

Willis Construction

OPEN HEARTH, RINGLAND, NEWPORT

Outline Remediation Strategy Report

14144/RH/26/ORS

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1.0 INTRODUCTION

1.1 GENERAL

Intégral Géotechnique (Wales) Limited have been appointed as Geotechnical and Geoenvironmental Consultants by Willis Construction to prepare a remediation strategy for the redevelopment of the site known as Open Hearth, Ringland, Newport to a standard suitable for proposed residential end use.

The location of the site is shown in Figure 1.

The following reports have been produced by Intégral Géotechnique (Wales) Limited for the site:

- Open Hearth, Ringland, Newport, Site Investigation Report, Report No. 14144/LS/23/SI dated February 2023.
- Open Hearth, Ringland, Newport, Supplemental Site Investigation Report, Report No. 14144/RH/26/SSI/RevA dated February 2026.

These reports have been used as part of this remediation strategy and should be read in conjunction.

The purpose of this report is to provide a remediation strategy for the delivery of the site to a standard suitable for the proposed residential end use and it details how the remediation works will be monitored and validated.

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1.2 PROPOSED DEVELOPMENT

A sketch layout for the scheme indicates that the proposed development will likely comprise a two-storey apartment block in the southwest of the site, a three storey apartment block in the southeast of the site and six semi-detached houses in the northern half of the site.

1.2 PROPOSED DEVELOPMENT (CONTINUED)

The development will also include associated access, car parking, private and communal gardens and areas of soft landscaping.

A 2-2.5m high gabion retaining wall is to be constructed to the south and east of the proposed semi-detached housing, segregating this part of the development from the remainder of the site. It is also proposed to form reinforced earth bank retaining structures within the existing sloped grassed area in the north of the site.

The area behind the gabion retaining wall will be filled in front of the existing slope to achieve desired levels beneath the proposed plots and gardens.

The sketch layout is shown on Le Trucco Design Drawing No. LTS296.03.01, Revision B, dated July 2021. An extract of this layout plan is presented in Figure 2.

2.0 BACKGROUND

2.1 SITE LOCATION AND DESCRIPTION

The site is located in Ringland, Newport, centred on an approximate National Grid Reference of 335480, 188120, see Figure 1.

The site is irregular in shape and occupies an area of approximately 0.82 hectares. The boundaries of the site are defined by Hendre Farm Drive to the north, residential properties to the east, the A48 Southern Distributor Road to the south and mature trees to the west with residential properties beyond. A current site plan is presented in Figure 3.

The site is situated on sloping ground that declines from an approximate elevation of 18m AOD in the north, dropping some 5m in elevation to approximately 13m AOD in the south.

The northern area of the site comprises a southwards declining grassed slope, leading from Hendre Farm Drive down to the main body of the site. The slope becomes more pronounced towards the east as Hendre Farm Drive inclines gently towards the east.

A cul-de-sac also known as Hendre Farm Drive, diverges from the main Hendre Farm Drive route and passes through the northeast of the site.

At the base of the grassed bank, a tarmacked car park is present in the east of the site. A path and steps provide a pedestrian route from the car park, across the grass bank to Hendre Farm Drive. The car park's southern edge is defined by a brick wall, which retains it above a turning area at the end of the Hendre Farm Drive cul-de-sac.

The south-eastern portion of the site is fenced off from the remainder of the site and is disused. A metal palisade fence forms the northern edge of this area, and a high timber fence defines its southern edge, separating it from the adjacent A48 Southern Distributor Road. This area is surfaced with concrete and tarmac, and scrub vegetation and trees grow along its boundaries, particularly to the south. A number of disused underground fuel tanks are known to exist in the northeast corner of this area beneath surface concrete, two of which have been exposed to reveal tanks in concrete banded and sand filled chambers. Several metal fuel line pipes have also been identified in this excavation.

The western and south-western area of the site was previously occupied by the Open Hearth public house, and its surrounding access and car park, which remain tarmacked. The public house has been demolished, but its concrete floor slab is still present.

2.1 SITE LOCATION AND DESCRIPTION (CONTINUED)

Some rubble materials originating from demolition works remain across the northern area of the former building, and the old basement has also been infilled with rubble.

Two small overgrown mounds of waste materials are present, north and west of the former public house.

The far south-western corner of the site is wooded.

An un-named stream passes through the south of the site, roughly parallel to the southern site boundary. This is channelled in an open culvert through the wooded area, but continues beneath the east of the site within a closed culvert.

2.2 AVAILABLE SITE INVESTIGATION DATA

The following reports have been produced by Intégral Géotechnique (Wales) Limited for the site:

- Open Hearth, Ringland, Newport, Site Investigation Report, Report No. 14144/LS/23/SI dated February 2023
- Open Hearth, Ringland, Newport, Supplemental Site Investigation Report, Report No. 14144/RH/26/SSI/RevA dated February 2026.

The above reports should be reviewed in conjunction with this remediation strategy report to gain a detailed appraisal of the site.

2.3 SITE HISTORY

The earliest edition historical map dated 1883 indicated the site to be largely undeveloped green fields, likely in agricultural use. Buildings belonging to Hendre farm were located in the eastern area of the site. A well was also located within the eastern area of the site. A river was located along the southern site boundary. The area surrounding the site consisted of undeveloped green fields.

The map dated 1901 indicated a new small building had been constructed in the eastern area of the site. A river was located along the southern site boundary.

The 1920 map indicated a further building had been constructed within the eastern area of the site. The well located within the eastern area of the site was no longer present.

2.3 SITE HISTORY (CONTINUED)

By 1937 a tank, along with another building, had been constructed within the centre of the site. A pond was located in the southwest of the site, to the south of the watercourse. The area surrounding the site remained relatively unchanged.

In the period 1937 to 1964 Hendre Farm had been demolished and the tank removed. The river which extended across the southern area of the site had been channelled. The pond located in the southwest of the site had been infilled. Significant residential development had occurred in the wider area north, east and west of the site. Hendre Farm Drive had been constructed along the site's northern boundary. The B4004 road was located to the south of the site.

By 1971 the Open Hearth pub had been constructed in the western area of the site, with associated parking areas and pathways covering the majority of the remaining area of the site. A small building had also been constructed on the eastern site boundary. The watercourse located near the southern site boundary was indicated to have been partially culverted. The B4004 road was now noted as the A455. Two access roads entered the site from the A455, crossing the culverted watercourse. Further residential development had occurred immediately to the west of the site.

The 1973 historical map indicated a small building had been constructed in the central part of the site. The 1974 edition of the map indicated a filling station had been constructed in the south-eastern area of the site.

The site and surrounding area remained relatively unchanged over the subsequent years with the Open Hearth pub remaining in the same configuration on site.

By 1992 three buildings were located in the central to eastern areas of the site. An 'L' shaped building was located on the location of the filling station noted on the 1974 and 1975 maps.

The aerial photo published in 2000 indicated the buildings in the central to eastern area of the site, including the filling station, were no longer present, however, areas of hardstanding and suspected floor slabs remained. No other changes were recorded on site and the surrounding area remained unchanged.

By 2006, the south-eastern area of the site had been fenced off. The A455 had been extended to the site's southern boundary and was noted as the A48. The two junctions that previously entered the southern area of the site off the A455 had been removed and there was no access into the site from the A48.

2.3 SITE HISTORY (CONTINUED)

The 2006 aerial image of the site also indicated materials had been stockpiled on site. No further changes occurred to the site or surrounding area.

The 2016 aerial image of the site indicated trees/vegetation were located along the boundary of the fenced off area in the south-eastern area of the site. The trees/vegetation had been cleared by 2018.

By 2021, the Open Hearth public house had been demolished and no further changes have occurred onsite or within the surrounding area to the present day.

2.4 GROUND CONDITIONS SUMMARY

An initial intrusive investigation comprising the drilling of 5 No. windowless sample boreholes (referenced WS01 – WS05) and 1 No. hand dug trial pit (referenced HD1) was carried out during January 2023.

A supplemental intrusive investigation comprising 8 No. machine excavated trial pits (referenced TP01 – TP08) and 9 No. windowless sample boreholes (referenced WS06 – WS14) was undertaken on the 6th and 7th November 2025. Slightly deeper inspection of the ground conditions at the location of the previous hand dug pit (HD1) was also undertaken.

Copies of the exploratory hole logs may be found in Appendix A. Their positions are shown on Figure 3.

The ground conditions encountered beneath the site generally comprised a cover of made ground over weathered mudstone bedrock. Towards the south of the site superficial deposits were encountered, deposited along the former route of the stream (which is now culverted).

The northern section of the site situates on an area of natural sloping topography, declining towards the south. Prior to previous development of the site, localised cut into the hillside towards the east allowed a relatively level plateau to be formed for development of the existing car park.

Similarly, filling in the southwest corner of the site and in areas along the far southern edge of the site appear to have been undertaken to raise levels or to backfill around the stream culvert.

2.4 GROUND CONDITIONS SUMMARY (CONTINUED)

The previous cut into the existing slope in the east of the site was accompanied by filling across the far north of the site, within the upper grassed area.

The exploratory hole logs should be referred to for detailed information on the encountered shallow ground conditions.

2.4.1 Surface Hardstanding

Surface hardstanding currently remains across a large proportion of the site from previous site use, and includes the cul-de-sac of Hendre Farm Drive itself.

