



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

Firth Buildings, 99 - 101 Leeds Road, Dewsbury, WF12 7BU

t 01924 464342 f 01924 450662 e martin@haighhuddleston.co.uk

Our Ref: 7790L002A

Date: 16 February 2023

**FAO Aqeel Waheed
Acre Homes**

aqeel@acrehomes.co.uk

Dear Aqeel

Re : Development at Nab Lane, Mirfield

As specified in the 'Geo-Environmental Ground Investigation Report E21/7790/R001 By Haigh Huddleston & Associates dated July 2021', remediation work has been carried out at the above development. Further to your request, Haigh Huddleston & Associates attended site on 23rd August 2022 to validate the remediation works.

Due to the presence of contaminants within the made ground on site, and lack of clean topsoil on site, it was recommended that clean subsoils and topsoils were imported to site to provide a clean capping layer a minimum of 600mm deep. The clean capping layer was to consist of 150mm topsoil overlying 450mm clean subsoils.

To accommodate the clean capping layer and the proposed development (e.g foundation excavations), 210 tonnes of material was removed from. The waste transfer tickets confirming the removal of the material from site are included in Appendix A.

For the subsoils, 71.2 tonnes of 20-75mm clean stone has been imported to site to form a 500mm sub-soil layer over the made ground. This has been overlaid with a terram layer overlay. Invoices confirming the supply of the clean stone from Marshalls to the site are included in Appendix B.

For the topsoil, 22.8 tonnes of material has been imported to site to form a 250mm thick growing medium. Invoices confirming the supply of the topsoil from Greentech, along with the chemical analysis of the material provided and the tier 1 trigger levels used for comparison are included in Appendix C.

Following the laying of the above clean capping layer, hand dug trial holes were undertaken to the rear garden areas to confirm the depth of the clean capping layer. The hand dug trial holes confirmed that in both instances in excess of 600mm clean capping material was present. A trial pit location plan along with photographs confirming the depths is included in Appendix D.

We would therefore conclude that the proposed soft landscaped area of the site has been remediated in accordance with the proposals in the site investigation report and the risk to future site residents from the low levels of existing on-site contamination has been reduced to acceptable levels.

I trust the above and attached are acceptable to yourself. Should you require any further information, or wish to discuss, please do not hesitate to contact me direct.

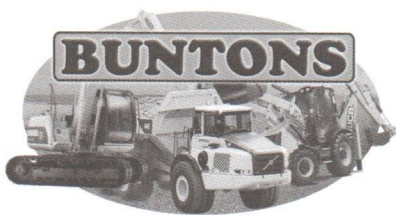
Yours sincerely

A handwritten signature in black ink, appearing to read 'M. Huddleston', with a stylized, cursive script.

MARTIN HUDDLESTON. Meng
martin@haighhuddleston.co.uk

APPENDIX A

WASTE TRANSFER TICKETS CONFIRMING REMOVAL OF
MATERIAL FROM SITE



5748

DUTY OF CARE CONTROLLED WASTE TRANSFER NOTE

A - Description of the Waste

- | | | |
|--|---|--|
| ☐ Mixed metals 17-04-07 | ☐ Plastic 17-02-03 | ☐ Tarmac / Bitumen 17-03-02 |
| ☐ Mixed construction 17-09-04 | ☐ Concrete 17-01-01 | ☒ Soil / stones 17-05-04 |
| ☐ Mixed municipal 20-03-01 | ☐ Cardboard 15-01-01 | ☐ Wood packaging 15-01-03 |

Other waste description : EWC : / /

2. How is it contained: ☒ Loose ☐ Skip ☐ Barrel Other: :3. The approximate amount of the waste : 20 tonnes Cu Metres

B - Producer / Holder of the Waste

1. Name of Company : AW DEVELOPMENTS2. Address of Company : 29 BECHWOOD ROAD BRADFORD3. SIC Code (2007) : 43120

4. Which of the following are you?

☒ Waste Producer ☐ Waste Importer ☐ Collection / Disposal Authority ☐ Broker☐ ENV Permit Holder Number : Waste Carriers Registration Number :☐ Waste Exemption Holder Number :☐ Exempt from waste carrier registration (give reason) :☒ I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste Regulations 2011.

C - Carrier of the Waste

1. Name of Company : R. Buntun Ltd2. Address of Company : The Sidings, Station Road, Harecroft, Wilsden, Bradford, W. Yorks, BD15 0BS3. Waste Carriers Registration Number : CBDU2094524. SIC Code (2007) : 431205. Vehicle Registration Number : NK20XYT6. Employee Name : Sam Signature : [Signature] Date : 19/08/21

D - First Transfer (holder to carrier)

1. Place of transfer : NAB LANE MIRFIELD2. Date of transfer : 19/08/21 to 19/08/21 Time(s) :

Producer Representative :

Name : Mohammed Ali Signature : [Signature] Date : 19/08/21

E - Disposer / Recoverer of the Waste

1. Name of Company : R. Buntun Plant Hire2. Address of Company : Hamm Green Street Bradford

3. Which of the following are you?

☐ Holder of an Environmental Permit (registration number) :☐ Holder of a valid waste exemption (registration number) :

4. Disposer / Recoverer Representative :

Name : Signature : [Signature] Date : 19/08/21

F - Second Transfer

1. Place of transfer :

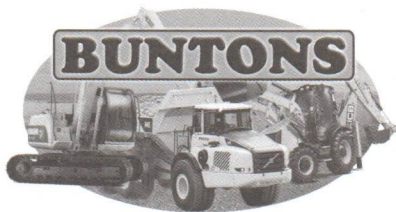
2. Date of transfer : / / to / / Time(s) :

3. Producer Representative :

Name : Signature : Date : / /

1. White - Waste producer / holder 2. Yellow - Disposer / Recoverer 3. Pink & Blue - Carrier of Waste (Buntons)

Tel : 01535 274943 - Fax : 01535 274960 - Email : sally@rbunton.co.uk



5766

DUTY OF CARE CONTROLLED WASTE TRANSFER NOTE

A - Description of the Waste

- | | | |
|--|---|--|
| ☐ Mixed metals 17-04-07 | ☐ Plastic 17-02-03 | ☐ Tarmac / Bitumen 17-03-02 |
| ☐ Mixed construction 17-09-04 | ☐ Concrete 17-01-01 | ☒ Soil / stones 17-05-04 |
| ☐ Mixed municipal 20-03-01 | ☐ Cardboard 15-01-01 | ☐ Wood packaging 15-01-03 |

Other waste description : EWC :/...../.....

