat and Genny during excavation and proceed with care. Hand dug excavations where necessary.

GENERAL DESIGN RISK ASSESSMENTS FOR TYPICAL FOUNDATION OPTIONS

ACTIVITY/ELEMENT OF DESIGN	HAZARD (ie slips, trips, falls, manual handling, use of mobile plant, chemicals etc.)	RISK ASSESSMENT								HAZARD AVOIDANCE MEASURES (specify measures required to avoid or minimize risk using hierarchy of controls)
		Construction Phase				Operational/Maintenance Phase				
		High	Med	Low	N/A	High	Med	Low	N/A	
<u>Foundations</u> <u>>1200mm deep and</u> <u>Drains/Services</u> (ie Deep Strip footings or Mass Concrete Trench Fill	Trench collapse	✓							✓	Ensure excavation sides supported by propping/trench sheeting, or battered back to a safe angle of repose. Provide information and training on working in excavations. Use daily inspections by competent person. Added risk in areas of groundwater. Ensure that excavation pumped dry at all times.
	Slips/trips/falls	✓							✓	Provide information and training on working in excavations. Use daily inspections by competent person prior to entry into trench and recording on Excavation Register
	Contamination			✓					✓	Removal of contaminated material to a licensed landfill site or use of inert cover over contaminated strata. Use of PPE by groundworkers. Enforcement of good hygiene rules and provision of welfare facilities.
	Existing Services			✓					✓	Contact utilities management companies to confirm existence or absence of live services. Provide utilities plans to Contractor. Use of Cat and Genny during excavation and proceed with care. Hand dug excavations where necessary.
Installation of polystyrene sheets for heave protection requiring manned entry to unsupported excavations	Trench collapse Slips/trips/falls	✓							✓	Install in accordance with approved method statement and to include edge protection and adequate cross over points. Alternatively consider integral raft foundation with stone blanket.
Concrete pouring/mortars	Skin Irritation/Eczema	✓							✓	Contractor to ensure proper use of barrier cream/PPE. Designer to ensure suitable mortar additives. Contractor to carry out COSHH assessments.
Handling of blocks/bricks and steel mesh	Musculo-Skeletal injury		✓						✓	Use of mechanical handling plus manual handling risk assessment. Certificate required for mechanical handling. Designer to specify use of blocks/bricks and mesh of suitable unit weight for manual handling. Contractor to ensure mesh lengths take into account manual handling. Mechanical handling where possible.
	Asphyxia and confined space working	✓							✓	Confined space procedures for working in deep excavations/manholes. Ensure fumes from mechanical plant, such as pumps, are well controlled.

GENERAL DESIGN RISK ASSESSMENTS FOR TYPICAL FOUNDATION OPTIONS

ACTIVITY/ELEMENT OF DESIGN	HAZARD (ie slips, trips, falls, manual handling, use of mobile plant, chemicals etc.)	RISK ASSESSMENT								HAZARD AVOIDANCE MEASURES (specify measures required to avoid or minimize risk using hierarchy of controls)
		Construction Phase				Operational/Maintenance Phase				
		High	Med	Low	N/A	High	Med	Low	N/A	
<u>Foundations >1200mm deep and Drains/Services</u>	Continued									
Breaking out existing foundations	Noise/Vibration			✓					✓	Identify existing foundations and dig out using mechanical excavator. If not possible break out using hand held breakers. Minimise vibration in breakers by maintenance. Ensure use of thick gloves/appropriate PPE
<u>Raft Foundations with Integral floor slab</u>	Slips/trips/falls		✓						✓	Provide information and training on working in excavations. Use daily inspections by competent person prior to entry into trench and recording on Excavation Register
Strip existing fill material and remove to approved bearing strata. Backfill with approved consolidated granular fill.	Trench collapse	✓							✓	Ensure excavation sides supported by propping/trench sheeting, or battered back to a safe angle of repose. Provide information and training on working in excavations. Use daily inspections by competent person. Added risk in areas of groundwater. Ensure that excavation pumped dry at all times.
	Contamination			✓					✓	Removal of contaminated material to a licensed landfill site or use of inert cover over contaminated strata. Use of PPE by groundworkers. Enforcement of good hygiene rules and provision of welfare facilities.
Construction of granular blanket beneath raft for heave precautions, depth <1200mm.	Trench collapse Slips/trips/falls			✓					✓	Ensure excavation sides battered back to a safe angle of repose. Provide information and training on working in excavations. Use daily inspections by competent person. Use daily inspections by competent person prior to entry into trench and recording on Excavation Register.
Breaking out existing foundations	Noise/Vibration			✓					✓	Identify existing foundations and dig out using mechanical excavator. If not possible break out using hand held breakers. Minimise vibration in breakers by maintenance. Ensure use of thick gloves/appropriate PPE
	Existing Services			✓					✓	Contact utilities management companies to confirm existence or absence of live services. Provide utilities plans to Contractor. Use of Cat and Genny during excavation and proceed with care. Hand dug excavations where necessary.

GENERAL DESIGN RISK ASSESSMENTS FOR TYPICAL FOUNDATION OPTIONS

ACTIVITY/ELEMENT OF DESIGN	HAZARD (ie slips, trips, falls, manual handling, use of mobile plant, chemicals etc.)	RISK ASSESSMENT								HAZARD AVOIDANCE MEASURES (specify measures required to avoid or minimize risk using hierarchy of controls)
		Construction Phase				Operational/Maintenance Phase				
		High	Med	Low	N/A	High	Med	Low	N/A	
<u>Raft Foundations with Integral floor slab</u>	Continued									
	Backfilling			✓					✓	Use mechanical excavators to place approved granular fill in layers and lightly compact. Geotextile wrap fills in 1m max. lift heights and use graded granular material with good self compacting properties. Compaction with plant only when excavation depth <1200mm deep.
Steel Fixing	Musculo-Skeletal injury		✓						✓	Designer to schedule bars to take into account manual handling. Avoid long large diameter bars. Use of mechanical handling where possible plus manual handling risk assessment. Certificate required for machanical handling
Concrete pouring/mortars	Skin Irritation/Eczema	✓							✓	Contractor to ensure proper use of barrier cream/PPE. Designer to ensure suitable mortar additives. Contractor to carry out COSHH assessments.

MO1

METHOD STATEMENT INSTALLATION OF CLAYMASTER/POLYSTYRENE SHEETS

CONTRACTOR NAME:

NAME OF CONTRACT:

RISK ASSESSMENT AND KEY CONTROL MEASURES

The relevant provisions of TO1 Groundworker (Roads sewers and Plot Works) 25th March 2004.
Revision to be complied with in full.

Operatives to be taken through the method statement (and sign overleaf) in addition to TO1 and associated risk assessments and control measures.

GENERAL METHOD STATEMENT

Please read in conjunction with the attached diagram.

Excavate trench to required depth.

Diagram 1 Lower weighted polythene down on the outside of the trench to 100mm from the bottom of the trench. (Weighting achieved by attaching steel bar to bottom of polythene prior to lowering into trench).

Install adequate crossing point over excavation.

Secure top of Polythene to the back wall of the trench by inserting long timber.

Diagram 2 Hold Polythene to the back wall of the trench by inserting long timber.
Concrete 500mm up from the bottom of the trench.

Diagram 3 Pull the polythene over at the top to the inside of the trench.

Diagram 4 Insert the Claymaster/Polystyrene tight down to the concrete base.

Diagram 5 Pull the Polythene tight over the Claymaster/Polystyrene and refix to the top of the bank.

Pour concrete into remainder of trench trapping the polythene tight to the Claymaster/Polystyrene.

Diagram 6 Insert the steel mesh if required.

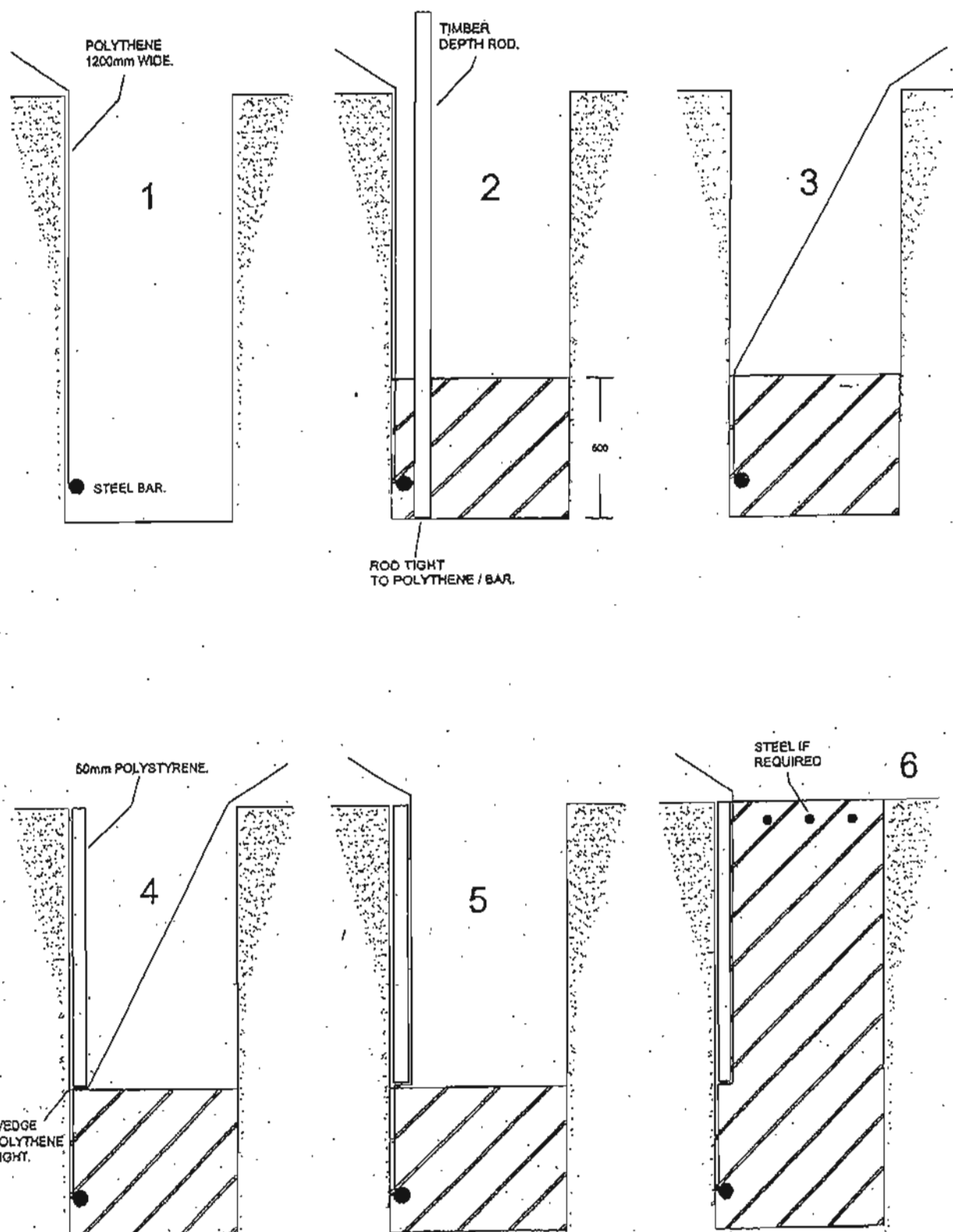
SITE SPECIFIC ADDITIONS TO METHOD STATEMENT IF ANY:

Name:

Signature:

Position:

Date:





Designated by Government
to issue
European Technical
Approvals

Dufaylite Developments Limited

Cromwell Road
St Neots
Cambridgeshire PE19 1QW
Tel: 01480 215000 Fax: 01480 405526

**Agrément
Certificate
No 98/3528**
Third issue*

CLAYBOARD MARK 2 KN30 VOID SYSTEM

Réducteurs de pression pour sols
Drückabschwächer für Boden

Product



• THIS CERTIFICATE RELATES TO THE CLAYBOARD MARK 2 KN30 VOID SYSTEM.

• The product is used to limit the pressure exerted on in-situ, reinforced, suspended concrete floors caused by expansion of clay soils (clay heave) or ground recovery.

• The product must not be used at depths greater than 2 m or in locations below the water table.

Regulations

1 The Building Regulations 2000 (England and Wales)



The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of compressible fill with the Building Regulations. In the opinion of the BBA, the Clayboard Mark 2 KN30 Void System, if used in accordance with the provisions of the Certificate, will meet or contribute to meeting the relevant requirements.

Requirement A2

Ground movement

Comment:

The product prevents expansion of clay soils impairing the stability of the building. See section 7.1 of this Certificate.

Requirement Regulation 7

Materials and workmanship

Comment:

The product is acceptable.

2 The Building Standards (Scotland) Regulations 1990 (as amended)



In the opinion of the BBA, the Clayboard Mark 2 KN30 Void System, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and Technical Standards listed below.

Regulation: 10

Fitness of materials

Standard B2.1

Selection and use of materials, and components

Comment:

The product is acceptable.

continued

Regulation: 11
Standard: C2 1
Comment:

Structure
Construction

The product contributes to meeting the relevant requirements of this Standard. See section 7.1 of this Certificate.

3 The Building Regulations (Northern Ireland) 2000



In the opinion of the BBA, there are no requirements in these Regulations pertaining to the use of the Clayboard Mark 2 KN30 Void System.

4 Construction (Design and Management) Regulations 1994 (as amended) Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

In the opinion of the BBA there is no information in this Certificate which relates to the obligations of the client, planning supervisor, designer and contractors under these Regulations.

Technical Specification

5 Description

5.1 The Clayboard Mark 2 KN30 Void System consists of a honeycomb cardboard core, bonded to polypropylene facing boards (see front page picture). The top face is black and the bottom face is white. Clayboard is supplied in panels 2440 mm long by 1000 mm wide and in thicknesses of 60, 85, 110 and 160 mm.

5.2 When dry, the product has sufficient compressive strength to support the weight of wet concrete and steel reinforcement. When water is introduced after the concrete has set, the honeycomb loses its compressive strength and yields to ground heave without transmitting pressure to the building.

5.3 Water is introduced into the product by using the Clayboard Voidpak System, comprising polythene sheeting to wrap the Clayboard and pre-shaped pipes which push into the honeycomb to introduce water.

5.4 Continuous quality control is exercised during manufacture.

6 Delivery and site handling

6.1 The Clayboard Mark 2 KN30 Void System is delivered to site on pallets, fully wrapped in polythene. During off-loading, care must be taken to avoid piercing or tearing the polythene, or damaging the panels.

