Sirius Geotechnical Ltd
Russel House
Mill Road
Langley Moor
Durham
DH7 8HJ

0191 3789972
www.thesiriusgroup.com

Mr E Martindale
Partner Construction
Ribble House
Mandale Business Park
Durham
DH1 1TH

Date: 23rd November 2023
Ref: C8785E/8486/AS/AS

Dear Elliott,

GROUND GAS VERIFICATIONS – STEPHENSON ROAD, PETERLEE (PLOTS 23 TO 28, 31 AND 47 TO 59)

Sirius Geotechnical Ltd (Sirius) was appointed by Partner Construction to undertake verification of the successful implementation of ground gas protection measures at their site at Stephenson Road, Peterlee.

This letter report considers plots 23 to 28, 31 and 47 to 59 at the development, which comprise a combination of semi- detached and link properties.

INTRODUCTION

In connection with the site and the proposed development, a number of site investigations have been completed by Sirius Geotechnical Ltd (SGL), most relevant being Sirius' Gas risk letter report Ref C8785/7712/MG/MG dated 30th October 2020.

The report concluded that the ground gas regime for the site represents "Characteristic Situation 2 – CS2", due to elevated carbon dioxide, and locally methane concentrations, associated with deep made ground, hence the requirement for ground gas protection measures. Sirius' remediation strategy ref C8785 Remediation Strategy and Gas Protection Verification Plan (June 2022) provides details of the measures to be installed to mitigate risks from ground gas and how the installation of such measures should be verified.

GROUND GAS PROTECTION MEASURES

Gas protection measures utilised at the site comprise a ventilated void (minimum 150mm in height), underlying a "beam and block" floor and with a proprietary gas-resistant membrane.

In accordance with the current (2019) version of BS8485, for residential developments, CS2 conditions require 3.5 protection points, which in this case would be achieved by the combination of the ventilated void (minimum 1.5 points) and the verified membrane (2 points).

The membrane used was a "Solshield Ultra" product, with associated Solcourse shaped cavity trays and approved detailing membrane used to form corners and seal service penetrations. It is understood that the membrane was installed by a qualified specialist company (Chris Wood) who hold the NVQ Level 2 diploma. A copy of the Solshield Ultra datasheets are included with this letter (Attachment A).

VERIFICATION WORKS

Verification works were undertaken as summarised in Table 1 below.

Date	Verification completed	Plot Nos	Completed by
20.02.23	Visual inspection of subfloor voids	25 to 26	Sirius
07.12.22	Inspection of membranes	27 to 28	Site manager
07.03.23	Inspection of membranes	24 to 25	Site manager
03.04.23	Inspection of membranes	23 and 26	Site manager
15.09.23	Internal service penetrations	23 to 28	Site manager
29.09.22	Visual inspection of subfloor voids	31	Sirius
23.01.23	Inspection of membranes	31	Site manager
10.11.23	Internal service penetrations	31	Site manager
19.01.22	Visual inspection of subfloor voids	47 to 51	Site manager
29.09.22	Inspection of membranes	47 to 51	Sirius
29.03.23	Inspection of membranes	54 to 55 and 58 to 59	Site Manager
03.04.23	Inspection of membranes	52 to 53	Site Manager
15.09.23	Internal service penetrations	55 to 59	Site manager
10.11.23	Internal service penetrations	47 to 54	Site manager

Membrane joints were in the form of heat-welds, and where penetration of the membrane had locally occurred, patches of self-adhesive bitumen tape or off cut patches of the membrane which had been heat welded had been applied, with a minimum dimension of 150mm.

Site record sheets including photographs of the key features of the plots verified are included in Attachment B.

Sirius have not directly inspected every membrane or sub-floor void covered by this report, although have directly inspected other installations on site which were found to meet the required standards of installation. Sirius have been provided with satisfactory records from site for all membranes and seals not directly inspected. This is in compliance with the requirements of the verification plan.

CONCLUDING COMMENTS

In conclusion, it is considered that the required gas protection measures have been successfully installed at the plots considered herein.

Care must be employed to ensure that membranes and seals are not damaged by follow on trades as the developments are completed.

We trust that you will forward this letter to the appropriate regulatory bodies and / or warranty provider, but if you require any other information, please do not hesitate to contact us directly.

Yours sincerely

Andrew Smeaton
Engineer

For and on behalf of
Sirius Geotechnical Ltd

Encl.

Attachments
A - Gas Protection Verification Photographs
B - Solshield Ultra Datasheet and Foundation Details
C - Site Layout Drawing

Gas Protection Verification Photographs

01 C8785E 03.04.23 Plot 23 and 24 Overview (client photo)

02 C8785E 03.04.23 Plot 23 and 24 Corners (client photo)

03 C8785E 03.04.23 Plot 23 and 24 Service Entry Ducts (client photo)

01 C8785E 20.02.23 Plot 25 Void Space (client photo)

02 C8785E 07.03.23 Plot 25 Overview (client photo)

03 C8785E 07.03.23 Plot 25 Corners (client photo)

04 C8785E 07.03.23 Plot 25 Overview and Service Entry Duct (client photo)

05 C8785E 20.02.23 Plot 25 Void Space (client photo)

06 C8785E 07.03.23 Plot 26 Overview (client photo)

07 C8785E 07.03.23 Plot 26 Corners (client photo)

08 C8785E 07.03.23 Plot 26 Overview and Service Entry Duct (client photo)

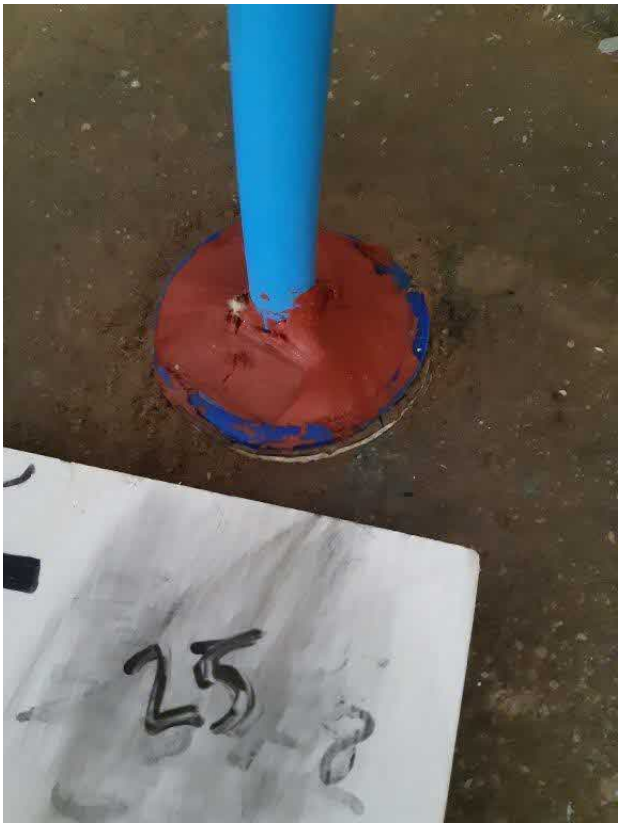
Gas Protection Verification
Photographs

01 C8785E 07.12.22 Plot 27 Overview (Client photo)

02 C8785E 07.12.22 Plot 28 Overview (Client photo)

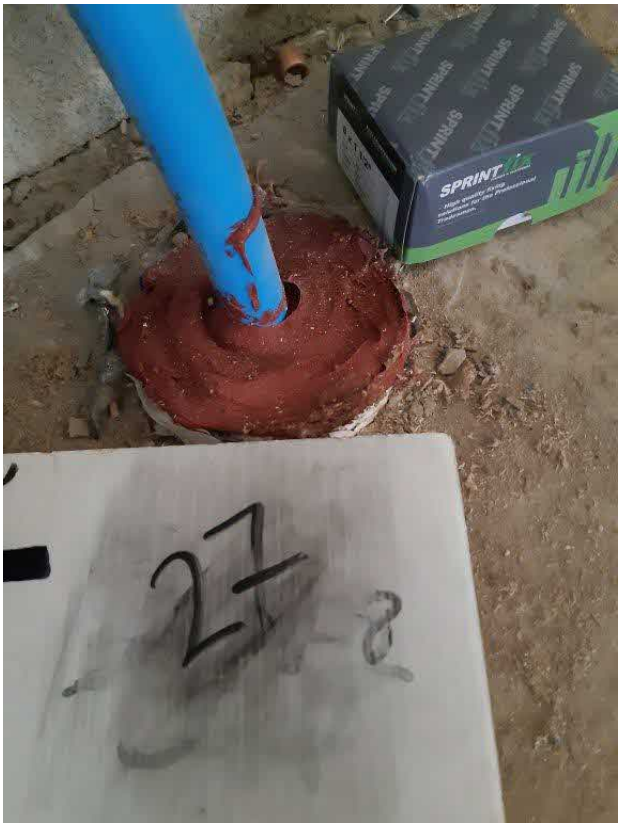
01 C8785E 15.09.23 Plot 23 Service Entry Seal (client photo)

02 C8785E 15.09.23 Plot 24 Service Entry Seal (client photo)



03 C8785E 15.09.23 Plot 25 Service Entry Seal (client photo)

04 C8785E 15.09.23 Plot 26 Service Entry Seal (client photo)



05 C8785E 15.09.23 Plot 27 Service Entry Seal (client photo)

06 C8785E 15.09.23 Plot 28 Service Entry Seal (client photo)

29th September 2022 and
23rd January 2023

Gas Protection Verification Photographs

01 C8585E 29.09.22 Plot 31 Void Space

02 C8785E 23.01.23 Plot 31 Overview (client photo)

Gas Protection Verification Photographs

03 C8785E 23.01.23 Plot 31 Corners (client photo)

04 C8785E 23.01.23 Plot 31 Service Entry Ducts (client photo)

VISUAL INSPECTION OF GAS PROTECTION MEASURES

Site name: Stephenson Road, Peterlee	Gas characteristic situation: Assessed as BS8485:2015+A1:2019 CS1 Measures to be installed commensurate with CS2 conditions
Job number: C8785E	Type of development and building/block checked: (residential/ commercial/other) Low rise residential, semi detached.
Client: United Living	Installer: Chris Wood
Date: 19.01.2021 (client) and 29.09.2022	Building description: Plot 47 detached residential
Visit by: D Gallagher	Foundation type: (suspended floor/raft/other) Suspended block and beam.
Weather at time of installation and inspection: Fine	Gas protection type: passive/active Passive

No.	Item	Comments (see notes)
1	*Gas membrane*	
1.1	Condition of sub-grade and underside of gas membrane	Not directly inspected during visit. No protuberances/ debris noted below membrane and no damage caused.
1.2	Gas membrane type	Solshield Ultra membrane with Solcourse along wall bases.
1.3	Gas membrane condition	Very good overall condition. Limited dirt and no damage observed.
1.4	Joining tape product	Details at corners and service penetrations using self-adhesive membrane.
1.5	Lapping design	Welded seams.
1.6	Laps, welds and joints seals	All laps, corner and service penetration seals in good condition.
1.7	Service entries seals	Services not installed within ducts at time of visit.
2	*Passive venting*	
2.1	Sub-floor void	Inspected by client on 19.01.21.
2.2	External wall airbricks	Periscopic vents around external walls.
2.3	Internal sleeper walls	Not inspected during this visit.
2.4	External vent trenches/ducts	N/A
3	*Active venting*	
3.1	System details	N/A

Additional notes:
This document does not constitute final validation of gas protection measures – evidence of service entry seals are required.