2. How is it contained: ☒ Loose ☐ Skip ☐ Barrel Other: :3. The approximate amount of the waste : 1000 tonnes Cu Metres**B - Producer / Holder of the Waste**1. Name of Company : A W Developments - LA Acne Homes

2. Address of Company :

3. SIC Code (2007) : 43120

4. Which of the following are you?

☒ Waste Producer ☐ Waste Importer ☐ Collection / Disposal Authority ☐ Broker☐ ENV Permit Holder Number : Waste Carriers Registration Number :☐ Waste Exemption Holder Number :☐ Exempt from waste carrier registration (give reason) :☒ I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste Regulations 2011.**C - Carrier of the Waste**1. Name of Company : R. Buntun Ltd2. Address of Company : The Sidings, Station Road, Harecroft, Wilsden, Bradford, W. Yorks, BD15 0BS3. Waste Carriers Registration Number : CBDU2094524. SIC Code (2007) : 451205. Vehicle Registration Number : NK20XY16. Employee Name : SAM Signature: [Signature] Date : 20/08/21**D - First Transfer (holder to carrier)**1. Place of transfer : NAD Lane MILDEN2. Date of transfer : 20/08/21 to 20/08/21 Time(s) :

3. Producer Representative :

Name : Signature: [Signature] Date : 20/08/21**E - Disposer / Recoverer of the Waste**1. Name of Company : R. Buntun2. Address of Company : HAMMINGTON ST BRADFORD

3. Which of the following are you?

☐ Holder of an Environmental Permit (registration number) :☐ Holder of a valid waste exemption (registration number) :

4. Disposer / Recoverer Representative :

Name : Signature: [Signature] Date : 20/08/21**F - Second Transfer**

1. Place of transfer :

2. Date of transfer :/...../..... to/...../..... Time(s) :

3. Producer Representative :

Name : Signature : Date :/...../.....



5946

DUTY OF CARE CONTROLLED WASTE TRANSFER NOTE

A - Description of the Waste

- | | | |
|--|---|--|
| ☐ Mixed metals 17-04-07 | ☐ Plastic 17-02-03 | ☐ Tarmac / Bitumen 17-03-02 |
| ☐ Mixed construction 17-09-04 | ☐ Concrete 17-01-01 | ☒ Soil / stones 17-05-04 |
| ☐ Mixed municipal 20-03-01 | ☐ Cardboard 15-01-01 | ☐ Wood packaging 15-01-03 |

Other waste description : EWC :/...../.....

2. How is it contained: ☒ Loose ☐ Skip ☐ Barrel Other:

3. The approximate amount of the waste : 70 tonnes Cu Metres

B - Producer / Holder of the Waste

1. Name of Company : AW DEVELOPMENTS ACRE HOMES

2. Address of Company : 29 BECKHURD ROAD BRADFORD

3. SIC Code (2007) : 43120

4. Which of the following are you?

☐ Waste Producer ☐ Waste Importer ☐ Collection / Disposal Authority ☐ Broker

☐ ENV Permit Holder Number : Waste Carriers Registration Number :

☐ Waste Exemption Holder Number :

☐ Exempt from waste carrier registration (give reason) :

☒ I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste Regulations 2011.

C - Carrier of the Waste

1. Name of Company : R. Buntun Ltd

2. Address of Company : The Sidings, Station Road, Harecroft, Wilsden, Bradford, W. Yorks, BD15 0BS

3. Waste Carriers Registration Number : CBDU209452

4. SIC Code (2007) : 43120

5. Vehicle Registration Number : NK69 XPM

6. Employee Name : Brett Signature : Date : 14/09/21

D - First Transfer (holder to carrier)

1. Place of transfer : NAS Lane / BANK STREET BRADFORD

2. Date of transfer : 14/09/21 to 14/09/21 Time(s) :

3. Producer Representative :

Name : Signature : Date : 14/09/21

E - Disposer / Recoverer of the Waste

1. Name of Company : ADRI T PANG AND RECYCLING

2. Address of Company : ADRI SPRINGS CUMINGWORTH

3. Which of the following are you?

☐ Holder of an Environmental Permit (registration number) :

☐ Holder of a valid waste exemption (registration number) :

4. Disposer / Recoverer Representative :

Name : Signature : Date : 14/09/21

F - Second Transfer

1. Place of transfer :

2. Date of transfer :/...../..... to/...../..... Time(s) :

3. Producer Representative :

Name : Signature : Date :/...../.....



5962

DUTY OF CARE
CONTROLLED WASTE TRANSFER NOTE**A - Description of the Waste**

1. ☐ Mixed metals 17-04-07 ☐ Plastic 17-02-03 ☐ Tarmac / Bitumen 17-03-02
☐ Mixed construction 17-09-04 ☐ Concrete 17-01-01 ☒ Soil / stones 17-05-04
☐ Mixed municipal 20-03-01 ☐ Cardboard 15-01-01 ☐ Wood packaging 15-01-03

Other waste description : EWC :/...../.....