6.2 The panels must be stored flat and off the ground, preferably on the delivery pallets. It is essential to protect the product from moisture.

Design Data

7 General



7.1 The Clayboard Mark 2 KN30 Void System, when designed and installed in accordance with the recommendations of this Certificate, is effective in limiting the pressure exerted on in-situ, reinforced, suspended concrete floors.

7.2 The product must not be used in locations below the water table, nor has it been assessed for use in areas where soil gas protection is required. A site survey, taking into account seasonal variations, must be carried out to establish the water table level before the decision is made to use Clayboard.

7.3 The product has a nominal compressive strength of 30 kNm^{-2} when dry, and is designed to support the weight of concrete up to 1 m thick. When the core is wetted, Clayboard will collapse under a nominal compressive load of approximately 3 kNm^{-2} .

7.4 The thickness of Clayboard to be used depends on the required void, but should be not less than the required void plus 10 to 15 mm (see Table 1). The maximum likely ground movement due to clay heave, and hence required void, is established from site investigations.

Table 1 Thickness of Clayboard Mark 2 KN30 Void System

Required void (max) (mm)	50	75	100	150
Clayboard thickness (mm)	60	85	110	160

Installation

8 General

8.1 The Clayboard Mark 2 KN30 Void System must be kept dry until the concrete achieves self-supporting strength. The time between laying the product and pouring the concrete should be kept to a minimum to reduce the risk of the Clayboard getting wet.

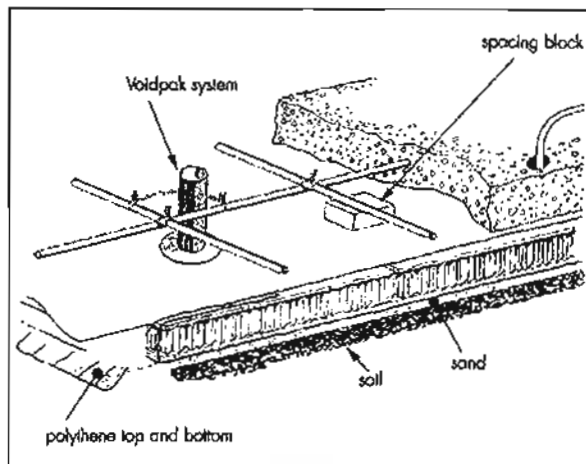
8.2 Provision should be made for the removal of all surface water from the foundation zone. This may necessitate forming a sump nearby, with facilities for pumping to a suitable drain.

9 Procedure (see Figure 1)

9.1 The bottom of the excavation must be flat, even, properly compacted, and blinded with a 25 mm dry sand layer to prevent pressure points damaging the polythene wrapping and underside of the Clayboard.

Electronic Copy

Figure 1 Installation



9.2 Clayboard can be easily cut on site with a power or hand saw to fit specific areas. The minimum recommended cut width is 300 mm.

9.3 Polythene sheeting is laid onto the blinding and the Clayboard is placed white face down on top of the polythene, ensuring adjoining panels butt closely together. Polythene is then laid on top of the Clayboard, overlapped, and the joints taped up.

9.4 Sufficient spacing blocks must be used to make sure that the correct depth of concrete cover to the reinforcement is achieved. It must be ensured that the load transmitted to the Clayboard does not exceed 30 kNm^{-2} and this is accomplished by selecting the types and quantities of spacing blocks.

9.5 The steel reinforcement is laid.

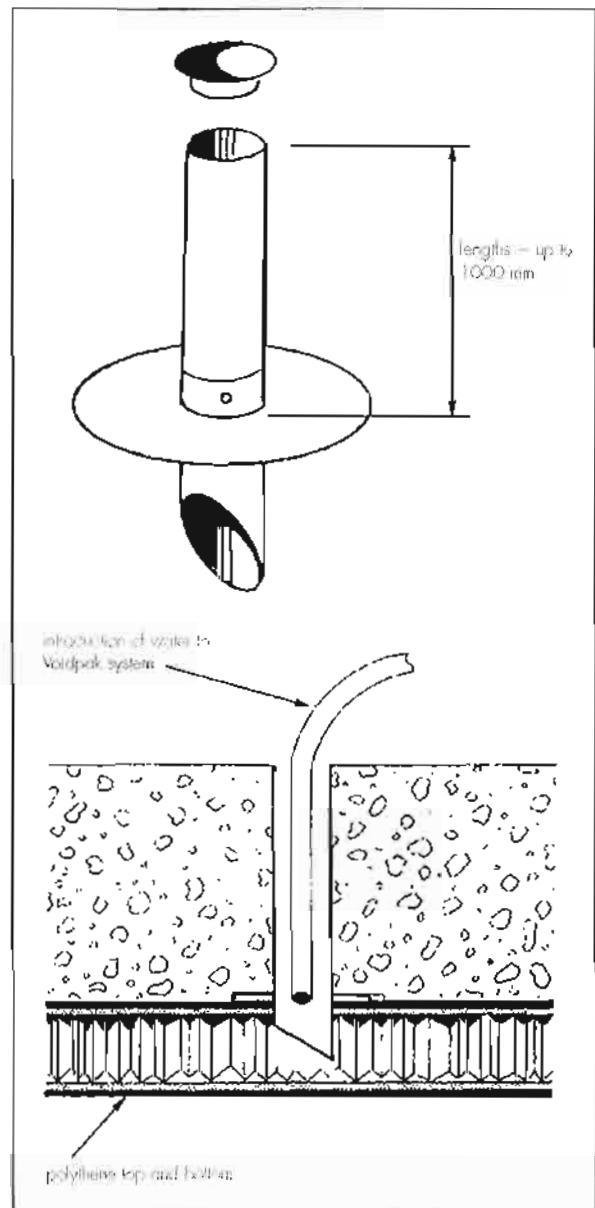
9.6 Provision for the introduction of water into the product is made using the Clayboard Voidpak System (see Figure 2). The pipe is positioned with the raked end to the Clayboard face and struck until the flange is flush with the Clayboard surface. A minimum of one pipe must be provided for each isolated area of clayboard, otherwise one pipe per 24 m^2 will suffice. The pipe must not penetrate the bottom face of the Clayboard.

9.7 Checks should be made to ensure all the pipes are secure and have caps fitted. If necessary, the pipes can be kept vertical during the pouring of the concrete by cross-tying to the adjacent reinforcements.

9.8 The concrete is poured and when it is totally self-supporting, a hose is inserted into each pipe and water introduced into the product. To ensure total saturation of the Clayboard, further water should be introduced at least twice over the next 48 hours.

9.9 After 48 hours, the hoses are removed and the bottom facing of the Clayboard and underlying polythene struck through to allow the water to drain away. The pipes are sealed with cement or waterproof sealant.

Figure 2 Voidpak System



Technical Investigations

The following is a summary of the technical investigations carried out on the Clayboard Mark 2 KN30 Void System.

10 Tests

An examination was made of test data and tests were conducted to determine:

dimensional accuracy
load capacity (when dry) — samples loaded at rate of $0.5 \text{ Nm}^{-2} \text{ min}^{-1}$ and held at 30 kNm^{-2} for 16 hours
load capacity after 24 hours' immersion in water.

11 Other investigations

11.1 The manufacturing process was examined, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Electronic Copy

11.2 Site visits were carried out to assess the practicability of installation.

11.3 An assessment was made of the performance characteristics of the product.

Conditions of Certification

12 Conditions

12.1 This Certificate:

(a) relates only to the product that is described, installed, used and maintained as set out in this Certificate;

(b) is granted only to the company, firm or person identified on the front cover — no other company, firm or person may hold or claim any entitlement to this Certificate;

(c) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;

(d) is copyright of the BBA.

12.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, shall be construed as references to such publication in the form in which it was current at the date of this Certificate.

12.3 This Certificate will remain valid for an unlimited period provided that the product and the manufacture and/or fabricating process(es) thereof:

(a) are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA;

(b) continue to be checked by the BBA or its agents; and

(c) are reviewed by the BBA as and when it considers appropriate.

12.4 In granting this Certificate, the BBA makes no representation as to:

(a) the presence or absence of any patent or similar rights subsisting in the product or any other product;

(b) the right of the Certificate holder to market, supply, install or maintain the product; and

(c) the nature of individual installations of the product, including methods and workmanship.

12.5 Any recommendations relating to the use or installation of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the installation and use of this product.



In the opinion of the British Board of Agrément, the Clayboard Mark 2 KN30 Void System is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 98/3528 is accordingly awarded to Dufaylite Developments Limited.

On behalf of the British Board of Agrément

P. C. Newman
Chief Executive

Date of Third issue: 30th January 2002

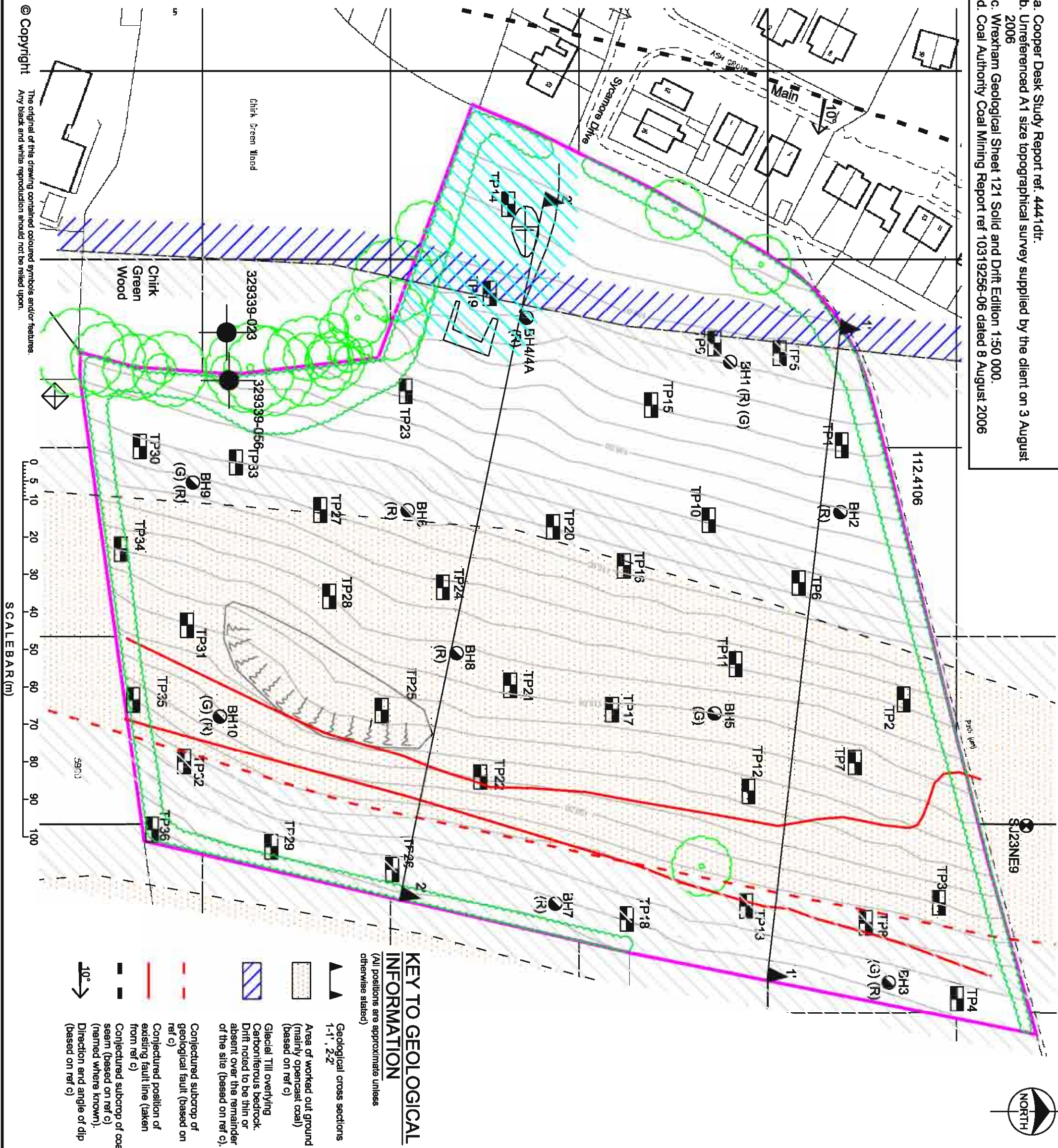
**Original Certificate issued 29th October 1998. This amended version includes reference to the revised Building Regulations and on update of the CDM Regulations*

Desk Top Study Report for land at
Ley Farm, Sycamore Drive, Chirk.**Appendix 8****Reference Drawings**

<u>Drawing</u>	<u>Rev</u>	<u>Title</u>
4441/L1	-	Site Location Plan
4441/01	-	Site Plan
4441/02	-	Extract from Early OS Map Circa 1879
4441/03	-	Extract from OS Map Circa 2006
4441/04	-	Geological Cross Section 1-1'
4441/05	-	Geological Cross Section 2-2'
4441/Ts/01	-	Traditional Strip Footing in Clay Bearing Strata with Ground Supported Slab
	-	Traditional Strip Footing in Clay Bearing Strata with Suspended Ground Floor Slab
4441/Rn/01	-	Nominally Reinforced Footing with Ground Supported Slab
	-	Nominally Reinforced Footing with Suspended Ground Floor Slab
4441/Tf/01	-	Trench Fill Foundation with Ground Supported Slab (No Heave Precautions)
	-	Trench Fill Foundation with Suspended Ground Floor Slab (No Heave Precautions)
4441/DpRs/01	-	Deep Reinforced Strip Foundation up to 2.00 metres deep with Suspended Ground Floor Slab
	-	Deep Reinforced Strip Foundation up to 3.00 metres deep with Suspended Ground Floor Slab
4441/TfH/01	-	Trench Fill Foundation affected by Existing Trees requiring Heave Precautions
4441/RfH/01	-	Typical Section/Detail through Raft Foundation for possible heave conditions
4441/Rf/01	-	Typical Section/Detail Thro' Raft Foundation
4441/PFDZ	-	Preliminary Foundation Zone Plan

This drawing is to be read in conjunction with the following:

- a. Cooper Desk Study Report ref. 4441.dtr.
- b. Unreferenced A1 size topographical survey supplied by the client on 3 August 2006
- c. Wrexham Geological Sheet 121 Solid and Drift Edition 1:50 000.
- d. Coal Authority Coal Mining Report ref 10319256-06 dated 8 August 2006



KEY
(All positions are approximate unless otherwise stated)

- Trial pits excavated by Ian Farmer Associates between 10 and 13 May 2004. (TP1 to TP36)
- Cable percussive boreholes BH1 to BH10 and BH4A drilled by H.B Boring and Company Ltd between 16 May and 4 June 2004.
- (R) denotes rotary open hole follow on carried out by H.B Boring and Company Ltd.
- (G) denotes gas standpipe.
- Borehole log available from the British Geological Survey, Black Park Colliery, Denbigh, drilled to a depth of 114m.
- Surveyed position of existing trees.
- Surveyed position of existing hedgerow.
- Area of recent earthworks and soil stripping. Anecdotal information suggests it is in an area of a collapsed / fire damaged adit mouth.
- Area of concave slope.
- Electricity pole with underground cable, possibly extending beneath the site.
- Conjectured location of Coal Authority referenced mine entry (based on ref e). 329339-056 - Stone lined shaft filled to an unknown specification at an unknown date.
- 329339-023 shaft filled to an unknown specification at an unknown date. Between 1976 and 1984. Several occurrences of fill settlement required the shaft to be topped up.
- Slope Contours (in metres).
- Site boundary.

