

22 June 2021

Our reference: 11542-L01(00)

Mr Pete Masters-Hall
(Development Project Officer)
Bury Council
Town Hall
Bury
BL9 0EJ

By e-mail only to - P.B.Masters-Hall@bury.gov.uk

TRAVELLERS SITE, EVERY STREET, BURY SUMMARY FINDINGS

Dear Pete

Following the on-line project meeting (17th June 2021) with Bury Council and Wilkinson Cowan Partnership, RSK present a summary of the findings to date for the Every Street site.

Please note these findings are preliminary and represent our high-level interpretation of the data, which will be confirmed upon issue of the site investigation report. Data from the final round of gas monitoring is awaited and upon receipt the ground investigation report will be compiled.

Site History

The site was formerly a gravel pit (western area), which had been progressively infilled to form a Corporation Yard. The gravel extraction had taken place between 1850 (no pit shown) and 1894 (complete). The site was generally open but bounded with tracks that crossed the site once filled (prior to 1930) and was occupied as a gypsy and traveller site in the 1990's to current.

Site Description

The site was occupied with individual plots for travellers, with six associated facility blocks. The site is roughly rectangular in shape and access is from the north via an entrance on Every Street. Individual plots are separated by wooden fencing secured with concrete posts, approximately 1.2m high. Occupied plots contained a mobile caravan. The facility blocks include a food preparation area with plumbing for washing, cleaning, and toilets.

Earth bunding surrounds the site to a height of approximately 4.00 m. The content of the bund includes mixed waste material, including wood, plastic, metal, fabric, and soil.

Borehole Log Summary

Six window sample boreholes were drilled under the supervision of RSK across the site. Made ground was encountered at depths ranging from 1.20-1.90 m bgl. However, the made ground at borehole BH2 (southwest corner) was noted to extending to 5.40 m bgl. The made ground was noted to typically comprise MoT gravel under asphalt, with the majority of made ground being clay with fragments of natural stone, ceramics, fragmented brick, macadam, and coal. The made ground encountered in BH2 contained ash and clinker from 1.45 m to 5.40 m bgl and is considered to comprise the waste utilised to backfill the former gravel pit in the first quarter of the Twentieth Century. This material appears to be confined to a smaller part of the site than initially anticipated. The made ground, which forms the upper surfaces (generally <1.45 m deep) over the entire site is considered relatively recent.

Groundwater was absent from boreholes BH2 and BH6, with only a slight seepage noted in BH4 at the time of drilling. Multiple water strikes, possibly associated with confined sand lenses, were encountered from 2.00 m to 4.50 m bgl within the remaining boreholes during drilling. Negligible groundwater was recorded during the course of the ground gas monitoring.

Ground and Landfill Gas Assessment

As the site (former gravel pit) had been filled predominantly prior to the 1930's, the made ground is not anticipated to be a highly putrescent, especially as there was an incinerator (refuse destructor) associated with the Corporation Yard, beyond the north western boundary. Typically for this age of landfill the predominant form of fill is ash and clinker.

Ground gas monitoring has been completed on five of the six boreholes drilled on site (a well was not installed into BH4). Groundwater was deep during the course of the ground gas monitoring and would not have impacted the results obtained.

During the course of the monitoring, no methane, carbon monoxide or hydrogen sulphide had been recorded. Carbon dioxide had been recorded within all boreholes with a concentration less than 5% by volume, with the exception of BH2 on the third visit, where a concentration of 7.3% by volume was recorded. Carbon dioxide is a ground gas which is common in ground, especially with ash and clinker deposits. As there was no ground gas flow recorded at this position, even at very low atmospheric pressure, this lone result which exceeds 5% by volume is not considered to pose a risk to human health. All properties will be considered as Characteristic Situation 1 for all ground floor slabs excluding pre-cast concrete ground floor slab (block and beam), where the NHBC Green ground gas situation is to be adopted. These require no special ground gas mitigation measures.

Contamination and Remediation

Eight samples were submitted for analysis at Envirolab from boreholes BH2, BH4, BH5 and BH6. During the logging of the drilled core, slight hydrocarbon odours were noted within boreholes BH1 (0.25-0.50 m bgl), BH2 (0.35-1.35 m bgl), BH5 (0.80-1.75 m bgl) and BH6 (0.40-1.85 m bgl). It should be noted that all these made ground strata had asphalt incorporated within the soil mass.

PAH (polycyclic aromatic hydrocarbon) compounds (a product of combustion) were noted to be elevated for human health in boreholes BH2 (0.40 m bgl), BH5 (0.90 m bgl) and BH6 (0.60 m bgl). The source of the PAH compounds is anticipated to be from the asphalt recorded as well as the clinker noted in the soil

mass. Hydrocarbon analysis of the soils with an odour noted elevated concentrations of aromatic compounds, and maybe associated with the PAH compounds previously discussed.

Concentrations of metals exceeded generic assessment criteria for human health of arsenic and lead within borehole BH2 (ash and clinker fill), and copper and zinc for phytotoxic thresholds (both 0.40 m and 1.55 m bgl).

