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Ref: 14-255-L1
Date: 5th August 2021

Multimaq Limited
Unit 6 Pacific Park
Bridge Road North
Wrexham Industrial Estate
Wrexham
LL13 9PN

BY Email

Dear Sirs

GROUND GAS MITIGATION PACIFIC PARK, WREXHAM

BACKGROUND AND OBJECTIVES

E3P has been recently completed a phase of intrusive ground investigation works at the site known as Pacific Park, Wrexham. The previous reports are as follows:

-  Phase I Geoenvironmental Site Assessment – Report Ref: 14-255-R1-1, dated July 2020;
-  Phase II Geoenvironmental Site Assessment – Report Ref: 14-255-R2-1, dated May 2021;
-  Ground Gas Addendum Report – Report Ref: 14-255-R3-1, dated July 2021; and,
-  Remediation and Enabling Works Strategy – Report Ref: 14-255-R4-1, dated July 2021.

As part of the works previously completed at the site, a phase of ground gas monitoring has been completed with the results summarised within the Ground Gas Addendum Report. The findings of the assessment considered the site to be characterised as characteristic situation 2 (CS2), and given the proposed development 1.5 points are required as detailed within BS8485 (2015)+A1(2019).

PROPOSED GROUND GAS MITIGATION MEASURES

The proposed full sub-structure design detail is currently being designed however it is understood that a cast in-situ reinforced concrete slab, 175mm in thickness will be utilised. The sub-structure design detail will be included with the validation report of the mitigation measures.



The ground gas mitigation measures will comprise a gas resistant membrane which will meet the requirements of CS2. The installation of the membrane will provide 2 points in line with BS8485 (2015)+A1(2019) and will therefore provide a sufficient score for the required protection. The membrane specification likely to be utilised is appended to this letter report.

The ground gas membrane will be installed by the contractors' specialists and independently validated by E3P where a validation certificate will be issued.

Yours sincerely,

For and on behalf of E3P Ltd

Rebecca Hodnett
Senior Geoenvironmental Consultant





ACS Business Centre
2-4, Middleton Road,
Heywood, Rochdale OL10 2HT
Tel: 01706 628524 Fax: 01706 628318



CE MARK TO EN 13967

ACS GAS RESISTANT MEMBRANE

ACS Gas Resistant Membrane 2019 is a Ground Gas Barrier Membrane that has been designed and developed as a solution to today's construction problems with contaminated land. The material is manufactured using a foil core, backed with an interweaved Polywoven 10 x 12 denier scrim reinforcement, which gives it one of the highest puncture resistance and tensile and tear strengths of any comparable product on the market. ACS Gas Resistant Membrane has been specifically designed as a Methane / Carbon Dioxide / Radon protection membrane to deal with both CS2 situations and NHBC Amber 1 & 2, which when combined with ACS Gasflow Venting products and our innovative designs, can deal with the full range of Characteristic Situations from CS2 to CS6.

ACS Gas Resistant Membrane has been at the forefront of installation throughout the UK for over 25 years with jobs ranging from CS2 to CS6 requirements and is a cost-effective solution to current contaminated land problems. From a simple house plot, to a 120,000m² distribution depot, ACS Gas Resistant Membrane remains a market leader for installation throughout the UK.

PRODUCT DATA SHEET

Characteristics	Test Method	Units	Compliance	Values
Visible Defects	Physical Test		Pass/Fail	Pass
Length	Physical Test	M	Pass/Fail	Pass 50 mt
Width	Physical Test	M	Pass/Fail	Pass 1.6 mt
Puncture Resistance	ASTM F1306	N	3.3mm plunger	108
Tensile Strength (MD)	12311-1	N/50mm	-	675
Tensile Strength (CMD)	12311-1	N/50MM	-	530
Tensile Elongation (MD)	12310-1	%	-	18
Tensile Elongation (CMD)	12310-1	%	-	18
Nail Shank Tear (MD)	12310-1	N	-	350
Nail Shank Tear CMD	12310-1	N	-	420

