Appendix J

Infiltration Testing

GEO-TESTING SERVICES
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COMPLIATION REPORT on INVESTIGATIVE WORK

carried out

on land known as

1, HENFAES ROAD TONNA NEATH GLAMORGAN.

on behalf of

Emily Byrne.

NOVEMBER 2024.

GEO-TESTING SERVICES
The Estate Office
Walnut Tree Farm
Cleeve
Bristol
BS49 4PQ

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WALK OVER STUDY.

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PHASE 1 WALK OVER STUDY REPORT.

of land at & adjacent to

1, HENFAES ROAD,
TONNA,
NEATH PORT TALBOT.

on behalf of

IMA TRANSPORT PLANNING LTD.

Report No: 2024/10/1100/A **October 2024**

GEO-TESTING SERVICES
The Estate Office
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SITE WALKOVER STUDY – 1, HENFAES ROAD, TONNA, NEATH.

1) A site walkover was undertaken on the 6th of September 2024 to assess the site for any visual or olfactory evidence of contamination, historical land use and potential investigation and development constraints. The weather during the site visit was dry.

2) The proposed development site is located along Henfaes Road, Neath/Port Talbot Glamorgan and is as shown on the attached site plan.

3) The current access to the site is directly off Henfaes Road and at the time of the survey comprised Herras Fence barriers. [See Photographs Main Reports].

4) The development site is a rectangular [albeit it a somewhat irregular] area of land some 0.6ha It is at present disused and considerably overgrown. [See Photographs]

5) The site contains a now derelict "Georgian Mansion" which in its time would have been of some substance. However, it is now derelict having suffered fire damage in [it is understood] c 2012 and has been the subject of a structural survey. The results of this survey show that the building is not capable of being restored and consequently it is not considered in these report to be an issue which requires attention other than that associated with its removal. [see Drainage Report and Main Report Photographs] The remainder of the land is now an historic garden area but completely overgrown.

6) The boundaries are:

   - To the north/east – A stone wall fronting Henfaeas Road.
   - The remainder of the boundaries are "old fences" and historic ditches/mounds alongside other property.

7) As a part of this exercise and preliminary to a Phase 1 Desk Study of the site Historical maps have been consulted and highlight that its historic use was as the garden/amenity land associated with the Georgian Mansion

8) It is also noted from this information that the site does lie within a coal mining area as defined by the as a High-Risk Reporting Area. Preliminary work suggests that the mining operations on or under the site [whilst considerable] will be at depths which have not had and will not have any impact on the proposed development. This aspect will however be dealt with in detail in the CMRA being prepared.

9) The walk over survey found no evidence of visual or olfactory contamination of any significance However there is likely to be some localised historic tipping resulting from the fire. This is likely to be buried within the undergrowth. There was no evidence of fuel storage tanks above or below ground, and no hazardous chemicals observed during the visit. No evidence of asbestos containing material (ACM) was observed on the ground surface of the site during the walkover survey.

10) There were no surface water features, or any areas of standing water observed.

11) The site at the time of this walk over survey was as it has been for some years.

12) CONCLUSION:

Following a review of the information gathered from historical maps of the area and the site walk-over, no significant evidence of any potential sources of contamination were identified from the site walk over survey. This is notwithstanding what may be found on the limited clearance of the area will require and with respect to potential contamination associated with the fire and its suppression. However, any contamination is likely to be localised and of a low level.

13) The proposed development is to comprise normal residential units of accommodation on two floors. These would be rated for contamination and occupation purposes as having the for plant up take within any soft landscaping/garden areas.

14) The attached photographs give some indication of the current layout of the site and its access.

15) Work on the geology of the site for the Desk Study indicates that the site will be underlain by superficial deposits of an unknown depth. There are however likely to be of such a composition and depths as to provide a foundation system which is normal.

Nicholas Harrisson BSc. Hons.....October 2024

PHASE 1 DESK STUDY.

PROPOSED RESIDENTIAL DEVELOPMENT

Henfaes Road, Neath, Port Talbot SA11 3DX

Geo-Environmental Site Assessment Report

REPORT NO. 2024/11/1100

REVISION 4

20/11/2024

PREPARED BY

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ON BEHALF OF

Emily Byrne

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APPENDICES

A Groundsure Report
B Historical Ordnance Survey Mapping
C Present Day Ordnance Survey Mapping
D Coal Mining Risk Assessment (CRMA) Report No. 2024/09/1100
E Walk Over Study Report No. 2024/10/1100 A
F Geo Technical Intrusive Ground Investigation Report No. 2024/10/1100 B
G Sustainable Drainage Systems (SUDS) Report No. 2024/10/1100 C

1. Introduction

1.1 Terms of Reference

Geo Testing Services has been commissioned by Emily Byrne, hereafter referred to as the Client, to prepare a Geo-Environmental Site Assessment Report in relation to a proposed residential development at Henfaes Road, Tonna, Neath.

The report presents the findings of the site assessment and includes the following Documents in the Appendix.

- Phase 1 preliminary desk-based assessment — Report No. 2024/11/1100
- Phase 1 Walk Over Study — Report No. 2024/10/1100A
- Phase 2 Geotechnical Intrusive Ground Investigation — Report No. 2024/10/1100B
- Phase 3 Coal Mining Risk Assessment CMRA — Report No. 2024/09/1100
- Phase 4 Sustainable Drainage Systems (SUDS) — Report No. 2024/10/1100C

The report provides a geotechnical interpretation, including preliminary advice concerning foundation and ground floor slab design / construction, together with information to aid in the design of pavements and soakaways. Generic quantitative assessments of chronic human health risks associated with the presence of potentially contaminated soils and risks arising from potentially hazardous ground gas are also presented, together with a preliminary qualitative assessment of potential risks to controlled waters.

