

Our Ref: DE/15710/VAL

Your Ref:

Contact: David Emanuel

31st March 2023

Manning Construction Limited

For the attn. of Steve Euston

Dear Mr Euston,

VALIDATION TESTING: PARC AVENUE, GLYNNEATH

CAPPING SOIL

TFW Group Limited were retained by Manning Construction Limited to provide an assessment of capping soils used at their development at Parc Avenue, Glynneath.

In March 2023 TFW Group Limited collected five samples soil from the study site. These were dispatched to Eurofin Chemtest for analysis. Soil chemical test results are provided in **Annex A**.

Pits were excavated in Gardens 2, 4, 6, 8 and 10 which confirmed capping soil was >600mm thickness. These pits are presented in Plates 1 – 5 in **Annex A**.

The results of the chemical analysis were compared to the published Generic Assessment Criteria for soils in a Residential Setting with Plant Uptake. The GAC and Chemical Test Results are summarised in **Table 01**.

Client: Terra Firma (Wales) Ltd	Chemtest Job No.:				23-08019	23-08019	23-07962	23-07962	23-07962
Quotation No.:	Chemtest Sample ID.:				1604411	1604412	1604125	1604126	1604127
	Sample Location:				Plot 2	Plot 4	Plot 6	Plot 8	Plot 10
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0	0	0	0	0
	Bottom Depth (m):				0.6	0.6	0.6	0.6	0.6
	Date Sampled:								
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD	Guideline				
ACM Type	U	2192		N/A	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	-	-	-
Moisture	N	2030	%	0.020	18	19	19	20	22
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Roots and Stones	Roots	Roots	Roots	Roots
Soil Texture	N	2040		N/A	Sand	Loam	Loam	Loam	Sand
pH	M	2010		4.0	8.6	8.7	8.7	8.6	8.6
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	290	0.79	0.78	2.4	1.2
Cyanide (Total)	M	2300	mg/kg	0.50	8	< 0.50	< 0.50	< 0.50	< 0.50
Sulphate (Acid Soluble)	U	2430	%	0.010	0.034	0.065	0.053	0.063	0.046
Arsenic	M	2455	mg/kg	0.5	37	6.3	7.1	5.8	7.5
Cadmium	M	2455	mg/kg	0.10	11	0.15	0.18	0.14	0.15
Chromium	M	2455	mg/kg	0.5		10	11	8.5	9.1
Mercury Low Level	M	2450	mg/kg	0.05	40	< 0.05	< 0.05	0.05	< 0.05
Copper	M	2455	mg/kg	0.50	2400	11	12	12	9.4
Nickel	M	2455	mg/kg	0.50	130	7.8	8.5	7.7	8.9
Lead	M	2455	mg/kg	0.50	200	18	20	16	21
Selenium	M	2455	mg/kg	0.25	250	0.30	0.36	0.30	0.36
Zinc	M	2455	mg/kg	0.50	3700	38	46	38	43
Chromium (Trivalent)	N	2490	mg/kg	1.0	910	10	11	8.5	9.1
Chromium (Hexavalent)	N	2490	mg/kg	0.50	6	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	M	2780	mg/kg	0.05	42	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	M	2780	mg/kg	0.05	100	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	M	2780	mg/kg	0.05	100	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C8-C10	M	2780	mg/kg	0.05	27	< 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	M	2780	mg/kg	0.25		< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	130	2.5	< 2.0	2.3	2.3
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	1100	5.4	3.9	2.1	2.5
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	65000	7.3	4.6	3.4	3.8
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	65000	11	7.3	5.2	6.5
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	65000	< 10	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00		26	18	13	15
Aromatic VPH >C5-C7	M	2780	mg/kg	0.05	70	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	M	2780	mg/kg	0.05	130	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	M	2780	mg/kg	0.05	34	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	M	2780	mg/kg	0.25		< 0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12	M	2690	mg/kg	1.00	74	12	12	6.9	3.9
Aromatic EPH >C12-C16	M	2690	mg/kg	1.00	140	19	19	9.1	12
Aromatic EPH >C16-C21	N	2690	mg/kg	2.00	260	23	23	13	13
Aromatic EPH >C21-C35	M	2690	mg/kg	2.00	1100	120	100	47	68
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	1100	15	13	9.0	10
Total Aromatic EPH >C10-C35	M	2690	mg/kg	5.00		170	150	77	97
Total VPH >C5-C10	M	2780	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35	M	2690	mg/kg	10.00		200	170	90	110
Naphthalene	M	2800	mg/kg	0.10	2.3	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	170	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	210	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	170	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	95	< 0.10	< 0.10	< 0.10	0.27
Anthracene	M	2800	mg/kg	0.10	2400	< 0.10	< 0.10	< 0.10	0.21
Fluoranthene	M	2800	mg/kg	0.10	280	0.13	0.20	0.18	0.39
Pyrene	M	2800	mg/kg	0.10	620	0.10	0.15	0.14	0.36
Benzo[a]anthracene	M	2800	mg/kg	0.10	7.2	< 0.10	< 0.10	< 0.10	0.35
Chrysene	M	2800	mg/kg	0.10	15	< 0.10	< 0.10	0.11	0.30
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	2.6	< 0.10	< 0.10	0.18	0.43
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	77	< 0.10	< 0.10	< 0.10	0.28
Benzo[a]pyrene	M	2800	mg/kg	0.10	2.2	< 0.10	< 0.10	< 0.10	0.33
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	27	< 0.10	< 0.10	< 0.10	0.31
Dibenz(a,h)anthracene	N	2800	mg/kg	0.10	0.24	< 0.10	< 0.10	< 0.10	0.28
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	320	< 0.10	< 0.10	< 0.10	0.34
Total Of 16 PAHs	N	2800	mg/kg	2.0		< 2.0	< 2.0	< 2.0	4.0
Total Phenols	M	2920	mg/kg	0.10	120	1.7	0.50	0.17	0.14
Organic Matter BS1377	N	2930	%	0.10		1.5	3.6	2.6	2.9

