

Appendix C

GAS PROTECTION MEASURES VERIFICATION VISUAL INSPECTION RECORD



Site Name:	Radcliffe Market Chambers Basement	Gas Characteristic Situation:	Basic Radon Only
Job Number:	5238	Type of development: (Residential/ commercial/ other)	Commercial
Date:	25/11/2024 and 29/11/24	Building Description:	Conversion / refurbishment of existing Market Hall Basement into Event Space with associated hospitality, catering and storage facilities.
Verification Engineer:	LM	Foundation Type: (suspended floor/ raft/ other)	Pile And Beam
Weather during inspection:	Cold, overcast and dry.	Gas Protection Type: (passive/ active)	Passive Radon
Area/ Plot number(s):	'Tomb area' (Western section) of market hall basement		
Gas Protection Components inspected:	Liquid barrier and root barrier applied to existing external and internal walls		

The box below should be used to present a sketch plan of the building/plot layout, showing locations of all key features of the gas protection system and installation (vents, joins, seals, service penetrations etc). All relative inspection details/comments should be recorded in the table below.



'Tomb area' (Western section) of market hall basement Radon Protection – Area of Installation/ Inspection for given date(s) highlighted green.

No.	Item	Comments (see notes)
1 - Passive Venting		
1.1	Sub-floor void	N/A
1.2	External wall airbricks	N/A
1.3	Internal sleeper walls	N/A
1.4	External vent trenches/ ducts	N/A
2 - Active Venting		
2.1	Active venting System details	N/A

No.	Item	Comments (see notes)
3 - Gas Membrane		
3.1	Condition of sub-grade and underside of membrane	<i>Generally acceptable, all surfaces cleaned down prior to being coated with SikaDur 32 Epoxy Liquid Barrier</i>
3.2	Details of gas membrane product used	<i>SikaDur 32 Epoxy Liquid Barrier</i>
3.3	Gas membrane condition (rips/ tears/ penetrations)	<i>N/A</i>
3.4	Details of joining/ lapping tape products used	<i>N/A</i>
3.5	Lapping design	<i>Overlaps adequate (meet min. 100mm recommended by manufacturer).</i>
3.6	Laps, welds and joint seals	<i>N/A</i>
3.7	Service entry seals	<i>N/A</i>
4 – Other comments/ considerations		
4.1		
4.2		
5 - Photographs		
Photograph		Description
		<i>Photograph showing the first stage of radon protection measures installed for the 'Tomb' area of the Market Hall Basement. SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/ foundations.</i>
		<i>Photograph showing the first stage of radon protection measures installed for the 'Tomb' area of the Market Hall Basement. SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/ foundations.</i>
		<i>Photograph showing the first stage of radon protection measures installed for the 'Tomb' area of the Market Hall Basement. SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/ foundations.</i>

	Photograph showing the first stage of radon protection measures installed for the 'Tomb' area of the Market Hall Basement. SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/ foundations.
	Photograph showing the first stage of radon protection measures installed for the 'Tomb' area of the Market Hall Basement. SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/ foundations.
	Photograph showing the first stage of radon protection measures installed for the 'Tomb' area of the Market Hall Basement. SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/ foundations. Root barrier installed (black).
	Photograph showing the first stage of radon protection measures installed for the 'Tomb' area of the Market Hall Basement. SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/ foundations. Root barrier installed (black).

REMEDIAL ACTIONS REQUIRED

N/A

CERTIFICATION

The visual verification inspection was undertaken by a suitably competent IDG verification engineer, in accordance with the requirements of CIRIA C735 and the site-specific Gas Protection Measures Verification Plan.

The Gas Protection Measures for this section of work:	A) Are acceptable and comply with the specification. <i>Final Certification of this section of work is subject to successful Air Lance Integrity Testing to demonstrate compliance.</i>	
	B) Are acceptable and comply with the specification. <i>Air Lance Integrity Testing is not required for this section of work.</i>	✓
	C) Are acceptable but attention is drawn to issues relating to item(s) No.	
	D) Are not acceptable due to issues requiring remedial action as indicated above. <i>This section of work should be re-inspected and verified upon completion of any required remedial works.</i>	
NAME	SIGNATURE	DATE
LIAM MURPHY		02/12/24

Inspection Checklist Notes:

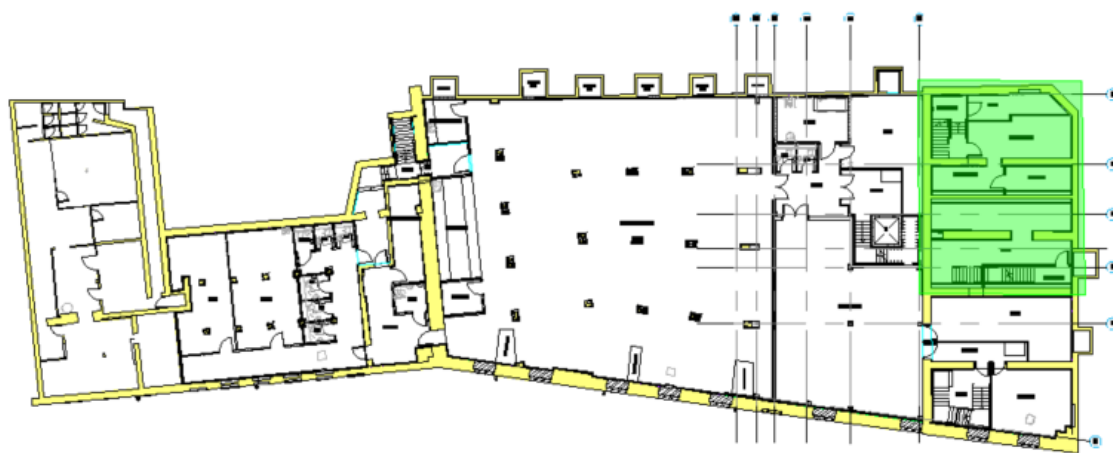
1.1	Sub-floor void	Is a check possible? Void former? Gravel (type/ specification)? Height of void space? Is it clear?
1.2	External wall airbricks	Numbers, size, positions as per design drawing?
1.3	Internal sleeper walls	Ventilation holes (honeycomb brickwork/ pipe crossings)? Size, spacing, location in accordance with design?
1.4	External vent trenches/ ducts	Located/ construction in accordance with design? If open-topped – 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 superstructure?
2.1	System details	Type of air supply: mechanical, natural, combined? Location/ condition/ number of fans and vents? Location and size of inlets? Provision of air-cleaning devices? Supply and exhaust ducting? Alarm provision/ installation? Gas monitoring system in under-floor void?
3.1	Condition of sub-grade and underside of 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?
3.2	Details of gas membrane product used	Manufacturer and product specification, gauge, colour, brand/name, material, batch/ roll numbers, storage arrangements (to protect from dirt/damage).
3.3	Gas membrane condition (rips/ tears/ penetrations)	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?
3.4	Details of joining/ lapping tape products used	Product type, brand, thickness, material, width, colour? Foil backed? Double sided?
3.5	Lapping design	Joints lapped and sealed in accordance with manufacturers requirements/ specification? Minimum overlap ensured? Sections taped twice (double sided and lapping)?
3.6	Laps, welds and joint seals	Welds complete? Appropriate jointing tape used? No creases or folds in sheet edges? Adequately bonded? (confirm by air lance integrity testing as necessary in accordance with the verification plan)
3.7	Service entry seals	Top hats seal arrangements fixed around service entries? Use of jubilee clips? Adequately taped to membrane at joins with double-sided and lapping tape?

GAS PROTECTION MEASURES VERIFICATION VISUAL INSPECTION RECORD



Site Name:	Radcliffe Market Hall Basement	Gas Characteristic Situation:	Basic Radon Only
Job Number:	5238	Type of development: (Residential/ commercial/ other)	Commercial
Date:	29/11/24 and 04/12/2024	Building Description:	Conversion / refurbishment of existing Market Hall Basement into 'Event Space' with associated hospitality, catering and storage facilities.
Verification Engineer:	LM	Foundation Type: (suspended floor/ raft/ other)	Pile And Beam to support new floor slab
Weather during inspection:	Cold, overcast and damp.	Gas Protection Type: (passive/ active)	Passive Radon
Area/ Plot number(s):	4 rooms within the 'Chambers' Area of market hall basement		
Gas Protection Components inspected:	Liquid barrier applied to existing walls and radon membrane installation		

The box below should be used to present a sketch plan of the building/plot layout, showing locations of all key features of the gas protection system and installation (vents, joins, seals, service penetrations etc). All relative inspection details/comments should be recorded in the table below.

