



Reference: **024-23-446.2872**

Date: **10th May 2023**

Keytec Geomembranes Ltd

Unit 6 Plover Close
Interchange Park
Newport Pagnell
Buckinghamshire
MK16 9PS

For the attention of: **Mr Gary Burgess**

**VALIDATION OF GAS PROTECTION MEASURES
PLOTS 125 TO 137
MARKFIELD ROAD, RATBY**

Dear Gary,

Further to your instructions we present the gas protection validation report for the installation of gas protection measures for Plots 125 to 137 at the above named site.

1.0 INTRODUCTION

The site is located to the north-east of Markfield Road approximately 0.15km to the north of Ratby village centre. The site is an active development site.

The development comprises the construction of approximately one hundred and sixty-eight semi-detached and terraced residential properties. The buildings are to be constructed with conventional foundations with a suspended beam and block floor slab with associated ventilated sub-floor void. Only Plots 125 to 145 are required to include gas protection measures.

ASL have previously completed a Gas Protection Verification Plan (report reference 024-23-446.2833, dated 13th March 2023). This current report should be read in conjunction with the ASL Verification Plan.

ASL were requested to undertake independent validation of the installation of gas protection measures completed by Keytec Geomembranes Ltd.

The following measures have been incorporated into the construction scheme.

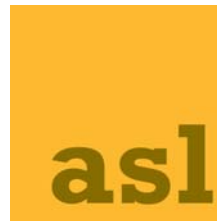
- Keytec 400 HP gas membrane installed to reasonable levels of workmanship;
- Passive ventilation of the subfloor void beneath suspended ground floor slab;
- CQA of installation works with independent validation.

2.0 VALIDATION WORKS

The site has been visited on three occasions to inspect the relevant plots between 2nd February 2023 and the 27th March 2023 as detailed below:

- 2nd February 2023 – Inspection of Plots 125 to 129;
- 1st March 2023 – Inspection of Plots 130 to 131 and 134 to 137;
- 27th March 2023 – Inspection of Plots 132 to 133.

The validation visits comprised visual inspection of the placement of the gas resistant membrane, the welding of joints, sealing of penetrations through the membrane and the general standard of



the installation works completed. Inspections of the installed passive ventilation were also completed.

3.0 INSPECTION FINDINGS

The findings of the inspections are as follows:

The membrane installed was a Keytec 400 HP gas resistant membrane together with Keytec Keyflex Self Adhesive Gas Membrane (SAGM) in general accordance with the Verification Plan. Photographs showing the general membrane installation are included in Appendix I and records of the site inspections are included in Appendix II.

The membranes have been installed to an appropriate standard with all joints and penetrations sealed. The defects identified during the inspections were repaired by Keytec Geomembranes Ltd installers to the satisfaction of the ASL validator during inspection.

The general standard of the installation works was good and care was being taken to protect the membrane during the installation works.

The subfloor void has been installed at all plots with periscopic vents installed to connect the subfloor void with vent bricks around the perimeter of the buildings.

Further to these inspections we can confirm that the gas protection measures installed within Plots 125 to 137 of the development meet the requirements of the Verification Plan and have been installed to an appropriate standard.

We trust this meets with your requirements and please contact us with any queries.

Yours sincerely
for **ASL**

ASHLEY MEHAFFY
Geo-environmental Scientist

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Certified holder of ABBE Level 4 NVQ Diploma in Verification of Ground Gas Protection Systems (143617)

Encl.

Appendix I: Photographs
Appendix II: Validation Inspection Reports
Appendix III: Keytec Geomembranes Limited Sign off Sheets





APPENDIX I

PHOTOGRAPHS

Plate 1 Plots 125 to 127 – Membrane (02/02/2023)



Plate 2 Plots 125 to 127 – Passive Vent Boxes (02/02/2023)



Plate 3 Plots 125 to 127 – Sealed Joint (02/02/2023)



Plate 4 Plots 128 to 129 – Corner Detail (02/02/2023)



Plate 5 Plots 128 to 129 – Sealed Penetrations (02/02/2023)



Plate 6 Plots 125 to 127 – Sealed Penetrations (02/02/2023)



Plate 7 Plots 130 to 131 – Membrane (01/03/2023)



Plate 8 Plots 130 to 131 – Sealed Joint and Penetration (01/03/2023)



Plate 9 Plots 134 to 137 – Membrane (01/03/2023)



Plate 10 Plots 134 to 137 – Sealed Penetrations and Corner Detail (01/03/2023)



Plate 11 Plots 133 to 131 – Corner Detail (01/03/2023)



Plate 12 Plots 134 to 137 – Sealed Penetrations and Corner Detail (01/03/2023)