Notes: inspection checklist

1.1	Underside of gas membrane	Check that the sub grade 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.
1.2	Gas membrane type	Manufacturer and product specification, gauge, colour, brand/name, material batch/roll numbers, storage arrangements (protected from dirt/damage?)
1.3	Gas membrane condition	Open punctures, tears, rips, stretching? Excessive footprints/evidence of traffic? Presence of debris? Repairs? Signs of weakness such as raised or sunken indentations? Protection plan in place to restrict access to lain gas membrane?
1.4	Joining tape product	Product type, brand, thickness, material, width, colour? Use of double sided tape?
1.5	Lapping design	Joints lapped and sealed in accordance with manufacturer's requirements/ specification? Minimum overlap insured? Sections taped twice?
1.6	Laps and joints sealed	Welds complete? Appropriate joining/double sided tape used?
1.7	Service entries sealed	Top hats seal arrangements fixed around service entries? Use of Jubilee clips?
2.1	Sub-floor void	Is a check possible? Void former? Gravel (type/specification)? Height of void space? Is it clear?
2.2	External wall airbricks	Numbers, size, positions as design drawing?
2.3	Internal sleeper walls	Ventilation holes (honeycomb brickwork/pipe crossings?) – size, spacing, location in accordance with design?
2.4	External vent trenches/ducts	Located and constructed in accordance with design drawings? If open-topped gravel – gravel type/presence of fines? If pipe or other vent, check position and construction for functionality and absence of blockages. Ability of void former to withstand bearing of the superstructure?
3.1	Active venting	Type of air supply: mechanical, natural, combined? Location/condition/number of fans and vents? Location and size of inlets? Provision of air-cleaning devices and air heaters? Supply and exhaust ductwork? Alarm provision/installation? Gas monitoring system in under-floor void?

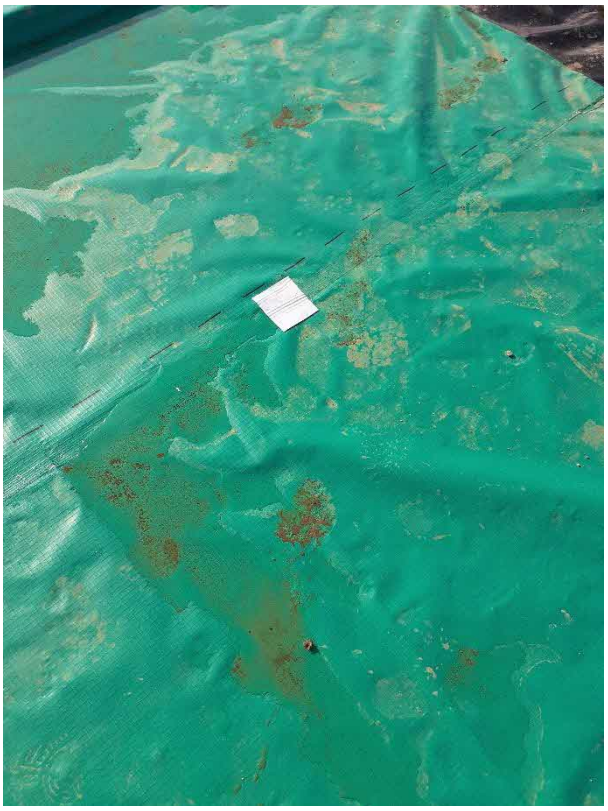
Photographs

01 C8585E 19.01.22 Plot 47 Void Space (client photo)

02 C8585E 29.09.22 Plot 47 Overview

03 C8585E 29.09.22 Plot 47 Corners

04 C8585E 29.09.22 Plot 47 Service Entry Ducts



05 C8585E 29.09.22 Plot 47 Repair

06 C8585E 29.09.22 Plot 47 Void Space Vent

The gas protection measures inspected:	a Are acceptable and comply with the specification
	~~b Are acceptable but attention is drawn to issues related to item no.~~
	~~c Are not acceptable due to the issues related to item no.~~

Name: Dan Gallagher **Signature:** [redacted] **Date: 29.09.2022**

VISUAL INSPECTION OF GAS PROTECTION MEASURES

Site name: Stephenson Road, Peterlee	Gas characteristic situation: Assessed as BS8485:2015+A1:2019 CS1 Measures to be installed commensurate with CS2 conditions
Job number: C8785E	Type of development and building/block checked: (residential/ commercial/other) Low rise residential, semi detached.
Client: United Living	Installer: Chris Wood
Date: 19.01.2021 (client) and 29.09.2022	Building description: Plot 48 semi detached residential
Visit by: D Gallagher	Foundation type: (suspended floor/raft/other) Suspended block and beam.
Weather at time of installation and inspection: Fine	Gas protection type: passive/active Passive

No.	Item	Comments (see notes)
1	*Gas membrane*	
1.1	Condition of sub-grade and underside of gas membrane	Not directly inspected during visit. No protuberances/ debris noted below membrane and no damage caused.
1.2	Gas membrane type	Solshield Ultra membrane with Solcourse along wall bases.
1.3	Gas membrane condition	Very good overall condition. Limited dirt and no damage observed.
1.4	Joining tape product	Details at corners and service penetrations using self-adhesive membrane.
1.5	Lapping design	Welded seams.
1.6	Laps, welds and joints seals	All laps, corner and service penetration seals in good condition.
1.7	Service entries seals	Services not installed within ducts at time of visit.
2	*Passive venting*	
2.1	Sub-floor void	Inspected by client 19.01.21
2.2	External wall airbricks	Periscopic vents around external walls.
2.3	Internal sleeper walls	Not inspected during this visit.
2.4	External vent trenches/ducts	N/A
3	*Active venting*	
3.1	System details	N/A

Additional notes:
This document does not constitute final validation of gas protection measures – evidence of service entry seals are required.

Notes: inspection checklist

1.1	Underside of gas membrane	Check that the sub grade 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.
1.2	Gas membrane type	Manufacturer and product specification, gauge, colour, brand/name, material batch/roll numbers, storage arrangements (protected from dirt/damage?)
1.3	Gas membrane condition	Open punctures, tears, rips, stretching? Excessive footprints/evidence of traffic? Presence of debris? Repairs? Signs of weakness such as raised or sunken indentations? Protection plan in place to restrict access to lain gas membrane?
1.4	Joining tape product	Product type, brand, thickness, material, width, colour? Use of double sided tape?
1.5	Lapping design	Joints lapped and sealed in accordance with manufacturer's requirements/ specification? Minimum overlap insured? Sections taped twice?
1.6	Laps and joints sealed	Welds complete? Appropriate joining/double sided tape used?
1.7	Service entries sealed	Top hats seal arrangements fixed around service entries? Use of Jubilee clips?
2.1	Sub-floor void	Is a check possible? Void former? Gravel (type/specification)? Height of void space? Is it clear?
2.2	External wall airbricks	Numbers, size, positions as design drawing?
2.3	Internal sleeper walls	Ventilation holes (honeycomb brickwork/pipe crossings?) – size, spacing, location in accordance with design?
2.4	External vent trenches/ducts	Located and constructed in accordance with design drawings? If open-topped gravel – gravel type/presence of fines? If pipe or other vent, check position and construction for functionality and absence of blockages. Ability of void former to withstand bearing of the superstructure?
3.1	Active venting	Type of air supply: mechanical, natural, combined? Location/condition/number of fans and vents? Location and size of inlets? Provision of air-cleaning devices and air heaters? Supply and exhaust ductwork? Alarm provision/installation? Gas monitoring system in under-floor void?

Photographs

01 C8585E 19.01.22 Plot 48 Void Space (client photo)

02 C8585E 29.09.22 Plot 48 Overview

03 C8585E 29.09.22 Plot 48 Corner

04 C8585E 29.09.22 Plot 48 Service Entry Ducts

05 C8585E 29.09.22 Plot 48 Repair

05 C8585E 29.09.22 Plot 48 Void Space Vents

The gas protection measures inspected:	a Are acceptable and comply with the specification
	~~b Are acceptable but attention is drawn to issues related to item no.~~
	~~c Are not acceptable due to the issues related to item no.~~

Name: Dan Gallagher **Signature:** [redacted] **Date: 29.09.2022**

VISUAL INSPECTION OF GAS PROTECTION MEASURES

Site name: Stephenson Road, Peterlee	Gas characteristic situation: Assessed as BS8485:2015+A1:2019 CS1 Measures to be installed commensurate with CS2 conditions
Job number: C8785E	Type of development and building/block checked: (residential/ commercial/other) Low rise residential, semi detached.
Client: United Living	Installer: Chris Wood
Date: 19.01.21 (client) and 29.09.2022	Building description: Plot 49 terrace of three residential
Visit by: D Gallagher	Foundation type: (suspended floor/raft/other) Suspended block and beam.
Weather at time of installation and inspection: Fine	Gas protection type: passive/active Passive

No.	Item	Comments (see notes)
1	*Gas membrane*	
1.1	Condition of sub-grade and underside of gas membrane	Not directly inspected during visit. No protuberances/ debris noted below membrane and no damage caused.
1.2	Gas membrane type	Solshield Ultra membrane with Solcourse along wall bases.
1.3	Gas membrane condition	Very good overall condition. Limited dirt and no damage observed.
1.4	Joining tape product	Details at corners and service penetrations using self-adhesive membrane.
1.5	Lapping design	Welded seams.
1.6	Laps, welds and joints seals	All laps, corner and service penetration seals in good condition.
1.7	Service entries seals	Services not installed within ducts at time of visit.
2	*Passive venting*	
2.1	Sub-floor void	Inspected by client 19.01.21.
2.2	External wall airbricks	Periscopic vents around external walls.
2.3	Internal sleeper walls	Not inspected during this visit.
2.4	External vent trenches/ducts	N/A
3	*Active venting*	
3.1	System details	N/A

Additional notes:
This document does not constitute final validation of gas protection measures – evidence of service entry seals are required.

Notes: inspection checklist

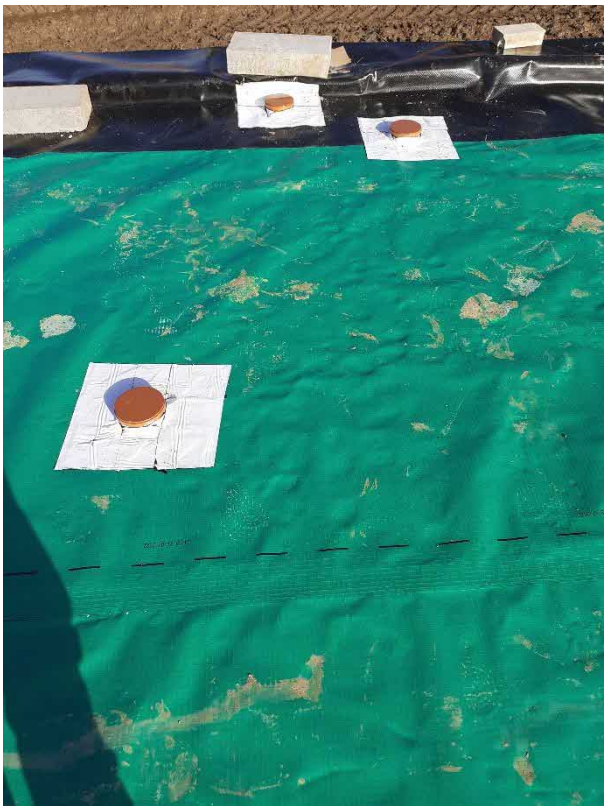
1.1	Underside of gas membrane	Check that the sub grade does not contain rough/uneven surfaces, is appropriately clean and that there are no hard/sharp objects. That protective sand blinding or geotextile (if specified) is present and meets the design criteria.
1.2	Gas membrane type	Manufacturer and product specification, gauge, colour, brand/name, material batch/roll numbers, storage arrangements (protected from dirt/damage?)
1.3	Gas membrane condition	Open punctures, tears, rips, stretching? Excessive footprints/evidence of traffic? Presence of debris? Repairs? Signs of weakness such as raised or sunken indentations? Protection plan in place to restrict access to lain gas membrane?
1.4	Joining tape product	Product type, brand, thickness, material, width, colour? Use of double sided tape?
1.5	Lapping design	Joints lapped and sealed in accordance with manufacturer's requirements/ specification? Minimum overlap insured? Sections taped twice?
1.6	Laps and joints sealed	Welds complete? Appropriate joining/double sided tape used?
1.7	Service entries sealed	Top hats seal arrangements fixed around service entries? Use of Jubilee clips?
2.1	Sub-floor void	Is a check possible? Void former? Gravel (type/specification)? Height of void space? Is it clear?
2.2	External wall airbricks	Numbers, size, positions as design drawing?
2.3	Internal sleeper walls	Ventilation holes (honeycomb brickwork/pipe crossings?) – size, spacing, location in accordance with design?
2.4	External vent trenches/ducts	Located and constructed in accordance with design drawings? If open-topped gravel – gravel type/presence of fines? If pipe or other vent, check position and construction for functionality and absence of blockages. Ability of void former to withstand bearing of the superstructure?
3.1	Active venting	Type of air supply: mechanical, natural, combined? Location/condition/number of fans and vents? Location and size of inlets? Provision of air-cleaning devices and air heaters? Supply and exhaust ductwork? Alarm provision/installation? Gas monitoring system in under-floor void?