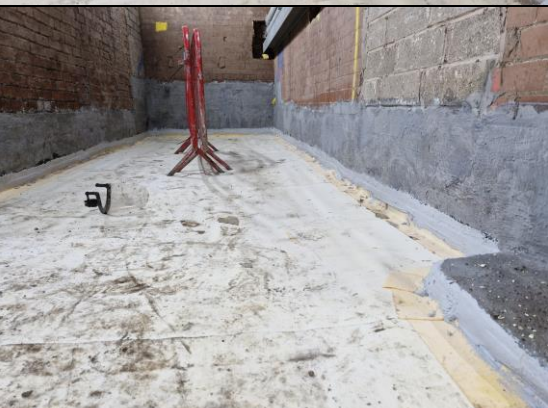


4 rooms within the 'Chambers' (Eastern section) of market hall basement Radon Protection – Area of Installation/ Inspection for given date(s) highlighted green.

No.	Item	Comments (see notes)
1 - Passive Venting		
1.1	Sub-floor void	N/A
1.2	External wall airbricks	N/A
1.3	Internal sleeper walls	N/A
1.4	External vent trenches/ ducts	N/A
2 - Active Venting		
2.1	Active venting System details	N/A

No.	Item	Comments (see notes)
3 - Gas Membrane		
3.1	Condition of sub-grade and underside of membrane	Generally acceptable, all surfaces cleaned down prior to being coated with SikaDur 32 Epoxy Liquid Barrier. Floor underlain by insulation sheets prior to placement of membrane.
3.2	Details of gas membrane product used	SikaProof A-08 Membrane SikaProof Tape-150 SikaProof Patch200 SikaDur 32 Epoxy Liquid Barrier
3.3	Gas membrane condition (rips/ tears/ penetrations)	Generally very good. No punctures/rips or tears identified.
3.4	Details of joining/ lapping tape products used	SikaProof Tape-150 SikaProof Patch200 Sikadur Combiflex Adhesive
3.5	Lapping design	Overlaps adequate (meet min. 100mm recommended by manufacturer).
3.6	Laps, welds and joint seals	Joints generally completed to a good standard using self-adhesive edge of membrane and/or SikaProof Tape-150. Sikadur Combiflex Adhesive also applied to reinforce joints between membrane and liquid barrier. Visual and mechanical point stress testing identified 3 No. small localised areas where creases in the membrane formed an air channel (and therefore incomplete seal) across the self-adhesive membrane joint. Contractor was advised and these were repaired.
3.7	Service entry seals	N/A
4 – Other comments/ considerations		
4.1		
4.2		
5 - Photographs		
Photograph		Description
		Photograph showing SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/ foundations in Market Hall Basement chambers. Insulation board being placed on floor prior to membrane being installed.
		Photograph showing SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/ foundations in Market Hall Basement chambers. Insulation board being placed on floor prior to membrane being installed.

	Photograph showing roll of SikaProof A-08 Membrane used in Market Hall Basement chambers to form wall to wall radon barrier
	Photograph showing SikaProof A-08 Membrane installed in Market Hall Basement chambers to form wall to wall radon barrier, using self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on walls.
	Photograph showing SikaProof A-08 Membrane installed in Market Hall Basement chambers to form wall to wall radon barrier, using self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on walls.
	Photograph showing SikaProof A-08 Membrane installed in Market Hall Basement chambers to form wall to wall radon barrier, using self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on walls.

	Photograph showing SikaProof A-08 Membrane installed in Market Hall Basement chambers to form wall to wall radon barrier, using self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on walls.
	Photograph showing SikaProof A-08 Membrane installed in Market Hall Basement chambers to form wall to wall radon barrier, using self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on walls.
	Photograph showing SikaProof A-08 Membrane installed in Market Hall Basement chambers to form wall to wall radon barrier, using self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on walls.
	Photograph showing SikaProof A-08 Membrane installed in Market Hall Basement chambers at threshold between rooms. Detailing completed with SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on walls.
	Photograph showing SikaProof A-08 Membrane installed in Market Hall Basement chambers at threshold between rooms. Detailing completed with SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on walls.

	Photograph showing failure point identified at self-adhesive edge of SikaProof A-08 Membrane installed in Market Hall Basement chambers.
	Photograph showing identified failure point identified at self-adhesive edge of SikaProof A-08 Membrane repaired using SikaProof Tape-150.

REMEDIAL ACTIONS REQUIRED

Minor repairs required as noted in Section 3.6.

These were completed by the installers and subject to integrity testing.

No further remedial works required for this section.

CERTIFICATION

The visual verification inspection was undertaken by a suitably competent IDG verification engineer, in accordance with the requirements of CIRIA C735 and the site-specific Gas Protection Measures Verification Plan.

The Gas Protection Measures for this section of work:	A) Are acceptable and comply with the specification. <i>Final Certification of this section of work is subject to successful Air Lance Integrity Testing to demonstrate compliance.</i>	
	B) Are acceptable and comply with the specification. <i>Air Lance Integrity Testing is not required for this section of work.</i>	
	C) Are acceptable but attention is drawn to issues relating to item(s) No. 3.6. <i>Final Certification of this section of work is subject to successful Air Lance Integrity Testing to demonstrate compliance.</i>	✓
	D) Are not acceptable due to issues requiring remedial action as indicated above. <i>This section of work should be re-inspected and verified upon completion of any required remedial works.</i>	
NAME	SIGNATURE	DATE
LIAM MURPHY		08/01/25

Inspection Checklist Notes:

1.1	Sub-floor void	Is a check possible? Void former? Gravel (type/ specification)? Height of void space? Is it clear?
1.2	External wall airbricks	Numbers, size, positions as per design drawing?
1.3	Internal sleeper walls	Ventilation holes (honeycomb brickwork/ pipe crossings)? Size, spacing, location in accordance with design?
1.4	External vent trenches/ ducts	Located/ construction in accordance with design? If open-topped – 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 superstructure?
2.1	System details	Type of air supply: mechanical, natural, combined? Location/ condition/ number of fans and vents? Location and size of inlets? Provision of air-cleaning devices? Supply and exhaust ducting? Alarm provision/ installation? Gas monitoring system in under-floor void?
3.1	Condition of sub-grade and underside of 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?
3.2	Details of gas membrane product used	Manufacturer and product specification, gauge, colour, brand/name, material, batch/ roll numbers, storage arrangements (to protect from dirt/damage).
3.3	Gas membrane condition (rips/ tears/ penetrations)	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?
3.4	Details of joining/ lapping tape products used	Product type, brand, thickness, material, width, colour? Foil backed? Double sided?
3.5	Lapping design	Joints lapped and sealed in accordance with manufacturers requirements/ specification? Minimum overlap ensured? Sections taped twice (double sided and lapping)?
3.6	Laps, welds and joint seals	Welds complete? Appropriate jointing tape used? No creases or folds in sheet edges? Adequately bonded? (confirm by air lance integrity testing as necessary in accordance with the verification plan)
3.7	Service entry seals	Top hats seal arrangements fixed around service entries? Use of jubilee clips? Adequately taped to membrane at joins with double-sided and lapping tape?