2. How is it contained: ☒ Loose ☐ Skip ☐ Barrel Other: :

3. The approximate amount of the waste : 20 tonnes Cu Metres

B - Producer / Holder of the Waste

1. Name of Company : AW DEVELOPMENTS A/C/H HOMES

2. Address of Company : 79 BEECHWOOD ROAD BRADFORD

3. SIC Code (2007) : 43120

4. Which of the following are you?

☒ Waste Producer ☐ Waste Importer ☐ Collection / Disposal Authority ☐ Broker☐ ENV Permit Holder Number : Waste Carriers Registration Number :☐ Waste Exemption Holder Number :☐ Exempt from waste carrier registration (give reason) :☒ I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste Regulations 2011.**C - Carrier of the Waste**

1. Name of Company : R. Bunton Ltd

2. Address of Company : The Sidings, Station Road, Harecroft, Wilsden, Bradford, W. Yorks, BD15 0BS

3. Waste Carriers Registration Number : CBDU209452

4. SIC Code (2007) : 43120

5. Vehicle Registration Number : NK60XYT

6. Employee Name : Sam Signature : [Signature] Date : 14.10.21

D - First Transfer (holder to carrier)

1. Place of transfer : NAS LANE/BANK STREET MIRCAD

2. Date of transfer : 14.10.21 to 14.10.21 Time(s) :

3. Producer Representative :

Name : Signature : [Signature] Date : 14.10.21

E - Disposer / Recoverer of the Waste

1. Name of Company : FLAOR TPAW AND RECYCLE

2. Address of Company : FLAOR SP.ROS COMMUNORTH

3. Which of the following are you?

☐ Holder of an Environmental Permit (registration number) :☐ Holder of a valid waste exemption (registration number) :

4. Disposer / Recoverer Representative :

Name : Signature : Date : 14.10.21

F - Second Transfer

1. Place of transfer :

2. Date of transfer : to Time(s) :

3. Producer Representative :

Name : Signature : Date :/...../.....

APPENDIX B

INVOICES CONFIRMING IMPORTATION OF CLEAN STONE
SUBSOILS FROM MARSHALLS

OBL

WOODTOP QUARRY
SWALESMOOR ROAD
HALIFAX HX3 6UF
United Kingdom
VAT 303772714

Tel: 01422 369688
email: accounts@oblquarries.co.uk

Balance Due
£0.00

Bill To
Aw Developments Ltd
29 BEECHWOOD ROAD
BRADFORD
BD6 3AQ
United Kingdom

Invoice Date : 10/08/22
Terms : Due on
Due Date : 10/08/22
P.O.# : Nab Lane - OBL6341

#	Item & Description	Qty	Rate	VAT %	VAT	Amount
1	10.08.2022 - RK22 FRC - 3inch marshalls	16.00	16.00	20.00	51.20	256.00

Sub Total 256.00

Standard Rate (20%) 51.20

Total £307.20

Payment Made (-) 307.20

Balance Due £0.00

Notes

Many Thanks

Terms & Conditions

BACS OBL Aggregates & Excavation Ltd Account No : 39065030 Sort Code : 56-00-36

OBL

WOODTOP QUARRY
SWALESMOOR ROAD
HALIFAX HX3 6UF
United Kingdom
VAT 303772714

Tel: 01422 369688
email: accounts@oblquarries.co.uk

Balance Due
£0.00

Bill To
Aw Developments Ltd
29 BEECHWOOD ROAD
BRADFORD
BD6 3AQ
United Kingdom

Invoice Date : 12/08/22
Terms : Due on
Due Date : 12/08/22
P.O.# : stone marshalls 12/8/22

#	Item & Description	Qty	Rate	VAT %	VAT	Amount
1	39.2 tons of 3 inch from marshalls price only we pay	39.20	18.12	20.00	142.06	710.30
2	2 x collect from quarry leeds to queensbury (l999 obl)	2.00	125.00	20.00	50.00	250.00
3	grab wait time	2.00	110.00	20.00	44.00	220.00
4	2 x delivery (k999 obl) from queensbury to mirfeild	2.00	110.00	20.00	44.00	220.00

Sub Total 1,400.30

Standard Rate (20%) 280.06

Total £1,680.36

Payment Made (-) 1,680.36

Balance Due £0.00

Notes

Many Thanks

Terms & Conditions

BACS OBL Aggregates & Excavation Ltd Account No : 39065030 Sort Code : 56-00-36

OBL

WOODTOP QUARRY
SWALESMOOR ROAD
HALIFAX HX3 6UF
United Kingdom
VAT 303772714

Tel: 01422 369688
email: accounts@oblquarries.co.uk

Balance Due
£0.00

Bill To

Aw Developments Ltd
29 BEECHWOOD ROAD
BRADFORD
BD6 3AQ
United Kingdom

Invoice Date : 16/08/22
Terms : Due on
Due Date : 16/08/22

#	Item & Description	Qty	Rate	VAT %	VAT	Amount
1	16 ton 20-40 mill limestone delivered to mirfeild site	16.00	27.50	20.00	88.00	440.00
2	transport leeds to queensbury from marshalls	1.00	125.00	20.00	25.00	125.00
Sub Total						565.00
Standard Rate (20%)						113.00
Total						£678.00
Payment Made						(-) 678.00
Balance Due						£0.00

Notes

Many Thanks

Terms & Conditions

BACS OBL Aggregates & Excavation Ltd Account No : 39065030 Sort Code : 56-00-36

APPENDIX C

INVOICES CONFIRMING IMPORTATION OF CLEAN TOPSOILS
FROM GREENTECH

CHEMICAL ANALYSIS OF TOPSOIL

TIER 1 TRIGGER LEVELS FOR RESIDENTIAL USE WITH PLANT
UPTAKE



SALES INVOICE

AW Developments (UK) Ltd t/a Acre Homes
29 Beechwood Road

BRADFORD
West Yorkshire
BD6 3AQ

Invoice No. 440238
Customer No. AWDE01
Your Order No. Nab Lane
Sales Manager Ben Hudson
Email address benh@green-tech.co.uk
Date 13/09/2022
Due date 13/09/2022
EC VAT No.