Photographs

01 C8585E 19.01.22 Plot 49 Void Space (client photo)

02 C8585E 29.09.22 Plot 49 Overview

03 C8585E 29.09.22 Plot 49 Corners



04 C8585E 29.09.22 Plot 49 Service Entry Ducts

05 C8585E 29.09.22 Plot 49 Void Space Vents

The gas protection measures inspected:	a Are acceptable and comply with the specification
	~~b Are acceptable but attention is drawn to issues related to item no.~~
	~~c Are not acceptable due to the issues related to item no.~~

Name: Dan Gallagher **Signature:** [redacted] **Date:** 29.09.2022

VISUAL INSPECTION OF GAS PROTECTION MEASURES

Site name: Stephenson Road, Peterlee	Gas characteristic situation: Assessed as BS8485:2015+A1:2019 CS1 Measures to be installed commensurate with CS2 conditions
Job number: C8785E	Type of development and building/block checked: (residential/ commercial/other) Low rise residential, semi detached.
Client: United Living	Installer: Chris Wood
Date: 29.09.2022	Building description: Plot 50 terrace of three residential
Visit by: D Gallagher	Foundation type: (suspended floor/raft/other) Suspended block and beam.
Weather at time of installation and inspection: Fine	Gas protection type: passive/active Passive

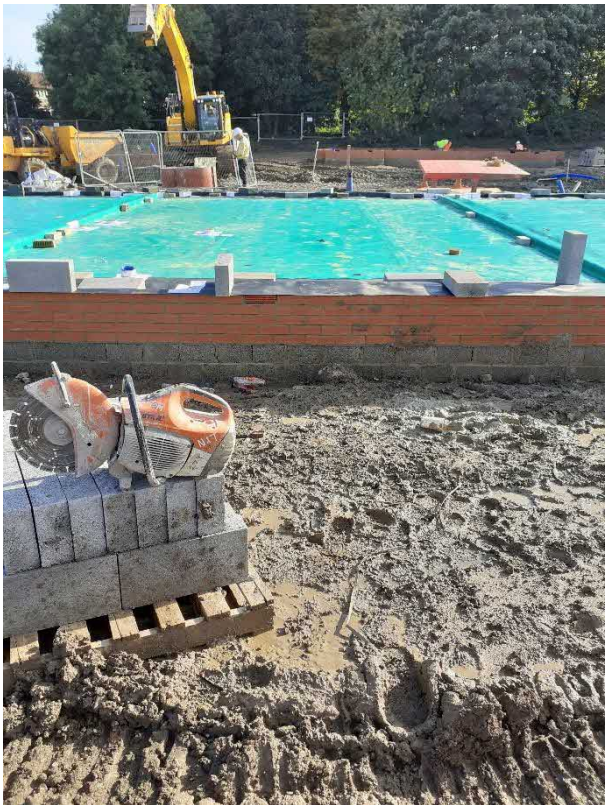
No.	Item	Comments (see notes)
1	*Gas membrane*	
1.1	Condition of sub-grade and underside of gas membrane	Not directly inspected during visit. No protuberances/ debris noted below membrane and no damage caused.
1.2	Gas membrane type	Solshield Ultra membrane with Solcourse along wall bases.
1.3	Gas membrane condition	Very good overall condition. Limited dirt and no damage observed.
1.4	Joining tape product	Details at corners and service penetrations using self-adhesive membrane.
1.5	Lapping design	Welded seams.
1.6	Laps, welds and joints seals	All laps, corner and service penetration seals in good condition.
1.7	Service entries seals	Services not installed within ducts at time of visit.
2	*Passive venting*	
2.1	Sub-floor void	Not inspected during this visit.
2.2	External wall airbricks	Periscopic vents around external walls.
2.3	Internal sleeper walls	Not inspected during this visit.
2.4	External vent trenches/ducts	N/A
3	*Active venting*	
3.1	System details	N/A

Additional notes:
This document does not constitute final validation of gas protection measures – evidence of service entry seals are required.

Notes: inspection checklist

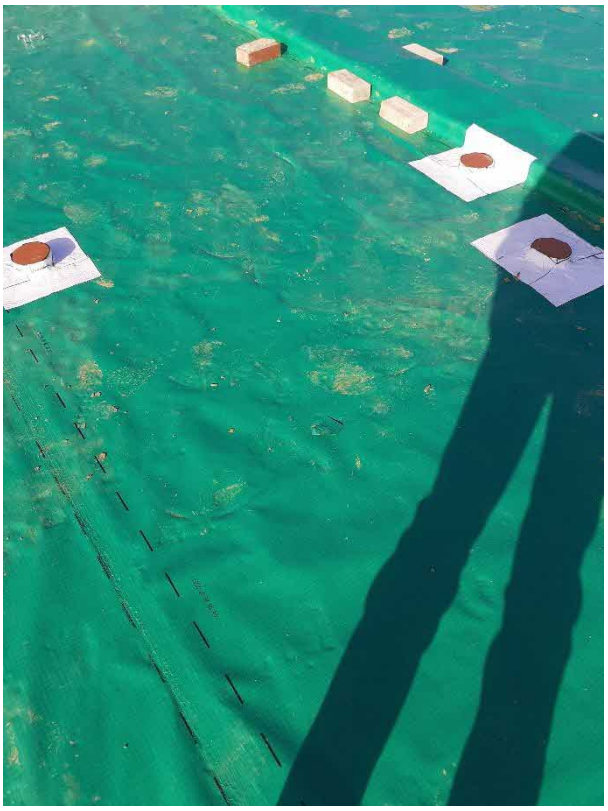
1.1	Underside of gas membrane	Check that the sub grade does not contain rough/uneven surfaces, is appropriately clean and that there are no hard/sharp objects. That protective sand blinding or geotextile (if specified) is present and meets the design criteria.
1.2	Gas membrane type	Manufacturer and product specification, gauge, colour, brand/name, material batch/roll numbers, storage arrangements (protected from dirt/damage?)
1.3	Gas membrane condition	Open punctures, tears, rips, stretching? Excessive footprints/evidence of traffic? Presence of debris? Repairs? Signs of weakness such as raised or sunken indentations? Protection plan in place to restrict access to lain gas membrane?
1.4	Joining tape product	Product type, brand, thickness, material, width, colour? Use of double sided tape?
1.5	Lapping design	Joints lapped and sealed in accordance with manufacturer's requirements/ specification? Minimum overlap insured? Sections taped twice?
1.6	Laps and joints sealed	Welds complete? Appropriate joining/double sided tape used?
1.7	Service entries sealed	Top hats seal arrangements fixed around service entries? Use of Jubilee clips?
2.1	Sub-floor void	Is a check possible? Void former? Gravel (type/specification)? Height of void space? Is it clear?
2.2	External wall airbricks	Numbers, size, positions as design drawing?
2.3	Internal sleeper walls	Ventilation holes (honeycomb brickwork/pipe crossings?) – size, spacing, location in accordance with design?
2.4	External vent trenches/ducts	Located and constructed in accordance with design drawings? If open-topped gravel – gravel type/presence of fines? If pipe or other vent, check position and construction for functionality and absence of blockages. Ability of void former to withstand bearing of the superstructure?
3.1	Active venting	Type of air supply: mechanical, natural, combined? Location/condition/number of fans and vents? Location and size of inlets? Provision of air-cleaning devices and air heaters? Supply and exhaust ductwork? Alarm provision/installation? Gas monitoring system in under-floor void?

Photographs



01 C8585E 29.09.22 Plot 50 Overview

02 C8585E 29.09.22 Plot 50 Corners



03 C8585E 29.09.22 Plot 50 Service Entry Ducts

04 C8585E 29.09.22 Plot 50 Repair

05 C8585E 29.09.22 Plot 50 Void Space Vents

The gas protection measures inspected:	a Are acceptable and comply with the specification
	~~b Are acceptable but attention is drawn to issues related to item no.~~
	~~c Are not acceptable due to the issues related to item no.~~

Name: Dan Gallagher **Signature** [redacted] **Date: 29.09.2022**

VISUAL INSPECTION OF GAS PROTECTION MEASURES

Site name: Stephenson Road, Peterlee	Gas characteristic situation: Assessed as BS8485:2015+A1:2019 CS1 Measures to be installed commensurate with CS2 conditions
Job number: C8785E	Type of development and building/block checked: (residential/ commercial/other) Low rise residential, semi detached.
Client: United Living	Installer: Chris Wood
Date: 19.01.22 (client)and 29.09.2022	Building description: Plot 51 terrace of three residential
Visit by: D Gallagher	Foundation type: (suspended floor/raft/other) Suspended block and beam.
Weather at time of installation and inspection: Fine	Gas protection type: passive/active Passive

No.	Item	Comments (see notes)
1	*Gas membrane*	
1.1	Condition of sub-grade and underside of gas membrane	Not directly inspected during visit. No protuberances/ debris noted below membrane and no damage caused.
1.2	Gas membrane type	Solshield Ultra membrane with Solcourse along wall bases.
1.3	Gas membrane condition	Very good overall condition. Limited dirt and no damage observed.
1.4	Joining tape product	Details at corners and service penetrations using self-adhesive membrane.
1.5	Lapping design	Welded seams.
1.6	Laps, welds and joints seals	All laps, corner and service penetration seals in good condition.
1.7	Service entries seals	Services not installed within ducts at time of visit.
2	*Passive venting*	
2.1	Sub-floor void	Inspected 19.01.22 by client.
2.2	External wall airbricks	Periscopic vents around external walls.
2.3	Internal sleeper walls	Not inspected during this visit.
2.4	External vent trenches/ducts	N/A
3	*Active venting*	
3.1	System details	N/A

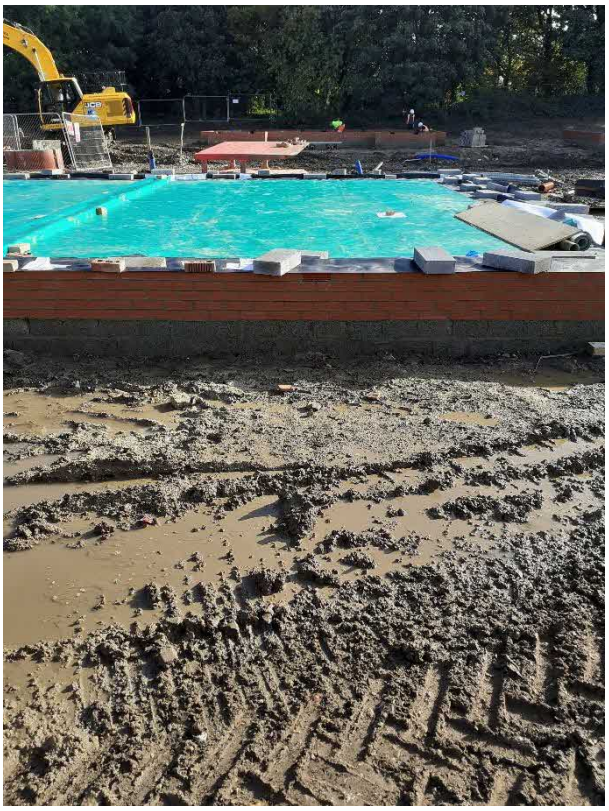
Additional notes:
This document does not constitute final validation of gas protection measures – evidence of service entry seals are required.