GAS PROTECTION MEASURES VERIFICATION AIR LANCE INTEGRITY TESTING RECORD

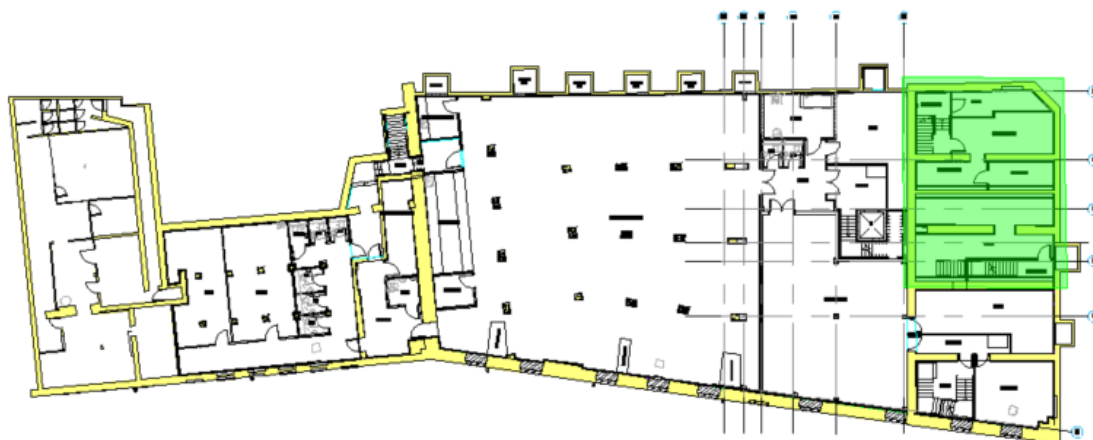


Site Name:	Radcliffe Market Chambers Basement	Gas Characteristic Situation:	Basic Radon Only
Job Number:	5238	Type of development: (Residential/ commercial/ other)	Commercial
Date:	04/12/2024	Building Description:	Conversion / refurbishment of existing Market Hall Basement into 'Event Space' with associated hospitality, catering and storage facilities.
Integrity Testing Engineer:	LM	Foundation Type: (suspended floor/ raft/ other)	Pile And Beam to support new floor slab
Weather during inspection:	Cold, overcast and damp.	Gas Protection Type: (passive/ active)	Passive Radon
Area/ Plot number(s):	4 rooms within the 'Chambers' Area of market hall basement		
Gas Protection Components inspected:	Liquid barrier applied to existing walls and radon membrane installation		

ASTM D4437-08:2013 Air Lance Test—Inspect all seams for unbonded areas using an air nozzle directed on the upper seam edge and surface to detect loose edges, ripples indicating unbonded areas within the seam, or other undesirable seam conditions. Check all bonded seams using a minimum 50 psi (345 kPa) (gage) air supply directed through a $\frac{3}{16}$ in. (4.8 mm) (typical) nozzle, held not more than 2 in. (51 mm) from the seam edge and directed at the seam edge.

The box below should be used to present a sketch plan of the building/plot layout and membrane, showing locations of all key joints and seal features of the gas protection system and installation which are subject to air-lance integrity testing (joins, seals, tophats around service penetrations etc).

- Failure points in seams or joins should be marked sequentially 'F₁', 'F₂' etc with approximate dimensions.
- Seams and joins deemed to be satisfactory should be marked with an S. All relative testing details/comments should be recorded in the table below.



4 rooms within the 'Chambers' (Eastern section) of market hall basement Radon Protection – Area of Installation/ Inspection for given date(s) highlighted green.



No.	Item	Comments (see notes)
A - Air Lancing Equipment		
	Air Lance with outflow nozzle of 4.8mm	All accessible seams, joints and service penetrations tested via air lancing in accordance with ASTM D4437-08:2013 Air Lance Test. Pressure monitored and maintained at 50-60psi at the lance throughout testing.
B - Membrane, Joints and Seals		
	Details of gas membrane product used	SikaProof A-08 Membrane SikaProof Tape-150 SikaProof Patch200 SikaDur 32 Epoxy Liquid Barrier
	Details of joining/ lapping tape products used	SikaProof Tape-150 SikaProof Patch200 Sikadur Combiflex Adhesive
	Joint/ Lapping design used	Overlaps adequate (meet min. 100mm recommended by manufacturer). Joints generally completed using self-adhesive edge of membrane and/or SikaProof Tape-150. Sikadur Combiflex Adhesive also applied to reinforce joints between membrane and liquid barrier.
	External vent trenches/ ducts	N/A

No.	Item	Comments (see notes)
C – Air Lance Integrity Test Results		
Test No.	Failed or Satisfactory (F or S)	Detail, comments and recommendations
Membrane to Liquid Barrier Joints	S	All membrane liquid barrier joints proven to be satisfactory by IDG via ASTM D4437 air lance test.
Membrane to membrane Joints	S	All membrane to membrane seams/join length proven to be satisfactory by IDG via ASTM D4437 air lance test. Minor failures identified as detailed below.
1	F (S)	F ₁ – Creases in the membrane formed an air channel (and therefore incomplete seal) across the self-adhesive membrane joint. Contractor was advised and these were repaired. Remedial works completed by contractor subsequently re-inspected / re-tested and determined to be satisfactory.
2	F (S)	F ₂ – Creases in the membrane formed an air channel (and therefore incomplete seal) across the self-adhesive membrane joint. Contractor was advised and these were repaired. Remedial works completed by contractor subsequently re-inspected / re-tested and determined to be satisfactory.
3	F (S)	F ₃ – Creases in the membrane formed an air channel (and therefore incomplete seal) across the self-adhesive membrane joint. Contractor was advised and these were repaired. Remedial works completed by contractor subsequently re-inspected / re-tested and determined to be satisfactory.
4 - Photographs		
Photograph		Description
		IDG's typical Air lance kit set up for integrity testing of the seams/ joints and tophat seals, and compliant with ASTM D4437.
		Photograph showing SikaProof A-08 Membrane installed in Market Hall Basement chambers to form wall to wall radon barrier, using self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on walls.

	Air lance testing of SikaProof A-08 Membrane installed in Market Hall Basement chambers, with pressure gauge showing maintained pressure above minimum of 50psi advocated by ASTM D4437-08:2013.
	Air lance testing of joint between two SikaProof A-08 Membrane sheets installed in Market Hall Basement chambers, with pressure gauge showing maintained pressure above minimum of 50psi advocated by ASTM D4437-08:2013.
	Air lance testing of taped joint between SikaProof A-08 Membrane and SikaDur 32 Epoxy Liquid Barrier in Market Hall Basement chambers, with pressure gauge showing maintained pressure above minimum of 50psi advocated by ASTM D4437-08:2013.
	Air lance testing of taped joint between SikaProof A-08 Membrane sheets at door way threshold in Market Hall Basement chambers, with pressure gauge showing maintained pressure above minimum of 50psi advocated by ASTM D4437-08:2013.

	Photograph showing failure point (F₁) identified at self-adhesive edge of SikaProof A-08 Membrane installed in Market Hall Basement chambers.
	Photograph showing identified failure point identified at self-adhesive edge of SikaProof A-08 Membrane repaired using SikaProof Tape-150.

REMEDIAL ACTIONS REQUIRED

N/A - all remedial actions completed

CERTIFICATION

The air lance integrity testing was undertaken by a suitably competent IDG testing engineer, using specialist equipment designed to comply with the requirements of ASTM D4437-08:2013, and the site-specific Gas Protection Measures Verification Plan.

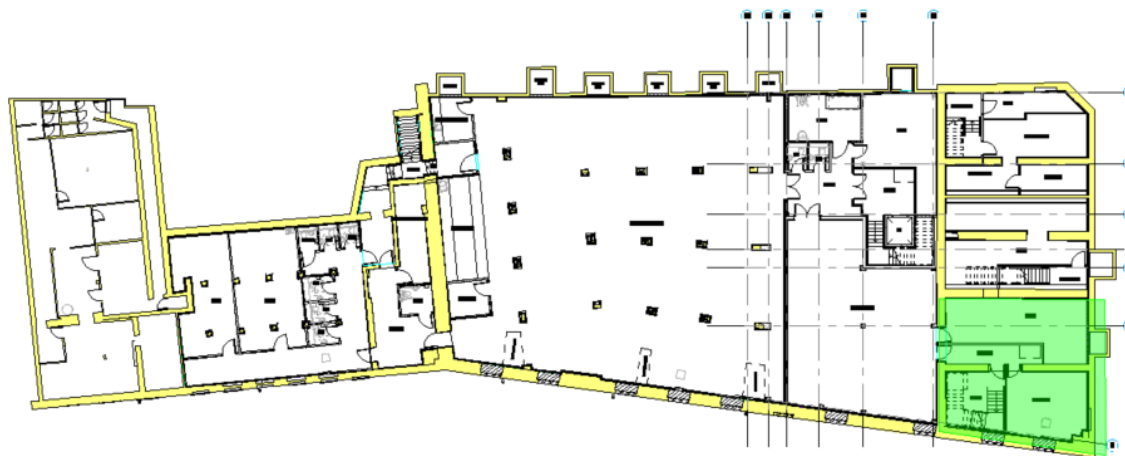
The Gas Protection Measures for this section of work:	A) Have passed both the visual verification inspection and air lance non-destructive integrity testing of all seams and joins. The quality of installation and workmanship are satisfactory and comply with the specification.	✓
	B) Are acceptable but attention is drawn to issues relating to item(s) No.	
	C) Are not acceptable due to issues requiring remedial action as indicated above. <i>This plot should be re-inspected and verified upon completion of any required remedial works.</i>	
NAME	SIGNATURE	DATE
LIAM MURPHY		08/01/25

