By Email

Our Ref. 24-116.08L

FAO Peter Lake
Countryside Partnerships
1 Red Hall Avenue
Paragon Business Village
Wakefield
WF1 2UL

15th April 2026

Dear Peter,

RE: Verification of Hazardous Ground Gas Protection Measures at Plots 76 & 77 Blue Hills Farm, Birkenshaw, BD11 2DU

As requested by Countryside Partnerships, site visits were conducted on Wednesday 15th March 2026 by a suitably qualified and experienced geo-environmental engineer from Arc Environmental Limited to independently validate the implementation of hazardous ground gas protective measures within Plots 76 & 77 on a proposed residential development at Blue Hills Farm, Birkenshaw.

From the results of the hazardous ground gas risk assessment completed by Arc Environmental Limited, it was determined that the installation of gas protective measures to meet NHBC Amber 1 classification were required, in order to negate any potential risks to the proposed end users.

To ensure that the gas protective measures were properly implemented validation works have been undertaken comprising the inspection of the construction and installation of the gas membrane, in general accordance with BS8485:2015 & A1:2019 - Code of practice for the design of protective measures for Methane and Carbon Dioxide ground gases for new buildings, and CIRIA C735:2014 - 'Good Practice on the Testing and Verification of Protection Systems for Buildings Against Hazardous Ground Gas'.

The inspection details are summarised in Table 1 below continued the following page. Photographic record sheets for the inspections are also attached with this report.

Table 1

1. Development Summary		
1.1	Type of development and building/blocks inspected	Residential development comprising 77 no. dwellings (6 no. blocks of 3 / 4 terraced houses, 17 no. blocks of semi-detached houses and 23 no. detached houses)
1.2	Foundation type	Strip foundations with a suspended block & beam floor and sub floor void.
1.3	Gas protection type	Passive vented sub–floor void and installation of hazardous ground gas barrier membrane.
2. Passive Venting		
2.1	Sub-floor void	A c.150mm minimum sub-floor void has been constructed below the block and beam floor and this was noted to be vented by way of telescopic swan neck vents (see photographic record sheets).
2.2	External wall airbricks	c.210mm x c70mm airbricks with double telescopic swan neck vents to sub-floor void at regular intervals / spacings.

Table 1 (cont'd)

3.Gas Barrier Membrane		
3.1	Condition of sub-grade and underside of gas membrane	No sub-grade present – block & beam and cavity wall construction. Floor cleaned before laying gas barrier membrane and noted to be free of significant debris.
3.2	Gas membrane type	Rhinoplast Evolution Gas Barrier Membrane (purple or grey) is an extremely robust and high-performance ground gas resistant membrane and also provides protection against moisture. The membrane was laid across all the individual floor areas. Joints were formed using double sided butyl tape and by neatly folding and overlapping the gas barrier membrane which was then double sealed utilising Rhinoplast Joint Strip Double Sided Bitumen Tape. Gas Resistant Self Adhesive Membrane (GR SAM), as well as pre-formed Top-Hats and Double Sided Bitumen Tape were used to seal all service entries.
3.3	Extent of coverage	The extent of the Rhinoplast Evolution Gas Barrier Membrane coverage was confirmed over all floor areas and the Rhinoplast Evolution Gas Barrier Membrane was folded up and across the external wall cavity to form a DPC.
3.4	Slab / membrane condition	The condition of the Rhinoplast Evolution Gas Barrier Membrane was confirmed as being in excellent condition, and no holes or tears were noted during the verification. There were some local repairs covering holes which had been rectified before the inspection.
3.5	Joining details	The Rhinoplast Evolution Gas Barrier Membrane sheets across the floor areas were jointed to each other by either heat. All overlaps were equal to or greater than 100mm.
3.6	Damp proof membrane	The Rhinoplast Evolution Gas Barrier Membrane was folded up and across the external wall cavity to form a gas resistant DPC layer, and it was confirmed that all laps were sealed using heat welding technique.
3.7	Service entries and seals	GR SAM was used to seal the Gas Barrier Membrane to every service entry point in the floor.
3.8	Service ducts	Service ducts will require appropriate sealing using a closed cell sealant such as FiloSeal or FiloForm. It remains the responsibility of the main contractor to provide photographic evidence of service duct sealings to the Local Authority once services have been pulled through the ducts, if required.