Notes: inspection checklist

1.1	Underside of gas membrane	Check that the sub grade 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.
1.2	Gas membrane type	Manufacturer and product specification, gauge, colour, brand/name, material batch/roll numbers, storage arrangements (protected from dirt/damage?)
1.3	Gas membrane condition	Open punctures, tears, rips, stretching? Excessive footprints/evidence of traffic? Presence of debris? Repairs? Signs of weakness such as raised or sunken indentations? Protection plan in place to restrict access to lain gas membrane?
1.4	Joining tape product	Product type, brand, thickness, material, width, colour? Use of double sided tape?
1.5	Lapping design	Joints lapped and sealed in accordance with manufacturer's requirements/ specification? Minimum overlap insured? Sections taped twice?
1.6	Laps and joints sealed	Welds complete? Appropriate joining/double sided tape used?
1.7	Service entries sealed	Top hats seal arrangements fixed around service entries? Use of Jubilee clips?
2.1	Sub-floor void	Is a check possible? Void former? Gravel (type/specification)? Height of void space? Is it clear?
2.2	External wall airbricks	Numbers, size, positions as design drawing?
2.3	Internal sleeper walls	Ventilation holes (honeycomb brickwork/pipe crossings?) – size, spacing, location in accordance with design?
2.4	External vent trenches/ducts	Located and constructed in accordance with design drawings? If open-topped gravel – gravel type/presence of fines? If pipe or other vent, check position and construction for functionality and absence of blockages. Ability of void former to withstand bearing of the superstructure?
3.1	Active venting	Type of air supply: mechanical, natural, combined? Location/condition/number of fans and vents? Location and size of inlets? Provision of air-cleaning devices and air heaters? Supply and exhaust ductwork? Alarm provision/installation? Gas monitoring system in under-floor void?

Photographs

01 C8585E 19.01.22 Plot 51 Void Space (client photo)



02 C8585E 29.09.22 Plot 51 Overview

03 C8585E 29.09.22 Plot 51 Corners and Service Entry Duct

04 C8585E 29.09.22 Plot 51 Service Entry Ducts

05 C8585E 29.09.22 Plot 51 Void Space vents

The gas protection measures inspected:	a Are acceptable and comply with the specification
	~~b Are acceptable but attention is drawn to issues related to item no.~~
	~~c Are not acceptable due to the issues related to item no.~~

Name: Dan Gallagher **Signature** [redacted] **Date: 29.09.2022**

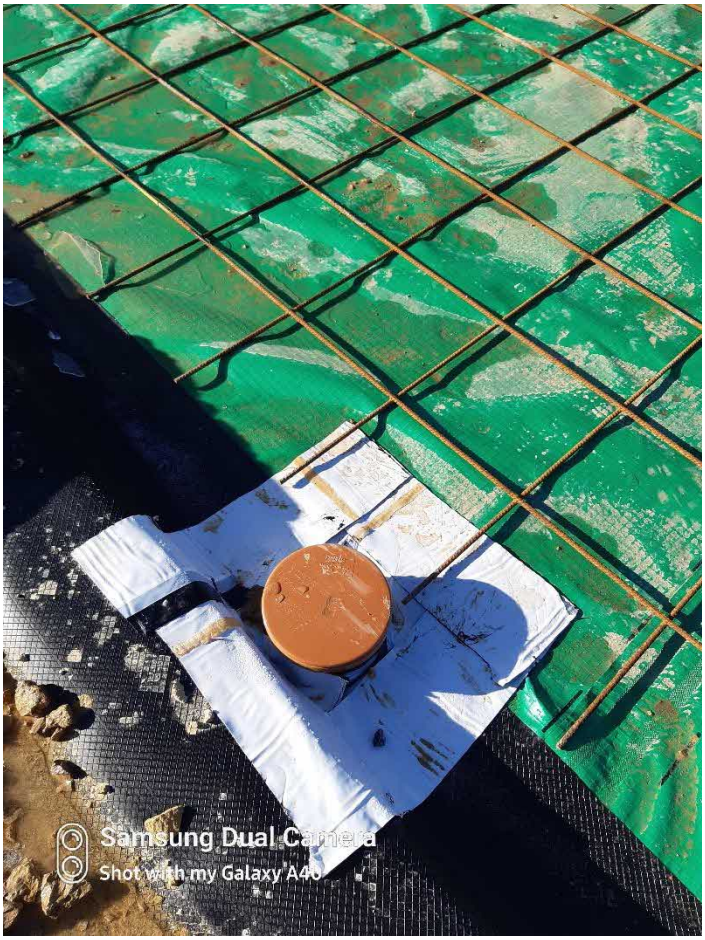
01 C8785E 03.04.23 Plot 52 Overview (client photo)

02 C8785E 03.04.23 Plot 52 Corner (client photo)

03 C8785E 03.04.23 Plot 52 Service Entry Duct (client photo)

01 C8785E 03.04.23 Plot 53 Overview (client photo)

02 C8785E 03.04.23 Plot 53 Overview and Corners (client photo)



03 C8785E 03.04.23 Plot 53 Service Entry Duct (client photo)

01 C8785E 29.03.23 Plot 54 Overview (client photo)

02 C8785E 29.03.23 Plot 54 Corners (client photo)

03 C8785E 29.03.23 Plot 54 Service Entry Ducts (client photo)

01 C8785E 29.03.23 Plot 55 Overview (client photo)

02 C8785E 29.03.23 Plot 55 Corners and Service Entrry Duct (client photo)

03 C8785E 29.03.23 Plot 55 Corners and Service Entry Duct (client photo)

01 C8785E 10.11.23 Plot 31 Service Entry Seal (client photo)

02 C8785E 10.11.23 Plot 47 Service Entry Seal (client photo)

03 C8785E 10.11.23 Plot 48 Service Entry Seal (client photo)

04 C8785E 10.11.23 Plot 49 Service Entry Seal (client photo)

05 C8785E 10.11.23 Plot 50 Service Entry Seal (client photo)

06 C8785E 10.11.23 Plot 51 Service Entry Seal (client photo)

07 C8785E 10.11.23 Plot 52 Service Entry Seal (client photo)

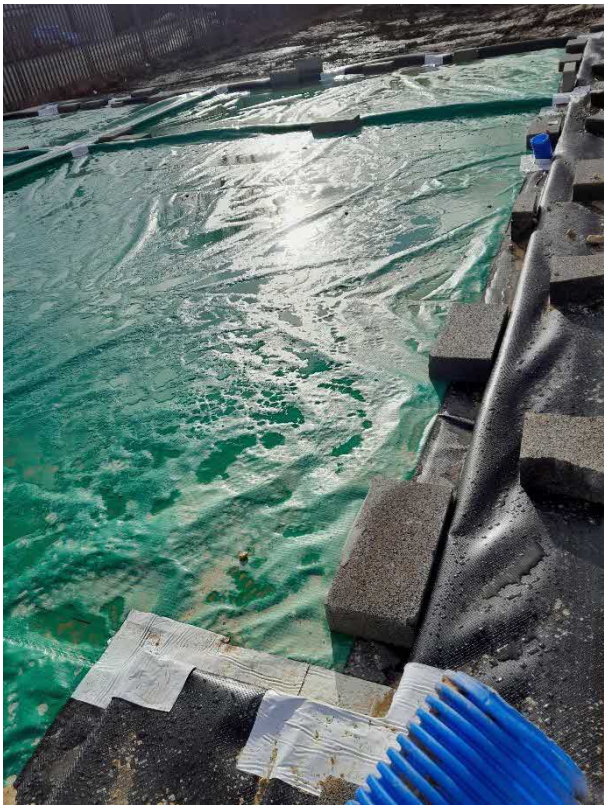
08 C8785E 10.11.23 Plot 53 Service Entry Seal (client photo)

09 C8785E 10.11.23 Plot 54 Service Entry Seal (client photo)

10 C8785E 10.11.23 Plot 55 Service Entry Seal (client photo)

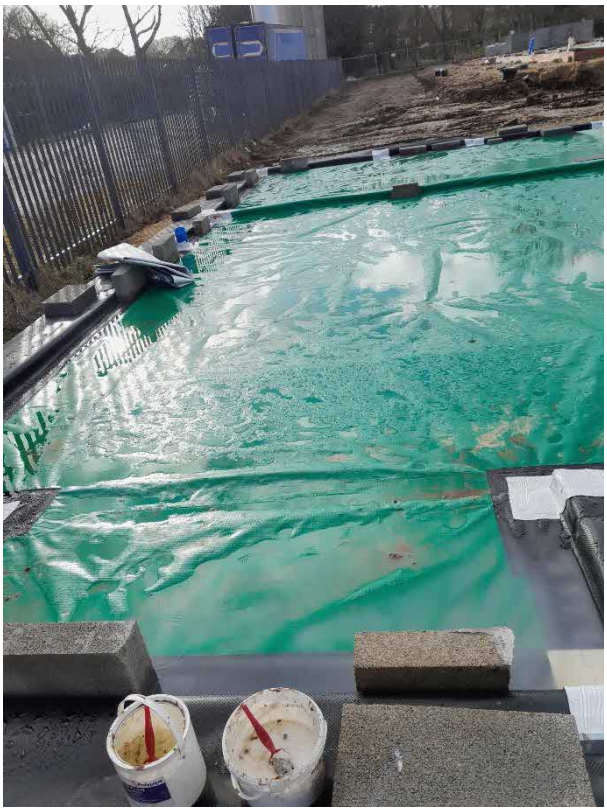
01 C8785E 24.03.23 Plot 58 Overview (client photo)

02 C8785E 24.03.23 Plot 58 Overview and Corners (client photo)



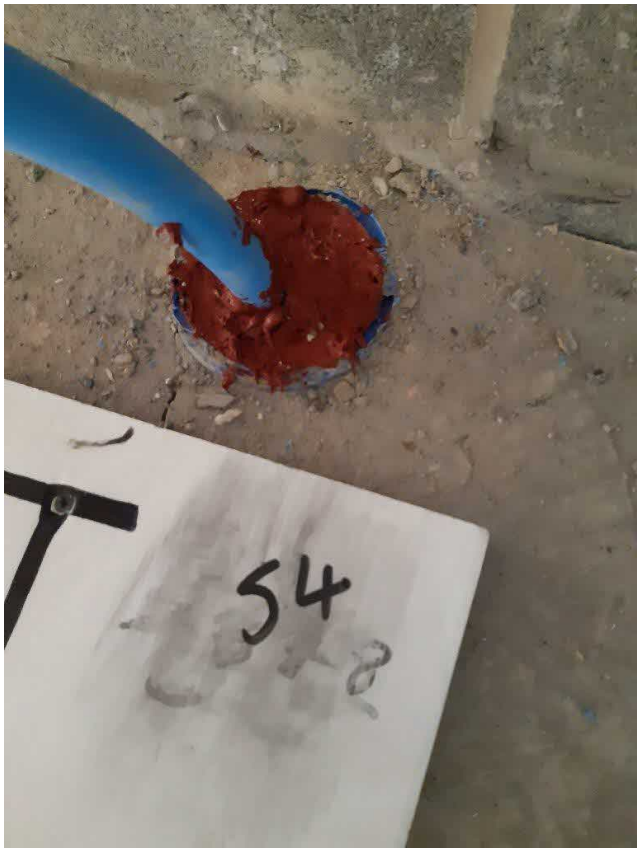
03 C8785E 24.03.23 Plot 58 Overview and Corner (client photo)

