Ground Investigation Report (intrusive) and
Remediation Strategy

4a Bridge Street, Batley

SOIL AND STRUCTURES

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Report Status

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Contents

The Report has been written with reference to various sources of information. These are either appended or hyperlinked / referenced throughout this Report.

Infoboxes ⓘ are also included throughout the Report intended to draw the reader's attention to key information.

Appointment

Soil and Structures Ltd were instructed by Stoddart Architecture on behalf of Atlas Properties (*the Client*) in October 2025 to prepare an intrusive Ground Investigation Report and Remediation Strategy (*this Report*) for a parcel of land located adjacent to 4a Bridge Street, Batley (*the Site*)

This Report has been prepared in support of the *erection of detached dwelling with associated car parking, secure cycle parking and refuse bin storage* as set out within planning application ref. 2025/62/90443/E

Reliance on the advice presented herein rests solely with the Client.

Scope - General

In the ground everything is inter-related: from strength to pollution potential; through to, stability and drainage characteristics. This Report presents the findings of an intrusive assessment of ground conditions across the Site and provides advice on ground-related risk management. The Report also sets out how the groundworks completed as part of the development project will influence, and be influenced, by these inter-related elements.

Scope and Legal Context - Specific

This Report presents advice with respect to all elements of ground engineering and considers all ground-related hazards as set out within the Ground Risk Register - Section 7.0.

The Report has also prepared in response to the conditioning of the planning application; conditions that may relate to the historical hazards of 'contaminated land' and 'coal mining (various)'. Given the 'contaminated land' focus, the Report is commonly referred to as a "combined Phase 1, Phase 2 and Phase 3 report" amongst other titles.

The more specific, legal context of the advice given in this Report relates to an assessment of:

i) Potential ground-related hazards that may affect the development that is governed by health and safety law (various acts and regulations).

ii) The suitability of the Site for its proposed end use that is rooted within national planning policy guidance (the National Planning Policy Framework) that is governed by planning law (various acts). The assessment of 'suitability' relates specifically to ground-related hazards of contamination, pollution and ground gases as set out within both the Environment Protection Act 1990 : Part 2A (2012) and Environment Agency guidance 'Land Contamination Risk Management' (LCRM) (2020) – *Conditions 3 to 7 of the above application.*

iii) The stability of the Site for its proposed end use. The assessment of 'stability' relates specifically to coal mining related hazards, e.g. mine entries and mine workings - *Condition 8 and 9 of the above application*.

In practice, this likely necessitates acceptance of this Report and its findings by the local planning authority's contaminated land team and the Mining Remediation Authority, two statutory consultees on the planning application (where the respective conditions are applied).

Fieldwork

The Report references intrusive investigation scoped and supervised by the Author of this Report.

Background to this Report

This Report is preceded by one ground-related report for the Site: a Coal Mining Risk Assessment report prepared by Earth Environmental & Geotechnical Ltd, dated March 2021 (ref. A4085/21).

1.0 The Site and Proposed Development

1.1 The Site

Location: The Site comprises an existing parcel land (c. 0.02 ha in area) located at the north-western end of a shared access driveway off Bridge Street, Batley, WF17 5NU - *Figure 1*.

Condition: At the point of fieldworks, the Site was occupied by two mounds of demolition arisings and a partially filled skip with the demolition works largely completed with only material recovery and off-Site disposal remaining – *Photograph 1 and 2*. Immediately south-west of the Site, the existing, masonry structure of 4a remained together with an associated area of concrete hardstanding.

Access: At the point of issue, the Site was accessible via a shared driveway off Bridge Street to the south.

Topography: the Site's topography slopes from north to south at varying but generally shallow angles.

Utilities: Below ground utilities are present across the Site (drainage).

1.2 The Proposed Development

Development proposals: include for the *'erection of detached dwelling with associated car parking, secure cycle parking and refuse bin storage' – Figure 2*.

ⓘ ***Development works and risk:*** *An appreciation of the construction processes is essential for development-related risk assessments given the groundworks stand to meaningfully alter the level of risk, e.g. unstable slopes being removed by earthworks, or unsuitable material being exposed as part of the works.*

To enable this development, the following groundworks or ground-related works are likely to be required, N.B. listing is outline only.

> Preparation: Shallow scrape of soils to suite proposed formation levels and removal of residual Made Ground deposits.

> Earthworks: A 'wedge' of material will require removal from Site to suit the proposed formation levels.

> Utility Excavations: Excavation of any drainage and other utility alignments.

> Foundations: Construction of new sub-structures (foundations) for proposed dwelling and retaining wall.

> Surfacing: Construction of new hardstanding surfaces and soft landscaping (private garden) around curtilage of the building.

ⓘ ***Human health risk profile:*** *The proposed development would see a former open field turned lock-ups/commercial yard being converted to a residential end use. Former lock-ups are classed as commercial premises; however, this broad definition doesn't capture the wide range of practices and differing levels of duty of care employed on them. Whilst the lock-ups appear to have been used for general storage, vehicle maintenance is also common that can have resulted in the shallow soil quality having been degraded, e.g. through localised fuel / oil spillages.*

Figure 1: Location Plan
> *Extract from Site Location Plan – copy appended*
> *Red line = planning boundary*
> *Blue line = ownership boundary*
> *Site approximately centred on NGR 424595, 424403*
> ***INSERT**: Extract from development plan – copy appended*

^^^ **Photograph 1:** General arrangement of the Site (looking south-west)

^^^ **Photograph 2:** General arrangement of the Site (looking south-east)

2.0 Site Setting

ⓘ ***Background information***: *The Site setting is mostly described within the Coal Mining Risk Assessment report (A4085/21) prepared by Earth Environmental & Geotechnical Ltd, dated March 2021 (EE&G reporting).*

The commentary within this section supplements that presented within the above report with specific reference to the 'history' and 'environmental setting' of the Site.

2.1 History

Recorded history

The Site has been subject to two phases of use since the 1840s (the date of the earliest available ordnance survey mapping):

> *The first phase:* occurred between c. 1840s and 1890 day when the Site was occupied by open fields.

'Tenters' (cloth drying lines) and a 'brick field' located immediately south-east.

Through this phase of use it is considered:

- Unlikely that *harmful or polluting material* would have been introduced into the Site's soils.
- Unlikely that *gas generating material* would have been introduced into the Site's soils.
- Unlikely that *sub-structures* were present on Site (noting possible field drains).

> *The second phase:* occurred between c. 1890s and 2010s when the Site was developed for a parcel of land with small outbuildings (lock-ups) that was either associated with the place of worship immediately west of the Site or else the terrace properties that were developed at this period. These outbuildings were ultimately developed / expanded to include the full length of the Site's western boundary with a yard area to the front – *Figure 2*.

A small 'mill pond' was recorded around 30 m south of the Site from around the 1890s to early 1900s and, based on the presence of other features locally, appears to have been an isolated reservoir not directly attached to a mill building but rather feeding mills lower down the valley (south-west of the Site).

Through this phase of use it is considered:

⚠ Possible that *harmful or polluting material* would have been introduced into the Site's soils.

Former lock-ups are classed as commercial premises; however, this broad definition doesn't capture the wide range of practices and differing levels of duty of care employed on them. Whilst the lock-ups appear to have been used for general storage, vehicle maintenance is also common that can have resulted in the shallow soil quality having been degraded, e.g. through localised fuel / oil spillages. Similarly, there is the potential for asbestos containing material (ACM) to have been used in the fabric of the building, e.g. roofing, with no evidence of this material observed within the stockpiles of demolition arisings on Site or across the surface of the Site.

- Unlikely that *gas generating material* would have been introduced into the Site's soils noting that, localised spillages of oils and fuels may have resulted in a source of vapour generating material remaining within the shallow soils. In the lock-ups having remained in use over this time,

⚠ Certain that *sub-structures* were present on Site in the form of the former garage/lock up foundations (since largely removed as part of the demolition works) and the sewer present on Site.

- Unlikely that *unexploded ordnance* is present on Site given Batley and the surrounding area was subject to isolated air raids during the Second World War[1] with an overall low density of bombing. Furthermore, there is no evidence of the land having been put to military use or evidence of ruins on Site of immediately surrounding the Site in post-war mapping.

The immediate surrounding area was, and remains, occupied by residential properties, a school (Park Road) and with heavy industry (engineering works, mills) formerly located 50 m south and south-west of the Site.

The following **historical hazards** could adversely impact the proposed development – sub-structures (former foundations, drains) and harmful or polluting material.

Figure 2: Screenshot of Google Streetview™ from June 2023

[1] https://www.leedsbeckett.ac.uk/school-of-humanities-and-social-sciences/leeds-blitz/bomb-map/

2.2 Geology

Apart from the comment on Radon below commentary on the Site's geology is included within the EE&G reporting.

In summary, the Site is recorded being underlain by outcropping bedrock of the Pennine Lower Coal Measures formation with outcropping coal of the Joan coal seam mapped along the northern edge of the Site, as illustrated on the Ground Model – Section 4.0.

Structural Geology

It is noted that bedrock dips at a flat angle (1.4˚ to 2.6˚) towards the east / southeast.

Boundary Conditions

With the requirement for a reduced level excavation across the Site to suit formation levels, the northern boundary of the Site will necessitate the formation of a retaining wall to support the adjoining, higher level land that lies beyond the Site boundary.

Similarly, construction of the foundations along the south-western gable elevation will necessitate temporary removal of support beneath the foundations of the adjoining structure that, unless suitable risk reduction measures are in place, could also give rise to reduced instability.

Radon

Radon is emitted from naturally occurring uranium sources within a range of geologies. The Public Health England data indicates that between 5 to 10 % chance the Site is above the residential Action Level (200 Bq m^{-3})[2]. This translates to overall moderate chance the Site is affected by radon and guides the requirement for full radon protection measures to be incorporated within the proposed development.

The following **geological hazards** could adversely impact the proposed development – slope stability, shrink-swell (natural clay deposits) and radon.

2.3 Mining Geology

Commentary on the Site's mining geology is included within the *EE&G* reporting.

Various **mining related hazards** are identified that could adversely impact the Site – coal outcrops, potential unrecorded mine workings, and potential mine shafts (a 'background threat' in all minefield regions).

Whilst the Joan coal is indicated to be shallow enough to have been opencast (extracted from the surface) this is considered unlikely with structures surrounding the Site from the mid-1850s.

2.4 Hydrogeology & Hydrology

A water catchment is divided into two main elements; groundwater (hydrogeology); and surface water (hydrology). The groundwater regime is chiefly governed by the geology and the surface water regime controlled by the topography and surface cover. For any given site, these regimes are likely to influence each other and be influenced by off-site factors, e.g. groundwater levels being 'recharged' higher up a catchment.

The Site's groundwater regime

is influenced by; i) the lack of superficial soils and the shallow dipping, interbedded sedimentary rocks (Secondary A aquifer; no Source Protection Zones); ii) the Site's sloping topography that reflects local topography; iii) the Site's location on a the south-western edge of a ridge formation that separates the valleys of Howley Beck (to the east) and Battle Beck (to the south-west); and, iv) the local area historically being served by 'wells' and 'pumps' suggesting, as anticipated, a varied depth to groundwater, noting no evidence of 'springs' is noted within the local area however, they are anticipated to be present.

Groundwater flows are likely to be primarily controlled by the interbedded sedimentary bedrock sequence (varied permeabilities) and topography with a shallow groundwater surface anticipated expressed as see seepage (possible spring) flows from the shallow rock units.

The Site's surface water regime

is influenced by: the recent, historical presence of a compacted stone cover across the Site limiting infiltration to ground with most rainwater anticipated to have either run off the Site; and/or draining to the existing drainage network; the outfall of which appears to be a drain that is located on Site (foul or combined system).

Surface water, river and reservoir flooding are recorded as being 'very low chance' events across the Site[3].

The nearest surface watercourse is Battle Beck around 160 m south-west of the Site (locally to the Site this watercourse is generally culverted but with sections of open channel).

2.5 Environmental Setting

The environmental setting relates to land designations either on-site or within the surrounding area that have the potential to influence or present a risk to the proposed development.

