

Our Ref: 2014/055/a/KRW
24th July 2015

FAO Mr Andrew France
AHR Global Ltd
Norwich Union House
High Street
Huddersfield
HD1 2LF



Dear Andrew,

**Coal Mining Risk Assessment at
Proposed Polyseam Site, St Andrews Road, Huddersfield**

Introduction

Following your email instruction, we have now carried out a Coal Mining Risk Assessment for the proposed site at St Andrews Road, Huddersfield on a Coal Mining Report obtained from the Coal Mining Authority and reviewed findings from a ground investigation by FWS Consultants Ltd.

This report should be read in conjunction with the Coal Authority Mining Report dated 03rd July 2008, and excerpts from FWS report, appended at the rear of this letter report.

The purpose of our report is to:

1. Undertake a desk-based review of all information on the coal mining issues which are relevant to the application site after review of the coal mining report.
2. The report should also identify and assess the risks to the development from any coal mining.
3. The report should set out appropriate mitigation measures to address the coal mining legacy issues affecting the site including any remedial works and assess how coal mining issues have influenced the proposed development.
4. Demonstrate to the Local Planning Authority that the application site is safe and stable to meet the requirements of the national planning policy with regard to development of unstable ground.

Sources of Information

Information has been gathered from the following sources :-

- The Coal Mining Authority Report dated 03rd July 2008 (Appendix A).
- Phase 2 Ground Investigation undertaken by FWS Consultants Ltd

We confirm that at present intrusive investigation and drilling has been undertaken on the site as part of the overall ground investigation. We will summarise the findings of the Phase 2 investigation below.

.....Continued
Page 1 of 4

Summary of Coal Authority Report

In Summary, the Coal Authority Non-Residential Ground Stability Report makes reference to:

Underground Coal Mining

Past

According to the records the site is **not** in the likely zone of influence from past underground workings.

The site **is** in an area where coal is believed to be at, or close to the surface. This coal **may** have been worked.

Present

The site is **not** in the likely zone of influence of any present underground coal workings.

Future

The site is not in an area for which the Coal Authority is determining whether to grant licences for future underground coal extraction. The site is **not** in an area that is likely to be affected at the surface from any planned future workings.

However, reserves of coal exist in the local area which could be worked at some time in the future.

No notice of the risk of the land being affected by subsidence has been given under section 46 of the Coal Mining Subsidence Act 1991.

Mine Entries

There are no known coal mine entries within the site, or within 20 metres of the boundary of the site.

Coal-mining Geology

The Coal Authority is not aware of any evidence of damage arising due to geological faults or other lines of weakness that have been affected by coal mining.

Opencast Coal Mining

Past

The development site is not within the boundary of an opencast site from which coal has been removed.

Present

The development site does not lie within 200 metres of the boundary of an opencast site.

Future

The development site is not within 800m of a site where a licence has been granted or being determined to grant a licence to remove coal.

Coal Mining Risk Assessment Report on
Proposed Polyseam Site, St Andrews Road, Huddersfield

Cont'

Coal-mining Subsidence

The Coal Authority has not received a damage notice or claim for the site, or any property within 50 metres, since 1st January 1994. There is no current Stop Notice delaying the start of remedial works or repairs to the site.

We are advised by the Coal Authority that this is a standard clause inserted in all reports.

Mine Gas

There are no records of mine gas emission.

Hazards relating to coal mining

The site has not been subject to remedial works.

Withdrawal of Support

The site is not within an area where a notice of entitlement to withdraw support has been published.

Comments on Coal Authority information.

In view of the mining circumstances a prudent developer would seek appropriate technical advice before any works are undertaken.

Technical advice relating to investigation of coal, should be obtained.

Executive Summary of Coal Mining Report

The site is not in the likely zone of influence from past workings. However, it must be appreciated that the site is in an area where coal is believed to be near or close to the surface and this coal if present, may have been worked at some time in the past.

Summary of Phase 2 Ground Investigation (FWS Consultants Ltd)

BGS Borehole Logs

The records of three boreholes were published within the report and were at distances of 80m, 25m and 30m. The first two boreholes encountered a coal strata, however this was at a depth of 25m ~ 26m. No coal was recorded in the final borehole.

Previous Borehole Investigation

An investigation on this site was undertaken in 1995 by LTG Environmental Services which included 2No. deep boreholes down to 27.5m. Neither of these boreholes encountered Coal or evidence of coal workings.