1.2 Site Location & Description

The site comprises a Grade II Listed building which is to be demolished as part of the proposed development on Henfaes Road, Tonna, Neath, Port Talbot, SA11 3DX. The approximate National Grid reference for the site is SS 76927 98616. The site is situated within Tonna, North East of Neath on Henfaes Road (B4434) and is mainly surrounded by residential properties. The River Neath lies approximately 140m to the north of the site and the A465 lies 400m to the north-west.

The site can be accessed from Henfaes Road.

The site is 0.64 hectares and is an irregular shape, nearly rectangular with a cut out area towards the East at the front of the property adjoining the main road (B4434).

In the southern corner of the site the original topographical survey indicates that there was a body of water and identified as having poor quality with signs of pollution. The ground is boggy across the southern aspect of the site. 8 trees within the site have Tree Preservation Orders.

The original house is elevated towards the rear of the plot with level variations across the site from North East to South West with a gradual fall towards the south east of around 1.5m overall.

1.3 Proposed Development

We understand that the proposed development will include the construction of 8 properties consisting of 5 detached units and 3 terraced units It is proposed that plot 1 at the front of the site utilises the existing basement of the demolished house and all other units will be 2 storey.

There are 3 access points to the site, spaced along the North West site boundary off Henfaes Road.

The access known as access 3 that formerly gave access to the rear stable yard will become the primary access. It is considered the most appropriate location for cars to access the site.

1.4 Objectives

The primary objectives of this investigation are summarized as follows.

(i) Examine the possible physical ground and groundwater conditions at the site.

(ii) Identify and investigate potentially significant geotechnical and geo-environmental hazards.

(iii) Consider ground contamination in relation to threats posed to human health and controlled waters.

(iv) Advise on the need for remedial actions, or further investigation, to address potentially unacceptable human health or environmental risks associated with identified ground contamination hazards.

(v) Advise on geotechnical conditions, identify foundation options, and provide advice relating to ground engineering matters in the context of the proposed development.

1.5 Scope of Work

In order to achieve the objectives summarized in Section 1.4 above, the following general scope of work has been carried out.

- A desk study involving the review, collation and appraisal of factual data
- A Walk over Survey assessing the site for visual or olfactory evidence of contamination, historical land use, potential investigation and development constraints
- Geotechnical Intrusive Ground Investigation

- Coal Mining Risk Assessment (CMRA)
- SUDS

2. Desk Study

2.1 General

The desk study has examined information relating to the historical and present-day land uses in the vicinity of the site, together with geological, hydrogeological and environmental conditions from a variety of sources. This section of the report identifies the principal sources of data that have been consulted.

The information furnished by this desk study is referred to in subsequent sections where it is significant, or has relevance, to consideration of the various issues addressed by this report.

2.2 Sources of Information

The principal sources of information consulted by the desk study are summarized below.

A	Groundsure Report	
B	Historical Ordnance Survey Mapping	
C	Present Day Ordnance Survey Mapping	
D	Coal Mining Risk Assessment (CRMA)	Report No. 2024/09/1100
E	Walk Over Study	Report No. 2024/10/1100 A
F	Geo Technical phase 2 Intrusive Investigation	Report No. 2024/10/1100 B
G	Sustainable Drainage Systems (SUDS)	Report No. 2024/10/1100 C
H	50yrs Archives	

2.3 Walkover Survey

The Walkover Survey was completed and the results are covered in the appended Report No: 2024/10/1100/A.

2.4 Recent History

The history of the site and the surrounding area is summarized below following the examination of historical Ordnance Survey and Groundsure mapping.

- The first documented map of the site are is from 1877. This shows a reference to Tyn Yr Heol, this is likely the name of the land in the immediate area, which is the name subsequently given to the main house. Various other buildings sit alongside the house. Sitting slightly below is a reference to Ty'n-Yr-Heol-Fach, again likely to be the name of the land area, with no buildings apparent. Fach means small, so this is the lesser area of land to Ty'n Yr Heol. Tonnau is named on the map and depicts a small area of houses, a methodist chapel and a small school. The Neath Canal runs through Tonna and there is reference to The Royal Oak and a property called The Lock House. The Great Western Railway runs on the same trajectory as the railway.

- By 1897, the house is depicted on the map with 2 other ancillary buildings and Ty'n-yr-Heol is written on the map with no further reference to Ty'n-yr-heol-fach. A towing path is illustrated on the same line of the canal as The Lock house and a lock. Tonna shows a more industrial picture with references to quarries and the Tin Plate works next to the railway. An increased number of clearly marked dwellings are apparent with The Methodist Chapel and St Anne's chapel referenced.

- The 1914 mapping shows that the original house has been extended, with two ancillary buildings still illustrated. Ty'n-yr-heol-fach is referenced this time on the other side of Henfaes Road (as known today) near a rectangular building. The immediate vicinity to the house is fields. The railway line is still very apparent with the Tennant Canal and tow path listed above the railway line. The River Neath is depicted below the Railway line. Tonna itself shows further development, mainly residential with an increased number of properties and cottages apparent. A wooded area is still prevalent beneath Tonna referencing "Old Quarries". The Methodist Chapel is still visible and St Ann's Chapel is now a church. The Tin Plate works by the railway is evident as a significant industrial site.

- No further mapping is available during the war time period.