KEY TO GEOLOGICAL INFORMATION
(All positions are approximate unless otherwise stated)

- Geological cross sections 1-1', 2-2'
- Area of worked out ground (mainly opencast coal) (based on ref c)
- Glacial Till overlying Carboniferous bedrock. Drift noted to be thin or absent over the remainder of the site (based on ref c).
- Conjectured subcrop of geological fault (based on ref c)
- Conjectured position of existing fault line (taken from ref c)
- Conjectured subcrop of coal seam (based on ref c) (named where known). Direction and angle of dip (based on ref c)

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Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU

Title		Ley Farm, Sycamore Drive Chirk	
SCALE		1 : 1000 @ A3	
DATE	08.08.06	Rev.	
DRAWN	MR		
CHECKD	PRS		
Drawing No.		4441 / 01	



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Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU

SCALE	1:2500 @A4
DATE	10.08.06
DRAWN	MR
CHEK'D	PRS

Ley Farm, Sycamore Drive
Chirk
EXTRACT FROM EARLY
O.S. MAP CIRCA 1879

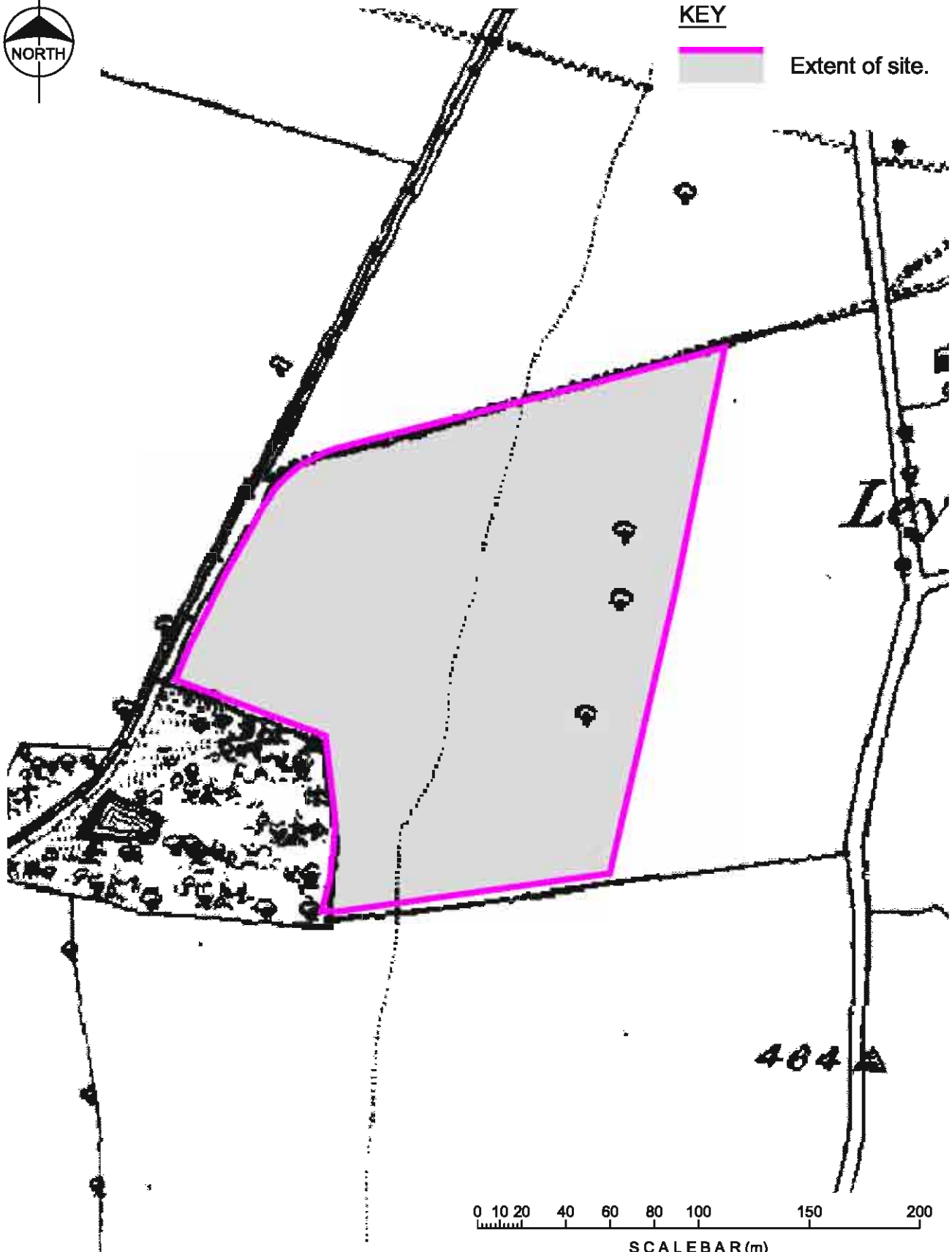
Drg No: 4441 / 02



KEY



Extent of site.



404 A

0 10 20 40 60 80 100 150 200

SCALEBAR (m)



coopers

chartered consulting engineers

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Chester Business Park
Chester
CH4 9QU

SCALE	1:2500 @A4
DATE	10.08.06
DRAWN	MR
CHEK'D	PRS

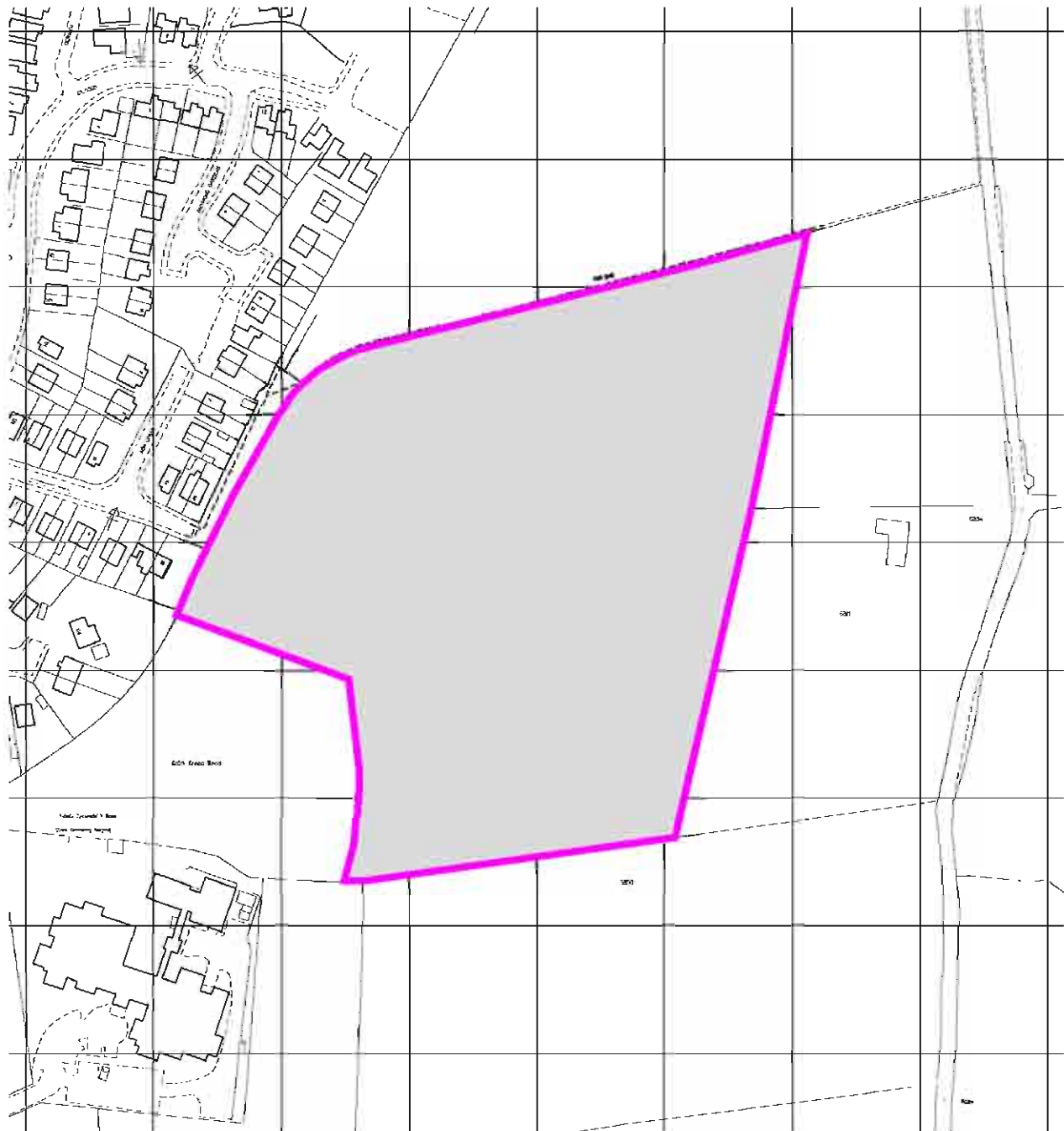
Ley Farm, Sycamore Drive
Chirk
EXTRACT FROM
O.S. MAP CIRCA 2006
Drg No: 4441 / 03



KEY



Extent of site.



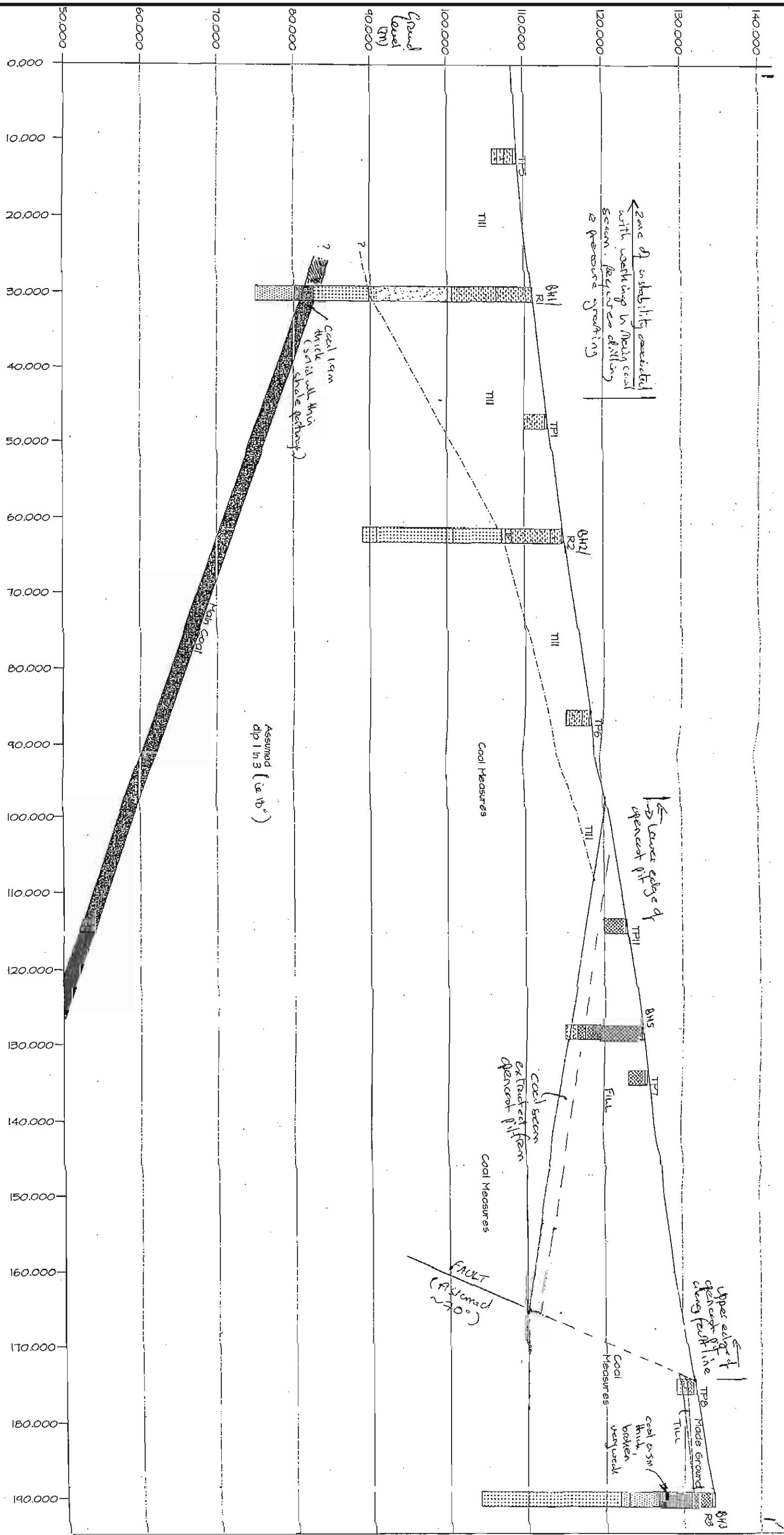
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SCALEBAR (m)