Borehole Investigation

As part of FWS Consultants Ltd ground investigation, two rotary boreholes were undertaken as part of the works. One recorded a layer of Coal approx. 540mm thick at a depth of 13.16m The other borehole did not record any coal. In both boreholes, there was no evidence of past workings.

Made Ground

The previous investigation and FWS Consultants Ltd investigation both found significant quantities of made ground. The recommendation for the foundation scheme is to use piles to a depth of between 6m and 11m approximately.

Executive Summary of Phase 2

It has been proven that coal does underlay at least part of the site at a minimum depth of 13.16m. The thickness of the seam at this depth however is very thin. The other coal seam encountered was at the limit of being considered 'shallow' being found at approx. 26m.

There is no evidence found in any boreholes both on and off site of past workings on the coal seams beneath the site.

The proposed form of foundation for the scheme will be piles down to a depth of 6m to 11m approximately.

Recommendations – Mitigation Measures

Due to the fact that there is no evidence of past mine workings on the shallow coal encountered, no mitigation measures are necessary.

The coal itself, being of either sufficient depth or insufficient seam thickness would not warrant future extraction, as this would constitute an uneconomic investiture.

The proposed foundation type of piling intends to utilise the rock strata above the position of the coal that has been found meaning it will not have any interaction with it.

Conclusion

1. The Coal Authority has stated that the site is not within an area of past, present or future workings. No mine entries have been recorded within 20m of the site, nor are there any other issues arising from coal mining.
2. The Coal Authority believed that shallow Coal reserves could exist below the site and unrecorded mine workings could be present. The records from several investigations have not indicated any evidence of previous workings. Coal has been found below the site at a sufficient depth to avoid interaction with the proposed foundations.
3. The proposed foundation type is piling down to a depth of 6m to 11m.

I trust the above recommendations meet with your present requirements, in the meantime should you have any further queries please do not hesitate to contact me.

Yours faithfully, Redacted

Stuart McCormick
B Eng (Hons) CEng MStructE
Director

SGM Structural Design Ltd

SGM Structural Design Ltd. Registered in England. Company No: 5465970
S. G. McCormick *BEng (Hons) CEng MStructE* Director
Office at: 24 Thornhill Road Edgerton Huddersfield West Yorkshire HD3 3DD

APPENDIX A

COAL AUTHORITY REPORT



Issued by:

The Coal Authority, Mining Reports Office, 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire NG18 4RG
On-Line Service: www.coalminingreports.co.uk - Phone: 0845 762 6848 - DX 716176 MANSFIELD 5

CUSTOMER SERVICES,
LANDMARK INFORMATION GROUP LIMITED,
ABBAY COURT UNIT 5/7,
EAGLE WAY,
SOWTON INDUSTRIAL ESTATE,
EXETER,
DEVON,
EX2 7HY

Person dealing with this matter: **Darren Moody**
Our reference: 00047233-08
Your reference: 25776495
Electronic Ref: EME_00009890380007_005
RRUID: 005.00009890380007
Date of your enquiry: 03 July 2008
Date we received your enquiry: 03 July 2008
Date of issue: 08 July 2008

This report is for the property described in the address below and the attached plan.

Coal and Brine Report

Car Park At, St. Andrews Road, Huddersfield, West Yorkshire

This report is based on and limited to the records held by, the Coal Authority, and the Cheshire Brine Subsidence Compensation Board's records, at the time we answer the search.

Coal mining	Yes
Brine extraction	No

Information from the Coal Authority

Underground Coal Mining

Past

According to the records in our possession, the property is not within the zone of likely physical influence on the surface from past underground workings.

However the property is in an area where the Coal Authority believe there is coal at or close to the surface. This coal may have been worked at some time in the past.

Present

The property is not in the likely zone of influence of any present underground coal workings.

Future

The property is not in an area for which the Coal Authority is determining whether to grant a licence to remove coal using underground methods.

All rights reserved. You must not reproduce, store or transmit any part of this document unless you have our written permission.

The property is not in an area for which a licence has been granted to remove coal using underground methods.

The property is not in an area that is likely to be affected at the surface from any planned future workings.

However reserves of coal exist in the local area which could be worked at some time in the future.

