

RESIDENTIAL DEVELOPMENT AT
LINN STREET, CRUMPSALL
REMEDICATION VALIDATION REPORT
FOR PLOTS 1 TO 14

Client:

Wiggett Construction Ltd.
Viking House
449 Middleton Road
Chadderton
Oldham
OL9 9LB

Consultant:

Build Vision Ltd
Consulting Engineers
Suite 1, Westleigh House
Wakefield Road
Denby Dale
Huddersfield
HD8 8QJ

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2. REMEDIATION VALIDATION
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1. INTRODUCTION

- 1.1.1. The REC Phase 2 Geo-Environmental and Geotechnical Assessment Report Ref: 105270P2R2 dated September 2018 and the Build Vision Remediation Strategy Ref:1284, dated 9th September 2020 should be referred to for further information.

2. REMEDIATION VALIDATION

2.1. Contamination

- 2.1.1. The groundworker GNL Construction Ltd. carried out the site strip and cut and fill across the whole of the site to formation level to achieve the levels for the proposed development and provide the plot construction and access road and hard pavement construction build ups and capping layers to the gardens.
- 2.1.2. GNL and Wiggett Construction Ltd. have confirmed that no evidence of contamination other than the made ground identified in the site investigation has been identified during the construction works.
- 2.1.3. Topsoil has been imported from a greenfield source on to site for use in the 600mm capping layers to back gardens and 450mm capping layers to front and side gardens and soft landscaped areas and source details and waste transfer notes are enclosed in Appendix A.
- 2.1.4. Sub Surface obtained 3 no. samples from the stockpile of topsoil on site to be used in the gardens and the samples were tested for a general soil suite including heavy metals, PAHs and TPHs and the results of these have been assessed using 1% soil organic matter residential land use with plant uptake and inhalation pathway Tier 1 assessment levels for soil. The topsoil test results were all below residential and inhalation assessment levels with the exception of slightly elevated levels of dibenz(a,h) anthracene in sample S1 but all the other PAHs and in particular benzo(a)pyrene were below assessment levels, which is used as a surrogate marker for PAHs in the C4SL assessment levels if it falls within appropriate limits and follows the profile in relation to the ratios of carcinogenic PAHs as described in HPA and CLAIRE guidance and therefore the risk is considered low and the topsoil is considered suitable for use in garden areas. The test results and assessment are enclosed in Appendix A.

2.1.5. GNL excavated 17 no. validation trial pits in the garden areas for plots 1 to 14 in December 2021 and January and February 2022 complying with guidance on validation rates of 1 no. per 2 to 3 plots requirements. The trial pits identified topsoil over a geotextile membrane or stone sub-base to a minimum depth of 600mm.

2.1.6. The validation trial pit location plan and photos are enclosed in Appendix A.

2.1.7. PE Barrier pipes have been provided for water supply pipes in accordance with the water pipe risk assessment enclosed in Appendix A.

2.1. Landfill Gas

2.1.1. Gas protection measures have been provided and validated in accordance with CS2 and NHBC Amber 1 from BS8485 as shown on the foundation drawings, manufacturers details, invoices, delivery notes and photos enclosed in Appendix B.

3. CONCLUSIONS

3.1.1. The remediation measures carried out have reduced the risk to end user receptors from the sources of the contamination and gases by effectively eliminating the pathway of direct contact/ingestion and migration.

3.1.2. The remediation measures carried out for Plots 1 to 14 of the development are complete and considered suitable for use.

APPENDIX A

CONTAMINATION REMEDIATION VALIDATION

- § Validation Trial Pit Location Plan
- § Validation Trial Pit Photo's
- § Waste Transfer Note for topsoil
- § Topsoil Test Results and Assessment
- § Water pipe risk assessment



North

Drawing Legend:

- tarmac finish to road
- block paving with to driveways
- pedestrian crossing at new road junction
- concrete paving to garden paths
- landscaped areas (see soft landscaping layout for full details)
- Proposed levels
- spaces for bins, bins
- secure locking hoop fixed to wall of building
- Bin boxes fixed to proposed trees (for full details refer to Ecology Report)
- Bin boxes fixed to proposed trees (for full details refer to Ecology Report)
- Electric car charging point
- Indicative positions of proposed trees (see soft landscaping layout for full details)

VALIDATION TRIAL PIT LOCATION

E	10/10/20	Block type references updated	TR	GG
D	10/09/20	Bin & trial box locations updated in line with latest Landscape Layout	TR	GG
C	07/09/20	Plans updated as per latest floor plan details. Boundary arrangements updated	TR	GG
REV	DATE	AMENDMENT	BY	CHKD

HNAarchitects
Architects | Planning | Design

PROJECT:	Land at Linn Street, Crumpsall			
CLIENT:	Wiggitt Construction Ltd.			
DRAWING:	Site Layout Plan			
DRAWN BY:	TR	CHECKED BY:	GG	DATE: 01/10/20
STATUS:	Construction		DRAWING NO: 1320/C-001	SCALE: 1:200 @ A2
			REVISION: E	

DO NOT SCALE
HNAarchitects is a trading name of HNAarchitects Ltd.
HNAarchitects is located at CENTRE ALBERT STREET, GOSWOLD, GLASGOW, G4 7JG
T: 01469 888 1000
E: info@hnaarchitects.co.uk
RIBA Chartered Practice