01 C8785E 24.03.23 Plot 59 Overview and Corners (client photo)



02 C8785E 24.03.23 Plot 59 Overview and Corners (client photo)

03 C8785E 24.03.23 Plot 59 Overview and Service Entry Duct (client photo)



01 C8785E 15.09.23 Plot 54 Service Entry Seal (client photo)

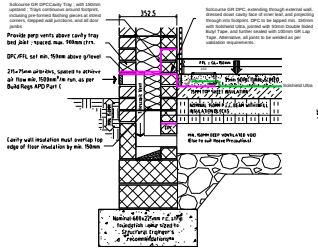
02 C8785E 15.09.23 Plot 55 Service Entry Seal (client photo)

03 C8785E 15.09.23 Plot 56 Service Entry Seal (client photo)

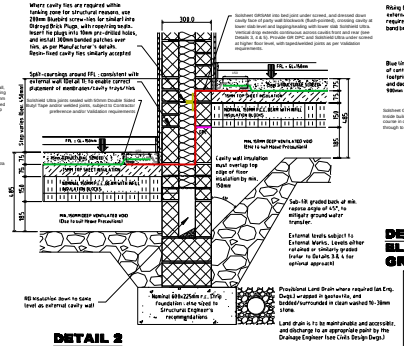
04 C8785E 15.09.23 Plot 57 Service Entry Seal (client photo)

05 C8785E 15.09.23 Plot 58 Service Entry Seal (client photo)

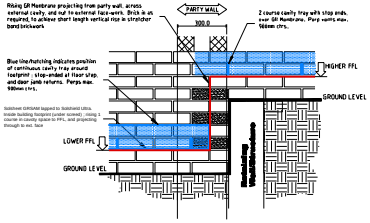
06 C8785E 15.09.23 Plot 59 Service Entry Seal (client photo)



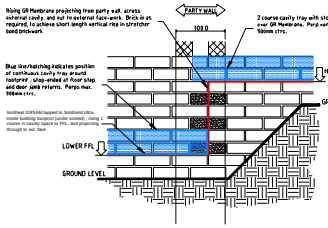
DETAIL 1
SECTION THRO' EXTERNAL WALL



DETAIL 2
SECTION THRO' PARTY WALL



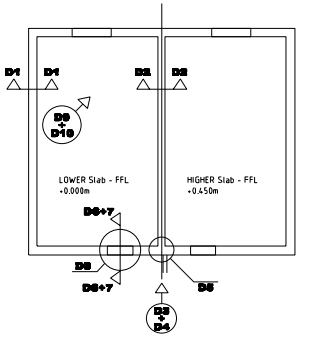
DETAIL 3
ELEVATION OPTION 1 : EXTERNAL GROUND LEVELS RETAINED



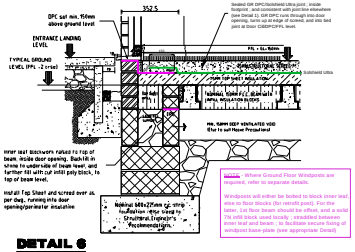
DETAIL 4
ELEVATION OPTION 2 : EXTERNAL GROUND LEVELS GRADED

NOTE - ALL DETAILS ARE BASED UPON SPRINGFIELD 'SBA' FLOOR SYSTEM, INCORPORATING 150MM BEAM DEPTHS, INSULATION "BETWEEN + OVER" BEAMS, AND 75MM TOP SHEET. IF/WHERE BEAM SIZES DIFFER, BEAM BEARING POINTS TO BE ADJUSTED TO SUIT.

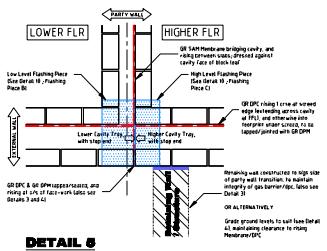
IN THE EVENT THAT ALTERNATIVE SYSTEMS ARE ADOPTED WITH INSULATION "BETWEEN + UNDER" BEAMS (EG. SPRINGVALE "BEAMSHIELD / BEAMSHIELD PLUS), SEPARATE DETAILS ARE AVAILABLE



TYPICAL SEMI FOOTPRINT, SHOWING INDICATIVE SECTION/DETAIL POSITIONS (NOT TO SCALE)



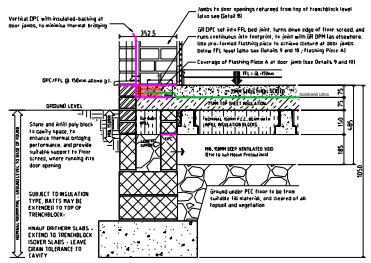
DETAIL 6
SECTION THRO' DOOR OPENING



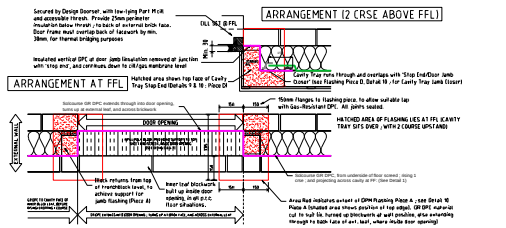
DETAIL 5
PLAN THRO' PARTY WALL

ADOPTED DPM MATERIAL SUBJECT TO GROUND CONDITIONS AND REQUIRED GAS PROTECTION. THE FOLLOWING PRODUCT SELECTOR IS BASED UPON SOLCO PRODUCTS:

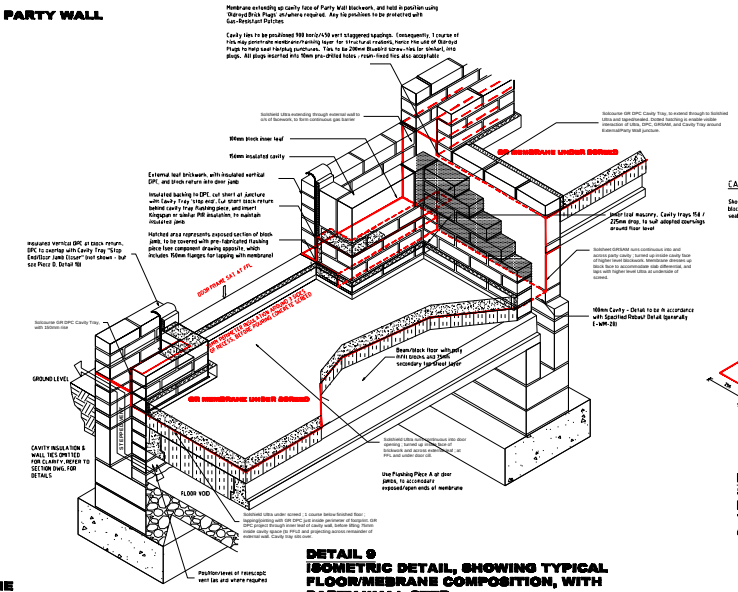
Gas Product Selector	Radon	CO2	Methane	Hydrocarbon Vapours	Hydrocarbon Immersions
Solshield Reinforced	Yes	Yes			
Solshield Ultra	Yes	Yes	Yes	Yes	
Solshield Flexible Hyd'carbon	Yes	Yes	Yes	Yes	Yes
Solco GP Titanbond/ Titanflex	Yes	Yes	Yes	Yes	Yes
Solsheet GR SAM	Yes	Yes	Yes	Yes	
Soseal Liquid Gas Barrier	Yes	Yes	Yes		
Solseal PB-2K	Yes	Yes	Yes	Yes	Yes



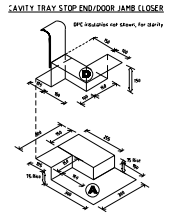
DETAIL 7
SECTION THRO' DOOR OPENING (NO JAMB FINISHES)

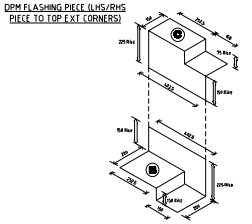


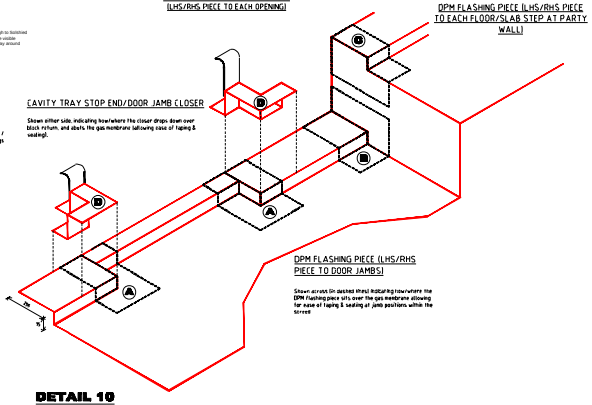
DETAIL 8
PLAN THRO' TYPICAL DOOR OPENING, INDICATING MEMBRANE FLASHING PIECES, AND CAVITY TRAY STOP ENDS



DETAIL 9
ISOMETRIC DETAIL, SHOWING TYPICAL FLOOR/MEMBRANE COMPOSITION, WITH PARTY WALL STEP







DETAIL 10
SHOWING MEMBRANE IN ITS ENTIRETY, & INTERFACE WITH VARIOUS FLASHING PIECES AND CAVITY TRAYS

General Notes

Solsheet GR Self-Adhesive Membrane (bonded to Primed Surface)

Solshield Ultra

Solco 50mm Double Sided Butyl Tape

Solco 100mm GR Lap Tape

Solcourse GR DPC

Solseal Liquid Gas Barrier

FOUNDATION /FLOOR DETAILS PCC (TOP SHEET) : GAS PROTECTED : 'GRADED'

SOLCO
Unit 51, Portmanmoor Road Industrial Estate
Ocean Park
Cardiff
CF24 5HB

Project Name and Address

Partner Construction
2018 Standard Details - Substructure

Project	PCL(2018)-SD-SUB/009
Date	5-Dec-19
Scale	N.T.S.

Datasheet

SOLSHIELD Ultra Gas Barrier

Solshield Ultra Gas Barrier is a flexible, loose laid proprietary gas barrier for use on sites with Radon (RN), Carbon Dioxide (Co^2), Methane (CH^4) and Hydrocarbon Vapours.

CE TYPE A EN 13967

- **Complies with latest codes of practice as published by BRE, CIRIA & BSI (BS8485:2015).**
- **BBA Cert 16/5382, NHBC Compliant & CE Marked**
- **Suitable to protect against the ingress of Radon (RN), Carbon Dioxide (Co^2), Methane (CH^4) and Hydrocarbon/VOC Vapours.**
- **A multi-layer reinforced polyethylene membrane with integral aluminium foil.**
- **Suitable for use as gas protection for NHBC Green, Amber 1, and Amber 2 site situations.**
- **High resistance to puncture.**
- **Also acts as a damp proof membrane.**

SOLSHIELD - Gas Protection Systems

Last Issue Date: 27.03.19
Rev E

Product Description

Solshield Ultra Gas Barrier is a multi layer low density polyethylene gas barrier and damp-proof membrane reinforced with a polypropylene grid with an integral aluminium foil, for use in concrete ground floors, above and below slab not subject to hydrostatic pressure, to protect the building against moisture, radon, methane & carbon dioxide from the ground.
Resistance to Hydrocarbon Vapours - when the membrane is separated from the ground e.g. above a block and beam floor.
Resistance to water & water vapour - the membrane provides an effective barrier to the passage of water & water vapours from the ground.
Resistance to puncture - the membrane has a strong resistance to puncture and on smooth surfaces will not be damaged by foot / site traffic.
Durability - the membrane remains effective against the ingress of water and water vapour, will restrict the ingress of radon, methane and carbon dioxide during the lifetime of the flooring construction in which it is installed.

Storage & Handling on Site

Solshield Ultra Gas Barrier is classified as non-hazardous (code of practice CP102 1973).

The product is chemically inert and any acids or alkalis present in the subsoil will not affect the membrane.

It is not recommended for use when exposed to sunlight and general outdoor weather conditions for long periods of time. Weathering will not occur when installed.

Rolls should be stored undercover and protected from sunlight, on a flat surface.

Quality control during the laying of the membrane is extremely important the membrane should be protected either through the use of temporary protection over its whole area or the immediate laying of the concrete slab.