No notice of the risk of the land being affected by subsidence has been given under section 46 of the Coal Mining Subsidence Act 1991.

Mine entries

There are no known coal mine entries within, or within 20 metres of, the boundary of the property.

Records may be incomplete. Consequently, there may exist in the local area mine entries of which the Coal Authority has no knowledge.

Coal-mining geology

At the surface, there are no known faults or other lines of weakness due to coal mining that have made the property unstable.

Opencast Coal Mining

Past

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

Present

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

Future

The property is not within 800 metres of the boundary of an opencast site for which the Coal Authority is determining whether to grant a licence to remove coal by opencast methods.

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

Coal-mining subsidence

The Coal Authority has not received a damage notice or claim for the property since 1 January 1984. There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority has not received a request to carry out preventive work before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine gas

There is no record of a mine gas emission requiring action by the Coal Authority within the boundary of the property.

Hazards related to coal mining

The property has not been subject to remedial works, by or on behalf of the Authority, under its Emergency Surface Hazard Call Out procedures.

Withdrawal of Support

The property is not in an area for which a notice of entitlement to withdraw support has been published.

APPENDIX B

FWS CONSULTANTS LTD REPORT EXCERPTS



towpath, with a Sainsburys supermarket and a six storey mill building occupied by SCM Turbo beyond; and, to the south by the southern part of the car park and a warehouse occupied by Haigh & Ellis (steel fabricators), with associated parking, beyond. The southern boundary has no physical marker but is approximately in line with the southern old cobbled street.

2.2 Site History

Details of the history of the site and surrounding area can be found in our Phase I report. The details pertinent to the current site are summarised below:-

- the northwestern corner of the site already developed by Turn Bridge Dye Works by 1851, expanding to occupy the majority of the northern margin by 1890, and progressively demolished after 1918;
- the occupation of the remainder of the site by cloth stretching frames by 1851, and by terraced residential houses by 1893;
- demolition of all of the residential houses by 1975 and development of welding works in the northwestern corner (the latter demolished by 1988);
- the use of the site as a car park from before 1988 to the present day.

2.3 Site Features

Our previous Phase I survey report (Ref. 1) should be referred to for descriptions of the features of the entire car park. The revised southern site boundary is shown on the plan in Appendix 1.

The whole car park is predominantly surfaced with very compact gravel and, with the exception of two old cobbled streets that provide access from St Andrew's Road, there are no surface features. In the relatively short period of time since the Phase I inspection was carried out nothing had changed on the site, with the exception of the removal of much of the rubbish/detritus along the western margin of the car park (e.g. television, suitcase of newspapers).

2.4 Previous Investigation

The entire car park site was investigated by LTG Environmental Services in 1995 (Ref. 5), as part of an investigation of two parcels of land in Huddersfield, approximately 400 m apart, which were reported together. On the current site, the investigation comprised the excavation of four trial pits to a maximum depth of 2.9 m and the drilling of four boreholes, using cable percussion techniques, to a maximum depth of 10.2 m. A plan showing the location of the exploratory holes is included in Figure 1. Two of the boreholes were continued using both open holing and coring rotary drilling techniques to a depth of 27.5 m (with a further rotary hole drilled in the southern part of the car park). All of the trial pits were terminated within the made ground, whilst all of the boreholes encountered natural strata. The precise depth of made ground encountered is slightly confused. The borehole logs frequently record the underlying alluvial deposits as 'probable made ground', whilst within the text they are 'considered to be natural in-situ material'.

One of the boreholes was installed with a gas monitoring/water sampling standpipe. Although monitoring of the site was to continue for a complete year, the report was completed after three gas monitoring visits and two water sampling visits. Soil samples were taken from the trial pits for chemical analysis for a wide range of determinands. We have not had sight of the original data and are unable to determine how many samples were tested from the current site. The soil chemical analytical results were assessed against the ICRCCL guideline values (Ref. 7) for buildings and hardcover.