Landfills

(historic[4] and/or active[5]) are recorded within 250 m of the Site, the distance across which viable pathways for gas migration are more likely.

A single, historic landfill is located within this distance, around 100 m from the Site at its closest point.

The landfill, 'Bridge Street' (ref. EAHLD31616) was registered to the James Duncan Ltd and licensed to accept liquid / sludge waste from June 1968 until an unspecified date. The landfill was formed within a historic railway cutting, that were commonly used for waste disposal historically.

[2] UKradon - UK maps of radon
[3] https://www.gov.uk/check-long-term-flood-risk
[4] https://www.data.gov.uk/dataset/17edf94f-6de3-4034-b66b-004ebd0dd010/historic-landfill-sites1
[5] https://www.data.gov.uk/dataset/ad695596-d71d-4cbb-8e32-99108371c0ee/permitted-waste-sites-authorised-landfill-site-boundaries1

By the 1980s the landfilling operations had ceased but likely much earlier, when the landfill was developed for a residential end use with evidence of sub-floor ventilation beneath each of the properties (air bricks) as would be anticipated as a minimum gas protection requirement on former landfill land.

The nature of the liquid or sludge waste is unknown but assumed to have a high gas generating potential[6] with liquid wastes either actively and quickly degrading when buried or, when placed in unlined landfills, likely to have been passively transported away from the landfill. Based on the dates of last landfilling likely being at least 50 years (before 1975) the gas generation potential of the waste will have diminished significantly, with household waste (mixed materials including liquids) entering the latter stages of a landfill's gas cycle; likely within Stage IV methanogenesis around this time (methane gas generation dominating {lighter than air} and diminishing with other bulk gases not generated). Taken together, the landfill is currently considered to have a low ground gas generation potential.

The landfill surface is located around 20 m higher than the Site with a base that is likely to have been between 7.5 to 10.0 m deep based on the track level on the retained railway line to the west of the landfill. Based on the plan area of the landfill as 0.6 ha (noting 'wedge' shaped void in railway embankment; half volume) and likely depth of the landfill (8 m) around 25,000 m^3 of waste may have been deposited. The landfill is also located on the crest of the ridge formation that characterised the local topography with most of the landfill located to the east of the crest, i.e. topographical falls trend towards the east, away from the Site. Coupled with the easterly to south-easterly bedrock dip angles, any leachate movement from the landfill (and with it, gas generating material) is likely to have been directed towards the east, likely along the railway line cutting itself, away from the Site. It is also noted that, at the depths the railway cutting was taken to, the same coal seams that are recorded beneath the Site are likely to have been intercepted (the shallowest seam; Joan coal). Any earlier mineworkings within this seam would have been intercepted by the railway cutting and, where unfilled, could serve as direct, advective pathways through which landfill gas could travel, including towards the Site, noting that this shallowest coal seam is indicated to outcrop on the higher, northern edge of the Site, i.e. any unrecorded workings in this coal seam may be 'above' the Site. Taken together, it is considered a low likelihood that liquid waste or landfill gas from the landfill will have been transported towards the Site noting the possible exception for mineworking pathways.

Based on the low ground gas generation potential and low likelihood for direct pathways to, it is considered unlikely that the landfill could adversely impact the proposed development and is therefore not considered to be a credible hazard or 'source'.

Historic infilled land, e.g. ponds and quarries are recorded on Site or within 100 m of Site (various sources); the distance across which viable pathways for gas migration are more likely.

A single, historic mill pond was located within this distance, around 25 m from the Site at its closest point in the 1890s. The mill pond appears to have been infilled around the early 1900s when various other mill ponds higher up the valley slops were consolidated into locations lower and closer to the industrial corridor south-west of the Site.

In having been infilled at least 100 years ago, even if degradable material was placed within the mill pond, the potential for this material to generate gas is considered highly diminished to the point it is considered to have a very low ground gas generation potential[6]. The mill pond construction will have also been resulted in an effective 'seal' for water retention that will also serve to inhibit the movement of leachate/gases that may be generated within this feature.

Based on the low ground gas generation potential and low likelihood for direct pathways to exist, it is considered unlikely that the mill pond could adversely impact the proposed development and is therefore not considered to be a credible hazard or 'source'.

Statutory protected areas, e.g. SSSI are not recorded on the Site[7].

Based on the above commentary landfill gas (or other non-natural ground gases) (**historical hazard**) is unlikely to adversely impact the proposed development.

[6] *BS 8576:2013 Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds (VOCs)*

[7] *https://magic.defra.gov.uk/MagicMap.aspx*

3.0 **Fieldworks –** Intrusive Investigation, Laboratory Testing and Monitoring

The intrusive investigation (Table 1) was designed in general accordance with guidance for site investigations[8] referencing; the Site setting, the anticipated ground conditions, access arrangements and responding to the revealed ground conditions, e.g. additional holes as and where required.

Comments on the scope of the fieldwork: Beyond general ground truthing, one key objective of the intrusive investigation was to: confirm the bedrocks sequence beneath the Site and presence/absence of coal or coal mine workings noting the uncertainty with respect to the coal seams' presentation locally.

It should be borne in mind that any ground investigation offers a snapshot of variations between exploratory hole positions cannot be ruled out. Unexpected or unforeseen ground conditions may be encountered even when extensive investigation is completed.

In this scenario, further investigation is not recommended.

Exploratory hole locations are illustrated on the Ground Model in Section 5.0 with descriptions of the materials encountered detailed within the following section, Section 4.0. The *exploratory hole logs* are appended.

Permits: The ground investigation fieldworks were conducted under a permit issued by the Mining Remediation Authority (ref. 30632 – copy appended).

Table 1: Scope and Rationale of the Intrusive Investigation

Activity	Ref.	Rationale
Exploratory Holes		
3 machine excavated trial pits	TP101 to TP103	To investigate the shallow ground conditions across the Site and facilitate infiltration testing (where viable).
In-Situ Testing		
Ground gas monitoring	RO101 and RO102	To enable a preliminary infiltration rate to be determined within the shallow soils / rocks.
Other		
Logging of soil arisings from exploratory holes	All holes	To characterise: ground conditions; existing foundations; and support classification of materials present in the ground. Material descriptions are discussed within Section 4.0 and Section 6.0, as well as more fully detailed within the accompanying exploratory hole logs.

Geotechnical and environmental samples

were obtained as set out within the accompanying logs however, the samples were misplaced in transit (external courier) and therefore, advice based in conservative assumptions is made.

It should be borne in mind that various material streams will be generated by the planned works for which additional sampling may be required, e.g. to confirm waste classifications and/or confirm suitability for re-use.

Ground gas monitoring

Was completed within the rotary borehole cavities during drilling and on completion with no detectable methane, carbon dioxide or hydrogen sulphide and no depleted oxygen detected – Photograph 3.

No extended monitoring of ground gases was undertaken or proposed based on: i) the lack of evidence of plausible pollutant linkages as part of the desk-based assessment (Section 2.1); and, ii) revealed ground conditions that included – an absence of potentially degradable material within the ground, poor permeability of the natural clay deposits and saturated nature of the shallow ground conditions making gas migration unlikely (all potential sources).

^^^ **Photograph 3:** Ground gas monitoring in R0101

^^^ **Photograph 4:** Backfilling/sealing of RO101

Fieldwork decision making:

1. The lack of evidence of coal or mine workings within 26.6 m of the ground surface in RO101 indicating that unrecorded shallow mine workings were not present beneath the Site.

   RO102 was proposed as a 'check hole' to confirm these findings with very similar drilling conditions evidenced.

[8] *Code of practice for site investigations. BS 5930 (2015)*

4.0 Ground Conditions – Anticipated and Revealed

Anticipated ground conditions:

Based on the Site setting the presence of three main materials were anticipated across the Site:

(1) Made Ground comprising demolition arisings mixed with natural soils;

> Possible relic sub-structures (foundations) within the Made Ground deposits.

(2) Weathered bedrock deposits (likely recovered as clay) becoming more lithified and intact with depth;

> Possible Joan coal deposits outcropping along the northern edge of the Site.

> Possible Flockton Thick coal deposits at unknown depths.

These materials were anticipated to be evenly distributed across the Site noting the sloping nature of the surrounding land was likely to have resulted in an increased thickness of Made Ground across the southern edge of the Site, as the ground was levelled for the Site's former use.

Revealed ground conditions:

The intrusive investigation undertaken on Site confirmed the anticipated conditions with no variations and seven key observations

> Observation 1: Two distinct 'types' of Made Ground were encountered: i) Made Ground 1 - mixed natural soils and demolition arisings (all exploratory holes) encountered over shallow depths; and, ii) Made Ground 2 - ash and clinker (TP101 only) encountered below the shallower Made Ground.

> Observation 2: A deep profile of weathering is evident across the Site with no evidence of intact bedrock deposits within 2.60 m of the ground surface (intact bedrock inferred at 6.00 m depth within rotary boreholes) with material of upwards of 'firm' consistency encountered at depths of between 0.70 m (TP103) and 1.80 m (TP101).

> Observation 3: Apart from the drainage alignments, no evidence of in-ground sub-structures was revealed on Site with the former lock-ups likely to have been supported on flat slab (pseudo-raft) foundations.

> Observation 4: Apart from the ash and clinker deposits no evidence of potentially harmful or polluting material was encountered in the exploratory holes, e.g. stained or odorous material.

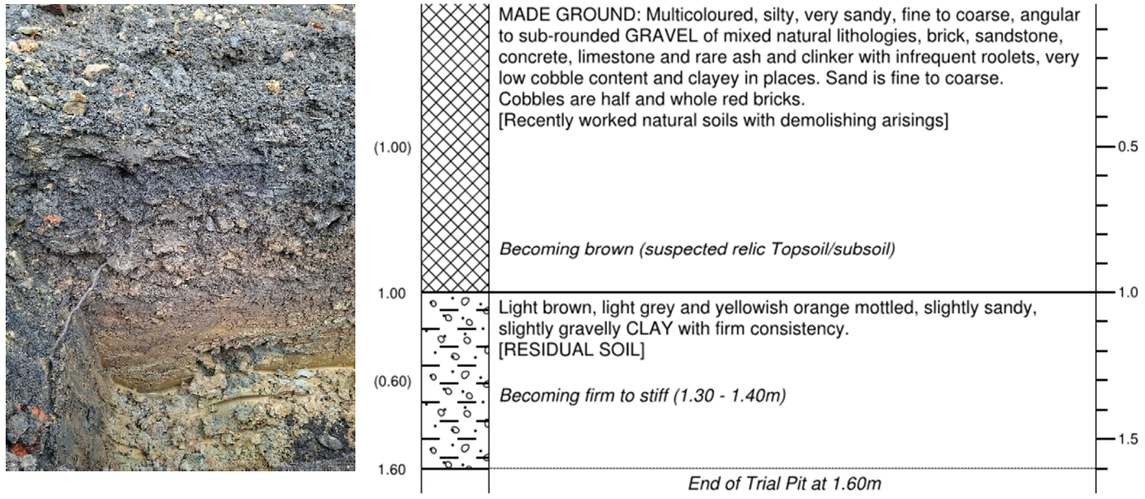
No evidence of asbestos containing material (ACM) was noted within the Made Ground deposits or on the surface of the Site.

> Observation 5: Groundwater was encountered as basal seepages within TP101 (2.60 m depth) and TP102 (1.60 m depth) that is indicative of natural groundwater that appears to be under sub-artesian pressure (wanting to rest at shallower depths but remaining below ground level).

> Observation 6: Apart from thin 'trace' coal, no evidence of coal or coal or non-coal related mine workings was revealed within 26.0 m of the ground surface (RO101).

