

Mr Robert McLaughlin
Quinn Developments NW Ltd
30 Lees Road
Knowsley Industrial Park North
Liverpool
L33 7SE



Date: 15/05/23

Dear Sir,

RE: Phase AF, Plots 364 - 366 Genbarry Close, Manchester, M13 9RQ

Summary

Description	NHBC CML	
	Pass	Fail
The cover system in the rear gardens of Phase AF, Plots 364 - 366 has achieved the required chemical quality and has been placed at the appropriate thickness.	✓	

A site inspection assessed the soils placed in the rear gardens of Phase AF, Plots 364 - 366. The material is known to be an imported product with no evidence of any significant visual or olfactory contamination. A review of chemical test results indicated the tested soil meets with the quality requirements of the development. The Chemical Laboratory Results are found in Appendix A. In addition and in accordance with the remediation strategy inspection pits have been excavated in the rear gardens of each property. The inspection pits indicated the soil to have been placed at the appropriate thickness in accordance with the requirements of the URA, Brunswick PFI, Remediation Strategy, April 2015, Report No. 47069217 – Phases 1-3, prepared for: Galliford Try.

Introduction

A development of approximately 517 new houses is being constructed in phases in Brunswick, Manchester. The redevelopment of the Brunswick Neighbourhood forms part of the Brunswick PFI regeneration project, and has been granted planning permission by Manchester City Council (Planning Application No. 101664/FO/2013/N2).

The site is currently occupied by residential housing with associated schools and public open spaces however most areas of the site were previously occupied by various types of historical industrial works. Prior to construction of the new properties land had been remediated in phases to remove buried obstructions, deal with contamination and re-profile site levels.

Remediation Works

Remediation works have been split into five scenarios. The proposed mitigation measures to reduce the risk to acceptable levels include the following:

Scenario 1: Site Wide Residential Gardens.

A minimum 600mm clean validated imported soil is recommended for gardens areas. This will consist of 150mm of topsoil underlain by 450mm of sub soil. Deeper clean 'soil bowls' of 1000mm are recommended for any proposed tree species to be planted.

Scenario 2: Statistical ‘Hot Spots’ Residential.

A minimum 600mm clean validated imported soil is recommended for gardens areas. This will consist of 150mm of topsoil underlain by 450mm of sub soil over a 100mm stone layer and geotextile. Deeper clean ‘soil bowls’ of 1000mm are recommended for any proposed tree species to be planted.

Scenario 3: Recreational space and landscaped areas.

A minimum of 300mm clean validated imported soil is recommended over these open spaces. This will consist of 150mm of topsoil underlain by 150mm of sub soil. Deeper clean ‘soil bowls’ of 1000mm are recommended for any proposed tree species.

Scenario 4: Play areas for children.

It is recommended that raised beds are considered for landscaped areas within the play areas. A minimum 450mm clean validated imported soil is recommended. This will consist of 150mm of topsoil underlain by 300mm of sub soil.

Scenario 5: Orchard and allotment areas.

A minimum of 600mm clean validated imported soil is recommended for the allotment areas. This will consist of 150mm of topsoil underlain by 450mm of sub soil. Deeper clean ‘soil bowls’ of 1000mm are required for any proposed tree species.

Engagement

Redstart was instructed by Quinn Developments Northwest Ltd to attend site to visually assess soils following placement and completion of inspection pits to confirm the soil had been placed at the appropriate thickness.

Imported Soil

A visual inspection of the imported soil was undertaken. The soil appeared of good quality with no visual or olfactory evidence of significant contaminants and no oversized material (such as brick rubble / construction debris). The soil appeared to be as described in the report included in Appendix A.

Chemical Testing

A Topsoil Analysis Report (Ref: SLC-1121-SA) was provided to Redstart prior to the site visit. The report details topsoil generated from a site in Astley, Greater Manchester. The report set out to determine the suitability of the topsoil for general landscaping purposes and its compliance with the current British Standard for topsoil (BS3882). The report includes laboratory chemical analysis results from a UKAS and MCERTS accredited laboratory for a broad range of determinants. The report concludes that the material tested would be considered well-suited to general landscaping purposes provided the physical condition of the soil was maintained. The Topsoil report and results of the chemical analysis testing are included in Appendix A.