Compliance

• NHBC Standards 2019, Chapters 4.1/5.1. • CE Marking Standard EN13967:2012. • BS8485:2015. • CP 102:1973, section 2. • BS8000-4:1989.

General

Solshield Ultra Gas Membrane should not be installed at temperatures below 5°C, to prevent the risk of surface condensation.

The membrane must be installed and fixed in accordance with BRE Report BR 211:2015, and guidance given in BS 8485:2015.

The membrane should be installed on a sand blinding layer, Solshield P30 protection fleece, or a smooth concrete float finish. In order to provide a continuous barrier across the cavity, Solshield Ultra Gas Barrier should be taken through the blockwork and incorporated below the damp proof course cavity tray in the outer leaf.

Solshield Ultra Gas Membrane is suitable for installation with beam and block floor application with 150mm clear void in an Amber 2 category project with hydrocarbons, reinforced raft foundation and in situ suspended slab providing the membrane is laid above the ground and not in direct contact with the source of hydrocarbon/VOC vapour.

Long periods of exposure to ultraviolet light will reduce the effectiveness of the membrane.

Technical Data & Test Results

Characteristic			Size
Thickness	EN 1849 - 2	mm	0.6
Width	EN 1849 - 2	M	2
Length	EN 1849 - 2	M	50
Weight	EN 1849 - 2	g/m^2	370
Hydraulic Properties			
Water Column Test	EN 20811		>300
Resistance to Water Penetration	EN 13967, EN 1928		Pass
Durability of watertightness against ageing	EN 1296, EN 13967, EN 1928		Pass
Mechanical Properties			
Resistance to Static Loading	EN 12730 - B	Kg	20
Tensile Strength MD	EN 12311 - 1	N/50mm	600
Tensile Strength CMD	EN 12311 - 1	N/50mm	480
Tensile Elongation MD	EN 12311 - 1	%	20
Tensile Elongation CMD	EN 12311 - 1	%	20
Puncture Resistance	EN 12236	kN	1.25
Resistance to tearing (nail shank) MD	EN 12310 - 1	N	330
Resistance to tearing (nail shank) CMD	EN 12310 - 1	N	400
Durability & Chemical Resistance			
Transmission rate of volatile liquids - Diesel	ISO 6179:2010 (B)	$g/m^2/h$	0.246
Transmission rate of volatile liquids - Xylene	ISO 6179:2010 (B)	$g/m^2/h$	0.571
Transmission rate of volatile liquids - Toluene	ISO 6179:2010 (B)	$g/m^2/h$	0.583
Transmission rate of volatile liquids - Petrol	ISO 6179:2010 (B)	$g/m^2/h$	0.135
Gas Permeability			
Methane Permeability	BS EN ISO 15105 - 1	$ml/m^2/day/atm$	<0.09
Carbon Dioxide Permeabiltiy	BS EN ISO 15105 - 1	ml/m2/day/atm	<0.09
Radon Permeabiltiy	K124/02/95	m^2/s	8×10^{-15}

SOLSHIELD - Gas Protection Systems

Last Issue Date: 27.03.19
Rev E

Installation

1. The membrane must only be applied to surfaces that have a smooth finish - free from voids, projections and mortar deposits. Surfaces should be dry and free from dust and frost. In order to provide a continuous barrier across the cavity, Solshield Ultra Gas Barrier should be taken through the blockwork and incorporated below the damp proof course cavity tray in the outer leaf.
2. Concrete surfaces should be dense. Vertical surfaces of brickwork and blockwork must be dry and rendered to provide an even surface. Brickwork or blockwork not rendered must be flush pointed to give a smooth surface without sudden changes in level.
3. The membrane is rolled out with the printed side uppermost, ensuring that it is properly aligned. All overlaps should be a minimum of 150 mm.
4. When the membrane is laid below the concrete slab, it should be loose-laid to accommodate any small movements.
5. All surfaces must be dried thoroughly prior to joining. Roll edges can be welded or taped.
6. Service ducts should be vented to prevent the possibility of gas accumulating in confined spaces.
7. The continuity of the gas protection must extend over the footprint of the building, and the membrane must be sealed to a gas-resistant damp-proof course where required.
8. The membrane should be covered by a screed or other protective layer, such as Solco Protection Fleece, as soon as possible after installation. Care must be taken to avoid damage to the membrane during construction if blockwork protection is used.
9. The membrane installation should be subject to third-party independent validation, in accordance with BS 8485 : 2015.

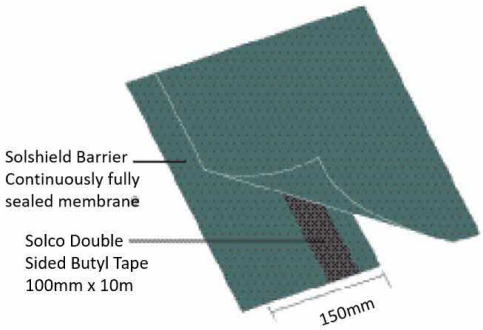
Jointing Detail

We recommend that particularly in situations where site investigation demonstrates chemicals or harmful gases are present in significant concentrations, all of our gas barriers are to be heat welded or tape jointed - ensuring the integrity of the membrane at the joint location. Seam welding provides maximum performance integrity and enables installers to complete installations quickly and efficiently.

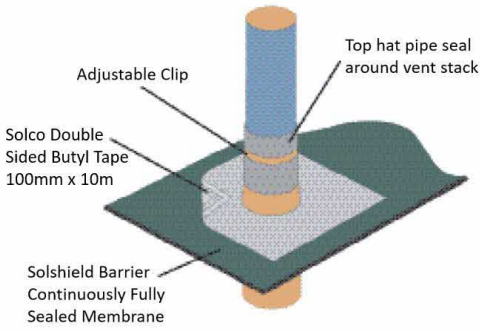
Apply Solco Double Sided Butyl Tape 50mm from the membrane edge, leaving the backing paper on. Lay the next width of membrane overlapping the first by 150mm. Remove the backing paper from the double sided butyl tape and join the top sheet to the bottom sheet, by applying pressure with a hand roller. Where the membranes overlap apply the Solco single sided foil tape, equidistant on both membranes (see detail). All service entry points must have airtight seals Top hats and corner pre-forms must be sealed using double sided butyl tape.

Datasheet

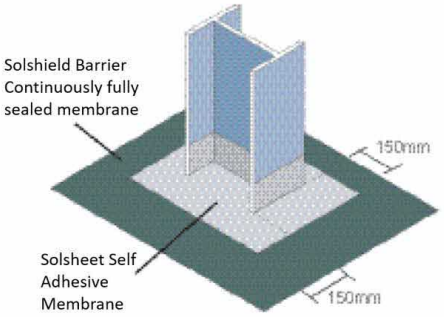
Typical Jointing Details for Solshield Ultra Gas Barrier



Typical Lap Detail



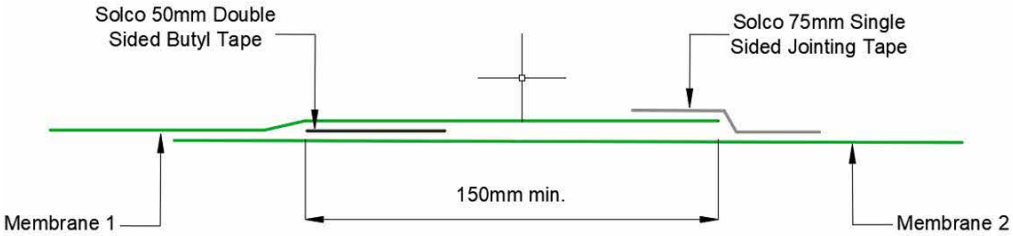
Typical Penetration Detail



Typical Column Detail

Note:

All service entry points must have airtight seals Top hats and corner pre-forms must be sealed using double sided butyl tape.



JOINTING DETAIL

Venting

Solshield Ultra Gas Barrier can be used on sites where passive or active ventilation is required.
Solshield Geocomposite Drainage & Venting Mat should be used in conjunction with the relative vent connectors where required. These types of systems are designed on a bespoke site specifi c nature, please contact us for our design advice.

Gas System Accessories

Product	Description	Sizes	Application	Supply
Solco Foil Backed Jointing Tape to BS EN ISO 15105 - 1	Single sided tape for securing laps and joints	75mm x 50m	Securing laps and joints	Rolls
Solco Double sided Butyl Jointing Tape	Butyl Adhesive Tape	50mm x 10m 100mm x 10m	Butyl based double sided tape for joints and laps	Rolls
Solco Top Hat Units	Polymeric	Various	For sealing around penetrations through gas membrane	Each
Solcourse Hydrocarbon DPC	A flexible Tri-polymer DPC	300mm - 1000mm	To prevent the transmission of Radon, CO_2, Methane Gas and Hydrocarbons	20m Rolls
Solco Gas Sump Units	Part of the Radon Protection System	430 x 430 x 220mm	Radon Sumps are used in full protection areas, where sub floor depressurisation may be required.	Each
Solco XL Jointing Tape	Reinforcing Tape	100, 150 & 300mm wide	Overband tape self-adhesive	100mm x 20m 150mm x 15m 300mm x 20m
Solseal HP Primer	Primer for SA Membrane	10L	Surface Primer	Drums
Solco Protection Boards	Bitumen / Polymeric	3mm thick	For heavy duty use	2m x 1m
Solco Corrugated Board	Plastic Corrugated	2mm thick	For light duty use	2.4m x 1.2m
Solco P30 Fleece	Geotextile Protection	2 x 50mt	For foot traffic	Roll

SOLCOURSE GR DPC

Gas Resistant Tri-polymer DPC

Solcourse GR DPC is a specially engineered tri-polymer construction that provides a highly effective barrier against Radon, Methane, Carbon Dioxide and Hydrocarbon gases

CE TYPE A EN 14909

- **CE Marked**
- **Gas Resistant to Radon, Methane, CO_2 & Hydrocarbons**
- **Capable of withstanding high superimposed loads.**
- **Flexible at low temperatures**
- **Very High Strength & Puncture Resistant**
- **Suitable for use with the Solco Cavity Tray System**
- **Independently Tested**

Colour	Product Code	Roll Sizes
Black	SOLCOURSEGRDPC	300mm - 900mm

SOLCOURSE - DPC / DPM Systems

Last Issue Date: 22.03.15
Rev 1

Product Description

Solcourse GR provides protection against the ingress of gases when sealed to both the slab membrane and dpc or cavity tray system. The use of factory welded preformed units, i.e. pipe penetrations, corners, stop ends and changes of level can be used as part of a gas protection scheme for either a passive, or active system. Solcourse GR conforms to the current requirements for use as part of a gas resistant membrane system.

Radon enters buildings by airflow from the underlying ground.
The two methods for sealing against Radon are, the passive system, normally achieved by increasing the air tightness of the damp protection within the floors and walls, and an active system, which requires providing a powered radon extraction system by means of an integral fan

In areas where significant concentration of radon is present, sufficient protection can be provided by a well installed damp-proof membrane linked to the damp proof course or sealed to a cavity tray system.
Dwellings in areas where higher Radon protection is required should be supplemented by the provision of sub floor ventilation or depressurisation.

