

Our Ref C4182/24/E/CSM&RS
6th August 2025

N Hall Construction
Hill Top Farm,
Whitehall Road East,
Birkenshaw,
Bradford,
West Yorkshire,
BD11 2LH



Ref: Revised Conceptual Site Model and Remediation Strategy

Further to the site investigation and consequent remediation strategy, it has come to light that tree protection barriers in the form of Restricted Activity Zones (RAZ) are present for a section of the rear soft landscaped areas within the proposed development. This is predominantly due to an ash tree that is present on neighbouring land, the root protection zone of which extends on to the site. As such, the conceptual site model and proposed remediation strategy is to be revised and amended for these zones only. Indeed, it should be appreciated that the proposed front garden areas and any other soft landscaped areas outside the RAZ are not subject to the tree protection barriers and therefore can be subject to planting of plants and bushes. Therefore, these areas will not be reassessed during this letter and the original conceptual site model and remediation strategy (Ref: C4182/24/E/R) should be still be applied i.e. up to a 600mm clean cover system is still required for any new planting areas.

As a result of the tree protection barriers, it is determined that landscaping development will be limited in the rear soft landscaped areas where the RAZ is applicable i.e. the area will not be used for planting fruits and vegetables or plants in general. As such, it is proposed that the rear turfed areas close to the tree will be left in situ and have continued use as an open grassed area (green space).

It should be appreciated that the representative contamination sample collected for the subject of this letter and RAZ was BH04 (Phase 2 ref C4182/24/E/8783_Rev1 dated 30.08.24), which was positioned just on the border of the RAZ to the south. Upon reviewing the report, and as per my phone call with Natalie Heaney of Kirklees Council in June 2025, it is evident that the sample in question had been mislabelled as having a bottom depth of 0.5m, when in fact the bottom depth was 0.3m. With reference to the appropriate borehole log in Appendix 2 of the Phase 2 report, topsoil was identified from surface to 0.3m depth, beneath which the natural cohesive weathered profile of the underlying rock was identified. As such, it has become evident during a recent review that the sample was collected from the topsoil, rather than the natural material, thus the top and bottom depth of the contaminated sample are 0m and 0.3m, respectively.



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In view of this, the Phase 2 report determined that the topsoil at BH04 was contaminated with respect to a residential with plant uptake end use.

Recent Site Visit

In light of the sample labelling error, RGS visited site on the 2nd July 2025 to confirm the topsoil thicknesses in the RAZ. In the excavations observed, topsoil was found to vary between 100mm and 200mm depth, prior to the underlying natural clays being encountered. This topsoil thickness appears to be slightly less than that identified at BH04. To confirm that the underlying clay was uncontaminated, an environmental sample was collected and subjected to Greenfield Suite testing. The tests revealed that all PAHs fell below screening levels, no asbestos was present and all metals fell below screening thresholds for a residential with plant uptake end use. As such, it is considered that the natural clays beneath the topsoil are suitable for the intended end use and can be left insitu where appropriate.

Remediation Strategy

The client has held discussions with their arboriculture specialist, and it has become evident that remediating around the tree would be difficult, as the typical remedial systems for soft landscaped areas can usually not be applied in root protection zones. This is demonstrated in section 5.10 of the CL:AIRE document "A Regulator's guide to Cover Systems and their Verification". It is understood that the client provisionally recommended a small amount of excavation using hand-held tools, followed by the placement of clean soil above a geotextile. With reference to section 5.10.1 of the document named above, the guide says *"For managed areas, where an RPZ only forms a small portion of the site requiring remediation, the placement of a geotextile could be used to form a marker layer, preventing exposure to the underlying contaminated ground."* It should be appreciated however that this was under the proviso that topsoil thickness was in excess of 300mm i.e. before the sampling error was realised.

It should be appreciated that the client's arboricultural consultant has stated that up to 200mm of soil can be removed around the protected tree (subject to following the arboricultural consultant's method statement). If conditions are true to the recent RGS visit, however, then only 200mm of topsoil may be prevalent in the majority of the RAZ.

If removing this recommended thickness of soil, such works would remove the existing topsoil. This would thereby remove the 'source' of contamination in the RAZ, as the underlying clays are proven to be clean. Notwithstanding the above, any proposed landscaped areas outside of the RAZ will still be subject to the previous remediation strategy and shall require a clean cover system of up to 600mm. This is because those areas could be readily opened up by the client and end user to allow the planting of plants and bushes.

Root Inspection

Under the supervision of RGS, it is recommended that the client digs a trench along the eastern boundary by hand to the base of the topsoil or 200mm depth, whichever the greater, to expose the natural underlying clays. If topsoil exceeds 300mm depth, excavation should cease. It is reasoned that as the tree is present to the east of the site, if roots are to be present in the topsoil at the site, then they will be identified within this trench. If any roots are identified within this trench, then an air pick should be utilised to trace the roots across the RAZ. It should be appreciated that this methodology has been confirmed by the client's arboricultural specialist. They have recommended that the client *"protect any roots 25mm diameter or greater with damp hessian while uncovered"*.