The area around the former Open Hearth public house and its previous car park are tarmacked, as is much of the south-eastern portion of the site around the former filling station.

The car park in the northeast of the site is similarly laid to tarmac.

The reinforced concrete floor slab of the demolished Open Heath public house remains in-situ, with the exception of where a section of the ground floor slab has been broken out above an underlying basement.

The former forecourt of the petrol filling station in the southeast of the site is surfaced with reinforced concrete. Much of this concrete spans across the top of redundant buried fuel tanks, some of which have more recently been broken out to observe the tanks below.

2.4.2 Made Ground

Borehole WS01 was sunk in the grassed area in the far north of the site, at the highest point on the site. At this location an approximately 0.2m thick cover of dark brown very clayey gravelly sand with occasional fragments of plastic and brick fragments was noted, over firm becoming firm to stiff sandy gravelly cobbly clay with inclusions of brick, slag and clinker to approximately 1.65m depth.

The lower reaches of this grassed area were investigated in boreholes WS12, WS13 and in hand dug trial pit HD1. Within WS12 a made ground layer of dark brown silty gravelly clay was observed to approximately 0.4m depth. Within WS13 made ground extended to an approximate depth of 0.9m and was found to be comprised of soft to firm brown to reddish brown mottled silty slightly sandy slightly gravelly clay with inclusions of slag.

2.4 GROUND CONDITIONS SUMMARY (CONTINUED)

HD1 identified made ground to its termination depth of 0.5m, which consisted of a thin layer of soft brown silty gravelly clay over soft reddish brown silty gravelly clay with inclusions of concrete and slag.

Exploratory boreholes WS05 and WS14 were located in the car park. At both locations, beneath a 0.1m thick cover of tarmac, a granular stone sub-base was recorded to an approximate depth of 0.4m and 0.5m below existing ground level, respectively.

Exploratory holes WS02, WS06, WS07 and TP05 - TP07 were located in the south-eastern portion of the site. Trial pits TP05 and TP06 situated south of the culverted stream, close to the southern site boundary.

Borehole WS06 encountered an approximate 0.08m thickness of gravel and cobble limestone sub-base beneath the tarmac surface. Borehole WS02 found similar shallow ground conditions, where a gravel sub-base extending to approximately 0.9m depth was found to be underlain by a 0.1m thick horizon of medium dense silty sandy cobble of sandstone.

Within trial pit TP07 and borehole WS07 a much thinner limestone gravel sub-base was recorded beneath the surface hardstanding, between approximately 0.1m and 0.2m depth in TP07 and between approximately 0.2m and 0.4m depth in WS07. In TP07 the sub-base was found to be directly underlain to approximately 0.8m depth by firm red and grey mottled silty clay with occasional brick fragments. Similar made ground clay deposits were observed in WS07 below the sub-base, to an approximate depth of 1.1m, comprised of brown and red mottled silty gravelly clay with roots over dark grey silty clay.

At the location of trial pit TP06, beneath a surface cover of tarmac, a thin veneer of made ground of between approximately 0.08m and 0.15m depth comprised grey gravel of sandstone, slag and concrete was noted and was found to be directly underlain by firm to soft red and grey mottled dark grey gravelly clay with rare brick fragments to an approximate depth of 0.8m below existing ground level.

Trial pit TP05 identified surface concrete over the same thin band of granular made ground observed in TP06. However, further underlying made ground extended to the maximum investigation depth of 2.3m, and was found to be comprised of stiff red and orangish red slightly gravelly clay with rare brick fragments to approximately 0.7m, over firm grey mottled reddish brown silty slightly gravelly clay with rare fragments of brick and china to approximately 1.0m depth, over firm becoming soft to firm brown silty clay with rare fragments of china, organic inclusions and small to large sections of tree branch.

2.4 GROUND CONDITIONS SUMMARY (CONTINUED)

Made ground within exploratory holes clustered across and around the northern end of the former Open Hearth public house was observed to extend to depths of approximately 0.1m to 1.1m below existing ground level, with the exception of the area of the infilled basement of the former Open Hearth public house.

Trial pit TP02 was excavated within the former basement. The basement has been infilled with rubble originating from the building's demolition. The infill has not been engineered, with no compaction, and visible voids in the backfill were observed. The rubble backfill was found to be comprised of grey sandy gravel and cobble sized fragments of brick and concrete, with the inclusion of numerous waste materials such as rebar, timber, glass, tiles, beer kegs and old pipework.

A portion of the rubble materials was seen to remain across a small localised area directly north of the infilled basement, as observed in trial pit TP01, which was excavated to approximately 1.1m depth and terminated on a buried concrete slab.

Made ground in boreholes WS03, WS11 and trial pit TP04 was identified to respective approximate depths of 0.3m, 0.1m and 0.2m. Below a tarmac surface 0.1m in thickness in WS03 and in TP04, made ground was found to consist of sandy and clayey gravel of limestone, ash, slag and clinker. Made ground in WS11 comprised grey sand and gravel.

Borehole WS09 was sunk through the old floor slab of the public house. Some loose remnant building rubble lay across the top of the floor slab. The tiled floor slab was constructed of a 0.04m screed of concrete over a 0.14m thick slab of reinforced concrete.

An approximate 0.2m thick sub-base of limestone gravel was found to underlie the floor slab. Directly below the sub-base a brown silty slightly gravelly clay was noted to approximately 0.7m depth, underlain by an approximate 0.2m thick layer of dark grey and brown mottled silty gravelly clay.

Trial pit TP03 was excavated directly adjacent to the outer wall of the former public house. Here, made ground extended to a depth of approximately 1.0m, which comprised backfill material to a service trench. Defunct cables were observed to enter the building channelled within a clay pipe lying between approximately 1.2m – 1.4m depth below existing ground level. The backfill material was composed of loose dark grey sandy gravel, where gravel was fine to coarse sub-angular to angular of limestone and slag, with inclusions of brick, ash and clinker.

2.4 GROUND CONDITIONS SUMMARY (CONTINUED)

Within borehole WS10 situated slightly further south and closer to the western site boundary than TP03 grey sand and gravel of concrete and slag was identified to approximately 0.45m depth, underlain by reddish brown silty gravelly clay to approximately 1.1m depth.

Situating towards the southwest corner of the site, boreholes WS04 and WS08 encountered made ground to approximate depths of 2.2m and 2.0m, respectively. Beneath a surface cover of tarmac, made ground was generally found to comprise a granular horizon to approximately 0.4m depth over several layers of soft silty and variably sandy and/or gravelly clay. The granular material was formed of limestone and slag in WS08 and limestone with fragments of brick, ash, slag and clinker in WS04. The clays were generally devoid of any anthropogenic material in WS08, but ash, slag and clinker were again observed within WS04.

2.4.3 Superficial Deposits and Weathered Mudstone Bedrock

Weathered mudstone was observed to directly underlie the made ground, below approximate depths of between 0.2m and 1.0m in exploratory holes located in the northern half of the site (namely, WS01, WS03, WS05, WS06, WS11-WS14, TP03, TP04 and TP08), where original site levels appear to have been cut prior to development to create development plateaux.

Within borehole WS04, the made ground was similarly found to directly overlie the mudstone at approximately 2.2m depth below existing ground level.

The weathered mudstone was generally present as red to orangish red silty gravelly clay, where gravel comprised angular mudstone lithorelicts, grading into weathered rock, which was retrieved in the exploratory holes as angular gravel.

Towards the south of the site the weathered mudstone bedrock was encountered at greater depth, where superficial soils were identified between the made ground and bedrock. These soils are considered to have been deposited by the stream running through the south of the site prior to being culverted.

Within borehole WS08 in the southwest corner of the site, a thin layer of brown silty clay was found to divide the made ground and weathered mudstone, between approximately 0.9m – 1.05m depth.

2.4 GROUND CONDITIONS SUMMARY (CONTINUED)

Borehole WS10 positioned in the west of the site. Here the made ground was found to be underlain from approximately 1.1m to 1.8m depth by very soft grey silty clay with fine rootlets.

Within the southeast area of the site, the weathered mudstone was encountered at approximate depths of between 1.4m to 1.7m depth within exploratory holes WS02, WS07 and TP06. Soils extending between the made ground and weathered mudstone typically comprised soft to firm or firm brown to grey or orangish brown silty often gravelly clay. However, in TP07 weathered mudstone was not observed to the full excavation depth of 2.5m, where firm brown silty slightly gravelly clay from approximately 0.8m to 2.0m depth was underlain by stiff brown mottled grey silty slightly gravelly clay.

2.4.4 Fuel Tanks

Two buried former fuel tanks had been exposed prior to the supplementary site investigation works. The tanks were both found to be confined within a concrete bund and surrounded by sand. It is understood that the tanks are believed to have been decommissioned by infill with concrete or foam.

Potentially one or more additional buried tanks lie adjacent to the exposed tanks.

2.4.5 Infilled Basement

Trial pit TP04 was excavated alongside the exterior wall of the infilled basement of the former Open Hearth public house. The wall was found to extend to approximately 1.9m below existing ground level and appeared to be constructed of concrete.

Excavation into the backfilled basement was undertaken in trial pit TP02. This pit extended to approximately 2.3m depth and terminated due to instability of the loose materials being excavated. The difference in ground level between TP02 and TP4 was not significant, which suggests that the depth of the basement floor could potentially be greater than observed in TP04.

