

Gas Membrane Installation
Validation Report
Marbank Limited
Harts Farm
Havant
PO9 1HU

1. INTRODUCTION

1.1 Purpose

NEA CONTRACTS are installing a gas protection membrane to the aforementioned site. MEC Environmental Ltd (MEC) has been appointed by NEA CONTRACTS to carry out independent validation of the installation of the membrane on the site.

1.2 Limitations

(MEC) has prepared this report in accordance with the instructions of NEA CONTRACTS ("the Client") under the terms of its appointment for the gas membrane validation/inspections and report.

This report is limited to the verification that the gas membrane measures are correctly installed. MEC Environmental Ltd have not carried out any design work in respect of the gas protection measures prescribed for this site and therefore no professional liability is extended in respect of the gas protection design.

This report has been prepared in accordance with the best available practise and the relevant guidance documents listed below of which the author of the report was a contributor and member of the steering committees:

Chartered Institute of Environmental Health (2008). "The local authority guide to ground gas".

Mallett H, Wilson S, Corban M (2014) "Good practice on the testing and verification of protection systems for buildings against hazardous ground gases". CIRIA Report C735

This report and its contents should not be used for any purpose other than that for which it was prepared and provided. Should the Client require to pass copies of the report to other parties for information, the whole of the report should be so copied, but no professional liability or warranty shall be extended to other parties by MEC in this connection without the explicit written agreement thereto by MEC.

1.3 Method

The Validation Consultant visually inspected 100% of the surface area of the gas membrane to identify any holes, areas of bridging and defects in the gas membrane and ancillary products.

The Validation Consultant then integrity tested (air lance) 100% of all joints and seams of the gas membrane, acoustic details, pipe penetrations and corner details.

1.4 Equipment

Electronic Tablet (Ipad), Tape Measure, Air lancing Equipment and PPE

1.5 Identification

All seams and non-seam areas of the gas membrane were inspected/tested as per 1.3 by the Validation Consultant for identification of defects, protruding and penetrating objects, lack of subgrade support, overheating, holes, blisters, undispersed raw materials, scratches and gouges, and any sign of contamination by foreign matter.

Any portion of the gas membrane exhibiting a flaw, or failing a visual inspection/testing was repaired. Several procedures exist for the repair of these areas. The final decision as to the appropriate repair procedure was agreed upon between the Validation Consultant and the Installer at the time of the repair and is noted in the survey sheets.

Each repair was visually inspected/tested, repairs passing the inspection/testing were considered acceptable. The Validation Consultant carried out all visual inspections/testing of repairs and recorded the type and result of the repairs on the survey report, prior to taking sample photos which are presented in section 1.8

1.6 Validators Experience

(See Appendix 1)

1.7 Survey Sheets

Verification of gas protection measures

Site name: Marbank Limited, Harts Farm, Havant, Hants		Units/ plots checked: Units 3&4 100% Total Floor Area	
Postcode: PO9 1HU			
Installers Name: NEA CONTRACTS			
Date: 12/12/2018			
Inspection by: Dan Squire		Weather at time of inspection: 09°C Dry	
	Item	Comments	
	Sub-floor void	Not applicable	
	Ventilation Inlets and Outlets	Not applicable	
	Materials used:	Juta GP1 gas membrane	
		Self-Adhesive Membrane ☒ Yes ☐ No ☐ N/A	Preformed Top hats ☐ Yes ☒ No ☐ N/A
		Double Sided Butyl Tape ☒ Yes ☐ No ☐ N/A	Preformed Corners ☐ Yes ☒ No ☐ N/A
		Others Please List: Butyl tape	
Installation Notes	<u>(brief description of area/plots and list of defects/repairs identified to the main membrane sheet, excluding detailing and joints)</u> MEC Environmental Ltd carried out a thorough visual inspection of the membrane installed to a good standard as a full line out to the area denoted above. >100+ patch repairs made by the installers during the inspection using self-adhesive gas membrane and butyl tape as part of their CQA to repair damage caused by follow on trades throughout the main floor membrane. Have any defects identified above been satisfactorily rectified ☒ Yes ☐ No No remedial or further remedial work required at the time of inspection ☒		
Type of Joint	Tape Joint ☐	Auto Weld ☐	Hand Weld ☒ Extrusion Weld ☐