The findings relevant to the current site are summarised below:-

- Made ground encountered across the entire site, up to 3.4 m below ground level (bgl) along the eastern site margin (BH 27). This generally comprised ash, gravel and brick rubble with cobbles and boulders.
- Natural soils comprising 'granular river deposits' of sand, gravel and clay, were proven to depths of between 6.7 m and 10.4 m bgl, with the deepest in the southwestern corner (BH 28). The underlying upper bedrock strata comprised mudstone (described as a shale) in all cases. Deeper bedrock proven by rotary advancement of two of the boreholes encountered a sequence of shale, sandstone and mudstone to 18.1 and 23.0 m bgl; neither encountered beds of coal nor historical workings. Groundwater was encountered between 4.6 and 8.8 m bgl within the alluvial deposits and also within the bedrock at 15.6 m bgl in BH 28.
- From only a very limited amount of gas monitoring, no positive levels of methane and only low carbon dioxide levels (0.8% v/v maximum) were recorded from the single borehole standpipe located on the site.
- A summary of the chemical analytical results indicates exceedences of the ICRCCL and Kelly values in the made ground samples for arsenic, copper, zinc and manganese (although these values would be below the current respective generic assessment values, where relevant). A low concentration (1.595 mg/kg) of polychlorinated biphenyls (PCBs) was also recorded in TP 101 (0.3-1.1 m), located in the north of the site. No significant levels of potential contamination were identified in the groundwater samples tested.
- Due to the confusion between probable made ground and natural soils, the geotechnical data is also difficult to interpret. SPT 'N' values in the made ground appear to range from 19 to 42 and those in the natural soils range from 14 to 45. The undrained shear strength of a clay sample at 2.8 m is recorded as 119 kPa.

3 GROUND CONDITIONS

3.1 Geology/Mining Information

Published British Geological Survey (BGS) information (Ref. 6) indicates that the site is underlain, in turn, by superficial deposits of alluvium and Carboniferous Lower Coal Measures strata (typically mudstone, shale, coal, siltstone and sandstone horizons), with a shallow dip to the east and the Hard Bed coal seam indicated to outcrop below the site in a NE/SW orientation. The underlying Coal Measures strata are classified as a minor aquifer by the Environment Agency.

The logs of three boreholes drilled close to the current site have been obtained from the BGS and are detailed in our Phase 1 Survey report (Ref. 1). These are summarised below:

BH REF.	LOCATION	DEPTH (m)	STRATA
SE11NW323	Approx 80 m SW of SW corner of site	2.8	Made Ground
		4.3	Gravelly Clayey Sand
		7.6	Gravelly Sandy Clay
		8.05	Gravelly Clayey Sand
		11.4	Mudstone/Black Shale
		12.1	'Poor Coal'
		15.0	Shale
		19.0	Sandstone
		27.3	Black Shale
		30.0	Black Shale
SE11NW321	Approx 25 m W of SW corner of site	3.6	Made Ground
		8.8	Gravelly Clayey Sand
		12.5	Mudstone/Black Shale
		13.2	'Poor Coal'
		25.0	Black Shale
		25.7	Coal
		30.0	Black Shale
SE11NW436	Approx 30 m N of NW corner of site	1.7	Made Ground
		7.8	Clayey Very Sandy Gravel
		9.4	Sand and Gravel
		11.0	Carbonaceous Mudstone

The Coal Authority report provided in our original survey report (Ref. 1), for the whole car park, identified that the site was not within the likely zone of influence on the surface from past, present, or known future, underground workings. It does, however, point out that the site is in an area where near surface coal is believed to exist that may have been worked at some time in the past. The Coal Authority has no knowledge of any mine shafts/entries on, or within 20 m of, the site. The Coal Authority has no records of any fault or other line of weakness at the surface having affected the stability of the property, or of any notice of the risk of the land being affected by subsidence being given under the Coal Mining Subsidence Act 1991, or of any related damage notice or claim having been given, made or pursued in respect of the property since 1 January 1984. The property does not lie within a geographical area in respect of which notices of entitlement to withdraw support have been published or revoked. The site does not lie within a geographical area for which a court order has been served to allow coal to be mined in the national interest.

The site does not fall in an area within which basic radon protection measures should be provided (Ref. 1).

3.2 Made Ground

Made ground was encountered in all of the exploratory holes, extending to depths varying between 0.9 (TP 1) and 4.5 m (BH 5), with the deepest likely to represent backfilled basements associated with the former houses. Trial pits 3 and 4 were terminated within the made ground deposits. The upper layer, forming the car park surface, comprised very dense sandy gravel of limestone, dolomite and sandstone. Trial pit 1 encountered several layers of poor quality concrete to 0.35 m. The underlying made ground comprised a mixture of both granular and cohesive materials, but with the same constituent gravel of sandstone, mudstone, brick, cinders, clinker and coal, in various proportions. Rubble of whole bricks,

brick fragments and sandstone cobbles and boulders was encountered in TP 4 (0.4 to >1.85 m), presumably the material used to backfill an old basement.