Redstart have also compared the analysis results against those set out in the remediation strategy. A summary of the acceptance criteria is included as Appendix B. No exceedances were identified and the soil was therefore considered suitable for use.

Laboratory Results

The chemical laboratory results indicated that the chemical analysis provided met the remediation criteria and are suitable for use. No visual or olfactory sign of contamination was noted.

Soil Thickness

An experienced Geo-environmental engineer from Redstart attended site on 15th May 2023. Soil had been placed by the groundworkers and a stockpile of remaining topsoil was observed nearby. Soil thickness was confirmed during this visit. Phase AF, Plots 364 - 366 fall under Statistical 'Hot Spots' Residential:

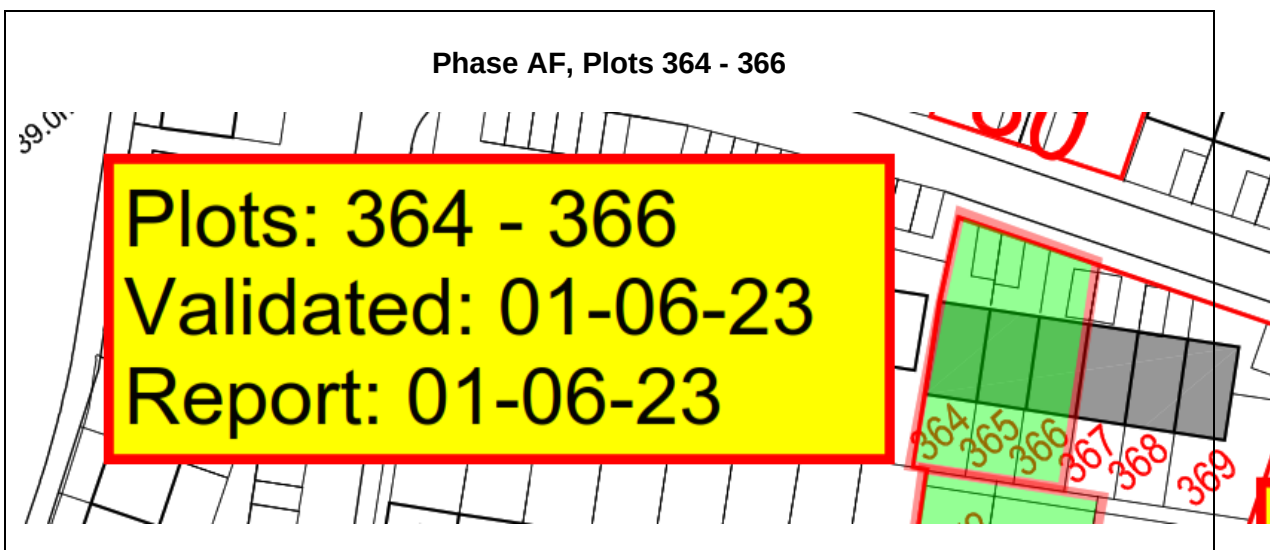
- ❖ A minimum 600mm clean validated imported soil is recommended for gardens areas. This will consist of 150mm of topsoil underlain by 450mm of sub soil over a 100mm stone layer and geotextile.

An inspection pit was advanced in each of the rear garden of Phase AF, Plots 364 - 366. The thickness of the soil was measured and photographed. The clean cover soil was measured at a minimum thickness of 600mm with a geotextile and hard dig layer below. A location plan and photographs are included below.

Conclusions

Overall, the soils on site appeared to be consistent with those detailed within the topsoil report included in Appendix A. The chemical analysis provided for the imported soils meets with the requirements of the development. A visual inspection of the soil confirmed the soil to be of a reasonable quality. Inspection pits completed in the rear gardens indicated the soil has been placed in accordance with the recommendations for soil thickness in the specification.

Sampling Plot Location Plan



Depth Validation Location Photographs - Phase AF



Photograph 1: Plot 364 Validation Pit 1 Location



Photograph 2: Plot 364 Validation Pit 1 Depth



Photograph 3: Plot 365 Validation Pit 2 Location



Photograph 4: Plot 365 Validation Pit 2 Depth



Photograph 5: Plot 366 Validation Pit 2 Location



Photograph 6: Plot 366 Validation Pit 2 Depth

Final Remarks

We trust this meets with your requirements. Please do not hesitate to contact us if you require further information.