- The 1921 mapping shows further development to the town. 2 schools are illustrated and the Methodist Chapel is a Presbyterian Church. 3 dwellings are also evident in close proximity to Ty'n-yr-Heol. The area surrounding the house still shows to be mainly flanked by fields.

- During 1936-1938 Tonna shows to be a small town with an increased number of post World War 1 residential dwellings. A large number of fields still exist below the site and areas of woodland are still apparent below Tonna.

- No mapping is available during the Second World War period and the immediate years afterwards.

- By 1951 The Tin Plate works are not documented but a much smaller building is apparent where the site once stood. This is likely due to the Second World War. The site itself is still flanked by fields. Development in the area at this point seems very much the same as the period of 1936-1938. No significant development is apparent in the mapping of 1962.

- The mapping for 1973 shows an increased area of development above the Neath Canal. Tonna itself shows expansion and the large wooded areas beneath it show a vast reduction. Henfaes Road is documents as the road which the site is accesses off. Residential properties with clear gardens are shown to either side of the site. 2 large industrial buildings sit on the Old Tin Plate works site. Various school playing fields are also listed with an increase in the number of schools around the area.

- During 1982-1991 steady development of Tonna and surrounding areas is evident. A large roundabout above the railway line is documented with roads spurring from it. Llantwit in particular shows further development into the rural fields towards the area that the site sits. The railway line is depicted as a mineral railway.

- The period of 2001 shows major infrastructure changes on the mapping. The roundabout now feeds major A roads including A4109, A4230, A465. A smaller roundabout feeds off the main round about with the B road B4434 which is Henfaes Road where the site is located. The maps are now modern day maps clearly showing green spaces and residential properties as well as major infrastructure. The site now reflects the current site today with the addition of a cul-de-sac of properties behind the site.

2.5 Geology

The geology of the site has been assessed on the basis of an examination of published British Geological Survey mapping, together with information included within the Geology Report and Envirocheck Report and other data, as summarized below.

- No Made Ground Deposits are shown to underlie the site. However, an area above the site, where large infrastructure changes have occurred do show made ground deposits. This has previously been identified as the development of a major roundabout and A roads detailed in the recent history section above.

- There are superficial geological deposits known as drift, (the youngest geological deposits that rest on bedrock), these boulders, cobbles, gravels and sands created by river deposition. Landslips have not impacted the

areas around the site. There are 5 records noted within 500m which include Diamicton, Sand and Gravel, Clay, silt, sand and gravel.

- The Bedrock on the site is comprised of Mudstone, Siltstone and Sandstone.
- There are no recorded boreholes, shafts or wells in the form of drilling or site investigations. However extensive SOB (Single Onshore Boreholes) are recorded where the infrastructure development occurred for the main roundabout and subsequent A roads, also annotated in the Made Ground paragraph.
- The site Geology infers there is a very low or negligible risk of natural ground subsidence as a result of soils that absorb water (when wet) leading to swelling and then shrinking as it dries. Running sands at the site are highlighted as a very low risk. There is a risk associated to the area of Made Ground as identified in the infrastructure development of the main road areas. Compressible deposits from soft materials such as clay or peat are identified as being very low at the site. The Made Ground area above the site are identified as presenting a high risk. The risk of collapsible deposits is very low.

2.6 Hydrology, Hydrogeology and Environmental Setting

- In close proximity to the site is the Neath Canal, a manmade water source, that contains water all year-round under normal circumstances. The Neath River, an inland river with no tidal influences is located relatively close to the site. It contains water all year round under normal circumstances.
- The Tennant Canal is also in the vicinity, a manmade watercourse that contains water all year round under normal circumstances.
- The River Neath holds a good chemical and ecological rating.
- There is a low risk of flooding at the site. The site falls in flood zone 1 for Rivers and Sea, with a 0.1% chance of flooding each year with a low risk of flooding from surface water and small watercourses between 0.1% and 1% each year.
- There is a low to moderate risk of groundwater flooding at the site.
- There are Ancient Semi Natural Woodlands in the vicinity of the site, that have been present since 1600AD.
- There are records of several listed buildings, including the dilapidated building on the site Tyn Yr Heol, which is Grade II listed and sits back from Henfaes Road. Other listed buildings include Nazareth Chapel, The Lock House and The Lock and Bridge.
- There is a conservation area listed as Tonna Canal Depot.
- Some 36 agricultural land areas are identified ranging from moderate to good

2.7 CONCLUSIONS RELATING TO CONTAMINATION.

It is possible to make the following comments after considering the findings of the desk-based research. The reports of the Phase 2 work, the SUD's work, and the Coal/Coal Legacies work have also been referenced.

- Based on the available mapping and other sources identified in this desk study, the site has been for some considerable time a historic garden area of a large house in Tonna. The land itself has not historically or currently been used for any contaminative activities and the site itself has always been an agricultural field/garden area. It has remained sealed since its closure.

- The surrounding areas are not considered to have significant contaminative legacies, although the site does lie within a wider area of some industrial activity [mining now historic] There is no significant driver for considering potential contamination from these activities at a level which would impact on the proposed development.

- The site whilst being underlain by a normal thickness of topsoil is entirely covered with small trees and shrubs producing disproportionate levels of roots and rootlets. This, material when disturbed by the groundworks would not be capable of reuse as encapsulation for any soft landscaping. The site will therefore require a Clean Cover System to provide the soft areas which may arise from the detailed design. It is recommended that this be designed nearer the completion of the project and be based upon a testing program to quantify the thickness of imported topsoil which would be required for a classification of

  - **RESIDENTIAL WITH PLANT UPTAKE.**

- Radon. The site is located near areas of Radon in the range of 10% to 30%. The actual site is in a designation of 5% to 10%. Given the likely high-end value of the houses as built it is recommended that full Radon protection be installed in all houses.