VALIDATION TRIAL PIT PHOTOGRAPHS



TRIAL PIT P1F



TRIAL PIT P1F

VALIDATION TRIAL PIT PHOTOGRAPHS



TRIAL PIT P1R



TRIAL PIT P1R

VALIDATION TRIAL PIT PHOTOGRAPHS



TRIAL PIT P3R



TRIAL PIT P3R

VALIDATION TRIAL PIT PHOTOGRAPHS



TRIAL PIT P4F



TRIAL PIT P4F

VALIDATION TRIAL PIT PHOTOGRAPHS



TRIAL PIT P4S



TRIAL PIT P4S

VALIDATION TRIAL PIT PHOTOGRAPHS

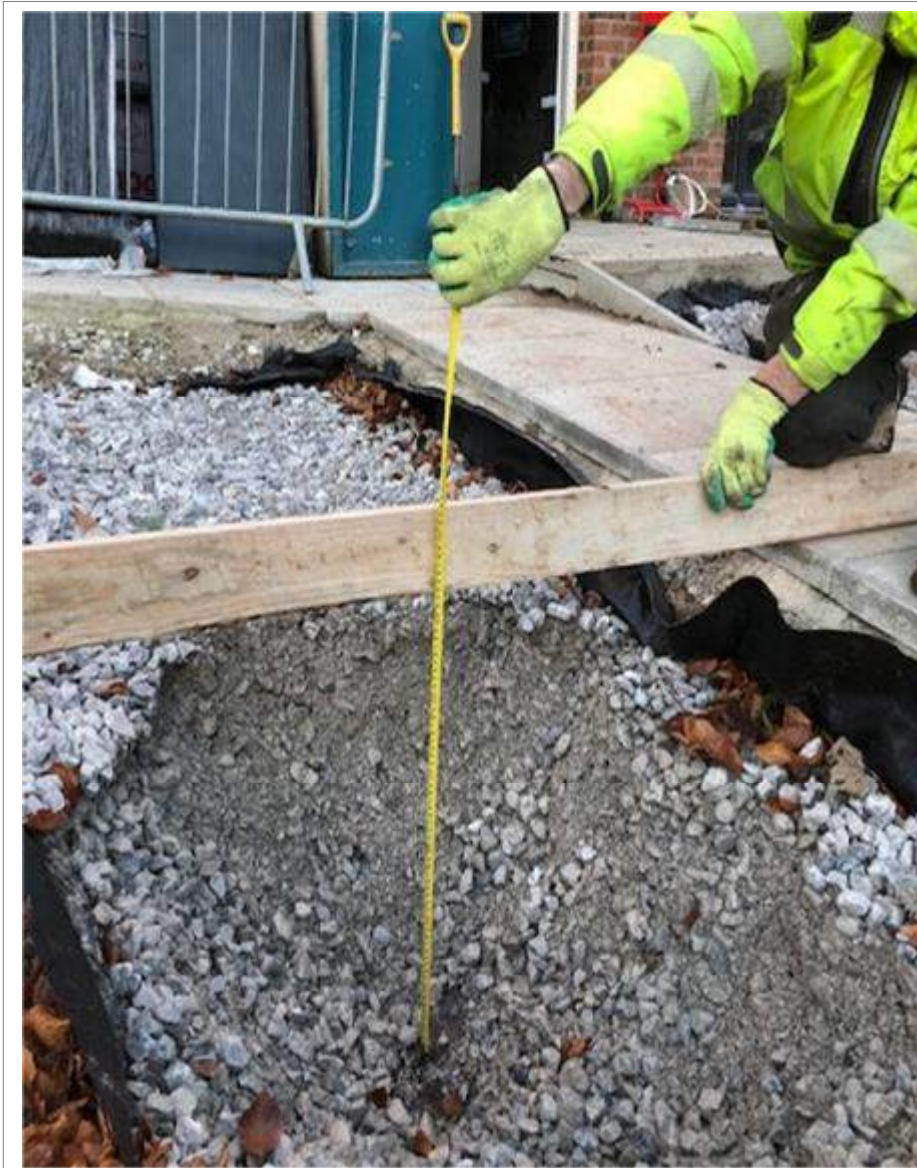


TRIAL PIT P5R



TRIAL PIT P5R

VALIDATION TRIAL PIT PHOTOGRAPHS



TRIAL PIT P6F

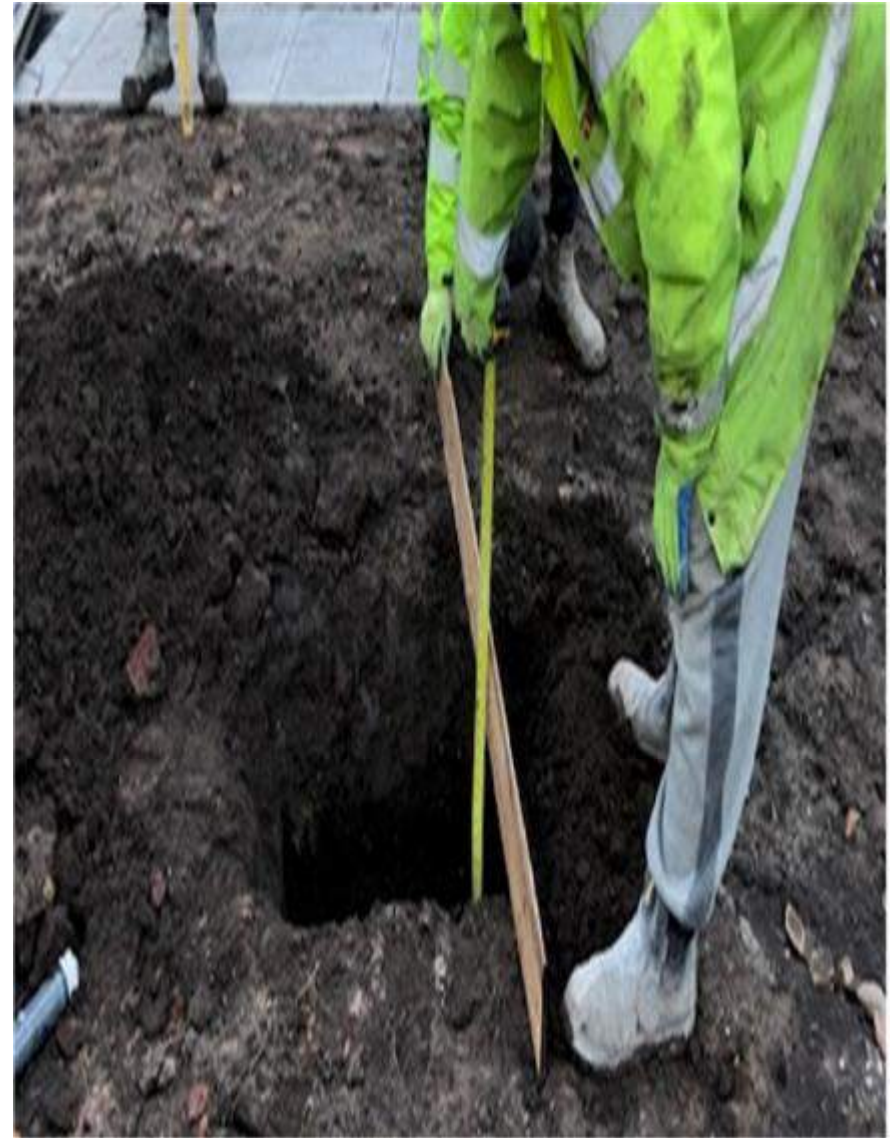


TRIAL PIT P6F

VALIDATION TRIAL PIT PHOTOGRAPHS



TRIAL PIT P7R



TRIAL PIT P7R

VALIDATION TRIAL PIT PHOTOGRAPHS

B_v



TRIAL PIT P8R



TRIAL PIT P8R

VALIDATION TRIAL PIT PHOTOGRAPHS



TRIAL PIT P8F



TRIAL PIT P8F

VALIDATION TRIAL PIT PHOTOGRAPHS



TRIAL PIT P9F



TRIAL PIT P9F

VALIDATION TRIAL PIT PHOTOGRAPHS



TRIAL PIT P10R



TRIAL PIT P10R

VALIDATION TRIAL PIT PHOTOGRAPHS

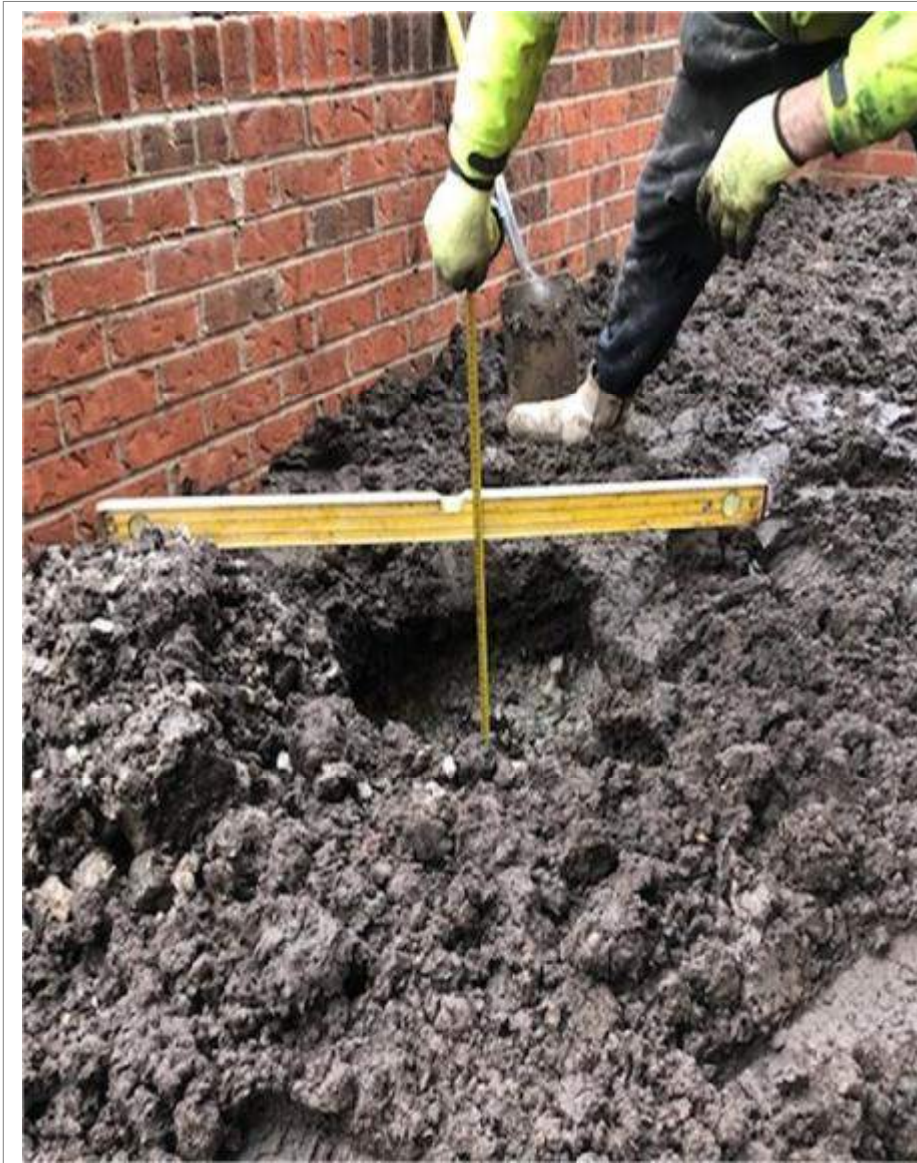


TRIAL PIT P11F



TRIAL PIT P11F

VALIDATION TRIAL PIT PHOTOGRAPHS



TRIAL PIT P11S



TRIAL PIT P11S

VALIDATION TRIAL PIT PHOTOGRAPHS



TRIAL PIT P12R



TRIAL PIT P12R

VALIDATION TRIAL PIT PHOTOGRAPHS

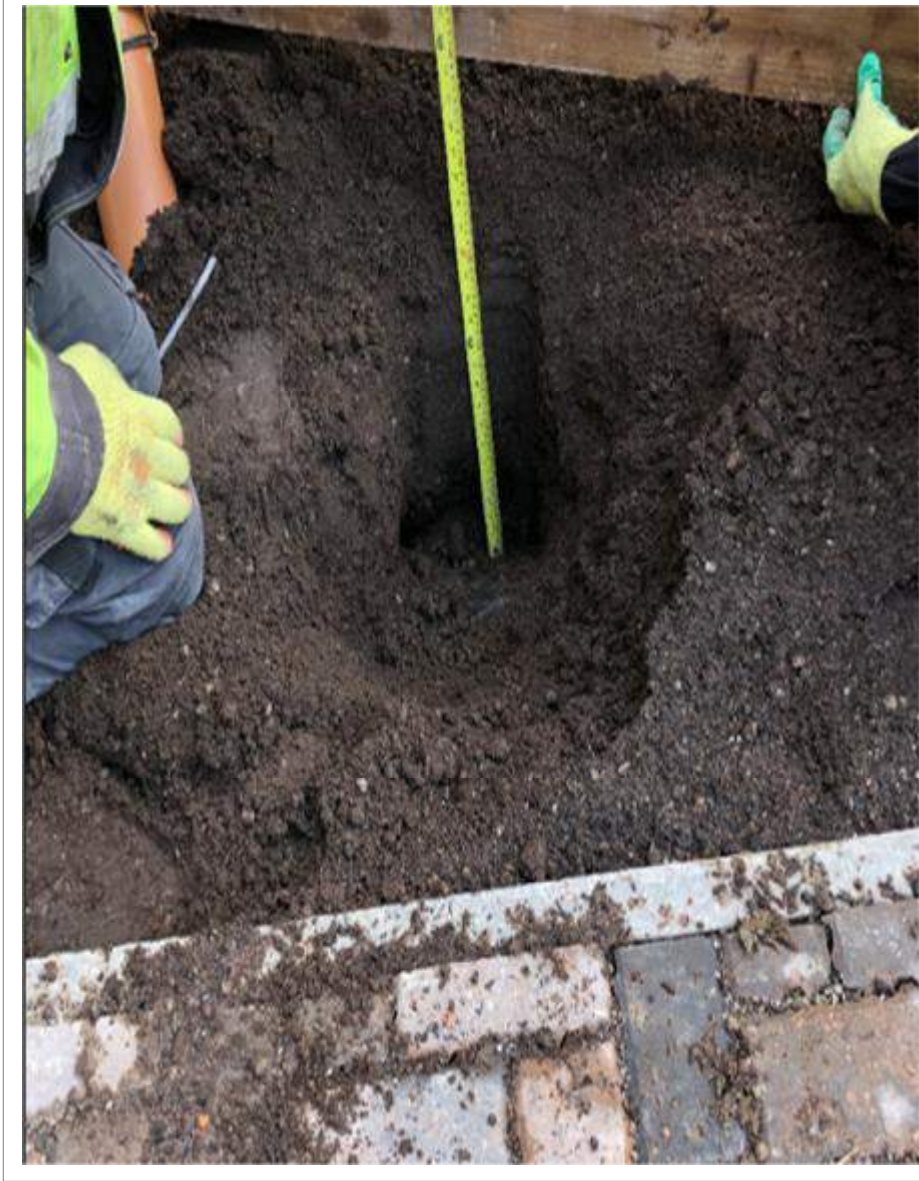


TRIAL PIT P14R



TRIAL PIT P14R

VALIDATION TRIAL PIT PHOTOGRAPHS



TRIAL PIT P14S

Soil strip site : Land off Northwich Rd, Knutsford, WA16 0AR

Search
wa16 0ar **Search**
ex: 37° 25' 19.1"N, 122° 05' 06"W
[Get Directions](#) [History](#)

Places
My Places
Sightseeing Tour
Make sure 3D Buildings layer is checked
Temporary Places

Layers
Primary Database
New Layers
Borders and Labels
Places
Photos
Roads and Transport...
3D Buildings
Weather
Gallery
More
Borders and Labels ...
Places (Outdated)
Roads (Outdated)
Terrain

Area of soil strip

Soil storage area

WA16 0AR

Google Earth

1945

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53°18'25.48" N 2°22'52.80" W elev 69 m eye alt 1.33 km

19°C Cloudy 11:48 24/08/2021

DHI Excavations Ltd 11 - 13 Church Street, Farnworth, Bolton. BL4 8AG		Serial No. DHI/ N/A					
Duty of Care -		SIC Code: 41.20/2					
A Description of the SOIL	1. How is the waste contained? ☒ Loose ☐ Skips ☐ Sacks ☐ Drums ☐ Other (Specify):						
	2. Describe the waste being transferred TOP SOIL AS PER ANALYSIS SUPPLIED Classification code: 17-05-01						
	3. Quantity kg/Tonnes /m3 Group number:						
	4. The Landfill Tax (Qualifying Material) order schedule 2011 ☐ Applicable						
B Producer Details	1. Full name (print): DHI EXCAVATIONS LTD						
	2. Company name, address and postcode: AS PART C						
	3. Which of the following are you? (Please tick one or more boxes)						
	<table border="1"> <tr> <td>A</td> <td>☐ Waste producer ☒ Soil Producer ☐ Waste collection/disposal authority ☐ Broker</td> </tr> <tr> <td>B</td> <td>☐ Holder of disposal / management licence ☐ Exempt from carrier Licence / Carrier number(s) Issued by:</td> </tr> <tr> <td>C</td> <td>☐ Exempt from licensing requirements ☐ Exempt from carrier registration Reason:</td> </tr> </table>		A	☐ Waste producer ☒ Soil Producer ☐ Waste collection/disposal authority ☐ Broker	B	☐ Holder of disposal / management licence ☐ Exempt from carrier Licence / Carrier number(s) Issued by:	C
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B	☐ Holder of disposal / management licence ☐ Exempt from carrier Licence / Carrier number(s) Issued by:						
C	☐ Exempt from licensing requirements ☐ Exempt from carrier registration Reason:						
C Carrier Details	1. Full name (print): DHI Excavations Ltd						
	2. Company name, address and postcode: 11 - 13 Church Street, Farnworth, Bolton. BL4 8AG ☒ Registered carrier (give number): CBDU181466 SIC: 43120						
We have fulfilled our obligation with regards to the waste hierarchy regulations 12 of Waste (England and Wales) Regulations 2011							
D First Transfer (producer to carrier)	1. Place of transfer: LAND OFF NORTHWICH RD, KNUTSFORD, WA16 9AR.						
	2. Date of transfer: 1/11/21 TO 5/2/22 (for multiple transfer give between dates, see notes)						
	3. Name and address of broker arranging transfer (if applicable):						
	<table border="1"> <tr> <td> 4. Producers representatives Name (print): Signed: </td> <td> Carriers representatives Name (print): SEAN KINGSTON Signed: </td> </tr> </table>		4. Producers representatives Name (print): Signed:	Carriers representatives Name (print): SEAN KINGSTON Signed:			
4. Producers representatives Name (print): Signed:	Carriers representatives Name (print): SEAN KINGSTON Signed:						
E Disposer Details ☐ Waste ☒ Soils	1. Full name (print): GNL CONSTRUCTION LTD						
	2. Company name, address and postcode: 324 STYAL RD, HEALD GREEN, CHADDLE, SK8 3ES						
	3. Which of the following are you? (Please tick one or more boxes)						
	<table border="1"> <tr> <td>☐ Holder of waste disposal / management licence (give number): Issued by: N/A</td> </tr> <tr> <td>☐ Exempt from licence requirements (give reason): N/A</td> </tr> </table>		☐ Holder of waste disposal / management licence (give number): Issued by: N/A	☐ Exempt from licence requirements (give reason): N/A			
☐ Holder of waste disposal / management licence (give number): Issued by: N/A							
☐ Exempt from licence requirements (give reason): N/A							
F Second Transfer (carrier to disposer)	1. Place of transfer: LYNN ST, CRUMPSALL, MANCHESTER, M8 5SN						
	2. Date of transfer: 1/11/21 TO 5/2/22 (for multiple consignments give between dates)						
	3. Name and address of broker arranging transfer (if applicable):						
	<table border="1"> <tr> <td> 4. Carriers representatives Name (print): SEAN KINGSTON Signed: </td> <td> Disposers representatives Name (print): GARY GOLDRICK Signed: </td> </tr> <tr> <td>Company name: DHI Excavations Ltd</td> <td>Company name: GNL CONSTRUCTION LTD</td> </tr> </table>		4. Carriers representatives Name (print): SEAN KINGSTON Signed:	Disposers representatives Name (print): GARY GOLDRICK Signed:	Company name: DHI Excavations Ltd	Company name: GNL CONSTRUCTION LTD	
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Company name: DHI Excavations Ltd	Company name: GNL CONSTRUCTION LTD						

Important: This page must be retained by you, on a register held by you, for at least two years from the date of the last transfer to which the note applies.
 White - DHI copy, Blue - Disposer copy, Yellow - Producer copy, Pink - Spare



2183

Final Report

Report No.: 21-35310-1

Initial Date of Issue: 19-Oct-2021

Client Sub Surface

Client Address: 3 Peel Street
Preston
Lancashire
PR2 2QS

Contact(s): Simon Gabbatt

Project 7033A Linn Street, Crumpsall,
Manchester

Quotation No.: **Date Received:** 12-Oct-2021

Order No.: **Date Instructed:** 12-Oct-2021

No. of Samples: 3

Turnaround (Wkdays): 7 **Results Due:** 20-Oct-2021

Date Approved: 19-Oct-2021

Approved By:



Details: Glynn Harvey, Technical Manager

Results - Soil

Project: 7033A Linn Street, Crumpsall, Manchester

Client: Sub Surface	Chemtest Job No.:				21-35310	21-35310	21-35310
Quotation No.:	Chemtest Sample ID.:				1296223	1296224	1296225
	Client Sample ID.:				186 187 188	190 191 192	194 195 196
	Sample Location:				S1	S2	S3
	Sample Type:				SOIL	SOIL	SOIL
	Date Sampled:				08-Oct-2021	08-Oct-2021	08-Oct-2021
	Asbestos Lab:				DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD			
ACM Type	U	2192		N/A	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	15	18	8.8
pH	U	2010		4.0	9.3	> 12.0	> 12.0
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.84	0.93	0.69
Cyanide (Total)	U	2300	mg/kg	0.50	1.0	1.1	1.1
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	2.6	2.7	2.1
Sulphate (Total)	U	2430	%	0.010	0.13	0.10	0.096
Arsenic	U	2450	mg/kg	1.0	6.0	3.2	4.5
Cadmium	U	2450	mg/kg	0.10	0.22	< 0.10	0.11
Chromium	U	2450	mg/kg	1.0	19	10	12
Molybdenum	U	2450	mg/kg	2.0	< 2.0	< 2.0	< 2.0
Copper	U	2450	mg/kg	0.50	29	15	18
Mercury	U	2450	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Nickel	U	2450	mg/kg	0.50	18	9.9	12
Lead	U	2450	mg/kg	0.50	32	16	19
Selenium	U	2450	mg/kg	0.20	< 0.20	< 0.20	< 0.20
Zinc	U	2450	mg/kg	0.50	84	42	49
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	6.6	6.6	5.2
TPH >C6-C10	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C10-C21	N	2670	mg/kg	1.0	7.4	< 1.0	< 1.0
TPH >C21-C40	N	2670	mg/kg	1.0	4.5	< 1.0	< 1.0
Total TPH >C6-C40	U	2670	mg/kg	10	12	< 10	< 10
Naphthalene	U	2700	mg/kg	0.10	0.23	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	0.29	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	0.22	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	0.21	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	2.7	1.3	1.0
Anthracene	U	2700	mg/kg	0.10	0.58	0.41	0.30
Fluoranthene	U	2700	mg/kg	0.10	2.3	0.28	0.64
Pyrene	U	2700	mg/kg	0.10	2.5	0.56	0.48
Benzo[a]anthracene	U	2700	mg/kg	0.10	1.3	0.24	0.65
Chrysene	U	2700	mg/kg	0.10	2.2	0.57	0.51
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	1.3	< 0.10	0.28
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	0.95	< 0.10	0.72
Benzo[a]pyrene	U	2700	mg/kg	0.10	0.94	< 0.10	0.21