Based on the inspection carried out by Arc Environmental Ltd., this validation letter confirms that the hazardous ground gas protective measures within Plots 76 & 77 of the residential development have been satisfactorily installed and as such have PASSED inspection.

It is deemed suitable that a 1 in 10 independent verification frequency can be adopted for validation of the gas protection measures at the site, and so the remaining plots on site (13, 24 & 65-70) can be validated by Countryside Partnerships.

RE: Verification of Hazardous Ground Gas Protection Measures at Plots 76 & 77, Blue Hills Farm, Birkenshaw, BD11 2DU (Cont'd)

We trust the information we have provided to you is to your satisfaction. However, if you require any further information or clarification, please do not hesitate to contact us.

Yours sincerely,

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For and on behalf of Arc Environmental Ltd
John Ditchburn *BEng (Hons) MIMMM CSci MIEnvSc MCIEH FGS*
Director

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Photographic Record Sheets

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Blue Hills Farm - Plots 76 & 77

24-116

Wednesday, 15 April 2026

Prepared For Countryside Partnerships

Photo 1
Plot 76

Photo 2
Plot 77

Photo 3
View of air brick

Photo 4
DPM / gas membrane used as a gas resistant DPC

Photo 5
Multiple sealed service entries

Photo 6
Double heat welds and internal wall element

Photo 7
Double corner detail with sealed service entry

Photo 9
View across plot 76

Photo 10
Upstand detail

Photo 11
Small hole repair using self adhesive membrane

Photo 12
View over Plot 77

Photo 13
Service entry sealed with self adhesive membrane

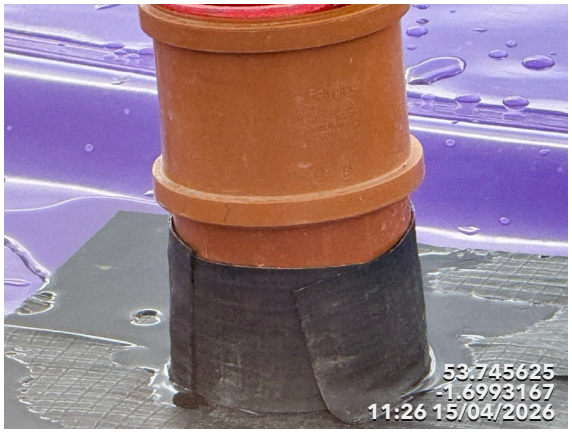

Photo 14
Service entry sealed with self adhesive membrane

Photo 15
Overview showing total coverage

Photo 16
Heat welded joints

Photo 17
Plot 77

JPD
Arc Environmental Limited

Product Specifications

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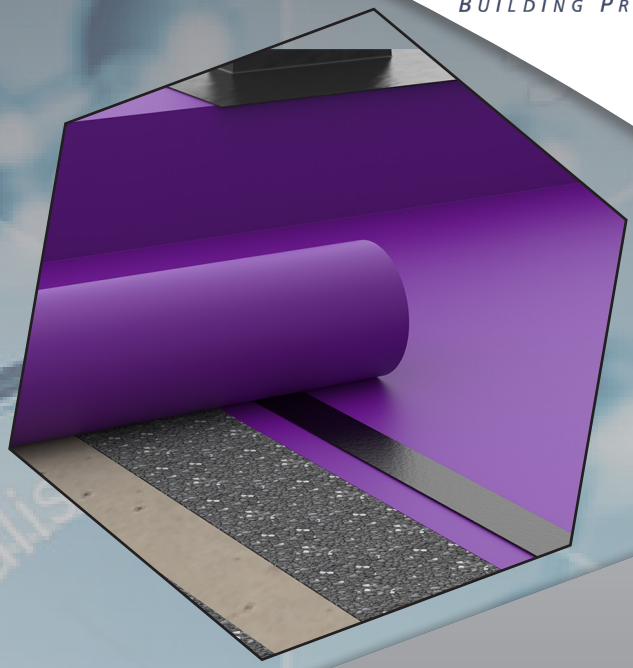
PrinciPal
BUILDING PRODUCTS