It can be seen from **Table 01** that all determinants tested were recorded at concentrations below the corresponding Generic Assessment Criteria (GAC) with the exception of one incident of elevated dibenz(ah)anthracene in Plot 10.

A Dibenz(ah)anthracene concentration of 0.28 mg/kg was recorded in Plot 8 although this does not exceed the GAC when corrected for the prevailing Soil Organic Matter (>2.5%).

RADON

Manning Construction have informed TFW Group that they installed Toughsheet Radon Barrier at the site. Details of the product used, and installation photos provided by Manning Construction, are presented in **Annex B**.

POTABLE WATER SUPPLY PIPE

Manning Construction have provided TFW Group Limited with correspondence from Dwr Cymru confirming 25mm barrier pipe was required at the site. The email mentions a forthcoming inspection from Dwr Cymru (see email Katy Davies (Dwr Cymru) dated 29/03/2022). This correspondence is presented in **Annex C**.

We trust that the above is to your satisfaction, however, if you have any queries or require any further information please do not hesitate to contact us.

Yours sincerely

for: Terra Firma (Wales) Ltd



Mr D Emanuel

Annex A
Soil Chemical Test Results



Final Report

Report No.: 23-08019-1

Initial Date of Issue: 22-Mar-2023

Client Terra Firma (Wales) Ltd

Client Address: 5 Deryn Court
Wharfedale Road
Pentwyn
Cardiff
CF23 7HA

Contact(s): Dave Emanuel

Project 15710a Glynneath, 15710a

Quotation No.: **Date Received:** 09-Mar-2023

Order No.: **Date Instructed:** 09-Mar-2023

No. of Samples: 2

Turnaround (Wkdays): 7 **Results Due:** 17-Mar-2023

Date Approved: 22-Mar-2023

Approved By:

