

Date: 28 March 2025
Reference: 14-768-V5

GAS MEMBRANE VALIDATION – HAWKS VIEW, CASTLETON

Project Name:	Hawks View, Castleton (formerly known as Castleton Sidings)
Project Number:	14-768
Client:	Kellen Homes
Date:	28th March 2025
Project Manager & Qualifications:	J Sheridan (MeSci, FGS)
E3P Engineer:	J. James
Gas Membrane Installers Name & Qualifications:	Westbourne Civil Engineers Ltd & Keytec Installation Services
Ground Gas Protection Design Report:	E3P Gas Protection Design Report (14-768-R8, March 2025)
Plots:	Membrane – Plots 13-15

The gas mitigation measures validation site inspection record and associated photographs are enclosed within this letter as a Controlled Quality Assurance (CQA) site data capture record.

FINAL QUALITY ASSURANCE

E3P SITE VALIDATION CQA	QUALIFICATIONS	POSITION
Jordan James	-	Technician

PREPARED BY	QUALIFICATIONS	POSITION
Jessica Sheridan	MeSci, FGS, MEnvSci	Senior Consultant

AUTHORISED BY	QUALIFICATIONS	POSITION
Martin Dyer	BSc (Hons), FGS, FEnvSci, CEnv	Director

Table 1 Validation Letter References

PLOT NUMBER	DATE	REPORT REFERENCE
Subfloor 9-15, 18-21, 127-129	14/03/2025	V1
Membrane – Plots 18-21	19/03/2025	V2
Membrane – Plots 9-12, 125-129	21/03/2025	V3
Membrane- 13-15	28/03/2025	V4





GROUND GAS MITIGATION DESIGN

The Ground Gas Risk Assessment for the site determined that site should be classified as Characteristic Situation 2 with incorporation of low-level VOC resistant membrane in accordance with BS8485 2015 (+A1 2019).

A Gas Protection Design Report (GPDR) was prepared by E3P (14-768-R8-2, March 2025). Since the issue of the report, minor revisions have been made to the subfloor design, which are presented within this verification letter for clarity.

The GPDR has been prepared, reviewed, and authorised by a suitably qualified person who holds the relevant technical and professional qualifications.

OVERVIEW OF GROUND GAS MITIGATION DESIGN & CONSTRUCTION REQUIREMENTS

Characteristic Situation 2 – Design Mitigation Requirements.

- ❖ Passive sub-floor dispersal layer of very good performance which meets all criteria out in Paragraph B.6 of BS8485:2015 (minimum 150 mm clear void space and with correct frequency of side ventilation).
- ❖ Lapped and taped / sealed gas and low-level VOC resistant membrane in the floor slab construction which meets all the criteria as set out in Table 7 of BS8485:2015 (+A1 2019) and Verification in Section 3.2.2 of CIRIA 735³³

Banners Gate prepared the site-specific engineering drawings on behalf of Kellen Homes as Foundation Detail Ref: 23147 500 F.

The sub-structure design forms a key component of the validation procedure to ensure the constructed mitigation requirements meet the specified design criteria.