RHINOPLAST EVOLUTION GAS BARRIER



Coverage - 100m²

BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE 24/7140

400mu Thickness

Purple Colour

Rhinoplast Evolution is a high specification co-extruded multi-layer barrier specifically developed for use on construction sites contaminated by Volatile Organic Compounds, Hydrocarbons and other ground gasses such as Methane, Radon and CO2 and the product will also act as a damp proof membrane.

The membrane is a loose laid gas membrane designed for full 'line out' installation, manufactured to 14 layers containing 2 layers of gas barrier polymer (EVOH) to offer exceptional performance and prevent the ingress of dangerous gasses into buildings. It is manufactured using the latest co-extrusion technology.

The membrane is manufactured using virgin grade high performance engineering polymers to give exceptional strength and does not require reinforcement. It can be installed by the use of sealing tapes or can easily be welded for VOC applications.

CE
EN 13967

A NEW GENERATION OF GAS BARRIER

- BBA Approved
- Produced from Virgin grade Polymers
- Advanced Fourteen Layer Barrier
- Two layers of Ethylene Vinyl Alcohol Co-Polymer (EVOH)
- Single wound to achieve a flat surface
- CE Marked for Waterproofing to EN 13967:2012+A1:2017
- Conforms with BS8485:2015 + A1:2019 (Table 7)
- Incorporates performance guidance outlined in CIRIA C748
- Conforms to the specification requirements of NHBC Amber 1 & Amber 2 applications
- Suitable for all characteristic Gas Situation (CS) ground gas regimes
- Excellent Welding Characteristics
- Fully Integrated Components and Tapes available

Web: www.pbpltd.co.uk | Tel: 01709728150
Principal Building Products Ltd, Barbot Hall Ind Est. Mangham Road, Rotherham. S614RJ

Technical Data

Material Properties			Test Method	Value	
Thickness			DIN EN 1849-2	0.4mm	
Material			Polyethylene/ Ethylene Vinyl Alcohol	PE/EVOH	
Colours				Purple or Silver	
Width			DIN EN 1848-2	1650mm	
Length			DIN EN 1848-2	61m	
Area/roll			1.65m x 61m	100m²	
Mass			DIN EN 1849-2/ISO 9864	385g.m²	
Reaction to fire			DIN EN ISO 11925-2/EN 13501-1	E	
Water tightness @ 60kPa 24h & 500kPa 72h			DIN EN 1928 – Method B	Watertight/Pass	
Resistance to impact			DIN EN 12691 – 350mm drop	Watertight/Pass	
Resistance to static loading			DIN EN 12730	20kg (Pass)	
Durability against thermal ageing @ 60kPa			DIN EN 1296/DIN EN1928	Watertight/Pass	
Durability against chemicals @ 60kPa			DIN EN 1847/DIN EN 1928	Watertight/Pass	
Durability against alkaline environment @ @ 60kPa			DIN EN 1847/DIN EN 1928	Watertight/Pass	
Durability against sulphurous acid @ 60kPa			DIN EN 1847/DIN EN 1928	Watertight/Pass	
Compatibility with bitumen @ 60kPa			DIN EN 1548/DIN EN 1928	Watertight/Pass	
3mm Puncture Force			ASTM D2582	36.9 N	
3mm Puncture Deflection			ASTM D2582	3.63mm	
Tensile strength	MD	CMD	DIN EN 12311-2/DIN EN ISO 291-23/50-2	409 N/50mm	397 N/50mm
Elongation	MD	CMD	DIN EN12311-2/DIN EN ISO 291-23/50-2	606%	686%
Trouser Strength	MD	CMD	BBA Test Method	387 N	388 N
Shear resistance of tapped joint seam – 50mm double sided / 75mm Reinforced fleece single sided			DIN EN 12317-2	228 N/50mm	166 N/50mm
Shear strength of welded joints			BS EN 12317-2	360N	
Water vapour permeability			DIN EN 1931 – Method B	0.054g/m²/day	
Oxygen transmission rate			ASTM F 1927, 20°C 60% RH	<0.75cc/m²/day	
Methane permeability			ISO 15105-1	≤0.09 ml/m²/day.atm	
Radon permeability			SP Method 3873	$<1.2 \cdot 10^{-12}$ m²/s	
Carbon Dioxide transmission			ISO 15105-1	0.37 ml/m²·d·atm	
Transmission rate of volatile liquid – Diesel			ISO 6179 Method B	0.99 g·m²·h	
Transmission rate of volatile liquid – Petrol			ISO 6179 Method B	2.341 g·m²·h	