Nicholas Harrisson BSc. Hons. .....November 2024.

PHASE 2 INTRUSIVE REPORT.

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REPORT ON PHASE 2 STUDY

of land at & adjacent to

1, HENFAES ROAD, TONNA, NEATH PORT TALBOT.

Report No: 2024/10/1100/B **October 2024**

GEO-TESTING SERVICES
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1. INTRODUCTION.

1.1 TERMS OF REFERENCE

This report describes various inspections, the Phase 2 geotechnical intrusive ground investigation completed at the site known as 1 Henfaes Road, Tonna Neath. Glamorgan.

A part of the geotechnical work on the site it has been the subject of a full Desk Study [REPORT NO 2024/11/1100.

This Phase 2 Intrusive report has referenced the above report and may contain extracts from it and other published work.

The rationale for this work is that the site was previously used as housing for a large Georgian House with extensive gardens. The creation of the current site involves the demolition of the Georgian House and the use of the original gardens.

The current intrusive phase of the investigation has involved the construction of trial holes, on site testing and the extraction of samples for the completion of engineering laboratory tests.

In addition, a report on the investigation as to the likely permeability of the site in relation to SUD's requirements has been carried out and reported separately. [REPORT NO 2024/10/1100/C.

The findings of additional trial holes carried for possible high-level coal/coal legacies under the site. [REPORT NO 2024/09/110/A.

1.2 DEVELOPMENT PROPOSALS.

The site is a rectangular area of land enclosed on three sides by other residential properties the fourth boundary is Henfaes Road.

A consent has not yet been granted by the LPA for the development of the site with new units of residential accommodation. However, this is likely and that they will comprise houses of conventional construction of two storeys.

1.3 OBJECTIVES OF THE INTRUSIVE INVESTIGATION.

The main aims of the present ground investigation have been to:

- Delineate the strata succession at the three trial hole locations and additional trenches as shown on the appended plan. The former as part of the SUD's investigation. The latter was to investigate the possibilities of historic near surface coal/coal legacies. This method of exploration was chosen to suit the existing access and to limit disturbance the ecological state of the site.

- To review the requirement and relevance of this work with reference to the Desk Study and other work in the area and to evaluate the way that they might impact on the site and in turn on this report.

- Complete insitu tests and obtain samples of the various subsoil materials encountered, to enable engineering laboratory tests to be completed to determine a characterisation of the natural ground.

- Observe and record the presence if any and level of water in the trial holes during the investigation.
- To observe and report on any unforeseen visual or olfactory [hydrocarbon derivatise] materials likely to cause contamination.

2.0 SITE DETAILS.

2.1 LOCATION AND DESCRIPTION.

The site is located adjacent to Henfaes Road Tonna Neath and at the time of this work it comprised disused garden areas and the derelict property. The latter will be demolished as part of any development.

The site is located at a general post code of SA11 3EQ. The site is approximately 0.12 ha.

A site location plan is presented in the body of this report.

2.2 HISTORY.

The history of the site is not repeated here, it having been covered in the Desk Study report save to say that its present configuration is the result of the original house and its gardens/ associated infrastructure becoming derelict and disused following a fire.

The fire itself [it was understood in 2012] is unlikely to have caused possible contamination other that from what may have been used to extinguish it. However, for the purposes of this report it has been assume that the removal of its remains will be carried out under normal Waste Accreditation Certification [WAC] as apart of any groundwork.

2.3 GEOLOGY.

The detailed geology is dealt with in the Desk Study. It is however, thought that in terms of the materials which will form the foundation medium for the development, that they will be superficial deposits as described in this report. Insitu rock was not reached by the trial holes. These may be classed as dense.

The superficial deposits comprise boulder to gravel size rounded pebbles with some sub angular and angular rock debris. These are bound in a matrix of coarse to fine sand with some silt.

FOR THE PURPOSE OF THIS REPORT THESE WILL BE DESCRIBED AS SUPERFICIAL DEPOSITS.

3.0 INVESTIGATION.

3.1 FIELDWORK

The plan appended to this report indicates the approximate position of the three trenches/trial holes constructed during the investigation. The excavation works, trenches, insitu testing and sampling were undertaken in October 2024 in fair weather conditions.

The results of these trial holes were also used for the investigations related to the SUD's investigations and testing and some exploratory work associated with coal/coal legacies. They are reported elsewhere but referenced here.

The location and number were determined in the light of the proposed development, previous work in the area, the Terms of Reference set out above and the protection of the trees within the Tree Preservation Order zone [TPO].

In addition, the trial hole positions were located with consideration for underground services, the ecology of the site and any existing underground or surface features possibly linked to adjacent residential properties.

Prior to excavations at each position the area was scanned using a Cable Avoidance Tool.

A 3-ton rubber tracked excavator was used to dig the holes which enabled virtually continuous disturbed soil samples to be recovered for testing.

These recovered samples were examined on site and sub-sampled for transportation to the laboratory.

Observations were to be kept concerning the presence and level of water in the trial holes.

Observations were to be kept concerning the olfactory presence of any hydrocarbon related ground gases.

The trial holes terminated at the depths shown on the appended log sheets. Their main purpose was to establish the nature of the underlying materials, and particularly the composition of the likely river superficial deposits thought likely to exist under the site.

They were also to be used to examine the superficial deposits to make a judgement on the possible occurrence of near surface coal workings or legacies. This was likely to be of the order of 2/3m in depth. Insitu rock was not expected to be located at the depths likely to be reached by the digger.