Figure 1 Structural Engineers Substructure Design – External Wall

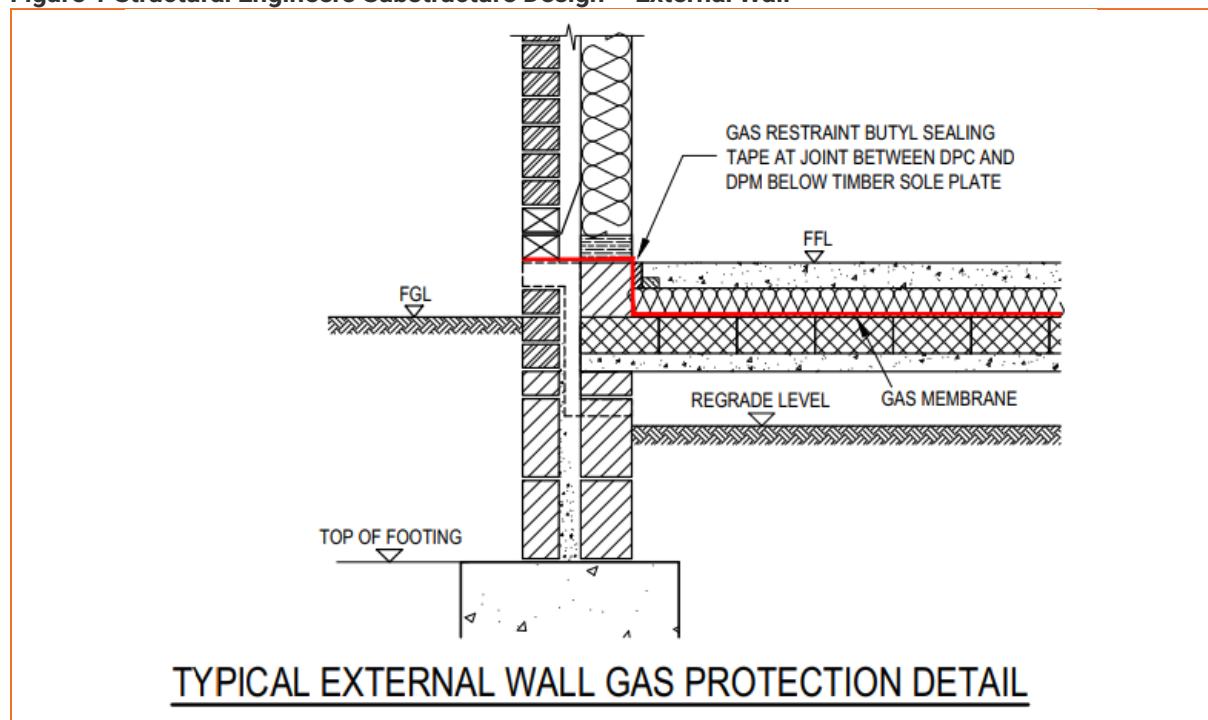