SALES INVOICE: 440238

Item no.	Item name	Qty.	Price	VAT %	Total (GBP)
190GT3210	Green tree Topsoil Barnsdale Landscape Grade GT2 (Tonne) - 8wh Grab	15.8000	35.0000	20.00	553.00
tkr 27252/4175510					
Haulage	Cancellation charge for second wagon	1.0000	135.0000	20.00	135.00

Delivery address (if different)

Nab Lane

MIRFIELD
West Yorkshire
WF14 9QJ

Total net 688.00

VAT 137.60

Document total (GBP) **825.60**

Please pay directly to HSBC
Sort Code: 40-47-31
Account Number: 54643143
Account Name: Greentech Ltd

Our standard terms & conditions apply

Only products itemised as FSC Mix 70% are FSC certified INT - COC 001296

Greentech Ltd, Rabbit Hill Park, Great North Road, Arkendale, Knaresborough. HG5 0FF. UK
Tel: +44 (0)1423 332100 Fax: +44 (0)1423 332101 Email: sales@green-tech.co.uk Web: www.green-tech.co.uk
Greentech Ltd Registered in England No. 04543146 VAT Registration No: GB 115 100 677



SALES INVOICE

AW Developments (UK) Ltd t/a Acre Homes
29 Beechwood Road

BRADFORD
West Yorkshire
BD6 3AQ

Invoice No. 440326
Customer No. AWDE01
Your Order No. Order 16/09
Sales Manager Ben Hudson
Email address benh@green-tech.co.uk
Date 20/09/2022
Due date 20/09/2022
EC VAT No.

SALES INVOICE: 440326

Item no.	Item name	Qty.	Price	VAT %	Total (GBP)
190GT4213	Rabbit Hill Green-Tree Topsoil 12mm (Bulk Bag) sales use	7.0000	79.0000	20.00	553.00
SHIPFL	Full Load Shipping - Hi-Ab	1.0000	100.0000	20.00	100.00

Delivery address (if different)

Nab Lane

MIRFIELD
West Yorkshire
WF14 9QJ

Total net 653.00

VAT 130.60

Document total (GBP) **783.60**

Please pay directly to HSBC
Sort Code: 40-47-31
Account Number: 54643143
Account Name: Greentech Ltd

Our standard terms & conditions apply

Only products itemised as FSC Mix 70% are FSC certified INT - COC 001296

Greentech Ltd, Rabbit Hill Park, Great North Road, Arkendale, Knaresborough. HG5 0FF. UK
Tel: +44 (0)1423 332100 Fax: +44 (0)1423 332101 Email: sales@green-tech.co.uk Web: www.green-tech.co.uk
Greentech Ltd Registered in England No. 04543146 VAT Registration No: GB 115 100 677



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr Mark Wood
Green-tech Ltd
Rabbit Hill Business Park
Great North Road
Arkendale
Knaresborough
North Yorkshire HG5 0FF

1st August 2022
Our Ref: TOHA/22/7605/SS
Your Ref: PO 421233

Dear Sirs

Topsoil Analysis Report: Barnsdale Landscape Grade Topsoil – New Mix

We have completed the analysis of the soil sample recently submitted, referenced *Barnsdale Landscape Grade Topsoil*, and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the sample for general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

This report presents the results of analysis for the sample submitted to our office, and it should be considered 'indicative' of the topsoil source. The report and results should therefore not be used by third parties as a means of verification or validation testing or waste designation purposes, especially after the topsoil has left the Green-tech Ltd site.

SAMPLE EXAMINATION

The sample was described as a dark yellowish brown (Munsell Colour 10YR 3/4), slightly moist, friable, moderately calcareous LOAMY SAND with a weakly developed, very fine granular structure*. The sample was virtually stone-free and contained a low proportion of organic fines and common woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

*This appraisal of soil structure was made from examination of a disturbed sample. Structure is a key soil characteristic that may only be accurately assessed by examination in an in-situ state.

Tim O'Hare Associates LLP
Howbery Park Wallingford Oxfordshire OX10 8BA
T:01491 822653 E:info@toha.co.uk
www.toha.co.uk

ANALYTICAL SCHEDULE

The sample was submitted to a UKAS and MCERTS accredited laboratory for a range of physical and chemical tests to confirm the composition and fertility of the soil, and the concentration of selected potential contaminants. The following parameters were determined:

- detailed particle size analysis (5 sands, silt, clay);
- stone content (2-20mm, 20-50mm, >50mm);
- pH and electrical conductivity values;
- exchangeable sodium percentage;
- major plant nutrients (N, P, K, Mg);
- organic matter content;
- C:N ratio;
- heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, B);
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16 suite);
- aromatic and aliphatic TPH (C5-C35 banding);
- benzene, toluene, ethylbenzene, xylene (BTEX);
- asbestos screen.

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

RESULTS OF ANALYSIS

Detailed Particle Size Analysis and Stone Content

The sample fell into the *loamy sand* texture class. Further detailed particle size analysis found the sample to have a sufficiently narrow particle size distribution and a predominance of *medium sand* (0.25-0.50mm). This particle size distribution is usually considered suitable for general landscape applications provided the soil's physical condition is satisfactory.