3.2 LABORATORY TESTING

Samples obtained from the investigation have been used for a variety of laboratory tests to determine basic engineering characteristics of the sub soils.

- **Engineering Tests – Laboratory.**

The following types of tests have been completed on samples obtained during the excavations and the results are appended to this report.

- Moisture Content Determinations,
- Plasticity Tests,
- Soil Classification Tests.
- Samples were selected for testing for the normal geotechnical requirements in relation to the need to decide the type of concrete to be used in any buried concrete.

- **Insitu Testing.**

Hand Vane Tests were to be carried out if possible.

3.3 PHYSICAL GROUND AND GROUNDWATER CONDITIONS

a) MADE GROUND

The made ground on this site comprised was in the main topsoil and other garden material associated with the existing derelict house and its previous use.

Details of the depths of these materials are as shown on the log sheet as attached but in general are likely to form a thin layer across the site of c 250mm in depth.

b] NATURAL GROUND.

The natural strata succession encountered in the trial holes was consistent with that expected from an examination of the geological map and the Desk Study Report.

These comprised dense superficial deposits as described above.

3.4 GROUNDWATER

Groundwater was not encountered during the excavation of any of the trial holes.

Given the composition of the superficial deposits there is unlikely to be a general standing water table at a depth likely affect the development.

3.5 GROUND GAS AND OLFACTORY CONTAMINATION

There were no visual and/or olfactory signs of any hydrocarbon related material/ground gas during the construction of the trial holes.

3.6 VISUAL INSPECTION FOR POSSIBLE CONTAMINATION.

All of the excavated material was inspected for possible non- hydrocarbon contamination.

3.7 TRENCHING.

The BRE 365 trial holes were to be extended to establish if any coal/coal legacies were present within the depths excavated.

3.8 BRE 365 TESTING.

Three BRE 365 tests were to be completed in the locations decided upon by the Drainage Consultants. Access was created to these locations and the suspected superficial deposits exposed.

The BRE 365 tests holes were then excavated within this material and the tests carried out.

4. CONCLUSIONS and RECOMMENDATIONS

The site, notwithstanding the various points made in this report is obviously satisfactory for the development of normal residential accommodation. It is also considered that coal/coal legacies will not have or make any material impact on the construction of the houses and infrastructure.

Geotechnical

This site has very few geotechnical issues in relation to what are likely to be modest loadings from conventionally built properties. These are dealt with as below.

Foundations.

The object of this report is primarily to define the most suitable option available in respect to the foundations for the houses.

Given that natural ground [the head deposit/superficial materials of the insitu rock] is at a shallow depth below the present surface level there are no other options.

These foundations would take the form of normal reinforced strip foundations located on the natural or in the superficial deposits. The final level will be decided by the Geotechnical Engineer. It is however thought that this will be of the order of 1.2 m to 1.5m below existing ground level.

The available safe bearing capacity of these material is far in excess of what is required for he likely imposed loads.

They should be located on or in the head deposits/rocks at a general depth of 1.2m to 1.5m below the current ground level and are likely to be of the order of 1.0m wide by 600mm deep.

The possible design bearing capacity is unlikely to exceed is 100 kNm^{2} based on the normal loadings for such buildings. The capacity of the dense superficial deposits is more than adequate to deal with this.

Any additional reinforcement as may be needed should comprise two layers of suitable mesh [as approved] with 75 mm cover to the top and bottom.

It is not known what new tree planting may be required but the existing designated trees are at or near their maturity.

Given that the superficial deposits are non plastic any future root growth form these is unlikely to be an issue.

RADON.

The site in a designated Radon area where 5% to 10% of properties may be affected.

It is however considered that houses of the likely value of these houses would have appropriate membranes installed irrespective of this designation.

GROUND BEARING SLABS.

The site is suitable for the consideration of ground bearing slabs. These should be located on the superficial deposits and constructed on a layer of 300mm of clean Type 1 material which has been rolled and compacted in two layers. The 250mm concrete slab should contain layer/s of mesh with suitable cover.

The mesh reinforcement should be not less than B503 Fabric Reinforcement with minimum laps of 400mm.

TOPSOIL

The site is underlain by general topsoil/garden arisings. Whilst it is considered that these would be suitable for reuse [following testing] they are likely to contain considerable small root growth for the vegetation on the site.
It is recommended that a clean cover system of topsoil encapsulation be adopted for the development in line with 5 below.

SOIL CLASSIFICATIONS

Engineering.

The natural material overlying the insitu rocks is classified as

NON-PLASTIC.

The superficial deposits are in total considered to be also non plastic, and it is not considered that ground heave will be a problem on this site.

Buried Concrete/Soluble Sulphates Cement Classification.

The results of the engineering chemical tests carried out indicate that no special precautions are needed in respect to soluble sulphates.

There being non plastic superficial deposits underlying the site and no water table present within them any buried concrete in the foundations will not be affected by soluble sulphates.

It is recommended and assumed that a normal design mix with Portland Cement should be used. It is assumed that this mix will reflect its use for reinforced concrete.

REMEDIATION

The site does not require any remediation as no made ground was encountered and a Clean Cover System will be applied to the gardens using the existing topsoil [where possible] when it has been tested to ensure its compliance with relevant Soil Guideline Values SGV's. The classification of the Clean Cover System should be.

RESIDENTIAL WITH PLANT UPTAKE.

Nicholas Harrisson BSc. Hons.....November 2024.

BRE 365 TESTING REPORT.

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REPORT

on

BRE 365 TESTING

of land at & adjacent to

1, HENFAES ROAD,
TONNA,
NEATH PORT TALBOT.