GAS PROTECTION MEASURES VERIFICATION VISUAL INSPECTION RECORD



Site Name:	Radcliffe Market Hall Basement	Gas Characteristic Situation:	Basic Radon Only
Job Number:	5238	Type of development: (Residential/ commercial/ other)	Commercial
Date:	16/12/2024	Building Description:	Conversion / refurbishment of existing Market Hall Basement into 'Event Space' with associated hospitality, catering and storage facilities.
Verification Engineer:	LM	Foundation Type: (suspended floor/ raft/ other)	Pile And Beam to support new floor slab
Weather during inspection:	Cold, overcast and raining.	Gas Protection Type: (passive/ active)	Passive Radon
Area/ Plot number(s):	2 southern rooms within the 'Chambers' Area of market hall basement		
Gas Protection Components inspected:	Liquid barrier applied to existing walls and radon membrane installation		

The box below should be used to present a sketch plan of the building/plot layout, showing locations of all key features of the gas protection system and installation (vents, joins, seals, service penetrations etc). All relative inspection details/comments should be recorded in the table below.



2 Southern rooms within the 'Chambers' (Eastern section) of market hall basement Radon Protection – Area of Installation/ Inspection for given date(s) highlighted green.

No.	Item	Comments (see notes)
1 - Passive Venting		
1.1	Sub-floor void	N/A
1.2	External wall airbricks	N/A
1.3	Internal sleeper walls	N/A
1.4	External vent trenches/ ducts	N/A
2 - Active Venting		
2.1	Active venting System details	N/A

No.	Item	Comments (see notes)
3 - Gas Membrane		
3.1	Condition of sub-grade and underside of membrane	Generally acceptable, all surfaces cleaned down prior to being coated with SikaDur 32 Epoxy Liquid Barrier. Floor underlain by insulation sheets prior to placement of membrane.
3.2	Details of gas membrane product used	SikaProof A-08 Membrane SikaProof Tape-150 SikaProof Patch200 SikaDur 32 Epoxy Liquid Barrier
3.3	Gas membrane condition (rips/ tears/ penetrations)	Generally very good. No punctures/rips or tears identified.
3.4	Details of joining/ lapping tape products used	SikaProof Tape-150 SikaProof Patch200 Sikadur Combiflex Adhesive
3.5	Lapping design	Overlaps adequate (meet min. 100mm recommended by manufacturer).
3.6	Laps, welds and joint seals	Joints generally completed to a good standard using self-adhesive edge of membrane and/or SikaProof Tape-150. Sikadur Combiflex Adhesive also applied to reinforce joints between membrane and liquid barrier.
3.7	Service entry seals	N/A
4 – Other comments/ considerations		
4.1		
4.2		
5 - Photographs		
Photograph		Description
		Photograph showing roll of SikaProof A-08 Membrane used in Market Hall Basement chambers to form wall to wall radon barrier
		Photograph showing SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/ foundations. SikaProof A-08 Membrane installed in Market Hall Basement chambers to form wall to wall radon barrier, using self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on walls.

	Photograph showing SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/foundations. SikaProof A-08 Membrane installed in Market Hall Basement chambers to form wall to wall radon barrier, using self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on walls.
	Photograph showing SikaProof A-08 Membrane installed in Market Hall Basement chambers to form wall to wall radon barrier, using self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on walls.
	Photograph showing SikaProof A-08 Membrane installed in Market Hall Basement chambers to form wall to wall radon barrier. Detailing completed with SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on walls.
	Photograph showing SikaProof A-08 Membrane installed in Market Hall Basement chambers to form wall to wall radon barrier. Detailing completed with SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on walls.
	Photograph showing SikaProof A-08 Membrane installed in Market Hall Basement chambers to form wall to wall radon barrier. Detailing completed with SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on walls.

REMEDIAL ACTIONS REQUIRED

N/A

CERTIFICATION

The visual verification inspection was undertaken by a suitably competent IDG verification engineer, in accordance with the requirements of CIRIA C735 and the site-specific Gas Protection Measures Verification Plan.

The Gas Protection Measures for this section of work:	A) Are acceptable and comply with the specification. <i>Final Certification of this section of work is subject to successful Air Lance Integrity Testing to demonstrate compliance.</i>	✓
	B) Are acceptable and comply with the specification. <i>Air Lance Integrity Testing is not required for this section of work.</i>	
	C) Are acceptable but attention is drawn to issues relating to item(s) No. 3.6. <i>Final Certification of this section of work is subject to successful Air Lance Integrity Testing to demonstrate compliance.</i>	
	D) Are not acceptable due to issues requiring remedial action as indicated above. <i>This section of work should be re-inspected and verified upon completion of any required remedial works.</i>	
NAME	SIGNATURE	DATE
LIAM MURPHY		09/01/25

Inspection Checklist Notes:

1.1	Sub-floor void	Is a check possible? Void former? Gravel (type/ specification)? Height of void space? Is it clear?
1.2	External wall airbricks	Numbers, size, positions as per design drawing?
1.3	Internal sleeper walls	Ventilation holes (honeycomb brickwork/ pipe crossings)? Size, spacing, location in accordance with design?
1.4	External vent trenches/ ducts	Located/ construction in accordance with design? If open-topped – 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 superstructure?
2.1	System details	Type of air supply: mechanical, natural, combined? Location/ condition/ number of fans and vents? Location and size of inlets? Provision of air-cleaning devices? Supply and exhaust ducting? Alarm provision/ installation? Gas monitoring system in under-floor void?
3.1	Condition of sub-grade and underside of 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?
3.2	Details of gas membrane product used	Manufacturer and product specification, gauge, colour, brand/name, material, batch/ roll numbers, storage arrangements (to protect from dirt/damage).
3.3	Gas membrane condition (rips/ tears/ penetrations)	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?
3.4	Details of joining/ lapping tape products used	Product type, brand, thickness, material, width, colour? Foil backed? Double sided?
3.5	Lapping design	Joints lapped and sealed in accordance with manufacturers requirements/ specification? Minimum overlap ensured? Sections taped twice (double sided and lapping)?
3.6	Laps, welds and joint seals	Welds complete? Appropriate jointing tape used? No creases or folds in sheet edges? Adequately bonded? (confirm by air lance integrity testing as necessary in accordance with the verification plan)
3.7	Service entry seals	Top hats seal arrangements fixed around service entries? Use of jubilee clips? Adequately taped to membrane at joins with double-sided and lapping tape?

GAS PROTECTION MEASURES VERIFICATION AIR LANCE INTEGRITY TESTING RECORD

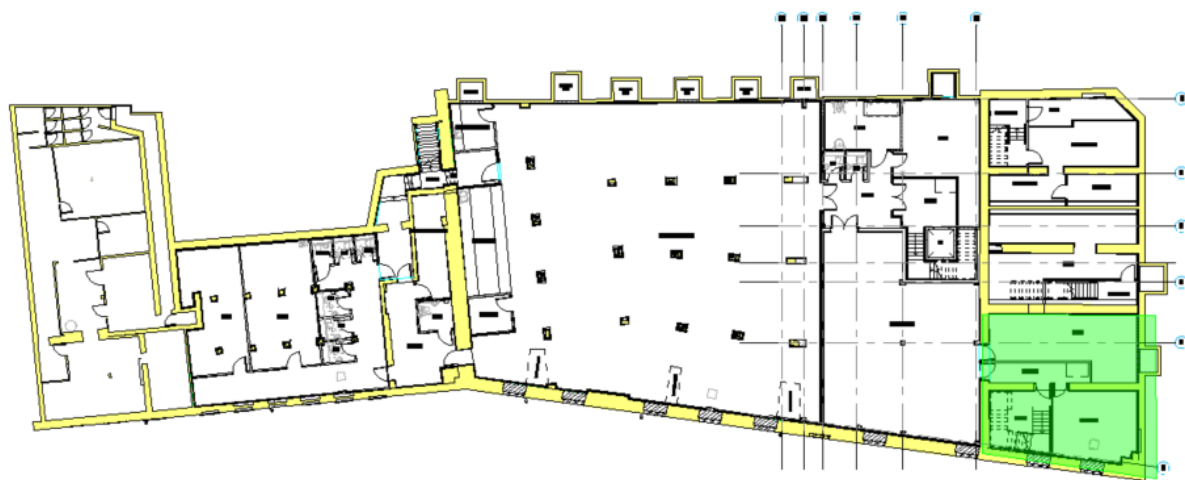


Site Name:	Radcliffe Market Chambers Basement	Gas Characteristic Situation:	Basic Radon Only
Job Number:	5238	Type of development: (Residential/ commercial/ other)	Commercial
Date:	16/12/2024	Building Description:	Conversion / refurbishment of existing Market Hall Basement into 'Event Space' with associated hospitality, catering and storage facilities.
Integrity Testing Engineer:	LM	Foundation Type: (suspended floor/ raft/ other)	Pile And Beam to support new floor slab
Weather during inspection:	Cold, overcast and raining.	Gas Protection Type: (passive/ active)	Passive Radon
Area/ Plot number(s):	2 southern rooms within the 'Chambers' Area of market hall basement		
Gas Protection Components inspected:	Liquid barrier applied to existing walls and radon membrane installation		