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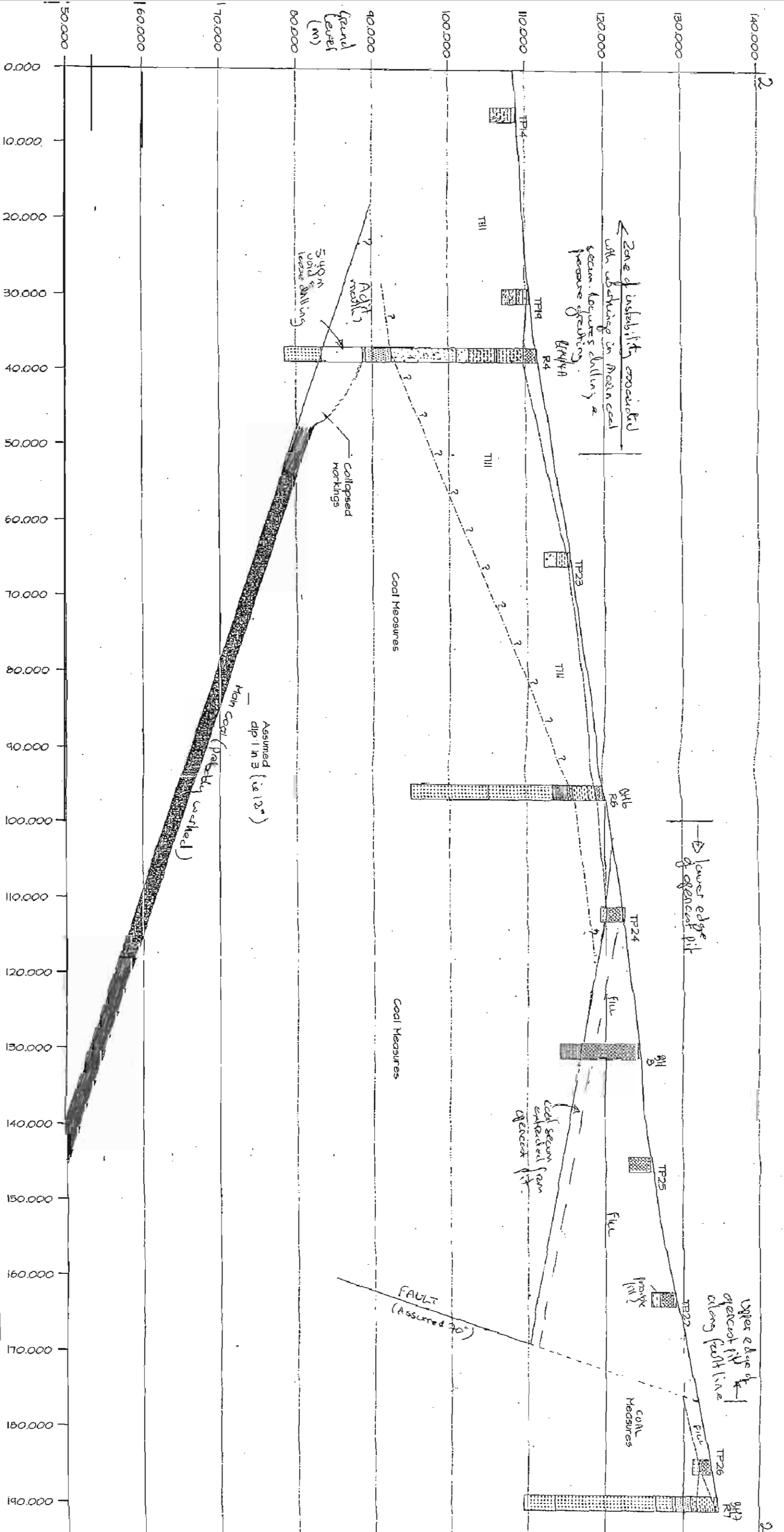
SCALE	1 : 500 @ A3				
DATE	11.08.06				
DRAWN	MR				
CHECKD	PRS	Rev	Dwn	Date	App'd
		Comments			

Ley Farm, Sycamore Drive,
Chirk.
GEOLOGICAL
CROSS SECTION 1-1'

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Drawing No.	4441 / 04	Rev.	-
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DO NOT SCALE

SCALE 1 : 500 @ A3

DATE	11.08.06
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DRAWN MR

CHEKD	PRS
-------	-----

Ley Farm, Sycamore Drive

Chirk

GEOLOGICAL

CROSS SECTIONS 2-2'

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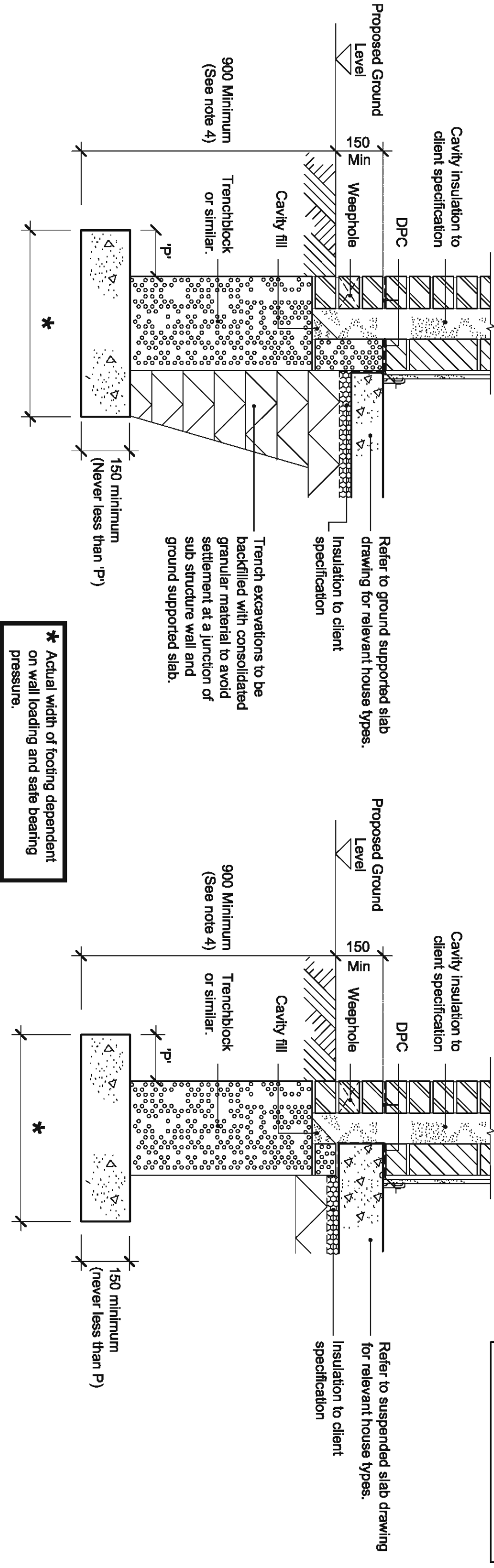
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Drawing No.

4441 / 05

Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU

Rev.

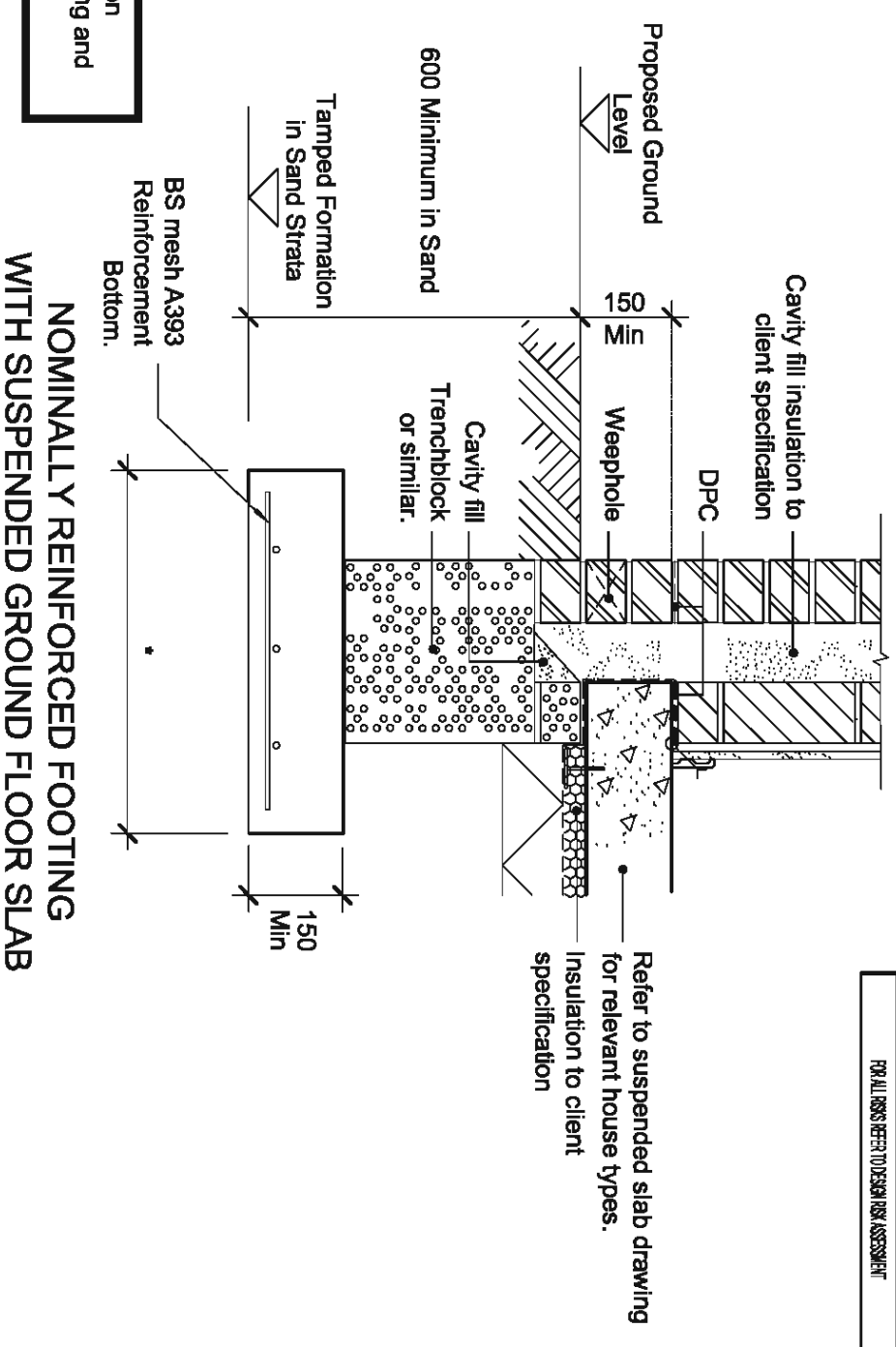
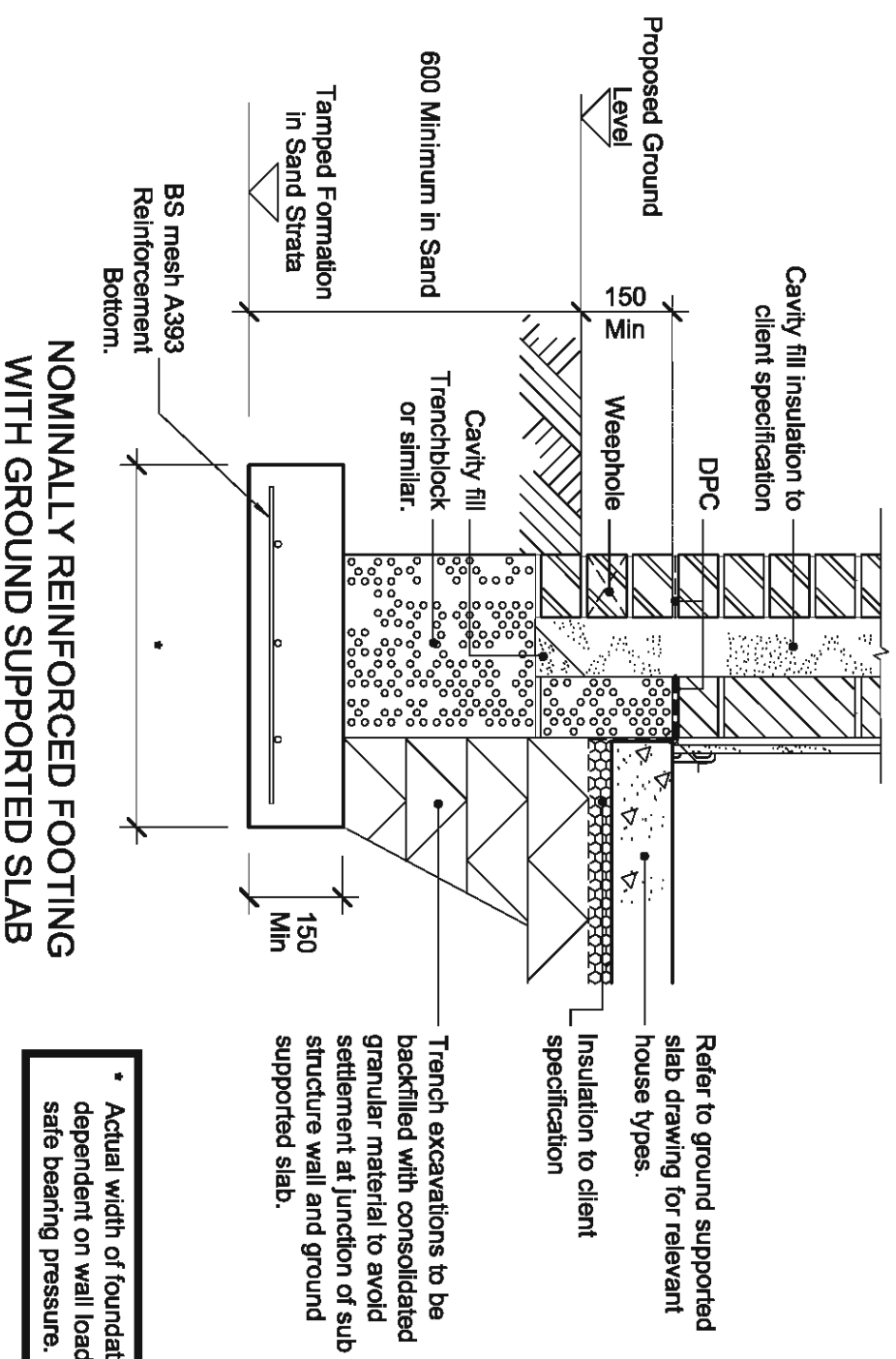


TRADITIONAL STRIP FOOTING
IN CLAY BEARING STRATA
WITH GROUND SUPPORTED SLAB

NOTES

1. This drawing is to be read in conjunction with Coopers Desk Study Report ref. 4441dtr.
2. The safe bearing pressure on clay strata limited to that indicated in the Site Investigation Report referred to in Note 1 above.
3. Foundation depths indicated assume that the proposed foundations are outside the zone of influence of former, existing and proposed trees (Refer to NHBC Standards Chapter 4.2).
4. Minimum foundation depth for footings founded in the Clay Bearing Strata are to be in accordance with the NHBC Standards Chapter 4.2, Clause D6(c) Table 5 and are as follows:-
5. All backfill material to the foundation excavations and floor voids to be inert, non-biodegradable and free of all harmful contaminants in accordance with Approved Document C/1/2/3 of the Building Regulations (1992).
6. All wall cavities below ground to be filled with GEN 1 concrete to BS 5328 (max. agg. size 10mm). Wall cavities to be filled prior to the commencement of backfill to the foundation excavations and/or the floor voids. All backfilling to be completed in a uniform manner to prevent horizontal forces being applied to the foundation walls.
7. For Concrete, Blockwork/Brickwork and Mortar below DPC refer to the information contained in the Site Investigation Report referred to in Note 1 above.