Storage

Solcourse GR DPC is chemically stable and free from solvents and aggressive chemicals. Solcourse GR DPC is safe to handle & requires no specific condition for storage or disposal

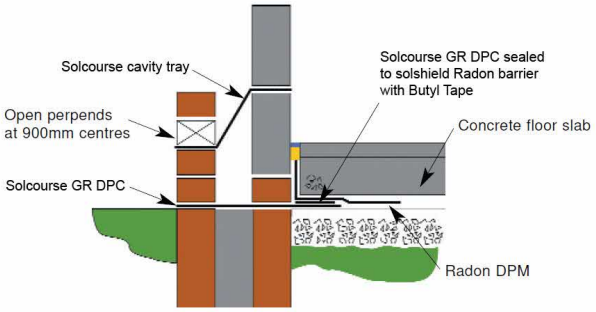


Fig 1: Passive System

Roll Width	Roll Length	Roll Weight
300mm	20m	6.3 kg
337.5mm	20m	7.2 kg
450mm	20m	9.5 kg
600mm	20m	12.5 kg
900mm	20m	19.0 kg

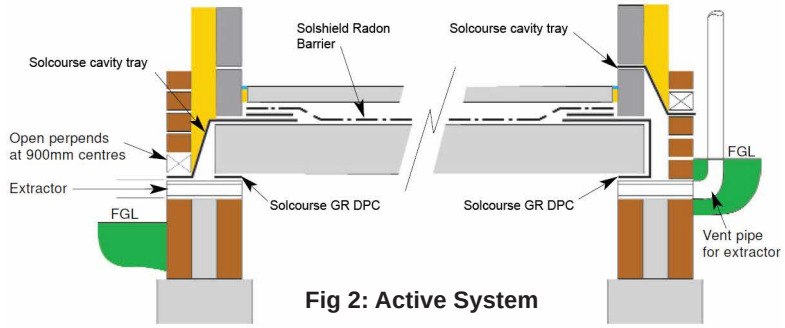


Fig 2: Active System

Technical Performance & Test Data				
Mass	EN 1849-2	g/M²	+2% / -2%	921
Tensile Strength - MD /CD	EN EN 12311	N/mm²	≥MLV	24 / 22
Resistance to impact	EN 12691	mm	≥MLV	660
Resistance to static loading	EN12730	Kg	≥MLV	20
Resistance to nail tear - MD / CD	EN 12310-1	N	≥MLV	700 / 750
Water vapour permeability	EN 1932	g/ m²/day	≥MLV	0.08
Methane permeability	ISO 2782	M³/ (M².day.atm)	MDV	2.53 x 10-4
Radon Permeability		M²/S	≥MLV	9.5 x 10-12

Datasheet

Gas System Accessories

Product	Description	Sizes	Application	Supply
Solco Foil Backed Jointing Tape	Single sided tape for securing laps & joints	75mm x 50m	Securing Laps & Joints	Rolls
Solco Double sided Butyl Jointing Tape	Butyl Adhesive Tape	50mm x 10m 100mm x 15m	Butyl based double sided tape for joints and laps	Rolls
Solco Top Hat Units	Polymeric	Various	For sealing around penetrations through gas membrane	Each
Solcourse Hydrocarbon DPC	A flexible Tri-polymer DPC	300mm - 1000mm	To prevent the transmission of Radon, CO_2, Methane Gas & Hydrocarbons	20m Rolls
Solco Gas Sump Units	Part of the Radon Protection System	430 x 430 x 220mm	Radon Sumps are used in full protection areas, where sub floor depressurisation may be required.	Each
Solco XL Jointing Tape	Reinforcing Tape	100, 150 & 300mm wide	overband tape self-adhesive	20m Rolls
Solseal Bitumen Primer	Primer for SA Membrane	5L & 25L	Surface Primer	Drums
Solco Protection Boards	Bitumen / Polymeric	3mm thick	For heavy duty use	2m x 1m
Solco Corrugated Board	Plastic Corrugated	2mm thick	For light duty use	2m x 1m

Accessory Products for Jointing and Supporting Solcourse DPC Materials

Features and benefits

- DPC joint fully supported
- Product enables designer and installer to comply with best practice
- Provides a clean and watertight joint
- Improves installation procedures helping to reduce overall costs

Product	Description	Size(s) / Coverage	Pack Sizes
SOLCO DPC Joint Support System	Polypropylene Support Boards used in conjunction with Solco Butyl DPC Jointing Tape	15 No. 350 x 220mm 1No. Solco Butyl Jointing Tape	System
SOLCO Double sided Butyl Jointing Tape	Butyl double sided Adhesive Tape for securing joints and laps in DPC's, Cavity trays & pre-formed Cloaks	100mm x 10m	Rolls
SOLCO DPC Lap Adhesive	A brush applied synthetic rubber / resin mixture. It is used to seal joints between Solcourse high performance DPCs, cavity trays and preformed cloak unit	750ml (Covers approx 4-5m^2)	Cans
SOLCO Primer	A rubber modified bituminous primer for preparing block, concrete or metal surfaces prior to the application of Solsheet self adhesive tanking membranes and Solco Butyl DPC Jointing Tape	Coverage is 3 to 4m^2 per litre.	5 Litre Can & 25 Litre Drum
SOLCO DPC Mastic	A thick synthetic rubber mastic adhesive with gap filling properties up to 6mm. Solco DPC Mastic is suitable for bonding surface-fixed Solcourse high performance DPC cavity trays and preformed cloak units to a wide range of common building materials such as block, concrete or metal. No primer is necessary.	Coverage is 1.2 to 2m^2 per litre. A 400ml Cartridge equates to 14 linear meters @ 6mm bead.	2.5 litres Tins 400 ml Cartridge
SOLCO DPC Fixing Strips	Solcourse DPC Fixing Strip is corrosion resistant rigid plastic strip, It is used to surface fix Solcourse high performance DPC cavity trays and preformed cloak units to the inner leaf	25mm x 2mm x 2m pre-drilled at 150mm centres c/w DPC Fixing pins	Pack of 40 LM
SOLCO DPC Fixing Pins (Masonry)	Solco DPC Fixing Pins for Masonry are corrosion resistant and can be used for surface fixing Solcourse high performance DPC systems to any solid internal substrate such as brick, stone and concrete	6mm x 35mm Fixing pins	Pack of 200
SOLCO DPC Fixing Pins (Insulation)	Solco DPC Fixing Pins for Insulation are corrosion resistant and can be used for surface fixing to the rigid insulation of composite inner skins.	6mm x 35mm Fixing pins	Pack of 1000
SOLCO Membrane Fixing plugs	The fixing plug is used in damp proofing applications, to secure the specialist membranes to the base material, usually brickwork and concrete.	70mm x 30mm (head) Sealing washer also available	Pack of 100

SOLSHEET GR SAM

Gas Resistant Self Adhesive Membrane

SOLSHEET Gas Resistant Self Adhesive Membrane is a preformed waterproofing and gas proofing system, compatible with concrete, smooth brickwork and blockwork or screeded substrates.

CE TYPE A EN 13967

- Excellent resistance to chlorides, sulphates, alkalis and acids.
- Can also be used as a gas resistant DPM - resistant to Radon, Methane and CO_2 gases, as well as Hydrocarbon vapours.
- Cross-laminated film – provides dimensional stability, high tear strength, puncture and impact resistance.
- Flexible - will accommodate minor settlement and shrinkage.
- Meets the requirements of BS 8485:2015 and EN ISO 15105-1.
- Polymer modified bitumen coating - resistant to UV.
- Cold applied – no heating required on site.
- Full design and on-site technical support.
- **BBA Approved** & CE Marked.

BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE 14/5164

Product Details	
Thickness	1.5mm ± 0.2
Widths (m)	≥ 1.0m
Length (m)	20m
Roll Weight	32kg
Colour	Black
Coverage	18.9m² (inc. Standard Laps)

SOLSHEET - Waterproofing Systems

Last Issue Date: 01.01.19
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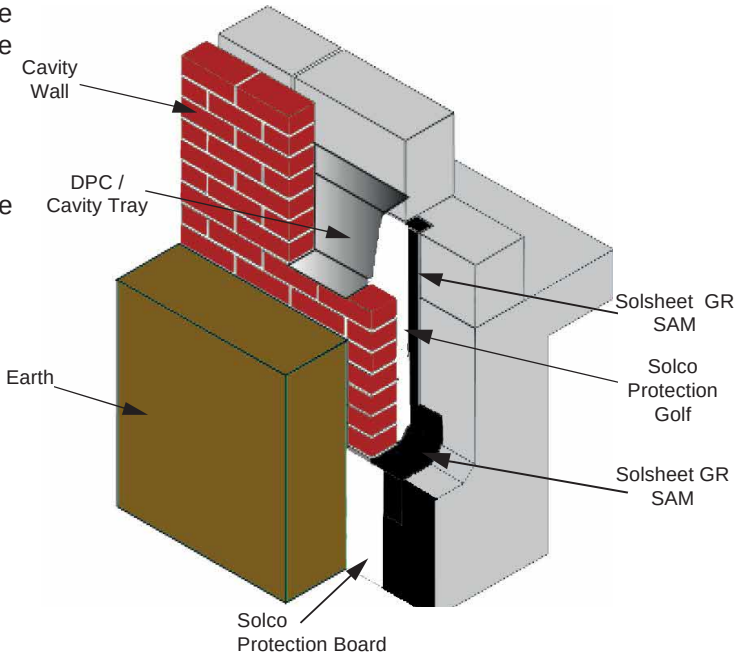
SOLSHEET Gas Resistant Self Adhesive Membrane is a 1.5mm thick, cross-laminated, polythene membrane coated on the lower surface with a layer of polymer-modified bitumen - protected by a layer of release film.

Resistance to gas is achieved with a SBS polymer-modified bitumen compound reinforced with HDPE, laminated with a 50 micron thick aluminium film. The membrane has a thin thermally bonded polyethylene protective film on the upper side and a release film on the lower.

SOLSHEET Gas Resistant Self Adhesive Membrane conforms to the requirements of BS 8485 and BS 8102. Substrates should be primed with SOLSEAL Bitumen Primer prior to application. SOLSHEET Gas Resistant Self Adhesive Membrane can be used with Solcourse GR DPC and other Solshield Gas Membranes



Typical Detail
Please contact our Technical department for project specific application details

Technical Data	Value	Test Method
Watertightness	Pass (10kPa)	EN 1928:2000 (B)
Longitudinal tensile strength	300 ± 70 N/50 mm	UNE-EN 12311-1
Transversal tensile strength	300 ± 70 N/50 mm	UNE-EN 12311-1
Peeling Strength	4 N/mm	UNE-EN 12316
Elongation (L x T)	10 ± 5 %	UNE-EN 12311-1
Resistance to root penetration	Pass	prEN 13984
Resistance to static loading	≥ 5 Kg	UNE-EN 12730
Resistance to impact	NPD	EN 12691:2006
Longitudinal resistance to tearing (nail shank)	180 ± 50 N	UNE-EN 12310-1
Transversal resistance to tearing (nail shank)	140 ± 70 N	UNE-EN 12310-1
Flexibility at low temperature	< -15	UNE-EN 1109
Humidity resistance factor	115.000	EN 1931
Softening point	110ºC	UNE-EN 1427
Penetration at 25ºC	70 dmm	UNE-EN 1426

Technical Data	Value	Test Method
Water Vapour Transmission	<0.1 g/m2/ day	EN 1931
Methane Gas Permeability	<2.90 ml/m² /day	EN ISO 15105-1
Radon Gas Permeability	< 50 Bq/m3	(^{222}Rn) (CSI)
Heat resistance at elevated temperature	>90 ºC	UN-EN 1110
Dimensional stability at elevated temperature (longitudinal)	< 1.0 %	UNE-EN 1107-1
Dimensional stability at elevated temperature (transversal)	< 1.0 %	UNE-EN 1107-1

Datasheet

Self Adhesive Membrane Installation Guide

The installation and repair should be subject to third-party independent validation, in accordance with BS 8485 : 2015.

Surface Preparation: Applied To Concrete, Masonry, Steel & Timber

All surfaces should be smooth, clean and dry. Loosely adhering material and sharp protrusions should be removed by mechanical means. Concrete or renders should be allowed to dry before applying Solsheet membrane.

Priming:

All vertical surfaces should be primed using **Solseal HP Emulsion/Primer**. Horizontal surfaces do not require priming where the membrane is covered with a screed, floor slab etc. Priming should be carried out as follows:

1. Roll can well before use.
2. Apply at the rate of approximately 6m^2/L. Only prime the area which is to be covered with Solsheet within the next 4 hours. Allow to dry for at least 1 hour until touch dry. Keep free from dust.
3. On very porous surfaces, use two coats of primer.