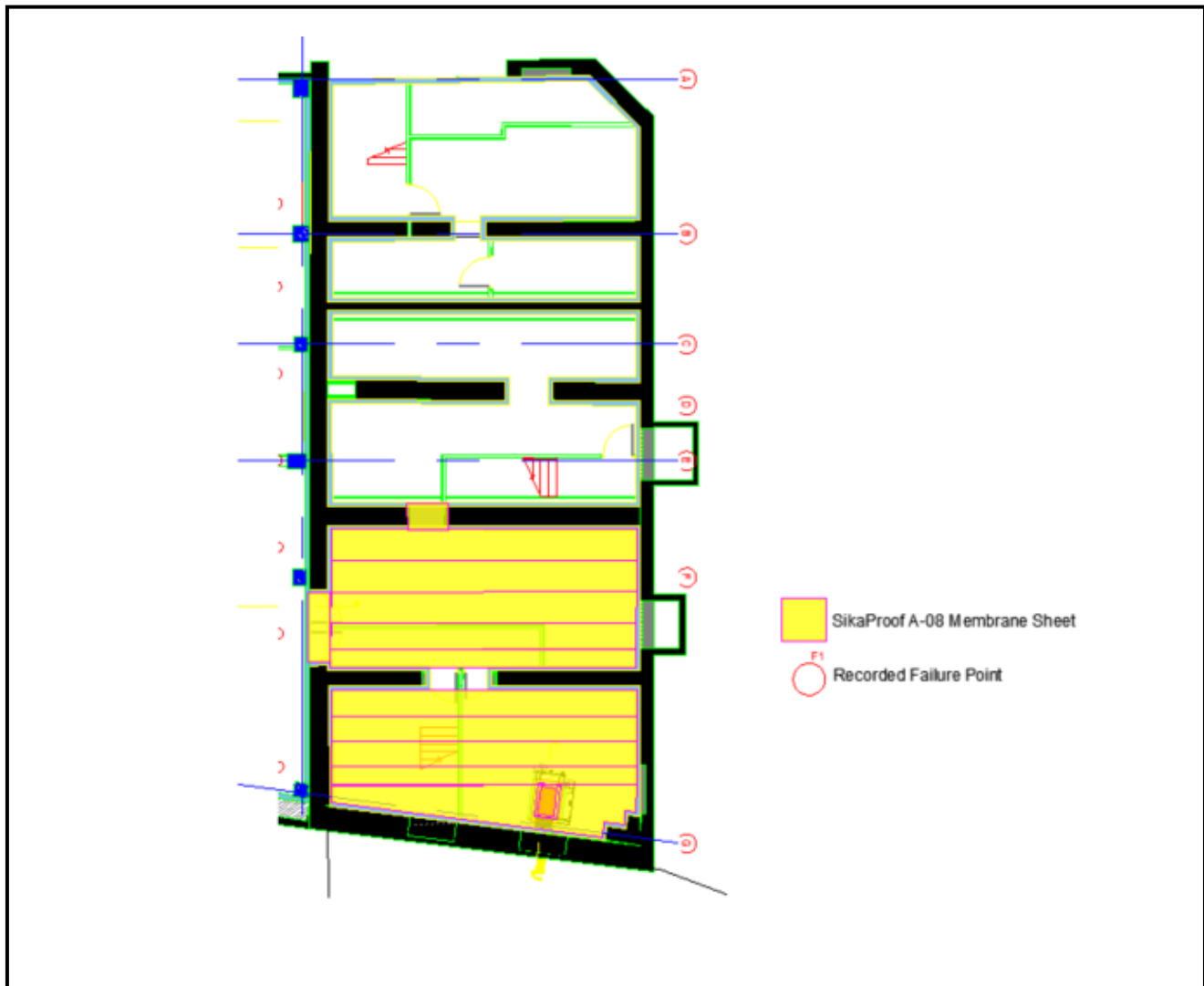
ASTM D4437-08:2013 Air Lance Test—Inspect all seams for unbonded areas using an air nozzle directed on the upper seam edge and surface to detect loose edges, ripples indicating unbonded areas within the seam, or other undesirable seam conditions. Check all bonded seams using a minimum 50 psi (345 kPa) (gage) air supply directed through a $\frac{3}{16}$ in. (4.8 mm) (typical) nozzle, held not more than 2 in. (51 mm) from the seam edge and directed at the seam edge.

The box below should be used to present a sketch plan of the building/plot layout and membrane, showing locations of all key joints and seal features of the gas protection system and installation which are subject to air-lance integrity testing (joins, seals, tophats around service penetrations etc).

- Failure points in seams or joins should be marked sequentially 'F₁', 'F₂' etc with approximate dimensions.
- Seams and joins deemed to be satisfactory should be marked with an S. All relative testing details/comments should be recorded in the table below.



2 Southern rooms within the 'Chambers' (Eastern section) of market hall basement Radon Protection – Area of Installation/ Inspection for given date(s) highlighted green.



No.	Item	Comments (see notes)
A - Air Lancing Equipment		
Air Lance with outflow nozzle of 4.8mm		All accessible seams, joints and service penetrations tested via air lancing in accordance with ASTM D4437-08:2013 Air Lance Test. Pressure monitored and maintained at 50-60psi at the lance throughout testing.
B - Membrane, Joints and Seals		
Details of gas membrane product used		SikaProof A-08 Membrane SikaProof Tape-150 SikaProof Patch200 SikaDur 32 Epoxy Liquid Barrier
Details of joining/ lapping tape products used		SikaProof Tape-150 SikaProof Patch200 Sikadur Combiflex Adhesive
Joint/ Lapping design used		Overlaps adequate (meet min. 100mm recommended by manufacturer). Joints generally completed using self-adhesive edge of membrane and/or SikaProof Tape-150. Sikadur Combiflex Adhesive also applied to reinforce joints between membrane and liquid barrier.
External vent trenches/ ducts		N/A

No.	Item	Comments (see notes)
C – Air Lance Integrity Test Results		
Test No.	Failed or Satisfactory (F or S)	Detail, comments and recommendations
Membrane to Liquid Barrier Joints	S	All membrane liquid barrier joints proven to be satisfactory by IDG via ASTM D4437 air lance test.
Membrane to membrane Joints	S	All membrane to membrane seams/join length proven to be satisfactory by IDG via ASTM D4437 air lance test.
4 - Photographs		
Photograph	Description	
	IDG's typical Air lance kit set up for integrity testing of the seams/ joints and tophat seals, and compliant with ASTM D4437.	
	Air lance testing of SikaProof A-08 Membrane installed in Market Hall Basement chambers.	
	Air lance testing of SikaProof A-08 Membrane installed in Market Hall Basement chambers, with pressure gauge showing maintained pressure above minimum of 50psi advocated by ASTM D4437-08:2013.	