BS 8485:2015 TESTING REQUIREMENTS

Methane Permeability	BS EN ISO 15105-1	<40 ml/m ² /day/atm	Pass/Fail	Pass
Carbon Dioxide	BS EN ISO 15105-1	<40 ml/m ² /day/atm	Pass /Fail	Pass
Thickness	EN 1849-2	mm	-3%+/3%	.4
Mass	EN 1849-2	g/m ²		400

COMPLIANCE AND CERTIFICATION

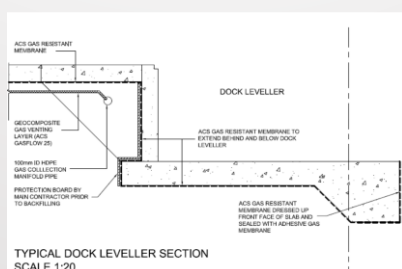
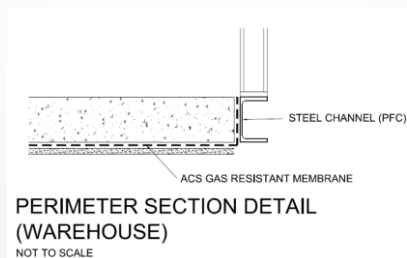
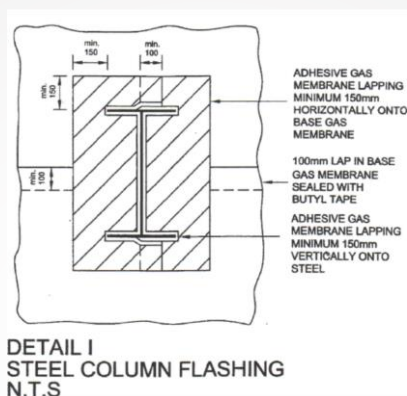
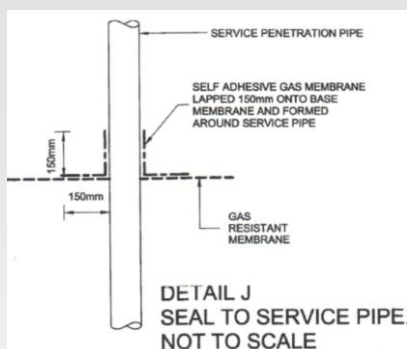
BS 8485: 2015 COMPLIANT

CE MARK – EN13967:2012

NHBC STANDARDS COMPLIANT

Company Reg No. 2956502
VAT No. 652 5326 44

TYPICAL DETAILS



ACS Business Centre
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Tel: 01706 628524 Fax: 01706 628318

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ACS GAS RESISTANT MEMBRANE

HANDLING AND STORAGE

Rolls of ACS Gas Resistant Membrane should be stored on stable/level ground and stacked no more than five rolls high, with no other material stored on top and protected from exposure to UV Light.

Rolls weigh in excess of 20kg therefore appropriate care and equipment is required for unloading and handling.

INSTALLATION

ACS Gas Resistant Membrane should be installed in accordance with best practise and guidance contained within BS 8485:2015.

JOINTING AND SEALING

ACS Gas Resistant Membrane can be taped using ACS Butyl Tape or heat welded. Joints should be overlapped by at least 100mm and installed by ACS Lining's Employees who are qualified and fully trained to NVQ Level 2.

ACCESSORY PRODUCTS

ACS Lining Ltd has wide range of products to use in conjunction with ACS Gas Resistant Membrane. These include:

- ACS Butyl Tape
- ACS Self Adhesive Membrane
- ACS Preformed Top Hats and Corners
- ACS Gas Vent Sheet (25/50)

ADDITIONAL INFORMATION

Additional information can be obtained by contacting ACS Lining Ltd directly on 01706 628524 or enquiries@acslining.co.uk

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VAT No. 652 5326 44