Details: Stuart Henderson, Technical Manager

Results - Soil

Project: 15710a Glynneath, 15710a

Client: Terra Firma (Wales) Ltd			Chemtest Job No.:		23-08019	23-08019
Quotation No.:			Chemtest Sample ID.:		1604411	1604412
			Sample Location:		Plot 2	Plot 4
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0	0
			Bottom Depth (m):		0.6	0.6
			Date Sampled:			
			Asbestos Lab:		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
ACM Detection Stage	U	2192		N/A	-	-
Moisture	N	2030	%	0.020	18	19
Soil Colour	N	2040		N/A	Brown	Brown
Other Material	N	2040		N/A	Roots and Stones	Roots
Soil Texture	N	2040		N/A	Sand	Loam
pH	M	2010		4.0	8.6	8.7
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	0.79	0.78
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50
Sulphate (Acid Soluble)	U	2430	%	0.010	0.034	0.065
Arsenic	M	2455	mg/kg	0.5	6.3	7.1
Cadmium	M	2455	mg/kg	0.10	0.15	0.18
Chromium	M	2455	mg/kg	0.5	10	11
Mercury Low Level	M	2450	mg/kg	0.05	< 0.05	< 0.05
Copper	M	2455	mg/kg	0.50	11	12
Nickel	M	2455	mg/kg	0.50	7.8	8.5
Lead	M	2455	mg/kg	0.50	18	20
Selenium	M	2455	mg/kg	0.25	0.30	0.36
Zinc	M	2455	mg/kg	0.50	38	46
Chromium (Trivalent)	N	2490	mg/kg	1.0	10	11
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	M	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	M	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	M	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C8-C10	M	2780	mg/kg	0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	M	2780	mg/kg	0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	2.5	< 2.0
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	5.4	3.9
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	7.3	4.6
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	11	7.3
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10	< 10
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	26	18
Aromatic VPH >C5-C7	M	2780	mg/kg	0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	M	2780	mg/kg	0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	M	2780	mg/kg	0.05	< 0.05	< 0.05

Results - Soil

Project: 15710a Glynneath, 15710a

Client: Terra Firma (Wales) Ltd	Chemtest Job No.:				23-08019	23-08019
Quotation No.:	Chemtest Sample ID.:				1604411	1604412
	Sample Location:				Plot 2	Plot 4
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0	0
	Bottom Depth (m):				0.6	0.6
	Date Sampled:					
	Asbestos Lab:				DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD		
Total Aromatic VPH >C5-C10	M	2780	mg/kg	0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12	M	2690	mg/kg	1.00	12	12
Aromatic EPH >C12-C16	M	2690	mg/kg	1.00	19	19
Aromatic EPH >C16-C21	N	2690	mg/kg	2.00	23	23
Aromatic EPH >C21-C35	M	2690	mg/kg	2.00	120	100
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	15	13
Total Aromatic EPH >C10-C35	M	2690	mg/kg	5.00	170	150
Total VPH >C5-C10	M	2780	mg/kg	0.50	< 0.50	< 0.50
Total EPH >C10-C35	M	2690	mg/kg	10.00	200	170
Naphthalene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Anthracene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Fluoranthene	M	2800	mg/kg	0.10	0.13	0.20
Pyrene	M	2800	mg/kg	0.10	0.10	0.15
Benzo[a]anthracene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Chrysene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0
Total Phenols	M	2920	mg/kg	0.10	1.7	0.50
Organic Matter BS1377	N	2930	%	0.10	1.5	3.6

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8–C10 Aromatics: >C5–C7,>C7–C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
2930	Organic Matter	Organic Matter	Acid Dichromate digestion/Titration

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



Final Report

Report No.: 23-07962-1
Initial Date of Issue: 27-Mar-2023
Client Terra Firma (Wales) Ltd

Client Address: 5 Deryn Court
Wharfedale Road
Pentwyn
Cardiff
CF23 7HA

Contact(s): Dave Emanuel

Project 15710 Glynneath, 15710

Quotation No.: **Date Received:** 09-Mar-2023

Order No.: **Date Instructed:** 09-Mar-2023

No. of Samples: 3

Turnaround (Wkdays): 7 **Results Due:** 17-Mar-2023

Date Approved: 27-Mar-2023

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - Soil

Project: 15710 Glynneath, 15710

Client: Terra Firma (Wales) Ltd	Chemtest Job No.:				23-07962	23-07962	23-07962
Quotation No.:	Chemtest Sample ID.:				1604125	1604126	1604127
	Sample Location:				Plot 6	Plot 8	Plot 10
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				0	0	0
	Bottom Depth (m):				0.6	0.6	0.6
	Date Sampled:				07-Mar-2023	07-Mar-2023	07-Mar-2023
	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
ACM Detection Stage	U	2192		N/A	-	-	-
Moisture	N	2030	%	0.020	19	20	22
Soil Colour	N	2040		N/A	Brown	Brown	Brown
Other Material	N	2040		N/A	Roots	Roots	Roots
Soil Texture	N	2040		N/A	Loam	Loam	Sand
pH	M	2010		4.0	8.7	8.6	8.6
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	2.4	1.2	1.2
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Sulphate (Acid Soluble)	U	2430	%	0.010	0.053	0.063	0.046
Arsenic	M	2455	mg/kg	0.5	5.8	5.8	7.5
Cadmium	M	2455	mg/kg	0.10	0.14	0.13	0.15
Chromium	M	2455	mg/kg	0.5	8.5	9.4	9.1
Mercury Low Level	M	2450	mg/kg	0.05	0.05	0.05	< 0.05
Copper	M	2455	mg/kg	0.50	12	12	9.4
Nickel	M	2455	mg/kg	0.50	7.7	7.5	8.9
Lead	M	2455	mg/kg	0.50	16	21	15
Selenium	M	2455	mg/kg	0.25	0.30	0.30	0.36
Zinc	M	2455	mg/kg	0.50	38	43	36
Chromium (Trivalent)	N	2490	mg/kg	1.0	8.5	9.4	9.1
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	M	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	M	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	M	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C8-C10	M	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	M	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	2.3	2.3	2.3
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	2.1	2.5	1.7
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	3.4	3.8	5.2
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	5.2	6.5	7.4
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	13	15	17
Aromatic VPH >C5-C7	M	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	M	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	M	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	M	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25

Results - Soil

Project: 15710 Glynneath, 15710

Client: Terra Firma (Wales) Ltd	Chemtest Job No.:				23-07962	23-07962	23-07962
Quotation No.:	Chemtest Sample ID.:				1604125	1604126	1604127
	Sample Location:				Plot 6	Plot 8	Plot 10
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				0	0	0
	Bottom Depth (m):				0.6	0.6	0.6
	Date Sampled:				07-Mar-2023	07-Mar-2023	07-Mar-2023
	Asbestos Lab:				DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD			
Aromatic EPH >C10-C12	M	2690	mg/kg	1.00	6.9	3.9	7.8
Aromatic EPH >C12-C16	M	2690	mg/kg	1.00	9.1	12	5.8
Aromatic EPH >C16-C21	N	2690	mg/kg	2.00	13	13	16
Aromatic EPH >C21-C35	M	2690	mg/kg	2.00	47	68	75
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	9.0	10	11
Total Aromatic EPH >C10-C35	M	2690	mg/kg	5.00	77	97	100
Total VPH >C5-C10	M	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35	M	2690	mg/kg	10.00	90	110	120
Naphthalene	M	2800	mg/kg	0.10	< 0.10	< 0.10	0.12
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	< 0.10	0.13	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	< 0.10	0.27	0.17
Anthracene	M	2800	mg/kg	0.10	< 0.10	0.21	0.24
Fluoranthene	M	2800	mg/kg	0.10	0.18	0.39	0.36
Pyrene	M	2800	mg/kg	0.10	0.14	0.36	0.38
Benzo[a]anthracene	M	2800	mg/kg	0.10	< 0.10	0.35	0.51
Chrysene	M	2800	mg/kg	0.10	0.11	0.30	0.66
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	0.18	0.43	0.40
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	< 0.10	0.28	0.43
Benzo[a]pyrene	M	2800	mg/kg	0.10	< 0.10	0.33	0.50
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	< 0.10	0.31	0.48
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	0.28	0.56
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	< 0.10	0.34	0.41
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	4.0	5.2
Total Phenols	M	2920	mg/kg	0.10	0.17	0.14	< 0.10
Organic Matter BS1377	N	2930	%	0.10	2.6	2.9	3.2

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8–C10 Aromatics: >C5–C7,>C7–C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
2930	Organic Matter	Organic Matter	Acid Dichromate digestion/Titration

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

PLATES



Plate 01. Plot 2



Plate 02. Plot 4



Plate 03. Plot 6



Plate 04. Plot 8



Plate 05. Plot 10

Annex B
Radon Barriers and Photos

DECLARATION OF PERFORMANCE CERT- 99/3603.

TOUGHSHEET RADON /GAS BARRIER – EN13967

Usage, 400/500 micron Flexible Sheeting to be used for water proofing and gas control in solid concrete floors that are not subject to hydrostatic pressure from the ground.

SPECIFICATION- CFS -2MT/ 4MT X 20MTS X 400MICRON

CFS -2MT/ 4MT X 12.5MTS X 500MICRON

THICKNESS -EN12311	400mu Amber1	500mu AMBER 2
LENGTH – EN1848-2	20 MTS - 0 + 5%	12.5 MTS - 0 +5%
WIDTH – EN1842-2	4MT - 0 + 10%	4MT - 0 + 10%
DROP DART-EN12691	30 MLV	30MLV
WATER TIGHTNESS	BBA PASS.	
STATIC LOADING	BBA PASS	
DURABILITY / AGED	BBA PASS	
MASS BBA TEST.	368 MLV	460 MLV

GAS TRANSMISSION RATE: 2015

Rapra ASTM-D1434/2009.	23 ± 2°C	-Report.
Methane transmission	321+	222+
Carbon Dioxide Transmission	1077+	771+
Radon- K124/02/95	0.2 x 10 ⁻¹¹ m2 .5 ⁻¹	

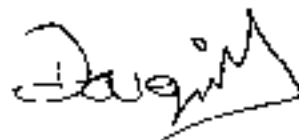
F mercer & sons hold current CE markings and harmonized EN13967 standard.
NHBC standards 2016 has accepted Toughsheet Radon Barrier when installed
In accordance with NHBC standards, this product must be laid in accordance
Of the BRE report – BRE 211:2015. See guidance.

This product must be stored flat and undercover from direct sunlight.

Certificate of factory production control- 0836-CPR-13F030.

Singed for and on behalf of manufacturer.

Signed

A handwritten signature in black ink, appearing to read 'Dugan', written over a horizontal line of small, repeating characters.

dated

4-8-20









Frank Mercer & Sons Ltd

Chequerbent Works
Manchester Road
Chequerbent
Westhoughton
Bolton
Lancashire BL5 3JF



Tel: 01942 841111 Fax: 01942 842388

e-mail: sales@toughsheet.co.uk

website: www.toughsheet.co.uk

Agrément Certificate

99/3603

Product Sheet 2

FRANK MERCER MEMBRANES

TOUGHSHEET RADON BARRIER

This Agrément Certificate Product Sheet⁽¹⁾ relates to Toughsheet Radon Barrier, for use as a low-density polyethylene radon 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 and radon 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 gas 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 during the lifetime of the flooring construction in which it is installed (see section 12).



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 Second issue: 15 June 2017

John Albon – Head of Approvals
Construction Products

Claire Curtis-Thomas
Chief Executive

Originally certificated on 7 November 2016

Certificate amended on 18 March 2020 to update membrane thickness and associated text, and NHBC Standards.

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.bbacerts.co.uk

Readers MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

British Board of Agrément

Bucknalls Lane
Watford
Herts WD25 9BA

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Page 1 of 8

tel: 01923 665300
clientservices@bbacerts.co.uk
www.bbacerts.co.uk

Regulations

In the opinion of the BBA, Toughsheet Radon 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:		When properly installed in a correctly-designed structure, the product forms an effective barrier to radon gas enabling compliance with 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 section 6 of this Certificate.
Regulation:	7(1)	Materials and workmanship
Comment:		The product is of an acceptable material. See section 12.1 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 12.1 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 this Standard, 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 section 6 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 12.1 and the <i>Installation</i> part of this Certificate.
Regulation:	26	Site preparation and resistance to contaminants
Comment:		When properly installed in a correctly-designed structure, the product forms an effective barrier to radon gas enabling compliance with this Requirement. 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 section 6 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 2020

In the opinion of the BBA, Toughsheet Radon Barrier, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements 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.