Results - Soil

Project: 7033A Linn Street, Crumpsall, Manchester

Client: Sub Surface	Chemtest Job No.:				21-35310	21-35310	21-35310
Quotation No.:	Chemtest Sample ID.:				1296223	1296224	1296225
	Client Sample ID.:				186 187 188	190 191 192	194 195 196
	Sample Location:				S1	S2	S3
	Sample Type:				SOIL	SOIL	SOIL
	Date Sampled:				08-Oct-2021	08-Oct-2021	08-Oct-2021
	Asbestos Lab:				DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD			
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	0.39	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	0.39	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	1.8	< 0.10	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	18	3.4	4.8
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

Risk Parameter: Human Health - residential with plant uptake (1.0% SOM)
Data set: ALL

Project No: 1284 Client: Wiggett Construction Ltd.
Project: Linn Street, Crumpsall

All values in mg/kg unless otherwise stated							Soil Type:	SOIL	SOIL	SOIL									
							Location:	S1	S2	S3									
							Depth:												
							Lab	S	S	S									
							Result of Significance Test												
Chemicals of Potential Concern	No Samples	Min. Value	Max. Value	No. Samples >or = GAC	GAC	US ₉₅													
Asbestos		-	-		-	-													
General Suite																			
Arsenic	3	3.2	6		37		Potentially Suitable For Use	6	3.2	4.5									
Boron	3	<1	<1		290		Potentially Suitable For Use	0.84	0.93	0.69									
Cadmium	3	0.1	0.2		11		Potentially Suitable For Use	0.22	0.10	0.11									
Chromium (III)	3	10	19		910		Potentially Suitable For Use	19	10	12									
Chromium (VI)	3	0.5	0.5		6		Potentially Suitable For Use	0.5	0.5	0.5									
Copper	3	15	29		2400		Potentially Suitable For Use	29	15	18									
Lead	3	16	32		200		Potentially Suitable For Use	32	16	19									
Mercury, inorganic	3	<0	<0		40		Potentially Suitable For Use	0.100	0.100	0.100									
Mercury elemental	3	<0	<0		1.2		Potentially Suitable For Use	0.100	0.100	0.100									
Mercury Methyl	3	<0	<0		11		Potentially Suitable For Use	0.100	0.100	0.100									
Nickel	3	9.9	18		130		Potentially Suitable For Use	18	9.9	12									
Selenium	3	<0	<0		250		Potentially Suitable For Use	0.200	0.200	0.200									
Zinc	3	42	84		3700		Potentially Suitable For Use	84	42	49									
Cyanide (free)	3	1	1.1		24		Potentially Suitable For Use	1	1.1	1.1									
Phenol (total)	3	<0	<0		120		Potentially Suitable For Use	0.100	0.100	0.100									
Acenaphthene	3	0.1	0.22		210		Potentially Suitable For Use	0.22	0.1	0.1									
Acenaphthylene	3	0.1	0.29		170		Potentially Suitable For Use	0.29	0.1	0.1									
Anthracene	3	0.3	0.58		2400		Potentially Suitable For Use	0.58	0.41	0.3									
Benzo(a)anthracene	3	0.24	1.3		7.2		Potentially Suitable For Use	1.3	0.24	0.65									
Benzo(a)pyrene	3	0.1	0.94		2.2		Potentially Suitable For Use	0.94	0.1	0.72									
Benzo(b)fluoranthene	3	0.1	1.3		2.6		Potentially Suitable For Use	1.3	0.1	0.28									
Benzo(ghi)perylene	3	0.1	1.8		320		Potentially Suitable For Use	1.8	0.1	0.1									
Benzo(k)fluoranthene	3	0.1	0.95		77		Potentially Suitable For Use	0.95	0.1	0.72									
Chrysene	3	0.51	2.2		15		Potentially Suitable For Use	2.2	0.57	0.51									
Dibenz(a,h)anthracene	3	0.1	0.39	1	0.24		Further Assessment Required	0.39	0.1	0.1									
Fluoranthene	3	0.28	2.3		280		Potentially Suitable For Use	2.3	0.28	0.64									
Fluorene	3	0.1	0.21		170		Potentially Suitable For Use	0.21	0.1	0.1									
Indeno(1,2,3,cd)pyrene	3	0.1	0.39		27		Potentially Suitable For Use	0.39	0.1	0.1									
Napthalene	3	0.1	0.23		2.3		Potentially Suitable For Use	0.23	0.1	0.1									
Phenanthrene	3	1	2.7		95		Potentially Suitable For Use	2.7	1.3	1									
Pyrene	3	0.48	2.5		620		Potentially Suitable For Use	2.5	0.56	0.48									
VOCs-BTEX & MTBE																			
Benzene	3	<0	<0		0.087		Potentially Suitable For Use	0.001	0.001	0.001									
Toluene	3	<0	<0		130		Potentially Suitable For Use	0.001	0.001	0.001									
Ethylbenzene	3	<0	<0		47		Potentially Suitable For Use	0.001	0.001	0.001									
Xylene o-	3	<0	<0		60		Potentially Suitable For Use	0.001	0.001	0.001									
Xylene m-	3	<0	<0		59		Potentially Suitable For Use	0.001	0.001	0.001									
Xylene p-	3	<0	<0		56		Potentially Suitable For Use	0.001	0.001	0.001									
MTBE	3	<0	<0		49		Potentially Suitable For Use	0.001	0.001	0.001									
TPH Fractions																			
TPH ali EC05-EC06	3	<1	<1		42		Potentially Suitable For Use	1.000	1.000	1.000									
TPH ali >EC06-EC08	3	<1	<1		100		Potentially Suitable For Use	1.000	1.000	1.000									
TPH ali >EC08-EC10	3	<1	<1		27		Potentially Suitable For Use	1.000	1.000	1.000									
TPH ali >EC10-EC12	3	<1	7.4		48		Potentially Suitable For Use	7.4	1.000	1.000									
TPH ali >EC12-EC16	3	<1	7.4		24		Potentially Suitable For Use	7.4	1.000	1.000									
TPH ali >EC16-EC35	3	<2	12		65000		Potentially Suitable For Use	12	1.000	1.000									
TPH ali >EC35-EC44	3	1	1		65000		Potentially Suitable For Use	1	1	1									
TPH aro EC05-EC07	3	<1	<1		70		Potentially Suitable For Use	1.000	1.000	1.000									
TPH aro >EC07-EC08	3	<1	<1		130		Potentially Suitable For Use	1.000	1.000	1.000									
TPH aro >EC08-EC10	3	<1	<1		34		Potentially Suitable For Use	1.000	1.000	1.000									
TPH aro >EC10-EC12	3	<1	7.4		74		Potentially Suitable For Use	7.4	1.000	1.000									
TPH aro >EC12-EC16	3	<1	7.4		140		Potentially Suitable For Use	7.4	1.000	1.000									
TPH aro >EC16-EC21	3	<2	<7		260		Potentially Suitable For Use	7.400	1.000	1.000									
TPH aro >EC21-EC35	3	1	4.5		1100		Potentially Suitable For Use	4.5	1	1									
TPH aro >EC35-EC44	3	1	4.5		1100		Potentially Suitable For Use	4.5	1	1									
TPH >EC44-EC70					1600														
Dioxins, furans & dioxin-like-PCBs																			
Total Dioxins, furans & DL-PCB (aerial dep)					0.0085														
Non-dioxin-like PCBs																			
PCB-28					0.2														
PCB-52					0.2														
PCB-101					0.34														
PCB-138					0.36														
PCB-153					0.36														
PCB-180					0.37														

Legend: MG denotes Made Ground, NAT denotes Natural Ground

Risk Parameter: Human Health - residential with plant uptake (2.5% SOM);
Data set: ALL

Project No: 1284 Client: Wiggett Construction Ltd.
Project: Linn Street, Crumpsall

All values in mg/kg unless otherwise stated							Soil Type:	SOIL	SOIL	SOIL									
							Location:	S1	S2	S3									
							Depth:												
							Lab	S	S	S									
Chemicals of Potential Concern	No Samples	Min. Value	Max. Value	No. Samples >or = GAC	GAC	US ₉₅	Result of Significance Test												
Asbestos		-	-		-	-													
General Suite																			
Arsenic	3	3.2	6		37		Potentially Suitable For Use	6	3.2	4.5									
Boron	3	<1	<1		290		Potentially Suitable For Use	<1	<1	<1									
Cadmium	3	<0	<0		11		Potentially Suitable For Use	<0	<0	<0									
Chromium (III)	3	10	19		910		Potentially Suitable For Use	19	10	12									
Chromium (VI)	3	<1	<1		6		Potentially Suitable For Use	<1	<1	<1									
Copper	3	15	29		2400		Potentially Suitable For Use	29	15	18									
Lead	3	16	32		200		Potentially Suitable For Use	32	16	19									
Mercury, inorganic	3	<0	<0		40		Potentially Suitable For Use	<0.100	<0.100	<0.100									
Mercury elemental	3	<0	<0		1.2		Potentially Suitable For Use	<0.100	<0.100	<0.100									
Mercury Methyl	3	<0	<0		11		Potentially Suitable For Use	<0.100	<0.100	<0.100									
Nickel	3	9.9	18		130		Potentially Suitable For Use	18	9.9	12									
Selenium	3	<0	<0		250		Potentially Suitable For Use	<0	<0	<0.2									
Zinc	3	42	84		3700		Potentially Suitable For Use	84	42	49									
Cyanide (free)	3	1	1.1		24		Potentially Suitable For Use	1	1.1	1.1									
Phenol (total)	3	<0	<0		200		Potentially Suitable For Use	<0	<0.1	<0.1									
Acenaphthene	3	0.1	0.22		480		Potentially Suitable For Use	0.22	0.1	0.1									
Acenaphthylene	3	0.1	0.29		420		Potentially Suitable For Use	0.29	0.1	0.1									
Anthracene	3	0.3	0.58		5400		Potentially Suitable For Use	0.58	0.41	0.3									
Benzo(a)anthracene	3	0.24	1.3		11		Potentially Suitable For Use	1.3	0.24	0.65									
Benzo(a)pyrene	3	0.1	0.94		2.7		Potentially Suitable For Use	0.94	0.1	0.72									
Benzo(b)fluoranthene	3	0.1	1.3		3.3		Potentially Suitable For Use	1.3	0.1	0.28									
Benzo(ghi)perylene	3	0.1	1.8		340		Potentially Suitable For Use	1.8	0.1	0.1									
Benzo(k)fluoranthene	3	0.1	0.95		93		Potentially Suitable For Use	0.95	0.1	0.72									
Chrysene	3	0.51	2.2		22		Potentially Suitable For Use	2.2	0.57	0.51									
Dibenz(a,h)anthracene	3	0.1	0.39	1	0.28		Further Assessment Required	0.39	0.1	0.1									
Fluoranthene	3	0.28	2.3		560		Potentially Suitable For Use	2.3	0.28	0.64									
Fluorene	3	0.1	0.21		400		Potentially Suitable For Use	0.21	0.1	0.1									
Indeno(1,2,3,cd)pyrene	3	0.1	0.39		36		Potentially Suitable For Use	0.39	0.1	0.1									
Napthalene	3	0.1	0.23		5.6		Potentially Suitable For Use	0.23	0.1	0.1									
Phenanthrene	3	1	2.7		220		Potentially Suitable For Use	2.7	1.3	1									
Pyrene	3	0.48	2.5		1200		Potentially Suitable For Use	2.5	0.56	0.48									
VOCs-BTEX & MTBE																			
Benzene	3	<0	<0		0.17		Potentially Suitable For Use	<0.0	<0.0	<0.0									
Toluene	3	<0	<0		290		Potentially Suitable For Use	<0.0	<0.0	<0.0									
Ethylbenzene	3	<0	<0		110		Potentially Suitable For Use	<0.0	<0.0	<0.0									
Xylene o-	3	<0	<0		140		Potentially Suitable For Use	<0.0	<0.0	<0.0									
Xylene m-	3	<0	<0		140		Potentially Suitable For Use	<0.0	<0.0	<0.0									
Xylene p-	3	<0	<0		130		Potentially Suitable For Use	<0.00	<0.00	<0.0									
MTBE	3	<0	<0		84		Potentially Suitable For Use	<0.00	<0.0	<0.0									
TPH Fractions																			
TPH ali EC05-EC06	3	<1.0	<1.0		78		Potentially Suitable For Use	<1.0	<1.0	<1.0									
TPH ali >EC06-EC08	3	<1.0	<1.0		230		Potentially Suitable For Use	<1.0	<1.0	<1.0									
TPH ali >EC08-EC10	3	<1.0	<1.0		65		Potentially Suitable For Use	<1.0	<1.0	<1.0									
TPH ali >EC10-EC12	3	<1.0	7.4		118		Potentially Suitable For Use	7.4	<1.0	<1.0									
TPH ali >EC12-EC16	3	<1.0	7.4		59		Potentially Suitable For Use	7.4	<1.0	<1.0									
TPH ali >EC16-EC35	3	<2.0	12		92000		Potentially Suitable For Use	12	<1.0	<1.0									
TPH ali >EC35-EC44	3	1	1		92000		Potentially Suitable For Use	1	1	1									
TPH aro EC05-EC07	3	<1.0	<1.0		140		Potentially Suitable For Use	<1.0	<1.0	<1.0									
TPH aro >EC07-EC08	3	<1.0	<1.0		290		Potentially Suitable For Use	<1.0	<1.0	<1.0									
TPH aro >EC08-EC10	3	<1.0	<1.0		83		Potentially Suitable For Use	<1.0	<1.0	<1.0									
TPH aro >EC10-EC12	3	<1.0	7.4		180		Potentially Suitable For Use	7.4	<1.0	<1.0									
TPH aro >EC12-EC16	3	<1.0	7.4		330		Potentially Suitable For Use	7.4	<1.0	<1.0									
TPH aro >EC16-EC21	3	<2.0	<7.4		540		Potentially Suitable For Use	<7.4	<1.0	<1.0									
TPH aro >EC21-EC35	3	1	4.5		1500		Potentially Suitable For Use	4.5	1	1									
TPH aro >EC35-EC44	3	1	4.5		1500		Potentially Suitable For Use	4.5	1	1									
TPH >EC44-EC70					1800														
Dioxins, furans & dioxin-like-PCBs																			
Total Dioxins, furans & DL-PCB (aerial dep)					0.0087														
Non-dioxin-like PCBs																			
PCB-28					0.27														
PCB-52					0.28														
PCB-101					0.37														
PCB-138					0.37														
PCB-153					0.38														
PCB-180					0.38														