For and on behalf of Redstart

Phil Sales BSc MSc FGS CSci QP
Technical Manager – Redstart Northwest Limited
Enclosed:

Appendix A – Laboratory Testing Results
Appendix B – Clean Cover Requirements

Appendix A

Laboratory Results



Freeland Horticulture Ltd
Rosedale Nursery
College Road
Hextable
Kent BR8 7LT

Attention: Philippa Lambourne

Our Ref: SLC-1121-SA

3 January 2023

Dear Philippa

Topsoil Analysis Report: Astley, Greater Manchester Topsoil January 2023

We have completed the analysis of the topsoil sample recently taken from the above site and it has been forwarded to an approved laboratory for analysis and have the pleasure of reporting our findings. The purpose of the analysis was to determine the suitability of the topsoil for general landscaping purposes and its compliance with the current British Standard for topsoil (BS3882).

SOIL SAMPLING & EXAMINATION

At the time of our sampling visit the topsoil was stored in a stockpile. A series of 10 hand augered trial holes were constructed across the stockpile for the purpose of soil examination and sample collection. As the soil examination confirmed a consistent topsoil composition, the ten samples were combined together to form one composite sample for analysis purposes. The soil was described as dark brown, slightly moist and friable with a well-developed, fine to medium granular structure. The soil contained a low fraction of small stones and no deleterious materials (eg. building waste materials, glass, roots or rhizomes of pernicious weeds) or unusual odours (eg. hydrocarbons) were recorded.

LABORATORY ANALYSIS

The topsoil sample was submitted to a UKAS and MCERTS accredited laboratory for routine physical and chemical parameters to confirm the composition and fertility of the soil. The following parameters were determined:

- ⊕ pH & electrical conductivity values;
- ⊕ major plant nutrients (N, P, K, Mg) & organic matter content;
- ⊕ particle size distribution and stone content;
- ⊕ heavy metals & potentially toxic elements (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, B);
- ⊕ sulphate, sulphur, sulphide;
- ⊕ total cyanide and total (mono) phenols;
- ⊕ speciated PAHs (US EPA16)
- ⊕ banded aromatic and aliphatic petroleum hydrocarbons (C₅-C₃₅).
- ⊕ Asbestos

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

Phone: 01322 619161;

*Freeland horticulture Ltd, Registered in England: Rosedale Nursery, College Road, Hextable, Kent BR8 7LT
Company Registration No: 04015968*

COMMENTS

pH & Electrical Conductivity (salinity) Values

The sample was alkaline in nature (pH 8.5) with a pH value that would be considered suitable for general landscaping purposes.

The electrical conductivity (salinity) value using the soil:water extract was (1002 μ S/cm) indicating that soluble salts are not present at levels that would be harmful to plants.

The electrical conductivity values by CaSO₄ extract (BS3882 requirement) fell below the maximum specified value (3300 μ S/cm) given in BS3882:2015.

Organic Matter & Nutrient Status

The sample was rich in organic matter and all major plant nutrients. No further additions of compost or fertiliser are required, or indeed recommended, for at least the first growing season.

The C:N ratio of the sample was acceptable for general landscape purposes

Particle Size Distribution & Stone Content

The sample contained 77% sand and fell into the sandy loam texture class. This particle size distribution is considered suitable for a broad range of landscape applications, including tree and shrub planting, turfing and seeding.

The sample was Virtually free from stones of 50 mm and upwards in diameter and only contained a slight fraction of smaller stones (2.2%). As such, stones will not restrict the use of the soil for landscaping purposes.

Potential Contaminants

We are not aware of any specified contaminant levels set for the proposed end-use of this topsoil. This includes human health, environmental protection and metals considered toxic to plants. In the absence of any site-specific assessment criteria, the concentrations that affect human health have been compared with the 'residential with homegrown produce' land use in the Suitable For Use Levels presented in 'The LQM/CIEH S4UIs' for Human Health Risk Assessment (2015) and DEFRA SP1010: 'Development of Category 4 Screening Levels' for Assessment of Land Affected by Contamination – Policy Companion Document (2014).

Of the potential contaminants determined, none was found at levels that would exceed their respective guideline values.