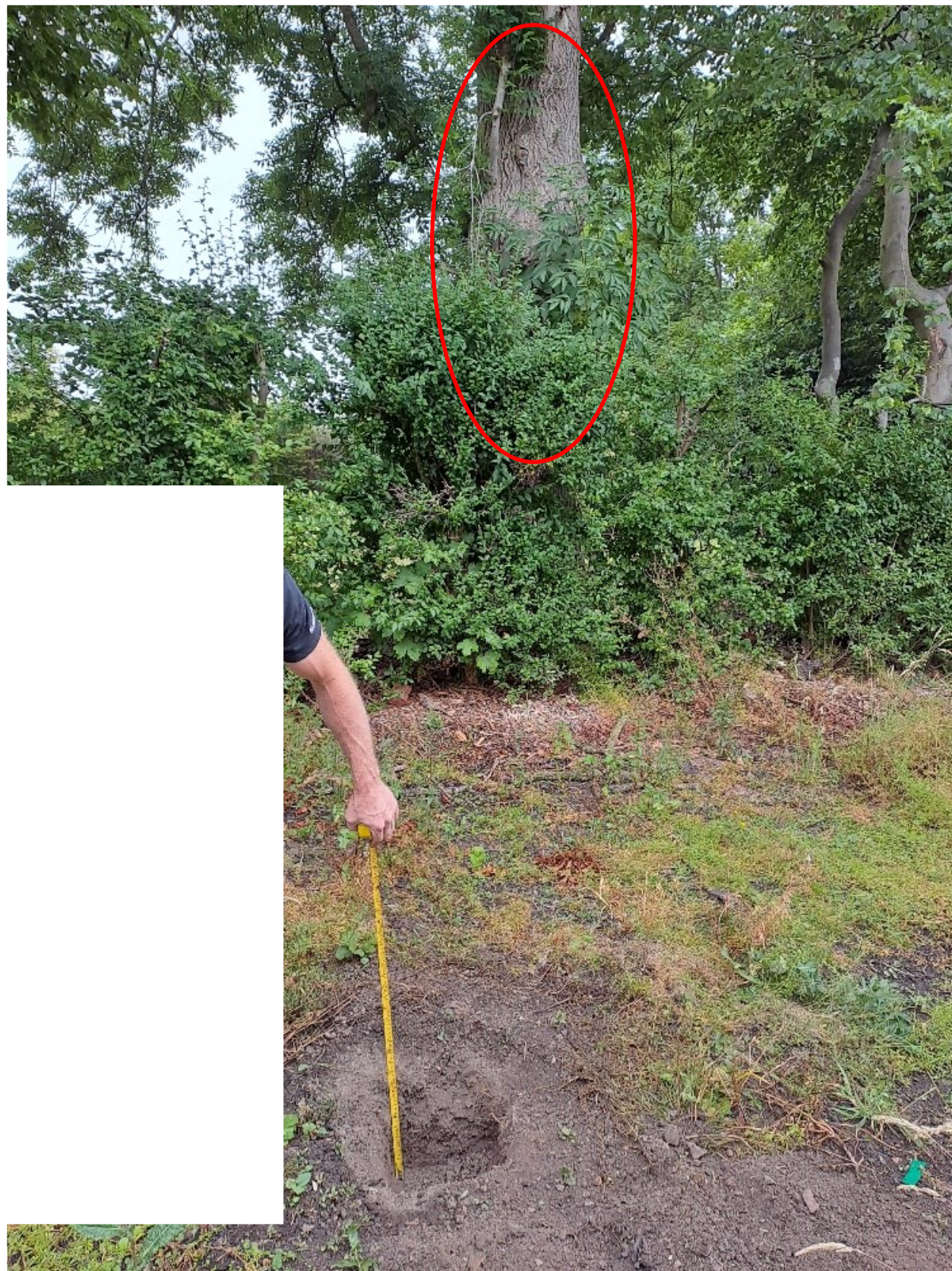


Photo 1: Trial pit dug in RAZ to expose natural soils. Ash tree highlighted in background.



Photo 2: Cross section near building which shows nominal thickness of topsoil above natural soil.



Photo 3: Trial pit dug to show level of natural clay below topsoil. Topsoil 170mm thick at this location.



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Job No:

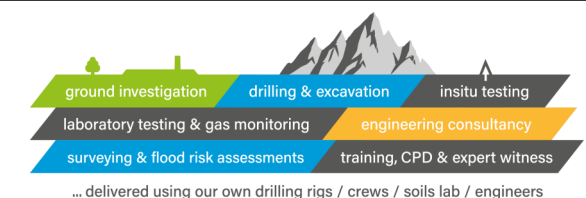
C4182/24/E

Site:

672 Bradford Rd

Client:

N Hall Construction



... delivered using our own drilling rigs / crews / soils lab / engineers

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Analytical Report Number : 25-035238

Project / Site name:	672 Bradford Rd, Birkenshaw	Samples received on:	02/07/2025
Your job number:	C 4182 24 E 6783	Samples instructed on/ Analysis started on:	02/07/2025
Your order number:		Analysis completed by:	08/07/2025
Report Issue Number:	1	Report issued on:	08/07/2025
Samples Analysed:	1 soil sample		

Signed:

Dominika Liana
 Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
 leachates - 2 weeks from reporting
 waters - 2 weeks from reporting
 asbestos - 6 months from reporting
 air - once the analysis is complete

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Retention period for records and reports is minimum 6 years from the date of issue of the final report.
 Some records may be kept for longer according to other legal/best practice requirements.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
 Application of uncertainty of measurement would provide a range within which the true result lies.
 An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 25-035238

Project / Site name: 672 Bradford Rd, Birkenshaw

Lab Sample Number				602855
Sample Reference				TH01
Sample Number				None Supplied
Water Matrix				N/A
Depth (m)				0.2
Date Sampled				02/07/2025
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	20
Total mass of sample received	kg	0.1	NONE	0.8

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8
Free Cyanide	mg/kg	1	MCERTS	< 1.0
Organic Matter (automated)	%	0.1	MCERTS	1

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	4.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	30
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	16
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.7
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	41
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	63

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 25-035238

Project / Site name: 672 Bradford Rd, Birkenshaw

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
602855	TH01	None Supplied	0.2	Brown clay with vegetation

Analytical Report Number : 25-035238

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Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution