



Ground Gas Protection System Verification Report

Site: Plots 1-4 Pearson Way, Neath

Prepared For: Wellspring Property and Investment Ltd

Issue Date: September 2025

Job No: 16819

REPORT TITLE : **Ground Gas Protection System Verification Report, Pearson Way, Neath**

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SECTION 1 Introduction and Proposed Development

1.1 Introduction

Wellspring Property and Investments Ltd (the Client) is proposing the construction of residential properties at Pearson Way, Neath

TFW Group Ltd (Terra Firma) have been commissioned by the Client to prepare a Ground Gas Protection System Verification Report (Verification Report) for the development.

Verification of the ground gas protection system has been undertaken in accordance with TFW Group Ltd (Terra Firma) Ground Gas Protection System Verification Plan, Referenced GGVP-160123-16819-2.

This report should be read in conjunction with the aforementioned documents.

1.2 Objectives

The objective of the Verification Report is to accurately record the ground gas protection system installation and to confirm its acceptability and compliance with the Verification Plan methodology and remedial objectives at the time of inspection.

1.3 Limitations and Exceptions of Investigation

This report has been prepared for the sole internal reliance of the Client and its design and construction team. This report shall not be relied upon or transferred to any other parties without the express written authorisation of TFW Group Ltd. If an unauthorised third party comes into possession of this report they rely on it at their peril and the authors owe them no duty of care and skill. The report represents the findings and opinions of experienced geo-environmental and geotechnical consultants. TFW Group Ltd does not provide legal advice and the advice of lawyers may be required.

1.4 Verification Officer Competency

The principal Verification Officer at Terra Firma is Mr James Rhys-Williams.

Mr Rhys-Williams is suitably qualified holding a Level 4 NVQ Diploma in Verification of Ground Gas Protection Systems. Furthermore, he is an accredited Specialist in Gas Protection Verification (SGPV) by CL:AIRE (SGPV0009), an assessor for the same scheme and is a full member of the British Verification Council (BVC) with instant access to industry peers.

Mr Rhys-Williams has extensive experience in brownfield land investigation, risk assessment and site remediation gained while working for various geotechnical and geoenvironmental contractors and consultants since 2014.

Mr Rhys-Williams holds a bachelor honours degree in Geology obtained from the University of Bristol in 2010 and is a fellow of the Geological Society of London, maintaining regular industry related continuous professional development.

1.5 Quality Assurance

The quality and environmental aspects of the assessment and investigation comply with UKAS Accredited ISO 9001:2015 and ISO 14001:2015 standards.

SECTION 1 Installed Protection Measures

1.1 Structural Barrier

As proposed the structural barrier comprised a cast in-situ reinforced raft. The surface of the raft was often observed to be flat, smooth and clear of debris or other protrusions.

Structural barriers of this nature provide very reliable ground gas protection and achieve a design score of 1.5 points (BS8485:2015+A1:2019).

1.2 Membrane

The membrane was installed by the Client as proposed. Informal guidance on the appropriate detailing of service entries and jointing of membrane was provided by GeoEnginSeer Ltd during the first inspection visit.

As proposed Powerbase Multigas 500 gas barrier membrane and Atal Bentofix 5300 waterproofing membrane was used throughout.

Membrane joints were sealed using 50 mm double sided butyl tape, Bentofix secured at joints with 150mm single sided butyl tape.

Some utility entries, along with small repairs were detailed as necessary using Visqueen Pro Detailing Strip (GR SAM). The remaining utility entries were sealed using prefabricated Visqueen Ultimate Top Hat Units secured to the pipe with a tightened jubilee clip.

Site visits were scheduled to verify 100% of plots as proposed by the Verification Plan. All joints, pipe penetration etc. were pick probed to ASTM D4437-08:2013. Observations and results are recorded on the verification pro forma, presented in **Annex A**. Photographic evidence of the installation is also presented in **Annex A**. As a consequence of the 100% verification programme and inexperience of the Client installer, it was not considered necessary nor appropriate for the Client installer to prepare a daily log/ sign off document for each plot.

1.2.1 Non-Conformances

Phase 1 Plot 1

7th June 2023 – carpet frequently unstuck at corners which was immediately fixed by groundworker using additional butyl tape under the instruction and supervision of Terra Firma.