Report No: 2024/10/1100/C **October 2024**

GEO-TESTING SERVICES
The Estate Office
Walnut Tree Farm
Cleeve
Bristol
BS49 4PQ

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EXECUTIVE SUMMARY.

EXECUTIVE SUMMARY/GENERAL CONCLUSIONS.

1. It is concluded from this work that the site is suitable for normal redevelopment of a residential nature.

2. The site has been shown to be underlain by the superficial sub soils which were previously anticipated.

3. STORM WATER DISPOSAL. In terms of sustainable drainage for the design arising's from the stormwater the site has been found to be underlain by an adequate suitable disposal medium in the form of glacial superficial deposits. The results of the BRE 365 tests indicate an adequate level of K [Coefficient of Permeability] to indicate that normal soakaway will be able to dispose of the design storm arisings. These whilst not known in detail at this are likely to be such that each property will be able to have its own bespoke soakaway, and that the communal areas/attenuation areas/permeable paving's can also be adequately drained. holes. The general material in which the soakaways will be constructed is defined as boulder, cobble, pebble and gravel size superficial deposits and are in matrix of coarse and fine sand with some silt.

   This material has a Coefficient of Permeability well in excess of that required to provide the drainage of the site.

4. UNFORSEEN CONTAMINATION. No unforeseen contamination was found during any of the excavations conducted on the site whilst conducting these tests.

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1. INTRODUCTION.

1.1 TERMS OF REFERENCE

This report describes the findings of an intrusive investigation and BRE 365 testing for ground permeability completed at the site known as Land 1 Henfaes Road Tonna Neath Port Talbot Glamorgan.

The site was at a general post code of SA11 3EQ.

The testing requirements have been designed and commissioned by the drainage designers.

Our own data base, previous reports and published documentation has also been reviewed as part of this phase of the work.

The current intrusive/testing phase of the investigation has involved the construction of three BRE 365 trial holes and the completion of insitu and laboratory tests.

These were constructed at locations chosen by the drainage consultants.

BRE365 permeability tests were undertaken at the location shown on the appended plan.

1.2 DEVELOPMENT PROPOSALS.

The site is an area of land in Tonna Neath and comprises an area of old garden land with a derelict Georgina House adjacent to it. It fronts Henfaes Road and is surrounded by other residential development.

Final details of any proposed development are not known at this stage as there is no planning consent. It is however likely that this will comprise some eight detached units of accommodation.

1.3 OBJECTIVES OF THE INTRUSIVE INVESTIGATION.

The main aims of the present work have been to:

To complete a review of the work carried out under our various Reports by way of a Coal Mining Risk Assessment, a Phase 1 Desk Study and a Phase 2 Intrusive Investigation.
These also included reference to available public sources of information and was followed by:

- Work to delineate the strata succession at the trial hole locations. These were excavated by a tracked mechanical digger. This method of exploration was chosen to suit the existing access and conditions.

- Insitu testing tests and the extraction of samples of the various subsoil materials upon which laboratory tests to be completed to determine the engineering properties of the ground.

- Observations to record the presence and level of any water in the trial holes during their excavation.
- To complete BRE 365 [2016] permeability tests at the chosen points on the site These locations were to be based upon the preliminary drainage strategy prepared by IMA of Bath.

2.0 SITE DETAILS.

2.1 LOCATION AND DESCRIPTION.

The site and its location and description are dealt with in previous reports, but reference here as required.

2.2 HISTORY.

The history of the site is dealt with in detail in previous reports the information from which has been used and referenced as needed.

2.3 GEOLOGY.

The solid and drift geology of the site is not dealt with here in detail. However, it was thought likely that the site would be underlain by substantial thicknesses of superficial deposits.

These superficial deposits are likely to comprise historic sand and gravels with silts and clays laid down by the action of rivers and water many years ago.

3 INVESTIGATION.

3.1 FIELDWORK.

The plan appended to this report indicates the approximate position of the trial holes constructed during this investigation.

The BRE 365 tests were carried out in the trial holes as shown on the appended plan.

The location of the BRE 365 trial hole was determined by the Drainage Consultant [Messrs IMA of Bath] in the light of the site conditions, the positions of underground services, existing underground, and surface features and tree preservation orders. These were adjusted to avoid where possible disturbance in relation to access.

Prior to digging the positions were scanned using a Cable Avoidance Tool.

A rubber tracked excavator was used to dig the holes.

Water was supplied by 20 lt. drums and refilled from water near the site.

The work was conducted on the 17th & 18th of October 2024 in clear weather with no rain.

The recovered samples were examined on site and sub-sampled for transportation to the laboratory.

Observations were to be kept during the excavation of the trial holes concerning the presence and level of any natural ground water which might ingress as the work proceeded.

3.2 SITE & LABORATORY TESTING

Samples obtained from the investigation have been used for a variety of laboratory tests to determine their basic engineering properties to supplement those already taken and evaluated.

The following types of tests have been completed.

Engineering. [Laboratory]

Moisture Content Determinations,
Plasticity Tests,
pH & Soluble Sulphate Determinations.
Laboratory Falling Head Permeability tests.

Site Testing.

A BRE 365 [2016] permeability test was conducted in each of the trial holes at the locations shown on the appended plan.

The field results of the tests are also appended to this report.

3.3 GROUND CONDITIONS.

a) GENERAL.

The investigation over most of the site has revealed uniformity and consistency in the natural ground conditions in which closely replicated those expected from reference to geological data.

