

Date: 4th June 2025
Reference: 16465-V10

GAS MEMBRANE VALIDATION – EDENFIELD ROAD, NORDEN

Project Name:	Edenfield Road, Rochdale
Project Number:	16-465
Client:	Stonebond Group Ltd
Date:	03-06-2025
Gas Membrane Installers Name & Qualifications:	Arch and Wood Construction & Commercial Ltd NVQ Level 2 Qualified Installer
Ground Gas Risk Assessment	Vapour resistant membranes (Plots 1-10) Characteristic Situation (CS2) (11-49)
Plots:	36-39 & 49

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
Joe Newall	CL:AIRE Course – Verification of Gas Protection Measures	Technician

PREPARED BY	QUALIFICATIONS	POSITION
Mark Wilson	BSc (Hons) Ind, FGS, MEnvSc	Senior Consultant

AUTHORISED BY	QUALIFICATIONS	POSITION
Alex Smith	BSc (Hons), FGS, MEnvSc, CEnv	Associate Director

Table 1 Validation Letter References

PLOT NUMBER	DATE	REPORT REFERENCE
1-6	22-11-2024	V1
7-10	25-11-2024	V2
7-10 New Detail	10-04-2025	V3
1-6 New Detail	23-04-2025	V4
17-19	07-05-2025	V5
43-45	12-05-2025	V6
40-42	14-05-2025	V7
20-23	20-05-2025	V8





PLOT NUMBER	DATE	REPORT REFERENCE
24-25	27-05-2025	V9
36-39 & 49	03-06-2025	V10

GROUND GAS MITIGATION DESIGN

The Ground Gas Risk Assessment for the site determined that the site should be classified as Characteristic Situation 2 in accordance with BS8485 2015 (+A1 2019).

In addition, vapour resistant membranes are required to be installed for plots located within the east and southeast part of the site (Plots 1-10) due to elevated concentrations of volatile contaminants.

A Gas Protection Design Report (GPDR) was prepared by E3P as detailed within their document (Ref: 16-465-R7-2) dated April 2025.

The GPDR has been prepared, reviewed, and authorised by a suitably qualified person who holds the relevant technical and professional qualifications as prescribed within the NHBC Document NF94 2023.

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 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 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 735:2014.

For Plots 1-10, the following mitigation measures will be required:

Volatile Organic Compounds – Design Mitigation Requirements

- ✳ Sealed/welded vapour resistant membrane in the floor slab construction which meets all the criteria as set out in Table 7 of BS8485:2015 (+A1 2019), Verification in Section 3.2.2 of CIRIA 735:2014, and is compliant with CIRIA 748:2014.
- ✳ Every second plot constructed will be subject to air lancing integrity testing in accordance with an internationally recognised standard – to be undertaken by specialist third party contractor and reported separately.

A detailed sub-structure design has been prepared by AJP Consulting Engineers as detailed within their Drawing EDE-AJP-XX-00-DR-S-2013, Rev P05, dated 7th April 2025.

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 **Suspended Floor Slab – Typical Edge – VSC**