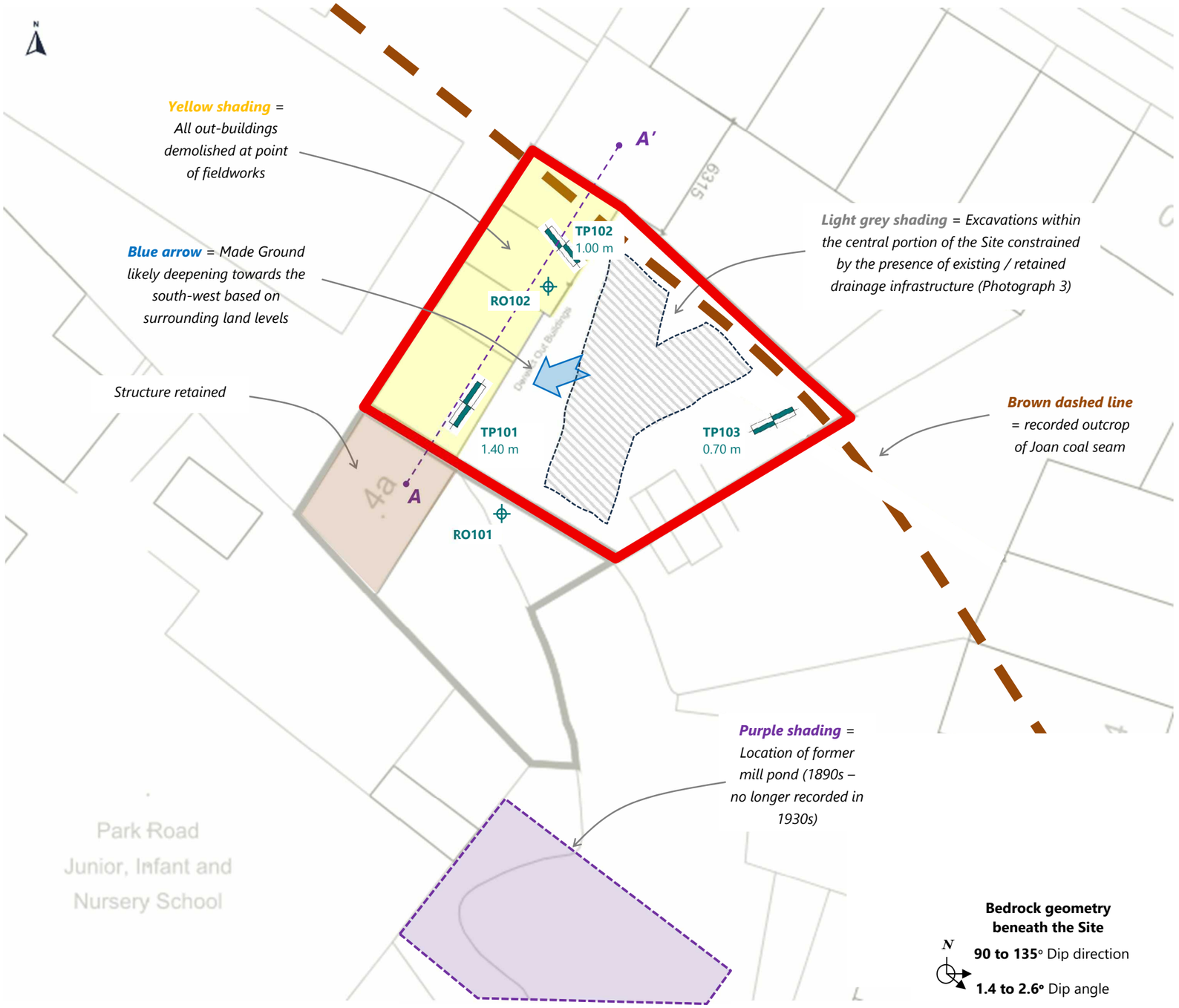
> Observation 7: No mine gases (various) were detected within the borehole cavities (RO101 and RO102) during drilling and after, prior to the holes being sealed.

The Ground Model for the Site is presented in Section 5.0.



^^^ Figure 3: TP102 side profile alongside extract of the exploratory hole log illustrating generalised profile of the ground that, apart from varying depths, is typically of the other exploratory holes

5.0 **Ground Model** - Plan



Key

- Planning boundary
- Ownership boundary

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- Rotary openhole borehole
- Machine excavated trial pit
- 1.00 m Depth to base of Made Ground

Bedrock geometry beneath the Site

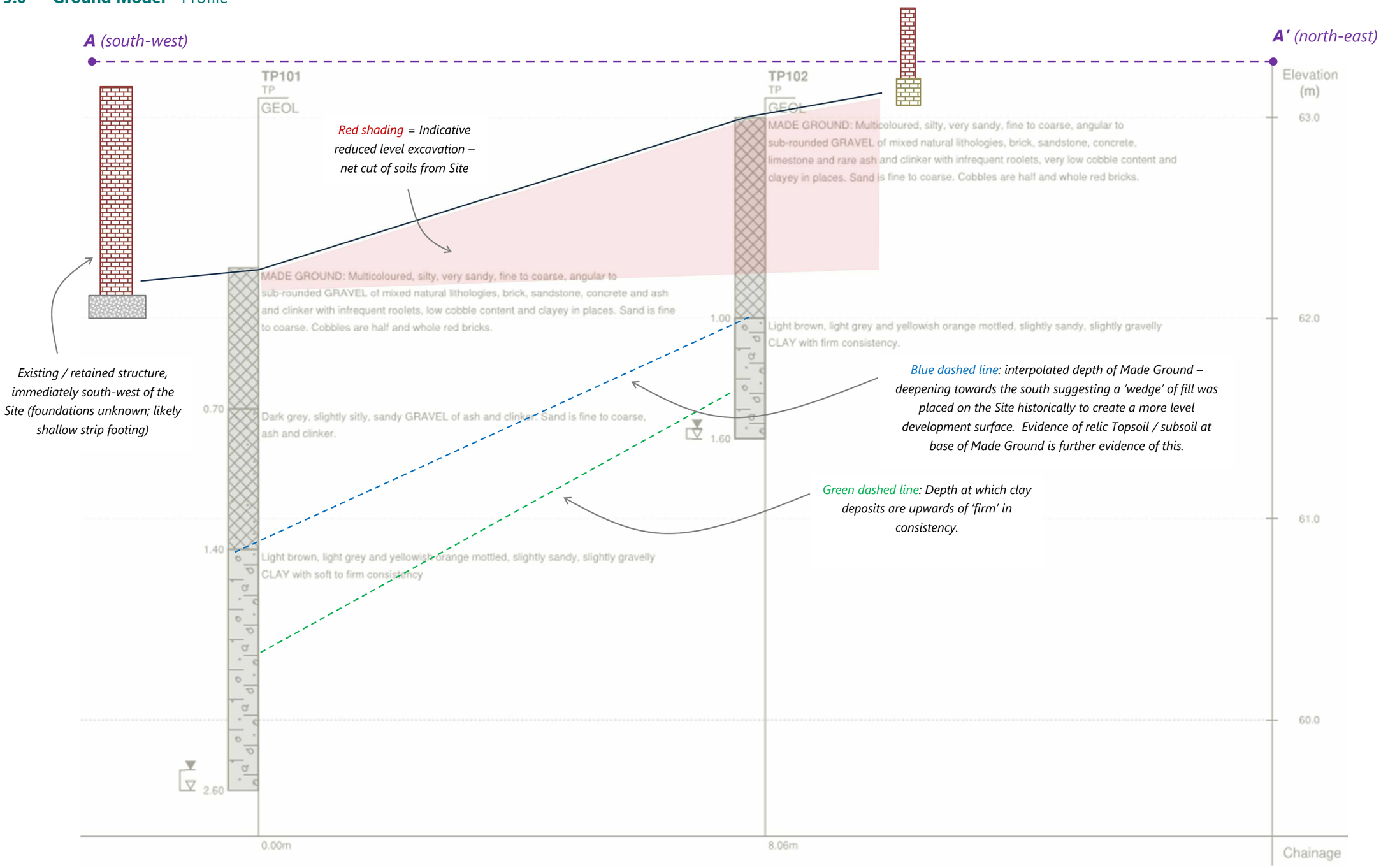
N

90 to 135° Dip direction

1.4 to 2.6° Dip angle

^^^ Photograph 3: Approximate alignment of drainage infrastructure within the central portion of the Site restricting access for investigation

5.0 **Ground Model** - Profile



6.0 **Ground Engineering** – Risk Management and Design Considerations

The main design considerations include, but are not limited to;

> Low to moderate imposed loads from the proposed structure (two-storey residential dwelling);

> The presence of 'wedge' of Made Ground deposits that deepens towards the southern end of the Site that appear to have been introduced as historic fill to level the ground across the Site;

> The presence of shallow natural clay deposits (residual soil / completely weathered bedrock) with firm to stiff consistency that will offer 'good support' at shallow depths;

> The proximity of the existing, retained structure immediately to the south of the Site; and,

> The absence of any suitable, soil forming material that might otherwise be recovered for re-use within soft landscaping areas.

***Key watch-points for all groundworks*:**

ⓘ **Below ground utilities:** Utility strikes represent one of the highest background threats of injury, death and programme delays of all ground-related hazards. The investigation of existing utilities is typically work completed by utility specialists with reference within this Report included for completeness.

ⓘ **Excavation access:** Excavation collapses carry a high background threat of injury and death – even collapses within shallow excavations can pose a risk of harm. Personnel access into any excavations should therefore only be undertaken with adequate support and appropriate risk assessment. Advice on the general stability of excavations is therefore offered on a preliminary basis only within this Report. Further guidance is available[9].

ⓘ **Materials management.** For all scenarios, developing a strategy for management of materials/soils in advance of the works commencing is recommended to maximise recovery/reuse and maintain soil conditioning, e.g. not repeatedly handling or compacting Topsoil. In some scenarios, formalising this plan[10] will be required.

Preliminary advice on the re-use and recovery of materials is presented within this Report with indicative material classes given in accordance with Series 0600[11] of the Manual of Contract Documents for Highway Works.

For material re-use as an engineering or load-bearing fill the Engineer's approval will be required. Additional testing may be required to confirm grading and where necessary, a compaction regime.

ⓘ **Waste classification of excavation arisings.** The waste classification of soils is something that should be approached in a step-wise manner, in line with current guidance[12]:

Step 1: Confirming whether a soil is Hazardous or Non-Hazardous (through solid soil testing) followed by

Step 2: Waste acceptance criteria (WAC)testing only when and where off-Site disposal is confirmed as the fate for the material.

Groundworks contractors have access to waste brokerage firms and landfills directly where acceptance criteria can vary and, as such, are generally best placed to confirm waste classifications. The waste classification any material surplus to requirements (requiring disposal) will need to be agreed with the groundworks contractor in advance of works commencing. Advice on waste classification is therefore offered on a preliminary basis within this Report.

ⓘ **Construction workers health and safety.** Contractors working in the ground will be exposed to the soils and any materials contained within them throughout the duration of the works phase (construction).

Based on the history of this plot and findings of the fieldworks, apart from the ash and clinker, it is unlikely that chemically unsuitable soils are present beneath the Site, e.g. oil-stained soils. This does not mean material of this nature will not be encountered, but rather, it is less likely. At this stage, if and where any potentially harmful material, e.g. oil-stained soils, was encountered within the soils on Site, this would be managed as an unforeseen encounter (Guidance Note annexed to this Report).

The appointed contractor should satisfy themselves of having in place suitable measures to protect workers and neighbours against the compounds detected within the Site soils.

[9] CIRIA Report 97 - Trenching practice. 2nd edition
[10] https://claire.co.uk/projects-and-initiatives/dow-cop/28-framework-and-guidance/111-dow-cop-main-document
[11] https://www.standardsforhighways.co.uk/search/471049cb-7dd8-452a-81e6-fc8af7d31b91
[12] Classify different types of waste: your legal responsibilities - GOV.UK

6.1 Groundworks

Excavations

Excavations are anticipated to encounter the following materials that, unless otherwise stated, are listed in a generalised, descending order from the surface.

> Made Ground deposits (two types)

Likely present across the entire Site and characterised by;

- Made Ground 1 – mixed natural soils and demolition arisings: '*Multicoloured, silty, very sandy, fine to coarse, angular to sub-rounded GRAVEL of mixed natural lithologies, brick, sandstone, concrete, limestone and rare ash and clinker with infrequent rootlets, very low cobble content and clayey in places. Sand is fine to coarse. Cobbles are half and whole red bricks.*' (TP102 description)
- Made Ground 2 – ash and clinker: Present in TP101 only between 0.70 to 1.40 m below ground level.