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Verification of gas protection measures

Site name: Marbank Limited, Harts Farm, Havant, Hants		Units/ plots checked: Units 1 and 2 Office areas	
Postcode: PO9 1HU			
Installers Name: NEA CONTRACTS			
Date: 23/01/2019			
Inspection by: Dan Squire		Weather at time of inspection: 04°C Dry	
	Item	Comments	
	Sub-floor void	Not applicable	
	Ventilation Inlets and Outlets	Not applicable	
	Materials used:	Juta GP1 gas membrane	
		Self-Adhesive Membrane ☒ Yes ☐ No ☐ N/A	Preformed Top hats ☐ Yes ☐ No ☐ N/A
		Double Sided Butyl Tape ☐ Yes ☐ No ☐ N/A	Preformed Corners ☐ Yes ☐ No ☐ N/A
		Others Please List:	
Installation Notes	<u>(brief description of area/plots and list of defects/repairs identified to the main membrane sheet, excluding detailing and joints)</u> MEC Environmental Ltd carried out a thorough visual inspection of the membrane installed to a good standard as a perimeter and part infill on the areas denoted above. Have any defects identified above been satisfactorily rectified ☐ Yes ☐ No ☒ N/A No remedial or further remedial work required at the time of inspection ☒		
Type of Joint	Tape Joint ☐	Auto Weld ☐	Hand Weld ☒ Extrusion Weld ☐
Jointing/Detailing Testing	☒ Air Lance (ASTM D4437)		☒ Probe Test (ASTM D4437)

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Verification of gas protection measures

Site name: Marbank Limited, Harts Farm, Havant, Hants		Units/ plots checked: Units 3 re-inspection/repairs	
Postcode: PO9 1HU			
Installers Name: NEA CONTRACTS			
Date: 07/02/2019			
Inspection by: Dan Squire		Weather at time of inspection: 05°C Dry	
	Item	Comments	
	Sub-floor void	Not applicable	
	Ventilation Inlets and Outlets	Not applicable	
Materials used:	Juta GP1 gas membrane		
	Self-Adhesive Membrane ☒ Yes ☐ No ☐ N/A	Preformed Top hats ☐ Yes ☐ No ☒ N/A	
	Double Sided Butyl Tape ☐ Yes ☐ No ☒ N/A	Preformed Corners ☐ Yes ☐ No ☒ N/A	
	Others Please List:		
Installation Notes	<u>(brief description of area/plots and list of defects/repairs identified to the main membrane sheet, excluding detailing and joints)</u> MEC Environmental Ltd carried out a thorough visual inspection of the remedial work carried out to a good standard on the areas denoted above. Prior to the inspection, the installers laid extra membrane and placed >50 No. patch repairs using self-adhesive gas membrane to repair damages caused by follow on trades. Have any defects identified above been satisfactorily rectified ☒ Yes ☐ No ☐ N/A No remedial or further remedial work required at the time of inspection ☒		

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Verification of gas protection measures

Site name: Marbank Limited, Harts Farm, Havant, Hants Postcode: PO9 1HU		Units/ plots checked: Units 1 & 2, Pour area – Gridlines A-F, 1-6, Unit 1 Office area Gridlines G-J 1-2 Approximately 60% of total floor area Approximately 90%perimeter prepared	
Installers Name: NEA CONTRACTS			
Date: 22/02/2019			
Inspection by: Dan Squire		Weather at time of inspection: 08°C Fine	
	Item	Comments	
	Sub-floor void	Not applicable	
	Ventilation Inlets and Outlets	Not applicable	
	Materials used:	Juta GP1 gas membrane	
		Self-Adhesive Membrane ☒ Yes ☐ No ☐ N/A	Preformed Top hats ☐ Yes ☒ No ☐ N/A
		Double Sided Butyl Tape ☒ Yes ☐ No ☐ N/A	Preformed Corners ☐ Yes ☒ No ☐ N/A
		Others Please List:	
	Installation Notes	<u>(brief description of area/plots and list of defects/repairs identified to the main membrane sheet, excluding detailing and joints)</u> MEC Environmental Ltd carried out a thorough visual inspection the areas denoted above. Installation completed to a good standard. Membrane installed on a just in time basis in front of a laser screeding machine. Perimeter preparation, membrane sealed to cladding upstand using self-adhesive gas membrane. Unit 1 office area, and holes identified caused by follow on trades. Repaired/sealed by installer using patches of self-adhesive gas membrane. Shuttering pin being sealed using double-sided butyl tape. Have any defects identified above been satisfactorily rectified ☒ Yes ☐ No ☐ N/A No remedial or further remedial work required at the time of inspection ☒	