	<i>Air lance testing of joint between two SikaProof A-08 Membrane sheets installed in Market Hall Basement chambers, with pressure gauge showing maintained pressure above minimum of 50psi advocated by ASTM D4437-08:2013.</i>
	<i>Air lance testing of taped joint between SikaProof A-08 Membrane and SikaDur 32 Epoxy Liquid Barrier in Market Hall Basement chambers, with pressure gauge showing maintained pressure above minimum of 50psi advocated by ASTM D4437-08:2013.</i>
	<i>Air lance testing of taped joint between SikaProof A-08 Membrane and SikaDur 32 Epoxy Liquid Barrier in Market Hall Basement chambers, with pressure gauge showing maintained pressure above minimum of 50psi advocated by ASTM D4437-08:2013.</i>

REMEDIAL ACTIONS REQUIRED

N/A - all remedial actions completed

CERTIFICATION

The air lance integrity testing was undertaken by a suitably competent IDG testing engineer, using specialist equipment designed to comply with the requirements of ASTM D4437-08:2013, and the site-specific Gas Protection Measures Verification Plan.

The Gas Protection Measures for this section of work:	A) Have passed both the visual verification inspection and air lance non-destructive integrity testing of all seams and joins. The quality of installation and workmanship are satisfactory and comply with the specification.	✓
	B) Are acceptable but attention is drawn to issues relating to item(s) No.	
	C) Are not acceptable due to issues requiring remedial action as indicated above. <i>This plot should be re-inspected and verified upon completion of any required remedial works.</i>	
NAME	SIGNATURE	DATE
LIAM MURPHY		09/01/25

GAS PROTECTION MEASURES VERIFICATION VISUAL INSPECTION RECORD



Site Name:	Radcliffe Market Hall Basement	Gas Characteristic Situation:	Basic Radon Only
Job Number:	5238	Type of development: (Residential/ commercial/ other)	Commercial
Date:	16/12/2024	Building Description:	Conversion / refurbishment of existing Market Hall Basement into 'Event Space' with associated hospitality, catering and storage facilities.
Verification Engineer:	LM	Foundation Type: (suspended floor/ raft/ other)	Pile And Beam to support new floor slab
Weather during inspection:	Cold, overcast and raining.	Gas Protection Type: (passive/ active)	Passive Radon
Area/ Plot number(s):	'Tomb area' (Western section) of market hall basement		
Gas Protection Components inspected:	Liquid barrier applied to stanchion bases, newly poured beams and radon membrane installation		

The box below should be used to present a sketch plan of the building/plot layout, showing locations of all key features of the gas protection system and installation (vents, joins, seals, service penetrations etc). All relative inspection details/comments should be recorded in the table below.



'Tomb area' (Western section) of market hall basement Radon Protection – Area of Installation/ Inspection for given date(s) highlighted green.

No.	Item	Comments (see notes)
1 - Passive Venting		
1.1	Sub-floor void	N/A
1.2	External wall airbricks	N/A
1.3	Internal sleeper walls	N/A
1.4	External vent trenches/ ducts	N/A
2 - Active Venting		
2.1	Active venting System details	N/A

No.	Item	Comments (see notes)
3 - Gas Membrane		
3.1	Condition of sub-grade and underside of membrane	<i>Generally acceptable, all surfaces cleaned down prior to being coated with SikaDur 32 Epoxy Liquid Barrier. Floor underlain by insulation sheets prior to placement of membrane.</i>
3.2	Details of gas membrane product used	<i>SikaProof A-08 Membrane SikaProof Tape-150 SikaProof Patch200 SikaDur 32 Epoxy Liquid Barrier</i>
3.3	Gas membrane condition (rips/ tears/ penetrations)	<i>Generally very good. No punctures/rips or tears identified.</i>
3.4	Details of joining/ lapping tape products used	<i>SikaProof Tape-150 SikaProof Patch200 Sikadur Combiflex Adhesive</i>
3.5	Lapping design	<i>Overlaps adequate (meet min. 100mm recommended by manufacturer).</i>
3.6	Laps, welds and joint seals	<i>Joints generally completed to a good standard using self-adhesive edge of membrane and/or SikaProof Tape-150. Sikadur Combiflex Adhesive also applied to reinforce joints between membrane and liquid barrier.</i>
3.7	Service entry seals	<i>N/A</i>
4 – Other comments/ considerations		
4.1		
4.2		
5 - Photographs		
Photograph		Description
		<i>Photograph showing the 'Tomb' area of the Market Hall Basement, with SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/foundations and applied to new ground beams and stanchion bases. SikaProof A-08 Membrane installed in 'slab' areas between ground beams to form wall to wall radon barrier. Self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on stanchion bases and beams.</i>
		<i>Photograph showing the 'Tomb' area of the Market Hall Basement, with SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/foundations and applied to new ground beams and stanchion bases. SikaProof A-08 Membrane installed in 'slab' areas between ground beams to form wall to wall radon barrier. Self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on stanchion bases and beams.</i>

	Photograph showing the 'Tomb' area of the Market Hall Basement, with SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/foundations and applied to new ground beams and stanchion bases. SikaProof A-08 Membrane installed in 'slab' areas between ground beams to form wall to wall radon barrier. Self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on stanchion bases and beams.
	Photograph showing the 'Tomb' area of the Market Hall Basement, with SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/foundations and applied to new ground beams and stanchion bases. SikaProof A-08 Membrane installed in 'slab' areas between ground beams to form wall to wall radon barrier. Self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on stanchion bases and beams.
	Photograph showing the 'Tomb' area of the Market Hall Basement, with SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/foundations and applied to new ground beams and stanchion bases. SikaProof A-08 Membrane installed in 'slab' areas between ground beams to form wall to wall radon barrier. Self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on stanchion bases and beams.
	Photograph showing the 'Tomb' area of the Market Hall Basement, with SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/foundations and applied to new ground beams and stanchion bases. SikaProof A-08 Membrane installed in 'slab' areas between ground beams to form wall to wall radon barrier. Self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on stanchion bases and beams.
	Photograph showing SikaProof A-08 Membrane installed in 'Tomb' area of the Market Hall Basement to form wall to wall radon barrier. Detailing completed with SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on walls.

REMEDIAL ACTIONS REQUIRED

N/A

CERTIFICATION

The visual verification inspection was undertaken by a suitably competent IDG verification engineer, in accordance with the requirements of CIRIA C735 and the site-specific Gas Protection Measures Verification Plan.

The Gas Protection Measures for this section of work:	A) Are acceptable and comply with the specification. <i>Final Certification of this section of work is subject to successful Air Lance Integrity Testing to demonstrate compliance.</i>	✓
	B) Are acceptable and comply with the specification. <i>Air Lance Integrity Testing is not required for this section of work.</i>	
	C) Are acceptable but attention is drawn to issues relating to item(s) No. 3.6. <i>Final Certification of this section of work is subject to successful Air Lance Integrity Testing to demonstrate compliance.</i>	
	D) Are not acceptable due to issues requiring remedial action as indicated above. <i>This section of work should be re-inspected and verified upon completion of any required remedial works.</i>	
NAME	SIGNATURE	DATE
LIAM MURPHY		09/01/25

Inspection Checklist Notes:

1.1	Sub-floor void	Is a check possible? Void former? Gravel (type/ specification)? Height of void space? Is it clear?
1.2	External wall airbricks	Numbers, size, positions as per design drawing?
1.3	Internal sleeper walls	Ventilation holes (honeycomb brickwork/ pipe crossings)? Size, spacing, location in accordance with design?
1.4	External vent trenches/ ducts	Located/ construction in accordance with design? If open-topped – 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 superstructure?
2.1	System details	Type of air supply: mechanical, natural, combined? Location/ condition/ number of fans and vents? Location and size of inlets? Provision of air-cleaning devices? Supply and exhaust ducting? Alarm provision/ installation? Gas monitoring system in under-floor void?
3.1	Condition of sub-grade and underside of 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?
3.2	Details of gas membrane product used	Manufacturer and product specification, gauge, colour, brand/name, material, batch/ roll numbers, storage arrangements (to protect from dirt/damage).
3.3	Gas membrane condition (rips/ tears/ penetrations)	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?
3.4	Details of joining/ lapping tape products used	Product type, brand, thickness, material, width, colour? Foil backed? Double sided?
3.5	Lapping design	Joints lapped and sealed in accordance with manufacturers requirements/ specification? Minimum overlap ensured? Sections taped twice (double sided and lapping)?
3.6	Laps, welds and joint seals	Welds complete? Appropriate jointing tape used? No creases or folds in sheet edges? Adequately bonded? (confirm by air lance integrity testing as necessary in accordance with the verification plan)
3.7	Service entry seals	Top hats seal arrangements fixed around service entries? Use of jubilee clips? Adequately taped to membrane at joins with double-sided and lapping tape?