⚠ Harmful material: In lieu of chemical analysis, both Made Ground deposits are considered chemically and physical unsuitable for re-use within soft landscaping areas.

Similarly, if retained within soft landscaping areas, the risk presented by this material to end users of the Site would be considered unacceptable. Without risk reduction measures, end users of the Site, or 'the receptors', could be exposed via various 'pathways' to this 'source' of harmful material. Further details on this are presented within Section 7.4.

No evidence of suspected asbestos containing material (ACM) was noted in the ground or across the surface of the Site, e.g. within the demolition arisings temporarily stockpiled on Site.

Comment on pollution potential: Whilst chemical analysis has not been completed on the Made Ground deposits, the pollution potential of both material types is considered low with no evidence of free-product, e.g. staining or odours in either type of Made Ground and the ash and clinker being typical of combustion by-products from coal furnaces and not deposits from more specific manufacturing sources, e.g. brick works ash that is typically more 'colourful', finer grained and contains more mobile forms of inorganic compounds.

It is also noted that, following construction, most of the Site will be encapsulated by either building or hardstanding cover resulting in very limited effective infiltration that would otherwise serve to mobilise/leach any chemicals present within the Made Ground. Similarly, the presence of clay soils across the Site that are anticipated to have very low permeability will limit the vertical movement of water and any chemicals with it.

Taken together, the risk presented by this material to Controlled Water receptors, e.g. groundwater or nearby watercourses, is considered acceptably low.

⚠ Made Ground (geotechnical hazards): Localised spalling of the Made Ground deposits was noted during the fieldworks with the excavations found to be generally stable otherwise.

To reduce the risk of instability in excavations to acceptable levels, it is recommended that: i) excavations are kept open for as short a duration as possible, ii) surface loadings, e.g. plant and machinery, near excavation edges is limited as far as practicable, iii) excavation stability is approached in a responsive manner with the potential requirement for shoring.

⚠ Sub-structures: The existing drainage alignment that crosses the Site appears to be in-use and needing to be retained / protected as part of the proposed development.

> Clay deposits (weathered bedrock)

Likely present across the Site and characterised by:

'*Light brown, light grey and yellowish orange mottled, slightly sandy, slightly gravelly CLAY with soft to firm consistency.*' (TP101 description) becoming firmer/stiffer and darker with depth.

Initially low becoming medium strength characteristics with depth with undrained shear (c_u) estimated to be upwards of 50 kN/m^2 at depths of 1.80 m (TP101) and 1.40 m (TP102).

In lieu of laboratory testing, the clay deposits are assumed to have medium volume change potential.

Poor drainage characteristics anticipated with an infiltration rate (f) less than 10^{-6} m/s estimated based on the texture and composition of the material noting that shallow seepage flows of groundwater are likely arising from the deeper, more lithified/gravelly deposits.

⚠ Radon: Full radon protection is recommended as part of the proposed development in accordance with current guidance[13].

> Groundwater

The groundwater table is anticipated to rest within 3 m of the finished floor level of the proposed structure noting that the sloping nature of the Site is more likely to give rise to seepages flows (sloping groundwater surface) in otherwise very low permeability clay soils that underlie the Site.

Rainwater (surface water) is likely to accumulate within excavations given the anticipated 'very poor' drainage characteristics of the clay deposits (weathered bedrock) and shallow seepage flows.

Earthworks (cut and fill)

Earthworks are not anticipated to be required with ground levels remaining broadly consistent pre/post construction.

6.2 Structural Engineering

Proposed foundations

Foundation options are open based on these anticipated ground conditions and will be guided by:

⚠ Slope stability: Sequencing of the proposed dwelling's foundation along the south-western gable will likely be required to ensure support to the adjacent property is maintained (guarding against instability). Once the foundation is constructed, permanent support will have been provided, guarding against the potential for slope instability / undermining of the foundation.

⚠ Made Ground (geotechnical hazards): Unregulated Made Ground presents a risk of excessive levels of total and differential settlement when loaded, movement that can occur even after the initial construction related consolidation has completed (time-variable).

[13] *BRE 211 Radon: Guidance on protective measures for new buildings… 2023 Edition*

To reduce this risk to acceptable levels it is recommended that the foundations for new structures are taken through the fill deposits and 'keyed into' the underlying natural clay deposits at depths set out in the bullet point below.

⚠ Sub-structures: The existing drainage alignment that crosses the Site appears to be in-use and needing to be retained / protected as part of the proposed development.

Foundation formation depths will need to be extended down below the base of these pipes to ensure excessive stress/strain is not placed on the pipes.

⚠ Shrink-swell: as a cohesive soils, this material will be susceptible to both; i) softening and ii) shrink-swell with changes in moisture content. Both could give rise to excessive levels of settlement or longer-term subsidence related ground movement. The weathered bedrock is conservatively assessed to have a medium volume change potential.

To reduce this risk to acceptable levels, it is recommended that: i) foundation excavations (and excavations in general) are kept open for a minimum duration to limit the potential for saturation and softening; and, ii) foundations are formed at minimum depths of at least 0.90 m below ground level (proposed ground level) and that foundations are deepened to reflect the influence of any existing or proposed trees and vegetation (existing ground level can be referenced).

- The presence of medium strength weathered bedrock deposits at depths of between 1.40 to 1.80 m depth locally to the proposed structure.
- Seepage flows of groundwater within 3 m depth of the ground surface.
- The proximity of nearby structures.

Whilst it is likely the existing foundation will be reused, as an indicative solution, for hypothetical, new, centrally loaded liner (strip) footings up to 0.75 m wide that are formed at a minimum depth of 900 mm below ground level (shrink-swell); within the 'firm' clay deposits (typically between 1.40 to 1.80 m depth), a presumed bearing capacity of upwards of 100 kN/m^2 could be adopted as part of the foundation design (BS EN 1997-1 methodology based on a conservative estimate of the strength characteristics of the weathered bedrock).

Proposed floor slabs

Options are guided towards a ground bearing floor slab based on these anticipated ground conditions internally (shallow weathered bedrock).

⚠ Radon: Full radon protection is recommended as part of the proposed development in accordance with current guidance[14].

Detailing of this protection should be included for as part of the architectural drawings and, in outline, is likely to include for a ventilated sub-floor space together with a continuously sealed, radon resistant membrane, e.g. damp proof membrane, across the full footprint of the development.

Comment on other ground gases: Whilst the risk presented by other ground gases, e.g. landfill, mine or natural, and vapours is considered acceptably low, the provision of 'full' radon protection will offer inherent protection to all sources of ground gas and vapours.

Retaining walls

A retaining wall is proposed along a short section of the Site's northern boundary. It is assumed that this retaining wall will be less than 1.50 m in height.

The soils that this wall will be retaining are off Site and therefore not able to be readily characterised however, conservative assumptions can be made to support the design

For the purposes of the reinforced concrete retaining wall solution design, the following characteristic values can be used.

- Between 0.50 to 1.50 m depth = undrained shear strength (c_u) 25 kN/m^2 (soft clay)

The coefficient of earth pressure (ko) in the residual soil deposits and deeper bedrock deposits is expected to be in the range of 0.15 to 0.45 and, for the purposes of the retaining wall design can be modelled as:

- Between 0.50 depth to base – ko = 0.50

It is recommended that the same advice for the proposed dwelling's foundation can be applied to the retaining wall with the foundation formation depth extended through the Made Ground deposits into the 'firm to stiff' natural clay deposits.

⚠ Slope stability: Sequencing of the retaining wall's construction will likely be required to ensure support to the adjacent property is maintained (guarding against instability). Once the retaining wall is constructed, permanent support will have been provided, guarding against the potential for slope instability.

⚠ Sub-structures: The existing drainage alignment that crosses the Site appears to be in-use and needing to be retained / protected as part of the proposed development.

Buried concrete

Buried concrete placed in all soils encountered as part of this investigation is recommended to be designed to suit DS-2 AC-2 classifications[15] based on conservative assumptions of each of the material's chemistry.

For buried concrete design purposes, groundwater should be regarded as 'mobile' (seepage flows of groundwater).

6.3 Civil Engineering

Hard-standing

Hard-standing formations/sub-grades will be subject to final design levels being agreed however, based on the revealed ground conditions and likely formation levels (reduced levels), the sub-grade is anticipated expected to comprise natural clay deposits, e.g. TP103, with localised areas of Made Ground associated with the existing drain.

[14] *BRE 211 Radon: Guidance on protective measures for new buildings… 2023 Edition*
[15] BRE Special Digest 1 Concrete in aggressive ground

Where confirmed as the formation, the natural clay deposits are anticipated to offer 'good support' to new hardstanding with a preliminary CBR value of 3 % recommended at this stage noting that, shallow residual thicknesses of Made Ground may remain below the formation. Higher values may be possible if and where check-testing is performed.

The presence of 'soft spots' should be anticipated given the presence of the existing drain and, where encountered, will require excavation and replacement with a suitable, well-compacted granular fill.

The use of reinforcing layers, e.g. geo-grid and geo-textile should be considered given the presence of Made Ground deposits that are typically deeper than 1.0 m across the Site and

Drainage

Drainage of the former garage units is anticipated have been via the existing sewer running below the Site.

Cohesive (clay) soils were confirmed across shallow depths the drainage characteristics of which are anticipated to be 'very poor'. Soil infiltration rates can be determined through various means. In this scenario, with the revealed ground conditions (natural clay deposits) confirming the anticipated ground conditions and these soils being fine grained (clay) the soils will have inherently very low permeability.

Drainage to ground is therefore not recommended beyond the use of permeable paving or similar disperse drainage systems that emulate the effective infiltration occurring areas of former soft landscaping.

It is further noted that the shallow groundwater surface evidenced across the Site will limit the viability of infiltration to ground being used (insufficient free-broad).

Water Supply Pipes

Water supply pipes are likely to be laid within the shallow Made Ground deposits and/or natural clay deposits.

Whilst no evidence of fuel or oil impacted soils was noted as part of the investigation, in lieu of laboratory testing, the shallow Made Ground deposits are conservatively assumed to include chemicals that, when in contact with water supply pipes, have the potential to foul water quality.

As a precautionary measure, it is recommended that barrier pipe (PE/AL/PE) is adopted as part of the proposed development. This material will reduce the potential for any chemical compounds to foul water supply pipes.

6.4 Landscaping

Soft landscaping

For areas of new soft landscaping (around the proposed dwelling) the sub-grade is anticipated to comprise the shallow Made Ground deposits in some, if not all areas.