2.4.6 Groundwater

Groundwater was only encountered within one windowless sample borehole, WS05, and one trial pit, TP05.

Groundwater was encountered at 0.4mbgl in WS05 and consisted of perched groundwater at the interface between the granular made ground and the cohesive low permeability underlying natural strata (weathered mudstone).

2.4 GROUND CONDITIONS SUMMARY (CONTINUED)

A slight groundwater seepage was noted in TP05 at 2.0m depth within the made ground.

The groundwater conditions are based on observations made at the time of the fieldwork. It should be noted that groundwater levels may vary due to seasonal and other effects.

2.5 IDENTIFIED CONTAMINATION - SOILS

2.5.1 *Made Ground*

Beryllium was found to exceed its respective soil guideline of 1.7mg/kg in two samples of made ground taken from boreholes WS03 (0.2m) and WS04 (0.4m) where a concentration of 5.6mg/kg and 7.7mg/kg was recorded, respectively.

A sample of the rubble material in the backfilled basement was found to contain loose fibrous debris containing amosite asbestos. Quantification testing revealed an asbestos content of 0.017%.

2.5.2 *In-situ Natural Ground*

No visual evidence of contamination of the in-situ natural ground was identified in the exploratory holes.

All substances tested for were found to be present at concentrations below their respective soil residential threshold levels. This includes two samples taken from adjacent to the underground fuel tanks where a hydrocarbon odour was noted during the investigation.

2.6 RESIDUAL STRUCTURES

The floor slabs and all foundation and basement structures from the Open Heath public house remain in the west of the site.

At least two sub-surface fuel storage tanks, encased in a concrete bund, are known to be present in the east of the site.

2.7 GROUND GAS AND VAPOURS

2.7.1 Ground Gas

The gas monitoring programme recorded a maximum methane concentration of <0.5% and a maximum carbon dioxide concentration of <0.5%. A maximum gas flow rate of <0.3l/hr was measured during the gas monitoring programme.

In accordance with CIRIA Report C665 a Gas Screening Value (GSV) of <0.0015l/hour has been calculated. This GSV corresponds to gas Characteristic Situation 1.

In accordance with BS8485:2015:2019 and based on the results of the gas monitoring with the site being classified as Characteristic Situation 1 (CS1), for Development Types A and B (private and private with building management control, respectively), the minimum gas protection score required is zero and therefore no specific gas protection measures are required.

2.7.2 Radon Gas

A BGS Report shows that the majority of the site lies within a low probability area, meaning 0-1% of properties are above action level and that no radon protective measures would be required.

A small section within the south-western corner of the site lies within an intermediate probability area, where 5% to 10% of properties are above action level, meaning basic radon protective measures would be required for new buildings in this area.

The indicative site development plan show that no houses are planned to be constructed within the south-western corner of the site area where basic radon protective measures would be needed.

Therefore, based on the indicative proposed development layout, no radon protective measures would be necessary in the construction of new buildings within the site.

2.7.3 VOC Vapours

Hydrocarbon odours and VOC vapours were observed/recorded within the vicinity of the buried fuel tanks in the southeast part of the site (Plots 15-32).

At this stage, due to the potential risk from residual petroleum hydrocarbons associated with the former fuel tanks, it is recommended that a suitable hydrocarbon/VOC vapour resistant membrane is incorporated within Plots 15-32 inclusive. This could be reviewed following removal of the buried fuel tanks, fuel lines and any associated affected soils.

2.8 DETAILED SITE-SPECIFIC RISK ASSESSMENT – HUMAN HEALTH

The 'general' approach for assessing the potential risk to a receptor is by a combination of qualitative and quantitative risk assessment.

A quantitative risk assessment would involve selecting and deriving generic assessment criterion to compare low risk substances, based on the fate, transport and toxicological properties and the exposure scenario being considered.

With regards to assessing risk to human health, a generic quantitative risk assessment have been undertaken using published screening criteria values for a proposed residential with home grown produce end use.

There are no published screening criteria values for asbestos, and neither are there any in preparation. As discussed in CIRIA Report C733 Asbestos in Soil and Made Ground: a Guide to Understanding and Managing Risks, agreement has yet to be reached in the UK on an appropriate toxicological criterion on which a screening value for asbestos could be based. It also states that 'based on current knowledge, it is believed that that a scientifically defensible UK GAC (generic acceptance criteria) for asbestos in soil cannot be developed or imported.'

It is therefore considered that a more qualitative assessment of the potential risk is appropriate, as asbestos is determined to be a non-threshold substance.

CIRIA Report C733 states that asbestos (asbestos containing materials and asbestos containing soils) only present a risk to health if airborne fibres are released into the atmosphere. The report goes on to state that the number of fibres released into the air from asbestos containing soils is likely to be influenced by a number of site-specific factors, as listed below.

- Characteristics of the asbestos (concentration, degree of heterogeneity, depth in relation to final ground level, volume/area, type, condition, extent of bonding, weathering, fraction of free fibres, shape of fibres)
- Characteristics of the soil (type, moisture content, surface vegetation, presence of hard standing)
- Weather (humidity, precipitation, temperature, ground freezing, wind speed and direction)
- Land use/soil disturbing activities (behaviour of receptors, distance between receptor and source, types of activity, duration/frequency of activity, dust mitigation measures).

2.8 DETAILED SITE-SPECIFIC RISK ASSESSMENT – HUMAN HEALTH (CONTINUED)

The depth below ground level of the asbestos containing soils is imperative to the potential risk posed.

CIRIA Report C733 states that in the absence of significant physical disturbance, exposure to airborne asbestos fibres from soil will be from friable materials or asbestos fibres present at, or very close to, the soil surface (the soil – air interface).

Materials that have been buried, or are below the soil surface, will pose a lower, or less immediate, risk as these materials are unable to release airborne fibres unless brought to the soil surface by physical activity/disturbance.

Asbestos fibres, consisting of loose amosite fibres were detected at 0.017% asbestos by weight within rubble and waste materials derived from demolition of the former Open Hearth public house. These materials presently largely comprise backfill to the former public house basement, but remnant rubble is also seen to be scattered across the ground surface in the vicinity of the basement, following the removal of a former rubble stockpile.

The soil test results showed elevated concentrations of beryllium in the made ground.

Soils adjacent to the underground fuel storage tanks exhibited a hydrocarbon odour, and in-situ monitoring identified VOC vapours in a monitoring well installed within soils adjacent to the tanks.

It is considered that a potential risk to human health may exist via the following relevant pollutant linkages:

- Dermal contact with soil/soil dust.
- Ingestion of soil or soil derived dust,
- Ingestion of soil attached to homegrown produce,
- Ingestion of homegrown produce,
- Inhalation of soil borne dust,
- Inhalation of asbestos fibres,
- Inhalation of vapours.

It is considered necessary to protect future site end users and construction operatives from exposure to the contamination recorded.

2.8 DETAILED SITE-SPECIFIC RISK ASSESSMENT – HUMAN HEALTH (CONTINUED)

The remediation works to be carried out at the site have been designed to address the identified potentially active contaminant pathways listed above.

2.9 DETAILED SITE-SPECIFIC RISK ASSESSMENT – CONTROLLED WATERS

The findings of the site investigation indicate only the limited and inconsistent presence of shallow perched groundwater within the made ground deposits beneath the site.

Groundwater in made ground was only encountered within one windowless sample borehole, WS05, and one trial pit, TP05.

The results of the soil chemical testing carried out on samples of site soils have not identified any significant contamination with the potential to impact on controlled waters.

The made ground is underlain at shallow depths by low permeability clay soil/weathered mudstone bedrock (Secondary B Aquifer). No groundwater was encountered in these in-situ materials.

In the developed state, the site will be covered by either the building footprints or areas of hardstanding and any gardens or areas of soft landscaping will be covered by a minimum 600mm thick capping layer of clean inert imported soils placed above a geotextile separation membrane.

It is therefore considered that the potential for rainfall infiltration into the made ground, subsequent leachate generation from the made ground and the potential for vertical migration of unacceptable leachate concentrations to impact the underlying groundwater is considered to be low.

It is therefore considered that the potential risk to controlled waters is very low, and no further consideration is required.

3.0 REMEDIATION STRATEGY

The findings of the site investigations carried out across the site have identified that a potential risk to end users exists within the site due to elevated beryllium compounds in made ground and the presence of asbestos fibres in building rubble materials. Additionally, there is a potential risk from residual petroleum hydrocarbons in the area of the former fuel storage tanks, which currently remain in situ.

The remediation strategy set out below has been developed to reclaim the site and eliminate potential pollutant linkages to future site users and construction workers. The remediation strategy is proposed such that the site is prepared to a standard suitable for the proposed residential end use.

The following remediation measures are proposed:

- **Excavation and processing of existing demolition rubble** – the existing demolition rubble within the basement of the former public house building will be excavated, sorted and processed, with any unsuitable materials such as timber, metals, etc. removed and disposed of off-site. During excavation works, the excavated materials shall be visually inspected for the presence of any suspect asbestos-containing materials. Any such materials identified shall be carefully segregated and managed in accordance with an appropriate risk assessment and the requirements of the Control of Asbestos Regulations (2012). Any identified ACM should be reported to the site management and picked/disposed off-site by a licensed asbestos contractor as hazardous waste. The remaining acceptable demolition materials will be crushed to a suitable grade for reuse,.
- **Site Clearance Works** – any remaining areas of hardstanding, including the remnant floor slab of the former public house, together with any existing foundations, basement structures, any other buried obstructions will be broken out, sorted, processed and crushed to a suitable grade for reuse,.
- **Removal of buried fuel tanks** - The location and number of buried former fuel storage tanks will be confirmed, and the tanks will be removed. Any residual concrete cradles and structures that supported the former tanks will also be broken out and removed.