Figure 2 Structural Engineers Substructure Design – Party Wall

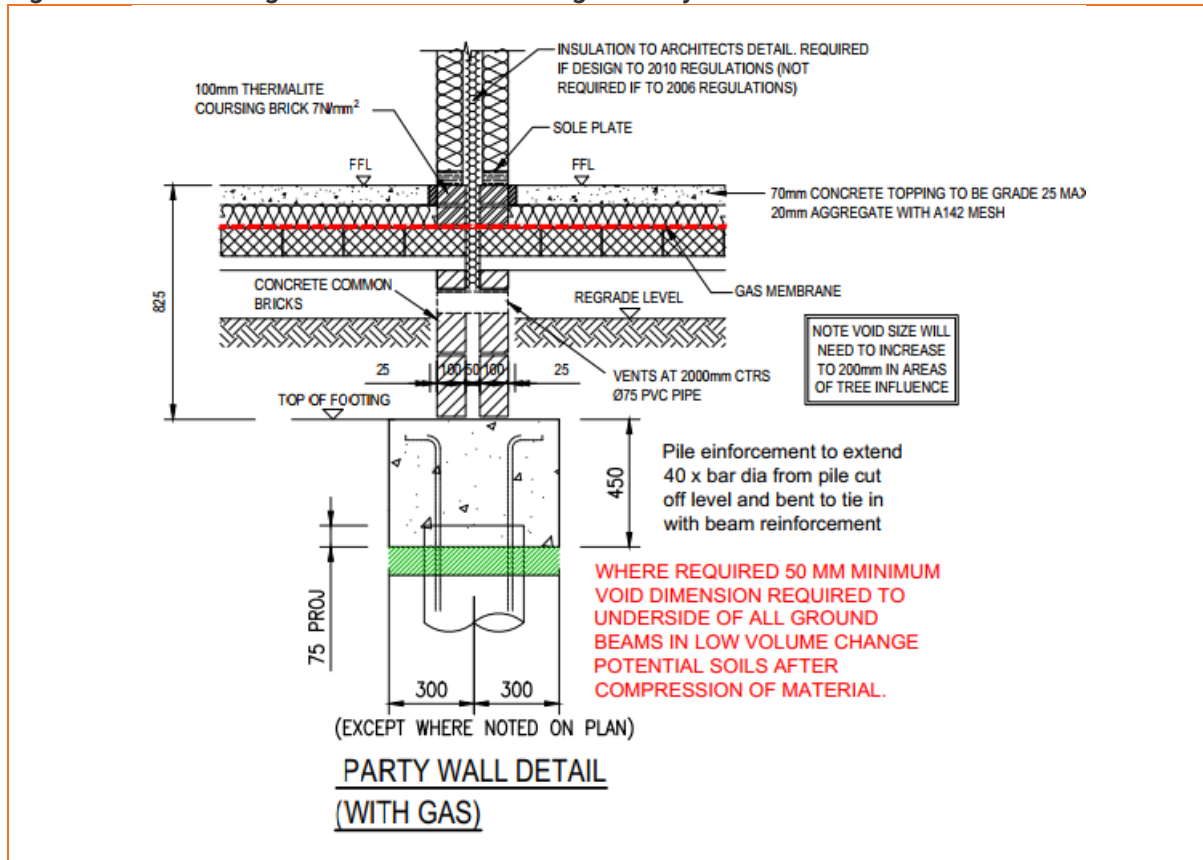
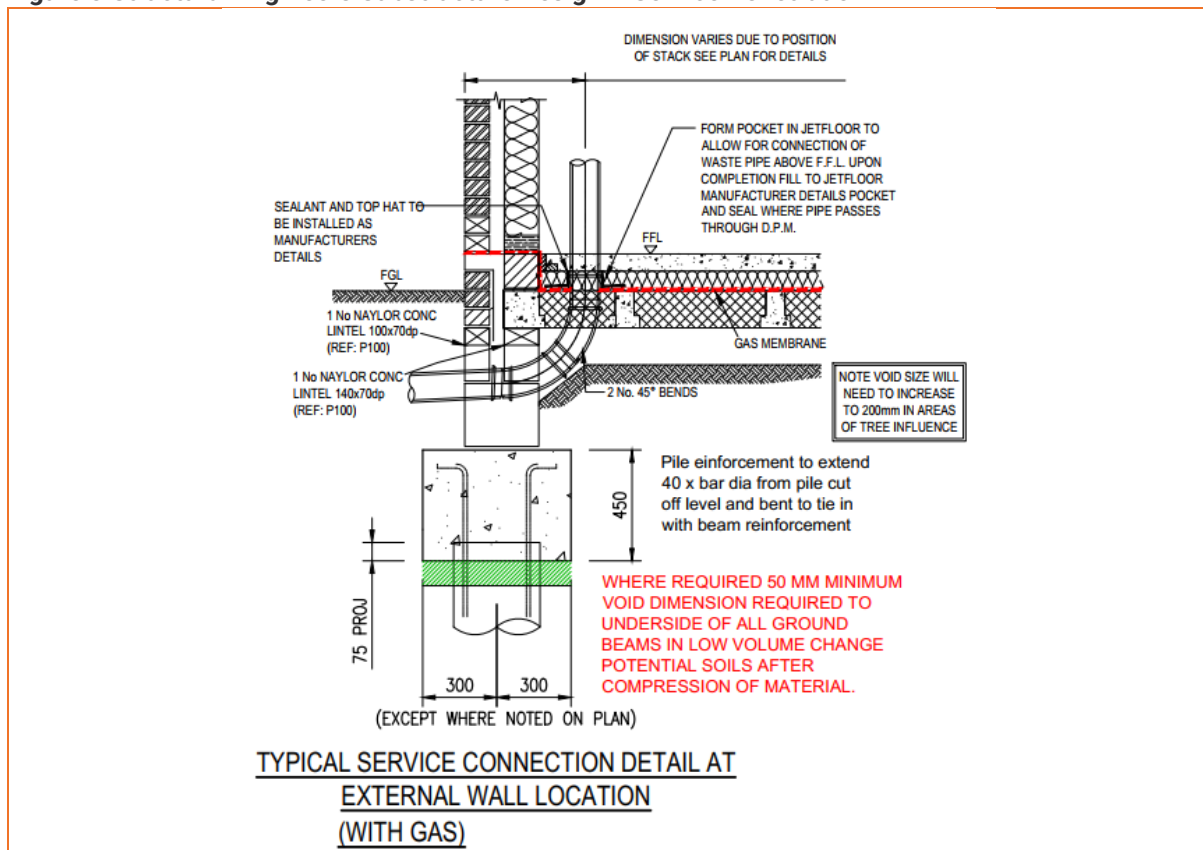