Legend: MG denotes Made Ground, NAT denotes Natural Ground

Risk Parameter: Human Health - residential with plant uptake (6.0% SOM);
Data set: ALL

Project No: 1284 Client: Wiggett Construction Ltd.
Project: Linn Street, Crumpsall

All values in mg/kg unless otherwise stated							Soil Type:	SOIL	SOIL	SOIL									
							Location:	S1	S2	S3									
							Depth:												
							Lab	S	S	S									
Chemicals of Potential Concern	No Samples	Min. Value	Max. Value	No. Samples >or = GAC	GAC	US ₉₅	Result of Significance Test												
Asbestos		-	-		-	-													
General Suite																			
Arsenic	3	3.2	6		37		Potentially Suitable For Use	6	3.2	4.5									
Boron	3	<1	<1		290		Potentially Suitable For Use	<1	<1	<1									
Cadmium	3	<0	<0		11		Potentially Suitable For Use	<0	<0	<0									
Chromium (III)	3	10	19		910		Potentially Suitable For Use	19	10	12									
Chromium (VI)	3	<1	<1		6		Potentially Suitable For Use	<1	<1	<1									
Copper	3	15	29		2400		Potentially Suitable For Use	29	15	18									
Lead	3	16	32		200		Potentially Suitable For Use	32	16	19									
Mercury, inorganic	3	<0	<0		40		Potentially Suitable For Use	<0.100	<0.100	<0.100									
Mercury elemental	3	<0	<0		1.2		Potentially Suitable For Use	<0.100	<0.100	<0.100									
Mercury Methyl	3	<0	<0		11		Potentially Suitable For Use	<0.100	<0.100	<0.100									
Nickel	3	9.9	18		130		Potentially Suitable For Use	18	9.9	12									
Selenium	3	<0	<0		250		Potentially Suitable For Use	<0	<0.2	<0.2									
Zinc	3	42	84		3700		Potentially Suitable For Use	84	42	49									
Cyanide (free)	3	1	1.1		24		Potentially Suitable For Use	1	1.1	1.1									
Phenol (total)	3	<0	<0		380		Potentially Suitable For Use	<0	<0.1	<0									
Acenaphthene	3	0.1	0.22		1000		Potentially Suitable For Use	0.22	0.1	0.1									
Acenaphthylene	3	0.1	0.29		920		Potentially Suitable For Use	0.29	0.1	0.1									
Anthracene	3	0.3	0.58		11000		Potentially Suitable For Use	0.58	0.41	0.3									
Benzo(a)anthracene	3	0.24	1.3		13		Potentially Suitable For Use	1.3	0.24	0.65									
Benzo(a)pyrene	3	0.1	0.94		3		Potentially Suitable For Use	0.94	0.1	0.72									
Benzo(b)fluoranthene	3	0.1	1.3		3.7		Potentially Suitable For Use	1.3	0.1	0.28									
Benzo(ghi)perylene	3	0.1	1.8		350		Potentially Suitable For Use	1.8	0.1	0.1									
Benzo(k)fluoranthene	3	0.1	0.95		100		Potentially Suitable For Use	0.95	0.1	0.72									
Chrysene	3	0.51	2.2		27		Potentially Suitable For Use	2.2	0.57	0.51									
Dibenz(a,h)anthracene	3	0.1	0.39	1	0.3		Further Assessment Required	0.39	0.1	0.1									
Fluoranthene	3	0.28	2.3		890		Potentially Suitable For Use	2.3	0.28	0.64									
Fluorene	3	0.1	0.21		860		Potentially Suitable For Use	0.21	0.1	0.1									
Indeno(1,2,3,cd)pyrene	3	0.1	0.39		41		Potentially Suitable For Use	0.39	0.1	0.1									
Napthalene	3	0.1	0.23		13		Potentially Suitable For Use	0.23	0.1	0.1									
Phenanthrene	3	1	2.7		440		Potentially Suitable For Use	2.7	1.3	1									
Pyrene	3	0.48	2.5		2000		Potentially Suitable For Use	2.5	0.56	0.48									
VOCs-BTEX & MTBE																			
Benzene	3	<0	<0		0.37		Potentially Suitable For Use	<0.0	<0.0	<0.0									
Toluene	3	<0	<0		660		Potentially Suitable For Use	<0.0	<0.0	<0.0									
Ethylbenzene	3	<0	<0		260		Potentially Suitable For Use	<0.0	<0.0	<0.0									
Xylene o-	3	<0	<0		330		Potentially Suitable For Use	<0.0	<0.0	<0.0									
Xylene m-	3	<0	<0		320		Potentially Suitable For Use	<0.0	<0.0	<0.0									
Xylene p-	3	<0	<0		310		Potentially Suitable For Use	<0.00	<0.00	<0.0									
MTBE	3	<0	<0		160		Potentially Suitable For Use	<0.00	<0.0	<0.0									
TPH Fractions																			
TPH ali EC05-EC06	3	<1.0	<1.0		160		Potentially Suitable For Use	<1.0	<1.0	<1.0									
TPH ali >EC06-EC08	3	<1.0	<1.0		530		Potentially Suitable For Use	<1.0	<1.0	<1.0									
TPH ali >EC08-EC10	3	<1.0	<1.0		150		Potentially Suitable For Use	<1.0	<1.0	<1.0									
TPH ali >EC10-EC12	3	<1.0	7.4		283		Potentially Suitable For Use	7.4	<1.0	<1.0									
TPH ali >EC12-EC16	3	<1.0	7.4		142		Potentially Suitable For Use	7.4	<1.0	<1.0									
TPH ali >EC16-EC35	3	<2.0	12		110000		Potentially Suitable For Use	12	<1.0	<1.0									
TPH ali >EC35-EC44	3	1	1		110000		Potentially Suitable For Use	1	1	1									
TPH aro EC05-EC07	3	<1.0	<1.0		300		Potentially Suitable For Use	<1.0	<1.0	<1.0									
TPH aro >EC07-EC08	3	<1.0	<1.0		660		Potentially Suitable For Use	<1.0	<1.0	<1.0									
TPH aro >EC08-EC10	3	<1.0	<1.0		190		Potentially Suitable For Use	<1.0	<1.0	<1.0									
TPH aro >EC10-EC12	3	<1.0	7.4		380		Potentially Suitable For Use	7.4	<1.0	<1.0									
TPH aro >EC12-EC16	3	<1.0	7.4		660		Potentially Suitable For Use	7.4	<1.0	<1.0									
TPH aro >EC16-EC21	3	<2.0	<7.4		930		Potentially Suitable For Use	<7.4	<1.0	<1.0									
TPH aro >EC21-EC35	3	1	4.5		1700		Potentially Suitable For Use	4.5	1	1									
TPH aro >EC35-EC44	3	1	4.5		1700		Potentially Suitable For Use	4.5	1	1									
TPH >EC44-EC70					1900														
Dioxins, furans & dioxin-like-PCBs																			
Total Dioxins, furans & DL-PCB (aerial dep)					0.0087														
Non-dioxin-like PCBs																			
PCB-28					0.32														
PCB-52					0.34														
PCB-101					0.38														
PCB-138					0.38														
PCB-153					0.38														
PCB-180					0.39														

Legend: MG denotes Made Ground, NAT denotes Natural Ground

Risk Parameter: Residential SOM 1% Inhalation Pathway only for Volatile PAH's and
Data set: ALL

Project No: 1284 Client: Wiggett Construction Ltd.
Project: Linn Street, Crumpsall

All values in mg/kg unless otherwise stated								Soil Type:	SOIL	SOIL	SOIL								
								Location:	S1	S2	S3								
								Depth:											
								Lab	S	S	S								
Chemicals of Potential Concern	No Samples	Min. Value	Max. Value	No. Samples >or = GAC	GAC	Cheby chev US ₉₅	US ₉₅	Result of Significance Test											
General Suite																			
Napthalene	3	0.1	0.23		16			Potentially Suitable For Use	0.23	0.1	0.1								
VOCs-BTEX & MTBE																			
Benzene	3	<0.00	<0.00		0.27			Potentially Suitable For Use	<0.00	<0.00	<0.00								
TPH Fractions																			
TPH ali EC05-EC06	3	<1.0	<1.0		30			Potentially Suitable For Use	<1.0	<1.0	<1.0								
TPH ali >EC06-EC08	3	<1.0	<1.0		73			Potentially Suitable For Use	<1.0	<1.0	<1.0								
TPH ali >EC08-EC10	3	<1.0	<1.0		19			Potentially Suitable For Use	<1.0	<1.0	<1.0								
TPH ali >EC10-EC12	3	<1	7.4		93			Potentially Suitable For Use	7.4	<1	<1								
TPH ali >EC12-EC16	3	<1	7.4		782			Potentially Suitable For Use	7.4	<1	<1								
TPH aro EC05-EC07	3	<1.0	<1.0		266			Potentially Suitable For Use	<1.0	<1.0	<1.0								
TPH aro >EC07-EC08	3	<1.0	<1.0		626			Potentially Suitable For Use	<1.0	<1.0	<1.0								
TPH aro >EC08-EC10	3	<1.0	<1.0		33			Potentially Suitable For Use	<1.0	<1.0	<1.0								
TPH aro >EC10-EC12	3	<1	7.4		182			Potentially Suitable For Use	7.4	<1	<1								
TPH aro >EC12-EC16	3	<1	7.4		2000			Potentially Suitable For Use	7.4	<1	<1								

Legend: MG denotes Made Ground, NAT denotes Natural Ground

Supplementary guidance for the selection of water pipes in land potentially affected by contamination



Introduction

In January 2011, UK Water Industry Research (UKWIR) published "Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites" (Ref 10/WM/03/21; the 'UKWIR Guidance'). Its aim is to ensure that the correct materials are selected for water pipes and components to be used below ground in brownfield sites to protect the quality of drinking water whilst taking into account the service life of the water distribution system. It supersedes the Water Regulations Advisory Scheme (WRAS) Information and Guidance Note 9-04-03 "Laying Pipes in Contaminated Land" which has been withdrawn.

The UKWIR Guidance is for use by developers, self-lay organisations, water companies and consultants when planning, designing and constructing water mains and/or services in brownfield sites. It defines brownfield sites as "land or premises that have previously been used or developed. They may also be vacant or derelict. However, they are not necessarily contaminated." The UKWIR Guidance states that it does not apply to greenfield sites; however, we consider this supplementary guidance and the relevant sections of the UKWIR guidance as being equally suitable for application to those greenfield sites considered to be potentially affected by contamination. Where greenfield sites are not affected by contamination a preliminary risk assessment (see below) will suffice.

The UKWIR Guidance also states that there should be no departure from its provisions "*except where formally approved by the Water Company, such departure being technically justifiable or representing advances in knowledge or product development*".

We have adopted the UKWIR Guidance in principle and produced this company specific supplementary guidance (the 'UUW Guidance') which includes the Risk Assessment for Water Pipes (the 'RA').

This guidance does not cover operative safety, health exposure modelling or accidental pipe damage.

Risk Assessment for Water Pipes in Land Potentially Affected by Contamination

Any application for new water supplies to a development (construction of new properties, or renovation or conversion of existing buildings) in land potentially affected by contamination shall include a completed RA.

As a minimum a desk study (preliminary risk assessment) shall be provided with the RA in accordance with the framework in Environment Agency publication "Model Procedures for the Management of Land Contamination" (ref: CLR11) that sets out whether the land through which the pipes are to be laid may be affected by contamination. The application of the source, pathway, receptor concept will be an integral part of any pipeline risk assessment. For each potential source (the contamination) and each potential receptor (the water pipe), consideration shall be given to whether a potential pathway between source and receptor exists, or may exist in the future, linking the two. There are normally only three pathways by which contamination may come into contact with water pipes. These are direct contact with the soil or backfill, an excessive vapour phase or a contaminated groundwater regime. If none of these conditions exist on site (adopting the source, pathway, receptor concept) then it is likely that extended and/or targeted soil testing will not be required and a simple risk assessment will suffice. For those sites where land may be affected by contamination appropriate testing shall be undertaken on the materials within which the pipes are to be laid, whether that be existing ground materials, remediated materials or imported capping materials. The testing requirements are as described in the following section.

The signatories of the Water Supply Application Form and the RA must ensure that all assessments of land condition have been carried out in accordance with applicable current standards and guidelines by or under the direction of a suitably qualified competent person.

We require the competent person to be a) a chartered member of an appropriate professional body (such as the Institution of Civil Engineers, the Geological Society of London or the Royal Institution of Chartered Surveyors) with relevant experience of investigating contaminated sites or b) a Specialist in Land Condition (SiLC) with appropriate geo-environmental experience.

Testing Requirements

The soil, rock and if appropriate groundwater tests that are required on all sites where the potential for organic contamination has been identified in the desk study and where water pipes are proposed to be laid must be accredited by United Kingdom Accreditation Service (UKAS) as a minimum and where commercially available the Environment Agency's Monitoring Certification Service (MCERTS). These accredited tests should be undertaken for:

Banded hydrocarbons EC5-EC10, EC10-EC16, EC16-EC40 (Total aliphatic and aromatic hydrocarbons for each banding may be summed). Aliphatic/aromatic fractionation and subsequent banding may be required should a more detailed site specific risk assessment be undertaken. The bandings have been amended to take into account readily available laboratory tests. The equivalent carbon number (EC) is used to assess petroleum hydrocarbon mixtures rather than the actual number of carbon atoms in the molecule in line with guidance issued by the Environment Agency (2005).

Volatile organic compounds (VOCs) (method by head space or purge & trap GCMS) with tentative identification of compounds greater than 20µg/kg. The method used should be capable of detecting a wide range of compounds listed in US EPA Method 8260C or similar. The method should include analysis of naphthalene.

BTEX (Benzene, toluene, ethyl benzene and xylenes) plus MTBE (Methyl-tertiary butyl ether) (by head space GCMS)

Semi-Volatile Organic Compounds (SVOCs) (method by GCMS) with tentative identification of compounds greater than 20µg/kg. The method used should be capable of detecting the compounds listed in US EPA Method 8270D or similar. The total concentration of SVOCs excludes polycyclic aromatic hydrocarbons, ethers, nitrobenzene, ketones, aldehydes, phenols, cresols and chlorinated phenols. Phenols, cresols and chlorinated phenols which are detected by the SVOC analysis are given their own assessment criteria.