Asbestos was assessed within three samples. Chrysotile fibres and cement board were noted in BH2 (0.40 m bgl), however the samples analysed from BH4 and BH6 were not noted to contain asbestos.

Remediation is anticipated to be associated with the capping of the site to prevent contact from the travellers occupying the site, as well as service contractors working on site within the made ground strata. It is proposed that the majority of the site will be covered with hardstanding, with limited areas green space. Due to the presence of asbestos within the made ground in borehole BH2, all road corridors should comprise inert strata to a depth of 1.00 m below the proposed invert of the deepest service (typically foul sewer), where made ground is present, to protect service workers when repairing infrastructure.

It would be prudent to aerate those made ground noted to have a hydrocarbon odour to naturally deplete any volatile compounds.

A potable water supply pipe risk assessment has not been undertaken but it is possible that due to the presence of hydrocarbons within the soil, water supply pipes will require some protection.

Geotechnical Assessment

Standard penetration tests (SPT's) have been completed on all natural strata at metre intervals during drilling. The strength of strata (measured in blows with the SPT hammer - 'N' values) were typically over 10 (generally 10 to 20), although BH5 recorded 'N' values between 4 and 14. SPT tests are meant to be in situ tests for granular strata. However, there is a rule of thumb correction factor for alluvium (x5) and glacial clay (x10). An 'N' value of between 10 and 30 is considered medium dense in granular strata. Borehole BH5 was noted to be very loose to loose, becoming medium dense at 5m bgl. The conversion to cohesive classification, will make the clay strata predominantly firm becoming stiff with the shallower natural strata in BH5 being soft.

Foundations for these units are anticipated to comprise either custom designed screw piled foundations, small diameter piles or semi-stiff integral rafts.

For rafts to be adopted, a safe bearing pressure of 50kN/m² will be required and it would be prudent to turn the site over to a depth of 1.5m and recompact. This will ensure that should there be any unforeseen contamination, this will be treated accordingly, and should provide a development platform for the proposed use.

Bund Material

The site is surrounded by an earth bund containing approximately 2,000m³ of a mixture of soil and solid waste material (rubber, timber, metal, fabric, plastic, etc). Prior investigation has shown the soil to contain some asbestos and hydrocarbon contamination. The footprint of the bund covers a large area of the site and will require treatment to remove this feature. There are several options for the treatment of bund material, including:

- excavate and remove to landfill as hazardous (due to asbestos)
- leave in-situ and cover
- sort the bund into material suitable for reuse, and those which require disposal

Estimates for the removal and disposal of this material from site are between £750-850,000 but volatile prices will need to be confirmed at the time of commissioning. These costs are based on landfill tax at the rate of £96.70/tonne (2021/2022 rate) and estimates of current disposal costs. The disposal costs are largely market driven and can fluctuate very quickly depending on demand.

Disposal to landfill is the least sustainable option and there is also a considerable carbon footprint associated with the anticipated tipper-lorry journeys.

The bunds could be covered to remove the potential direct contact risk for the site occupants, and this would also prevent the proposed development from being completed.

It may be possible to sort and remove unsuitable ('U' grade) materials from the bund for disposal and reuse those soils which have a geotechnical purpose on site. This approach, if feasible, will be sustainable and potentially cheaper compared to the complete removal and disposal off-site. The volume of 'U' grade materials is not known but can vary between 20-40% and is highly dependent on the composition. The bund material will need to be assessed for its suitability for re-use on the site.

It may be possible to incorporate the bund soils into the site development as part of a soil turnover exercise, whereby the shallow made ground is excavated, sorted and recompacted and the recovered soil from the bund may be placed within this turnover and only within approved areas (below the plots, hardstanding and green areas at depth).

Compaction, which occurs during soil turnover can typically reduce site levels. An assessment of the volume of suitable materials from the bund which will be incorporated within the general made ground are likely to make a minimal impact on site levels.

The suitability of the bund material for re-use and the methodology for placement will need to be assessed as part of a remediation strategy for the site. Assessment for the use of a material management plan (MMP) under the Definition of Waste Code of Practice (CL:AIRE) should also be undertaken at the time the remediation strategy is produced.

Contractors

A list of local companies who can undertake the work required at the site include:

- RemedX (an RSK Group company)
- ADM Regen
- Soilfix
- Cheetham Hill Construction (CHC)
- Urban Regen

Should you have any queries regarding the above, please do not hesitate to contact our office.

Yours sincerely

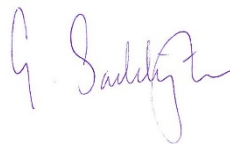
For RSK Geosciences



Nik Reynolds

(Author)

Principal Geo-Environmental Consultant



Gavin Saddington

(Reviewer)

Principal Hydrogeologist

cc. David Booton (Wilkinson Cowan Partnership) – by e-mail to david.booton@wilcowan.com