The cohesive materials varied considerably in strength, ranging from soft to very stiff, whilst the degree of compaction of the granular materials varied from loose to dense.

With the exception of a slight stale odour in TP 5 (0.65 to 1.35 m), there were no marked odours, oily discolouration or significantly elevated PID readings (0.2 ppm maximum) in any of the made ground materials sampled.

3.3 Natural Ground

Natural ground was encountered in all of the boreholes and in three of the trial pits and comprised a mixture of both granular and cohesive alluvial deposits. The cohesive soils were often very gravelly and/or very sandy and the sand and gravel deposits often very clayey, or occasionally silty. In addition, there were also frequent small scale local variations within each of the deposits. It is likely that the variation in these soils, often on a local scale, has led to them previously being recorded as 'possible made ground' or 'disturbed' (Ref. 5). The gravel was mostly sandstone with mudstone, quartz and some fine coal.

Where encountered, the strength of the clay varies from soft to firm, where initially encountered in the upper strata, and increasing in strength with depth to stiff or 'stiff to very stiff' (BHs 1, 2 and 3). The compaction of the granular deposits also increases with depth, generally from medium dense to dense.

No visible oily discolouration, marked odours or elevated organic vapour levels (all <0.1 ppm) were detected in any of the natural soil samples obtained.

3.4 Bedrock/Past Mine Workings

All five of the cable percussion boreholes reached the upper strata of the underlying bedrock, at depths varying between 6.8 m (in BH 5, located adjacent to the southeastern corner of the site) and 11.2 m (in BH 4, located adjacent to the southwestern corner of the site, but at a higher elevation). In each case this was a weak mudstone, highly to completely weathered, and recovered as either a clayey gravel or stiff clay.

The two rotary boreholes (RH 1 and RH 2) drilled in the western part of the site encountered bedrock of dark grey mudstone at 10.1 and 10.4 m respectively. After penetrating the upper weathered mudstone for about 0.5 m, each hole was cored for the next 3 m, and then progressed to a depth of 20 m by further open-holing. The general sequence encountered comprised mudstone, with a bed of sandstone from 16.7 to 17.9 m bgl (1.2 m thick) in RH 1 and from 15.4 to 18.1 m bgl (2.7 m thick) in RH 2. Borehole RH 1 also recorded a bed of coal from 13.16 to 13.7 m bgl, although this was absent in RH 2. The cored sections of each borehole comprised a thinly bedded, moderately strong mudstone with solid core recovery (SCR) ranging from 6.5% to 56.3%. There were no sections of solid core large enough to undertake unconfined compressive stress (UCS) or point load testing (Rock Quality Designation was 0% throughout).

None of the rotary boreholes encountered any evidence of cavities or broken ground from the drilling progress which might suggest the possible presence of former shallow coal workings.

In summary, made ground was encountered across the site, generally with the upper layer, forming the existing car park surface, comprising very dense sandy gravel of limestone, dolomite and sandstone, in varying quantities. Beneath this, the made ground extended to depths varying between 0.9 and 4.5 m and comprised a mixture of both granular and cohesive materials, but with the same constituent gravel. The more cohesive materials varied considerably in strength, ranging from soft to very stiff, whilst the degree of compaction of the more granular materials was generally medium dense. Standard penetration test values within the made ground ranged from N=10 to N=42. Old foundations/infilled cellars have been encountered in places to depths up to roughly 2.0 m, with the deepest made ground also likely to represent backfilled basements.

The natural soils consisted of variable deposits of soft to very stiff, gravelly, sandy clay and generally medium dense to dense, fine to coarse sand and fine to coarse gravel, all in varying proportions. Standard penetration test values within the natural soils ranged from N=15 to N>50. Bedrock, in the form of thinly bedded mudstone, was encountered at depths varying between 6.8 m and 11.2 m. This was assessed as weak and highly to completely weathered near rockhead, becoming moderately strong, occasionally moderately weak or strong. A sandstone band was present from 16.7 to 17.9 m bgl (RH 1) and 15.4 to 18.1 m bgl (RH 2). Coal was found from 13.16 to 13.7 m bgl (RH 1) in the northwestern corner of the site.