GAS PROTECTION MEASURES VERIFICATION AIR LANCE INTEGRITY TESTING RECORD



Site Name:	Radcliffe Market Chambers Basement	Gas Characteristic Situation:	Basic Radon Only
Job Number:	5238	Type of development: (Residential/ commercial/ other)	Commercial
Date:	16/12/2024	Building Description:	Conversion / refurbishment of existing Market Hall Basement into 'Event Space' with associated hospitality, catering and storage facilities.
Integrity Testing Engineer:	LM	Foundation Type: (suspended floor/ raft/ other)	Pile And Beam to support new floor slab
Weather during inspection:	Cold, overcast and raining.	Gas Protection Type: (passive/ active)	Passive Radon
Area/ Plot number(s):	'Tomb area' (Western section) of market hall basement		
Gas Protection Components inspected:	Liquid barrier applied to stanchion bases, newly poured beams and radon membrane installation		

ASTM D4437-08:2013 Air Lance Test—Inspect all seams for unbonded areas using an air nozzle directed on the upper seam edge and surface to detect loose edges, ripples indicating unbonded areas within the seam, or other undesirable seam conditions. Check all bonded seams using a minimum 50 psi (345 kPa) (gage) air supply directed through a $\frac{3}{16}$ in. (4.8 mm) (typical) nozzle, held not more than 2 in. (51 mm) from the seam edge and directed at the seam edge.

The box below should be used to present a sketch plan of the building/plot layout and membrane, showing locations of all key joints and seal features of the gas protection system and installation which are subject to air-lance integrity testing (joins, seals, tophats around service penetrations etc).

- Failure points in seams or joins should be marked sequentially 'F₁', 'F₂' etc with approximate dimensions.
- Seams and joins deemed to be satisfactory should be marked with an S. All relative testing details/comments should be recorded in the table below.

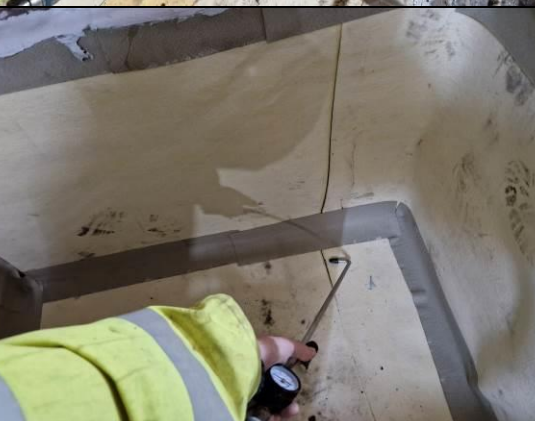


'Tomb area' (Western section) of market hall basement Radon Protection – Area of Installation/ Inspection for given date(s) highlighted green.



No.	Item	Comments (see notes)
A - Air Lancing Equipment		
Air Lance with outflow nozzle of 4.8mm		<i>All accessible seams, joints and service penetrations tested via air lancing in accordance with ASTM D4437-08:2013 Air Lance Test. Pressure monitored and maintained at 50-60psi at the lance throughout testing.</i>
B - Membrane, Joints and Seals		
Details of gas membrane product used		<i>SikaProof A-08 Membrane SikaProof Tape-150 SikaProof Patch200 SikaDur 32 Epoxy Liquid Barrier</i>
Details of joining/ lapping tape products used		<i>SikaProof Tape-150 SikaProof Patch200 Sikadur Combiflex Adhesive</i>
Joint/ Lapping design used		<i>Overlaps adequate (meet min. 100mm recommended by manufacturer). Joints generally completed using self-adhesive edge of membrane and/or SikaProof Tape-150. Sikadur Combiflex Adhesive also applied to reinforce joints between membrane and liquid barrier.</i>
External vent trenches/ ducts		<i>N/A</i>

No.	Item	Comments (see notes)
C – Air Lance Integrity Test Results		
Test No.	Failed or Satisfactory (F or S)	Detail, comments and recommendations
Membrane to Liquid Barrier Joints	S	All membrane liquid barrier joints proven to be satisfactory by IDG via ASTM D4437 air lance test.
Membrane to membrane Joints	S	All membrane to membrane seams/join length proven to be satisfactory by IDG via ASTM D4437 air lance test.
4 - Photographs		
Photograph	Description	
	IDG's typical Air lance kit set up for integrity testing of the seams/ joints and tophat seals, and compliant with ASTM D4437.	
	Air lance testing of SikaProof A-08 Membrane installed in 'Tomb area' (Western section) of market hall basement	
	Air lance testing of SikaProof A-08 Membrane installed in 'Tomb area' (Western section) of market hall basement, with pressure gauge showing maintained pressure above minimum of 50psi advocated by ASTM D4437-08:2013.	

	<i>Air lance testing of joint between two SikaProof A-08 Membrane sheets installed in 'Tomb area' (Western section) of market hall basement, with pressure gauge showing maintained pressure above minimum of 50psi advocated by ASTM D4437-08:2013.</i>
	<i>Air lance testing of taped joint between SikaProof A-08 Membrane and SikaDur 32 Epoxy Liquid Barrier in 'Tomb area' (Western section) of market hall basement, with pressure gauge showing maintained pressure above minimum of 50psi advocated by ASTM D4437-08:2013.</i>
	<i>Air lance testing of taped joint between SikaProof A-08 Membrane and SikaDur 32 Epoxy Liquid Barrier in 'Tomb area' (Western section) of market hall basement, with pressure gauge showing maintained pressure above minimum of 50psi advocated by ASTM D4437-08:2013.</i>
	<i>Air lance testing of joint between two SikaProof A-08 Membrane sheets installed in 'Tomb area' (Western section) of market hall basement, with pressure gauge showing maintained pressure above minimum of 50psi advocated by ASTM D4437-08:2013.</i>

REMEDIAL ACTIONS REQUIRED

N/A - all remedial actions completed

CERTIFICATION

The air lance integrity testing was undertaken by a suitably competent IDG testing engineer, using specialist equipment designed to comply with the requirements of ASTM D4437-08:2013, and the site-specific Gas Protection Measures Verification Plan.

The Gas Protection Measures for this section of work:	A) Have passed both the visual verification inspection and air lance non-destructive integrity testing of all seams and joins. The quality of installation and workmanship are satisfactory and comply with the specification.	✓
	B) Are acceptable but attention is drawn to issues relating to item(s) No.	
	C) Are not acceptable due to issues requiring remedial action as indicated above. <i>This plot should be re-inspected and verified upon completion of any required remedial works.</i>	
NAME	SIGNATURE	DATE
LIAM MURPHY		09/01/25

GAS PROTECTION MEASURES VERIFICATION VISUAL INSPECTION RECORD



Site Name:	Radcliffe Market Hall Basement	Gas Characteristic Situation:	Basic Radon Only
Job Number:	5238	Type of development: (Residential/ commercial/ other)	Commercial
Date:	22/01/2025	Building Description:	Conversion / refurbishment of existing Market Hall Basement into 'Event Space' with associated hospitality, catering and storage facilities.
Verification Engineer:	LM	Foundation Type: (suspended floor/ raft/ other)	Pile And Beam to support new floor slab
Weather during inspection:	Cold, overcast and dry.	Gas Protection Type: (passive/ active)	Passive Radon
Area/ Plot number(s):	Main event space (central section) of market hall basement		
Gas Protection Components inspected:	Liquid barrier applied to stanchion bases, newly poured beams and radon membrane installation		

The box below should be used to present a sketch plan of the building/plot layout, showing locations of all key features of the gas protection system and installation (vents, joins, seals, service penetrations etc). All relative inspection details/comments should be recorded in the table below.



Main event space (central section) of market hall basement Radon Protection – Area of Installation/ Inspection for given date(s) highlighted green.