The sample was virtually stone-free and as such, stones should not restrict the use of the soil for general landscape purposes.

pH and Electrical Conductivity Values

The sample was strongly alkaline in reaction (pH 8.5). This pH value would be considered suitable for general landscape purposes provided species with a wide pH tolerance or those known to prefer alkaline soils are selected for planting, turfing and seeding.

The electrical conductivity (salinity) value (water extract) was moderate, which indicates that soluble salts should not be present at levels that would be harmful to plants.

The electrical conductivity value by CaSO₄ extract (BS3882 requirement) fell below the maximum specified value (3300 µS/cm) given in BS3882:2015 – Table 1.

Organic Matter and Fertility Status

The sample was adequately supplied with organic matter and all major plant nutrients.

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

Potential Contaminants

With reference to BS3882:2015 - Table 1: Notes 3 and 4, there is a recommendation to confirm levels of potential contaminants in relation to the topsoil's proposed end use. This includes human health, environmental protection and metals considered toxic to plants. In the absence of site-specific assessment criteria, the concentrations that affect human health have been assessed for *residential with homegrown produce* end-use against the Suitable For Use Levels (S4ULs) presented in *The LQM/CIEH S4ULs for Human Health Risk Assessment* (2015) and the DEFRA SP1010: *Development of Category 4 Screening Levels (C4SLs) for Assessment of Land Affected by Contamination – Policy Companion Document* (2014).

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

Phytotoxic Contaminants

Of the phytotoxic (toxic to plants) contaminants determined (copper, nickel, zinc), none was found at levels that exceeded the maximum permissible levels specified in BS3882:2015 – Table 1.

CONCLUSION

The purpose of the analysis was to determine the suitability of the sample for general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Topsoil (BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil).

From the soil examination and subsequent laboratory analysis, the sample was described as a strongly alkaline, non-saline, moderately calcareous loamy sand with a weakly developed structure and very low stone content. The sample was adequately supplied with organic matter and all major plant nutrients. Of the potential contaminants determined, none exceeded their respective guideline values.

To conclude, based on our findings, the topsoil represented by this sample would be considered suitable for general landscape purposes (trees, shrubs and amenity grass), provided that species with a wide pH tolerance or those known to prefer alkaline soils are selected for planting, turfing and seeding and the physical condition of the soil is satisfactory.

The topsoil was also fully compliant with the requirements of the British Standard for Topsoil (BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil).

Soil Handling Recommendations

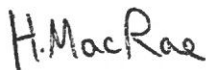
It is important to maintain the physical condition of the soil and avoid structural damage during all phases of soil handling (e.g. stockpiling, resspreading, cultivating, planting, seeding or turfing). As a consequence, soil handling operations should be carried out when soil is sufficiently dry to be non-plastic (friable) in consistency.

It is important to ensure that the soil is not unnecessarily compacted by trampling or trafficking by site machinery, and soil handling should be stopped during and after heavy rainfall and not continued until the soil is friable in consistency. If the soil is structurally damaged and compacted at any stage during the course of soiling or landscaping works, it should be cultivated appropriately to relieve the compaction and to restore the soil's structure prior to any planting, turfing or seeding.

Further details on soil handling are provided in Annex A of BS3882:2015.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if we can be of further assistance.

Yours faithfully



Harriet MacRae
BSc MSc
Graduate Soil Scientist



Ceri Spears
BSc MSc MScSoilSci
Senior Associate

For & on behalf of Tim O'Hare Associates LLP



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	Green-tech Ltd
Project:	Barnsdale Landscape Grade - New Mix
Job:	Topsoil Analysis - BS3882:2015
Date:	01/08/2022
Job Ref No:	TOHA/22/7605/SS

Sample Reference	
	Accreditation
Clay (<0.002mm)	% UKAS
Silt (0.002-0.05mm)	% UKAS
Very Fine Sand (0.05-0.15mm)	% UKAS
Fine Sand (0.15-0.25mm)	% UKAS
Medium Sand (0.25-0.50mm)	% UKAS
Coarse Sand (0.50-1.0mm)	% UKAS
Very Coarse Sand (1.0-2.0mm)	% UKAS
Total Sand (0.05-2.0mm)	% UKAS
Texture Class (UK Classification)	-- UKAS
Stones (2-20mm)	% DW GLP
Stones (20-50mm)	% DW GLP
Stones (>50mm)	% DW GLP

Barnsdale Landscape Grade Topsoil	
	9
	12
	8
	17
	44
	7
	3
	79
	LS
	1
	0
	0

pH Value (1:2.5 water extract)	units	UKAS
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS
Electrical Conductivity (1:2 CaSO ₄ extract)	uS/cm	UKAS
Exchangeable Sodium Percentage	%	UKAS
Organic Matter (LOI)	%	UKAS
Total Nitrogen (Dumas)	%	UKAS
C : N Ratio	ratio	UKAS
Extractable Phosphorus	mg/l	UKAS
Extractable Potassium	mg/l	UKAS
Extractable Magnesium	mg/l	UKAS

	8.5
	953
	3090
	4.2
	3.8
	0.20
	11
	61
	1159
	150

Total Arsenic (As)	mg/kg	MCERTS
Total Cadmium (Cd)	mg/kg	MCERTS
Total Chromium (Cr)	mg/kg	MCERTS
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS
Total Copper (Cu)	mg/kg	MCERTS
Total Lead (Pb)	mg/kg	MCERTS
Total Mercury (Hg)	mg/kg	MCERTS
Total Nickel (Ni)	mg/kg	MCERTS
Total Selenium (Se)	mg/kg	MCERTS
Total Zinc (Zn)	mg/kg	MCERTS
Water Soluble Boron (B)	mg/kg	MCERTS
Total Cyanide (CN)	mg/kg	MCERTS
Total (mono) Phenols	mg/kg	MCERTS