Trial Hole No. SA1

GL - 250 mm Black/Dark Brown and TOPSOIL and rootlets.
250mm - 450mm Coarse pebbles ranging from 15mm to boulder size in fine angular and sub angular gravels with coarse to fine sand and silts
450mm - 1250mm Cobbles. Pebbles and sub angular gravels in fine To coarse sand with some silts.

No ground water ingress or standing.

Trial Hole No.SA 2.

GL - 200mm Black TOPSOIL and roots.
450mm - 1100mm Boulders/cobbles/large of pebbles and sub angular gravels in light and some silt/sand as a matrix.

No ground water ingress or standing.

Trial Hole No. SA 3.

GL - 200mm		**TOPSOIL**
200mm - 1200mm		**Boulder size pebbles, sub angular cobbles and gravels in matrix of coarse and fine sand.**

No ground water ingress or standing.

b] MADE GROUND.

The made ground strata succession encountered in the trial holes was consistent with that expected and is as described above and comprised normal black agricultural topsoil with rootlets.

c] **NATURAL GROUND.**

The site area investigated is underlain in general terms by a superficial deposits comprising various sized boulders to fine gravels in a matrix of sands with some silts. They derive from deposits of water borne material created over many years. Whilst they were not found at depths greater than the base of the trial holes it is considered from nearby recent investigative work in the area that they could be up to 10/12m in thickness.

3.4 GROUNDWATER.

There was no external ingress of water into the trial/test holes.

4. CONCLUSIONS.

a) General.

The BRE 365 trial holes found natural sub soil in the form of boulder size to small gavels size rounded glacial river deposits in a coarse to fine sand with some silt. These were proven to a depth of c 1.20m and became progressively denser with depth.

They are the result of historic erosion and action by the flow of river/waterways etc. from the surrounding hillside leading to their deposition at lower levels. Their main pebble-like structure having been created by general attrition during the deposition.

b] Soil Classifications. [Engineering]

The sands/sandy clays and silt matrix to the gravels found throughout all the trial holes is classed as being of

NO PLASTICITY or on separation LOW PLASTICITY.

The results of the engineering chemical tests indicate that no special precautions will be needed in respect to soluble sulphates for any new buried concrete.

c] Unforeseen Contamination

No unforeseen contamination was found during any of the excavations.

d] Laboratory Soil Permeability. [Falling Head/Constant Head Permeability
Testing.

A disturbed sample of the smaller pebbles/gravel/silts was reconstituted to form a sample at the likely density and consistency of the natural insitu formation.

It was prepared to a degree of compaction to replicate its likely optimum density as measured by displacement testing of the insitu material.

The purpose of this was to seek a correlation between the material likely to form the upper part of any soakaway/attenuation system and the BRE 365 field tests.

5. SITE PERMEABILITY. [Attenuation/Soakaways]

The results of the insitu permeability tests [BRE 365 Tests] indicate that the main zone for any soakaways/attenuation/ slow disposal of stormwater arisings will be the superficial geological deposits which were found throughout the succession of each trial hole.

The was little general difference in the ground level across the site of each trial holes.

The detailed results of the drawdown/s achieved is appended to this report.

The following are the average values of the Coefficient of Permeability for the materials likely to be used to provide the percolation medium/s for any soakaways/attenuation areas.

They have been averaged across the site and referenced in conjunction with the laboratory tests and the possible design volumes of storm water.

Underlying Material	Average k [m/s]
Boulder/cobble/Pebble size gravels in a coarse to fine sands [c 200mm to 1200mm]	1.0×10^{-2}

The permeability of the sub soil at or below the 1.20m whilst not located by the trial holes is likely to remain at the above levels or increase with less fine matrix material.

Nicholas Harrisson BSc. Hons.....November 2024

SITE LOCATION/PLAN SURVEY.

Scale 1:200

TRANSPORT PLANNING

MONTREUX HOUSE, 18A JAMES STREET WEST
BATH BA1 2BT
01225 444 011
www.ima-tp.com

CLIENT: Emily Byrne	TITLE: Location of Trial Pits	SCALE: (A3) 1:500	CHECKED: DS	APPROVED: DS
PROJECT: 1 Henfaes Road, Tonna Neath		CAD FILE: IMA-24-077_TP01.dwg	DESIGN/DRAWN: PDI	DATE: October 2024
		PROJECT No: IMA-24-077	DRAWING No: TP-01	REV: -

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TRANSPORT PLANNING

MONTREUX HOUSE, 15A JAMES STREET WEST
BATH BA1 2BT
01225 444 011
www.ima-tp.com

CLIENT:	Emily Byrne
PROJECT:	1 Henfaes Road, Tonna Neath
TITLE:	Location of Trial Pits

SCALE: (A3) 1:500	CHECKED: DS	APPROVED: DS
CAD FILE: IMA-24-077_TP01.dwg	DESIGN/DRAWN: PDI	DATE: October 2024
PROJECT No: IMA-24-077	DRAWING No: TP-01	REV: -

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BRE 365 FIELD TEST LOCATIONS.

TRANSPORT PLANNING

MONTREUX HOUSE, 19A JAMES STREET WEST
BATH BA1 2BT
01225 444 811
www.ima-tp.com

CLIENT: Emily Byrne	TITLE: Location of Trial Pits	SCALE: (A3) 1:500	CHECKED: DS	APPROVED: DS
PROJECT: 1 Henfaes Road, Tonna Neath		CAD FILE: IMA-24-077_TP01.dwg	DESIGN/DRAWN: PDI	DATE: October 2024
		PROJECT No: IMA-24-077	DRAWING No: TP-01	REV: -

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BRE 365 FIELD TEST RESULTS.

