

Date: 2nd May 2025
Reference: 16465-V4

GAS MEMBRANE VALIDATION – EDENFIELD ROAD, NORDEN

Project Name:	Edenfield Road, Rochdale
Project Number:	16465
Client:	Stonebond Group Ltd
Date:	23-04-2025
Project Manager & Qualifications:	M. Wilson
E3P Engineer & Qualifications:	J. James- Qualified Engineer
Gas Membrane Installers Name & Qualifications:	Arch and Wood Construction & Commercial Ltd NVQ Level 2 Qualified Installer
Ground Gas Risk Assessment	Characteristic Situation (CS2) (all plots) Vapour resistant membranes (Plots 1-10)
Plots:	1-6

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

FINAL QUALITY ASSURANCE

E3P SITE VALIDATION CQA	QUALIFICATIONS	POSITION
Jordan James	CL:AIRE Course – Verification of Gas Protection Measures	Technician
PREPARED BY	QUALIFICATIONS	POSITION
Mark Wilson	BSc (Hons) Ind, FGS, MEnvSc	Senior Consultant
AUTHORISED BY	QUALIFICATIONS	POSITION
Roy Walker	BSc(Hons), FGS, AEMA, AMICE, MEnvSc, CEnv	Associate Director

Table 1 Validation Letter References

PLOT NUMBER	DATE	REPORT REFERENCE
1-6	22-11-2024	V1
7-10	25-11-2024	V2
7-10 New Detail	10-04-2025	V3
1-6 New Detail	23-04-2025	V4





GROUND GAS MITIGATION DESIGN

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

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

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

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

OVERVIEW OF GROUND GAS MITIGATION DESIGN & CONSTRUCTION REQUIREMENTS

Characteristic Situation 2 – Design Mitigation Requirements.

- ✳ Passive sub-floor dispersal layer of very good performance which meets all criteria in Paragraph B.6 of BS8485:2015 (minimum 150 mm clear void space and with correct frequency of side ventilation).
- ✳ Lapped and taped / sealed gas resistant membrane in the floor slab construction which meets all the criteria as set out in Table 7 of BS8485:2015 (+A1 2019) and Verification in Section 3.2.2 of CIRIA 735:2014.

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

Volatile Organic Compounds – Design Mitigation Requirements

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

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

Following a review of the sub-structure design by the NHBC in March 2025, concerns were raised about the placement of the membrane over the thermalite block, in terms of potentially creating a cavity that would allow for the accumulation of moisture, which in turn could have a detrimental impact upon the timber frame structure.

As such, AJP Consulting Engineers redesigned the sub-structures so that the membrane dipped away from the internal walls and thus removed the potential for moisture to accumulate.

As this redesign occurred during the Build Phase, a number of plots had already had membranes installed and the timber frames erected in line with the previous designs. As such, AJP Consulting Engineers developed remedial measures for the affected plots; which are summarised below.