Phase 1 Plot 2

12th June 2023 – 12 unstuck joints noted. Fixed immediately by groundworker using additional tape. Heat was applied to dry area and cleaned with rags. 12/6 2no joints not sealed, fixed immediately with double sided butyl tape and retested

Phase 1 Plots 3

No non conformances

Phase 2 Plots 4

22nd June 2023 – 1no large joint unstuck, likely due to water. 3no triple junctions noted. 3/8 pick and probe, 2no large joints unstuck, likely due to water. Repaired immediately with additional double sided butyl tape.

SECTION 2 Verification Statements

It is considered that lines of evidence gathered during the verification process confirms ground gas protection measures have been install in all plots as per the requirements of the verification methodology and satisfy the remedial objectives, severing the pathway between the source and receptor.

Further in-situ integrity testing was considered unnecessary based on robustness of materials and the inspection findings.

Follow on contractors should be made aware of the ground protection system in place. It is essential that the integrity of all gas protection measures is maintained post-verification and not damaged by any subsequent construction works.

Accidental damage to the membrane system post verification should be reported to the verifier, rectified, and re-inspected later.

ANNEX A
Inspection Proforma & Photographs

Site Verification Pro Forma



Site Name: Pearson Way	Installer: Groundworker
Job Number: 16819	Phase: NA
Start Date: 25/1/23	Plot Number: 1 upper level
End Date: 7/6/23	Housing Style:
Verifier: JRW	Foundation Type: Raft split level
Weather Conditions: Dry	Gas Protection Type: CS2

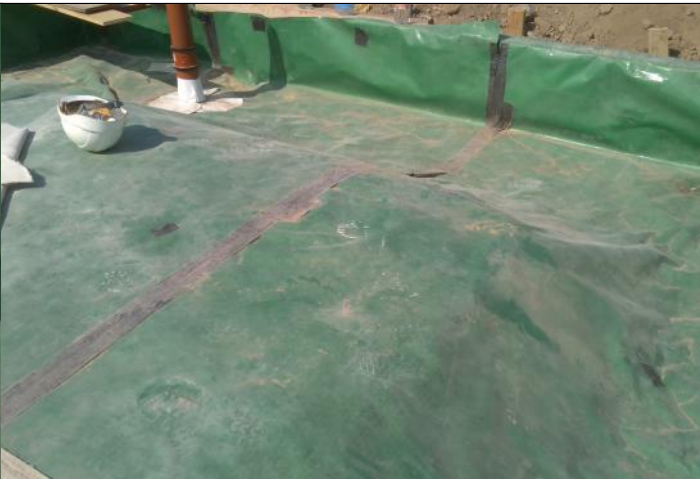
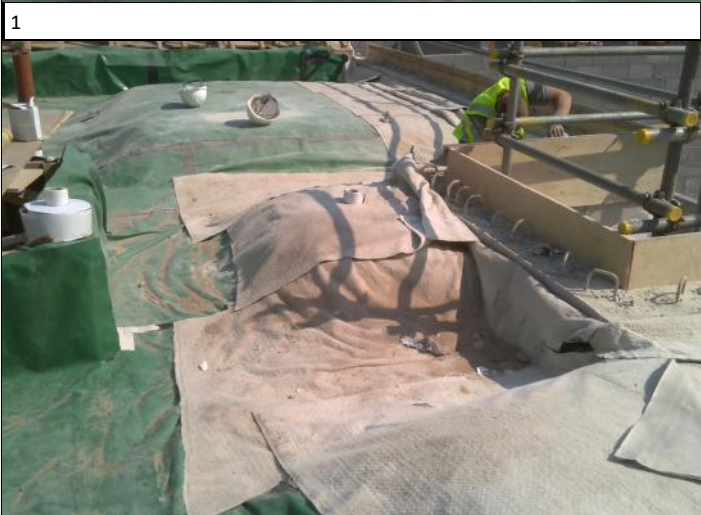
Site Visit Dates & Comments
7/6/23 pick probe to upper level of plot 1, lower level inspected previously by GeoEnginSeer Ltd
Access restrictions hindered any other form of in-situ testing

No.	Item	Comments
1. Membrane		
1.1	Condition of sub-grade and underside of gas membrane	50mm sand blinding to underside of membrane
1.2	Gas membrane type	green powerbase multigas 500 and Bentofix 5300 on retaining wall side, up to 1m into the plot section horizontally
1.3	Gas membrane condition	good, no damage to membrane noted
1.4	Joining tape product	50 mm double sided butyl tape, Bentofix secured at joints with 150mm single sided butyl tape
1.5	Lapping design	overlapped by 150mm
1.6	Laps, welds, and joints seals	pick and probe, carpet frequently unstuck at corners. Fixed immediately by groundworker using additional butyl tape.
1.7	Service entries seals	one service entry on membrane, SAM used, good seal
2. Ventilation		
2.1	Sub-floor void	NA