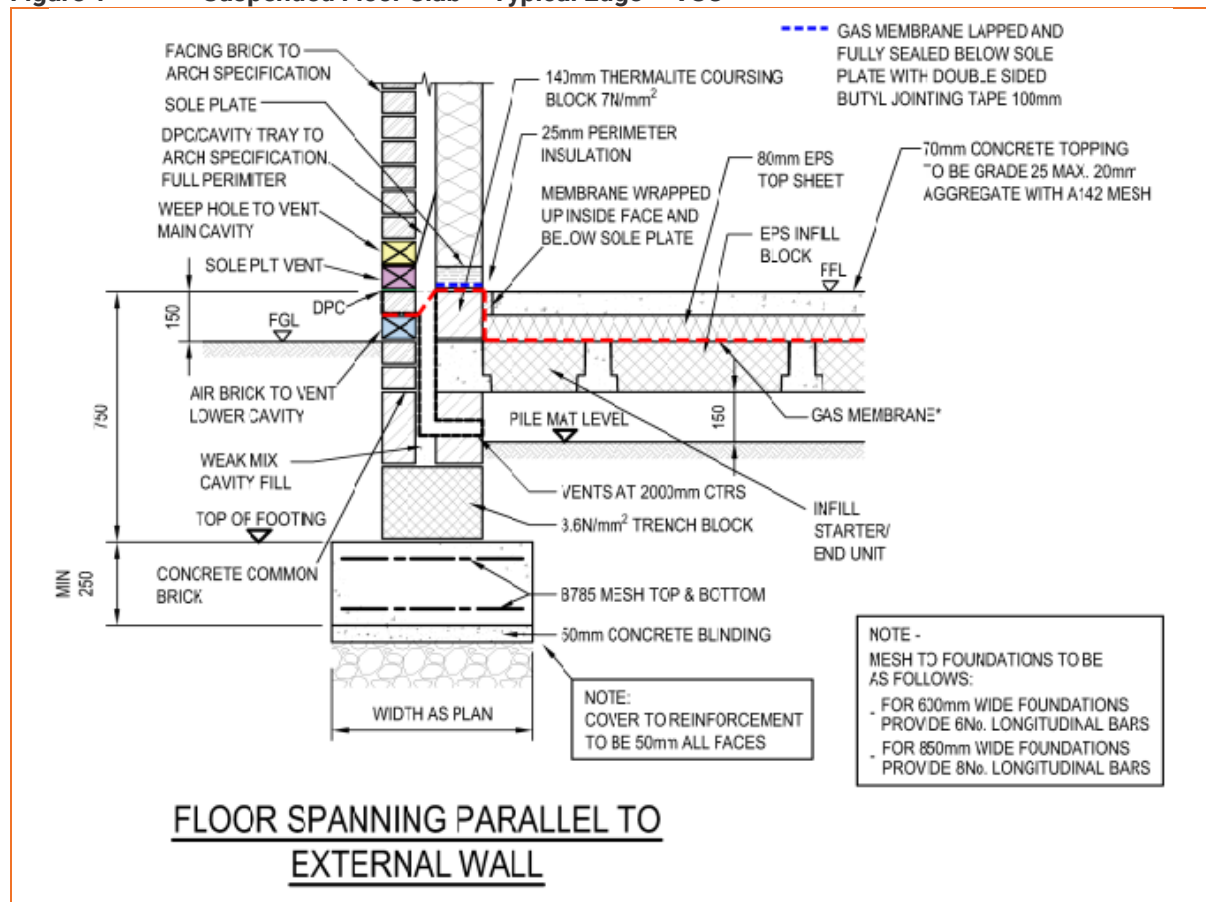


Figure 2 **Suspended Floor Slab – Typical Party Wall**

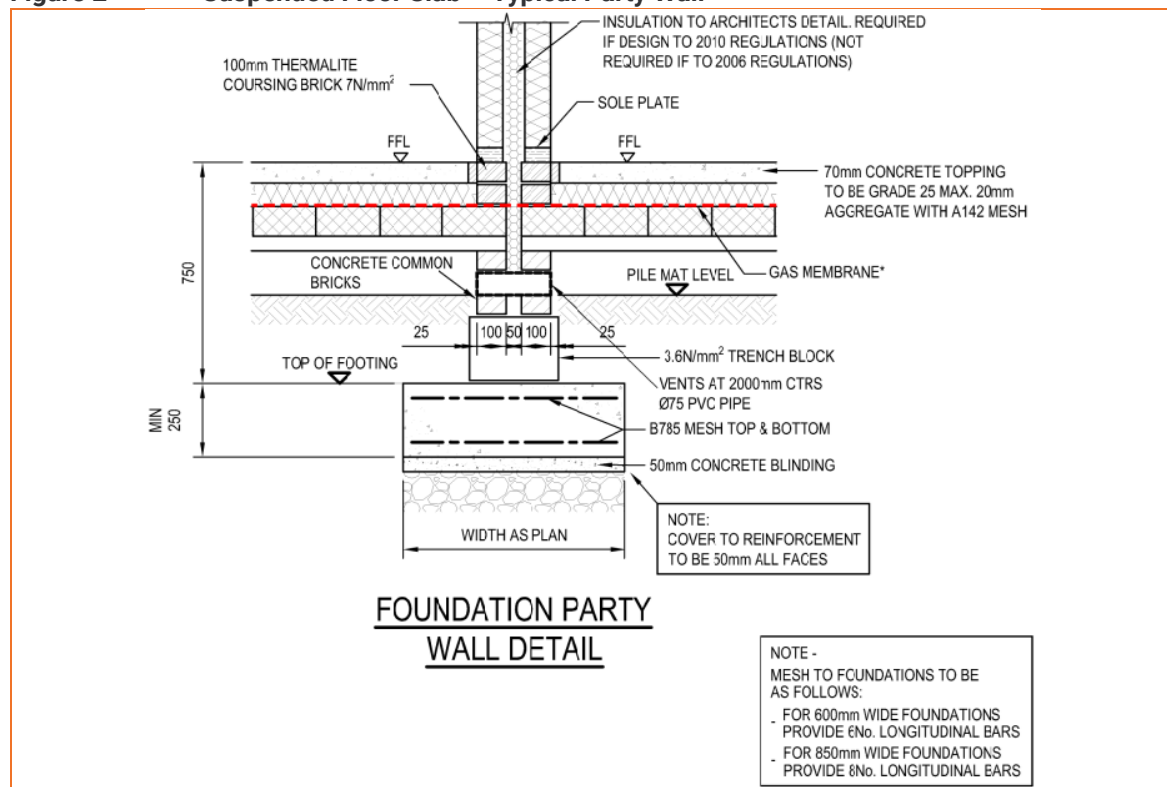




Figure 3 **Suspended Floor Slab - Typical Level Threshold Detail - VSC**

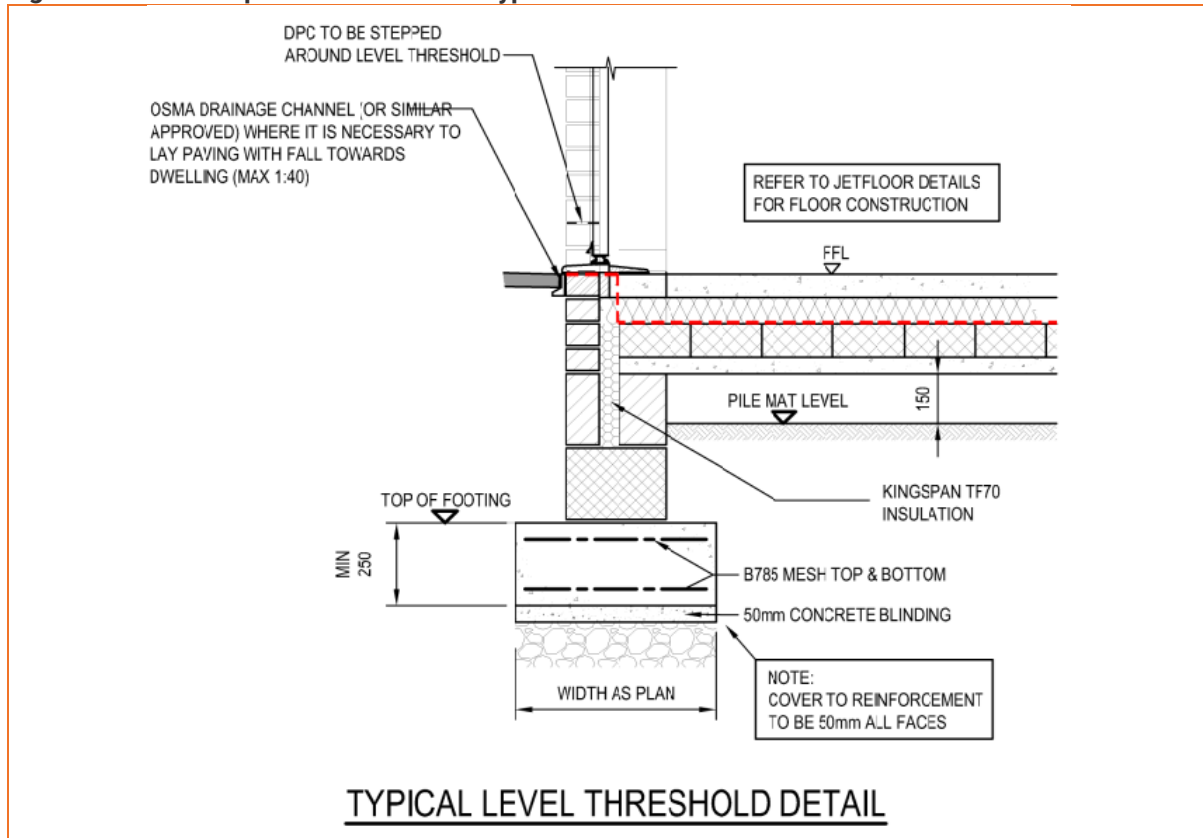
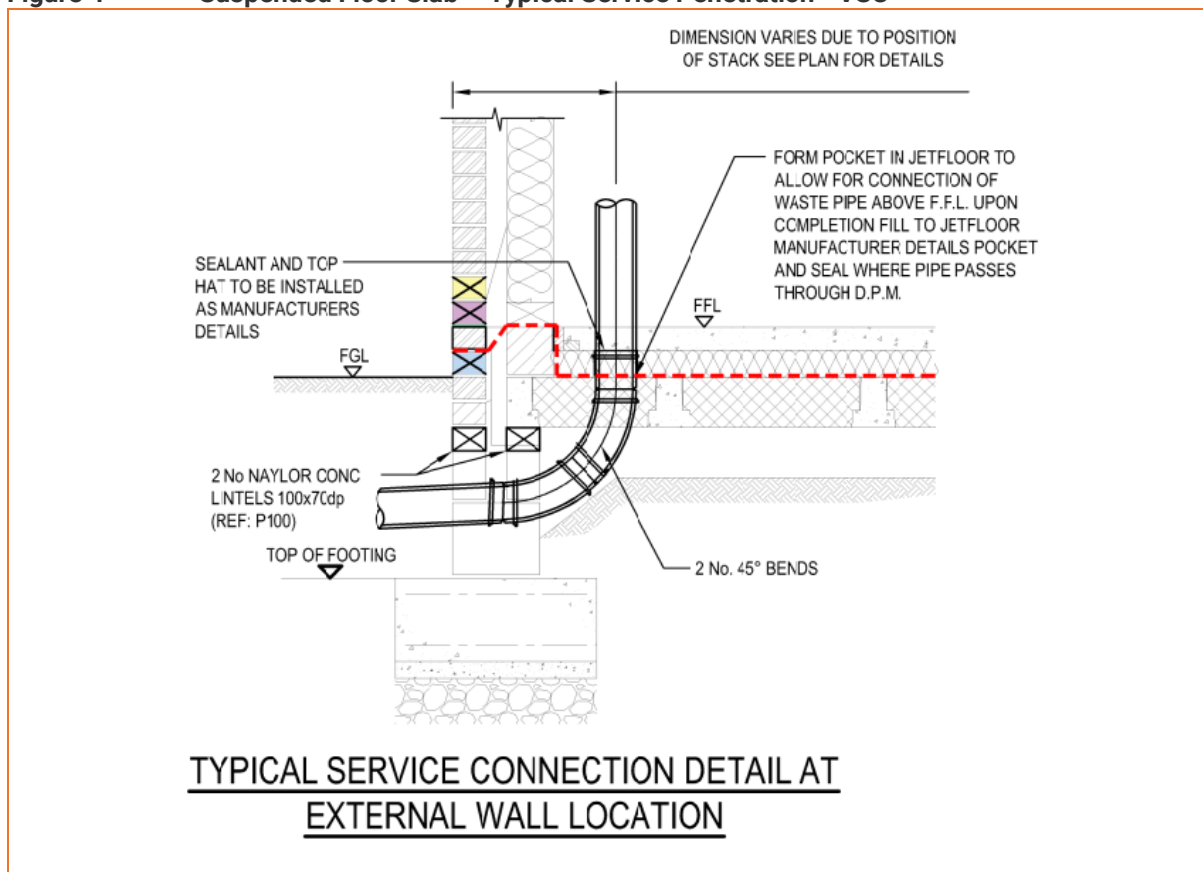


Figure 4 **Suspended Floor Slab – Typical Service Penetration - VSC**





SUMMARY OF VALIDATION INSPECTION & APPROVAL

SUB-FLOOR VOID

As per NHBC guidance and the structural engineers design, the sub-floor voids should be a minimum of 150 mm with no visible inclusions that would limit the performance of the ventilation mechanism.

The GPDR requires sub-floor voids to be inspected every plot for the first ten structures to establish protocols (as and where possible), and then every ten plots thereafter for sub-floor void (minimum 150 mm sub-floor void) and internal sleeper wall ventilation (to ensure uninhibited airflow). Plots requiring vapour-resistant membranes (i.e. Plots 1-10) will require 50% of sub-floor voids to be inspected.

The sub-floor voids for Plots 36-39 & 49 could not be inspected on this particular occasion. However, the subfloor voids of Plot 22 were previously inspected on 7th May 2025 as part of a previous visit (CQA Validation Report V5, dated 07-05-2025).

The sub-floor voids were observed and inspected to be a minimum of 150 mm with no visible inclusions that would limit the performance of this ventilation mechanism.