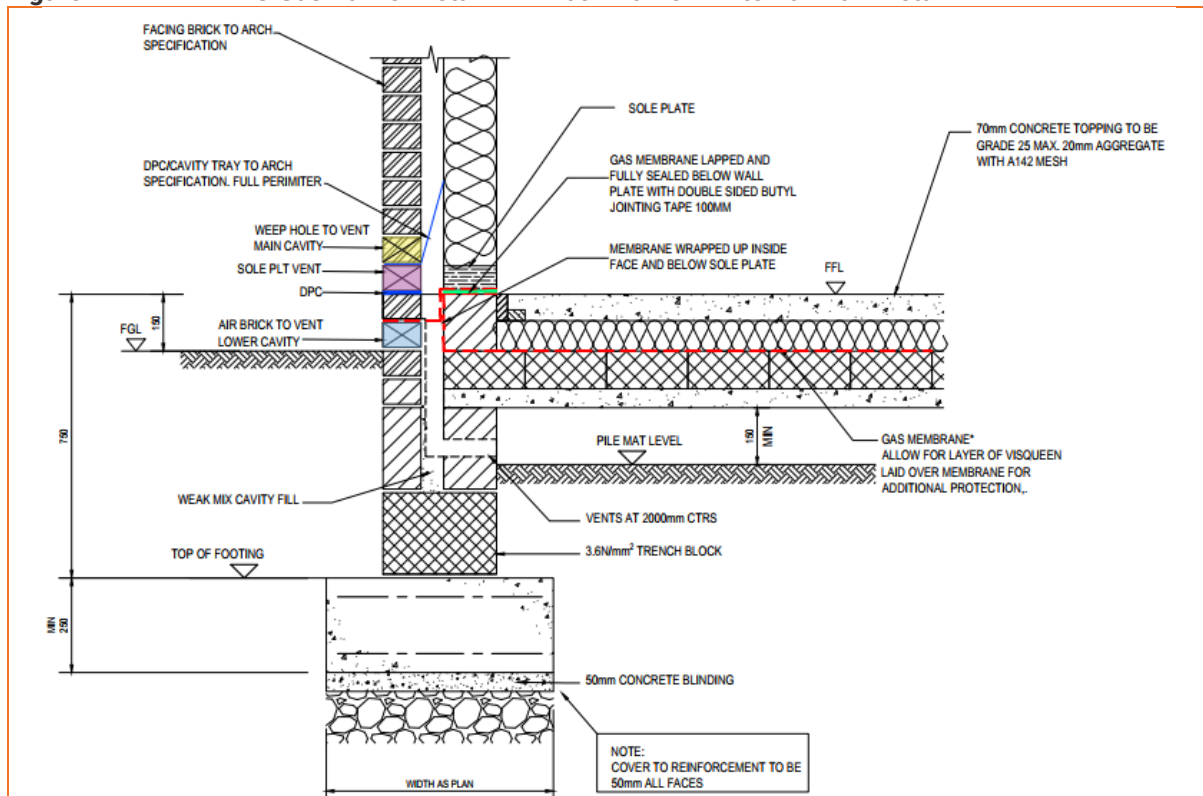


- EDE-AJP-XX-00-DR-S-9991, Rev P01, dated February 2025 – NHBC Gas Barrier Detail – Timber Frame – External Wall Detail – Gas membrane lapped and fully sealed below wall plate with double sided butyl jointing tape 100 mm.

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

For plots where the membranes had already been installed at the time of the sub-structure redesign (Plots 1-10), remedial details in line with drawing EDE-AJP-XX-00-DR-S-9991, Rev P01, dated February 2025 and Figure 1 are to be installed.

Figure 1 NHBC Gas Barrier Detail – Timber Frame – External Wall Detail





SUMMARY OF VALIDATION INSPECTION & APPROVAL

SUB-FLOOR VOID

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

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

The sub-floor voids for Plots 2, 4 and 6 were previously inspected on 22nd November 2024 as part of previous visits (CQA Validation Report V1, dated 22-11-2024). The sub-floor voids were observed and inspected to be a minimum of 150 mm with no visible inclusions that would limit the performance of this ventilation mechanism.

Photographs of the sub-floor voids for Plots 2, 4, and 6 are included in the final section of the previous CQA Validation Reports (CQA Validation Report V1, dated 22-11-2024).

AIR BRICKS & TELESCOPIC VENTILATION

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

GAS RESISTANT MEMBRANE

The membrane for Plots 1-6 had previously been inspected on 22nd November 2024 as part of a previous visit (CQA Validation Report V1, dated 22-11-2024). An additional inspection of the membrane to confirm the gas membrane remedial details had been installed in accordance with the detailed structural design has been undertaken, with photographs included in the final section of this CQA Validation Report.

The membrane utilised on-site comprises: Juta - TitanFlex Gas and Hydrocarbon Barrier resistant to Volatile Organic Compounds.

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

The E3P Technician has inspected the installation of the membrane remedial detail for Plots 1-6 in line with the structural engineer's specifications in terms of placement and position (**Figure 1**), and the manufacturer's detail in terms of the workmanship. E3P can confirm that the gas membrane has been lapped and welded to form a seal beyond the external wall. Due to the use of vapour resistant membranes on Plots 1-6, the lapped membranes were welded together rather than sealed with double sided butyl jointing tape (100 mm).

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

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

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



All the overlaps at the corners were then additionally taped to avoid damage/trip hazards using specialist jointing tape (foil-backed girth tape).

Based on the information provided within this report, the site inspection and validation checklists, E3P can confirm that **Plots 1-6** have been installed with gas and vapour resistant protection measures remedial detail in accordance with the detailed structural design and the requirements of BS8485:2015 (+A1 2019) Characteristic Situation 2, CIRIA 735:2014, and CIRIA 748:2014 to an acceptable level of workmanship.