Plate 13 Plots 132 to 133 – Membrane (27/03/2023)



Plate 14 Plots 132 to 133 – Passive Vent Boxes (27/03/2023)



Plate 15 Plots 132 to 133 – Sealed Joint (27/03/2023)



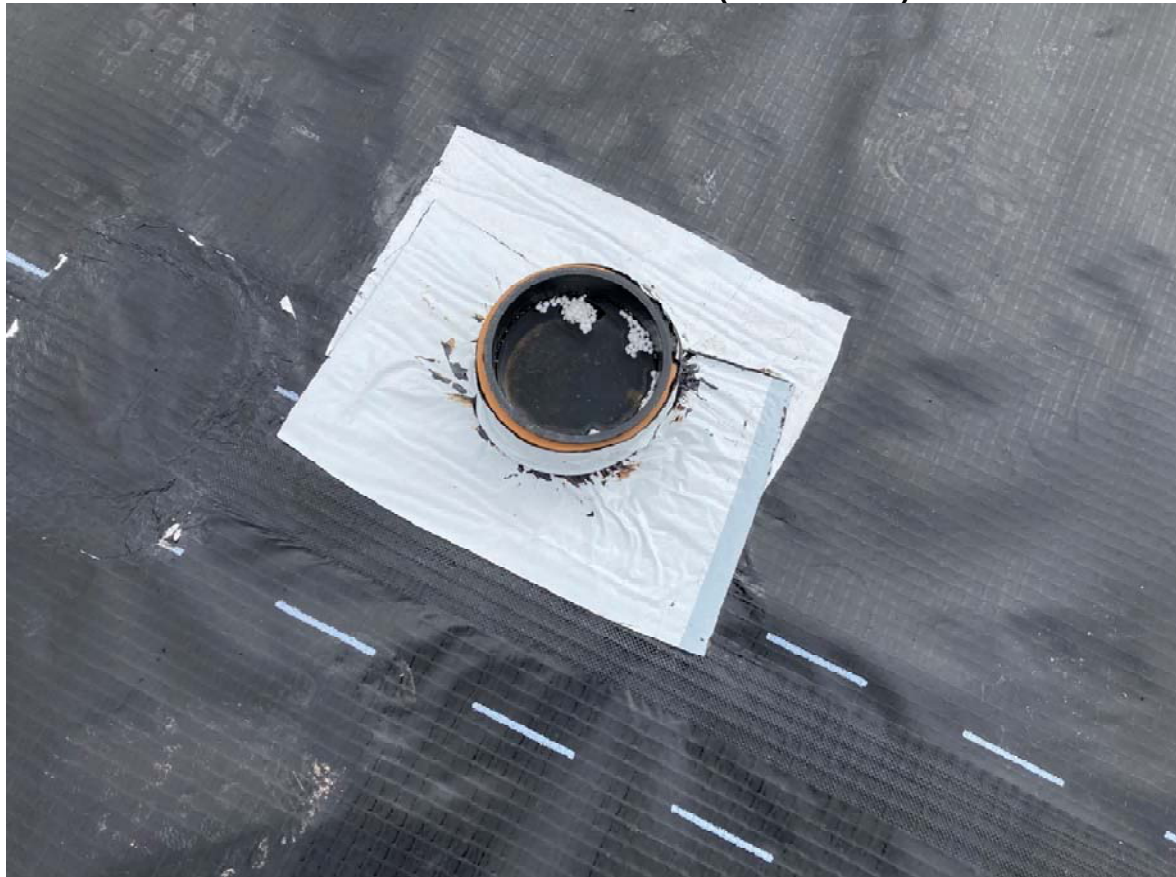
Plate 16 Plots 132 to 133 – Sealed Penetrations (27/03/2023)



Plate 17 Plots 132 to 133 – Corner Detailing (27/03/2023)



Plate 18 Plots 132 to 133 – Sealed Penetration (27/03/2023)





APPENDIX II

VALIDATION INSPECTION RECORDS

GAS PROTECTION MEASURES VALIDATION INSPECTION REPORT

Project Name: MARKFIELD ROAD RATBY	Inspection Carried Out by: ASM
Project No.	Date: 02/02/23

Plot Type: Detached / Semi-Detached / Apartments / Commercial - <u>Permitted</u>	Plot Number (s): 125 - 128	Gas Membrane Installer: keytec Geomembranes
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Gas Risk Rating (CS) CS2	VOC Yes ☐ No ☒	Radon Yes ☐ No ☒
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Verification Plan Completed:	Yes ☐ No ☐ In Production ☒
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Gas Protection Provided by:	Other Details (Membrane Products, Ventilation Type etc):
1. Gas Resistant Membrane ☒ Yes ☐ No	keytec keytec 460 HP + SAG-2M
2. Ventilation ☒ Yes ☐ No	subfloor void + periscope air bricks
3. Structural Barrier ☐ Yes ☒ No	N/A