2.2	External wall airbricks	NA
2.3	Internal sleeper walls	NA
2.4	External vents trenches/ducts	NA
Additional Notes:		

Photographs	
No.	Description
1	service entry sealing
2	full area
3	full area
4	full area

Conclusions
The gas protection measures inspected: A - are acceptable and comply with the specification

			
1		2	
			
3		4	
5		6	
7		8	

Site Verification Pro Forma



Site Name: Pearson Way	Installer: Groundworker
Job Number: 16819	Phase: NA
Start Date: 23/3/23	Plot Number: Plot 2
End Date: 12/6/23	Housing Style:
Verifier: JRW	Foundation Type: Raft split level
Weather Conditions: Dry	Gas Protection Type: CS2

Site Visit Dates & Comments
23/3/23 pick probe to lower level of plot 2
12/6/23 pick probe of upper level plot 2
Access restricting other forms of in-situ testing

No.	Item	Comments
1. Membrane		
1.1	Condition of sub-grade and underside of gas membrane	50mm sand blinding to underside of membrane
1.2	Gas membrane type	green powerbase multigas 500 and Bentofix 5300 on retaining wall sides up to 1m horizontally into the plot
1.3	Gas membrane condition	good, no damage to membrane noted
1.4	Joining tape product	50 mm double sided butyl tape, Bentofix secured at joints with 150mm single sided butyl tape
1.5	Lapping design	overlapped by 150mm
1.6	Laps, welds, and joints seals	23/3 pick and probe, 12 unstuck joints noted. Fixed immediately by groundworker using additional tape. Heat was applied to dry area and cleaned with rags. 12/6 2no joints not sealed, fixed immediately with double sided butyl tape and retested
1.7	Service entries seals	one service entry on Bentofix, sealed as designed with bentonite paste solution. One service entry on upper level sealed with SAM. Good detail, PASS
2. Ventilation		
2.1	Sub-floor void	NA

2.2	External wall airbricks	NA
2.3	Internal sleeper walls	NA
2.4	External vents trenches/ducts	NA
Additional Notes: 23/3 Reminded the site manager about triple junctions and appropriate sealing of the overlap flap of the bottom sheet.		

Photographs	
No.	Description
1	full plot lower
2	full plot lower
3	full plot lower
4	full plot lower
5	plot 1 retaining wall external
6	plot 1 retaining wall external
7	plot 1 retaining wall external tape sealing x2
8	placement of protection boards post inspection
9	full plot upper
10	full plot upper
11	service entry sealing upper
12	service entry sealing upper

Conclusions
The gas protection measures inspected: A - are acceptable and comply with the specification