CONCLUSION

The purpose of the analysis was to determine the suitability of the topsoil for general landscaping purposes. From the soil examination and laboratory analysis, the soil is described as an alkaline, non-saline, sandy loam. The organic matter and nutrient levels are acceptable, and no significant contamination was found with respect to the parameters determined. This soil would adhere to the current BS3882 specification for 'multipurpose grade'.

To conclude, based on our findings, the topsoil would be considered well-suited to general landscaping purposes provided the physical condition of the soil is maintained.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if you have any queries or comments.

George Longmuir MSc Soil Sci. M.I Soil Sci.

Client	Freeland Horticulture Ltd
Job Name	Topsoil Analysis
Site	Astley, Greater Manchester
Month/Year	January 23
Our Ref	1121-SA
Date	03 January 2023

Composite sample

pH Value & Salinity

pH value (1:2.5 soil/water ext)	units	8.5
Electrical Conductivity (1:2.5 soil/water ext)	µS/cm	1002
Electrical Conductivity (1:2.5 soil/CaSO ₄ ext)	µS/cm	2905
Neutralising Value (CaCO ₃ equivalent)	%	3.4

Organic Matter & Nutrient Status

Organic Matter (LOI)	%	6.6
Organic Carbon (Derived)	%	3.8
Total Nitrogen	%	0.321
Carbon:Nitrogen Ratio	:1	12.0
Available Phosphorus	mg/l	45.2
Available Potassium	mg/l	912
Available Magnesium	mg/l	168

Particle Size Analysis & Stones

Clay (<0.002mm)	%	7
Silt (0.063-0.002mm)	%	1
Sand (2.0-0.063mm)	%	77
Texture Class	UK Class	Sandy Loam

Stones 2-20mm	% by DW	1.6
Stones 20-50mm	% by DW	0.6
Stones >50mm	% by DW	0.0

Potential Contaminants

Total Arsenic (As)	mg/kg	3.5
Total Cadmium (Cd)	mg/kg	<0.1
Total Chromium (Cr)	mg/kg	15.3
Hexavalent Chromium (Cr ^{VI})	mg/kg	1.2
Total Copper (Cu)	mg/kg	14.7
Total Lead (Pb)	mg/kg	18.4
Total Mercury (Hg)	mg/kg	<0.2
Total Nickel (Ni)	mg/kg	11.3
Total Selenium (Se)	mg/kg	0.10
Total Zinc (Zn)	mg/kg	40.6
Total Beryllium (Be)	mg/kg	<1
Total Barium (Ba)	mg/kg	33.5
Total Vanadium (V)	mg/kg	11.2
Hot Water Soluble Boron (B)	mg/kg	1.4
Total Cyanide (CN)	mg/kg	<1
Elemental Sulphur (S)	mg/kg	<5
Easily Liberated Sulphide (S ²⁻)	mg/kg	<1
Water Soluble Sulphate (SO ₄ ²⁻)	mg/l	109
Total Phenols Index	mg/kg	<1
Asbestos Screen	-	N.D.

Client	Freeland Horticulture Ltd
Job Name	Topsoil Analysis
Site	Astley, Greater Manchester
Month/Year	January 23
Our Ref	1121-SA
Date	03 January 2023

Polyaromatic Hydrocarbons

Naphthalene	mg/kg	<0.05
Acenaphthylene	mg/kg	<0.05
Acenaphthene	mg/kg	<0.05
Fluorene	mg/kg	<0.05
Phenanthrene	mg/kg	0.1
Anthracene	mg/kg	<0.05
Fluoranthene	mg/kg	0.3
Pyrene	mg/kg	0.3
Benzo[a]anthracene	mg/kg	0.3
Chrysene	mg/kg	0.3
Benzo[b]fluoranthene	mg/kg	0.3
Benzo[k]fluoranthene	mg/kg	0.3
Benzo[a]pyrene	mg/kg	0.3
Indeno[1,2,3-cd]pyrene	mg/kg	0.3
Dibenzo[a,h]anthracene	mg/kg	0.2
Benzo[g,h,i]perylene	mg/kg	0.3
Total PAHs sum US EPA 16	mg/kg	3.1