Gas Membrane Installation:	☒ Welded ☐ Taped
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Inspection Findings: (note repairs, defects, vent locations, and any other issues identified) Plot No(s). 125 - 127	Key: X Repairs ■ Vents ○ Penetrations □ Columns

Number of Defects/Repairs Identified: None	All Defects/Repairs Completed: N/A Yes ☐ No ☒
Number of Vents/Vent Spacing: 50 N° vents @ 1-2m centers	(Note vent locations above)
Integrity Testing required? Yes ☐ No ☒	Details: N/A
General Comments/Further Action Required: Membrane in excellent condition, no repairs required, Membrane passed.	
Photos Taken (✓)	

Verifier Signature

Installer Representative

Name

A. GARRAS

Signed

Company

(keytec) 2-2-23

Site Representative

Name

L. Souch

Signed

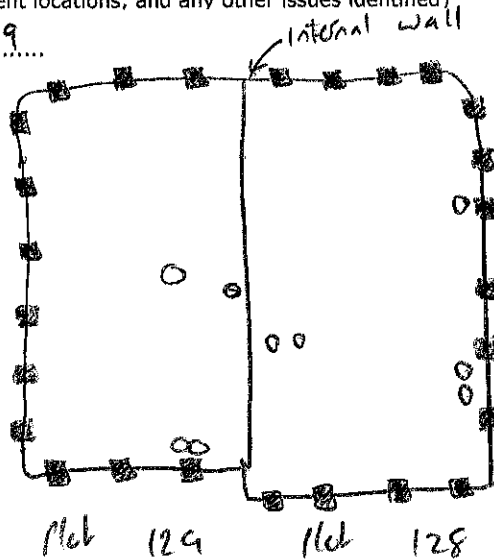
Company

2-2-23 (Miller Homes)

Inspection Findings:

(note repairs, defects, vent locations, and any other issues identified)

Plot No(s). 128-129

**Key:**

X	Repairs
■	Vents
○	Penetrations
□	Columns

Inspection Findings:

(note repairs, defects, vent locations, and any other issues identified)

Plot No(s).

Key:

X	Repairs
■	Vents
○	Penetrations
□	Columns

Inspection Findings:

(note repairs, defects, vent locations, and any other issues identified)

Plot No(s).

Key:

X	Repairs
■	Vents
○	Penetrations
□	Columns

asl

GAS PROTECTION MEASURES VALIDATION INSPECTION REPORT

Project Name: <u>Marksfield Road, Rantby</u>	Inspection Carried Out by: <u>JR</u>
Project No. <u>024-23-446</u>	Date: <u>29/03/23</u>

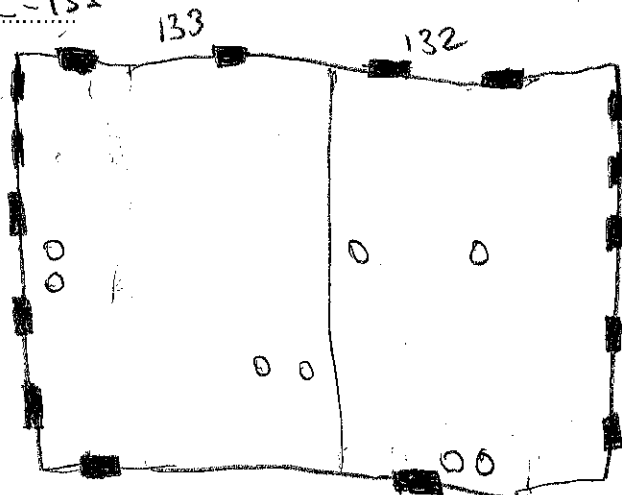
Plot Type: <u>Semi-Detached</u> / Apartments / Commercial	Plot Number (s):	Gas Membrane Installer: <u>Keytech</u>
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Gas Risk Rating (CS) <u>C82</u>	VOC	Yes	No	Radon	Yes	No
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Verification Plan Completed:	Yes	No	In Production
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Gas Protection Provided by:	Other Details (Membrane Products, Ventilation Type etc):
1. Gas Resistant Membrane <u>(Yes)</u> No	<u>Keytech HD HP + SogM</u>
2. Ventilation <u>(Yes)</u> No	<u>Pen vents.</u>
3. Structural Barrier Yes <u>(No)</u>	