We do not consider Table G1 and Table 3.1 of the UKWIR Guidance to be a definitive guide for assessing total concentrations. Table 1 in the RA below replaces Table 3.1 of the UKWIR Guidance.

Where previous site uses include the use, storage, treatment, disposal or manufacture of any of the following, appropriate testing for these substances will be required:

Ethers, nitrobenzene, ketones, aldehydes and amines. Note that the presence of amines on any site at the proposed pipe depth +/- 1.0m precludes the use of polyethylene. The methods of analysis and method of calculation of total concentrations of these compounds will need to be agreed with UUW.

To comply with the testing requirements, the suites of tests that are required on all brownfield sites where wrapped steel, wrapped ductile iron or copper pipes are to be laid as minimum must include:

pH, Conductivity and redox potential

Sufficiency of Testing

Water pipes are normally laid at between 0.75 and 1.35m from finished ground level to crown of pipe. Samples taken and tested must represent both a) the soil in which the water pipes are to be laid and b) the soil down to at least 500mm below the underside of the proposed pipe. Where the proposed depth of the pipes is unknown at the time of application, soil samples representative of the ground condition between surface level and 1.5m below finished ground level shall be taken as a minimum. Where appropriate (see UKWIR Guidance) groundwater sampling and groundwater monitoring will also be

necessary. Photo-ionisation detection (PID) monitoring along the proposed route of the pipeline may be employed, though this does not provide a definitive guide to the suitability of water pipe materials.

Where required a sufficient number of test results should be obtained from the material in which the pipes are to be laid. CLAIRE/CIEH 2008 "Guidance on comparing soil contamination data with a critical concentration" may be used, where appropriate, to justify the number of soil samples tested; however, this statistical model should not be used on heterogeneous materials or used to average test results from different types of materials.

Further guidance on representative sampling is contained within BS10175:2011 Code of Practice for the Investigation of Potentially Contaminated Sites, the Department of the Environment's Contaminated Land Research Report "Sampling strategies for contaminated land" prepared by The Centre for Research into the Built Environment, Nottingham Trent University (Ref: CLR 4; 1994) and the Environment Agency's "Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination" (ref: R&D Technical Report P5-066/TR; 2000).

Where remediation has been carried out on the site, the test results obtained from validation samples will be used in the assessment. Where a horizontal capping system has been or will be employed using materials spread across a site, sufficient samples will need to be taken to characterise the capping material used and the results presented to UUW. However, the sufficiency of sampling on the horizontal capping system, in which the pipeline will be placed, may be assessed on the basis of the source, quantity and type of materials used.

Detection Limits

Only positive concentrations, ie those above the limit of detection should be used in summation of VOC and SVOC (or other test groups of compounds ie phenols, cresols and chlorinated phenols). Laboratory methods shall provide a minimum limit of detection of 10µg/kg for each individual VOC or SVOC (or other test groups of compounds) quantitatively detected in accordance with the methods described above. For tentatively identified compounds (TICs), only those compounds with a concentration of 20µg/kg or greater shall be used in the summation of VOC and SVOC (or other test groups of compounds).

Protective Measures

Where polyethylene, ductile iron, steel or copper pipes are to be laid on a brownfield site or other land potentially affected by contamination (whether or not it has been remediated) and where the concentrations exceed the generic guideline values set out in Table 1 of the RA, the developer shall provide either:

- a) a robust risk assessment to show how any contaminants will not significantly impact on proposed water supplies or buried assets over the lifetime of the assets; or
- b) more suitable pipe materials; or
- c) an engineering solution to protect the pipe work backed up by an adequate assessment of the risk.

Liquid free phase product (e.g. oil or free solvent layers) shall not remain in the ground or groundwater in the vicinity of water pipes, whether barrier pipe or any other pipe materials are used.

When designing pipe routes on land potentially affected by contamination, new preferential contamination pathways along the route of new water pipes shall not be created. Particular measures may be required to prevent the possible migration of contamination through pipe bedding and into controlled waters.

References

BS10175:2011 "Investigation of Potentially Contaminated Sites Code of Practice"

CLAIRE/CIEH "Guidance on comparing soil contamination data with a critical concentration" 2008

Department of the Environment Contaminated Land Research Report "Sampling strategies for contaminated land" prepared by The Centre for Research into the Built Environment, Nottingham Trent University (Ref: CLR 4) 1994

Environment Agency "Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination" (ref: R&D Technical Report P5-066/TR) 2000

Environment Agency "Model Procedures for the Management of Land Contamination" (ref: CLR11), 2004

Environment Agency P5-080/TR3 "The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils", 2005

UK Water Industry Research (UKWIR) "Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites" (Ref 10/WM/03/21)" January 2011

Water Regulations Advisory Scheme (WRAS) Information and Guidance Note 9-04-03 "Laying Pipes in Contaminated Land" 2002



About us

United Utilities is the North West's water company. We keep the taps flowing and toilets flushing for seven million customers every day. From Crewe to Carlisle, we work hard behind the scenes to help your life flow smoothly.

United Utilities Water PLC, Haweswater House, Lingley Mere Business Park, Lingley Green Avenue, Warrington WA5 3LP.
Registered in England and Wales. Registered Number 2366678.

Risk Assessment for Water Pipes (RA)



The risk assessment for water pipes will help you choose appropriate materials for your development. We are happy to deal with a risk assessment for water pipes in advance of any formal application for a new water supply.

If you need any help completing the form please call us on 0845 026 4296.

When completing this form electronically, the larger text boxes will expand in height if required.

Section 1: Development Details

Development Name <i>(if it has one)</i>	
Development Address	Land off Linn Street, Crumpsall, Manchester, M8 5SN
OS Grid Reference <i>(mid point)</i>	384379E, 402251N
Developers Name	
UUW reference number <i>(for UU use only)</i>	

Please provide details below of the current and historical use of the site and adjacent sites.

If your supporting information has details of the current and historical site use, please reference below the relevant sections of your report.

Former Crumpsall Constitutional Club is located in the east, remainder of site non-operational bowling green

See Section 2.2 of report referenced 105270p2r2, dated September 2018, undertaken by REC Ltd.

Section 2: Preliminary Risk Assessment

Has your desk study and site walkover identified any land potentially affected by contamination?	☒ Yes ☐ No
--	---

If the site is potentially affected by contamination but you have not completed any intrusive site investigation please provide details below of the rationale behind the intended pipe selection.

If your supporting information has details of the rationale behind the intended pipe selection, please reference below the relevant sections of your report.

N/A

Section 3: Intrusive Site Investigation	
Have you completed any intrusive site investigation?	☒ Yes ☐ No
Date(s) when the site investigation(s) undertaken	15 th June 2018
At what level has groundwater been encountered?	1.4-2.3 metres below ground level or ☐ Not encountered
Table 1 (Pipeline Selection Risk Assessment Summary (PSRAS)) below classifies testing required where the preliminary risk assessment has identified land potentially affected by contamination. Please provide details below of any test groups which have not been tested and the rationale for not testing. <i>If your supporting information has details of the rationale behind not testing any particular test groups, please reference below the relevant sections of your report.</i>	
BTEX, MTBE, SVOCs, Phenols, cresols, chlorinated phenols, ethers, nitrobenzene, ketones, aldehydes, amines. No source of these contaminants identified. No visual or olfactory evidence of contaminants identified during the site works therefore no testing undertaken.	
If the intrusive site investigation has identified concentrations above the PE threshold (see PSRAS) and your intended pipe selection is PE please provide details below of the rationale behind the intended pipe selection. <i>If your supporting information has details of the rationale behind the intended pipe selection, please reference below the relevant sections of your report.</i>	
N/A	

Section 4: Site Remediation	
Please provide details below of any site remediation (which may include a change in site levels) already completed. <i>If your supporting information has details of the site remediation already completed, please reference below the relevant sections of your report.</i>	
N/A	
Has the PSRAS (Table 1) been completed using appropriate data after remediation?	☐ Yes ☒ No ☐ N/A
Please provide details below of any proposed site remediation and an analysis of whether this will affect your intended pipe selection. <i>If your supporting information has details of any proposed site remediation and whether this will affect your intended pipe selection, please reference below the relevant sections of your report.</i>	
An environmental cover system is proposed for soft landscaped areas. This will not affect the intended pipe selection.	

Section 5: Final Use of Site

Please provide details below of any chemicals (including fuel) to be stored on site and any other future contamination risks which may affect your intended pipe selection.

If your supporting information has details of potential contamination risks which may affect your intended pipe selection, please reference below the relevant sections of your report.

Residential development therefore chemical storage not anticipated.

What water pipe materials are intended to be used on site?

☒ PE ☐ PE Barrier Pipe Type A ☐ PE Barrier Pipe Type B
Other (please specify):

Section 6: Additional Information

Please use the section below to provide any additional details to support your intended pipe selection.

If your supporting information has additional information to support your intended pipe selection, please reference below the relevant sections of your report.

No elevated levels of contaminants at proposed pipe line depths.

Section 7: Risk Assessor

Name and relevant qualifications of person directing the risk assessment for water pipes	Dr PaulQuimby (CSci)
Name and address of risk assessor's company	LK Group, Unit 29 Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS
Date risk assessment performed	08.10.2020

Section 8: Declaration

I confirm I have completed this form and provided supporting information in accordance with 'UKWIR Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites' and UUW's Supplementary Guidance. I also confirm that if any further site investigation is needed and carried out, I will be required to submit an additional Risk Assessment for Water Pipes with the relevant supporting information. I understand that failure to supply any of the required information may delay my application being processed.

Name	Dr Paul Quimby	Company	LK Group
Phone Number	0161 763 7200	Date	08.10.2020

Please e-mail the completed form and supporting information to water.connections@uuplc.co.uk. Alternatively you can fax a paper version to 01925 678926 or post to us at United Utilities Water, Metering and Connections, Ullswater House, Lingley Mere, Warrington, WA5 3LP.



About us

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Table 1 - Pipe Selection Risk Assessment Summary (PSRAS)

- 1) Testing must be undertaken on the materials within which the pipes are to be laid, whether that be existing ground materials, remediated materials or imported capping materials. Please use the appropriate testing data to complete Table 1 below.
- 2) If more than one pipe selection is being made, for example, for pipes in different areas of a large site, a completed PSRAS is required for each selection.

What materials have been tested to populate Table 1 below?

☒ Existing ground materials ☐ Remediated materials ☐ Imported capping materials

All concentrations in mg/kg								
Test Group	Testing Required?	PE threshold	Metal Pipes/ Barrier Pipe	Laboratory Detection Limit	Testing UKAS accredited Y/N	Maximum concentration at proposed pipeline depth See Note [2]	Maximum site concentration See Note [3]	Locations and depths where concentrations exceed proposed pipeline threshold
Total VOCs	Where Preliminary Risk Assessment (PRA) has identified land potentially affected by contamination	0.5	Pass	0.1	Y	<0.1 WS102 1.0-1.2m	1.3 WS105 0.3-0.4m	N/A
Total BTEX & MTBE		0.1	Pass	-	-	-	-	-
Total SVOCs (excluding PAHs and those substances marked with an *)		2	Pass	-	-	-	-	-
EC5-EC10 aliphatic and aromatic hydrocarbons		2	Pass	0.1-1.0	N	<0.1	<0.4	N/A
EC10-EC16 aliphatic and aromatic hydrocarbons		10	Pass	1.0	N	<1.0	<1.0	N/A
EC16-EC40 aliphatic and aromatic hydrocarbons		500	Pass	1.0	N	8 WS102 1.0-1.2m	68 WS105 0.3-0.4m	N/A
Phenols* (from SVOC analysis)		2	Pass	1.0	<1.0	<1.0	<1.0	N/A
Cresols and chlorinated phenols* (from SVOC analysis)		2	Pass	-	-	-	-	-
Ethers*	Only where identified	0.5	Pass	-	-	-	-	-
Nitrobenzene*		0.5	Pass	-	-	-	-	-
Ketones*		0.5	Pass	-	-	-	-	-
Aldehydes*		0.5	Pass	-	-	-	-	-
Amines		Fail	Pass	-	-	-	-	-
Corrosive	Conductivity, Redox and pH	Pass	See Note [1]	-	Y	6.3	4.9-7.4	N/A

Note [1] Threshold: For wrapped steel, corrosive if pH<7 and conductivity > 400µS/cm. For wrapped ductile iron corrosive if pH<5, Eh not neutral and conductivity > 400µS/cm. For copper, corrosive if pH<5 or >8 and Eh positive.

Note [2] Water pipes are normally laid at 0.75-1.35m below finished ground level.

Note [3] Also state if liquid free product is present in soil or groundwater.

APPENDIX B

GAS PROTECTION MEASURES REMEDIATION VALIDATION

- § Foundation Layout Drawings
- § Gas Membrane Details
- § Gas Membrane Delivery Notes
- § Gas Protection Measures Photos

DO NOT SCALE FROM THIS DRAWING

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER HBL DRAWINGS ISSUED FOR THIS PROJECT
ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS OTHERWISE NOTED.
ALL LEVELS SHOWN IN METRES (m) UNLESS OTHERWISE NOTED.

ANY DISCREPANCIES NOTED ON SITE ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY.

CONFLICTING INFORMATION SHOWN ON THE ENGINEERS DRAWINGS OR DISCREPANCIES BETWEEN THE INFORMATION GIVEN BY THE ENGINEER AND THAT PROVIDED BY OTHERS MUST BE REFERRED TO THE ENGINEER BEFORE WORK PROCEEDS.

DIMENSIONS MARKED 'DIMENSIONS TO BE CHECKED ON SITE' SHALL BE SUBJECT TO SITE MEASUREMENT BEFORE CONSTRUCTION PROCEEDS

FOUNDATIONS

THE BASE OF FOUNDATION EXCAVATIONS SHOULD BE INSPECTED ON COMPLETION TO ENSURE THE CONDITION OF THE SOIL COMPLIES WITH THAT ASSUMED IN DESIGN. SHOULD POCKETS OF INFERIOR MATERIAL BE PRESENT, BELOW SPECIFIED THICKNESS OF FOOTINGS, THEY SHOULD BE REMOVED TO REACH SUITABLE BEARING STRATUM, AND REPLACED WITH STRUCTURAL CONCRETE.

THE SURFACE OF FOUNDATION EXCAVATIONS SHOULD BE PROTECTED FROM DETERIORATION AND A 50mm THICK BLINDING LAYER OF CONCRETE PROVIDED WHERE FOUNDATIONS ARE NOT COMPLETED IMMEDIATELY.