3.0 REMEDIATION STRATEGY (CONTINUED)

Any associated fuel lines will be chased out and removed. Similarly, any petroleum hydrocarbon impacted soils will also be excavated out. Following removal of the former fuel tanks, residual structures, any associated fuel lines, and any hydrocarbon impacted soils, the resulting excavation will be sampled, tested and validated.

- **Capping of gardens and areas of soft landscaping** – following completion of the site development, all gardens and areas of soft landscaping will be capped with a minimum thickness of 600mm of clean imported subsoil/topsoil, placed over a hi-vis geotextile separation membrane.
- **Installation of a suitable hydrocarbon/VOC membrane** – a suitable hydrocarbon/VOC resistant membrane will be constructed within the floor slabs of Plots 15-32 inclusive. This recommendation should be reviewed following removal of the buried fuel tanks, fuel lines and any associated affected soils.
- **Drinking water supply pipes** - specification to be agreed between Willis Construction and DCWW.

4.0 REMEDIATION IMPLEMENTATION

4.1 OBJECTIVES

The main objective of the proposed remediation works is to render the site suitable for residential end use by removing potential exposure pathways between future site users and identified sources of contamination. The remediation activities required in order to achieve this objective are as follows:

4.2 METHODOLOGY

The remediation works required in order to meet the objectives defined above will be implemented in accordance with the following methodology:

- **Visual inspection during site clearance and during excavation** - Following site clearance works, all exposed formations within the site should be visually inspected by an asbestos awareness trained ground worker. During excavation, sorting and processing of the demolition rubble within the backfilled basement of the former public house, materials should be visually inspected for the presence of any suspect asbestos-containing materials. Any identified asbestos containing materials (ACM) shall be reported to the site manager and picked/disposed of by a licensed asbestos contractor as hazardous waste. Where suspect materials are identified, works shall cease pending appropriate assessment and implementation of suitable control measures in accordance with an appropriate risk assessment and the Control of Asbestos Regulations (2012). Daily records and waste transfer notes should be kept in order to document the identification and subsequent removal of any ACM. These records and waste transfer notes should be made available for review as they will be required for potential remediation verification. The remaining acceptable demolition materials will be crushed to a suitable grade for reuse.
- **Inspection and verification of tank removal and residual contaminated soils**
 - Following removal of the former underground fuel storage tanks, concrete cradles and structures, fuel lines, and any visually petroleum hydrocarbon impacted soils, representative samples of the exposed soils should be taken from the sides and base of the excavation and tested for petroleum hydrocarbon and BTEX compounds to confirm whether any residual petroleum hydrocarbon contamination remains. The detailed human health risk assessment will be reviewed once further data is obtained. If the risk assessment identifies residual soil contamination, then further soil excavation and validation sampling shall be carried out until all affected soils have been removed.

4.2 METHODOLOGY (CONTINUED)

- **Segregation of materials** – Excavated made ground shall be kept separate from underlying natural soils during the works in order to prevent cross-contamination.
- **Reinstatement of excavations** – Following excavation works, all reduced formations shall be reinstated in a controlled manner using site-won materials where possible, or suitable imported materials.
- **Installation of a suitable hydrocarbon/VOC barrier** – A hydrocarbon/VOC barrier is required within Plots 15-32 inclusive (subject to the findings of the above recommended supplementary soil testing and assessment following removal of the fuel tanks). A gas verification plan shall be prepared prior to development, outlining the specific vapour mitigation system. Following construction, the installation of the vapour barrier independent in-situ validation testing of the vapour barrier should be performed in accordance with BS 8485:2015+A1:2019 and CIRIA C735.
- **Capping of garden and soft landscaped areas** - Private gardens and soft landscaped areas will require the provision of a minimum 600mm thick capping layer of clean, imported inert subsoil and topsoil materials placed above a high visibility geotextile membrane in order to maintain the integrity of the capping layer and prevent upward migration of contaminants. The placement of the capping layer and barrier membrane shall be validated by a qualified engineer in accordance with the publication 'Requirements for the Chemical Testing of Imported Materials for Various End Uses and Validation of Cover Systems' prepared by Welsh Land Contamination Working Group, and will entail the excavation of a series of hand dug pits. A photographic record will be kept.
- **Validation of imported soils and recycled aggregate** - Soils or recycled aggregates imported onto site for use in the new development as backfill of excavations, engineered fill or capping soils shall be verified as clean and suitable prior to their intended use in accordance with the publication 'Requirements for the Chemical Testing of Imported Materials for Various End Uses and Validation of Cover Systems' prepared by Welsh Land Contamination Working Group. This document details the necessary soil chemical screening and sampling frequency requirements. Typically, samples should be tested at a rate of 4 per 250m³, per source. Soil screening results should be compared to appropriate soil guideline values for residential development (with home grown produce).

4.2 METHODOLOGY (CONTINUED)

- **Validation of site-won materials for re-use on site** – Any crushed and processed demolition materials intended for re-use on site as part of the development shall be sampled and chemically screened to confirm suitability for use. Any site-won soils destined for re-use on site shall be verified as clean and suitable in accordance with the publication 'Requirements for the Chemical Testing of Imported Materials for Various End Uses and Validation of Cover Systems' prepared by Welsh Land Contamination Working Group. This document details the necessary soil chemical screening and sampling frequency requirements.
- **Installation of suitable drinking water pipes** - Suitable drinking water supply pipes will be installed in accordance with UKWIR Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites, document No. 10/WM/03/21. Reference should be made to UKWIR Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites, document No. 10/WM/03/21. The final design and selection of the pipe and associated backfill should be agreed with DCWW prior to installation.
- **Unexpected contamination** – Should any unexpected contamination or unusual materials be encountered during the works, these shall be reported immediately to site management. Appropriate specialist advice shall be sought where necessary, and the remediation strategy shall be reviewed and updated in consultation with the Local Planning Authority.

4.3 OPERATIONS

The remediation works shall be undertaken by a competent groundworks contractor experienced in working on brownfield sites.

Detailed site preparation measures, dust control measures and general health and safety arrangements shall be set out within the contractors construction phase method statements. These should include the contractor's proposals for control and monitoring of dust, noise, vibrations and odour.

Appropriate measures shall be implemented to minimise dust generation and prevent the migration of airborne particulates during excavation works.

4.3 OPERATIONS (CONTINUED)

Site procedures for managing the remedial works in a manner that will not cause pollution to controlled waters will be covered in the contractor's method statements which will be submitted in discharge of the Conditions of Planning.

The proposed remediation works will be controlled by the appropriate mobile treatment license to be held by the remediation contractor, if such works become necessary. The conditions imposed under the planning process will be considered adequate to control the works.

An appropriately licensed asbestos contractor will be required to deal with and dispose of identified asbestos containing materials (ACM).

Additionally, a system should be established by which any 'unusual' materials that may be encountered are reported rapidly to the site management, so that the appropriate action may be taken, following specialist advice if necessary. An unusual material may be identified on site by colour, odour or physical nature.

The remediation works shall be overseen by a suitably qualified engineer to confirm that the works are undertaken in accordance with this Remediation Strategy and to support subsequent validation reporting.

5.0 REMEDIATION VERIFICATION

5.1 OBJECTIVES

The objective of the remediation verification is to demonstrate that the remediation works have been carried out in accordance with the approved Remediation Strategy and that the site is suitable for the proposed residential end use.

A remediation verification report is required in order to record the data gathering necessary to demonstrate that the works have been carried out in accordance with the agreed strategy, confirm that the works satisfy the site remediation criteria and that the site is suitable for the proposed development.

5.2 REMEDIATION VERIFICATION METHODOLOGY AND DATA GATHERING REQUIREMENTS

The site reclamation/remediation will be verified by the following measures:

- **Screening of crushed and processed demolition materials** – Processed and crushed demolition materials to be sampled and screened for asbestos prior to re-use. Confirmation of the removal of identified ACM including provision of waste transfer notes.
- **Verification of tank removal** - Photographic records of the removal of the former fuel tanks, including their concrete cradles and structures and any associated fuel lines. Laboratory analysis results for soils sampled from the sides and base of the excavation and review of the detailed human health risk assessment.
- **Validation of Capping** - Photographic records of the validation of the thickness of the 600mm thick capping layer and high visibility geotextile membrane placed within gardens and landscaped areas.
- **Imported Materials** – Assessment of all imported and re-used site-won soils and recycled aggregates through laboratory analysis to confirm their suitability for re-use.
- **Vapour barrier installation** - Vapour Verification Report confirming validation testing of the vapour barrier installed in Plots 15-32 (if required).
- **Water Pipe Installation** - Certification for the installation of DCWW agreed drinking water supply pipe.

5.2 REMEDIATION VERIFICATION METHODOLOGY AND DATA GATHERING REQUIREMENTS

(CONTINUED)

The above information will be compiled into a Remediation Verification Report suitable for submission to the Local Planning Authority

6.0 FINAL REMEDIATION VALIDATION

The development will not be complete, in accordance with the remediation strategy for the site, until the placement of the final 600mm (minimum thickness) of clean imported capping soils over a high visibility geotextile membrane in gardens and soft finished areas has been completed.