Technical Specification

1 Description

1.1 Toughsheet Radon Barrier is a blown film of extruded low-density polyethylene (LDPE).

1.2 The membrane has the following nominal characteristics:

Thickness (mm)	0.4, 0.5
Roll length (m)	20, 12.5
Roll width (m)	4
Mass per unit area (g·m ⁻²)	368, 460
Watertightness	pass
Durability (artificial ageing)	pass
Durability (alkali)	pass
Colour	yellow.

1.3 Ancillary products for use with the membrane include:

- double-sided butyl tape — for use in joints and laps
- jointing tape — for securing laps and joints.

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.

2.3 The management system of Frank Mercer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by ISOQAR (Certificate 2092QM-001).

3 Delivery and site handling

3.1 Rolls of the membrane are packed in wrappers bearing labels with the product name and the BBA logo incorporating the number of this Certificate. Rolls are supplied shrink-wrapped and on pallets.

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 Toughsheet Radon barrier.

Design Considerations

4 Use

4.1 Toughsheet Radon Barrier is satisfactory for use as a gas-resistant barrier to restrict the ingress of radon into buildings from naturally-occurring sources.

4.2 Buildings in areas of risk should be constructed in accordance with the recommendations of BRE Report BR 211 : 2015 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 3, BS 8000-0 : 2014 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 and will enable a floor to comply with the requirements of the national Building Regulations.

6.2 The membranes will comply with the minimum sheet thickness detailed in the documents supporting the national Building Regulations.

7 Resistance to underground gases



7.1 The product will restrict the ingress of radon into buildings from naturally-occurring sources.

7.2 Measured gas permeability/diffusion value on an unjointed membrane is given in Table 1.

Table 1 Gas permeability of Toughsheet Radon Barrier

Gas	Method	Result
Radon	K124/02/95	$0.2 \times 10^{-11} \text{ m}^2 \cdot \text{s}^{-1}$

7.3 In the opinion of the BBA, the membrane satisfies the criteria for a radon gas-resistant membrane of BRE Report BR 211 : 2015.

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 is compatible with other materials and products typically used in the same areas.

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 Maintenance

As the membrane is confined under concrete and has suitable durability (see section 12), maintenance is not required. However, any damage occurring before enclosure must be repaired (see section 16).

12 Durability



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

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

13 Reuse and recyclability

The product comprises polyethylene, which can be recycled.

14 General

14.1 Toughsheet Radon Barrier must be installed and fixed in accordance with the Certificate holder's instructions and the relevant Clauses of BRE Report BR 211 : 2015.

14.2 The membrane can be installed in all normal site conditions, provided that the air temperature is not below 5°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, 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 the application of the butyl tape. 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 as soon as possible after installation. If blockwork protection is used, care must be taken to avoid damage to the membrane during construction.

16 Repair

Any damage to the product must be repaired using a patch of the membrane, and laps 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, and should be subject to third-party validation, in accordance with BS 8485 : 2015.

Technical Investigations

17 Tests

17.1 Tests were carried out on Toughsheet Radon Barrier and the results assessed to determine:

- dimensions
- density
- water vapour resistance
- water vapour permeability.

17.2 Test were carried out on a product of similar composition and the results assessed to determine:

- dart impact
 - tensile strength and elongation
 - low temperature flexibility
 - nail tear
 - trouser tear
 - dimensional stability
 - heat ageing at 80° for 56 days followed by tensile strength, elongation and nail tear
 - short term UV ageing followed by tensile strengths and elongation
-
- tensile strength of joints
 - heat ageing of joints at 60° for 28 days followed by tensile strength and elongation.

18 Investigations

18.1 An evaluation was made of the results of the test data regarding permeability of radon.

18.2 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 8000-0 : 2014 *Workmanship on building sites — Introduction and general principles*

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 EN ISO 9001 : 2015 *Quality management systems — Requirements*

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*

BRE Report BR 211 : 2015 *Radon: Guidance on protective measures for new buildings*

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 or 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.