SHRINKAGE MINIMUM POTENTIAL	DEPTH (mm)
Medium	900



Notes

1. This drawing is to be read in conjunction with Coopers Desk Study Report ref. 4441 dtr.

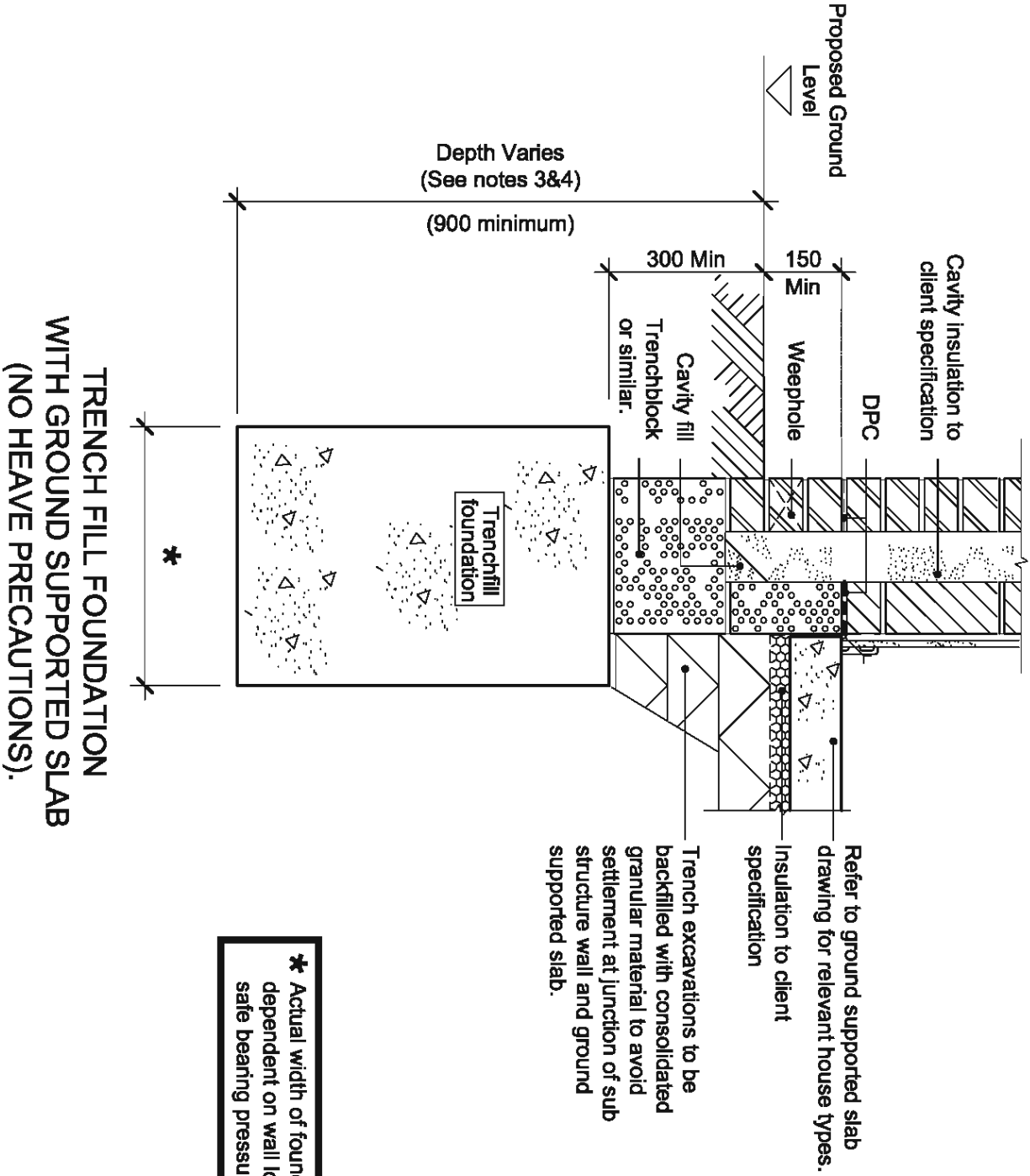
Bottom - BS Mesh A393
Laps - 350mm minimum
Cover - Bottom - 75mm
Sides - 75mm

3. All backfill material to the foundation excavations and floor voids to be inert, non-biodegradable and free of all harmful contaminants in accordance with Approved Document C/1/2/3 of the building Regulations (1992).
4. All wall cavities below ground to be filled with GEN 1 concrete to BS 5328 (max. agg. size 10mm). Wall cavities to be filled prior to the commencement of backfill to the foundation excavations and/or the floor voids. All backfilling to be complete in a uniform manner to prevent horizontal forces being applied to the foundation walls.
5. For concrete, Blockwork/Brickwork and Mortar below DPC, refer to Cooper Associates Specification appended to the Site Investigation Report in Note 1 above.

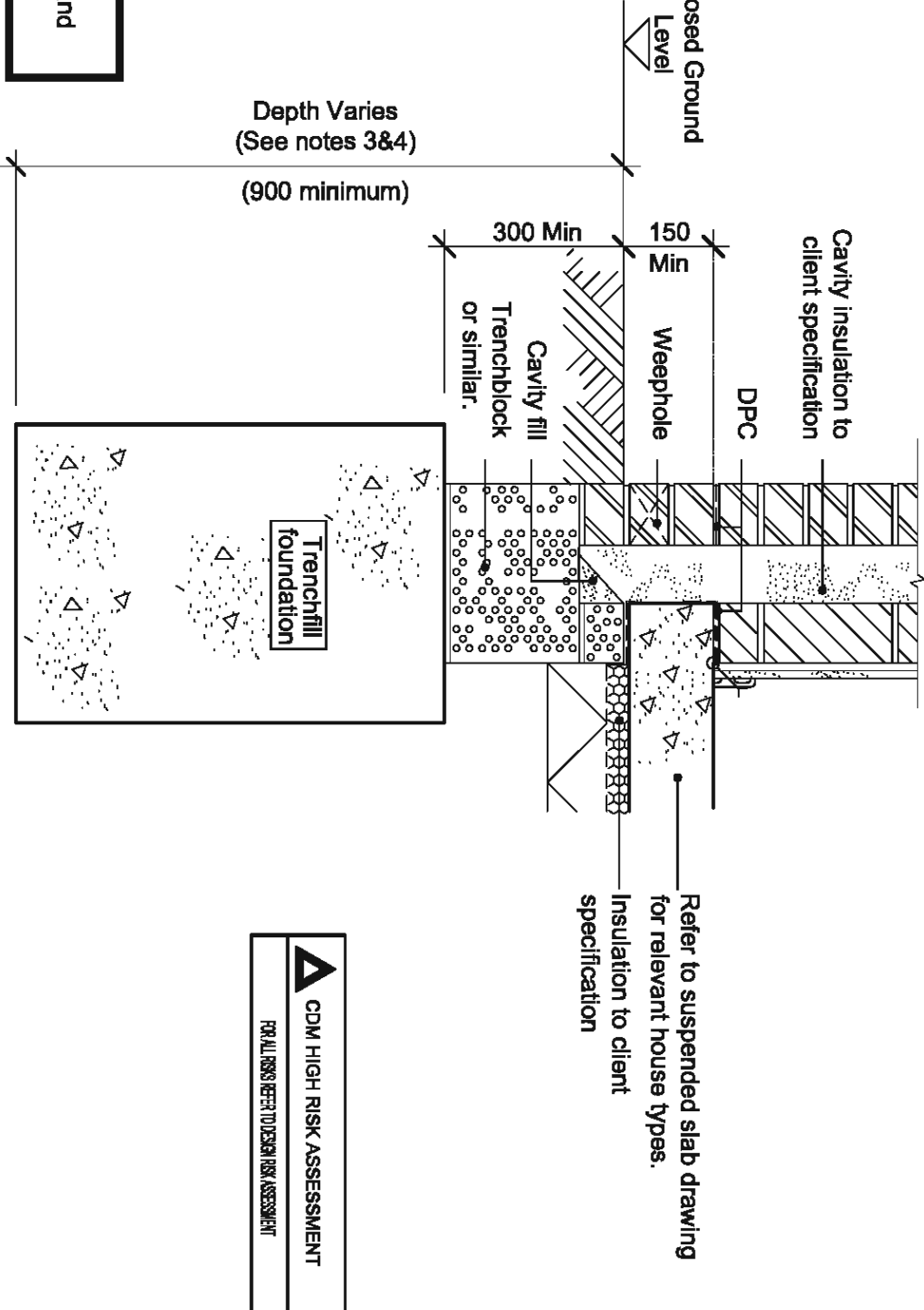
DRAWN BY	MR
DATE	15.08.08
SCALE(s)	N.T.S.
DRAWING NUMBER	REVISION

4441/Rn/01

-



TRENCH FILL FOUNDATION WITH GROUND SUPPORTED SLAB (NO HEAVE PRECAUTIONS).



TRENCH FILL FOUNDATION WITH SUSPENDED GROUND FLOOR SLAB (NO HEAVE PRECAUTIONS).

NOTES

1. This drawing is to be read in conjunction with Coopers Desk Study Report ref. 4441dtr.
2. The safe bearing pressure on strata limited to that indicated in the site investigation report referred to in Note 1 above.
3. Minimum foundation depths for those dwellings affected by trees is to be taken down to a moisture stable strata as determined by the NHBC Standards Chapter 4.2.
4. For foundations unaffected by existing or proposed trees, the mass concrete trenchfill is to be taken down to an approved bearing strata to be determined on site during construction.
5. All backfill material to the foundation excavations and floor voids to be inert, non-biodegradable and free of all harmful contaminants in accordance with Approved Document C/1/2/3 of the Building Regulations (1992).
6. All wall cavities below ground to be filled with GEN 1 concrete to BS 5328 (max. agg. size 10mm). Wall cavities to be filled prior to the commencement of backfill to the foundation excavations and/or the floor voids. All backfilling to be completed in a uniform manner to prevent horizontal forces being applied to the foundation walls.
7. For Concrete, Blockwork/Brickwork and Mortar below DPC refer to the information contained in the Site Investigation Report referred to in Note 1 above.



FOR ALL RISKS REFER TO DESIGN RISK ASSESSMENT

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CLIENT

greenspace architects

PROJECT

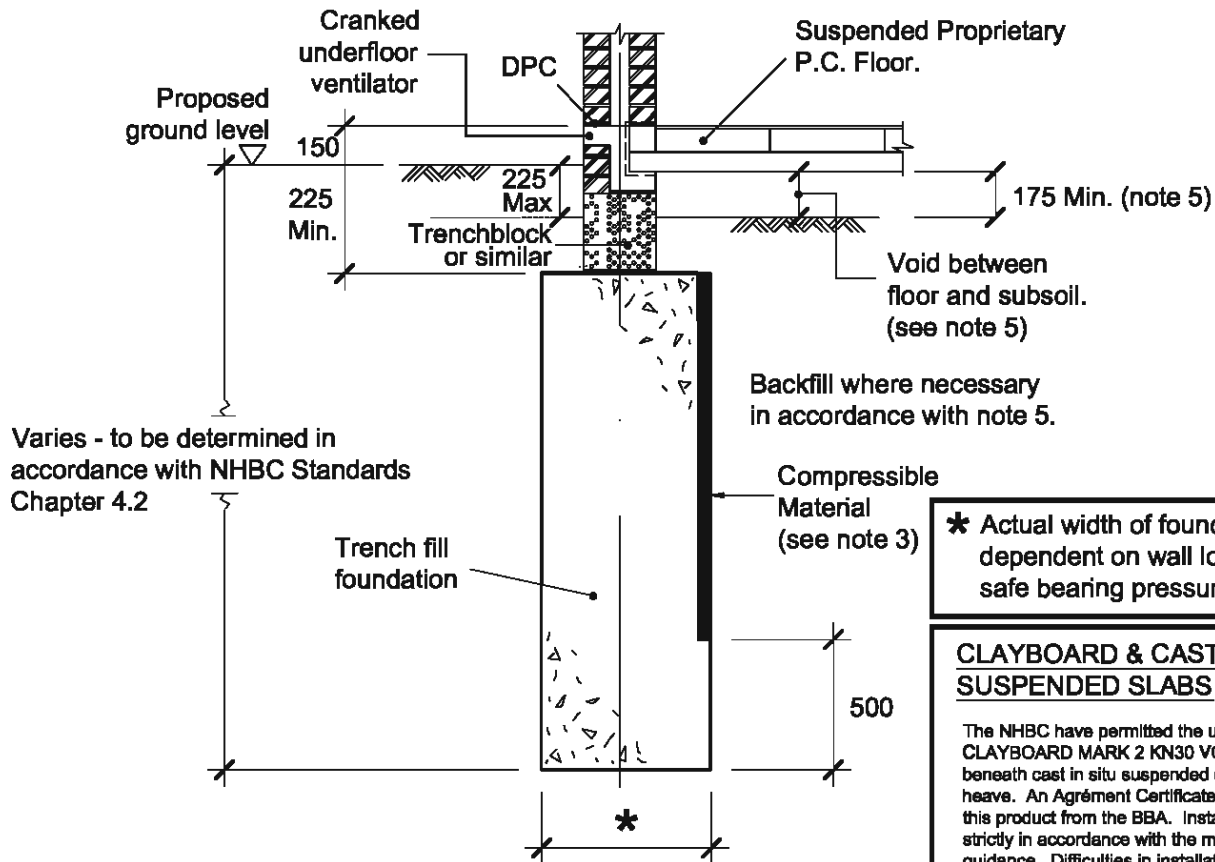
Ley Farm, Sycamore Drive
Chirk

TITLE

Typical Details
for Trenchfill Foundation with
Suspended and Ground
Supported Slab
(No Heave Precautions)

DRAWN BY	MR
DATE	11.08.08
SCALE(S)	NTS
DRAWING NUMBER	4441/TF/01
REVISION	-

THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE RELEVANT HOUSE TYPE DRAWINGS, FOUNDATION PLAN & SCHEDULE AND THE SITE SPECIFIC SITE INVESTIGATION REPORTS



Varies - to be determined in accordance with NHBC Standards Chapter 4.2

* Actual width of foundation dependent on wall loading and safe bearing pressure.