Figure 3 Structural Engineers Substructure Design – Service Penetration





SUMMARY OF VALIDATION INSPECTION & APPROVAL

SUB-FLOOR VOID

The sub-floor void for plots 9-15, 18-21, 127-129 was inspected on 14th and 17th March 2025.

The sub-floor void was observed and inspected to be a minimum of 150 mm with no visible inclusions that would limit the performance of this ventilation mechanism. Sleeper wall ventilation bricks were also observed to be present

Photographs of the sub-floor voids are included in validation letter V1.

AIR BRICKS & TELESCOPIC VENTILATION

As per NHBC guidance and the structural engineers design as part of the mitigation a telescopic vent and vent brick is required at 2 m intervals in the brick course. E3P can confirm these have also been fitted accurately on all elevations of the plot to allow the sufficient function of the passive sub-floor ventilation system.

GAS RESISTANT MEMBRANE

The membrane utilised on-site comprises: JUTA GP5 and JUTA GP5+ resistant to radon, carbon dioxide, methane and low-level Volatile Organic Compounds .

It has been confirmed as part of the validation that the membrane utilised in the plots discussed herein matches the membrane described.

The E3P Technician has inspected the installation of this membrane in line with the structural engineer's specifications in terms of placement and position (Figure 1-3), and the manufacturer's detail in terms of the workmanship.

E3P can confirm that there were no holes or rips at the inspection time.

Where any rips or tears have been noted patches have been applied in line with the manufacturer's detail with sufficient overlap to ensure long-term performance of the membrane.

E3P inspected all joints including corner details and can confirm that the membrane was overlapped in accordance with the manufacturer's specification and heat welded.

Where any penetration or service duct is present within the floor area E3P inspected each one in turn and can confirm that rigid black polyethylene top hat units have been adequately sealed against the membrane with double-sided jointing tape at both the base and the protruding pipe.

In accordance with the design, gas resistant butyl sealing tape is required beneath the membrane on the inner wall beneath the timber frame sole plate. E3P can confirm the butyl sealing tape has been installed accordingly.

Upon confirmation of suitable installation, the membrane is to be covered with a floor insulation material which is considered to provide a high degree of protection before the application of the cast in-situ concrete monolithic floor slab.

Based on the information provided within this report, the site inspection and validation checklists, E3P can confirm that Plot 18-21 has been installed with gas protection measures in accordance with the detailed structural design and the requirements of BS8485 Characteristic Situation 2 (including low-level VOC resistant membrane) to an acceptable level of workmanship.



E3P ENGINEER'S SITE CHECK SHEET

The engineer check sheet completed whilst on-site during the validation on a plot-by-plot basis is attached, and a complete set of images is presented as evidence. Larger images are presented at the rear of this letter.

All information provided within this validation letter report was accurate at the time of construction. E3P operates under the assumption that all data provided by installers is reliable.