E3P ENGINEER'S SITE CHECK SHEET

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

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



WELDED GAS MEMBRANE VALIDATION

Complete

Score	65 / 65 (100%)	Flagged items	0	Actions	0
Site Name	Edenfield Road				
Location	737 Edenfield Road Rochdale England OL11 5TT United Kingdom (53.62776540634983, - 2.21577578536957)				
Project Manager	Mark Wilson				
Project number	16485				
Developer	Stonebond				
Site representative Signature	 Dave - Stonebond 23 Apr 2025 12:38 PM BST				
Conducted on	23 Apr 2025 11:49 AM BST				
Prepared by	Jordan James				
Have you got the correct Gas Membrane detail (attached to the job in synergist)?	Yes				



Gas Membrane Inspection	64 / 64 (100%)
Plot Inspection 1	10 / 10 (100%)
Plot Number	1
Type of Development: if other add Note	House
Floor Slab Type	Block and beam suspended
Are telescopic vents present?	Yes
Gas Membrane Type: Manufacturer, gauge, and colour. (Take photos where possible showing Label)	Juta - TitanFlex Gas and Hydrocarbon Barrier
Installer's name, company and qualification	Arch and Wood
Gas Membrane Condition: Open punctures, tears, rips, stretching, Presence of debris, Repairs, Signs of weakness such as raised or sunken indentations, Protection plan in place to restrict access to laid gas membrane? IF FAIL DESCRIPTION IN ACTIONS AND PHOTOS REQUIRED	Pass
Are welds complete?	Yes
 Photo 1  Photo 2  Photo 3	
Are Joints lapped and sealed in accordance with manufacturer's requirements/ specification?	Yes
Service entries seals: Top hats seal arrangements fixed around service entries? Use of Jubilee clips or Bitumastic Sealant	Yes
Corners / Internal joints: Check all corners are correctly formed or contractor has used preformed corners.	Pass
 Photo 4  Photo 5	
Are folds running in line with joints? (no joints cutting across folds)	N/A



Extent of Coverage: Is the membrane covering the entire plot? Does membrane span over outside walls?	Yes
Sealant to the underside of the membrane at the sole plate position (Check with PM if not noted on schedule)	Yes
Condition of sub-grade and underside of gas membrane: Check that the subgrade does not contain rough/uneven surfaces, is appropriately clean and that there are no hard/sharp objects. That protective sand blinding or geotextile (if specified) is present and meets the design criteria. (Lift back the membrane and photo the subfloor)	Pass
Slab / membrane condition (is membrane clear of snow, standing water, debris or insulation): Can membrane be fully seen and photographed – ask contractor to remove any debris so membrane can be fully seen an inspected – this is a requirement of NHBC and local authorities.	Pass
External Wall Air bricks: Numbers, size. positions as design drawing? (Minimum of 3 walls)	Pass



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10



Photo 11



Plot Inspection 2	10 / 10 (100%)
Plot Number	2
Type of Development: if other add Note	House
Floor Slab Type	Block and beam suspended
Are telescopic vents present?	Yes
Gas Membrane Type: Manufacturer, gauge, and colour. (Take photos were possible showing Label)	Juta - TitanFlex Gas and Hydrocarbon Barrier
Installer's name, company and qualification	Arch and Wood
Gas Membrane Condition: Open punctures, tears, rips, stretching, Presence of debris, Repairs, Signs of weakness such as raised or sunken indentations, Protection plan in place to restrict access to lain gas membrane? IF FAIL DESCRIPTION IN ACTIONS AND PHOTOS REQUIRED	Pass
Are welds complete?	Yes
   Photo 12 Photo 13 Photo 14	
Are Joints lapped and sealed in accordance with manufacturer's requirements/ specification?	Yes
Service entries seals: Top hats seal arrangements fixed around service entries? Use of Jubilee clips or Bitumastic Sealant	Yes
Corners / Internal joints: Check all corners are correctly formed or contractor has used preformed corners.	Yes
Are folds running in line with joints? (no joints cutting across folds)	Pass
Extent of Coverage: Is the membrane covering the entire plot? Does membrane span over outside walls?	Yes
Sealant to the underside of the membrane at the sole plate position (Check with PM if not noted on schedule)	Yes