Laboratory tests were carried out on soil samples from the boreholes to assist in classifying the cohesive materials present and in providing evidence on in situ strengths. These included determinations of moisture content, Atterberg Limits, particle size distribution, and shear strength from multistage triaxial tests. The results of these tests are included in Appendix 5. There were no sections of solid rock core suitable for carrying out laboratory compressive strength tests or point load tests.

The triaxial tests have, occasionally, produced results which tend to be rather lower than had been anticipated from both field and initial laboratory appraisals. In some instances this could be attributed to the presence of weaker sand lenses within the sample and in others to localised softening on the sides of sample, possibly due to water in the boreholes at the time of sampling.

7.2 Foundations

The shallow made ground materials, in their present state, cannot be relied upon to support the structural or floor loadings normally associated with this type of development on traditional shallow foundations without undue differential settlements occurring. It will be necessary either to transfer the loads through the unpredictable made ground and variable, and in places weak, natural deposits to found in underlying stronger materials.

The use of piled foundations would provide a practical solution. The piles should penetrate any made ground and weak natural soils and, depending on the magnitude of individual pile loadings, are likely to found in the mudstone present between 6.8 and 11.2 m below existing ground level. The choice of a suitable pile type in the prevailing conditions should be made in collaboration with experienced piling contractors who will, on the basis of their experience, provide pile design parameters appropriate to the chosen type. Additional focused investigation to provide further information on rock quality may be required by the piling contractors. Allowance should be made, where necessary, for negative skin friction in the made ground. The presence of groundwater in the natural materials at depth could be of significance relative to any piling works.

gas flow rates or carbon dioxide levels, and no positive methane levels, were detected on the site on any occasion.

- 8.9 No significant potential risks to future construction workers, site occupants, building and services, landscaped borders, neighbouring properties, underlying groundwater or the nearby canal are indicated from the identified contamination, provided appropriate precautions are taken, as indicated in the following section.

9 RECOMMENDATIONS

- 9.1 The proposed development scheme should be designed incorporating the findings of this investigation and our Phase 1 Survey. No evidence of former shallow coal workings has been found in the current, or previously drilled, rotary boreholes. There is no need to remove any of the soil materials from the site based on the current testing programme carried out. If any of the soils have to be removed from site for levelling, services installation or geotechnical reasons, appropriate disposal facilities should be identified prior to their removal. If there is a requirement to dispose of any of the general soils at a landfill, there may be a need for future tests to be carried out on representative samples including Waste Acceptance Criteria (WAC) testing, and the relevant landfill operator(s) should be contacted regarding the acceptability of the relevant soils in the event.
- 9.2 Construction workers involved in any soil excavation operations on site should take normal sensible precautions, which should minimally include wearing clean overalls, protective boots and gloves (or barrier cream). Damping of the soils should be carried out during any excavation work in dry, windy weather or if on-site crushing of rubble is required. No poorly ventilated excavations should be entered without appropriate monitoring being carried out, due to the potential presence of depressed levels of oxygen. Appropriate washing facilities should be provided on site.
- 9.3 Design Sulphate Class DS-2, ACEC Class AC-2 concrete is indicated to be required for future structures coming into contact with the site soils.
- 9.4 No special requirements for resistance to attack by oils/tars or phenols are indicated for future plastic drains or service pipes. If any local pockets of oily contaminated ground are encountered during general excavations, or in pipe trenches, they should be assessed and, if necessary, removed and the excavations/trenches backfilled with clean fill. Unprotected metalwork should not be laid directly in the groundmass; additional protection (e.g. PE sleeving) would be required for non-zinc-coated ductile iron in the ground.
- 9.5 No special gas protection measures are indicated to be required for the proposed future buildings on the site.
- 9.6 For landscaped borders, future vegetation should be planted in soil that is appropriate (composition and thickness) for the purposes. An adequate thickness of clean imported sub/topsoil should be placed above the current soils (typically a minimum of 0.5 to 1.5 m for shrubs and trees, depending on species).
- 9.7 For geotechnical design purposes:-
- The made ground materials and the upper weak natural soils cannot be relied upon, in their present condition, to tolerate loadings anticipated for the proposed development without undue settlements occurring.