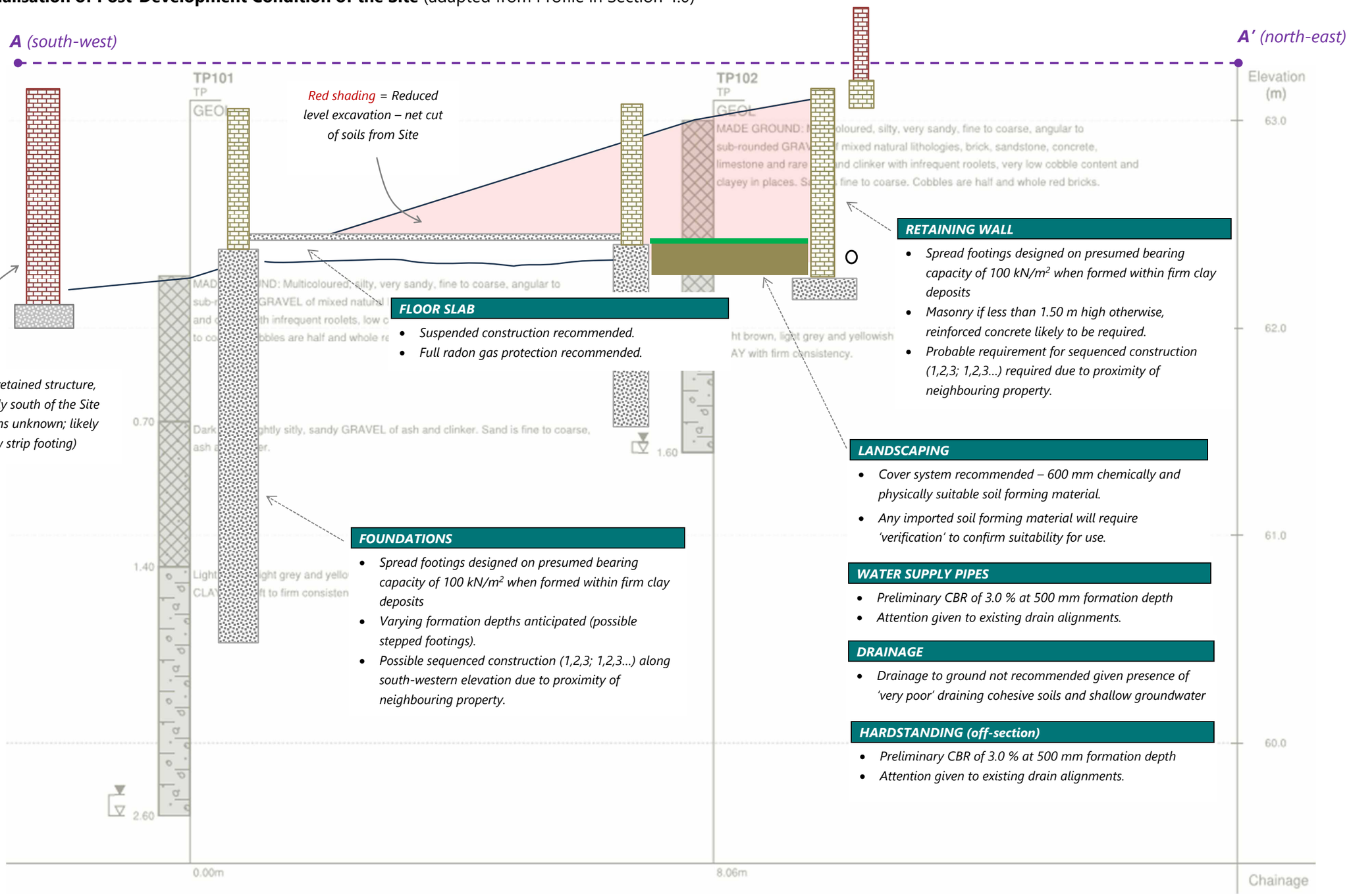
The Made Ground is considered physically unsuitable as a soil forming material and, in lieu of chemical analysis, also considered chemically unsuitable as a soil forming material.

On this basis, it is recommended that, where residual thickness of Made Ground are present within the formation of the new soft landscaping areas, a 'cover system' is employed to reduce the likelihood of end user of the Site being exposed to this material (breaking all potential pollutant linkages apart from vapour inhalation for which there is no evidence on Site).

Further details relating to the cover system are presented within Section 8.0

Figure 4: Extract from appended development plan illustrating areas of soft landscaping

Conceptualisation of Post-Development Condition of the Site (adapted from Profile in Section 4.0)



7.0 Conclusions and Recommendations

Based on available information and the scope of this Report (intrusive assessment) the ground conditions and associated, ground-related risks on Site are considered generally well characterised and broadly consistent with the anticipated ground conditions

It is reiterated that any ground investigation offers a snapshot of ground conditions from discrete exploratory hole positions and therefore variations in ground conditions cannot be ruled out.

7.1 Conclusions

A summary of the risk management process is presented within the **Ground Risk Register** on the following page.

> **Further assessment** is not recommended.
>
> If and where unexpected or unforeseen material is encountered, e.g. oil-stained soils, then further assessment may be required to support the design of a suitable response plan.

> **Risk management / mitigation** is recommended to reduce the level of risk presented by various hazards to acceptably low levels details of which are presented throughout Section 7.0 of this Report alongside more general ground engineering advice.

7.2 Recommendations

Recommended follow-on work includes:

1. *Submission of the Ground Investigation Report (intrusive) & Remediation Strategy* to the project design team, Local Planning Authority (for consultation) and other stakeholders, e.g. building control.
2. *Incorporation of the risk reduction measures recommended within Section 6.0 as part of the design works*.
3. *Completion of the remedial works set out within Section 8.0 of this Report*
4. Production of a Validation Report to confirm that recommended remedial works set out within Section 8.0 of this Report have been completed satisfactorily.

ⓘ **Photographic diary of the groundworks:** To re-emphasise the point above, it is recommended that a photographic record of the construction phase groundworks is maintained to document the physical condition and nature of the ground conditions across the Site. This will serve as a valuable record for the project as well as any future groundworks on the Site.

Ground Risk Register – Construction Issue

Hazard	Background threat [1]	>>> Risk Assessment [2] >>>		Risk Management [3]
		① *Desk-Based Lines of Evidence*	② *Intrusive Investigation Lines of Evidence*	
Historical Hazards				
Polluting material	***High***	**Unacceptable** *(Section 2.1)*	Acceptably low *(Section 4.0)*	Responsive
Harmful material	***Medium***	**Unacceptable** *(Section 2.1)*	**Unacceptable** *(Section 4.0)*	**Various actions** *(Section 6.4 and 8.0)*
Made Ground (geotechnical hazards)	***Medium***	Acceptably low *(Section 2.1)*	**Unacceptable** *(Section 4.0)*	**Various actions** *(Section 6.1 and 6.2)*
Sub-Structures	***Medium***	**Unacceptable** *(Section 2.1)*	**Unacceptable** *(Section 4.0)*	**Various actions** *(Section 6.1 and 6.2)*
Ground gas (landfill or infilled land)	***Low***	**Unacceptable** *(Section 2.5)*	Acceptably low *(Section 4.0)*	Responsive (*inherent protection; Section 6.2*)
Unexploded Ordnance	***Low***	Acceptably low *(Section 2.1)*	Acceptably low *(Section 4.0)*	Responsive
Aggressive geology (non-natural)	***Low***	Acceptably low *(Section 2.1)*	Acceptably low *(Section 4.0) – precautionary protection*	DS-2, AC-2 *(Section 6.2)*
Geological Hazards				
Slope instability	***High***	**Unacceptable** *(Section 2.2)*	**Unacceptable** *(Section 2.2)*	**Various actions** *(Section 6.2 and 6.3)*
Collapsible soil	***High***	Acceptably low *(Section 2.2)*	Acceptably low *(Section 4.0)*	Responsive
Running sand	***High***	Acceptably low *(Section 2.2)*	Acceptably low *(Section 4.0)*	Responsive
Radon	***High***	**Unacceptable** *(Section 2.2)*	**Unacceptable** *(Section 2.2)*	**Full protection** *(Section 6.2)*
Ground dissolution	***Medium***	Acceptably low *(Section 2.2)*	Acceptably low *(Section 2.2)*	Responsive
Shrink-swell	***Medium***	**Unacceptable** *(Section 2.2)*	**Unacceptable** *(Section 4.0)*	**Various actions** *(Section 6.2)*
Ground gas (natural sources)	***Medium***	Acceptably low *(Section 2.2)*	Acceptably low *(Section 2.2)*	Responsive (*inherent protection; Section 6.2*)
Aggressive geology (natural)	***Low***	Acceptably low *(No known, aggressive geologies, check testing recommended)*	Acceptably low *(Section 4.0) – precautionary protection*	DS-2, AC-2 *(Section 6.2)*
Compressible soil	***Low***	Acceptably low *(Section 2.2)*	Acceptably low *(Section 4.0)*	Responsive
Mining Hazards				
Surface instability (mine shafts)	***High***	Acceptably low *(Coal Mining Risk Assessment, prepared by others)*	Acceptably low *(Section 4.0)*	Responsive
Ground gas (mine gas)	***High***	**Unacceptable** *(Coal Mining Risk Assessment, prepared by others)*	Acceptably low *(Section 4.0)*	Responsive (*inherent protection; Section 6.2*)
Surface instability (shallow mining)	***Medium***	**Unacceptable** *(Coal Mining Risk Assessment, prepared by others)*	Acceptably low *(Section 4.0)*	Responsive
Surface instability (opencast)	***Medium***	Acceptably low *(Coal Mining Risk Assessment, prepared by others)*	Acceptably low *(Section 4.0)*	Responsive
Coal Outcrops	***Medium***	**Unacceptable** *(Coal Mining Risk Assessment, prepared by others)*	Acceptably low *(Section 4.0)*	Responsive
Geological Faults	***Low***	Acceptably low *(Coal Mining Risk Assessment, prepared by others)*	Acceptably low *(Section 4.0)*	Responsive

Notes:

1. ***Background threat*** *is included to help the reader better contextualise the relative risk associated with each hazard, and through that, take greater ownership of any recommended risk management. Proportionality is essential - being overprotective erodes the value of the process and adds unnecessary cost; being under protective exposes people and places to real risk.*

   The level of background threat in the table above represents an in-house, qualitative assessment of publicly available incident data (Health and Safety Executive and other sources) and other associated impacts relating to the hazard, e.g. commercial impacts from time-delays during groundworks. For example, whilst the consequence of an unexploded ordnance incident would be severe, no fatalities or injuries have occurred since 1949 and so the background threat is deemed 'low'. Similarly, collapsible ground is linked to excavation instability with a high number of fatalities due to excavation collapse meaning the background threat is deemed 'high'. Further details on this are available on request.

2. ***Risk assessments*** *are 'live' documents and risk levels can change as and when new information is made available. The assessment of risk associated with ground risk is commonly a step-wise process; analysis of desk-based lines of evidence that are either revised or confirmed by the lines of evidence that are gathered as part of the intrusive investigation.*

3. ***Risk management:*** *Where 'responsive' risk management is recommended this does not mean there is no risk but rather that groundwork operatives stay alert to the potential for unexpected or unforeseen ground conditions.*

8.0 Remediation Strategy

Based on scale of the recommended remedial works, advice on managing risk to human health and Controlled Waters is set out within this combined report.

The Remediation Strategy offers advice on risk mitigation measures or 'remedial actions' that have been recommended to bring the site up to a condition that would be deemed 'suitable for use'.

The legal context of this advice is rooted within national planning policy guidance (the National Planning Policy Framework) that is governed by planning law (various acts).

In this scenario, the Site would be deemed 'suitable for use' if residual risk is reduced to acceptable levels relating to one ground-related hazard; i) potentially harmful material in soils.

For completeness, it is also noted that the provision of radon protection measures (full protection) is recommended. Radon commonly falls outside the remit of 'contaminated land conditions' and therefore, more specific advice on the design, installation and verification of these measures is not included herein.

8.1 Risk Assessment Summary

The Made Ground deposits (both types) are considered physically and chemically unsuitable for retention within soft landscaping areas or, in other words, the Made Ground is considered to represent a 'sources' of potentially harmful material that, unless risk reduction is pursued, stands to present an unacceptable risk to end users of the proposed development.

The formation levels for these new areas of soft landscaping will be lower than the existing levels and are anticipated to result in the removal of between 150 to 1500 mm thickness of existing materials from the proposed garden areas. At these reduced levels, residual thicknesses of Made Ground deposits may be present.

Depending on the material revealed within the formation soils, one of two actions will be required:

i) Where formation soils are proven to be Made Ground: the thickness of soil forming material can be there may be a requirement to excavate soils deeper to suit the recommended clean cover design (Table 1); and,

ii) Where formation soils are proven to be natural clay deposits: the thickness of soil forming material can be a minimum of 150 mm, subject to the requirements and specification of the Architect / Landscape Architect (Table 1).

Over-digging the soft landscaping areas to reveal natural clay deposits could also be considered.

Risk is not static and can change for various reasons. In this scenario, the reduced level excavation may reveal material that differs from that described here and the level of risk may change, e.g. fuel impacted soils or asbestos containing material being encountered within the soils.

8.2 **Remedial Action 1 –** Provision of a Suitable Thickness of Soil Forming Material to Soft Landscaping Areas

The objective of this remedial action is to: prevent end users of the Site being exposed to physically or chemically unsuitable material (all Made Ground) that may be present within the shallow soils beneath areas of soft landscaping and, to provide end users of the Site with soft landscaping that is physically and chemically suitable for use.