Application:

Waterproofing of Basements, Ground Floors, Reservoirs & Retaining Walls.
Internal angles must always be provided with an adequate sand cement fillet. After priming as previously described a 300mm wide reinforcing strip of Solsheet must be applied with 150mm on either side of the centre of the fillet.

External angles or corners must be provided with a 25mm x 25mm splay and this covered with a 300mm wide strip of **Solsheet XL**, applied equidistant from the centre of the splay.

Horizontal membrane:

This should preferably be laid prior to the application of the vertical membrane, adequately protected from damage by a minimum 25mm screed or protection board, with the membrane bonded to the vertical surface at least 200mm above the top of the screed so that the vertical Solsheet can be overlaid. If it is not possible to apply the screed over the DPM before the application of the vertical membrane, full and adequate protection must be given to the horizontal membrane to prevent damage.

Vertical membrane:

Cut off the appropriate length of membrane, then starting at the top of the area to be waterproofed, peel off at least 200mm of release sheet and bond the Solsheet firmly to the surface, tucking the end of the material into the appropriate DPC or chase. Gradually peel off the remainder of the release sheet downwards, at the same time rolling the material against the surface until the bottom of the wall is reached. At the base, the vertical membrane must overlap the horizontal membrane by at least 100mm. All subsequent sheets must overlap the preceding sheet by 50mm at the edges and by 100mm at ends. Overlaps must be thoroughly rolled to ensure adequate bonding.

Backfilling:

On vertical applications where an abrasive backfill is to be used the Solsheet membrane should be protected by a concrete outer skin, brick skin or Solsheet protection board, the latter being held in place by Solco 50mm Butyl tape.

Precautions:

Solsheet and Solsheet Primer must not be applied when the surface temperature of the substrate falls below 5°C. When a brick-skin is applied to the face of the vertical Solsheet, care must be taken not to damage the membrane and a gap of 40mm should be left which is filled with sand/cement mortar as work proceeds. Only sufficient Solsheet should be laid which can be protected as work proceeds. When areas of Solsheet are left exposed for any length of time ensure that all edges are held in place by battens.

Storage & Handling on site

SOLSHEET Self Adhesive Membrane is classified as non-hazardous (code of practice CP102 1973). The product is chemically inert and any acids or alkalis present in the subsoil will not affect the membrane. It is not recommended for use when exposed to sunlight and general outdoor weather conditions for long periods of time. Weathering will not occur when installed. Rolls should be stored undercover. Quality control during the laying of the membrane is extremely important the membrane should be protected either through the use of temporary boarding over its whole area or the immediate laying of the concrete slab.

Rolls should be stored in dry conditions under cover, on their end. The temperature must be maintained at between 5°C and 30°C.

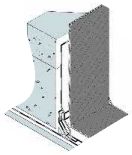
Repair

Damage to the products can be adequately repaired by patching prior to the application of protection or backfilling.

Solsheet Waterproof System Ancilliaries

Solseal HP Emulsion/Primer is a quick drying liquid applied, low viscosity bitumen solution used to prime and seal porous substrates and promotes the adhesion of bituminous waterproofingsystemsprior to application of Solsheet Membranes.

Technical Data	
Packaging	5, 25 & 205 Litres
Coverage	10m²/L



Solco HD Bitumen Protection Board is a tough, reinforced flexible bitumen modified board for the protection of adhesive waterproofing membrane and other types of waterproofing membranes against damage by abrasive backfillmaterialsandpouredconcrete

Technical Data	
Sheet Size	1.0m x 2.0m
Thickness	3mm / 6mm
Weight	8kg / 16kg

Solco XL Jointing / Reinforcing Tape is a self adhesive tape is used as reinforcing / over-banding tape for securing waterproofing membranes at overlaps edge and corner details and is available as standard or as a Gas Resistant XL Tape.

Technical Data	
Roll Width(s)	100 / 150 / 300mm
Roll Length	20m
Thickness	1.5mm

Solco Butyl Tape is a black double sided synthetic rubber based high performance butyl mastic tape. It can be used for bonding waterproofing and gas protection membranes at overlaps and for bonding membranes to DPCs, and fixing of other accessories such as top hats

Technical Data	
Roll Width	50 / 100mm
Roll Length	10m

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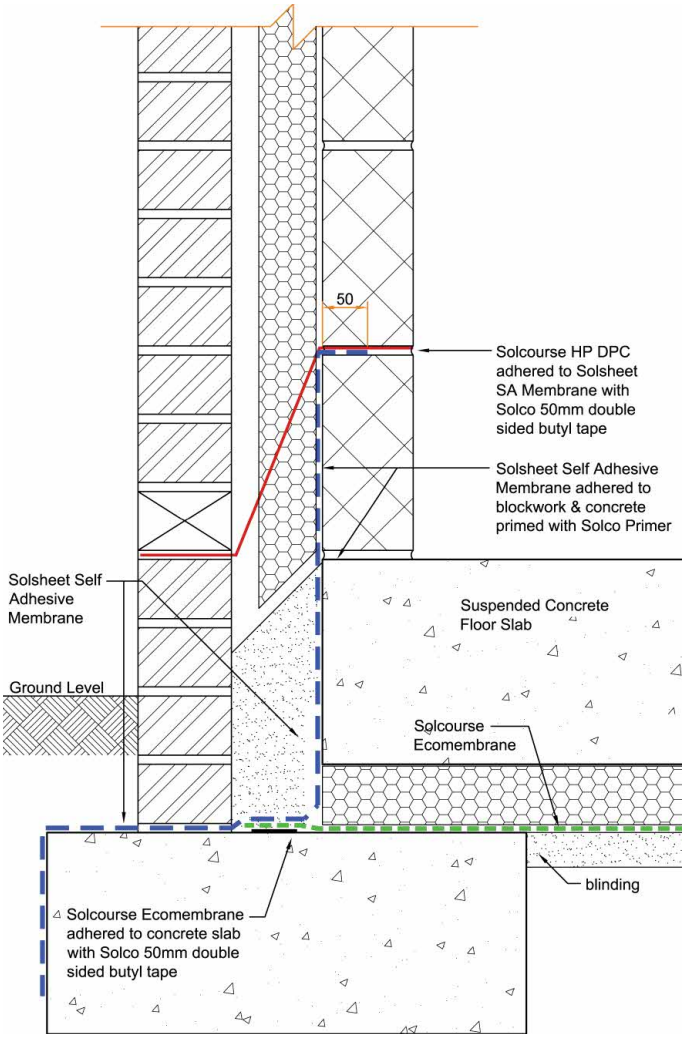
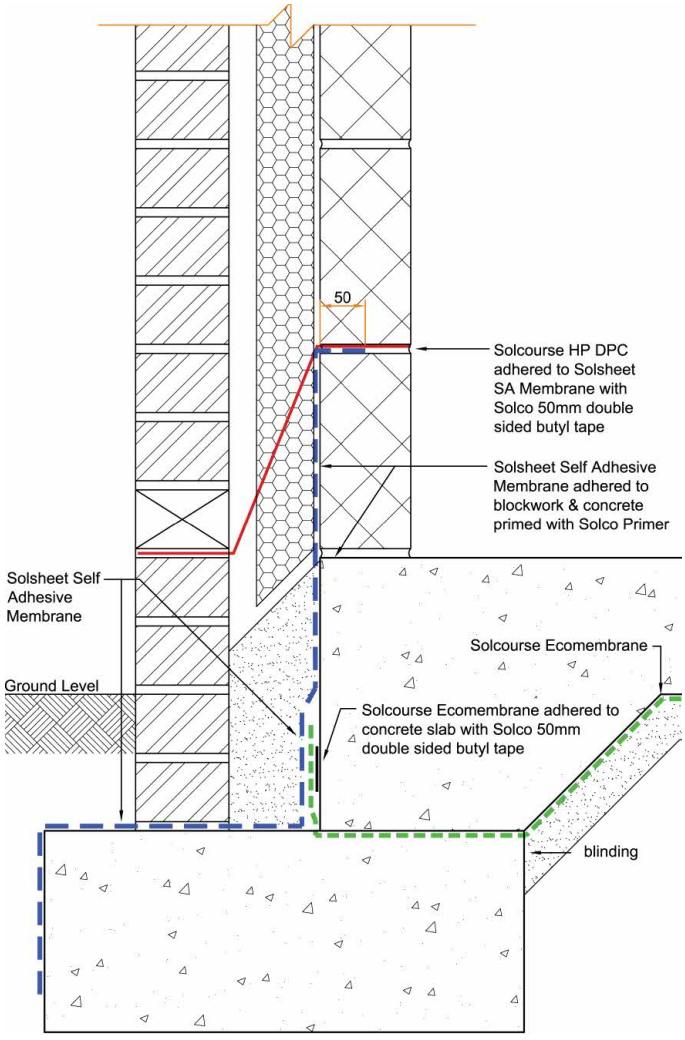


Typical Slab Edge Detail (Suspended)
Standard Construction



Typical Slab Edge Detail (Ground Bearing)
Standard Construction

Please contact our Technical department for project specific application details

CODE	NDSS	M4(2)	TYPE	NO	SQM	TOTAL SQM	SQFT	TOTAL SQFT
NDS 36	✓	✓	2 Bed 3P	6	63.26	379.56	681	4086
NDS 33 M4(2)	✓	✓	2 Bed 4P	15	80.62	1209.3	868	13020
NDS 13 (fa)	✓		3 Bed 5P	3	94.84	284.52	1021	3063
NDS 31 M4(2)	✓	✓	3 Bed 5P	21	94.84	1991.64	1021	21441
F119			4 BED 6P	6	105.2	631.0	1137	6822
F112			3 Bed 5P	6	83.7	502.2	901	5406
F114			2 Bed 4P	2	72.6	145.2	781	1562
				59		**5143.38**		**55400**

Note:
Do note scale from this drawing.
This drawing is copyright of Ergo Projects Ltd.
All dimensions to to checked prior to any work commencing. Any discrepancies to be reported to Ergo Projects immediately.

N

TOTAL SITE AREA - GROSS
= 4.63 Acres - 1.88 Hectares

Indicates trees and hedges to be removed

Note: All perimeter hedges and trees to be cut back where necessary to facilitate construction works

R	Plot 30 & 31 footpath alterations following ENG Drawing 28.04.22	17.05.22
Q	Fence line to follow RTW to the rear of plots 29-33.	10.05.22
P	Plot 5 FP moved	10.02.22
O	Layers amended	31.01.22
N	VP bay adjacent to plot 47 moved 1.2m	25.01.22
M	Private footpaths & parking amended to Partner specification.	20.01.22
L	600mm gravel margin to rear of M4-2 properties. EVCP to plots 17, 18 & 38	06.01.22
K	Footpath amendments to various plots	02.12.21
J	House type names amended to include M4(2).	15.09.21
I	Various amendments further to LA comments July 2021	04.08.21
H	fa added to NDS-13 house type	29.06.21
G	Acoustic fence added to plots 1, 13-17	26.03.21
F	Suds pond updated to suit engineers design	23.03.21
E	Footpath omitted &replaced with landscaping & F-Types reintroduced	15.03.21
D	Layout updated to incorporate NDS house types	12.03.21
C	Various amendments further to Pre-App discussions	04.03.21
B	Mix updated following email from MS on 13.11.20	13.11.20
A	Suds pond added and 3 plots omitted	08.06.20

ergo

0191 229 0231
info@ergoprojects.co.uk

Azure Business Centre, High Street,
Newburn, Newcastle upon Tyne. NE15 8LN
www.ergoprojects.co.uk

PROJECT:
Stephenson Road
Peterlee

TITLE:
Proposed Site Plan

DRAWING PURPOSE:	DATE OF DRAWING:	DRAWN BY:
Planning	May 2020	AR
SCALE:	**SHEET SIZE:**	**REVISION:**
1:500	A1	R
PROJECT NO:	**DRAWING NO:**	
654	003	