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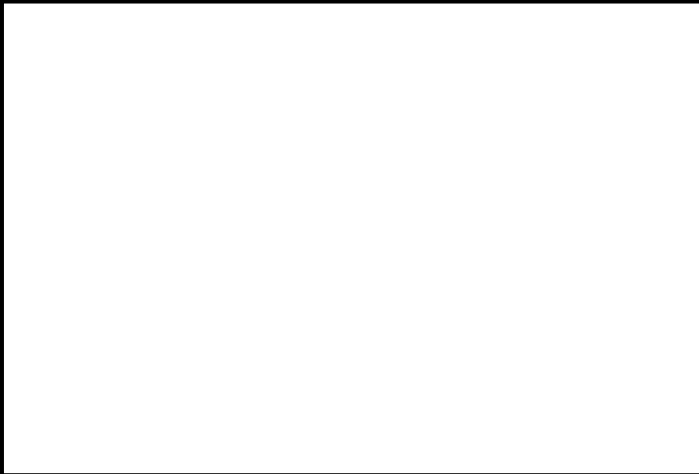
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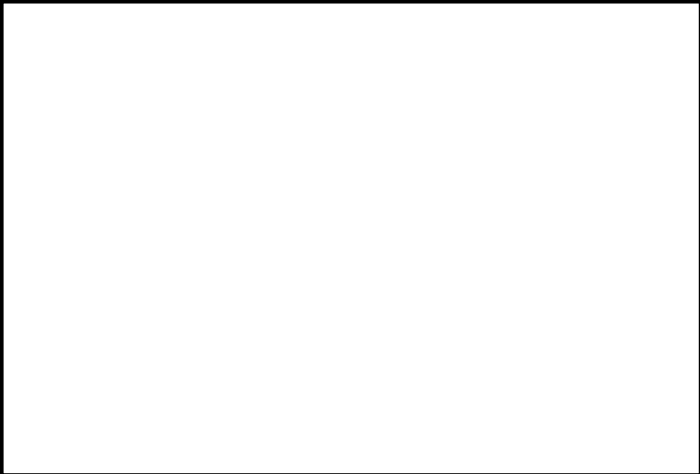
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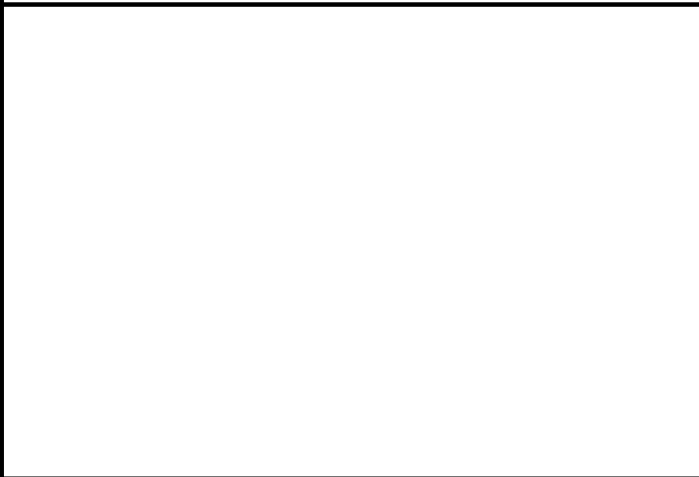
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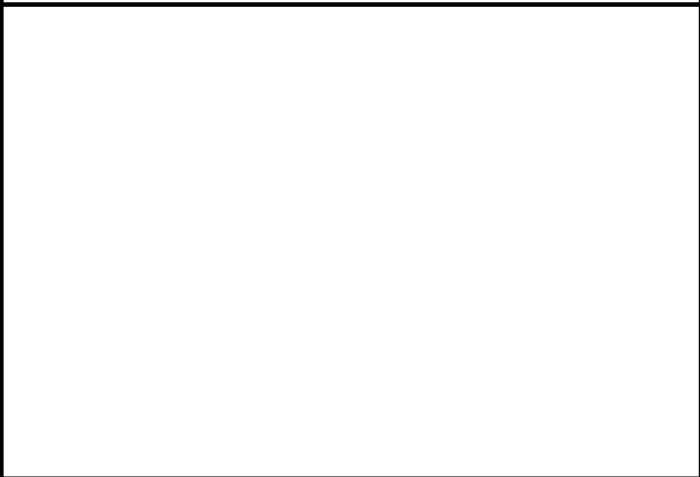
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16

Site Verification Pro Forma



Site Name: Pearson Way	Installer: Groundworker
Job Number: 16819	Phase: NA
Start Date: 25/4/23	Plot Number: 3
End Date: 13/7/23	Housing Style:
Verifier: JRW	Foundation Type: Raft split level
Weather Conditions: Dry	Gas Protection Type: CS2

Site Visit Dates & Comments
25/4/23 pick probe, visual inspection to lower level of plot 3
13/7/23 pick probe, visual inspection of upper level

No.	Item	Comments
1. Membrane		
1.1	Condition of sub-grade and underside of gas membrane	50mm sand blinding to underside of membrane
1.2	Gas membrane type	Green powerbase multigas 500 and Bentofix 5300 on retaining wall side extending up to 1m horizontally into the plot.
1.3	Gas membrane condition	very dirty but no damage to membrane noted. Mess attributed to rain yesterday. No damage noted on second visit.
1.4	Joining tape product	50 mm double sided butyl tape, Bentofix secured at joints with 150mm single sided butyl tape
1.5	Lapping design	overlapped by 150mm
1.6	Laps, welds, and joints seals	pick and probe, 100% pass no issues noted. Clearly groundworker has learnt from mistakes noted on last visit. 13/7 6no unstuck joints identified, fixed with additional double sided butyl tape. PASS
1.7	Service entries seals	one service entry on Bentofix, sealed as designed with bentonite paste solution. 13/7 1no entry sealed with SAM, good condition.
2. Ventilation		
2.1	Sub-floor void	NA

2.2	External wall airbricks	NA
2.3	Internal sleeper walls	NA
2.4	External vents trenches/ducts	NA
Additional Notes:		

Photographs	
No.	Description
1	full plot lower level
2	full plot lower level
3	full plot lower level
4	service entry sealing as per design
5	13/7 Service entry sealing
6	upper full plot
7	upper full plot