WELDED GAS MEMBRANE VALIDATION

Complete

Score	37 / 37 (100%)	Flagged items	0	Actions	0
Site Name	Castleton Sidings				
Location	96 Fairway Rochdale England OL11 3BZ United Kingdom (53.588882684257385, - 2.1825623446244924)				
Project Manager	Jess Sheridan				
Project number	14768				
Developer	Kellen Homes				
Site representative Signature	 Steve - Westbourne 28 Mar 2025 9:16 AM GMT				
Conducted on	28 Mar 2025 9:07 AM GMT				
Prepared by	Jordan James				
Have you got the correct Gas Membrane detail (attached to the job in synergist)?	Yes				



Gas Membrane Inspection	36 / 36 (100%)
Plot Inspection	36 / 36 (100%)
Plot Inspection 1	12 / 12 (100%)
Plot Number	13
Type of Development: if other add Note	House
Floor Slab Type	Block and beam suspended
Are telescopic vents present?	Yes
Gas Membrane Type: Manufacturer, gauge, and colour. (Take photos where possible showing Label)	Juta GP5
Installer's name, company and qualification	Keytec
Gas Membrane Condition: Open punctures, tears, rips, stretching, Presence of debris, Repairs, Signs of weakness such as raised or sunken indentations, Protection plan in place to restrict access to rain gas membrane? IF FAIL DESCRIPTION IN ACTIONS AND PHOTOS REQUIRED	Pass
Are welds complete?	Yes
Are Joints lapped and sealed in accordance with manufacturer's requirements/ specification?	Yes
Service entries seals: Top hats seal arrangements fixed around service entries? Use of Jubilee clips or Bitumastic Sealant	Pass
 Photo 1	 Photo 2
 Photo 3	 Photo 4
 Photo 5	
Corners / Internal joints: Check all corners are correctly formed or contractor has used preformed corners.	Pass



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10



Photo 11



Photo 12



Photo 13



Photo 14

Are folds running in line with joints? (no joints cutting across folds)

Pass

**Extent of Coverage: Is the membrane covering the entire plot?
Does membrane span over outside walls?**

Yes



Photo 15



Photo 16

Sealant to the underside of the membrane at the sole plate position (Check with PM if not noted on schedule)

Yes



Photo 17

Condition of sub-grade and underside of gas membrane: Check that the subgrade does not contain rough/uneven surfaces, is appropriately clean and that there are no hard/sharp objects. That protective sand blinding or geotextile (if specified) is present and meets the design criteria. (Lift back the membrane and photo the subfloor)

Pass

Slab / membrane condition (is membrane clear of snow, standing water, debris or insulation): Can membrane be fully seen and photographed – ask contractor to remove any debris so membrane can be fully seen and inspected – this is a requirement of NHBC and local authorities.

Pass



External Wall Air bricks: Numbers, size. positions as design drawing? (Minimum of 3 walls)

Pass



Photo 18



Photo 19



Photo 20

Plot Inspection 2

12 / 12 (100%)

Plot Number

14

Type of Development: if other add Note

House

Floor Slab Type

Block and beam suspended

Are telescopic vents present?

Yes

Gas Membrane Type: Manufacturer, gauge, and colour. (Take photos where possible showing Label)

Juta GP5+

Installer's name, company and qualification

Keytec

Gas Membrane Condition: Open punctures, tears, rips, stretching, Presence of debris, Repairs, Signs of weakness such as raised or sunken indentations, Protection plan in place to restrict access to lain gas membrane? IF FAIL DESCRIPTION IN ACTIONS AND PHOTOS REQUIRED

Pass

Are welds complete?

Yes

Are Joints lapped and sealed in accordance with manufacturer's requirements/ specification?

Yes

Service entries seals: Top hats seal arrangements fixed around service entries? Use of Jubilee clips or Bitumastic Sealant

Pass



Photo 21



Photo 22



Photo 23



Photo 24



Corners / Internal joints: Check all corners are correctly formed or contractor has used preformed corners.

Pass



Photo 25



Photo 26

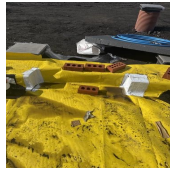


Photo 27



Photo 28

Are folds running in line with joints? (no joints cutting across folds)

Pass

Extent of Coverage: Is the membrane covering the entire plot? Does membrane span over outside walls?