No.	Item	Comments (see notes)
1 - Passive Venting		
1.1	Sub-floor void	N/A
1.2	External wall airbricks	N/A
1.3	Internal sleeper walls	N/A
1.4	External vent trenches/ ducts	N/A
2 - Active Venting		
2.1	Active venting System details	N/A

No.	Item	Comments (see notes)
3 - Gas Membrane		
3.1	Condition of sub-grade and underside of membrane	<i>Generally acceptable, all surfaces cleaned down prior to being coated with SikaDur 32 Epoxy Liquid Barrier. Floor underlain by insulation sheets prior to placement of membrane.</i>
3.2	Details of gas membrane product used	<i>SikaProof A-08 Membrane SikaProof Tape-150 SikaProof Patch200 SikaDur 32 Epoxy Liquid Barrier</i>
3.3	Gas membrane condition (rips/ tears/ penetrations)	<i>Generally very good. No punctures/rips or tears identified.</i>
3.4	Details of joining/ lapping tape products used	<i>SikaProof Tape-150 SikaProof Patch200 Sikadur Combiflex Adhesive</i>
3.5	Lapping design	<i>Overlaps adequate (meet min. 100mm recommended by manufacturer).</i>
3.6	Laps, welds and joint seals	<i>Joints generally completed to a good standard using self-adhesive edge of membrane and/or SikaProof Tape-150. Sikadur Combiflex Adhesive also applied to reinforce joints between membrane and liquid barrier.</i>
3.7	Service entry seals	<i>N/A</i>
4 – Other comments/ considerations		
4.1		
4.2		
5 - Photographs		
Photograph		Description
		<i>Photograph showing main event space of the Market Hall Basement, with SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/ foundations and applied to new ground beams and stanchion bases. SikaProof A-08 Membrane installed in 'slab' areas between ground beams to form wall to wall radon barrier. Self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on stanchion bases and beams.</i>
		<i>Photograph showing main event space of the Market Hall Basement, with SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/ foundations and applied to new ground beams and stanchion bases. SikaProof A-08 Membrane installed in 'slab' areas between ground beams to form wall to wall radon barrier. Self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on stanchion bases and beams.</i>

	Photograph showing main event space of the Market Hall Basement, with SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/foundations and applied to new ground beams and stanchion bases. SikaProof A-08 Membrane installed in 'slab' areas between ground beams to form wall to wall radon barrier. Self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on stanchion bases and beams.
	Photograph showing main event space of the Market Hall Basement, with SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/foundations and applied to new ground beams and stanchion bases. SikaProof A-08 Membrane installed in 'slab' areas between ground beams to form wall to wall radon barrier. Self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on stanchion bases and beams.
	Photograph showing main event space of the Market Hall Basement, with SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/foundations and applied to new ground beams and stanchion bases. SikaProof A-08 Membrane installed in 'slab' areas between ground beams to form wall to wall radon barrier. Self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on stanchion bases and beams.
	Photograph showing main event space of the Market Hall Basement, with SikaDur 32 Epoxy Liquid Barrier (grey) applied to existing walls/foundations and applied to new ground beams and stanchion bases. SikaProof A-08 Membrane installed in 'slab' areas between ground beams to form wall to wall radon barrier. Self-adhesive membrane edge for joints, and SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on stanchion bases and beams.
	Photograph showing SikaProof A-08 Membrane installed in main event space of the Market Hall Basement to form wall to wall radon barrier. Detailing completed with SikaProof Tape-150 with Sikadur Combiflex Adhesive used for joints between membrane and SikaDur 32 Epoxy Liquid Barrier on walls.

REMEDIAL ACTIONS REQUIRED

N/A

CERTIFICATION

The visual verification inspection was undertaken by a suitably competent IDG verification engineer, in accordance with the requirements of CIRIA C735 and the site-specific Gas Protection Measures Verification Plan.

The Gas Protection Measures for this section of work:	A) Are acceptable and comply with the specification. <i>Final Certification of this section of work is subject to successful Air Lance Integrity Testing to demonstrate compliance.</i>	✓
	B) Are acceptable and comply with the specification. <i>Air Lance Integrity Testing is not required for this section of work.</i>	
	C) Are acceptable but attention is drawn to issues relating to item(s) No. 3.6. <i>Final Certification of this section of work is subject to successful Air Lance Integrity Testing to demonstrate compliance.</i>	
	D) Are not acceptable due to issues requiring remedial action as indicated above. <i>This section of work should be re-inspected and verified upon completion of any required remedial works.</i>	
NAME	SIGNATURE	DATE
LIAM MURPHY		23/01/25

Inspection Checklist Notes:

1.1	Sub-floor void	Is a check possible? Void former? Gravel (type/ specification)? Height of void space? Is it clear?
1.2	External wall airbricks	Numbers, size, positions as per design drawing?
1.3	Internal sleeper walls	Ventilation holes (honeycomb brickwork/ pipe crossings)? Size, spacing, location in accordance with design?
1.4	External vent trenches/ ducts	Located/ construction in accordance with design? If open-topped – 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 superstructure?
2.1	System details	Type of air supply: mechanical, natural, combined? Location/ condition/ number of fans and vents? Location and size of inlets? Provision of air-cleaning devices? Supply and exhaust ducting? Alarm provision/ installation? Gas monitoring system in under-floor void?
3.1	Condition of sub-grade and underside of 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?
3.2	Details of gas membrane product used	Manufacturer and product specification, gauge, colour, brand/name, material, batch/ roll numbers, storage arrangements (to protect from dirt/damage).
3.3	Gas membrane condition (rips/ tears/ penetrations)	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?
3.4	Details of joining/ lapping tape products used	Product type, brand, thickness, material, width, colour? Foil backed? Double sided?
3.5	Lapping design	Joints lapped and sealed in accordance with manufacturers requirements/ specification? Minimum overlap ensured? Sections taped twice (double sided and lapping)?
3.6	Laps, welds and joint seals	Welds complete? Appropriate jointing tape used? No creases or folds in sheet edges? Adequately bonded? (confirm by air lance integrity testing as necessary in accordance with the verification plan)
3.7	Service entry seals	Top hats seal arrangements fixed around service entries? Use of jubilee clips? Adequately taped to membrane at joins with double-sided and lapping tape?

GAS PROTECTION MEASURES VERIFICATION AIR LANCE INTEGRITY TESTING RECORD



Site Name:	Radcliffe Market Chambers Basement	Gas Characteristic Situation:	Basic Radon Only
Job Number:	5238	Type of development: (Residential/ commercial/ other)	Commercial
Date:	22/01/2025	Building Description:	Conversion / refurbishment of existing Market Hall Basement into 'Event Space' with associated hospitality, catering and storage facilities.
Integrity Testing Engineer:	LM	Foundation Type: (suspended floor/ raft/ other)	Pile And Beam to support new floor slab
Weather during inspection:	Cold, overcast and dry.	Gas Protection Type: (passive/ active)	Passive Radon
Area/ Plot number(s):	Main event space (central section) of market hall basement		
Gas Protection Components inspected:	Liquid barrier applied to stanchion bases, newly poured beams and radon membrane installation		

ASTM D4437-08:2013 Air Lance Test—Inspect all seams for unbonded areas using an air nozzle directed on the upper seam edge and surface to detect loose edges, ripples indicating unbonded areas within the seam, or other undesirable seam conditions. Check all bonded seams using a minimum 50 psi (345 kPa) (gage) air supply directed through a $\frac{3}{16}$ in. (4.8 mm) (typical) nozzle, held not more than 2 in. (51 mm) from the seam edge and directed at the seam edge.

The box below should be used to present a sketch plan of the building/plot layout and membrane, showing locations of all key joints and seal features of the gas protection system and installation which are subject to air-lance integrity testing (joints, seals, tophats around service penetrations etc).

- Failure points in seams or joints should be marked sequentially 'F₁', 'F₂' etc with approximate dimensions.
- Seams and joints deemed to be satisfactory should be marked with an S. All relative testing details/comments should be recorded in the table below.



Main event space (central section) of market hall basement Radon Protection – Area of Installation/ Inspection for given date(s) highlighted green.



No.	Item	Comments (see notes)
A - Air Lancing Equipment		
Air Lance with outflow nozzle of 4.8mm	All accessible seams, joints and service penetrations tested via air lancing in accordance with ASTM D4437-08:2013 Air Lance Test. Pressure monitored and maintained at 50-60psi at the lance throughout testing.	
B - Membrane, Joints and Seals		
Details of gas membrane product used	SikaProof A-08 Membrane SikaProof Tape-150 SikaProof Patch200 SikaDur 32 Epoxy Liquid Barrier	
Details of joining/ lapping tape products used	SikaProof Tape-150 SikaProof Patch200 Sikadur Combiflex Adhesive	
Joint/ Lapping design used	Overlaps adequate (meet min. 100mm recommended by manufacturer). Joints generally completed using self-adhesive edge of membrane and/or SikaProof Tape-150. Sikadur Combiflex Adhesive also applied to reinforce joints between membrane and liquid barrier.	
External vent trenches/ ducts	N/A	