CLAYBOARD & CAST IN SITU SUSPENDED SLABS

The NHBC have permitted the use of the new CLAYBOARD MARK 2 KN30 VOID SYSTEM beneath cast in situ suspended slabs to cater for heave. An Agrément Certificate is available for this product from the BBA. Installation must be strictly in accordance with the manufacturers guidance. Difficulties in installation may be experienced and use of this product is at the house builders discretion. Minimum void former dimension beneath suspended slab in accordance with NHBC Standards Chapter 4.2 S4(d) Table 9.

CDM HIGH RISK ASSESSMENT

FOR ALL RISKS REFER TO DESIGN RISK ASSESSMENT

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Chester
CH4 9QU

CLIENT

greenspace
architects

PROJECT

**Ley Farm, Sycamore Drive
Chirk.**

TITLE

**Typical Details for
Trenchfill Foundation Affected
by Existing Trees Requiring
Heave Precautions**

DRAWN BY	MR
DATE	11.08.08
SCALE(S)	NTS
DRAWING NUMBER	REVISION

4441/TfH/01

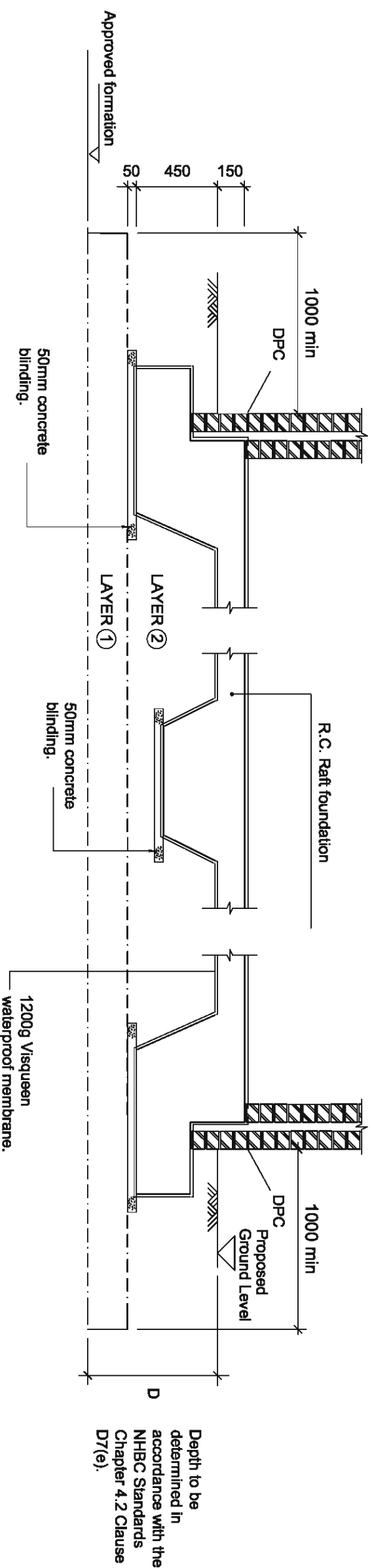
-

TRENCH FILL FOUNDATION AFFECTED BY EXISTING TREES REQUIRING HEAVE PRECAUTIONS

NOTES

1. This drawing is to be read in conjunction with Coopers Desk Study Report ref. 4441dtr.
2. The safe bearing pressure on strata limited to that indicated in the Site Investigation Report referred to in Note 1 above.
3. Claymaster or similar approved to be provided against internal face of perimeter foundations.
4. All backfill material to the foundation excavations and floor voids to be inert, non-biodegradable and free of all harmful contaminants in accordance with Approved Document C/1/2/3 of the Building Regulations (1992).
5. The minimum clear void below the suspended precast concrete ground floor is to be 175 mm and should be adequately ventilated in accordance with the Building Regulations (1992) and NHBC Standards Chapter 4.2 S4(d) table 10. The level of backfill to the floor voids is to be within 225mm of the adjoining outer ground level, with the backfill material being effectively drained.
6. All wall cavities below ground to be filled with GEN 1 concrete to BS 5328 (max. agg. size 10mm). Wall cavities to be filled prior to the commencement of backfill to the foundation excavations and/or the floor voids. All backfilling to be completed in a uniform manner to prevent horizontal forces being applied to the foundation walls.
7. Refer to proprietary precast concrete floor manufacturers specialist drawing for all P.C. floor details.
8. For Concrete, Blockwork/Brickwork and Mortar below DPC refer to the information contained in the Site Investigation Report referred to in Note 1 above.

FOR GENERAL NOTES REFER
TO RELEVANT SEMI STIFF
RAFT FOUNDATION DRAWING



CDM HIGH RISK ASSESSMENT

FOR ALL RISKS BEEN TO DESIGN RISK ASSESSMENT

**TYPICAL SECTION/DETAIL THRO' RAFT FOUNDATION FOR
POSSIBLE HEAVE CONDITIONS**

NOTES

1. This drawing is to be read in conjunction with the following:
 - a) Client's house type drawing(s)
 - b) Coopers Desk Study Report ref. 4441dtr.
2. For service connections, gullies and duct requirements refer to clients drawings.
Allow for flexible pipework to all service connections/ducting.
3. The safe bearing pressure of the approved consolidated granular fill limited to that indicated in the report referred to in Note 1 above.

LAYER ①-

HARDCORE BLANKET

Approved consolidated hardcore/ granular fill well compacted in layers not exceeding 225mm thick and compacted in accordance with the D.O.T specification for Highway Works Volume 1, Series 600. - Depth to be determined in accordance with NHBC Standards Chapter 4.2 Clause D7(e).

LAYER ②-

SLAB SUB-BASE

Approved consolidated granular fill sand blinded and compacted in accordance with the D.O.T. Specifications for Highway Works Volume 1, Series 600. Refer to RC drawing for further details.

DRAWN BY	MR
DATE	11.08.08
SCALE(S)	NTS

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Chick


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 Chartered accounting engineers

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 Web: <http://coopers.co.uk>

REVISIONS

4441/RTH/01 -

LAYER ① - HARDCORE BLANKET

Approved consolidated hardcore/ granular fill well compacted in layers not exceeding 225mm thick and compacted in accordance with the D.O.T specification for Highway Works Volume 1, Series 600.

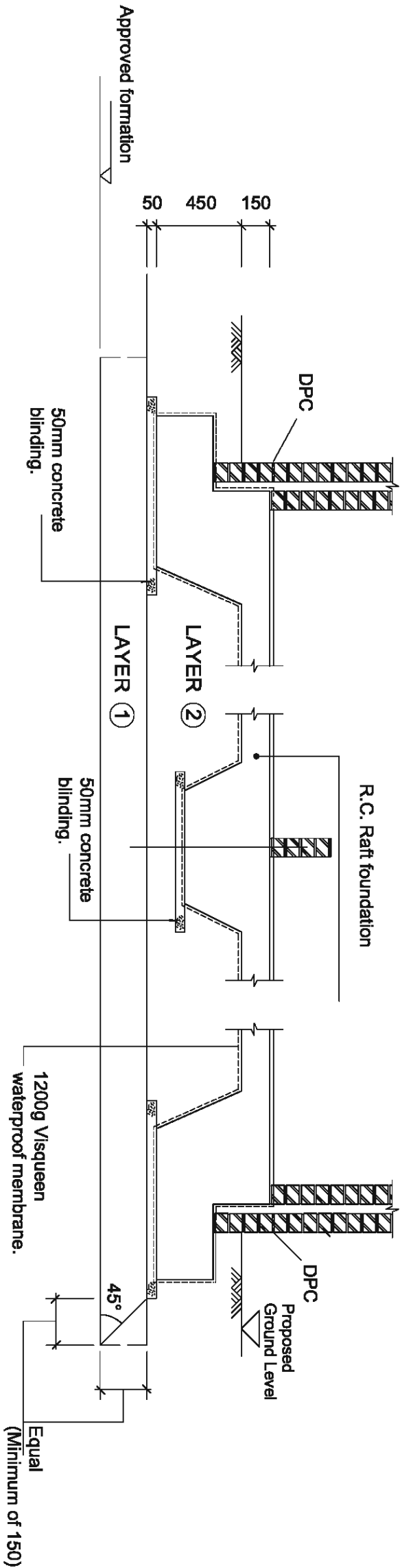
LAYER ② - SLAB SUB-BASE

Approved consolidated granular fill, sand blinded, compacted in accordance with the D.O.T. Specification for Highway Works Volume 1, Series 600. Refer to RC drawing for further details.

FOR GENERAL NOTES REFER TO RELEVANT SEMI STIFF RAFT FOUNDATION DRAWING

NOTES

1. This drawing is to be read in conjunction with the following:
 - a) Client's house type drawing(s)
 - b) Coopers Desk Study Report ref. 4441dtr.
2. For service connections, gullies and duct requirements refer to clients drawings. Allow for flexible pipework to all service connections/ducting.
3. The safe bearing pressure of the approved consolidated granular fill limited to that indicated in the report referred to in Note 1 above.



TYPICAL SECTION/DETAIL THRO' RAFT FOUNDATION.

CDM HIGH RISK ASSESSMENT

FOR ALL RISKS REFER TO DESIGN RISK ASSESSMENT

REVISIONS

structural consulting engineers

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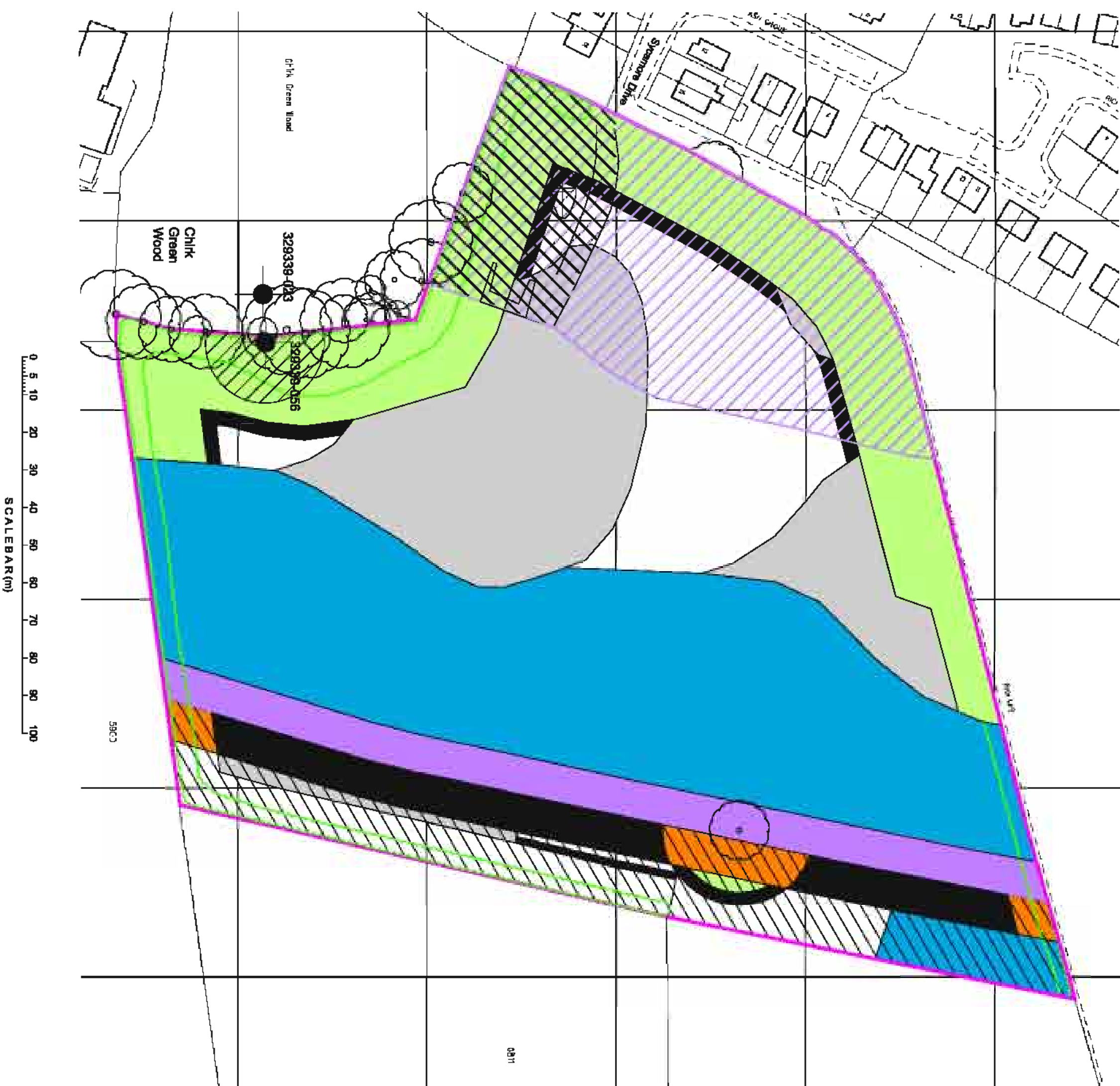
01244 684923

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FOR GUIDANCE
PURPOSES ONLY -
BASED ON LIMITED SITEWORK



KEY TO CONJECTURED ZONES

- 15% Nominally reinforced strip footing founded on loose to medium dense sands and gravels or firm, firm to stiff and stiff sandy clays +/- sand and gravel layers. Refer to Drawing No 4441/TH01
- 1% Deep reinforced strip / trenchfill footing on firm, firm to stiff and stiff clay affected by trees and hedgerows but not requiring heave precautions (subject to findings of a detailed arboricultural report). For budget purposes assume an average formation level to moisture stable strata of 1250mm. Refer to Drawing Nos. 4441/TH01 and 4441/DP01.
- 23% Trenchfill or semi-stiff raft foundations in areas where foundation requirements are potentially affected by the presence of trees and possibly requiring heave precautions (subject to findings of a detailed arboricultural report). For budget purposes, assume an average formation level to moisture stable strata of 1500mm for trenchfill foundations and a stone blanket thickness of 0.75m below downslope. Foundation shown in Mine Entry 328339-056, no build zone for information purposes only. Refer to Drawing Nos. 4441/TH01 & 4441/RH01
- 17% Trenchfill or deep reinforced strip footing founded in areas where fill or poor bearing strata exceeds 1250mm. For budget purposes, assume an anticipated formation level of 1500mm. Refer to Drawing Nos 4441/TH01 and 4441/DP01.
- 31% Piled foundation in area of a former backfilled open/cast pit where depth to bearing strata >2500mm.
- 6% Semi-stiff raft foundation in areas where foundation requirements are potentially affected by geological faulting. Refer to Drawing No 4441/DR01
- 6% Area where foundation requirements are potentially affected by geological faulting and in an area of a former backfilled open cast pit where the depth to a bearing strata could exceed 8000mm. Adoption of a raft foundation is subject to confirming that the predominantly clay backfill has been adequately compacted to achieve a SBP of >50 KPa within acceptable settlement design tolerances. Adoption of a piled foundation is subject to delineating the fault scarp / open-cast pit backfill.
- 1% Semi-stiff raft foundation in areas where foundation requirements are potentially affected by geological faulting and where also foundation requirements are potentially affected by the presence of trees and possibly requiring heave precautions (subject to findings of a detailed arboricultural report). In the vicinity of trees, the thickness of the stone blanket needs to be designed in accordance with NHBC Standards 4.2. For budget purposes assume a stone blanket thickness of 0.75m below downslope. Refer to Drawing No. 4441/RH01.