Photographs of the sub-floor void for Plot 22 are included in the final section of the previous CQA Validation Report (CQA Validation Report V5, dated 07-05-2025).

AIR BRICKS & TELESCOPIC VENTILATION

As per NHBC guidance and the structural engineer's design as part of the mitigation a telescopic vent and vent brick is required at 2.00 m intervals in the brick course. E3P can confirm these have also been fitted accurately on all elevations of the plot (party walls exempt) to allow the sufficient function of the passive sub-floor ventilation system.

GAS RESISTANT MEMBRANE

The membrane utilised on-site comprises: Juta - GP1 Gas Barrier resistant to Carbon Dioxide, Methane and Radon.

It has been confirmed as part of the validation that the membrane utilised in the plots discussed herein matches that of **Figures 1-4**.

The E3P Technician has inspected the installation of this membrane in line with the structural engineer's specifications in terms of placement and position (**Figures 1-4**), and the manufacturer's detail in terms of the workmanship.

E3P can confirm that sand blinding has been utilised to protect the membrane and there were no holes or rips at the inspection time.

Where any rips or tares 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

All the overlaps were then additionally taped to avoid damage/trip hazards using foil-backed girth tape.



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 as well as being secured against the pipe with a metal jubilee clip.

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 **Plots 36-39 & 49** have been installed with gas protection measures in accordance with the detailed structural design and the requirements of BS8485:2015 (+A1 2019) Characteristic Situation 2, 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 section.

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	61 / 61 (100%)	Flagged items	0	Actions	0
Site Name	Land at Edenfield Road				
Location	Tenterhouse Mill, Greenbooth Road Rochdale England OL12 7TD United Kingdom (53.629216523644324, - 2.2180890105105564)				
Project Manager	Mark Wilson				
Project number	16-465				
Developer	Stonebond				
Site representative Signature	 3 Jun 2025 10:52 AM BST				
Conducted on	3 Jun 2025 10:08 AM BST				
Prepared by	Joe Newall				
Have you got the correct Gas Membrane detail (attached to the job in synergist)?	Yes				



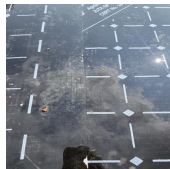
<u>Gas Membrane Inspection</u>		60 / 60 (100%)
Plot Inspection 1		12 / 12 (100%)
Plot Number		36
Type of Development: if other add Note	House	
Floor Slab Type	Block and beam suspended	
Are telescopic vents present?	Yes	
  Photo 1 Photo 2		
Gas Membrane Type: Manufacturer, gauge, and colour. (Take photos were possible showing Label)		JUTA – GP1 Gas Barrier
Installer's name, company and qualification		Arch and Wood
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
    Photo 3 Photo 4 Photo 5 Photo 6		
Are welds complete?		Yes
   Photo 7 Photo 8 Photo 9		
Are Joints lapped and sealed in accordance with manufacturer's requirements/ specification?		Yes



Photo 10



Photo 11

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

Pass



Photo 12



Photo 13



Photo 14



Photo 15



Photo 16

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

Pass



Photo 17



Photo 18



Photo 19



Photo 20



Photo 21



Photo 22



Photo 23

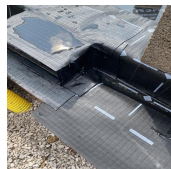


Photo 24

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

Pass



Photo 25

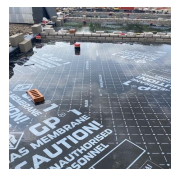


Photo 26



Photo 27



Photo 28

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

Yes

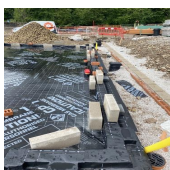


Photo 29



Photo 30

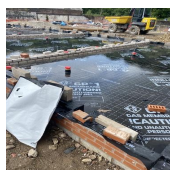


Photo 31



Photo 32

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

N/A



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 an 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