Following completion of the remediation works, a Remediation Verification Report shall be prepared. The report will present the findings of the verification inspections, sampling and laboratory testing and will confirm that the remediation has been completed in accordance with this Remediation Strategy and that the site does not present an unacceptable risk to human health.

With regards to validation of the installed topsoil and subsoil capping layer to minimum thickness of 600mm and underlying hi-vis geotextile membrane in garden and soft landscaped areas, a series of hand dug pits will be excavated to confirm an adequate thickness of inert soils are in place in accordance with publication 'Requirements for the Chemical Testing of Imported Materials for Various End Uses and Validation of Cover Systems'. A photographic record will be kept

All imported capping soils should be validated as suitable for use in accordance with the publication 'Requirements for the Chemical Testing of Imported Materials for Various End Uses and Validation of Cover Systems' prepared by Welsh Land Contamination Working Group. This document details the necessary soil chemical screening and sampling frequency requirements. Typically, samples should be tested at a rate of 4 per 250m³, per source. Soil screening results should be compared to appropriate soil guideline values for residential development (with home grown produce).

Placement of the required capping and membrane layers to garden and soft landscaped areas will be the responsibility of the developer and is usually undertaken late in the development programme, as plots are completed.

Reporting of the clean capping to garden areas will be submitted independently of the remediation works.

APPENDIX A

EXPLORATORY HOLE LOGS AND EXPLORATORY HOLE LOCATION PLAN

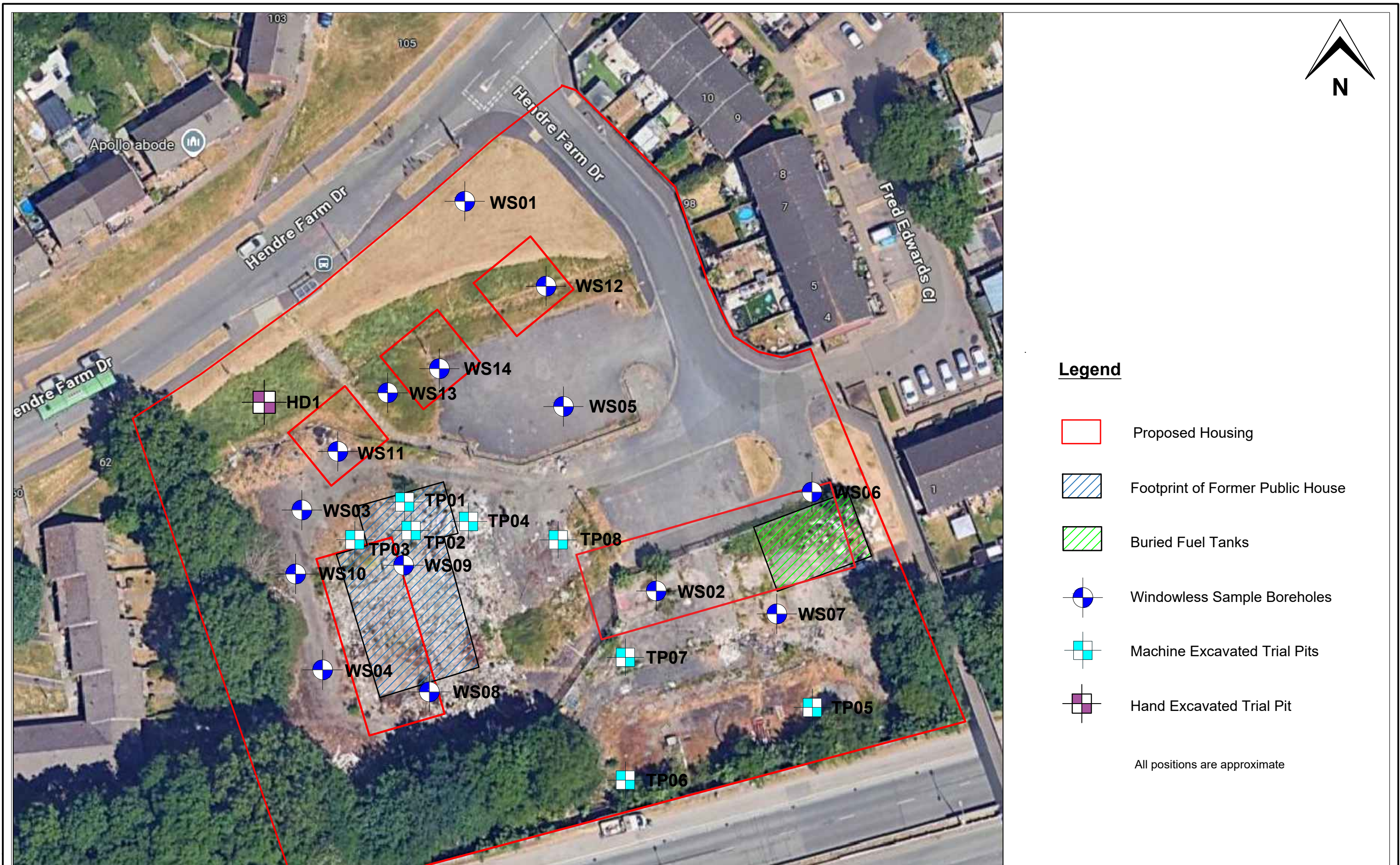


Figure: Exploratory Hole Locations

Project: Ringland, Newport

Client: Willis Construction

Job No.: 14144

Scale: NTS

Intégral
Géotechnique

Integral House,
7 Beddau Way,
Castlegate Business Park,
Caerphilly,
CF83 2AX.
Tel: 029 2080 7991

		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Open Hearth, Ringland			Project No.: 14144		Borehole No.: WS01 Sheet 1 of 1	
Location: Newport				Client: Willis Construction			Coordinates:		Hole Type: WLS	
Equipment: Dart 346				Diameter of Casing:			Level:		Scale 1:25	
Diameter of Boring: 101+97mm				Depth of Casing:			Dates 04/01/2023 -		Logged By: LS	

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES		0.20		(Loose) dark brown very clayey gravelly SAND with frequent rootlets. Gravel is fine to coarse sub-angular and angular mudstone with occasional plastic and brick fragments.		
		1.00	C	N=33 (0,0/4,8,10,11)			(Firm becoming) stiff orangish brown slightly sandy gravelly CLAY with occasional cobble of sub-angular mudstone. Gravel is fine to coarse sub-angular and angular mudstone, occasional brick fragments, slag and clinker. (MADE GROUND)	1	
		1.70	D		1.65		Stiff becoming hard red and orange brown mottled light green slightly friable silty CLAY. (St Maughan's Formation)		
		1.80	C	N=59 (7,8/59 for 245mm)	1.80		End of Borehole at 1.80 m	2	
								3	
								4	
								5	

Remarks: 1. Windowless sample borehole refused at 1.8mbgl. 2. No groundwater encountered.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Open Hearth, Ringland		Project No.: 14144		Borehole No.: WS02 Sheet 1 of 1	
Location: Newport				Client: Willis Construction		Coordinates:		Hole Type: WLS	
Equipment: DART 346				Diameter of Casing:		Level:		Scale 1:25	
Diameter of Boring: 101+97mm				Depth of Casing:		Dates 04/01/2023 -		Logged By: LS	

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10		TARMAC		
		0.30	ES				Compact grey gravel over (loose) grey sandy slightly silty fine to coarse sub-angular and angular GRAVEL of limestone. (MADE GROUND)		
					0.70		(Medium dense) beige and light brown slightly clayey slightly sandy fine to coarse sub-angular and angular GRAVEL of limestone. (MADE GROUND)		
		1.00	C	N=12 (2,2/2,3,3,4)	0.90		Medium dense slightly silty slightly sandy COBBLE of sub-angular and angular sandstone. (MADE GROUND)	1	
					1.00		Firm orangish brown slightly sandy gravelly CLAY with occasional cobbles of sub-angular mudstone. Gravel is fine to coarse sub angular and angular mudstone. (St Maughan's Formation)		
					1.50				
		1.70	C	N=50 (4,5/50 for 235mm)	1.70		Stiff becoming hard red and orange brown mottled light green slightly friable silty CLAY. (St Maughan's Formation)		
							End of Borehole at 1.70 m	2	
								3	
								4	
								5	

Remarks: 1. Windowless sample borehole refused at 1.7mbgl. 2. No groundwater encountered.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Open Hearth, Ringland		Project No.: 14144		Borehole No.: WS03 Sheet 1 of 1	
		Location: Newport		Client: Willis Construction		Coordinates:		Hole Type: WLS	
Equipment: DART 346		Diameter of Casing:		Level:		Scale 1:25			
Diameter of Boring: 101+97mm		Depth of Casing:		Dates 04/01/2023 -		Logged By: LS			

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.10		TARMAC		
					0.30		(Medium dense) grey very clayey sandy fine to coarse sub-angular and angular GRAVEL of limestone, ash, slag and clinker. (MADE GROUND)		
							Firm becoming stiff orange brown very friable silty CLAY. (St Maughan's Formation)		
		1.00	C	N=42 (2,7/6,8,12,16)			Becoming mottled green below 0.8mbgl.	1	
		1.50	D		1.50		End of Borehole at 1.50 m	2	
								3	
								4	
								5	