Yes



Photo 29



Photo 30

Sealant to the underside of the membrane at the sole plate position (Check with PM if not noted on schedule)

Yes



Photo 31

Condition of sub-grade and underside of gas membrane: Check that the subgrade does not contain rough/uneven surfaces, is appropriately clean and that there are no hard/sharp objects. That protective sand blinding or geotextile (if specified) is present and meets the design criteria. (Lift back the membrane and photo the subfloor)

Pass

Slab / membrane condition (is membrane clear of snow, standing water, debris or insulation): Can membrane be fully seen and photographed – ask contractor to remove any debris so membrane can be fully seen and inspected – this is a requirement of NHBC and local authorities.

Pass

External Wall Air bricks: Numbers, size, positions as design drawing? (Minimum of 3 walls)

Pass



Photo 32



Photo 33

Plot Inspection 3

12 / 12 (100%)

Plot Number

15

Type of Development: if other add Note

House

Floor Slab Type

Block and beam suspended

Are telescopic vents present?

Yes

Gas Membrane Type: Manufacturer, gauge, and colour. (Take photos where possible showing Label)

GP5+

Installer's name, company and qualification

Keytec

Gas Membrane Condition: Open punctures, tears, rips, stretching, Presence of debris, Repairs, Signs of weakness such as raised or sunken indentations, Protection plan in place to restrict access to gas membrane? IF FAIL DESCRIPTION IN ACTIONS AND PHOTOS REQUIRED

Pass

Are welds complete?

Yes

Are Joints lapped and sealed in accordance with manufacturer's requirements/ specification?

Yes

Service entries seals: Top hats seal arrangements fixed around service entries? Use of Jubilee clips or Bitumastic Sealant

Pass

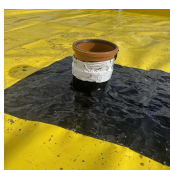


Photo 34

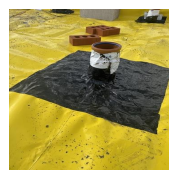


Photo 35

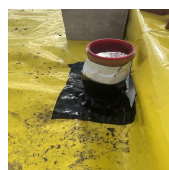


Photo 36



Photo 37



Photo 38

Corners / Internal joints: Check all corners are correctly formed or contractor has used preformed corners.

Pass



Photo 39



Photo 40



Photo 41



Photo 42



Photo 43



Photo 44

Are folds running in line with joints? (no joints cutting across folds)

Pass

**Extent of Coverage: Is the membrane covering the entire plot?
Does membrane span over outside walls?**

Yes

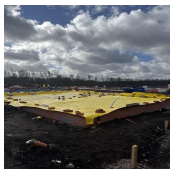


Photo 45



Photo 46

Sealant to the underside of the membrane at the sole plate position (Check with PM if not noted on schedule)

Yes



Photo 47

Condition of sub-grade and underside of gas membrane: Check that the subgrade does not contain rough/uneven surfaces, is appropriately clean and that there are no hard/sharp objects. That protective sand blinding or geotextile (if specified) is present and meets the design criteria. (Lift back the membrane and photo the subfloor)

Pass

Slab / membrane condition (is membrane clear of snow, standing water, debris or insulation): Can membrane be fully seen and photographed – ask contractor to remove any debris so membrane can be fully seen and inspected – this is a requirement of NHBC and local authorities.

Pass

External Wall Air bricks: Numbers, size. positions as design drawing? (Minimum of 3 walls)

Pass



Photo 48



Photo 49

Passive Venting

Sub-floor Void: Is a check possible on future plots (insert Plot number or NO in text box)

No



Media summary



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10



Photo 11



Photo 12



Photo 13



Photo 14



Photo 15



Photo 16



Photo 17



Photo 18



Photo 19



Photo 20



Photo 21



Photo 22



Photo 23



Photo 24



Photo 25



Photo 26



Photo 27



Photo 28



Photo 29



Photo 30



Photo 31



Photo 32



Photo 33



Photo 34



Photo 35



Photo 36



Photo 37



Photo 38



Photo 39



Photo 40



Photo 41



Photo 42



Photo 43



Photo 44



Photo 45



Photo 46



Photo 47



Photo 48



Photo 49