	4
	0.2
	6.6
	< 1.8
	27
	14
	< 0.3
	6.2
	< 1.0
	35
	0.9
	< 1.0
	< 1.0

Naphthalene	mg/kg	MCERTS
Acenaphthylene	mg/kg	MCERTS
Acenaphthene	mg/kg	MCERTS
Fluorene	mg/kg	MCERTS
Phenanthrene	mg/kg	MCERTS
Anthracene	mg/kg	MCERTS
Fluoranthene	mg/kg	MCERTS
Pyrene	mg/kg	MCERTS
Benzo(a)anthracene	mg/kg	MCERTS
Chrysene	mg/kg	MCERTS
Benzo(b)fluoranthene	mg/kg	MCERTS
Benzo(k)fluoranthene	mg/kg	MCERTS
Benzo(a)pyrene	mg/kg	MCERTS
Indeno(1,2,3-cd)pyrene	mg/kg	MCERTS
Dibenzo(a,h)anthracene	mg/kg	MCERTS
Benzo(g,h,i)perylene	mg/kg	MCERTS
Total PAHs (sum USEPA16)	mg/kg	MCERTS

	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.80

Aliphatic TPH >C5 - C6	mg/kg	MCERTS
Aliphatic TPH >C6 - C8	mg/kg	MCERTS
Aliphatic TPH >C8 - C10	mg/kg	MCERTS
Aliphatic TPH >C10 - C12	mg/kg	MCERTS
Aliphatic TPH >C12 - C16	mg/kg	MCERTS
Aliphatic TPH >C16 - C21	mg/kg	MCERTS
Aliphatic TPH >C21 - C35	mg/kg	MCERTS
Aliphatic TPH (C5 - C35)	mg/kg	MCERTS
Aromatic TPH >C5 - C7	mg/kg	MCERTS
Aromatic TPH >C7 - C8	mg/kg	MCERTS
Aromatic TPH >C8 - C10	mg/kg	MCERTS
Aromatic TPH >C10 - C12	mg/kg	MCERTS
Aromatic TPH >C12 - C16	mg/kg	MCERTS
Aromatic TPH >C16 - C21	mg/kg	MCERTS
Aromatic TPH >C21 - C35	mg/kg	MCERTS
Aromatic TPH (C5 - C35)	mg/kg	MCERTS

	< 0.001
	< 0.001
	< 0.001
	< 1.0
	< 2.0
	< 8.0
	< 8.0
	< 10
	< 0.001
	< 0.001
	< 0.001
	< 1.0
	< 2.0
	< 10
	< 10
	< 10

Benzene	mg/kg	MCERTS
Toluene	mg/kg	MCERTS
Ethylbenzene	mg/kg	MCERTS
p & m-xylene	mg/kg	MCERTS
o-xylene	mg/kg	MCERTS
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS

	< 0.001
	< 0.001
	< 0.001
	< 0.001
	< 0.001
	< 0.001

Asbestos Screen	ND/D	ISO 17025
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Not-detected

LS = LOAMY SAND

Visual Examination

The sample was described as a dark yellowish brown (Munsell Colour 10YR 3/4), slightly moist, friable, moderately calcareous LOAMY SAND with a weakly developed, very fine granular structure. The sample was virtually stone free and contained a low proportion of organic fines and common woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

Results of analysis should be read in conjunction with the report they were issued with

H. MacRae

Harriet MacRae
BSc MSc
Graduate Soil Scientist



TIM O'HARE ASSOCIATES
SOILS & LANDSCAPE CONSULTANTS

Client	Green-leach Ltd
Project	Bermadale Landscape Grade
Job	Topsoil Analysis - BS3862:2015
Date	18/02/2022
Job Ref No	TOHA/222/2401185

Sample Reference		
		Acceptation
Clay (<0.002mm)	%	UKAS
Silt (0.002-0.05mm)	%	UKAS
Very Fine Sand (0.05-0.15mm)	%	UKAS
Fine Sand (0.15-0.25mm)	%	UKAS
Medium Sand (0.25-0.5mm)	%	UKAS
Coarse Sand (0.5-1.0mm)	%	UKAS
Very Coarse Sand (1.0-2.0mm)	%	UKAS
Total Sand (0.05-2.0mm)	%	UKAS
Topsoil Class (UK Classification)		UKAS
Stones (>20mm)	% DW	CLP
Stones (>50mm)	% DW	CLP
Stones (>90mm)	% DW	CLP

Landscape Grade

7
15
10
15
40
4
5
15
1.5
13
0
0

pH Value (1:2.5 water extract)	unit	UKAS
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS
Electrical Conductivity (1:2.5 CaSO ₄ extract)	uS/cm	UKAS
Exchangeable Sodium Percentage	%	UKAS
Organic Matter (LOI)	%	UKAS
Total Nitrogen (Dumas)	%	UKAS
C - N Ratio	ratio	UKAS
Extractable Phosphorus	mg/l	UKAS
Extractable Potassium	mg/l	UKAS
Extractable Magnesium	mg/l	UKAS

8.7
813
2563
3.7
6.4
0.29
14
6.5
161
139

Total Arsenic (As)	mg/kg	MCERTS
Total Cadmium (Cd)	mg/kg	MCERTS
Total Chromium (Cr)	mg/kg	MCERTS
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS
Total Copper (Cu)	mg/kg	MCERTS
Total Lead (Pb)	mg/kg	MCERTS
Total Mercury (Hg)	mg/kg	MCERTS
Total Nickel (Ni)	mg/kg	MCERTS
Total Selenium (Se)	mg/kg	MCERTS
Total Zinc (Zn)	mg/kg	MCERTS
Water Soluble Boron (B)	mg/kg	MCERTS
Total Cyanide (CN)	mg/kg	MCERTS
Total (mon) Phenols	mg/kg	MCERTS