Remarks: 1. Windowless sample borehole refused at 1.5mbgl. 2. No groundwater encountered.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Open Hearth, Ringland		Project No.: 14144		Borehole No.: WS04 Sheet 1 of 1	
Location: Newport				Client: Willis Construction		Coordinates:		Hole Type: WLS	
Equipment: DART 346				Diameter of Casing:		Level:		Scale 1:25	
Diameter of Boring: 101+97+86+75mm				Depth of Casing:		Dates 04/01/2023 -		Logged By: LS	

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10		TARMAC		
		0.40	ES		0.40		(Medium dense) dark grey slightly sandy slightly clayey fine to coarse sub-angular and angular GRAVEL of limestone and occasional brick, ash, slag and clinker. (MADE GROUND)		
					0.70		(Soft) dark and orangish brown silty gravelly CLAY with occasional cobbles of sub-angular mudstone. Gravel is fine to coarse sub-angular and angular of mudstone. (MADE GROUND)		
					0.90		<i>Becoming light brown below 0.65mbgl.</i> (Loose) dark grey and black clayey sandy fine to coarse sub-angular to angular GRAVEL of limestone and occasional ash, slag and clinker. (MADE GROUND)		
		1.00	C	N=6 (1,1/2,1,2,1)			Soft light brown and orangish brown silty gravelly CLAY. Gravel is fine to coarse sub-angular and angular mudstone and occasional ash, slag and clinker. (MADE GROUND)	1	
		2.00	C	N=7 (1,2/2,1,2,2)	2.20		Firm becoming stiff red brown silty gravelly CLAY. Gravel is fine angular of mudstone lithorelicts. (St Maughan's Formation)	2	
		3.00	C	N=23 (2,3/3,7,7,6)				3	
		3.70	C	N=52 (7,8/52 for 235mm)	3.70			4	
								End of Borehole at 3.70 m	5

Remarks: 1. Windowless sample borehole refused at 3.7mbgl. 2. No groundwater encountered.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Open Hearth, Ringland		Project No.: 14144		Borehole No.: WS05 Sheet 1 of 1	
Location: Newport				Client: Willis Construction		Coordinates:		Hole Type: WLS	
Equipment: DART 346				Diameter of Casing:		Level:		Scale 1:25	
Diameter of Boring: 101+97mm				Depth of Casing:		Dates 04/01/2023 -		Logged By: LS	

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
	0.40 	0.10						TARMAC	
		0.30	ES			0.40		Compact orange and beige clayey slightly sandy GRAVEL of fine to coarse sub-angular and angular limestone. (sub-base) (MADE GROUND)	
								(Firm becoming stiff) orangish brown silty friable CLAY with occasional light green inclusions. (St Maughan's Formation)	
		1.00	C	N=51 (7,9/10,11,14,16)	1.00		Stiff becoming hard red gravelly silty CLAY. Gravel is fine to coarse sub-angular and angular mudstone. (St Maughan's Formation)	1	
		1.10	D						
		1.30	C	50 (17,19/50 for 100mm)					
					1.50		End of Borehole at 1.50 m		
									2
									3
									4
									5

Remarks: 1. Windowless sample borehole refused at 1.5mgl. 2. Perched groundwater encountered at 0.4mbgl.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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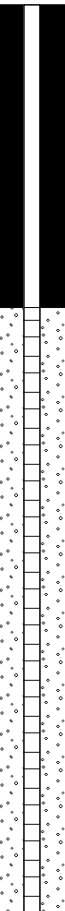
		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Open Hearth, Ringland		Project No.: 14144		Borehole No.: WS06 Sheet 1 of 1	
Location: Newport				Client: Willis Construction		Coordinates:		Hole Type: WLS	
Equipment: Dart 634				Diameter of Casing:		Level:		Scale 1:25	
Diameter of Boring: 86+97+101mm				Depth of Casing:		Dates 07/11/2025 -		Logged By: RH	

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES		0.07 0.15		TARMAC (Medium dense) black sandy fine to medium angular GRAVEL of limestone. (MADE GROUND) (Dense) pinkish brown silty fine to coarse angular GRAVEL and COBBLE of sandstone (sub-base). (MADE GROUND)		
		1.00	C	N=16 (3,4/3,4,5,4)	0.75		Stiff red with grey inclusions silty CLAY. Occasional fine to medium angular gravel of mudstone lithorelicts. (St Maughan's Formation)	1	
		1.10	ES						
		1.20	D						
		1.90	ES		1.70		(Soft) red with grey inclusions silty CLAY. Occasional fine to medium angular gravel of mudstone lithorelicts. (St Maughan's Formation) <i>Slight hydrocarbon odour 1.7m to 2.2m depth.</i>		
		2.00	C	50 (10,17/50 for 105mm)	1.90		Very stiff red with grey inclusions silty CLAY. Occasional fine to medium angular gravel of mudstone lithorelicts. (St Maughan's Formation)	2	
					2.20		End of Borehole at 2.20 m		
								3	
								4	
								5	

Remarks: 1. Windowless sample borehole refused at 2.2mbgl. 2. No groundwater encountered.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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Intégral Géotechnique Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com				Project Name: Open Hearth, Ringland				Project No.: 14144		Borehole No.: WS07 Sheet 1 of 1			
Location: Newport				Client: Willis Construction				Coordinates:		Hole Type: WLS			
Equipment: Dart 634				Diameter of Casing:				Level:		Scale 1:25			
Diameter of Boring: 86+97+101mm				Depth of Casing:				Dates 07/11/2025 -		Logged By: RH			
Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description					
		Depth (m)	Type	Results									
								Reinforced CONCRETE					
					0.20				(Medium dense) pinkish brown clayey sandy fine to coarse angular GRAVEL of limestone. (MADE GROUND)				
					0.40				(Stiff) brown and red mottled silty gravelly CLAY. Gravel is fine to coarse angular of limestone. Old roots. (MADE GROUND)				
					0.70				(Firm) dark grey silty CLAY with with fine black inclusions. (MADE GROUND)				
		0.90	ES	N=8 (1,1/2,2,2,2)					Soft to firm brown silty CLAY. Occasional fine black organic inclusions Very slight hydrocarbon odour.				
		1.00	C										
		1.10	D		1.10								
										Stiff red CLAY with grey green inclusions. (St Maughan's Formation)			
		1.50	ES										
					1.70								
		2.00	C	N=17 (2,3/3,4,5,5)					Very stiff red slightly gravelly CLAY with fine grey green inclusions. Gravel is fine angular of mudstone lithorelicts. (St Maughan's Formation)				
						2.70							
		3.00	C	N=50 (7,11/50 for 285mm)	3.00				End of Borehole at 3.00 m				
								</					

		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Open Hearth, Ringland		Project No.: 14144		Borehole No.: WS08 Sheet 1 of 1	
Location: Newport				Client: Willis Construction		Coordinates:		Hole Type: WLS	
Equipment: Dart 634				Diameter of Casing:		Level:		Scale 1:25	
Diameter of Boring: 86+97+101mm				Depth of Casing:		Dates 07/11/2025 -		Logged By: RH	

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.07		TARMAC		
					0.40		(Medium dense) grey sandy fine to coarse angular GRAVEL of limestone and slag. (MADE GROUND)		
		0.50	ES		0.80		(Firm) greyish brown to reddish brown mottled with fine black inclusions silty slightly gravelly CLAY. (MADE GROUND)		
		1.00	C	N=6 (0,1/1,1,2,2)	1.00		(Soft) brown and reddish brown mottled silty CLAY.	1	
		1.30	D		1.25		Soft brown and reddish brown mottled with fine black inclusions silty very sandy CLAY. (MADE GROUND)		
		1.30	ES				Soft brownish grey silty CLAY with occasional red clay inclusions.		
		2.00	C	N=8 (1,1/2,2,2,2)	2.00		Soft grey and brown mottled silty CLAY.	2	
					2.70		Stiff red mottled grey and brown silty CLAY. (St Maughan's Formation)		
		3.00	C	N=50 (4,6/50 for 285mm)	3.00		End of Borehole at 3.00 m	3	
								4	
							5		

Remarks: 1. Windowless sample borehole refused at 3.0mbgl. 2. No groundwater encountered.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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Location: Newport		Client: Willis Construction		Coordinates:		Hole Type: WLS				
Equipment: Dart 634		Diameter of Casing:		Level:		Scale 1:25				
Diameter of Boring: 97+101mm		Depth of Casing:		Dates 07/11/2025 -		Logged By: RH				
Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					0.02			Floor tile.	1	
					0.06			CONCRETE		
					0.20			Reinforced CONCRETE (FLOOR SLAB)		
					0.40			(Medium dense) pinkish brown sandy fine to coarse angular GRAVEL of limestone (sub-base). (MADE GROUND)		
					0.70			(Soft) brown silty slightly sandy slightly gravelly CLAY. (MADE GROUND)		
					0.90			Dark grey and brown mottled with black inclusions silty gravelly CLAY. Gravel is fine to medium angular of mudstone. (MADE GROUND)		
		0.90	ES		0.90			(Firm) brown silty CLAY.		
		1.00	C	N=18 (2,2/3,5,5,5)	1.05			Stiff becoming very stiff orangish red silty gravelly CLAY. Gravel is fine to medium angular of mudstone lithorelicts. (St Maughan's Formation)		
									3	
									4	
									5	
Remarks: 1. Windowless sample borehole refused at 2.0mbgl. 2. No groundwater encountered.							Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone) W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation			