This remedial action can be achieved through: the formation of a physically and chemically clean cover layer within gardens to serve as a physical barrier between end users and the underlying soils.

It is noted that, based on the findings of this investigation, following the planned reduced level excavation to the garden areas that the formation soils may also comprise natural clay deposits.

A clean cover is designed to serve as a dedicated barrier between potentially harmful material (any residual Made Ground) and end users (residents).

> **Thickness (Table 1):** If following the reduced level excavation, residual Made Ground (non-natural soils) is present beneath the soft landscaping areas, it is recommended that 'two spades depth' or 600 mm of suitable soil forming material is provided to private garden area or, where no residual Made Ground deposits are present that at least 150 mm of suitable soil forming material is provided to soft landscaping areas.

  These thicknesses align with current guidance[16] and the level of risk present on Site.

  For tree and shrub planting areas, the advice of the landscape architect should be sought however, in general, at least 600 mm of soil is likely to be required.

Table 1: Clean cover design

Soft Landscaping Area	Clean Cover Component and Thickness			Total Depth Required
	Topsoil	Subsoil	Other	
Where Made Ground deposits are encountered within the formation				
All soft landscaping areas	Min. 150 mm*	450 mm	n/a	600 mm
Where natural soils deposits are encountered within the formation				
All soft landscaping areas	Min. 150 mm*	TBC by Architect / Landscape Architect		> 150 mm

** In general, the provision of topsoil thicknesses greater than 300 mm is liable to induce a collapse of the soil structure (compression or collapse)*

> **Soil separation layer:** the requirement for a geotextile demarcation layer as part of the clean cover is not recommended at this stage.

> **Sourcing:** soil forming materials should be sourced from a reputable supplier who can demonstrate the chemical quality of the material before being imported onto Site.

> **Quality:** Clean cover soils' quality should be verified for suitability against both; the relevant British Standards, e.g. BS3882:2015 for topsoil and BS8601:2013 for subsoil, and Local Planning Authority (LPA) guidance[5].

  The LPA guidance is hyperlinked below[17] and reference should be made to Appendix 1A for the specific frequencies and suites of testing that are required for both reclaimed and imported soils.

[16] *Cover Systems for Land Regeneration - Thickness of cover systems for Contaminated Land BRE/AGS/NHBC: 2004 (under review)*

[17] https://www.the-ies.org/resources/regulator%E2%80%99s-guide-cover-systems-NCLOG

The frequency and suite of testing vary depending on the nature of the source, e.g. Greenfield or manufactured.

Imported soils shall therefore be defined as 'suitable for use' if the verification testing falls within the Generic Assessment Criteria append here.

If and where any exceedances of the Generic Assessment Criteria do occur, the consultant or engineer responsible for the validation of the remedial works should be responsible for assessing the suitability of the material, in agreement with the Local Planning Authority.

8.3 **Other Actions** – New Water Supply Pipes

The objective of this action is to: ensure water supplies are not fouled by any potentially polluting material within the ground (confirming the chemical quality of the ground won't affect supply pipes).

This objective can be achieved through: the provision of suitable construction material for water supply pipes.

Based on the findings of the Ground Investigation Report, new water supply pipes are expected to be formed within both Made Ground and natural soil deposits. Whilst considered to present a generally low risk to water supply pipes, water supply companies typically require extensive testing on non-natural materials such that it is commonly more cost-effective and precautionary to recommend risk mitigation.

In this scenario, the use of barrier pipe (PE/AL/PE) is recommended for new water supply pipes. This recommendation is considered appropriate for all formation materials apart from those within which visible or olfactory evidence of hydrocarbons is noted. If evidence of hydrocarbons is noted, further assessment or responsive risk reduction will be required for various reasons.

8.3 **Other Actions** – Response Plan for Unexpected or Unforeseen Harmful or Polluting Material

The objective of this action is to: ensure any unforeseen harmful or polluting material is dealt with in a way that ensures the development can still be deemed 'suitable for use' on completion and that future liabilities associated with the land are limited, e.g. pollution incidents.

This objective can be achieved through: continual inspection of soils during groundworks.

If and where any material is revealed on Site that is suspected as being unsuitable, i.e. potentially harmful, then the advice of the Engineer or the Author of this Report should be sought.

Examples of 'unforeseen contamination' could include visibly stained or odorous soils. If and where soils are encountered that differ physically or in colour from those detailed and illustrated herein then it is also recommended that the advice of the Engineer or the author of this Report is sought.

The Engineer should in turn notify the local planning authority's Contaminated Land Team of the encounter.

If and where the unforeseen contamination requires remedial action that differs from the actions detailed herein, then a revised Remediation Strategy should be submitted to local planning authority's Contaminated Land Team and agreed in advance of any work on or around the potentially contaminated material recommencing.

8.4 Validation Plan

The following lines of evidence should be sought to demonstrate the recommended remedial work has been completed satisfactorily:

> ***For the cover system thickness*:** Either;
  - Reduced level survey alongside finished level survey illustrating (through comparison of levels on survey drawings) how, the required thickness of clean capping has been provided over the ash fill deposits or,
  - Hand excavated trial pits illustrating (through photographic evidence) how, the required thickness of clean capping has been provided over the Made Ground deposits. Guidance on the requirement for photographic evidence can be found in Local Planning Authority guidance [18].

> ***For the suitability of the soil forming material:***
  - The chemical quality of the soil forming material shall be deemed 'suitable for use' when tested in line with the requirements of the Local Planning Authority and against the relevant screening criteria (both of which are detailed in Section 9.2).
  - The physical quality of the soil forming material shall be deemed 'suitable for use' through visual inspection, i.e. assessment of the potential presence of 'sharps', in line with current guidance[19]. Further checks on the material's suitability as a growing medium (macro-nutrients) is beyond the scope of this Report but may also require consideration.

> ***For other forms of barrier, e.g. paving*:**
  - Photographic evidence of the physical barrier and commentary from a suitably qualified person as to the adequacy of the barrier to achieve the objective of the risk mitigation.

The following lines of evidence should also be sought to demonstrate that other actions have been completed satisfactorily:

> *For water supply pipes:*

Order sheet or photographic confirmation of the water supply pipe material / construction.

> *For unexpected encounters of potentially harmful or polluting material:*

If and where any unexpected encounters of potentially harmful or polluting material are made, then confirmation of the response plan having been completed satisfactorily should be included within the Validation Report.

[18] *https://www.the-ies.org/resources/regulator%E2%80%99s-guide-cover-systems-NCLOG*

[19] BS3882:2015 Specification for Topsoil

1m SCALE 1:100

Rev	Description	Date	By	App'd
-	-	-	-	-

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STODDART ARCHITECTURE

RIBA Chartered Practice

Client:
Mr M Butt

Project:
4A Bridge Street,
Batley

Drawing Title:
Existing Block Plan

Project No.	Dwg No.	Rev.	Scale @ A1	Date.	By.
2024.026	PL02	-	1:100	28/01/25	AJS

Issue Status:
PLANNING

Rev	Description	Date	By	App'd
-	-	-	-	-

STODDART ARCHITECTURE

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RIBA Chartered Practice

Client:
Mr M Butt

Project:
4A Bridge Street,
Batley

Drawing Title:
Proposed Site Plan

Project No.	Dwg No.	Rev.	Scale @ A1	Date.	By.
2024.026	PL100	-	1:100	28/01/25	AJS

Issue Status:
PLANNING

SOIL AND STRUCTURES

Key to exploratory hole symbols and abbreviations

SAMPLE TYPES

ACM - Asbestos sample
AMAL - Amalgamated sample
B - Bulk disturbed sample
BLK - Block sample
C - Core sample
CBR - CBR test sample
D - Disturbed sample
ES - Environmental sample
EW - Environmental water sample
G - Gas sample
J - Jar sample
L - Liner sample
TW - Pushed thin wall sample
U - Undisturbed sample
UT - Undisturbed thin wall sample
W - Water sample

IN-SITU TESTS

HV - Hand shear vane
HV(r) - Hand shear vane residual
PID - Photo ionisation detector
PP - Hand penetrometer
SPT - Standard penetration test
SPT(C) - SPT using cone

GROUNDWATER

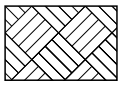
 Groundwater strike

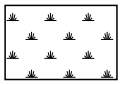
 Groundwater rest level

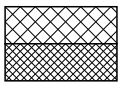
ROTARY CORE DETAILS

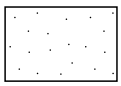
TCR - Total core recovery (%)
SCR - Solid core recovery (%)
RQD - Rock quality designation (%)
FI - Fracture index
NI - Non-intact core
AZCL - Assumed zone of core loss

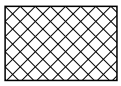
LEGEND

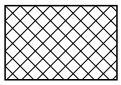
 Topsoil

 Peat

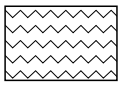
 Made ground [cohesive]

 Concrete

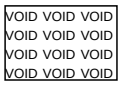
 Wood

 Brick

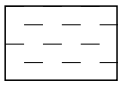
 Bituminous material

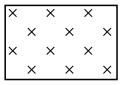
 Gypsum

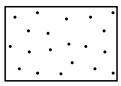
 Coal

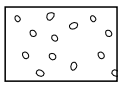


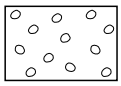
Void

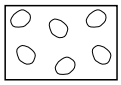
 Clay

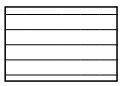
 Silt

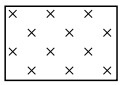
 Sand

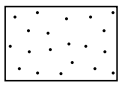
 Gravel

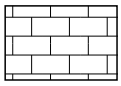
 Cobbles

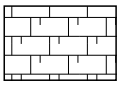
 Boulders

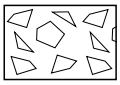
 Mudstone

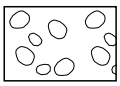
 Siltstone

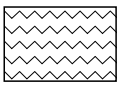
 Sandstone

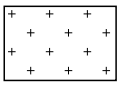
 Limestone

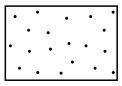
 Chalk

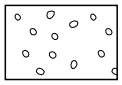
 Breccia

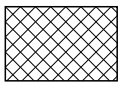
 Conglomerate

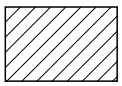
 Metamorphic

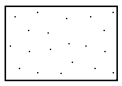
 Igneous

 Sand backfill

 Gravel backfill

 Arisings

 Bentonite

 Concrete

 Grout

 Plain pipe

 Slotted pipe

SOIL AND STRUCTURES

Trial Pit

TP101

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	424587.00	424402.00	62.25	1:25

Project Name	Project No.	Start Date	End Date
Bridge Street, Batley	20549	2025-11-24	2025-11-24

Client
Atlas Properties

Consultant
Soil and Structures Ltd

Contractor
Sandvik & PS Excavations

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Samples and Tests: Type/ Ref	Samples and Tests: Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Strata: Description
		0.30-0.50	ES 1			(0.70)		MADE GROUND: Multicoloured, silty, very sandy, fine to coarse, angular to sub-rounded GRAVEL of mixed natural lithologies, brick, sandstone, concrete and ash and clinker with infrequent roolets, low cobble content and clayey in places. Sand is fine to coarse. Cobbles are half and whole red bricks. [Recently worked natural soils with demolishing arisings]
		0.70-0.90	ES 2		61.55	0.70		Dark grey, slightly sitly, sandy GRAVEL of ash and clinker. Sand is fine to coarse, ash and clinker. [ASH AND CLINKER]
						(0.70)		
		1.50-1.70	D 3		60.85	1.40		Light brown, light grey and yellowish orange mottled, slightly sandy, slightly gravelly CLAY with soft to firm consistency [RESIDUAL SOIL]
								Becoming firm to stiff (1.80 - 2.30m)
						(1.20)		*Becoming brown and grey mottled and stiff to very stiff (2.30 - 2.60m)*
					59.65	2.60		*End of Trial Pit at 2.60m*

Remarks
PURPOSE: Targeting western corner of the Site, former building footprint and proposed dwelling footprint. TERMINATION: Engineer's decision, stiff Till confirmd for 0.50 m. LOCATION: Opensource grid reference finder on Site with levels taken off satellite imagery. OTHER: Evidence of potentially harmful or polluting material - ash and clinker deposits across shallow depths.