CONCRETE

DESIGN CHEMICAL CLASS FOR CONCRETE IS DS-1 AND AC-1s

CONCRETE TO BE A DESIGNED MIX IN ACCORDANCE WITH THE REQUIREMENTS OF BSEN 206/1, BS 8500/2 AND BS8110: PART 1:1997 DESIGNED MIX.
ORDINARY PORTLAND CEMENT TO BS 12.
COARSE & FINE AGGREGATE TO BS 882.
NOMINAL MAXIMUM SIZE OF AGGREGATE = 20mm
STRENGTH CLASS = RC35/40
MINIMUM CEMENT CONTENT = 300 kg/m³
RATE OF SAMPLING = 12m³
WORKABILITY - TARGET SLUMP = 50mm
MAXIMUM FREE-WATER/CEMENT RATIO = 0.60
NO ADDITIVES TO THE CONCRETE WILL BE ALLOWED UNLESS AGREED WITH THE ENGINEER

ALTERNATIVELY CONCRETE FOR FOUNDATION WORK TO BE A DESIGNATED MIX RC28/35 IN ACCORDANCE WITH THE REQUIREMENTS OF BSEN 206/1, BS 8500/2 AND BS8110: PART 1:1997 DESIGNED MIX

CONCRETE TO BE WELL COMPACTED USING POKER VIBRATORS

ALL CONCRETE TO CONFORM TO BS EN 206-1 2000 AND BS8500-2. DESIGNED TO COMPLY WITH THE REQUIREMENTS OF BRE SPECIAL DIGEST 1 - "CONCRETE IN AGGRESSIVE GROUND" AND THE CLASSIFICATIONS DETERMINED IN THE GROUND INVESTIGATION REPORT (DS3) AND TO BE MIN GRADE C32/40

MASONRY (BELOW DPC)

ALL MASONRY BELOW D.P.C. TO COMPRISE BRICKWORK (TO BS 3921:1985) WITH A MINIMUM COMPRESSIVE STRENGTH OF 20 N/mm² OR BLOCKWORK (TO BS 6073-PARTS 1 & 2:1981) WITH A MINIMUM DENSITY OF 1500kg/m³ AND A MINIMUM COMPRESSIVE STRENGTH OF 7.3N/mm².

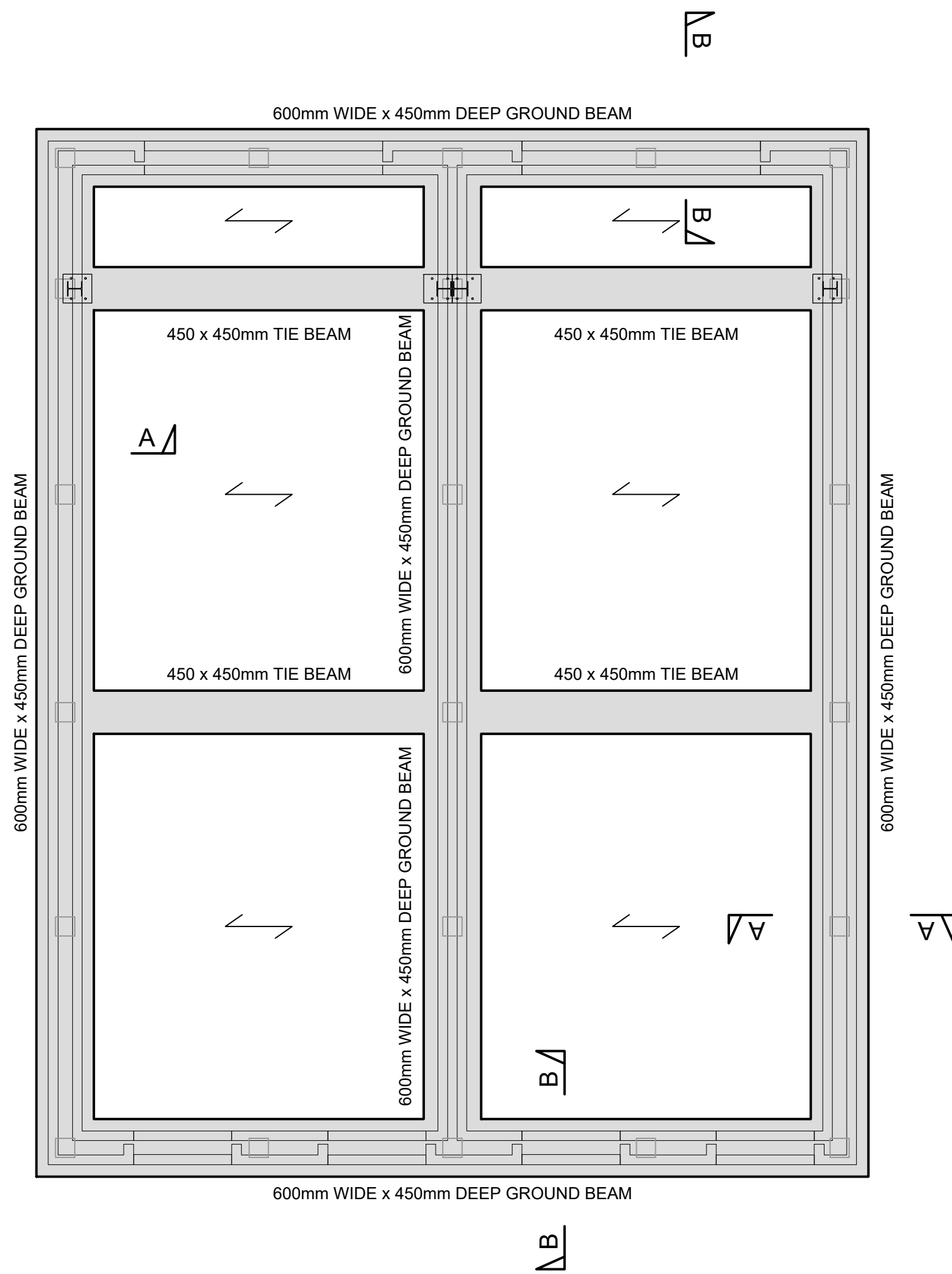
ALL MASONRY BELOW D.P.C. LEVEL TO BE SET IN 1:0.0.25:3, S.R. CEMENT-LIME-SAND, MORTAR IN ACCORDANCE WITH BS 5628:PART 1:1992.

ALL LEVELS, BUILDING & SETTING OUT
DIMENSIONS IN ACCORDANCE WITH
ARCHITECTS DRAWINGS AND DETAILS

C03	NOV'20	DP	TOP OF GROUND BEAM LEVEL UPDATED			
C02	NOV'20	DP	COLUMNS UPDATED WHERE INDICATED			
C01	NOV'20	DP	ISSUED FOR CONSTRUCTION	LDM	LDM	
P03	SEPT'20	DP	CLAY HEAVE PROTECTION MEASURES ADDED			
P02	SEPT'20	LB	FOR CONSTRUCTION	LDM	LDM	
REV.	DATE	DRAWN	DESCRIPTION	CHKD	APPRD	
STATUS DESCRIPTION				STATUS		
FOR CONSTRUCTION				A1		

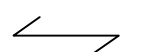
HBL Brook House
Weybrook Road,
Manchester M19 2QD
+44 (0)161 432 9977 | www.hbl.ltd
Consulting Civil & Structural Engineers

PROJECT	PROPOSED RESIDENTIAL DEVELOPMENT LINN STREET, CRUMPSALL		
DRAWING TITLE	BLOCK TYPE 1 FOUNDATION PLAN AND DETAILS		
CLIENT	WIGGETT CONSTRUCTION LTD.		
HBL REF.	8487	DATE	AUGUST 2020
SCALE(S)	1:50/1:20		A1
DRAWN	H.MAMAGANI	CHECKED	L.MASSEY
APPROVED	L.MASSEY		
DRAWING No.	8487-HBL-XX-00-DR-S-0100		
REV.	C03		



BLOCK TYPE 1 - FOUNDATION PLAN
(SHOWING SPANS OF BEAM & BLOCK FLOOR)
SCALE 1:50

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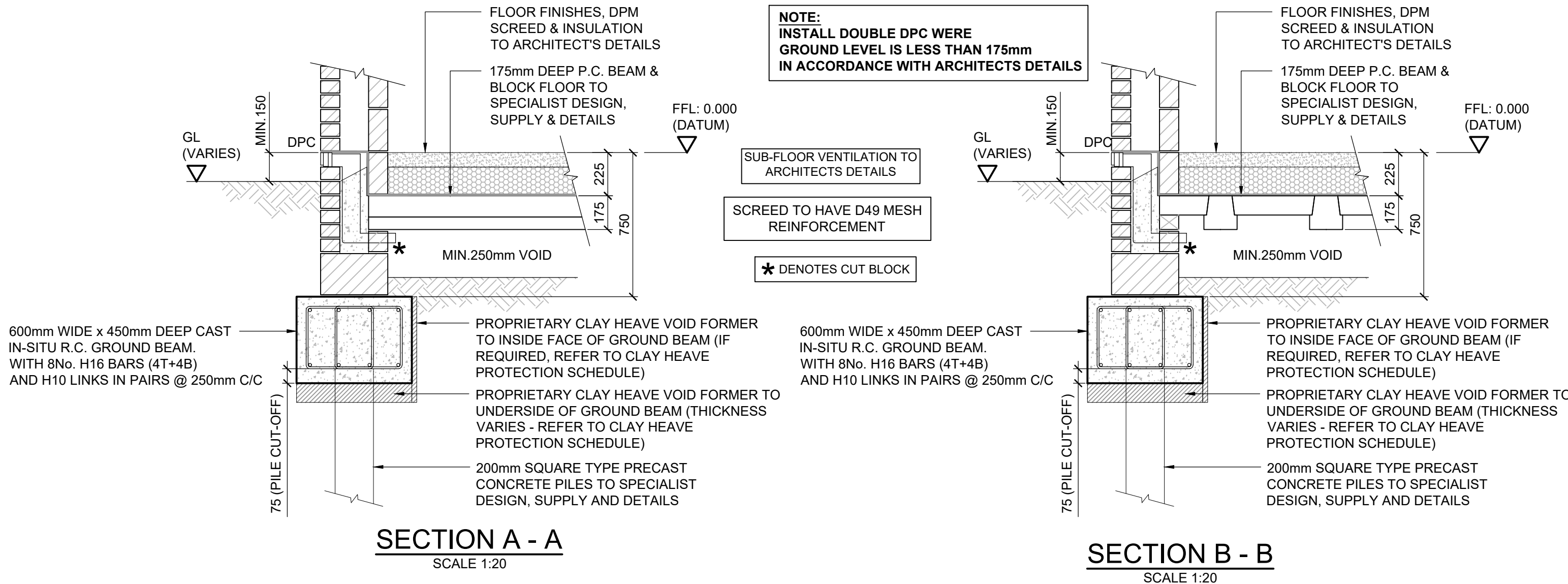


DENOTES SPAN OF 175mm DEEP BEAM AND BLOCK FLOOR
TO SPECIALIST DESIGN SUPPLY & DETAILS

FLOOR TO BE DESIGNED FOR THE FOLLOWING LOADINGS:

DEAD LOAD = 1.80kN/m² (FINISHES EXCLUDING SELF WEIGHT)

LIVE (IMPOSED) LOAD = 1.50kN/m² (DOMESTIC) + 1.00 kN/m² (FOR PARTITIONS) = 2.50 kN/m²



PILING NOTES:

PILES TO BE DESIGNED WITH AN ADEQUATE FACTOR OF SAFETY TO RESIST UPLIFT FORCES ON THE SHAFT DUE TO HEAVE AND BE SUITABLY REINFORCED FOR THE LENGTH OF THE MEMBER GOVERNED BY THE HEAVE DESIGN. SUFFICIENT ANCHORAGE SHOULD BE PROVIDED BELOW THE DEPTH OF DESICCATED SOIL. SLIP LINERS MAY BE USED TO REDUCE UPLIFT BUT THE AMOUNT OF REDUCTION IS SMALL, AS FRICTION BETWEEN MATERIALS CANNOT BE ELIMINATED. THE JOINT DESIGN OF THESE PILES SHOULD BE CAPABLE OF TRANSMITTING TENSILE HEAVE FORCES

CLAY HEAVE PROTECTION SCHEDULE (GROUND BEAMS)

PLOT NUMBER	PROTECTION REQ'D TO UNDERSIDE	PROTECTION REQ'D TO INSIDE FACE	VOID FORMER THICKNESS TO UNDERSIDE	VOID FORMER THICKNESS TO INSIDE FACE
1	YES	YES	100	25
2	YES	YES	100	25
3	YES	YES	100	25
4	YES	YES	100	25
5	YES	YES	100	25
6	YES	YES	100	25
7	YES	YES	100	25
8	YES	NO	50	N/A
9	YES	NO	50	N/A
10	YES	NO	50	N/A
11	YES	NO	50	N/A
12	YES	NO	50	N/A
13	YES	NO	50	N/A
14	YES	NO	50	N/A

NOTE: VOID FORMER THICKNESS IS TAKEN AS THE REMAINING THICKNESS AFTER COLLAPSE - REFER TO MANUFACTURES DATA SHEETS

DO NOT SCALE FROM THIS DRAWING

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WORKABILITY - TARGET SLUMP = 50mm
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NO ADDITIVES TO THE CONCRETE WILL BE ALLOWED UNLESS AGREED WITH THE ENGINEER

ALTERNATIVELY CONCRETE FOR FOUNDATION WORK TO BE A DESIGNATED MIX RC28/35 IN ACCORDANCE WITH THE REQUIREMENTS OF BSEN 206/1, BS 8500/2 AND BS8110: PART 1:1997 DESIGNED MIX

CONCRETE TO BE WELL COMPACTED USING POKER VIBRATORS

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ALL LEVELS, BUILDING & SETTING OUT
DIMENSIONS IN ACCORDANCE WITH
ARCHITECTS DRAWINGS AND DETAILS

C03	NOV'20	DP	TOP OF GROUND BEAM LEVEL UPDATED		
C02	NOV'20	DP	COLUMNS UPDATED WHERE INDICATED		
C01	NOV'20	DP	ISSUED FOR CONSTRUCTION	LDM	LDM
P03	SEPT'20	DP	CLAY HEAVE MEASURES ADDED / GROUND BEAMS UPDATED		
P02	SEPT'20	LB	FOR INFORMATION	LDM	LDM
REV.	DATE	DRAWN	DESCRIPTION	CHKD	APPRD

STATUS DESCRIPTION				STATUS	
FOR CONSTRUCTION				A1	

HBL

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Weybrook Road,
Manchester M19 2QD
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Consulting Civil & Structural Engineers