4
0.3
7
< 4.0
24
22
< 0.5
7
< 1.0
43
1.5
< 1.0
< 1.0

Naphthalene	mg/kg	MCERTS
Acenaphthylene	mg/kg	MCERTS
Acenaphthene	mg/kg	MCERTS
Fluorene	mg/kg	MCERTS
Phenanthrene	mg/kg	MCERTS
Anthracene	mg/kg	MCERTS
Fluoranthene	mg/kg	MCERTS
Pyrene	mg/kg	MCERTS
Benzo[a]anthracene	mg/kg	MCERTS
Chrysene	mg/kg	MCERTS
Benzo[b]fluoranthene	mg/kg	MCERTS
Benzo[k]fluoranthene	mg/kg	MCERTS
Benzo[e]pyrene	mg/kg	MCERTS
Indeno[1,2,3-cd]pyrene	mg/kg	MCERTS
Dibenz[a,h]anthracene	mg/kg	MCERTS
Benzo[g,h,i]perylene	mg/kg	MCERTS
Total PAHs (sum UDEPA15)	mg/kg	MCERTS

< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05

Aliphatic TPH <C8 - C8	mg/kg	MCERTS
Aliphatic TPH <C8 - C8	mg/kg	MCERTS
Aliphatic TPH <C8 - C10	mg/kg	MCERTS
Aliphatic TPH <C10 - C12	mg/kg	MCERTS
Aliphatic TPH <C12 - C16	mg/kg	MCERTS
Aliphatic TPH <C16 - C21	mg/kg	MCERTS
Aliphatic TPH <C21 - C25	mg/kg	MCERTS
Aliphatic TPH <C25 - C35	mg/kg	MCERTS
Aromatic TPH <C8 - C10	mg/kg	MCERTS
Aromatic TPH <C10 - C12	mg/kg	MCERTS
Aromatic TPH <C12 - C16	mg/kg	MCERTS
Aromatic TPH <C16 - C21	mg/kg	MCERTS
Aromatic TPH <C21 - C25	mg/kg	MCERTS
Aromatic TPH <C25 - C35	mg/kg	MCERTS

< 0.001
< 0.001
< 0.001
< 1.0
< 2.0
< 8.0
< 8.0
< 10
< 0.001
< 0.001
< 0.001
< 0.001
< 0.001
< 10

Benzene	mg/kg	MCERTS
Toluene	mg/kg	MCERTS
Ethylbenzene	mg/kg	MCERTS
p & m-xylene	mg/kg	MCERTS
o-xylene	mg/kg	MCERTS
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS

< 0.001
< 0.001
< 0.001
< 0.001
< 0.001
< 0.001

Asbestos Screen	NDD	ISO 17025
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Not detected

LS = LOAMY SAND

Visual Examination

The sample was described as a dark reddish brown (Munsell Colour 5YR 4/2), moist, friable, non-calcareous LOAMY SAND with a weakly developed, very fine to medium granular structure. The sample was slightly stony and contained a moderate proportion of organic fines and occasional woody fragments. No unusual odours, tastes or discolorations of specimens were observed.

mp, mtd, wtd

Tilly Ainslie-Wilde
BSc MSc
Graduate Soil Scientist

Results of analysis should be read in conjunction with the report they were issued with.

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TIER 1 SOIL GUIDANCE VALUES FOR USE IN DOMESTIC GARDENS
(WITH PLANT UPTAKE)

<u>CONTAMINANT</u>	<u>ICRCL – TTV / DEFRA – SGV</u>
	<u>MG/KG</u>
Arsenic	37 (4)
Cadmium	22 (4)
Chromium	130 (2)
Lead	200 (4)
Mercury	40 (1,5)
Selenium	250 (1)
Copper	2400 (1)
Nickel	180 (1)
Zinc	3700 (1)
Cyanide (total)	25
Sulphate	0.24% (3)
Sulphide	250
Thiocyanate	50
PAH (Total)	40
TPH (Total)	250
Phenols	280 (1)
PH	6-8
Asbestos	No fibres present

- (1) Copyright Land Quality Management Ltd reproduced with permission; Publication Number S4UL3499. All rights reserved.
- (2) DEFRA CLR SGV's withdrawn used for initial comparison
- (3) BS 8110 1985 Table 6.1
- (4) Category 4 Screening Level
- (5) Unless there is considered to be historical site usage that would result in elemental and methylmercury compounds to be present, the inorganic mercury SGV is used as this is the most prevalent for of mercury present in the natural environment.

**TIER 1 SOIL GUIDANCE VALUES FOR USE IN DOMESTIC GARDENS WITH
PLANT UPTAKE (SPECIATED PAH)**

<u>CONTAMINANT</u>	<u>SCREENING CRITERIA FOR PAH</u> <u>(mg/kg)</u>		
	1% SOM	2.5% SOM	6% SOM
Acenaphthlene	210 (1)	510 (1)	1100 (1)
Acenaphthylene	170 (1)	420 (1)	920 (1)
Anthracene	2400 (1)	5400 (1)	11000 (1)
Benzo[a]anthracene	7.2 (1)	11 (1)	13 (1)
Benzo(a)pyrene	5 (2)	5 (2)	5 (2)
Benzo[b]fluoranthene	2.6 (1)	3.3 (1)	3.7 (1)
Benzo[ghi]perylene	320 (1)	340 (1)	350 (1)
Benzo[k]fluoranthene	77 (1)	93 (1)	100 (1)
Chrysene	15 (1)	22 (1)	27 (1)
Dibenzo[ah]anthracene	0.24 (1)	0.28 (1)	0.3 (1)
Fluoranthene	280 (1)	560(1)	890 (1)
Fluorene	170 (1)	400 (1)	860 (1)
Indeno[123-cd]pyrene	27 (1)	36 (1)	41 (1)
Naphthalene	2.3 (1)	5.6 (1)	13 (1)
Phenanthrene	95 (1)	220 (1)	440 (1)
Pyrene	620 (1)	1200 (1)	2000 (1)