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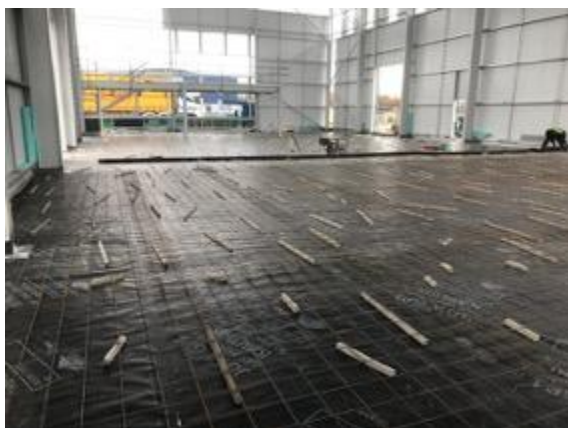
Photographs



12/12/18



12/12/18



12/12/18



12/12/18



12/12/18



12/12/18



12/12/18



23/01/19



23/01/19



23/01/19



23/01/19



23/01/19



23/01/19



07/02/19



07/02/19



07/02/19



07/02/19



22/02/19



22/02/19



22/02/19



22/02/19



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22/02/19

The installation has **PASSED** inspection and a further inspection is not required to these plots.

The installers all hold the NVQ Level 2 “Gas membrane Installations” qualification and as such are classed as a qualified and experienced installer. MEC Environmental have checked the CSCS Trade Cards of the installers, which confirms the holder has attained the qualification.

The frequency and number of independent visits and inspection regime employed is broadly in line with Annex 1 of CIRIA C735.

Signed:
Director



Date: 22/02/2019

MEC Environmental Ltd

Appendix 1

Consultants Gas Protection Specific Experience:

Michael Corban

10 years Building Surveyor (Blackburn Borough Council)

2 years Surveyor (Environmental Protection Group)

4 years Geo-engineering Technical Manager (APG Ltd)

2 years Geo-engineering Technical Manager (Geosolutions Ltd)

8 Years Technical Director (MEC Environmental Ltd)

Member of Technical Committee Published Guidance and Papers

1) Ciria 665 "Assessing risks posed by hazardous ground gases" (Steering Group Member Non-Funder)

2) Ciria C716 "Remediating and Mitigating risks from volatile organic compound (VOC) vapours from land affected by contamination" (Steering Group Member Non-Funder)

Author of Published Guidance and Papers

1) Chartered Institute of Environmental Health Card G & Wilson S **"Local Authority Ground Gas Handbook"** (Text Contributor and Peer Review Committee)

2) Corban M & Wilson S 2012 **"Gas membranes and the requirements of CIRIA C665/British Standard BS8485"** (co-author)

3) Corban M & Wilson S 2012 **"Gas Membrane Tracer Gas Testing Trial"** (co-author)

4) Mallet H, Taffel-Andureau L, Wilson S & Corban M **Ciria 735 "Good Practice on the testing and verification of protection systems for buildings against hazardous ground gases"** (co-author)

5) Consultant to Construction Skills CITB - co-author of the **Cskills NVQ Level 2 syllabus for "Gas membrane Installation and Integrity Testing apprenticeship and Up-skilling Courses"**

Gas Protection Specific Qualifications

- 1) The Welding Institutes **"Geomembrane Welding Training and Inspection Course"**
- 2) BGA & Construction skills **"Quality Controls of Inspection and Validations of Gas Membrane Installations"**
- 3) Radon Council (Approved Designer)
- 4) Co-Author of the syllabus and Instructor of the BGA & Construction Skills Training Course **"Quality Controls of Inspection and Validations of Gas Membrane Installations"**
- 5) Construction Skills CITB **"Cskills "Gas membrane Installation Up-skilling Course"**

Associations

British Geomembrane Association (BGA)

Construction Related Qualifications

- ONC Building Construction (Blackburn College 1989-91)
- HNC Building Construction (Blackburn College 1991-93)