(NOTE: The percentage in brackets refers to percentage of the site area.)

NOTES

1. This drawing is to be used in conjunction with Coopers Desk Study Report ref. 4441dt.
2. This drawing takes no account of regrading, invasive species or contamination issues and should be used for guidance purposes only.
3. This drawing is based on limited fieldwork and is subject to amendment, modification and updating based on the findings of additional intrusive investigations and should be used for guidance purposes only.
4. The drawing takes a generalised assessment of the effects of existing trees and is subject to amendment based on a detailed arboricultural report findings, and should be used for guidance purposes only.
5. The above foundation options are for properties not exceeding two storeys in height. Footings for apartment blocks should be specifically designed by a Structural Engineer and be founded in firm to stiff and stiff clays and medium dense sands.

KEY
(All positions are approximate unless otherwise stated)

- Surveyed position of existing trees.
- Surveyed position of existing hedgerow.
- Conjectured location of Coal Authority referenced mine entry. 328339-056 -Stone lined shaft filled to an unknown specification at an unknown date. 328339-023 shaft filled to an unknown specification at an unknown date. Between 1976 and 1984. Several occurrences of fill settlement required the shaft to be topped up.
- Site boundary.

KEY TO CONJECTURED COAL MINING
STABILIZATION ZONES

- 1% Conjectured no build zone around mine entry 328339-056 after drilling and grouting shaft backfill, and capping mine entry (assumed 3000mm diameter shaft and rockhead at 2600mm depth).
- 9% Area of recent earthworks and soil siting. Anecdotal information suggests it is in an area of a collapsed / filled damaged adit mouth. No build zone around adit to be determined after geophysical survey and intrusive investigations. No information to provide a budget estimate on likely treatment costs.
- 19% Potential zone of instability associated with workings in the Main coal seam (seam assumed to be 1900mm thick).
- 15% Further intrusive investigation to confirm status of 500mm thick coal seam encountered in BH-3, located east of conjectured fault line.

(NOTE: The percentage in brackets refers to percentage of the site area.)



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Project
Ley Farm, Sycamore Drive,
Chick

PRELIMINARY FOUNDATION
ZONE PLAN

DRAWING NUMBER 4441 / PFDZ	SCALE at A2		1:1000 @ A2
	DATE	15.08.08	REVISION
	DRAWN	MR	
	CHECKED	PRS	
			-

Drainage Assessment Report for Land at
Ley Farm, Chirk

Appendix 3

Drainage Assessment

Qbar greenfield run-off rate
Calculations for the 30 year and 100 year plus climate change rainfall events



Return Period (Years)

1

Area (ha)

4.000

SAAR (mm)

977

Soil

0.300

Growth Curve

(None)

Partly Urbanised Catchment (QBAR)

Urban

0.000

Region

Region 9

Calculate

Results

QBAR rural (l/s)

10.8

QBAR urban (l/s)

10.8

Return Period Flood

Region	QBAR (l/s)	Q (1yrs) (l/s)	Q (1 yrs) (l/s)	Q (30 yrs) (l/s)	Q (100 yrs) (l/s)
Region 1	10.8	9.2	9.2	20.3	26.7
Region 2	10.8	9.4	9.4	20.4	28.3
Region 3	10.8	9.3	9.3	18.9	22.4
Region 4	10.8	8.9	8.9	21.1	27.7
Region 5	10.8	9.4	9.4	25.9	38.3
Region 6/Region 7	10.8	9.2	9.2	24.4	34.3
Region 8	10.8	8.4	8.4	20.5	26.1
Region 9	10.8	9.5	9.5	19.0	23.5
Region 10	10.8	9.4	9.4	18.3	22.4

IH 124

ICP SUDS

ADAS 345

FEH

Greenfield Runoff Volume

OK

Cancel

Help

Enter Return Period between 1 and 1000



Variables

Results

Design

Overview 2D

Overview 3D

Vt

Variables

FSR Rainfall

Return Period (years)

30

Region

England and Wales

Map

M5-60 (mm)

18.000

Ratio R

0.299

Cv (Summer)

0.750

Cv (Winter)

0.840

Impermeable Area (ha)

1.280

Maximum Allowable Discharge (l/s)

10.8

Infiltration Coefficient (m/hr)

0.00000

Safety Factor

2.0

Climate Change (%)

0

Analyse

OK

Cancel

Help

Select required Rainfall Model from the list



Variables

Results

Design

Overview 2D

Overview 3D

Vt

Results

Global Variables require approximate storage of between 321 m³ and 523 m³.

These values are estimates only and should not be used for design purposes.

Analyse

OK

Cancel

Help

Select required Rainfall Model from the list

Quick Storage Estimate

Micro Drainage

Variables

Results

Design

Overview 2D

Overview 3D

Vt

Variables

FSR Rainfall

Return Period (years)

Region

Map

M5-60 (mm)

Ratio R

Cv (Summer)

Cv (Winter)

Impermeable Area (ha)

Maximum Allowable Discharge (l/s)

Infiltration Coefficient (m/hr)

Safety Factor

Climate Change (%)

100

England and Wales

18.000

0.299

0.750

0.840

1.280

10.8

0.00000

2.0

30

Analyse

OK

Cancel

Help

Enter Climate Change between -100 and 600

Quick Storage Estimate

Micro Drainage

Variables

Results

Design

Overview 2D

Overview 3D

Vt

Results

Global Variables require approximate storage of between 668 m³ and 1020 m³.

These values are estimates only and should not be used for design purposes.

Analyse

OK

Cancel

Help

Select required Rainfall Model from the list

Drainage Assessment Report for Land at
Ley Farm, Chirk

Appendix 4

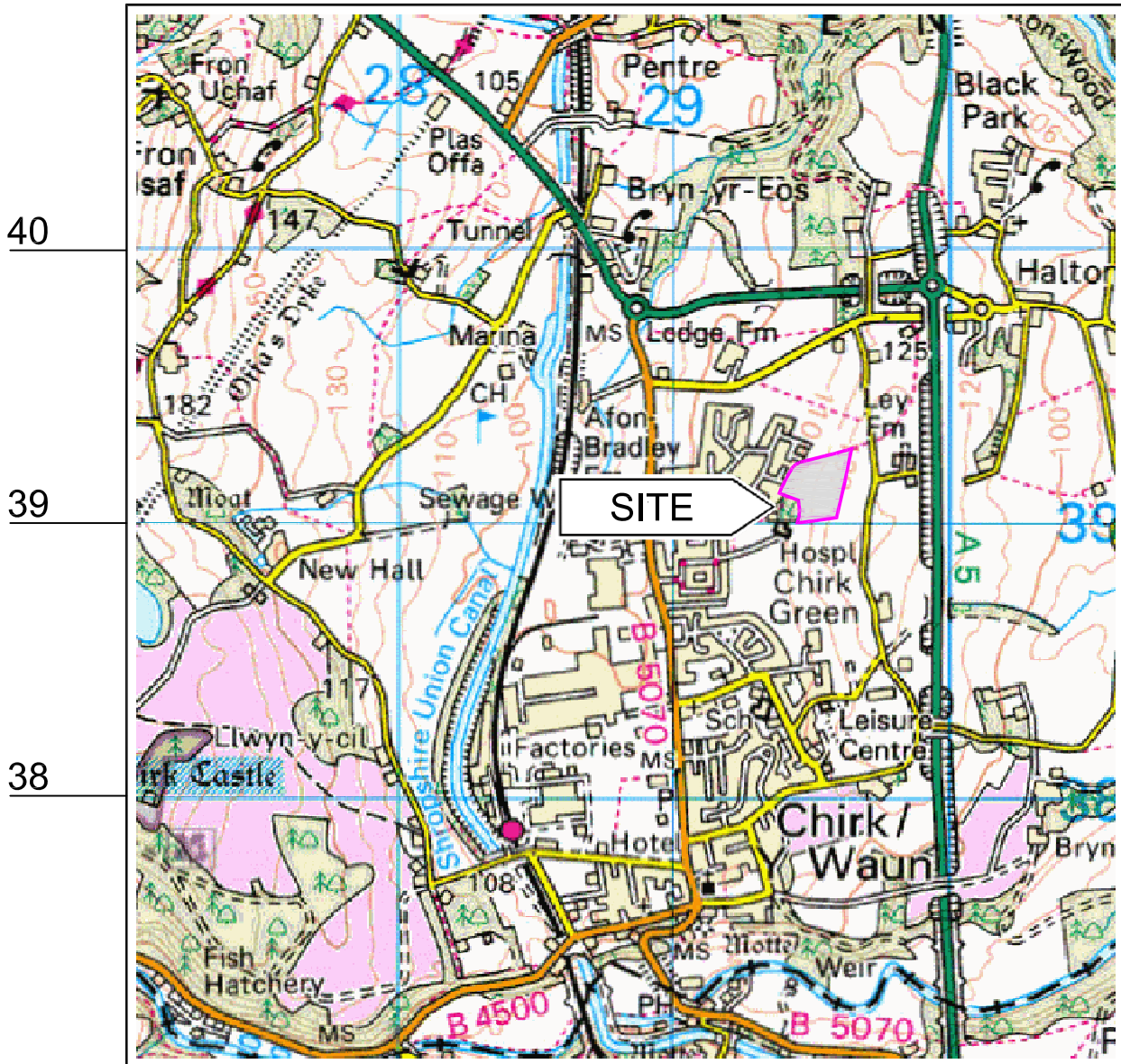
Reference Drawings

<u>Drawing No.</u>	<u>Rev</u>	<u>Title</u>
5823/L1	-	Site Location Plan
5823/100	-	Plan Showing Possible & Existing Culvert Route
5823/101	-	Existing Drainage Services around Culvery Area
5823/102	-	Proposed Route of Surface Water Drainage
5823/103	-	Proposed Development Layout
5823/SK02	-	Proposed Levels
5823/SK03	-	Drainage Strategy



National Grid reference
of the proposed site.

SJ 295 391



27

28

29

30

0 200 400 600 800 1000 1500 2000

SCALE BAR (m)



LEGEND

(All positions are approximate unless otherwise stated)

- Original watercourse route shown on 1954 historical mapping
- Known culvert route as observed by Coopers on 12 March 2015
- Assumed culvert route
- Site Boundary

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DO NOT SCALE

SCALE	NTS						Ley Farm, Sycamore Drive, Chirk. PLAN SHOWING POSSIBLE AND EXISTING CULVERT ROUTE	 chartered consulting engineers Tel: 01244 684910 Fax: 01244 684911 Email: admin@coopers.co.uk Web: http://coopers.co.uk Park House Sandpiper Court Chester Business Park Chester CH4 9QU
DATE	12.03.15							
DRAWN	AH							
CHEK'D	GL							
		Rev	Drwn	Date	App'd	Comments		



LEGEND

(All positions are approximate unless otherwise stated)

-  Original watercourse route shown on 1954 historical mapping
 Known culvert route as observed by Coopers on 12 March 2015
 Assumed culvert route
 Site Boundary

KEY TO CONJECTURED SERVICES

(All positions are approximate unless otherwise stated)

- Surface water lines with flow direction
(taken from ref. a)
- Foul (combined) water with flow direction
(taken from ref. a)

This drawing is to be read in conjunction with the following:-

a) Welsh Water database search conducted on 13 March 2014.

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DO NOT SCALE

SCALE	NTS						Ley Farm, Sycamore Drive, Chirk.	EXISTING DRAINAGE SERVICES AROUND CULVERT AREA	 coopers chartered consulting engineers Tel: 01244 684910 Fax: 01244 684911 Email: admin@coopers.co.uk Web: http://coopers.co.uk Park House Sandpiper Court Chester Business Park Chester CH4 9QU	Drawing No. 5823 / 101	Rev. -
DATE	13.03.15										
DRAWN	AH										
CHEK'D	GL	Rev	Drwn	Date	App'd	Comments					



LEGEND

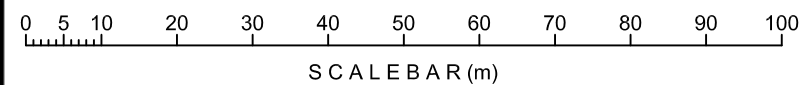
-  Original watercourse route shown on 1954 historical mapping
-  Known culvert route as observed by Coopers on 12 March 2015
-  Assumed culvert route
-  Proposed route of surface water drainage
-  Site Boundary

This drawing is to be read in conjunction with the following:-

a) Welsh Water database search conducted on 13 March 2014.