Banded Petroleum Hydrocarbons

Aliphatic TPH >C ₅ -C ₆	mg/kg	<0.05
Aliphatic TPH >C ₆ -C ₈	mg/kg	<0.05
Aliphatic TPH >C ₈ -C ₁₀	mg/kg	<0.05
Aliphatic TPH >C ₁₀ -C ₁₂	mg/kg	<10
Aliphatic TPH >C ₁₂ -C ₁₆	mg/kg	<10
Aliphatic TPH >C ₁₆ -C ₂₁	mg/kg	<10
Aliphatic TPH >C ₂₁ -C ₃₅	mg/kg	26.0
Aliphatic TPH >C ₃₅ -C ₄₄	mg/kg	28.0

Aromatic TPH >C ₅ -C ₇	mg/kg	<0.05
Aromatic TPH >C ₇ -C ₈	mg/kg	<0.05
Aromatic TPH >C ₈ -C ₁₀	mg/kg	<0.05
Aromatic TPH >C ₁₀ -C ₁₂	mg/kg	<10
Aromatic TPH >C ₁₂ -C ₁₆	mg/kg	<10
Aromatic TPH >C ₁₆ -C ₂₁	mg/kg	<10
Aromatic TPH >C ₂₁ -C ₃₅	mg/kg	61.0
Aromatic TPH >C ₃₅ -C ₄₄	mg/kg	85.0

Total Petroleum Hydrocarbons (C ₅ -C ₄₄)	mg/kg	200
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BTEX

Benzene	mg/kg	<0.02
Toluene	mg/kg	<0.2
Ethyl Benzene	mg/kg	<0.04
m- & p- Xylene	mg/kg	<0.2
o-Xylene	mg/kg	<0.1

Appendix B

Clean Cover Protocol

APPENDIX A

Determinand	LOD	Units	Residential with plant uptake assessment criteria
Arsenic	1	mg/kg	32
Boron (water-soluble)	1	mg/kg	291
Cadmium	1	mg/kg	10
Chromium	1	mg/kg	4.3
Chromium VI	1	mg/kg	4.3
Copper	1	mg/kg	2330
Lead	1	mg/kg	354
Mercury	1	mg/kg	170
Nickel	1	mg/kg	130
Selenium	3	mg/kg	350
Zinc	1	mg/kg	3750
Cyanide(Complex)	1	mg/kg	400
Cyanide(free)	1	mg/kg	25
pH	0.1	Units	No criteria
Phenols	1	mg/kg	390
SO4(Total)	0.01	%	No criteria
Sulphide	10	mg/kg	No criteria
Sulphur(Free)	500	mg/kg	No criteria
Thiocyanate	10	mg/kg	No criteria
Naphthalene	0.01	mg/kg	3.7
Acenaphthylene	0.01	mg/kg	400
Acenaphthene	0.01	mg/kg	480
Fluorene	0.01	mg/kg	380
Phenanthrene	0.01	mg/kg	200
Anthracene	0.01	mg/kg	4900
Fluoranthene	0.01	mg/kg	460
Pyrene	0.01	mg/kg	1000
Benzo(a)Anthracene	0.01	mg/kg	4.7
Chrysene	0.01	mg/kg	8
Benzo(b)Fluoranthene	0.01	mg/kg	6.5
Benzo(k)Fluoranthene	0.01	mg/kg	9.6
Benzo(a)Pyrene	0.01	mg/kg	0.94
Indeno(123-cd)Pyrene	0.01	mg/kg	3.9
Dibenzo(ah)Anthracene	0.01	mg/kg	0.86
Benzo(ghi)Perylene	0.01	mg/kg	46
PAH(total)	0.01	mg/kg	No criteria

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Nickel	1	mg/kg	130
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Cyanide(Complex)	1	mg/kg	400
Cyanide(free)	1	mg/kg	25
pH	0.1	Units	No criteria
Phenols	1	mg/kg	390
SO4(Total)	0.01	%	No criteria
Sulphide	10	mg/kg	No criteria
Sulphur(Free)	500	mg/kg	No criteria
Thiocyanate	10	mg/kg	No criteria
Naphthalene	0.01	mg/kg	3.7
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Benzo(ghi)Perylene	0.01	mg/kg	46
PAH(total)	0.01	mg/kg	No criteria