Conclusions
The gas protection measures inspected: A - are acceptable and comply with the specification



Site Verification Pro Forma



Site Name: Pearson Way	Installer: Groundworker
Job Number: 16819	Phase: NA
Start Date: 22/6/23	Plot Number: Plot 4
End Date: 3/8/23	Housing Style:
Verifier: JRW	Foundation Type: Raft split level
Weather Conditions: Dry	Gas Protection Type: CS2

Site Visit Dates & Comments
22/6/23 100% pick probe to lower level of plot 4
03/08/23 100% pick probe to upper level of plot 4
Access restricted to other forms of in-situ testing

No.	Item	Comments
1. Membrane		
1.1	Condition of sub-grade and underside of gas membrane	50mm sand blinding to underside of membrane
1.2	Gas membrane type	green powerbase multigas 500 and Bentofix 5300 on retaining wall sides extending up to 1m horizontally into the plot upper and lower areas.
1.3	Gas membrane condition	4no small holes on lower level, 2no small holes on upper level. Repaired with SAM patches
1.4	Joining tape product	50 mm double sided butyl tape, Bentofix secured at joints with 150mm single sided butyl tape
1.5	Lapping design	overlapped by 150mm
1.6	Laps, welds, and joints seals	22/6 pick and probe, 1no large joint unstuck, likely due to water. 3no triple junctions noted. 3/8 pick and probe, 2no large joints unstuck, likely due to water. Repaired immediately with additional double sided butyl tape. PASS
1.7	Service entries seals	Service entries on Bentofix, sealed as designed with bentonite paste solution. Service entry on membrane sealed with SAM. PASS
2. Ventilation		
2.1	Sub-floor void	NA

2.2	External wall airbricks	NA
2.3	Internal sleeper walls	NA
2.4	External vents trenches/ducts	NA
Additional Notes:		

Photographs	
No.	Description
1	full lower level
2	full lower level
3	full lower level
4	service entry sealing as per design
5	patches
6	Full upper level
7	utility pipe sealing SAM
8	Full upper level
9	Full upper level
10	Full upper level

Conclusions
The gas protection measures inspected: A - are acceptable and comply with the specification

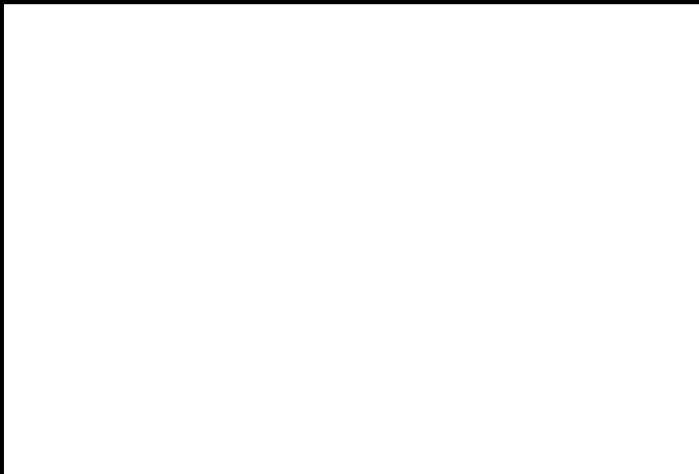




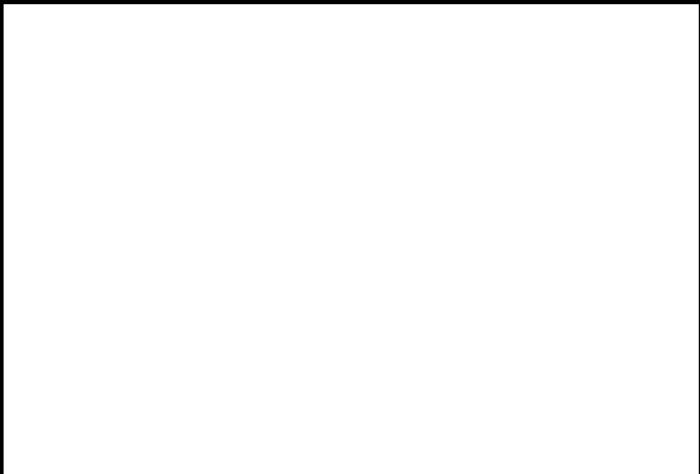
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12



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