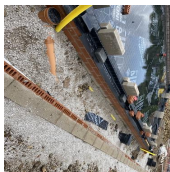


Photo 33

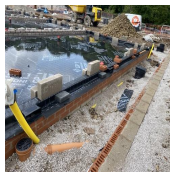


Photo 34



Photo 35



Photo 36



Plot Inspection 2		12 / 12 (100%)
Plot Number		37
Type of Development: if other add Note		House
Floor Slab Type		Block and beam suspended
Are telescopic vents present?		Yes
  Photo 37 Photo 38		
Gas Membrane Type: Manufacturer, gauge, and colour. (Take photos where possible showing Label)		JUTA – GP1 Gas Barrier
Installer's name, company and qualification		Arch and Wood
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
     Photo 39 Photo 40 Photo 41 Photo 42 Photo 43		
Are welds complete?		Yes
     Photo 44 Photo 45 Photo 46 Photo 47 Photo 48		
Are Joints lapped and sealed in accordance with manufacturer's requirements/ specification?		Yes
   Photo 49 Photo 50 Photo 51		



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

Pass



Photo 52



Photo 53



Photo 54

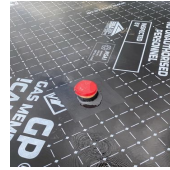


Photo 55

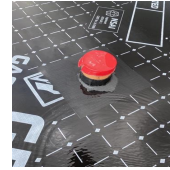


Photo 56



Photo 57



Photo 58

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

Pass



Photo 59



Photo 60



Photo 61



Photo 62



Photo 63



Photo 64



Photo 65



Photo 66

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

Pass



Photo 67



Photo 68

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

Yes



Photo 69



Photo 70



Photo 71



Photo 72

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

N/A



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 73

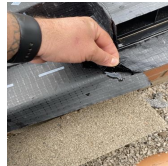
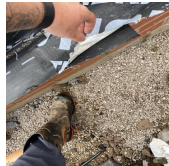
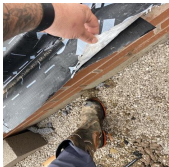


Photo 74



Photo 75



Plot Inspection 3		12 / 12 (100%)
Plot Number		38
Type of Development: if other add Note		House
Floor Slab Type		Block and beam suspended
Are telescopic vents present?		Yes
  Photo 76 Photo 77		
Gas Membrane Type: Manufacturer, gauge, and colour. (Take photos were possible showing Label)		JUTA – GP1 Gas Barrier
Installer's name, company and qualification		Arch and Wood
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
     Photo 78 Photo 79 Photo 80 Photo 81 Photo 82		
Are welds complete?		Yes
     Photo 83 Photo 84 Photo 85 Photo 86 Photo 87		
Are Joints lapped and sealed in accordance with manufacturer's requirements/ specification?		Yes
   Photo 88 Photo 89 Photo 90		



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

Pass



Photo 91



Photo 92



Photo 93



Photo 94



Photo 95



Photo 96



Photo 97



Photo 98



Photo 99

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

Pass



Photo 100



Photo 101



Photo 102



Photo 103



Photo 104



Photo 105



Photo 106



Photo 107

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

Pass



Photo 108



Photo 109

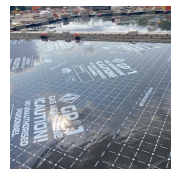


Photo 110



Photo 111

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

Yes



Photo 112

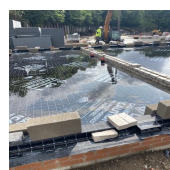


Photo 113



Photo 114



Photo 115



Photo 116

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

N/A



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 an 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 117



Photo 118



Photo 119



Photo 120



Plot Inspection 4		12 / 12 (100%)
Plot Number		39
Type of Development: if other add Note		House
Floor Slab Type		Block and beam suspended
Are telescopic vents present?		Yes
  Photo 121 Photo 122		
Gas Membrane Type: Manufacturer, gauge, and colour. (Take photos where possible showing Label)		JUTA – GP1 Gas Barrier
 Photo 123		
Installer's name, company and qualification		Arch and Wood
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 laid gas membrane? IF FAIL DESCRIPTION IN ACTIONS AND PHOTOS REQUIRED		Pass
     Photo 124 Photo 125 Photo 126 Photo 127 Photo 128		
Are welds complete?		Yes
    Photo 129 Photo 130 Photo 131 Photo 132		
Are Joints lapped and sealed in accordance with manufacturer's requirements/ specification?		Yes