PROJECT
PROPOSED RESIDENTIAL DEVELOPMENT
LINN STREET, CRUMPSALL

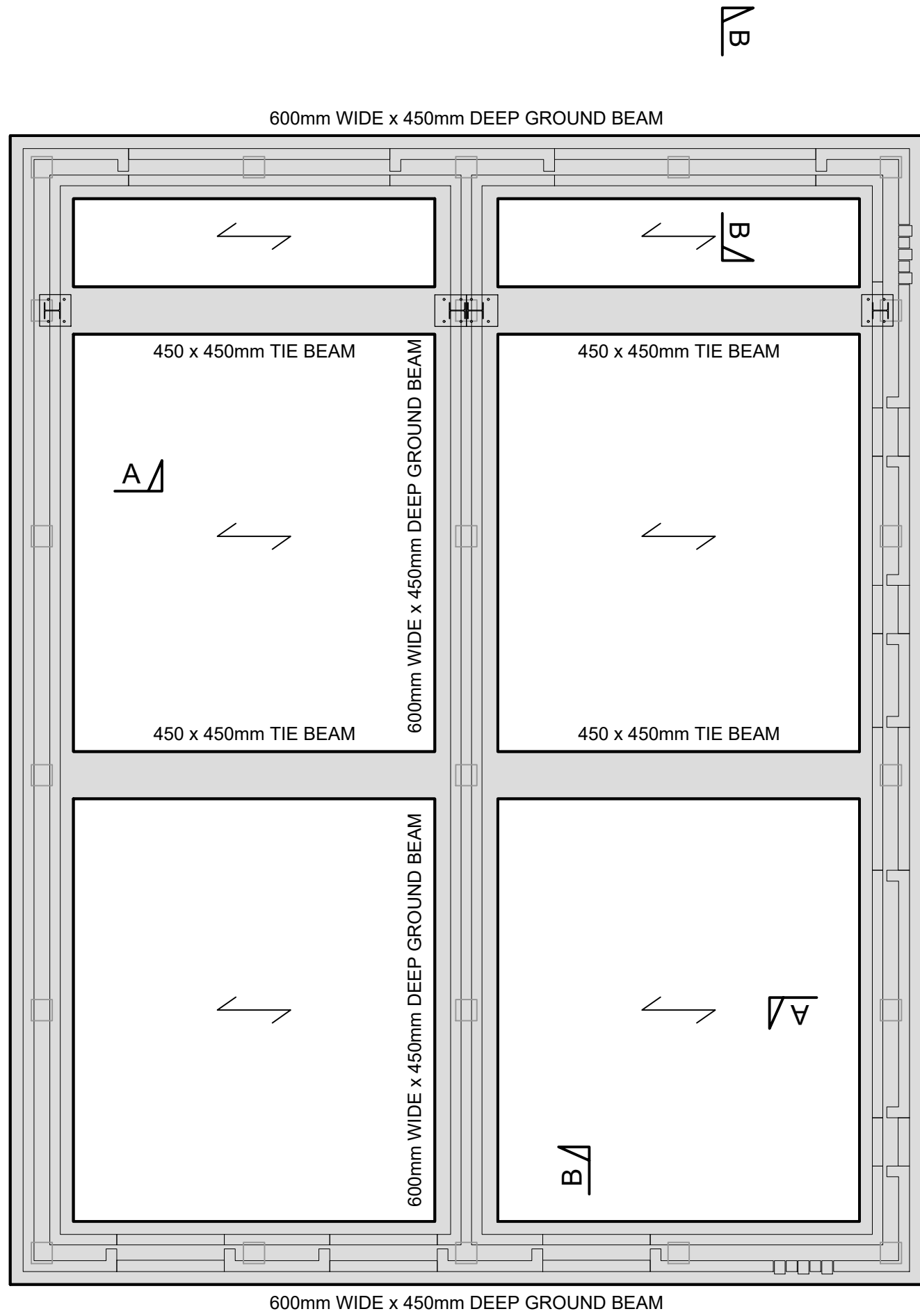
DRAWING TITLE
BLOCK TYPE 2
FOUNDATION PLAN AND DETAILS

CLIENT
WIGGETT CONSTRUCTION LTD.

HBL REF.	DATE	SCALE(S)	
8487	AUGUST 2020	1:50/1:20	A1

DRAWN	CHECKED	APPROVED
H.MAMAGANI	L.MASSEY	L.MASSEY

DRAWING No.	REV.
8487-HBL-XX-00-DR-S-0200	C03



BLOCK TYPE 2 - FOUNDATION PLAN
(SHOWING SPANS OF BEAM & BLOCK FLOOR)
SCALE 1:50

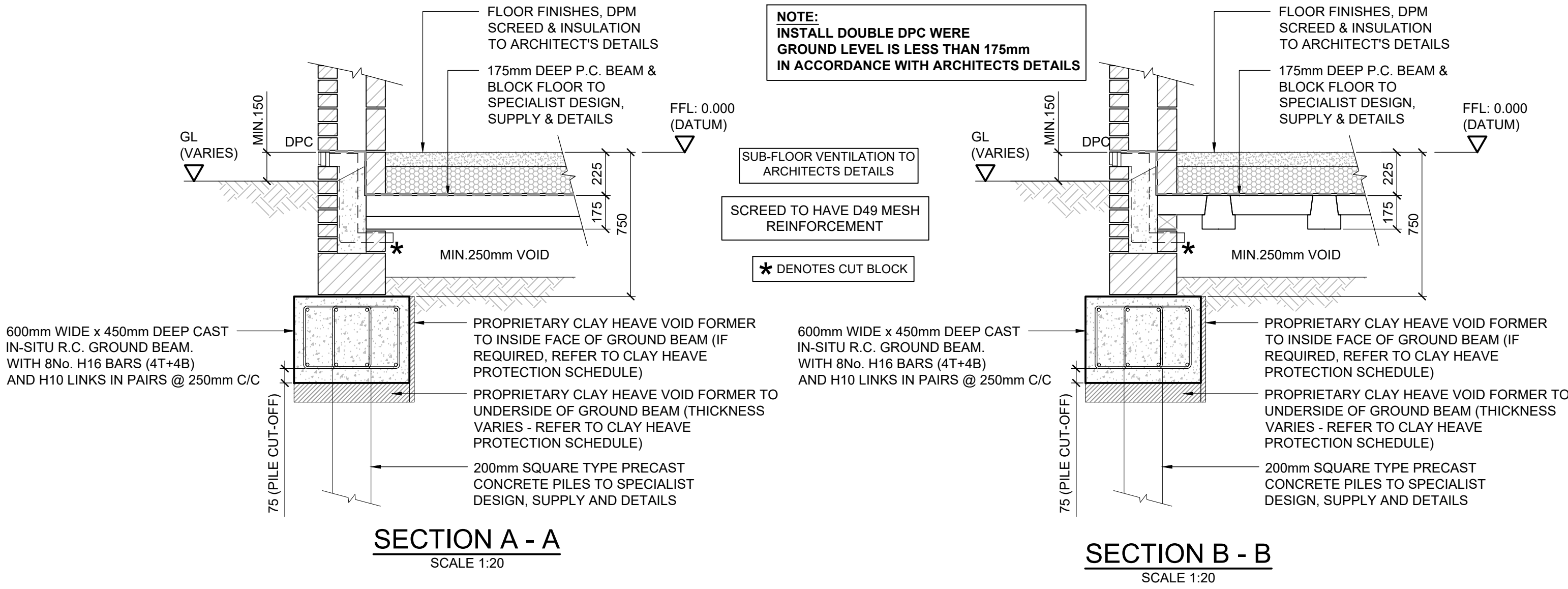
LEGEND:

↔ DENOTES SPAN OF 175mm DEEP BEAM AND BLOCK FLOOR TO SPECIALIST DESIGN SUPPLY & DETAILS

FLOOR TO BE DESIGNED FOR THE FOLLOWING LOADINGS:

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LIVE (IMPOSED) LOAD = 1.50kN/m² (DOMESTIC) + 1.00 kN/m² (FOR PARTITIONS) = 2.50 kN/m²



PILING NOTES:
PILES TO BE DESIGNED WITH AN ADEQUATE FACTOR OF SAFETY TO RESIST UPLIFT FORCES ON THE SHAFT DUE TO HEAVE AND BE SUITABLY REINFORCED FOR THE LENGTH OF THE MEMBER GOVERNED BY THE HEAVE DESIGN. SUFFICIENT ANCHORAGE SHOULD BE PROVIDED BELOW THE DEPTH OF DESICCATED SOIL. SLIP LINERS MAY BE USED TO REDUCE UPLIFT BUT THE AMOUNT OF REDUCTION IS SMALL, AS FRICTION BETWEEN MATERIALS CANNOT BE ELIMINATED. THE JOINT DESIGN OF THESE PILES SHOULD BE CAPABLE OF TRANSMITTING TENSILE HEAVE FORCES

CLAY HEAVE PROTECTION SCHEDULE (GROUND BEAMS)

PLOT NUMBER	PROTECTION REQ'D TO UNDERSIDE	PROTECTION REQ'D TO INSIDE FACE	VOID FORMER THICKNESS TO UNDERSIDE	VOID FORMER THICKNESS TO INSIDE FACE
1	YES	YES	100	25
2	YES	YES	100	25
3	YES	YES	100	25
4	YES	YES	100	25
5	YES	YES	100	25
6	YES	YES	100	25
7	YES	YES	100	25
8	YES	NO	50	N/A
9	YES	NO	50	N/A
10	YES	NO	50	N/A
11	YES	NO	50	N/A
12	YES	NO	50	N/A
13	YES	NO	50	N/A
14	YES	NO	50	N/A

NOTE: VOID FORMER THICKNESS IS TAKEN AS THE REMAINING THICKNESS AFTER COLLAPSE - REFER TO MANUFACTURES DATA SHEETS

Capital Valley Plastics Ltd

Cwmavon Works
Nr Pontypool
Gwent NP4 8UW

Tel: 01495 772255 Fax: 01495 772251
e-mail: sales@capitalvalleyplastics.com
website: www.capitalvalleyplastics.com



Agrément Certificate

17/5387

Product Sheet 1

CAPITAL VALLEY PLASTICS GAS-RESISTANT MEMBRANE

RADBAR AMBER 2 FOIL BARRIER

This Agrément Certificate Product Sheet⁽¹⁾ relates to Radbar Amber 2 Foil Barrier, for use as a low-density polythene gas barrier and damp-proof membrane in concrete ground floors, above and below the slab not subject to hydrostatic pressure, to protect the building against moisture, radon, methane and carbon dioxide from the ground.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.



KEY FACTORS ASSESSED

Resistance to water and water vapour — the membrane provides an effective barrier to the passage of liquid water and water vapour from the ground (see section 6).

Resistance to underground gases — the membrane is capable of restricting the ingress of radon, methane and carbon dioxide gases into the building (see section 7).

Resistance to puncture — the membrane has a high resistance to puncture and on a smooth or blinded surface will not be damaged by foot or site traffic (see section 8).

Durability — under normal service conditions the membrane will remain effective against the ingress of water and water vapour, and will restrict the ingress of radon, methane and carbon dioxide during the lifetime of the flooring construction in which it is installed (see section 13).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 22 February 2017

John Albon – Head of Approvals
Construction Products

Claire Curtis-Thomas
Chief Executive

The BBA is a UKAS accredited certification body – Number 113.

The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbaccerts.co.uk
Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

THIS IS NOT A VALID AGRÉMENT CERTIFICATE.

THE BBA ACCEPTS NO REponsibility NOR LIABILITY FOR ANY CONCLUSIONS DRAWN FROM, NOR DECISIONS BASED ON, THIS DOCUMENT.

Regulations

In the opinion of the BBA, Radbar Amber 2 Foil Barrier, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	C1(2)	Site preparation and resistance to contaminants
Comment:	The product can contribute to a structure satisfying this Requirement. See section 7.1 of this Certificate.	
Requirement:	C2(a)	Resistance to moisture
Comment:	When properly installed in a correctly-designed structure, the product forms an effective barrier to the movement of water within the ground floor slab, enabling compliance with this Requirement. See sections 6.1 and 6.2 of this Certificate.	
Regulation:	7	Materials and workmanship
Comment:	The product is of an acceptable material. See section 13.1 and the <i>Installation</i> part of this Certificate.	



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Durability, workmanship and fitness of materials
Comment:		The product can contribute to a construction satisfying this Regulation. See section 13.1 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	3.1	Site preparation — harmful and dangerous substances
Standard:	3.2	Site preparation — protection from radon gas
Comment:		The product will enable a floor to satisfy the requirements of these Standards, with reference to clauses 3.1.2 ⁽¹⁾⁽²⁾ , 3.1.6 ⁽¹⁾⁽²⁾ , 3.1.7 ⁽¹⁾⁽²⁾ , 3.1.8 ⁽¹⁾⁽²⁾ , 3.2.1 ⁽²⁾ and 3.2.2 ⁽¹⁾⁽²⁾ . See section 7.1 of this Certificate.
Standard:	3.4	Moisture from the ground
Comment:		When properly installed in a correctly-designed structure, the product forms an effective barrier to the movement of water within the ground floor slab, enabling compliance with this Standard, with reference to clauses 3.4.2 ⁽¹⁾⁽²⁾ , 3.4.4 ⁽¹⁾⁽²⁾ and 3.4.6 ⁽¹⁾⁽²⁾ . See sections 6.1 and 6.2 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The product can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation:	12	Building standards applicable to conversions
Comment:		Comments in relation to the product under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ .
		(1) Technical Handbook (Domestic)
		(2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	23(a)(i)	Fitness of materials and workmanship
Comment:	(iii)(b)(i)	The product is acceptable. See section 13.1 and the <i>Installation</i> part of this Certificate.

Regulation:	26	Site preparation and resistance to contaminants
Comment:		The product can contribute to a structure satisfying the requirements of this Regulation. See section 7.1 of this Certificate.
Regulation:	28	Resistance to moisture and weather
Comment:		When properly installed in a correctly-designed structure, the product forms an effective barrier to the movement of water within the ground floor slab, enabling compliance with this Regulation. See sections 6.1 and 6.2 of this Certificate.

Construction (Design and Management) Regulations 2015 Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See section: 1 *Description* (1.2) of this Certificate.

Additional Information

NHBC Standards 2017

NHBC accepts the use of Radbar Amber 2 Foil Barrier, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Chapters 4.1 *Land quality — managing ground conditions* and 5.1 *Substructure and ground bearing floors*.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard EN 13967 : 2012. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 Radbar Amber 2 Foil Barrier is a multilayer, low-density polyethylene membrane, reinforced with a polypropylene reinforcing grid with an integral aluminium foil.