Method, Plant, Stability, Dimensions
0.00 - 2.60m TP 3CX
Minor spalling in fill
L = 2.80m
W = 0.60m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP101

SUPPLEMENTARY INFO

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	424587.00	424402.00	62.25	1:25

Project Name	Project No.	Start Date	End Date
Bridge Street, Batley	20549	2025-11-24	2025-11-24

Client	Consultant	Contractor
Atlas Properties	Soil and Structures Ltd	Sandvik & PS Excavations

Water Strike - General

Struck (m)	Seal Depth (m)	Casing Depth (m)	Date and Time	Remarks
2.60				

Water Strike - Details

Struck (m)	Rose To (m)	Time (mins)	Remarks
2.60	2.50	60	Dry for previous 24 hours

Sample Details

Sample ID	Type	Water Level (m)	Remarks
	ES		
	ES		
	D		

Remarks

PURPOSE: Targeting western corner of the Site, former building footprint and proposed dwelling footprint. TERMINATION: Engineer's decision, stiff Till confirmd for 0.50 m. LOCATION: Opensource grid reference finder on Site with levels taken off satellite imagery. OTHER: Evidence of potentially harmful or polluting material - ash and clinker deposits across shallow depths.

Method, Plant, Stability, Dimensions

0.00 - 2.60m TP 3CX
Minor spalling in fill

L = 2.80m

W = 0.60m

Logger

RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP101

PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	424587.00	424402.00	62.25	1:25

Project Name	Project No.	Start Date	End Date
Bridge Street, Batley	20549	2025-11-24	2025-11-24

Client
Atlas Properties

Consultant
Soil and Structures Ltd

Contractor
Sandvik & PS Excavations

Remarks
PURPOSE: Targeting western corner of the Site, former building footprint and proposed dwelling footprint. TERMINATION: Engineer's decision, stiff Till confirmd for 0.50 m. LOCATION: Opensource grid reference finder on Site with levels taken off satellite imagery. OTHER: Evidence of potentially harmful or polluting material - ash and clinker deposits across shallow depths.

Method, Plant, Stability, Dimensions
0.00 - 2.60m TP 3CX
Minor spalling in fill
L = 2.80m
W = 0.60m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP102

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	424591.00	424409.00	63.00	1:25

Project Name	Project No.	Start Date	End Date
Bridge Street, Batley	20549	2025-11-24	2025-11-24

Client
Atlas Properties

Consultant
Soil and Structures Ltd

Contractor
Sandvik & PS Excavations

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Samples and Tests: Type/ Ref	Samples and Tests: Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Strata: Description
		0.30-0.50	ES 1			(1.00)		MADE GROUND: Multicoloured, silty, very sandy, fine to coarse, angular to sub-rounded GRAVEL of mixed natural lithologies, brick, sandstone, concrete, limestone and rare ash and clinker with infrequent roolets, very low cobble content and clayey in places. Sand is fine to coarse. Cobbles are half and whole red bricks. [Recently worked natural soils with demolishing arisings] *Becoming brown (suspected relic Topsoil/subsoil)*
		1.10-1.30	D 2		62.00	1.00		Light brown, light grey and yellowish orange mottled, slightly sandy, slightly gravelly CLAY with firm consistency. [RESIDUAL SOIL]
						(0.60)		*Becoming firm to stiff (1.30 - 1.40m)*
					61.40	1.60		*End of Trial Pit at 1.60m*

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Remarks
PURPOSE: Targeting north-western corner of the Site, former building footprint and proposed dwelling footprint. TERMINATION: Engineer's decision, stiff Till confirmd for 0.50 m. LOCATION: Opensource grid reference finder on Site with levels taken off satellite imagery. OTHER: No evidence of potentially harmful or polluting material.

Method, Plant, Stability, Dimensions
0.00 - 1.60m TP 3CX
Stable
L = 2.20m
W = 0.60m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP102

SUPPLEMENTARY INFO

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	424591.00	424409.00	63.00	1:25

Project Name	Project No.	Start Date	End Date
Bridge Street, Batley	20549	2025-11-24	2025-11-24

Client	Consultant	Contractor
Atlas Properties	Soil and Structures Ltd	Sandvik & PS Excavations

Water Strike - General

Struck (m)	Seal Depth (m)	Casing Depth (m)	Date and Time	Remarks
1.60				

Water Strike - Details

Struck (m)	Rose To (m)	Time (mins)	Remarks
1.60	1.55	60	Dry for previous 24 hours

Sample Details

Sample ID	Type	Water Level (m)	Remarks
	ES		
	D		

Remarks

PURPOSE: Targeting north-western corner of the Site, former building footprint and proposed dwelling footprint. TERMINATION: Engineer's decision, stiff Till confirmd for 0.50 m. LOCATION: Opensource grid reference finder on Site with levels taken off satellite imagery. OTHER: No evidence of potentially harmful or polluting material.

Method, Plant, Stability, Dimensions

0.00 - 1.60m TP 3CX
Stable

L = 2.20m

W = 0.60m

Logger

RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP102

PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	424591.00	424409.00	63.00	1:25

Project Name	Project No.	Start Date	End Date
Bridge Street, Batley	20549	2025-11-24	2025-11-24

Client
Atlas Properties

Consultant
Soil and Structures Ltd

Contractor
Sandvik & PS Excavations

Remarks
PURPOSE: Targeting north-western corner of the Site, former building footprint and proposed dwelling footprint. TERMINATION: Engineer's decision, stiff Till confirmd for 0.50 m. LOCATION: Opensource grid reference finder on Site with levels taken off satellite imagery. OTHER: No evidence of potentially harmful or polluting material.

Method, Plant, Stability, Dimensions
0.00 - 1.60m TP 3CX
Stable
L = 2.20m
W = 0.60m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP103

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	424600.00	424401.00	62.25	1:25

Project Name	Project No.	Start Date	End Date
Bridge Street, Batley	20549	2025-11-24	2025-11-24

Client
Atlas Properties

Consultant
Soil and Structures Ltd

Contractor
Sandvik & PS Excavations

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Description
						(0.70)		MADE GROUND: Multicoloured, silty, very sandy, fine to coarse, angular to sub-rounded GRAVEL of mixed natural lithologies, sandstone and ash and clinker with rare roolets, low cobble content and clayey in places. Sand is fine to coarse. Cobbles are small to large rounded to sub-rounded natural lithologies and rare, large angular sandstone flags. [Reworked natural soils with non-natural inclusions] *Becoming brown (suspected relic Topsoil/subsoil)*
					61.55	0.70		Light brown, light grey and yellowish orange mottled, slightly sandy, slightly gravelly CLAY with firm consistency. [RESIDUAL SOIL]
						(0.70)		
					60.85	1.40		*End of Trial Pit at 1.40m*

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Remarks
PURPOSE: Targeting eastern corner of the Site, propsoed . TERMINATION: Engineer's decision, stiff Till confirmd for 0.50 m. LOCATION: Opensource grid reference finder on Site with levels taken off satellite imagery. OTHER: No evidence of potentially harmful or polluting material.

Method, Plant, Stability, Dimensions
0.00 - 1.50m TP 3CX
Stable
L = 2.20m
W = 0.60m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP103

PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	424600.00	424401.00	62.25	1:25

Project Name	Project No.	Start Date	End Date
Bridge Street, Batley	20549	2025-11-24	2025-11-24

Client	Consultant	Contractor
Atlas Properties	Soil and Structures Ltd	Sandvik & PS Excavations

Remarks

PURPOSE: Targeting eastern corner of the Site, propsoed . TERMINATION: Engineer's decision, stiff Till confirmd for 0.50 m. LOCATION: Opensource grid reference finder on Site with levels taken off satellite imagery. OTHER: No evidence of potentially harmful or polluting material.

Method, Plant, Stability, Dimensions

0.00 - 1.50m TP 3CX
Stable
L = 2.20m
W = 0.60m

Logger

RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Key to exploratory hole symbols and abbreviations

SAMPLE TYPES

ACM - Asbestos sample
AMAL - Amalgamated sample
B - Bulk disturbed sample
BLK - Block sample
C - Core sample
CBR - CBR test sample
D - Disturbed sample
ES - Environmental sample
EW - Environmental water sample
G - Gas sample
J - Jar sample
L - Liner sample
TW - Pushed thin wall sample
U - Undisturbed sample
UT - Undisturbed thin wall sample
W - Water sample

IN-SITU TESTS

HV - Hand shear vane
HV(r) - Hand shear vane residual
PID - Photo ionisation detector
PP - Hand penetrometer
SPT - Standard penetration test
SPT(C) - SPT using cone

GROUNDWATER

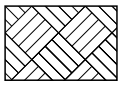
 Groundwater strike

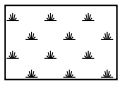
 Groundwater rest level

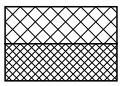
ROTARY CORE DETAILS

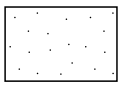
TCR - Total core recovery (%)
SCR - Solid core recovery (%)
RQD - Rock quality designation (%)
FI - Fracture index
NI - Non-intact core
AZCL - Assumed zone of core loss

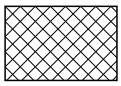
LEGEND

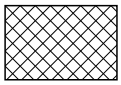
 Topsoil

 Peat

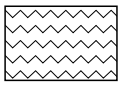
 Made ground [cohesive]

 Concrete

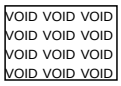
 Wood

 Brick

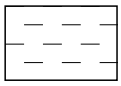
 Bituminous material

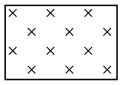
 Gypsum

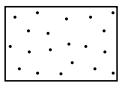
 Coal

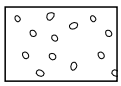


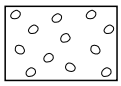
Void

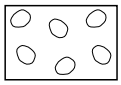
 Clay

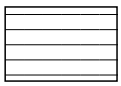
 Silt

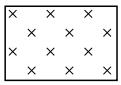
 Sand

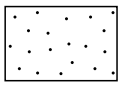
 Gravel

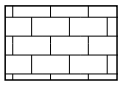
 Cobbles

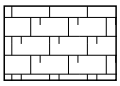
 Boulders

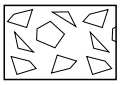
 Mudstone

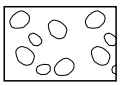
 Siltstone

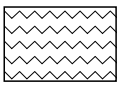
 Sandstone

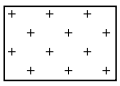
 Limestone

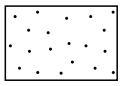
 Chalk

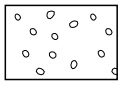
 Breccia

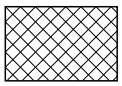
 Conglomerate

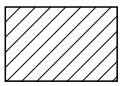
 Metamorphic

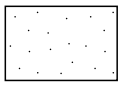
 Igneous

 Sand backfill

 Gravel backfill

 Arisings

 Bentonite

 Concrete

 Grout

 Plain pipe

 Slotted pipe

SOIL AND STRUCTURES

Open Hole Log

RO101

Hole Type	Easting	Northing	Ground Level (m)	Scale
RO	424590.00	424396.00	62.00	1:100

Project Name	Project No.	Start Date	End Date
Bridge Street, Batley	20549	2025-11-24	2025-11-24

Client
Atlas Properties

Consultant
Soil and Structures Ltd

Contractor
Sandvik & PS Excavations

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Coring: Core Run	TCR (%)	SCR (%)	RQD (%)	Frac	Level m	Depth (thickness) m	Strata: Legend	Description
											(1.20)		Soft, fast, smooth drilling - grey flush arisings [Suspected fill]
										60.80	1.20		Soft, fast, smooth drilling - light brown flush arisings [Suspected residual soil (completely weathered bedrock)]
											(4.80)		
										56.00	6.00		Firm, slow, smooth drilling - light grey flush arisings [Suspected Siltstone]
													Faint trace of coal (8.20 - 8.40m)
													Soft, firm, smooth drilling - suspected Siltstone (8.80 - 9.20m)
											(9.80)		
										46.20	15.80		Hard, slow, smooth drilling - light brown arisings [Suspected Sandstone]
											(10.80)		
													Continued on next page

Remarks
PURPOSE: Targeting eastern corner of the Site, propsoed . TERMINATION: Engineer's decision, >20 m intact bedrock and no evidence of coal or coal mine related features. LOCATION: Opensource grid reference finder on Site with levels taken off satellite imagery. OTHER: No loss of flush. Down-hole camera unable to be progressed due to accumulation of mudstone on borehole walls.