FIELD RESULTS:

Land at 1 Henfaes Road Tonna Neath Port Talbot Glamorgan.

SOAKAWAY FIELD TEST DATA [BRE 365 [2016]

Trial Hole SA1 . Location As per Plan.

Time	Drawdown 1	Drawdown 2
[Min]	[Total mm]	[Total mm]
1 min	N/R	NR
2 min	NR	NR
10 min	NR	NR
15 min	N/R	300
20 min	270	380
25 min	350	470
35 min	550	NR
40 min	800	550
50 min	NR	800

NOTES.

Trial Hole 800 mm x 800 mm x 800mm deep.

Effective Depth of Test: 0.20m to 0.80m

Material: See Report.

Drawdown: Depth below Datum.

Location: See Plan

Hole to be cleaned after each drawdown.

N/R denotes Not Recorded.

FIELD RESULTS:

Land at 1 Henfaes Road Tonna Neath Port Talbot Glamorgan.

SOAKAWAY FIELD TEST DATA [BRE 365 [2016]

Trial Hole SA 2 . Location As per Plan.

Time	Drawdown 1
[Min]	[Total mm]
1 min	N/R
2 min	N/R
3 min	270
4 min	380
5 min	NR
10 min	450
15 min	N/R
20 min	570
25 min	700
35 min	800

NOTES.

Trial Hole 800 mm x 800 mm x 650mm deep.

Effective Depth of Test: 0.00m to 0.80m

Material: See Report.

Drawdown: Depth below Datum.

Location: See Plan

Hole to be cleaned after each drawdown.

N/R denotes Not Recorded.

FIELD RESULTS:

Land at 1 Henfaes Road Tonna Neath Port Talbot Glamorgan.

SOAKAWAY FIELD TEST DATA [BRE 365 [2016]

Trial Hole SA3 . Location As per Plan.

Time	Drawdown 1
[Min]	[Total mm]
1 min	N/R
2 min	250
10 min	400
15 min	550
20 min	650
25 min	NR
35 min	700
40 min	800

NOTES.

Trial Hole 800 mm x 800 mm x 800mm deep.

Effective Depth of Test: 0.20m to 0.800m

Material: See Report.

Drawdown: Depth below Datum.

Location: See Plan

Hole to be cleaned after each drawdown.

N/R denotes Not Recorded.

RESULTS of ENGINEERING TESTS.

RESULTS OF LABORATORY TESTS.

Sample Ref.	Sample Depth [m/No]	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index %	% Passing 425µm sieve	pH	Sol. Sulphate mg/l SO_4
TP SA1	0.40 M	7.00	12	NP	NP		7.5	< 250
TP SA1	0.80				NP		7.0	<250
TP SA1	0.80				NP		7.0	<250
TP SA2	0.40 M	5.00			NP		8.0	300
TP SA2	0.60				NP		7.5	305
TP SA2	0.80				NP		6.	300
TPS A3	0.40M	3.00			NP		6.5	<250
TP SA 3	0.60				NP		8.0	<250
TP SA3	0.80				NP		7.5	<250

* Matrix Samples Sandy Clay/ Clay Fines tested. DENOTED M

PHOTOGRAPHS.

HITACHI
dpd

IMA-24-077 Tonna - SA1

	Test 1	Test 2	Test 3
Time taken to empty to 75% depth (Mins)	25	18	
Time taken to empty to 25% depth (Mins)	36	44	

Trail pit dimensions

Length (m)	Width (m)	Depth (m)
0.8	0.8	0.8

Invert of discharge, below ground level (m)	0.2
Volume between 75% and 25% depth (m^3)	0.192
Mean surface area of Trial Pit - a_{s50} (m^2)	1.6

Soil Infiltration rate	1.82E-04	7.69E-05	#DIV/0!
Average Soil Infiltration Rate	1.29E-04 m/s	4.66E-01 m/hr	

Depth of water above the base (mm)

Time (mins)	Test 1	Test 2	
1.00			
2.00			
10.00			
15.00		300	
20.00	270	380	
25.00	350	470	
35.00	550		
40.00	800	550	
50.00	0	800	

IMA-24-077 Tonna - SA2

	Test 1	Test 2	Test 3
Time taken to empty to 75% depth (Mins)	2		
Time taken to empty to 25% depth (Mins)	21		

Trail pit dimensions

Length (m)	Width (m)	Depth (m)
0.8	0.8	0.65

Invert of discharge, below ground level (m)	0
Volume between 75% and 25% depth (m^3)	0.208
Mean surface area of Trial Pit - a_{s50} (m^2)	1.68

Soil Infiltration rate	1.09E-04	#DIV/0!	#DIV/0!

Depth of water above the base (mm)

Time (mins)	Test 1	Test 2	
1.00			
2.00			
3.00	270		
4.00	380		
5.00			
10.00	450		
15.00			
20.00	570		
25.00	700		
35.00	800		

IMA-24-077 Tonna - SA3

	Test 1	Test 2	Test 3
Time taken to empty to 75% depth (Mins)	7		
Time taken to empty to 25% depth (Mins)	20		

Trail pit dimensions

Length (m)	Width (m)	Depth (m)
0.8	0.8	0.8

Invert of discharge, below ground level (m)	0.2
Volume between 75% and 25% depth (m^3)	0.192
Mean surface area of Trial Pit - a_{s50} (m^2)	1.6

Soil Infiltration rate	1.54E-04	#DIV/0!	#DIV/0!

Depth of water above the base (mm)

Time (mins)	Test 1	Test 2	
1.00			
2.00	250		
10.00	400		
15.00	550		
20.00	650		
25.00			
35.00	700		
40.00	800		