Photo 133



Photo 134



Photo 135



Photo 136

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

Pass



Photo 137



Photo 138



Photo 139



Photo 140



Photo 141



Photo 142

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

Pass



Photo 143



Photo 144



Photo 145



Photo 146



Photo 147



Photo 148



Photo 149



Photo 150



Photo 151



Photo 152

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

Pass



Photo 153



Photo 154

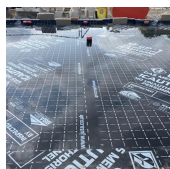


Photo 155



Photo 156

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

Yes



Photo 157

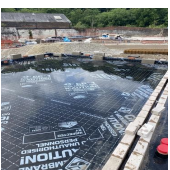


Photo 158

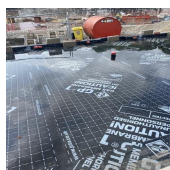


Photo 159



Photo 160

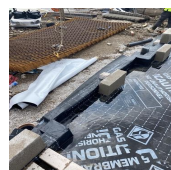


Photo 161



Photo 162



Photo 163

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

N/A

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 an 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 164



Photo 165



Photo 166



Photo 167



Plot Inspection 5		12 / 12 (100%)
Plot Number		49
Type of Development: if other add Note		House
Floor Slab Type		Block and beam suspended
Are telescopic vents present?		Yes
  Photo 168 Photo 169		
Gas Membrane Type: Manufacturer, gauge, and colour. (Take photos where possible showing Label)		JUTA – GP1 Gas Barrier
Installer's name, company and qualification		Arch and Wood
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 laid gas membrane? IF FAIL DESCRIPTION IN ACTIONS AND PHOTOS REQUIRED		Pass
      Photo 170 Photo 171 Photo 172 Photo 173 Photo 174 Photo 175		
Are welds complete?		Yes
    Photo 176 Photo 177 Photo 178 Photo 179		
Are Joints lapped and sealed in accordance with manufacturer's requirements/ specification?		Yes
  Photo 180 Photo 181		