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Location: Newport				Client: Willis Construction			Coordinates:		Hole Type: WLS	
Equipment: Dart 634				Diameter of Casing:			Level:		Scale 1:25	
Diameter of Boring: 97+101mm				Depth of Casing:			Dates 07/11/2025 -		Logged By: RH	

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
							Medium dense grey very clayey sandy GRAVEL. Gravel is fine to coarse sub angular and angular limestone and slag. (MADE GROUND)		
					0.45		(Firm) reddish brown and brown mottled with black inclusions silty gravelly CLAY. Gravel is fine to coarse angular of sandstone and limestone. (MADE GROUND)		
		1.00	C	N=3 (1,0/0,1,1,1)	1.10		Very soft grey becoming greyish brown silty CLAY. Fine rootlets.	1	
					1.80		Very stiff red silty gravelly CLAY. Gravel is fine to medium angular of mudstone lithorelicts. (St Maughan's Formation)		
		2.00	C	N=50 (8,10/50 for 245mm)	2.00		End of Borehole at 2.00 m	2	
								3	
								4	
								5	

Remarks: 1. Windowless sample borehole refused at 2.0mbgl. 2. No groundwater encountered.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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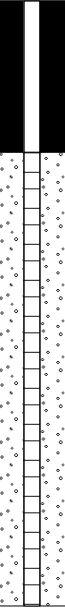
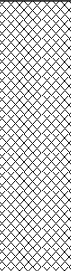
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Location: Newport		Client: Willis Construction		Coordinates:		Hole Type: WLS			
Equipment: Dart 634		Diameter of Casing:		Level:		Scale 1:25			
Diameter of Boring: 101mm		Depth of Casing:		Dates 07/11/2025 -		Logged By: RH			
Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10			Grey SAND and fine to medium angular GRAVEL. (MADE GROUND)	1 2 3 4 5
					0.20			(Firm) brown silty CLAY.	
								(Very stiff) red with grey green inclusions silty CLAY. (St Maughan's Formation)	
									
									
					0.50			Very stiff red silty gravelly CLAY. Gravel is fine to medium angular of mudstone lithorelicts. (St Maughan's Formation)	
									
									
									
					1.00				
End of Borehole at 1.00 m									
Remarks: 1. Windowless sample borehole refused at 1.0mbgl. 2. No groundwater encountered.									
Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone) W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation									

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Location: Newport				Client: Willis Construction			Coordinates:		Hole Type: WLS	
Equipment: Dart 634				Diameter of Casing:			Level:		Scale 1:25	
Diameter of Boring: 101mm				Depth of Casing:			Dates 07/11/2025 -		Logged By: RH	

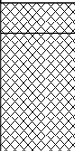
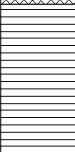
Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.40		Grass over (soft) dark brown silty gravelly CLAY. Gravel is fine to coarse angular of limestone. Fine rootlets. (MADE GROUND)		
							Very stiff red silty gravelly CLAY. Gravel is fine to medium angular of mudstone lithorelicts. (St Maughan's Formation)		
		1.00	C	N=50 (5,7/50 for 255mm)	1.00		End of Borehole at 1.00 m	1	
								2	
								3	
								4	
								5	

Remarks: 1. Windowless sample borehole refused at 1.0mbgl. 2. No groundwater encountered.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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Location: Newport				Client: Willis Construction		Coordinates:		Hole Type: WLS	
Equipment: Dart 634				Diameter of Casing:		Level:		Scale 1:25	
Diameter of Boring: 97+101mm				Depth of Casing:		Dates 07/11/2025 -		Logged By: RH	

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.90		 (Soft to firm) brown to reddish brown mottled silty slightly sandy slightly gravelly CLAY. Gravel is fine to medium angular of limestone and slag. Fine rootlets. (MADE GROUND)		
		1.00	C	N=26 (4,4/26 for 255mm)	1.00	 (Stiff) red silty gravelly CLAY. Gravel is fine to medium angular of mudstone lithorelicts. (St Maughan's Formation)	1		
		1.50	C	50 (11,13/50 for 160mm)		 Stiff orangish red silty gravelly CLAY. Gravel is fine to medium angular of mudstone lithorelicts. (St Maughan's Formation)			
					1.85	 Weathered red MUDSTONE retrieved as fine to coarse angular gravel. (St Maughan's Formation)	2		
					2.00		End of Borehole at 2.00 m		
									3
									4
									5

Remarks: 1. Windowless sample borehole refused at 2.0mbgl. 2. No groundwater encountered.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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Location: Newport		Client: Willis Construction		Coordinates:		Hole Type: WLS			
Equipment: Dart 634		Diameter of Casing:		Level:		Scale 1:25			
Diameter of Boring: 101mm		Depth of Casing:		Dates 07/11/2025 -		Logged By: RH			
Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10			TARMAC	
								(Dense) pink silty fine to coarse angular GRAVEL of limestone (sub-base). (MADE GROUND)	
					0.50			Weathered reddish orange MUDSTONE retrieved as fine to coarse angular gravel. (St Maughan's Formation)	
					1.00			End of Borehole at 1.00 m	1
									2
									3
									4
									5

Remarks:

1. Windowless sample borehole refused at 1.0mbgl. 2. No groundwater encountered.

Key:

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)

W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation



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Location: Newport			Client: Willis Construction			Logged By: LS		Scale 1:25	
Equipment: Hand Excavated			Coordinates:			Dimensions0.10m			
Date Excavated: 04/01/2023			Level:			Depth :0.50m0.10m			
Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description			
Depth (m)	Type	Results							
0.10	ES		0.20			Grass over soft brown silty gravelly CLAY. Gravel is fine to coarse sub angular and angular mudstone with occasional fragments of plastic, concrete and brick. (MADE GROUND)			
0.30	ES					Soft reddish brown silty gravelly CLAY. Gravel is fine to coarse sub angular and angular of mudstone, concrete and slag. (MADE GROUND)			
			0.50			End of Trialpit at 0.50 m			
						1			
						2			
						3			
						4			
						5			
Remarks: 1. Hand excavated trial pit terminated at 0.5mbgl, environmental sample collected. 2. No groundwater encountered.			Groundwater: No groundwater encountered.			Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample W - Water sample			
			Stability: Trial pit sides were stable in the short term.						

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TRIAL PIT PHOTOGRAPHS - TP01

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Location: Newport			Client: Willis Construction			Logged By: RH		Scale 1:25	
Equipment: JCB 3CX			Coordinates:			Dimensions m			
Date Excavated: 06/11/2025			Level:			Depth : 2.30m			
Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description			
Depth (m)	Type	Results							
1.80	ES		2.30			Loose grey sandy fine to coarse angular GRAVEL and COBBLE of brick and concrete. Fragments of rebar, glass, plastic, wire tile and slate. (Building Rubble) (MADE GROUND)			
						End of Trialpit at 2.30 m			
Remarks:						Groundwater: No groundwater encountered.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample W - Water sample	
						Stability: Pit unstable due to loose rubble material. Pit terminated at 2.3m depth due to instability.			



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Location: Newport			Client: Willis Construction			Logged By: RH+		Scale 1:25	
Equipment: JCB 3CX+			Coordinates:			Dimensions m			
Date Excavated: 06/11/2025			Level:			Depth : 1.40m			
Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description			
Depth (m)	Type	Results							
			1.00			Loose dark grey sandy GRAVEL. Gravel is fine to coarse sub angular and angular limestone and slag. Occasional fragments of brick, ash and clinker. (MADE GROUND)			
						Firm red mottled brown silty CLAY. Fine rootlets. (St Maughan's Formation)			
			1.40			End of Trialpit at 1.40 m			
Remarks: 1. Old electric cables within a clay pipe encountered between 1.2 - 1.4m depth. 2. Outer brick wall of former building extended to 1.2m depth.			Groundwater: No groundwater encountered.			Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample W - Water sample			
			Stability: Trial pit sides were stable in the short term. +						



Face A

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Face B

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Face C

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Face D

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Spoil

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Location: Newport			Client: Willis Construction			Logged By: RH		Scale 1:25	
Equipment: JCB 3CX			Coordinates:			Dimensions m			
Date Excavated: 06/11/2025			Level:			Depth : 2.60m E			
Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description			
Depth (m)	Type	Results							
			0.20			Loose dark grey sandy GRAVEL. Gravel is fine to coarse sub angular and angular limestone and SLAG. Occasional brick fragments, ash and clinker. (MADE GROUND)			
						Orangish red to red weathered MUDSTONE retrieved as fine, becoming fine to medium, angular gravel of mudstone lithorelicts. (St Maughan's Formation)			
			1.80			Dark red with occasional grey inclusions weathered MUDSTONE retrieved as fine to coarse angular GRAVEL. (St Maughan's Formation)			
			2.60			End of Trialpit at 2.60 m			
Remarks: 1. Basement outer wall observed to terminate at 1.9m depth.			Groundwater: No groundwater encountered.			Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample W - Water sample			
			Stability: Trial pit sides were stable in the short term.						