Gas Membrane Installation:	<u>Welded</u> Taped
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Inspection Findings: (note repairs, defects, vent locations, and any other issues identified) Plot No(s). <u>132-133</u> 	Key: X Repairs ■ Vents ○ Penetrations □ Columns
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Number of Defects/Repairs Identified: <u>0</u>	All Defects/Repairs Completed: <u>Yes</u> No
Number of Vents/Vent Spacing: <u>1-2m</u> (Note vent locations above)	<u>16 vents</u>
Integrity Testing required? Yes <u>(No)</u>	Details:
General Comments/Further Action Required: <u>Passed, good quality</u>	
Photos Taken <u>(✓)</u> ✓	

 Verifier Signature [Signature]

 Installer Representative Name L Williams Signed [Signature] Company

 Site Representative Name L Soule Signed [Signature] Company

GAS PROTECTION MEASURES VALIDATION INSPECTION REPORT

Project Name: <u>Marksfield Rd, Rugby</u>		Inspection Carried Out by: <u>TAC</u>	
Project No. <u>029-23-446</u>		Date: <u>01/03/23</u>	
Plot Type: <u>Detached</u> / <u>Semi-Detached</u> / Apartments / Commercial <u>Terrace</u>		Plot Number (s): <u>See Drawing</u>	Gas Membrane Installer: <u>Keytec</u>
Gas Risk Rating (CS)	<u>CS-2</u>	VOC	Yes ☐ No ☒
		Radon	Yes ☐ No ☒
Verification Plan Completed:		Yes ☐ No ☐ In Production ☒	
Gas Protection Provided by:		Other Details (Membrane Products, Ventilation Type etc):	
1. Gas Resistant Membrane	Yes ☒ No ☐	<u>Keytec 400 HP + SACM</u>	
2. Ventilation	Yes ☒ No ☐	<u>Pen vents</u>	
3. Structural Barrier	Yes ☐ No ☒		
Gas Membrane Installation: ☒ Welded ☐ Taped			
Inspection Findings: (note repairs, defects, vent locations, and any other issues identified)		Key:	
Plot No(s) <u>130 + 131</u>		☒ Repairs ☒ Vents ☐ Penetrations ☐ Columns	
Number of Defects/Repairs Identified: <u>1</u>		All Defects/Repairs Completed: (Note locations above) Yes ☒ No ☐	
Number of Vents/Vent Spacing: <u>56</u> <u>1-2m</u> (Note vent locations above)			
Integrity Testing required? Yes ☐ No ☒		Details:	
General Comments/Further Action Required: <u>All repairs performed on site, membrane in good condition. PASS</u>			
Photos Taken ☒			

Verifier Signature

Installer Representative

Name

C. Tompkins

Signed

Company

Keytec

Site Representative

Name

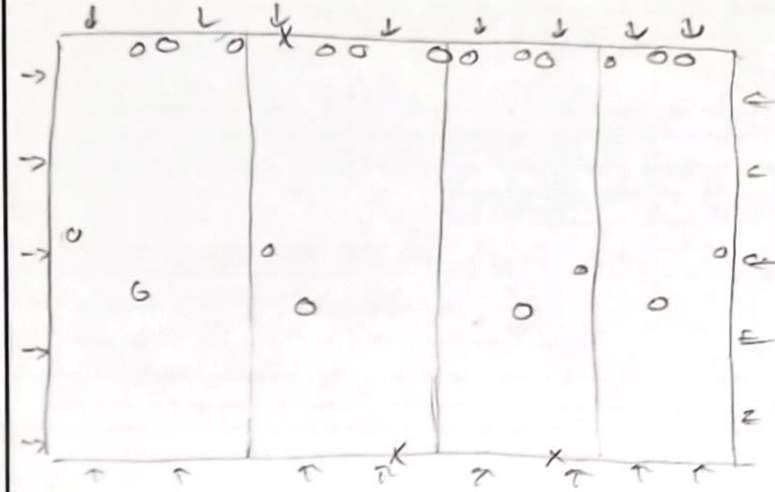
Robert Pley

Signed

Company

Inspection Findings:

(note repairs, defects, vent locations, and any other issues identified)

Plot No(s). B4-137**Key:**

X	Repairs
■	Vents
O	Penetrations
□	Columns

Inspection Findings:

(note repairs, defects, vent locations, and any other issues identified)

Plot No(s).

Key:

X	Repairs
■	Vents
O	Penetrations
□	Columns

Inspection Findings:

(note repairs, defects, vent locations, and any other issues identified)

Plot No(s).

Key:

X	Repairs
■	Vents
O	Penetrations
□	Columns