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

Pass

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

Pass

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

Pass



Photo 15



Photo 16



Photo 17



Plot Inspection 3		12 / 12 (100%)
Plot Number		3
Type of Development: if other add Note	House	
Floor Slab Type	Block and beam suspended	
Are telescopic vents present?	Yes	
Gas Membrane Type: Manufacturer, gauge, and colour. (Take photos were possible showing Label)	Juta - TitanFlex Gas and Hydrocarbon Barrier	
Installer's name, company and qualification	Arch and Wood	
Gas Membrane Condition: Open punctures, tears, rips, stretching, Presence of debris, Repairs, Signs of weakness such as raised or sunken indentations, Protection plan in place to restrict access to lain gas membrane? IF FAIL DESCRIPTION IN ACTIONS AND PHOTOS REQUIRED	Pass	
Are welds complete?	Yes	
  Photo 18 Photo 19		
Are Joints lapped and sealed in accordance with manufacturer's requirements/ specification?	Yes	
Service entries seals: Top hats seal arrangements fixed around service entries? Use of Jubilee clips or Bitumastic Sealant	Pass	
Corners / Internal joints: Check all corners are correctly formed or contractor has used preformed corners.	Pass	
  Photo 20 Photo 21		
Are folds running in line with joints? (no joints cutting across folds)	Pass	
Extent of Coverage: Is the membrane covering the entire plot? Does membrane span over outside walls?	Yes	



Sealant to the underside of the membrane at the sole plate position (Check with PM if not noted on schedule)	Yes
Condition of sub-grade and underside of gas membrane: Check that the subgrade does not contain rough/uneven surfaces, is appropriately clean and that there are no hard/sharp objects. That protective sand blinding or geotextile (if specified) is present and meets the design criteria. (Lift back the membrane and photo the subfloor)	Pass
Slab / membrane condition (is membrane clear of snow, standing water, debris or insulation): Can membrane be fully seen and photographed – ask contractor to remove any debris so membrane can be fully seen an inspected – this is a requirement of NHBC and local authorities.	Pass
External Wall Air bricks: Numbers, size. positions as design drawing? (Minimum of 3 walls)	Pass



Photo 22



Photo 23



Photo 24



Photo 25



Photo 26



Photo 27



Photo 28



Plot Inspection 4		11 / 11 (100%)
Plot Number		4
Type of Development: if other add Note	House	
Floor Slab Type	Block and beam suspended	
Are telescopic vents present?	Yes	
Gas Membrane Type: Manufacturer, gauge, and colour. (Take photos where possible showing Label)	Juta - TitanFlex Gas and Hydrocarbon Barrier	
Installer's name, company and qualification	Arch and Wood	
Gas Membrane Condition: Open punctures, tears, rips, stretching, Presence of debris, Repairs, Signs of weakness such as raised or sunken indentations, Protection plan in place to restrict access to lain gas membrane? IF FAIL DESCRIPTION IN ACTIONS AND PHOTOS REQUIRED	Pass	
Are welds complete?	Yes	
  Photo 29 Photo 30		
Are Joints lapped and sealed in accordance with manufacturer's requirements/ specification?	Yes	
Service entries seals: Top hats seal arrangements fixed around service entries? Use of Jubilee clips or Bitumastic Sealant	Yes	
Corners / Internal joints: Check all corners are correctly formed or contractor has used preformed corners.	Pass	
  Photo 31 Photo 32		
Are folds running in line with joints? (no joints cutting across folds)	Pass	
Extent of Coverage: Is the membrane covering the entire plot? Does membrane span over outside walls?	Yes	



Sealant to the underside of the membrane at the sole plate position (Check with PM if not noted on schedule)	Yes
Condition of sub-grade and underside of gas membrane: Check that the subgrade does not contain rough/uneven surfaces, is appropriately clean and that there are no hard/sharp objects. That protective sand blinding or geotextile (if specified) is present and meets the design criteria. (Lift back the membrane and photo the subfloor)	Pass
Slab / membrane condition (is membrane clear of snow, standing water, debris or insulation): Can membrane be fully seen and photographed – ask contractor to remove any debris so membrane can be fully seen an inspected – this is a requirement of NHBC and local authorities.	Pass
External Wall Air bricks: Numbers, size. positions as design drawing? (Minimum of 3 walls)	Pass