1.2 The membrane has the following nominal characteristics:

Thickness* (mm)	0.6 (overall)
Roll length* (m)	various
Roll width* (m)	various
Mass per unit area* ($\text{g}\cdot\text{m}^{-2}$)	350
Tensile strength* ($\text{N}\cdot 50\text{ mm}^{-1}$)	
MD	600
CD	480
Elongation*	
MD	20
CD	20
Nail tear resistance*	
MD	330
CD	400
Watertightness*	pass
Colour	
upper surface	various
lower surface	various.

1.3 Ancillary products for use with the membrane include:

- Radbar Double-sided Jointing Tape – for joints and laps
- Radbar Single-sided Overlap Tape.

1.4 Ancillary products for use with the membrane but outside the scope of the Certificate include:

- Radbar Top Hats — to seal around entry points to the membrane
- Radbar Internal Corner Cloaks — prefabricated corner details
- Radbar External Corner Cloaks — prefabricated corner details
- Radbar Primer — used to provide adhesion for application of bitumen enhanced geomembranes
- Radbar Void Vent 25 — cusped HDPE drainage core with a non-woven polypropylene geotextile separator/filter bonded to one side
- Radbar Void Vent 40 — cusped HDPE drainage core with a non-woven polypropylene geotextile separator/filter bonded to one side
- Radbar Protection Fleece — to form a protective layer to prevent damage to the membrane
- Radbar GR-SAM — gas-resistant self-adhesive membrane.

2 Manufacture

2.1 The product is manufactured by an extrusion/coating process.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control being operated by the manufacturer are being maintained.

3 Delivery and site handling

3.1 Rolls are wrapped in polythene film. Each roll has a leaflet enclosed describing the product and installation details. The BBA logo and Certificate number are printed on the leaflet and pallet label.

3.2 The rolls must be stacked on a flat surface, kept under cover and protected from sunlight and mechanical damage.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Radbar Amber 2 Foil Barrier.

Design Considerations

4 Use

4.1 Radbar Amber 2 Foil Barrier is satisfactory for use as a gas-resistant barrier to restrict the ingress of radon, methane and carbon dioxide gases into buildings from landfill and naturally-occurring sources.

4.2 Buildings in areas of risk should be constructed in accordance with the recommendations of BRE Report BR 211 : 2015 *Radon: Guidance on protective measures for new buildings*, and following the guidance set out in BS 8485 : 2015.

4.3 The product is also satisfactory for use as a damp-proof membrane in accordance with CP 102 : 1973, Section 2 and BS 8000-4 : 1989.

5 Practicability of installation

The membrane is designed to be installed by a competent general builder, or a contractor, experienced with this type of product.

6 Resistance to water and water vapour



6.1 The membrane, including joints, provides an effective barrier to the passage of liquid moisture from the ground.

6.2 When installed in accordance with the following documents, the membrane will comply with the minimum sheet thickness detailed in the national Building Regulations:

England and Wales — Approved document C, Requirement C2(a), Section 4.6

Scotland — Mandatory Standard 3.4, clauses 3.4.2, 3.4.4 and 3.4.6

Northern Ireland — Regulation 28(a).

6.3 The membrane is impervious to water and provides a waterproof layer capable of accepting minor structural movements without damage.

7 Resistance to underground gases



7.1 The product will restrict the ingress of radon, methane and carbon dioxide gases into buildings from landfill and naturally-occurring sources and meet the performance criteria for a gas resistant membrane as defined in BS 8485 : 2015.

7.2 Measured gas permeability/diffusion values on unjointed membrane are given in Table 1.

Table 1 Gas permeability of Radbar Amber 2 Foil Barrier

Gas	Method	Result
Methane	BS ISO 15105-1	$<0.09 \text{ ml} \cdot \text{m}^2 \cdot \text{day}^{-1} \cdot \text{atm}^{-1}$
Carbon dioxide	BS ISO 15105-1	$<0.09 \text{ ml} \cdot \text{m}^2 \cdot \text{day}^{-1} \cdot \text{atm}^{-1}$
Radon	K124/02/95	$8.0 \times 10^{-15} \text{ m}^2 \cdot \text{s}^{-1}$

7.3 BRE Report BR 211 : 2015 recommends a 300 μm thick polyethylene sheet as the minimum required thickness for a radon gas-resistant membrane. It is generally accepted that other materials with comparable or higher gas resistance are suitable, provided they can withstand the construction process. In the opinion of the BBA, the product meets these criteria.

8 Resistance to puncture

8.1 The membrane can be punctured by sharp objects, and care should be taken when handling building materials over the exposed surface.

8.2 Provided there are no sharp objects present on the membrane's surface prior to and during installation of the protective layer, the product will not be damaged by normal foot traffic.

9 Compatibility with other materials

The membrane contains an aluminium foil interplay which may be subject to corrosion by alkaline conditions if damage to the membrane and exposure occurs. However, under normal circumstances, the polyethylene faces of the membrane are compatible with other materials and products typically used in the same areas, with the exception of those containing pitch.

10 Underfloor heating

There will be no adverse effect on the membrane from underfloor heating under normal service conditions. In other circumstances, the Certificate holder's advice should be sought.

11 Effects of temperature

When the membrane is loose-laid and the joints are taped, the installation temperature should not be below 5°C.

12 Maintenance

As the product is confined under concrete and has suitable durability (see section 13), maintenance is not required. However, any damage occurring before enclosure must be repaired (see section 16).

13 Durability



13.1 The membrane will, in normal circumstances, remain effective against the ingress of water and water vapour, and will restrict the ingress of radon, methane and carbon dioxide during the lifetime of the building.

13.2 Long periods of exposure to ultraviolet light will reduce the effectiveness of the membrane.

Installation

14 General

14.1 Radbar Amber 2 Foil Barrier must be installed and fixed in accordance with the Certificate holder's instructions, the relevant clauses of BR 211 : 2015 and following the guidance of BS 8485 : 2015.

14.2 The membrane can be installed in all normal site conditions, provided that the air temperature is not below 4°C to prevent the risk of surface condensation.

15 Procedure

15.1 The product must only be applied to surfaces that have a smooth finish, ie they should be free from voids, projections and mortar deposits. Surfaces should be dry and free from dust and frost.

15.2 Concrete surfaces should be dense. Vertical surfaces of brickwork and blockwork must be dry and rendered to provide an even surface. Brickwork or blockwork not rendered must be flush pointed to give a smooth surface without sudden changes in level.

15.3 The membrane is rolled out with the coloured surface uppermost (white side down), ensuring that it is properly aligned. All end and side overlaps should be a minimum of 150 mm and prepared in accordance with the Certificate holder's instructions.

15.4 When the membrane is laid below the concrete slab, it should be loose-laid to accommodate any small movements.

15.5 All surfaces must be dried thoroughly prior to joining. Roll edges can be welded, or taped. A strip of the tape is unrolled over the membrane with its nearest edge 50 mm from the membrane edge. The protective paper is removed from the butyl tape prior to rolling an adjacent run of the membrane, which must be carefully unrolled over the jointing tape, ensuring a 100 mm overlap.

15.6 All service penetrations and direction changes should be properly detailed in accordance with the Certificate holder's instructions. Service ducts should be vented to prevent the possibility of gas accumulating in confined spaces.

15.7 The continuity of the gas protection must extend over the footprint of the building, and the gas membrane must be sealed to a gas-resistant damp-proof course.

15.8 The membrane should be covered by a screed or other protective layer, such as Radbar Protection Fleece, as soon as possible after installation. If blockwork protection is used, care must be taken to avoid damage to the membrane during construction.

15.9 The membrane installation should be subject to third-party independent validation, in accordance with BS 8485 : 2015.

16 Repair

Any damage to the product must be repaired using a patch of the membrane, and laps welded or sealed with double-sided tape and secured with the butyl tape. All patched areas must extend a minimum of 150 mm from the damaged area. If required by the local authority, repair work should be confirmed by an independent validation report, as all gas membrane installation should be subject to third-party validation in accordance with BS 8485 : 2015.

Technical Investigations

17 Tests

17.1 An assessment was made of data to EN 13967 : 2012 in relation to:

- tensile strength and elongation
- nail tear resistance
- watertightness
- resistance to static loading.

17.2 Tests were carried out to determine:

- thickness, width, density and mass per unit area
- dimensional stability, low temperature flexibility and water vapour permeability
- tensile strength and elongation on controls and after 12 weeks heat ageing at 70°C, and after 100 hours UVB exposure
- watertightness on controls and after 12 weeks heat ageing at 70°C
- nail tear strength on controls and after 12 weeks heat ageing at 70°C
- resistance of joints to air pressure
- tensile strength of joints on controls and after 12 weeks heat ageing at 70°C

to assess:

- product characteristics
- durability of the product and joints.

18 Investigations

18.1 An evaluation was made of the results of the test data regarding permeability of radon, methane and carbon dioxide.

18.2 A site visit was conducted to assess practicability of installation.

18.3 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*

BS 8485 : 2015 *Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*

BS ISO 15105-1 : 2007 *Plastics — Film and sheeting — Determination of gas-transmission rate — Differential-pressure methods*

CP 102 : 1973 *Code of practice for protection of buildings against water from the ground*

EN 13967 : 2012 *Flexible sheets for waterproofing — Plastic and rubber damp proof sheets including plastic and Rubber basement tanking sheet — Definitions and characteristics*

19 Conditions

19.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

19.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

19.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

19.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

19.5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

19.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.



BEESLEY & FILDES LTD

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Collection Note

Branch
Walkden Depot
Louisa Street
Walkden
Manchester
M28 3GA
Tel: 0161 713 1200

Invoice Address

JD Kelly Floors
Ropers Barn
Vallies Lane
Bolton
BL1 6DY

Order processed by: ajohnstone
Order No 67463400
Order Date 03/11/2020
Customer KE096
Your Ref Joe/E-mail
Delivery On 03/11/2020
Sale Type Collected
Our Ref

FAO

Special Instructions

Notes

Page 1 of 1

Item	Description	Qty	Weight			
1	3503VIS130 - VISQUEEN 2000G YELLOW GAS(A1) BARRIER (50m2) REF RS058903	5.00	0.000			
2	3503VIS105 - ROLL VISQUEEN GR DETAILING STRIPS 300MM X 10MTR REF RS061529	4.00	0.000			
3	3503VIS020 - 1000mm X20m ZEDEX CPT COMMERCIAL DPC BLACK REF RS063351	6.00	0.000			
4	3503VIS040 - 300MM X 20L/MTR ZEDEX CPT COMMERCIAL DPC-BLACK REF RS063343	4.00	0.000			
5	=====					
6	3501POL370 - Radbar Detailing Strip 300Mm X 10M	20.00	0.000			
7	3501POL375 - Radbar Amber 2 Gas Foil Barrier 2M X 50M Roll	10.00	0.000			

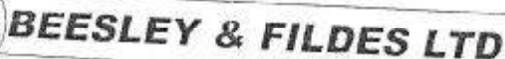
Received on behalf of JD Kelly Floors

Signature Name

Date

Subject to our terms and conditions of sale. Further copies available on request.





Wilson Road, Huyton, Merseyside, L36 6AF
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Web Site: www.beesleyandfildes.co.uk
Email: creditcontrol@beesleyandfildes.co.uk

Branch

Walkden Depot
Louisa Street
Walkden
Manchester
M28 3GA
Tel: 0161 713 1200

JD Kelly Floors
Ropers Barn
Vallets Lane
Bolton
BL1 6DY

Order processed by:	rbuller
Order No	67743080
Order Date	25/11/2020
Customer	KE096
Your Ref	2244
Delivery	On 25/11/2020
Sale Type	Collected
Our Ref	

Special Instructions

Page 1 of 1

Notes

Received on behalf of JD Kelly Floors

Signature _____ Name _____

Date _____

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Collection Note

Branch

Walkden Depot
Louisa Street
Walkden
Manchester
M28 3GA
Tel: 0161 713 1200

Order processed by:	rybradshaw
Order No	67845900
Order Date	03/12/2020
Customer	KE096
Your Ref	2244
Delivery	On 03/12/2020
Sale Type	Collected
Our Ref	

Invoice Address

JD Kelly Floors
Ropers Barn
Vallets Lane
Bolton
BL1 6DY

FAO

Special Instructions

Notes

Page 1 of 1

Item	Description	Qty	Weight			
1	3501POL370 - Radbar Detailing Strip 300M/m X 10M	20.00	0.000			
2	3501POL375 - Radbar Amber 2 Gas Foil Barrier 2M X 50M Roll	8.00	0.000			

Received on behalf of: JD Kelly Floors

Signature _____ Name _____

Date _____

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Registered No. 2412526 England VAT Registration No. GB 482 9643 07



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Picking Note

Branch

Walkden Depot
Louisa Street
Walkden
Manchester
M28 3GA
Tel: 0161 713 1200

Invoice Address

JD Kelly Floors
Ropers Barn
Vallets Lane
Bolton
BL1 6DY

Delivery Address

JD Kelly Floors
Ropers Barn
Vallets Lane
Bolton
BL1 6DY

Order processed by: ajohnstone
Order No 67854470
Order Date 04/12/2020
Customer KE096
Your Ref JOE
Delivery On 08/12/2020

FAO

Page 1 of 1

Special Instructions

Notes

Item	Description	Quantity	Per	Pick & Tick
1	zz_3501POL365_0001 - EACH; RADBAR SEALANT 300ml	8	Each	☐
2	zz_zz_3902IBS062_0009_0001 - DELIVERY CHARGE	1	Each	☐

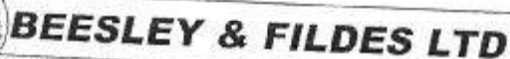
Goods picked by

Signature

Name

Date

Subject to our terms and conditions of sale. Further copies available on request.



Wilson Road, Huyton, Merseyside, L35 6AF
Tel: 0151 480 8304 Fax: 0151 480 4970
Web Site: www.beesleyandfildes.co.uk
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Walkden Depot
Louisa Street
Walkden
Manchester
M28 3GA
Tel: 0161 713 1200

JD Kelly Floors
Ropers Barn
Vaillets Lane
Bolton
BL1 6DY

Order processed by:	ajohnstone
Order No	67914000
Order Date	10/12/2020
Customer	KE096
Your Ref	Joe
Delivery	On 11/12/2020
Sale Type	Collected
Our Ref	

Page 1 of 1

Received on behalf of JD Kelly Floors

Signature _____ Name _____

Date _____

Subject to our terms and conditions of sale. Further copies available on request.