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

Pass



Photo 182



Photo 183



Photo 184



Photo 185



Photo 186



Photo 187

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

Pass



Photo 188



Photo 189



Photo 190



Photo 191

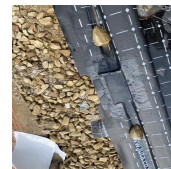


Photo 192



Photo 193

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

Pass

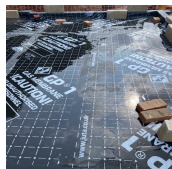


Photo 194



Photo 195



Photo 196



Photo 197

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

Yes



Photo 198



Photo 199

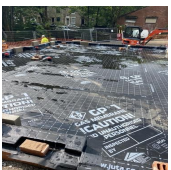


Photo 200

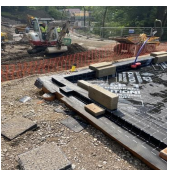


Photo 201

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

N/A

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 202



Photo 203



Photo 204



Photo 205

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



Photo 50



Photo 51



Photo 52



Photo 53



Photo 54

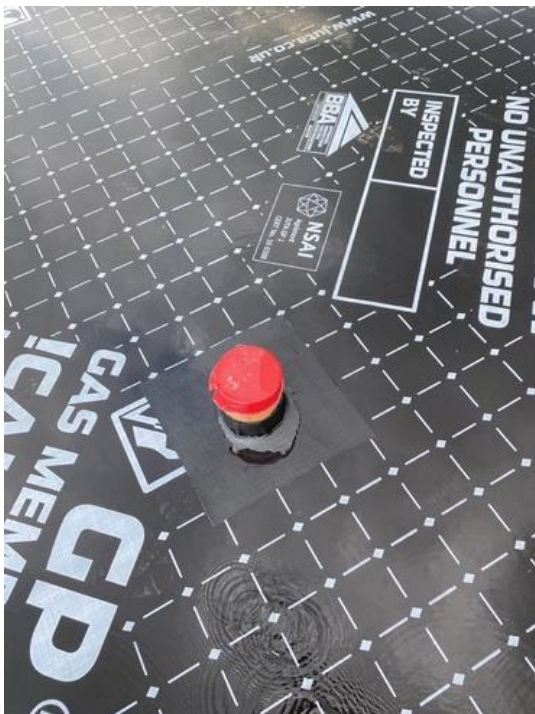


Photo 55

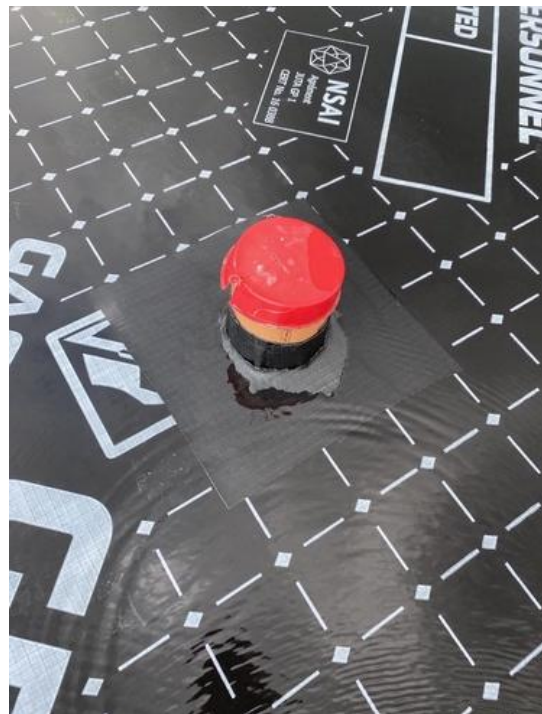


Photo 56



Photo 57



Photo 58



Photo 59



Photo 60



Photo 61



Photo 62



Photo 63



Photo 64



Photo 65



Photo 66



Photo 67



Photo 68



Photo 69



Photo 70



Photo 71



Photo 72



Photo 73



Photo 74



Photo 75



Photo 76



Photo 77



Photo 78



Photo 79



Photo 80



Photo 81



Photo 82



Photo 83



Photo 84



Photo 85



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Photo 154



Photo 155



Photo 156



Photo 157



Photo 158



Photo 159



Photo 160



Photo 161



Photo 162



Photo 163



Photo 164



Photo 165



Photo 166



Photo 167



Photo 168



Photo 169

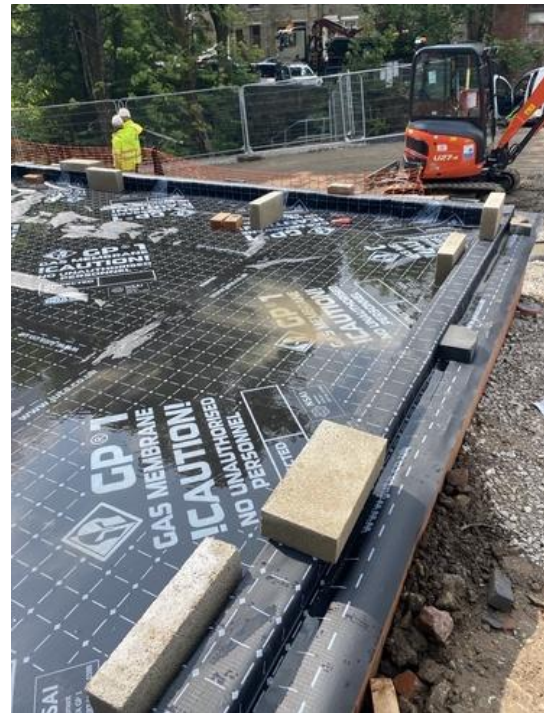


Photo 170



Photo 171



Photo 172



Photo 173



Photo 174



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Photo 182



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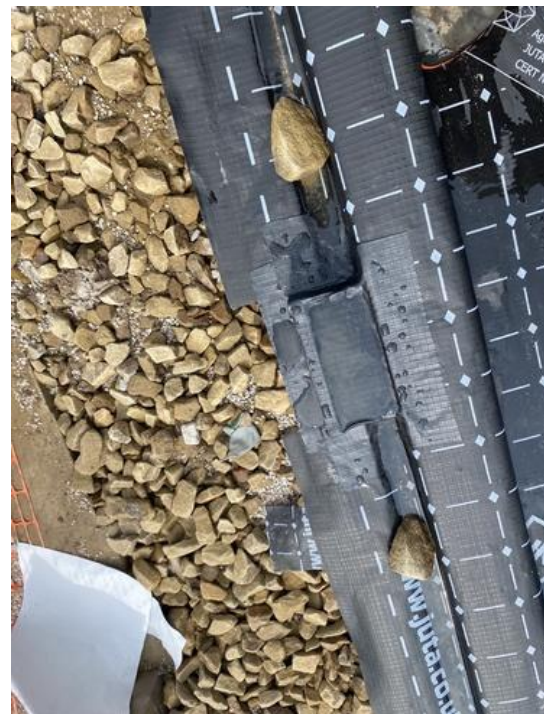


Photo 192



Photo 193



Photo 194



Photo 195



Photo 196



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Photo 198



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Photo 200



Photo 201



Photo 202



Photo 203



Photo 204



Photo 205