- (1) Copyright Land Quality Management Ltd reproduced with permission; Publication Number S4UL3499. All rights reserved.
- (2) Category 4 Screening Level

LQM S4UL SCREENING VALUES FOR SPECIATED TOTAL TPH
(RESIDENTIAL WITH PLANT UPTAKE 1% SOM)

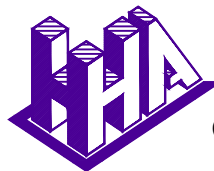
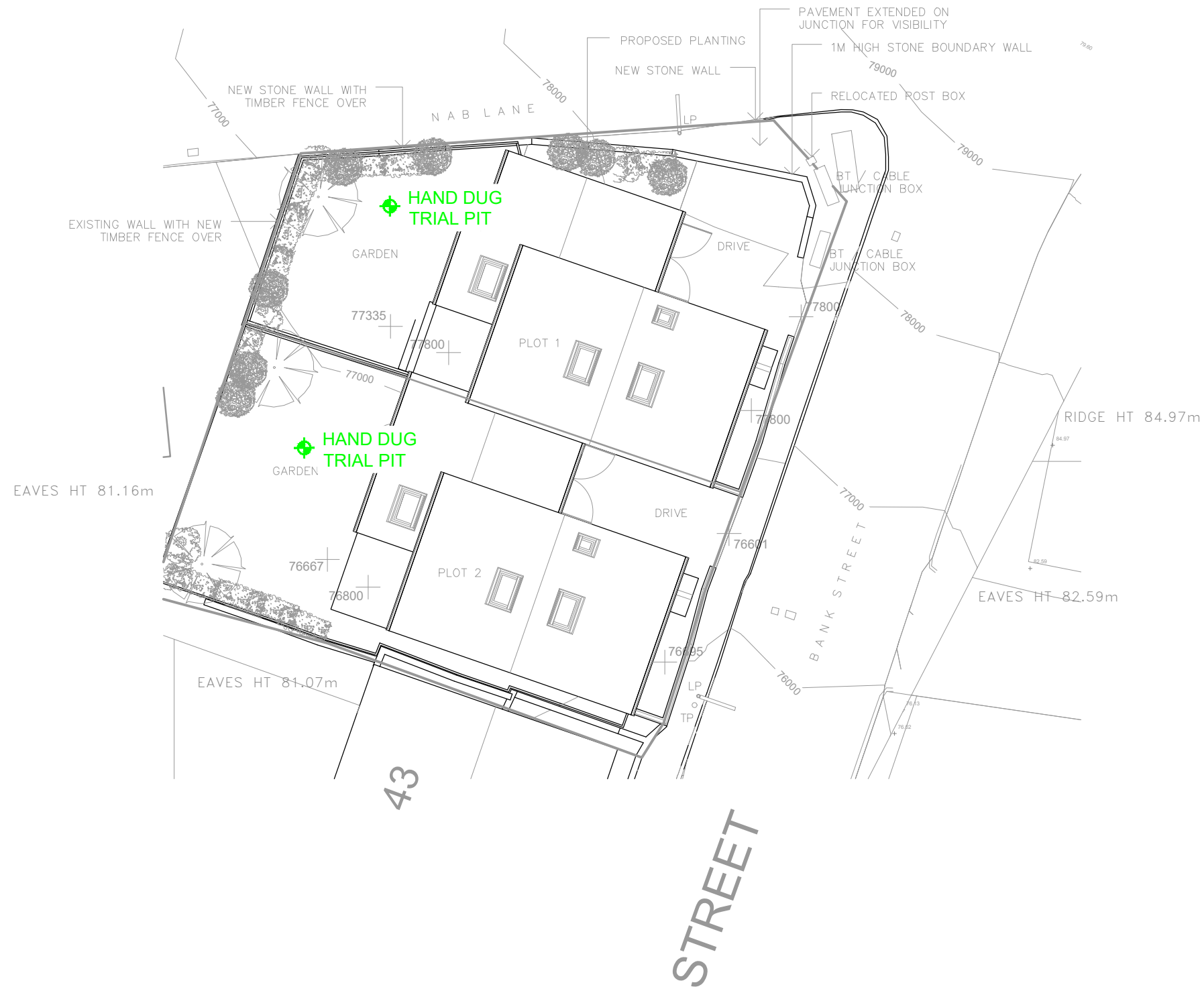
Petroleum Hydrocarbons	LQM S4UL Screening Values (mg/kg)
Aliphatics	
C5-C6	42
C6-C8	100
C8-C10	27
C10-C12	130 (38)
C12-C16	1100 (24)
C16-C35	65000 (8.48)
Aromatics	
C5-C7	70
C7-C8	130
C8-C10	34
C10-C12	74
C12-C16	140
C16-C21	260
C21-C35	1100

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APPENDIX D

VALIDATION TRIAL PIT LOCATION PLAN

TRIAL PIT PHOTOGRAPHS



Haigh Huddleston & Associates

Civil Structural Engineering Consultants

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Project			
NAB LANE, MIRFIELD			
Client			
AW DEVELOPMENTS UK Ltd			
Detail			
REMEDIATION VALIDATION PLAN			
Scale	Dwn	Date	Dwg No.
1:200@A3	MD	Feb'23	E21/7790/033