Method, Plant, Stability, Dimensions
0.00 - 26.60m RO Berretta T21

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Open Hole Log

RO101

Hole Type	Easting	Northing	Ground Level (m)	Scale
RO	424590.00	424396.00	62.00	1:100

Project Name	Project No.	Start Date	End Date
Bridge Street, Batley	20549	2025-11-24	2025-11-24

Client
Atlas Properties

Consultant
Soil and Structures Ltd

Contractor
Sandvik & PS Excavations

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Samples and Tests: Type/ Ref	Samples and Tests: Results	Coring: Core Run	Coring: TCR (%)	Coring: SCR (%)	Coring: RQD (%)	Frac	Level m	Depth (thickness) m	Strata: Legend	Strata: Description
													As previous page.
										35.40	26.60		*End of Borehole at 26.60m*

20.5 21.0 21.5 22.0 22.5 23.0 23.5 24.0 24.5 25.0 25.5 26.0 26.5 27.0 27.5 28.0 28.5 29.0 29.5 30.0 30.5 31.0 31.5 32.0 32.5 33.0 33.5 34.0 34.5 35.0 35.5 36.0 36.5 37.0 37.5 38.0 38.5 39.0 39.5 40.0

Remarks
PURPOSE: Targeting eastern corner of the Site, propsoed . TERMINATION: Engineer's decision, >20 m intact bedrock and no evidence of coal or coal mine related features. LOCATION: Opensource grid reference finder on Site with levels taken off satellite imagery. OTHER: No loss of flush. Down-hole camera unable to be progressed due to accumulation of mudstone on borehole walls.

Method, Plant, Stability, Dimensions
0.00 - 26.60m RO Berretta T21

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Open Hole Log

RO102

Hole Type	Easting	Northing	Ground Level (m)	Scale
RO	424592.00	424406.00	63.00	1:100

Project Name	Project No.	Start Date	End Date
Bridge Street, Batley	20549	2025-11-24	2025-11-24

Client
Atlas Properties

Consultant
Soil and Structures Ltd

Contractor
Sandvik & PS Excavations

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Coring: Core Run	TCR (%)	SCR (%)	RQD (%)	Frac	Level m	Depth (thickness) m	Strata: Legend	Description
											(2.00)		Soft, fast, smooth drilling - grey/brown flush arisings [Suspected fill (disturbed natural soils)]
										61.00	2.00		Soft, fast, smooth drilling - light brown flush arisings [Suspected residual soil (completely weathered bedrock)]
											(4.00)		*Soft, fast, smooth drilling - suspected Siltstone (4.80 - 6.00m)*
										57.00	6.00		Firm, slow, smooth drilling - dark grey flush arisings [Suspected Mudstone]
											(1.40)		*Faint trace of coal (6.10 - 6.30m)*
										55.60	7.40		Firm, slow, smooth drilling - no arisings below 14.6 m depth [Suspected Siltstone]
													Faint trace of coal (8.40 - 8.60m)
											(8.40)		*Lost flush (13.40 - 25.40m)*
										47.20	15.80		Hard, slow, smooth drilling - no arisings [Suspected Sandstone]
											(9.60)		

Continued on next page

Remarks
PURPOSE: Targeting eastern corner of the Site, propsoed . TERMINATION: Engineer's decision, >20 m intact bedrock and no evidence of coal or coal mine related features. LOCATION: Opensource grid reference finder on Site with levels taken off satellite imagery. OTHER: Flush lost at 14.6 m depth - suspected natural fissures. Down-hole camera unable to be progressed due to accumulation of mudstone on borehole walls.

Method, Plant, Stability, Dimensions
0.00 - 25.40m RO Berretta T21

Logger
LU / RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Open Hole Log

RO102

Hole Type	Easting	Northing	Ground Level (m)	Scale
RO	424592.00	424406.00	63.00	1:100

Project Name	Project No.	Start Date	End Date
Bridge Street, Batley	20549	2025-11-24	2025-11-24

Client
Atlas Properties

Consultant
Soil and Structures Ltd

Contractor
Sandvik & PS Excavations

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Samples and Tests: Type/ Ref	Samples and Tests: Results	Coring: Core Run	Coring: TCR (%)	Coring: SCR (%)	Coring: RQD (%)	Frac	Level m	Depth (thickness) m	Strata: Legend	Strata: Description
													As previous page.
										37.60	25.40		*End of Borehole at 25.40m*

Remarks
PURPOSE: Targeting eastern corner of the Site, propsoed . TERMINATION: Engineer's decision, >20 m intact bedrock and no evidence of coal or coal mine related features. LOCATION: Opensource grid reference finder on Site with levels taken off satellite imagery. OTHER: Flush lost at 14.6 m depth - suspected natural fissures. Down-hole camera unable to be progressed due to accumulation of mudstone on borehole walls.

Method, Plant, Stability, Dimensions
0.00 - 25.40m RO Berretta T21

Logger
LU / RB

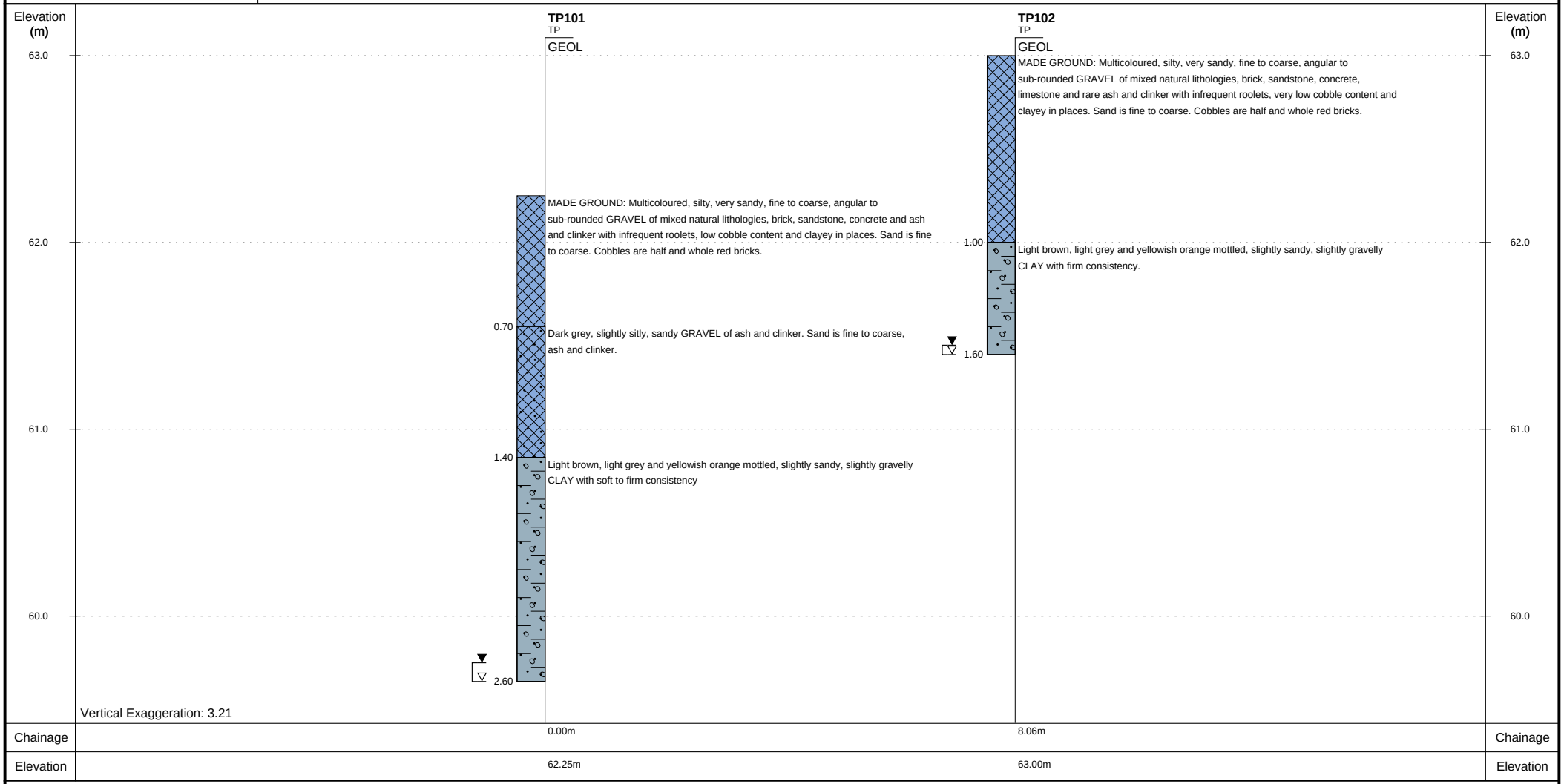
Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Cross-Section A-A'

Project Name	Project No.	Vertical Scale	Horizontal Scale
Bridge Street, Batley	20549	1:30	1:96

Client	Consultant	Contractor
Atlas Properties	Soil and Structures Ltd	Sandvik & PS Excavations



MADE GROUND | 110 | CLAY

WATER LEVELS

REST

STRIKE

Checked By: RB **Approved By:** RB **Status:** FINAL

Created using Pebble Geo

Guidance Note

Unforeseen Material

SOIL AND STRUCTURES

Some unforeseen material has been encountered in the ground. This material is suspected as being potentially harmful or polluting. What should you do?

Seek the advice of the project Engineer (*the Engineer may need to seek advice from a ground investigation consultant*).

What will the Engineer do?

The Engineer (or someone on the project team) will contact the local planning authority's contaminated land team to notify them of the encounter. The purpose of this contact is to agree a strategy for responding to and dealing with the unforeseen material. This strategy should be agreed in advance of any work on or around the unforeseen material recommencing.

What will the response strategy involve?

The responsive strategy will depend on the nature of the material encountered but may be as simple as confirming that the material will be excavated and disposed of off-site at a suitably licensed facility.

Do regulators have to be notified?

Advance notification is always recommended to avoid any response strategy being deemed inappropriate. There may or may not be a legal requirement for notification depending on the nature of the material encountered. In any case, the local planning authority's pollution control or contaminated land team should be able to assist finding the most cost-effective means of dealing with the material.

Purpose of this Guidance Note

> Support developers working on small development sites; and,

> Support decision making in scenarios where the likelihood of potentially harmful or polluting material being present in the ground has been assessed as low or unlikely (i.e. no remediation strategy has been put in place) but cannot be discounted.

General Commentary

A core aim of '*contaminated land*[1]' planning condition(s) is to ensure that, once completed, the development can be deemed '*suitable for use*'. Or, in other words, to ensure that end users (residents and visitors) will not be exposed to unacceptable levels of risk.

On any site where development works have previously taken place there is always the potential for potentially harmful or polluting material to have been introduced into the ground. Common examples of this include; fragments of asbestos containing material from old out-buildings, ash deposits from where coal ash was formerly tipped in a garden or localised fuel spillages.

Whilst ground investigation aims to remove as much uncertainty as possible from the ground, it is rarely cost-beneficial to investigate 100 % of any given development site. For this reason, unforeseen or unexpected material may be encountered during development works.

[1] *'Contaminated land' is strictly a legal definition of land that has been determined as such under Part 2A of the Environmental Protection Act. The term 'contamination' is often used as short-hand for material that may be chemically unsuitable (potentially harmful or polluting).*