Double Sided Mastic Tape

Product Description

- Synthetic rubber based extruded bonding and sealing strip
- Medium to hard composition
- Carefully selected fillers to provide good stability at higher temperatures

Applications

- Lap joining of plastic sheeting such as DPCs and DPMs
- Sealing of panels in water storage tanks
- Higher specification roofing applications such as rooflight manufacture
- Sealing of caravan rails such as awning and gutter details

Technical Performance

Description	Units	Value	Test Method
Specific Gravity	g/cm ³	1.5	In House
Shear Adhesion	N/cm ²	22	In House
180° Peel Adhesion (1mm thick)	N/cm	24	In House
Force to compress by 20%	N/cm ²	7	In House

Performance Characteristics

Application Temperature	>4°C
Service Temperature	-40°C to +90°C
UV Resistance	Good
Chemical Resistance	Good to dilute acids and alkalis

Surfaces should be clean, dry and free from oil or grease

Features and Benefits

- Easy and accurate to use with little waste and no mess
- Can be supplied in roll form or ready-cut pads
- Approvals include WRC (portable water contact) for black version
- Black or white are standard colours. Others subject to minimum order quantity.

Storage Details

- Shelf Life is 2 years at 5 -25°C in dry conditions (in original packaging)



Accredited

Reprocessor
DOE ER199846

Valpak

2001 Challenge
Award Winner
Recycling

Annex C
Welsh Water Correspondence

Archived: 31 March 2023 08:59:30
From: [New Connections](#)
Sent: Tue, 29 Mar 2022 12:01:07
To: [Stephen Euston](#)
Subject: RE: Maes - y -Parc, SA11 5EH - Welsh Water
Sensitivity: Normal
Attachments:
[WMR0002574-001-C01.pdf](#) 

Afternoon Stephen

I can confirm 25mm barrier pipe is needed due to contaminated land one of our water regulations inspectors will be out to inspect the pipework has been laid to a minimum depth of 750mm

The trench is open, or...

The trench isn't open, but I have created inspection holes along the trench and excavated both ends

You've made sure there'll be nothing obstructing our access onto the site such as skips or scaffolding

The pipe can go in any route from the plot to the green marking on the mains design

Thank you



Katy Davies

Developer Services Advisor | Developer Services | Dwr Cymru Welsh Water

Extension number: 58008

T: 0800 917 2652

A: PO Box 3146, Cardiff, CF30 0EH



W: dwrcymru.com



E: developer.services@dwrcymru.com



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Did you know you can now apply for and track applications online via our new Developers portal? Find out more [here](#).

From: Stephen Euston <SEuston@manning-online.com>
Sent: 28 March 2022 14:36
To: New Connections <New.Connections@dwrcymru.com>
Subject: RE: Maes - y -Parc, SA11 5EH - Welsh Water

***** External Mail *****

Katy,

Good afternoon,

Thank you for your time last week, just wanted to confirm our conversation

- 25mm barrier pipe to be used from the property to connection point

- Excavation to be inspected by Welsh water
- Excavation to be 750mm in depth

On the drawing there is no detail of the connection route, I assume it's from the meters , can these be relocate to suit the duct entries.

I will mark up a drawing and send it through

Best Regards

Stephen Euston

Managing Director

Manning Construction Limited

Tel: 01656 862333

Fax: 01656 861439

Mob: 07773 356084

www.manning-online.com



 Please consider the environment before printing this email

From: New Connections <New.Connections@dwrcymru.com>

Sent: 15 March 2022 12:58

To: Stephen Euston <SEuston@manning-online.com>

Subject: Maes - y - Parc, SA11 5EH - Welsh Water

Good Afternoon

Please see attached quote and the mains design attached for plots 1-10 at Maes - y - Parc, SA11 5EH.

Any questions please let me know

Thank you



Katy Davies

Developer Services Advisor | Developer Services | Dwr Cymru Welsh Water

Extension number: 58008

T: 0800 917 2652

A: PO Box 3146, Cardiff, CF30 0EH



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Did you know you can now apply for and track applications online via our new Developers portal? Find out more [here](#).

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