Photo 33



Photo 34



Photo 35



Photo 36



Photo 37



Photo 38



Photo 39



Photo 40



Plot Inspection 5		10 / 10 (100%)
Plot Number		5
Type of Development: if other add Note	House	
Floor Slab Type	Block and beam suspended	
Are telescopic vents present?	Yes	
Gas Membrane Type: Manufacturer, gauge, and colour. (Take photos where possible showing Label)	Juta - TitanFlex Gas and Hydrocarbon Barrier	
Installer's name, company and qualification	Arch and wood	
Gas Membrane Condition: Open punctures, tears, rips, stretching, Presence of debris, Repairs, Signs of weakness such as raised or sunken indentations, Protection plan in place to restrict access to lain gas membrane? IF FAIL DESCRIPTION IN ACTIONS AND PHOTOS REQUIRED	Pass	
Are welds complete?	Yes	
  Photo 41 Photo 42		
Are Joints lapped and sealed in accordance with manufacturer's requirements/ specification?	Yes	
Service entries seals: Top hats seal arrangements fixed around service entries? Use of Jubilee clips or Bitumastic Sealant	Yes	
Corners / Internal joints: Check all corners are correctly formed or contractor has used preformed corners.	Yes	
Are folds running in line with joints? (no joints cutting across folds)	Pass	
Extent of Coverage: Is the membrane covering the entire plot? Does membrane span over outside walls?	Yes	
Sealant to the underside of the membrane at the sole plate position (Check with PM if not noted on schedule)	Yes	



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

Pass

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

Pass

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

Pass



Photo 43



Photo 44



Photo 45



Plot Inspection 6		11 / 11 (100%)
Plot Number		6
Type of Development: if other add Note	House	
Floor Slab Type	Block and beam suspended	
Are telescopic vents present?	Yes	
Gas Membrane Type: Manufacturer, gauge, and colour. (Take photos where possible showing Label)	Juta - TitanFlex Gas and Hydrocarbon Barrier	
Installer's name, company and qualification	Arch and wood	
Gas Membrane Condition: Open punctures, tears, rips, stretching, Presence of debris, Repairs, Signs of weakness such as raised or sunken indentations, Protection plan in place to restrict access to lain gas membrane? IF FAIL DESCRIPTION IN ACTIONS AND PHOTOS REQUIRED	Pass	
Are welds complete?	Yes	
  Photo 46 Photo 47		
Are Joints lapped and sealed in accordance with manufacturer's requirements/ specification?	Yes	
Service entries seals: Top hats seal arrangements fixed around service entries? Use of Jubilee clips or Bitumastic Sealant	Yes	
Corners / Internal joints: Check all corners are correctly formed or contractor has used preformed corners.	Pass	
  Photo 48 Photo 49		
Are folds running in line with joints? (no joints cutting across folds)	Pass	
Extent of Coverage: Is the membrane covering the entire plot? Does membrane span over outside walls?	Yes	



Sealant to the underside of the membrane at the sole plate position (Check with PM if not noted on schedule)	Yes
Condition of sub-grade and underside of gas membrane: Check that the subgrade does not contain rough/uneven surfaces, is appropriately clean and that there are no hard/sharp objects. That protective sand blinding or geotextile (if specified) is present and meets the design criteria. (Lift back the membrane and photo the subfloor)	Pass
Slab / membrane condition (is membrane clear of snow, standing water, debris or insulation): Can membrane be fully seen and photographed – ask contractor to remove any debris so membrane can be fully seen an inspected – this is a requirement of NHBC and local authorities.	Pass
External Wall Air bricks: Numbers, size. positions as design drawing? (Minimum of 3 walls)	Pass
      	
Passive Venting	
Sub-floor Void: Is a check possible on future plots (insert Plot number or NO in text box)	No



Media summary



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10



Photo 11



Photo 12



Photo 13



Photo 14



Photo 15



Photo 16



Photo 17



Photo 18



Photo 19



Photo 20



Photo 21



Photo 22



Photo 23



Photo 24



Photo 25



Photo 26



Photo 27



Photo 28



Photo 29



Photo 30



Photo 31



Photo 32



Photo 33



Photo 34



Photo 35



Photo 36



Photo 37



Photo 38



Photo 39



Photo 40



Photo 41



Photo 42



Photo 43



Photo 44



Photo 45



Photo 46



Photo 47



Photo 48



Photo 49



Photo 50



Photo 51



Photo 52



Photo 53



Photo 54



Photo 55



Photo 56