DO NOT SCALE

SCALE	NTS						Ley Farm, Sycamore Drive, Chirk.	PROPOSED ROUTE OF SURFACE WATER DRAINAGE	coop ers chartered consulting engineers Tel: 01244 684910 Fax: 01244 684911 Email: admin@coopers.co.uk Web: http://coopers.co.uk Park House Sandpiper Court Chester Business Park Chester CH4 9QU
DATE	13.03.15								
DRAWN	AH								
CHEK'D	GL	Rev	Drwn	Date	App'd	Comments		Drawing No. 5823 / 102	Rev. -

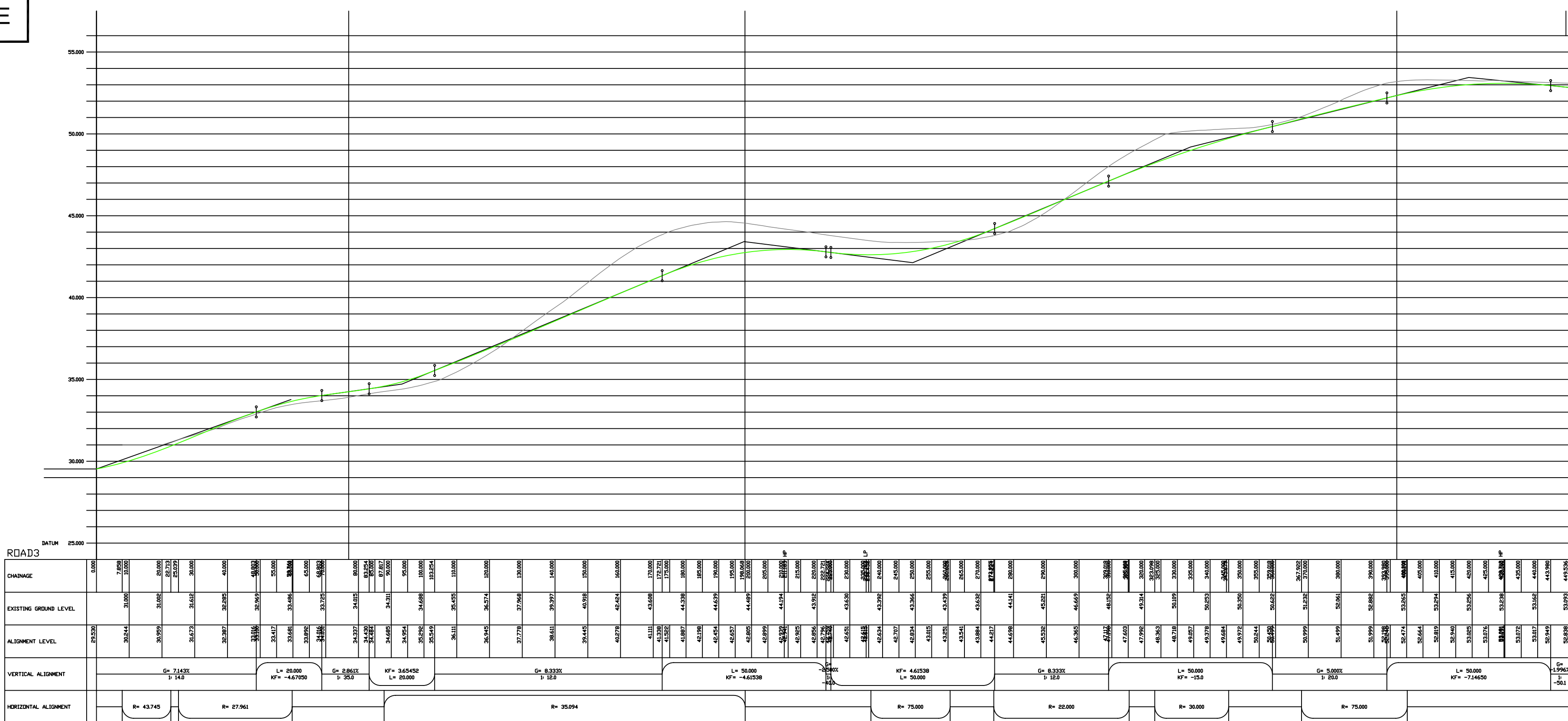


The original of this drawing contained coloured symbols and/or features.
Any black and white reproduction should not be relied upon.

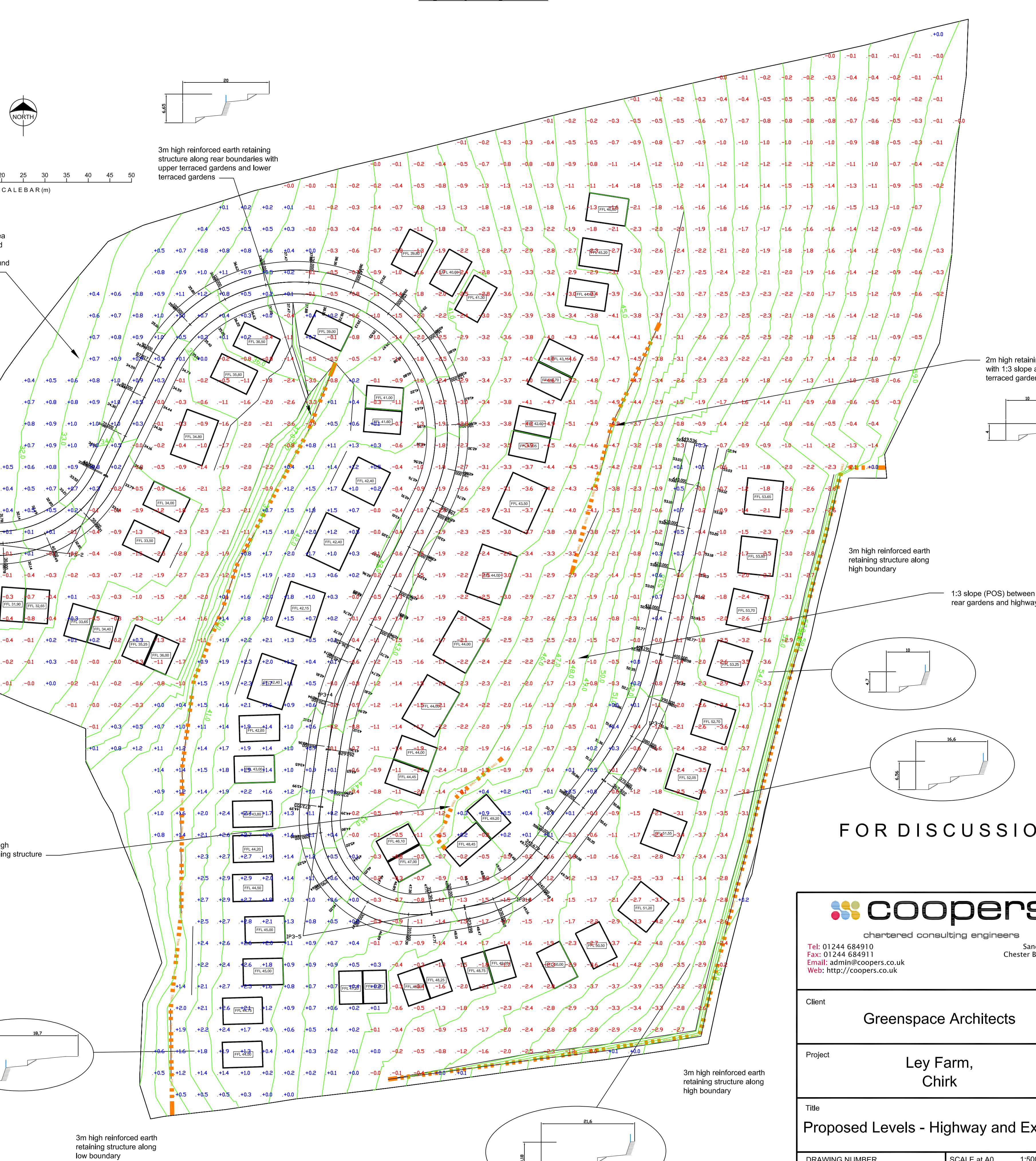
DO NOT SCALE

SCALE	1 : 1250 @ A3						Ley Farm, Sycamore Drive, Chirk.	PROPOSED SITE LAYOUT	 chartered consulting engineers Tel: 01244 684910 Fax: 01244 684911 Email: admin@coopers.co.uk Web: http://coopers.co.uk Park House Sandpiper Court Chester Business Park Chester CH4 9QU
DATE	13.03.15								
DRAWN	AH								
CHEK'D	-	Rev	Drwn	Date	App'd	Comments		Drawing No. 5823 / 103	Rev. -

DO NOT SCALE



Highway Longsection



FOR DISCUSSION

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chartered consulting engineers

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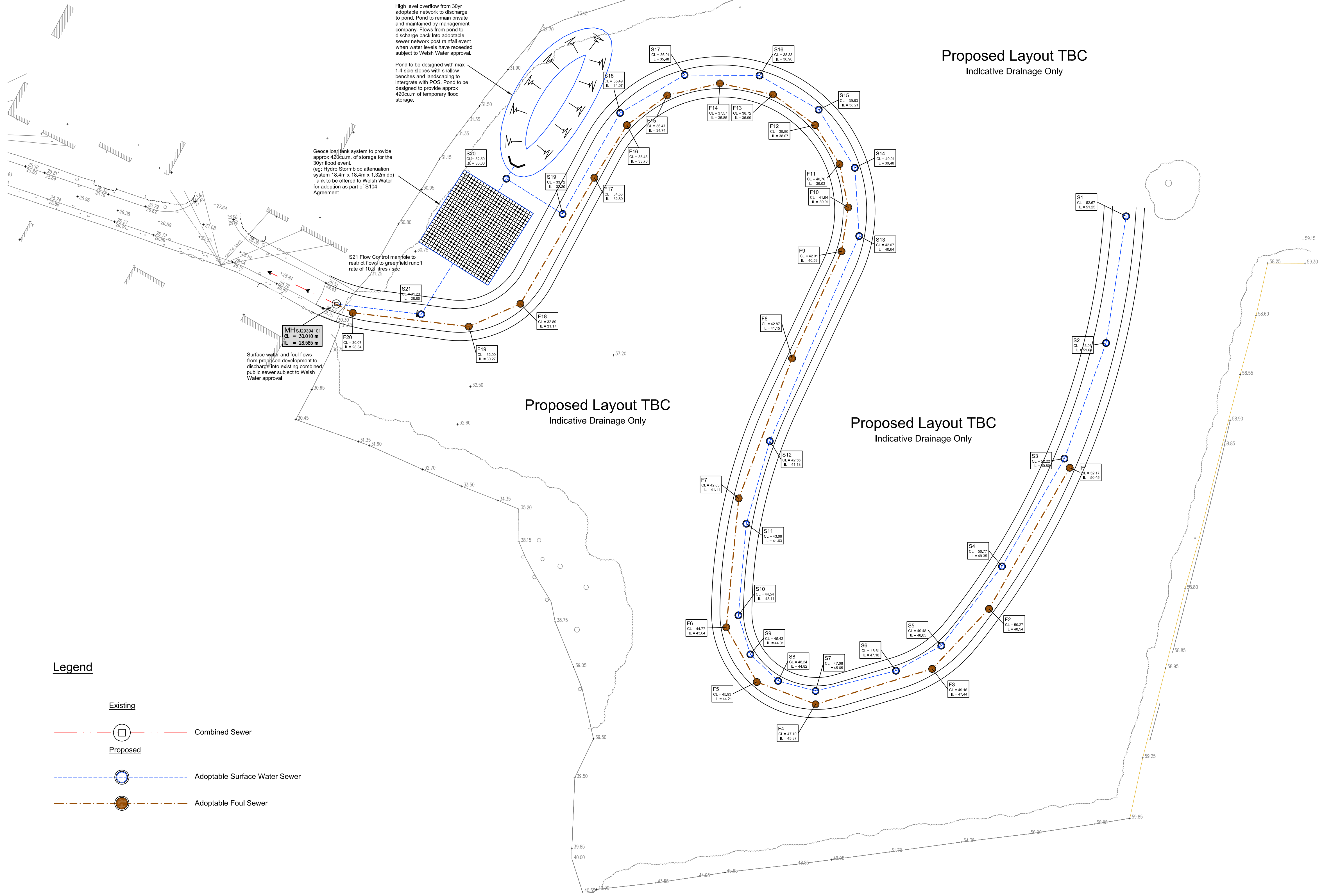
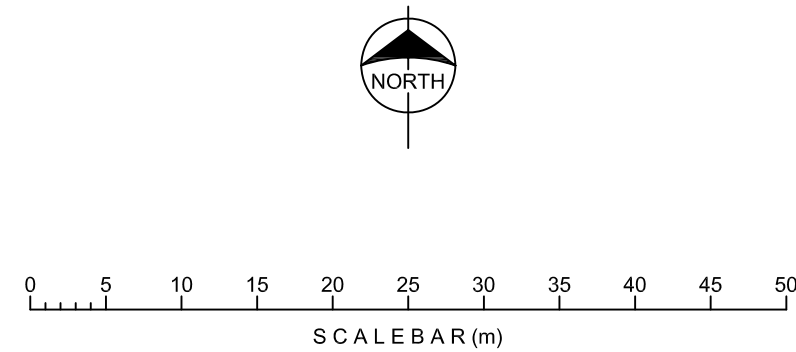
Client
Greenspace Architects

Project
**Ley Farm,
Chirk**

Title
Proposed Levels - Highway and External

DRAWING NUMBER	SCALE AT A0	1:500
5823/SK02	DATE	June 2014
	DRAWN	DK
	CHECKED	AJ
	REVISION	A

DO NOT SCALE



- Notes:
1. All adoptable drainage shall be constructed in accordance with 'Sewers for Adoption' 7th Edition and Welsh Water Details and Guidelines.
 2. All existing invert levels to be checked by the contractor at the start of works and any other discrepancies notified to the Engineer prior to commencing works. All levels are based on topographical survey information provided by others.
 3. It is the responsibility of the Contractor to verify all information given with regards to existing services and drainage connections etc. prior to commencing the works. The Contractor shall adhere to the CDM Regulations at all times.
 4. Only trained personnel shall be permitted to enter confined spaces.
 5. All materials to bear the relevant B.S. Kitemark and comply fully with the specifications. All concrete & concrete products must use Sulphate resistant cement to withstand Class 3 conditions (unless the site investigation report proves that sulphate attack from soils and groundwater will not occur).
 6. All opening notices etc. as required under Highways Acts etc. are to be obtained prior to commencement of works. All works are to be inspected by Wrexham County Borough Council.
 7. Hydro Stormbloc and ancillary products to be constructed in accordance with manufacturers details.

PRELIMINARY



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Client	Greenspace Architects		
Project	Ley Farm, Chirk		
Title	Drainage Strategy		
DRAWING NUMBER	5823/SK03		
SCALE at A1	1:500	REVISION	
DATE	August 2014		
DRAWN	DK		
CHECKED	AJ		