Face A

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Face B

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Face C

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Face D

TRIAL PIT PHOTOGRAPHS - TP04

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Location: Newport			Client: Willis Construction			Logged By: RH		Scale 1:25	
Equipment: JCB 3CX			Coordinates:			Dimensions m			
Date Excavated: 06/11/2025			Level:			Depth : 2.30m E			
Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description			
Depth (m)	Type	Results							
0.50	ES		0.08			CONCRETE			
			0.15			Grey SAND and fine to coarse angular GRAVEL of sandstone, slag and concrete. Occasional tile fragment. (MADE GROUND) Stiff red to orangish red with grey green inclusions slightly gravelly CLAY. Gravel is fine to coarse angular of sandstone. Rare brick fragment. (MADE GROUND)			
			0.70			Firm grey mottled reddish brown silty slightly gravelly CLAY. Gravel is fine to coarse angular to sub-angular of mudstone. Rare fragments of brick and china. (MADE GROUND)			
			1.00			Firm becoming soft to firm brown mottled grey with grey inclusions silty CLAY. Occasional black organic inclusions. Small to large tree branch fragments. Rare china fragment. (MADE GROUND)			
			2.30			End of Trialpit at 2.30 m			
Remarks:			Groundwater: Slight groundwater seep at 2.0m depth.			Key:			
			Stability: Trial pit sides were stable in the short term.			D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample W - Water sample			



Face A

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Face B

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Face C

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Face D

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Spoil

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Location: Newport			Client: Willis Construction			Logged By: RH		Scale 1:25	
Equipment: JCB 3CX			Coordinates:			Dimensions m			
Date Excavated: 06/11/2025			Level:			Depth : 1.70m E			
Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description			
Depth (m)	Type	Results							
0.30	ES		0.08			TARMAC			1
			0.15			Grey SAND and fine to coarse angular GRAVEL of sandstone, slag and concrete. (MADE GROUND)			
						Firm to soft red and grey mottled dark grey gravelly CLAY. Gravel is fine to coarse angular of sandstone. Rare brick fragments. Fine roots. (MADE GROUND)			
			0.80			Firm grey silty CLAY.			2
			1.00			Firm brown mottled grey silty CLAY.			
			1.40			Stiff orangish brown mottled grey silty CLAY. (St Maughan's Formation)			3
			1.70			End of Trialpit at 1.70 m			4
									5
Remarks:			Groundwater: No groundwater encountered.			Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample W - Water sample			
			Stability: Trial pit sides were stable in the short term.						

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	Location: Newport		Client: Willis Construction		Logged By: RH Scale 1:25		
Equipment: JCB 3CX		Coordinates:		Dimensions m Depth : 2.50m E			
Date Excavated: 06/11/2025		Level:					
Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.10			TARMAC	
			0.20			Brown silty fine to coarse angular GRAVEL of limestone (sub-base). (MADE GROUND)	
						Firm red and grey mottled with black organic inclusions silty CLAY. Occasional brick fragment. (MADE GROUND)	
			0.80			Firm brown silty slightly gravelly CLAY. Gravel is fine to medium sub-angular to sub-rounded of mudstone.	
			2.00			Stiff brown mottled grey silty slightly gravelly CLAY. Gravel is fine to medium sub-angular to sub-rounded of mudstone.	
			2.50			End of Trialpit at 2.50 m	
Remarks:			Groundwater: No groundwater encountered.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample W - Water sample		
			Stability: Trial pit sides were stable in the short term.				

Intégral Géotechnique Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com			Project Name: Open Hearth, Ringland			Project No.: 14144		Trial Pit No.: TP08 Sheet 1 of 1	
Location: Newport			Client: Willis Construction			Logged By: RH		Scale 1:25	
Equipment: JCB 3CX			Coordinates:			Dimensions m			
Date Excavated: 06/11/2025			Level:			Depth : 1.20m E			
Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description			
Depth (m)	Type	Results							
0.60	ES		0.10			TARMAC			
					PinkISH silty fine to coarse angular GRAVEL and COBBLE of limestone (sub-base). (MADE GROUND)				
			0.40			Loose fine black ash			
			0.50			Very stiff to hard red gravelly CLAY. Gravel is fine to coarse angular of mudstone lithorelicts. (St Maughan's Formation)			
			1.20			End of Trialpit at 1.20 m			
Remarks:			Groundwater: No groundwater encountered.			Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample W - Water sample			
			Stability: Trial pit sides were stable in the short term.						



Face A

TRIAL PIT PHOTOGRAPHS - TP08

14144 Ringland, Newport

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Caerphilly
CF83 2AX
Tel: 029 2080 7991



Face B

TRIAL PIT PHOTOGRAPHS - TP08

14144 Ringland, Newport

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Géotechnique

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Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Face C

TRIAL PIT PHOTOGRAPHS - TP08

14144 Ringland, Newport

Intégral
Géotechnique

Intégral House
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Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Face D

TRIAL PIT PHOTOGRAPHS - TP08

14144 Ringland, Newport

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991

FIGURES



Site Location



Figure 1: Site Location

Project: Ringland, Newport

Job no.: 14144

Client: Willis Construction

Scale: 1:10,000 at A4

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Caerphilly,
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Tel: 029 2080 7991



Figure 2: Proposed Site Layout

Project: Ringland, Newport

Job no.: 14144

Client: Willis Construction

Scale: NTS

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Caerphilly,
CF83 2AX.
Tel: 029 2080 7991

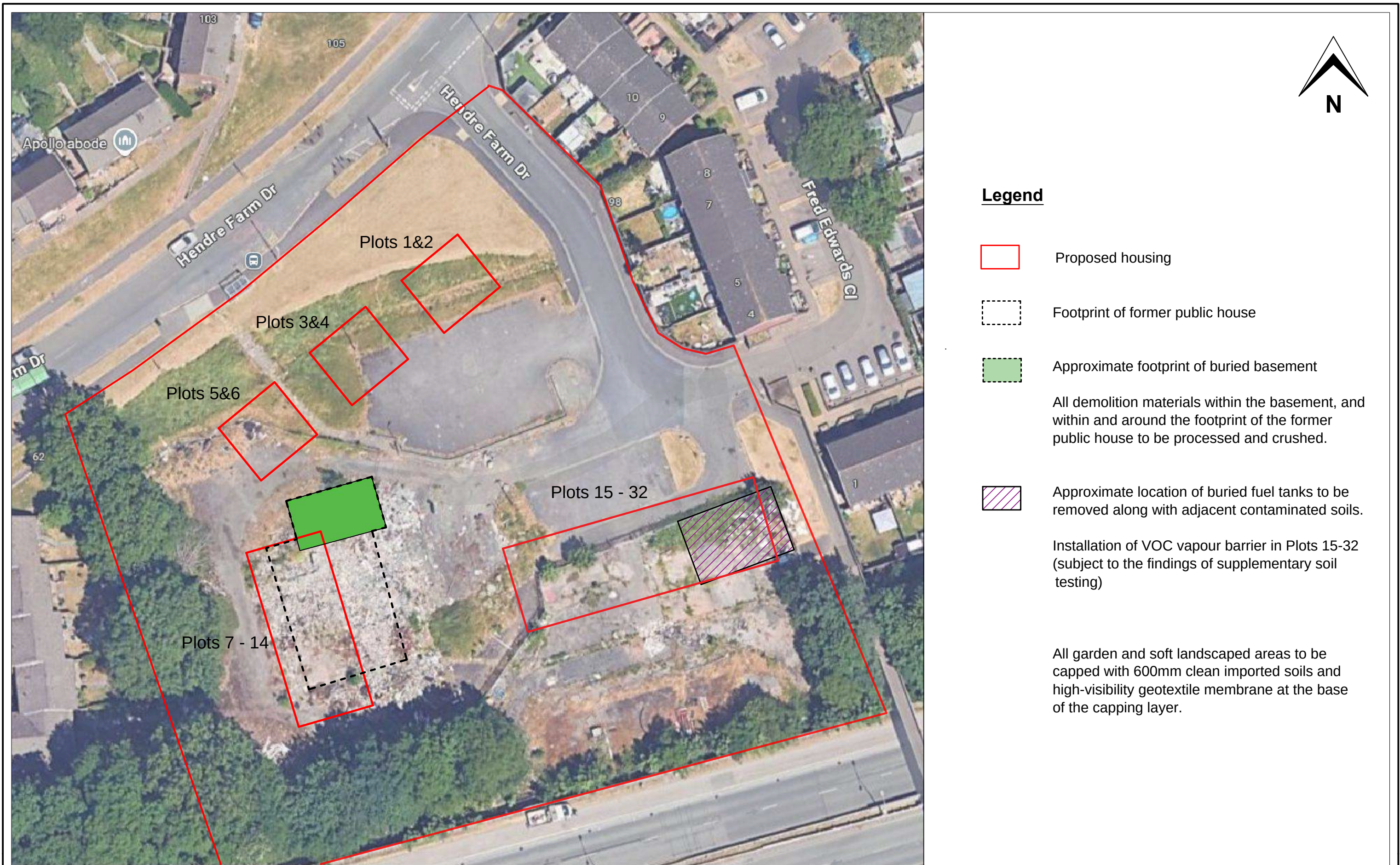


Figure 3: Current Site Layout and Proposed Remediation Measures

Project: Ringland, Newport		Job No.: 14144	Intégral Géotechnique	Integral House, 7 Beddau Way, Castlegate Business Park, Caerphilly, CF83 2AX. Tel: 029 2080 7991
Client: Willis Construction		Scale: NTS		