C748:2014 - Permeation vapour tests – 100% concentration

Material Properties	Test Method – Annex B	Value
Benzene transmission rate	EN ISO 15105-2	0.0003 $mg \cdot m^2 \cdot d^{-1}$
Toluene transmission rate	EN ISO 15105-2	0.0004 $mg \cdot m^2 \cdot d^{-1}$
Ethyl Benzene transmission rate	EN ISO 15105-2	0.0009 $mg \cdot m^2 \cdot d^{-1}$
Xylene transmission rate	EN ISO 15105-2	0.0005 $mg \cdot m^2 \cdot d^{-1}$
Hexane transmission rate	EN ISO 15105-2	0.0004 $mg \cdot m^2 \cdot d^{-1}$
Tetrachloroethene (PCE) transmission rate	EN ISO 15105-2	0.0007 $mg \cdot m^2 \cdot d^{-1}$
Trichloroethene (TCE) transmission rate	EN ISO 15105-2	>7.5661 $mg \cdot m^2 \cdot d^{-1}$
Naphthalene transmission rate	EN ISO 15105-2	0.0006 $mg \cdot m^2 \cdot d^{-1}$

C748:2014 – Chemical immersion resistance testing

Material Properties	Test Method	Tensile Strength retained		Result
		MD	CMD	
Benzene	EN ISO 14414	101%	97%	Pass
Toluene	EN ISO 14414	103%	100%	Pass
Ethyl Benzene	EN ISO 14414	104%	102%	Pass
Xylene	EN ISO 14414	104%	98%	Pass
Hexane	EN ISO 14414	104%	100%	Pass
Tetrachloroethene (PCE)	EN ISO 14414	105%	102%	Pass
Trichloroethylene (TCE)	EN ISO 14414	102%	99%	Pass
Naphthalene	EN ISO 14414	102%	98%	Pass
Sulfuric Acid (10% solution)	EN ISO 14414 A	91%	101%	Pass
Calcium Hydroxide	EN ISO 14414 B	94%	101%	Pass
Solvents (35% Diesel, 35% Paraffin, 30% Oil	EN ISO 14414 C	102%	97%	Pass
Synthetic Leachate (Acids, Chlorides, Sulphates & Phosphates)	EN ISO 14414 D	104%	102%	Pass

BS8485:2015+A1:2019

Meets all the following criteria:

- Sufficiently impervious to the gases with a methane gas transmission rate <40.0 ml/day/ m^2/atm (average) for sheet and joints (tested in accordance with BS ISO 15105-1 manometric method)
- Sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions
- Sufficiently strong to withstand in-service stresses (e.g settlement if placed below floor slab)
- Sufficiently strong to withstand the installation process and following trades until covered (e.g penetration from steel fibres in fibres reinforced concrete, penetration of reinforcement ties, tearing due to working above it, dropping tools, etc)
- Capable, after installation, of providing a complete barrier to the entry of the relevant gas

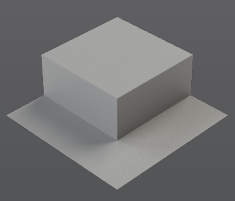
Download a copy of our Gas barrier Solutions Brochure

SCAN ME

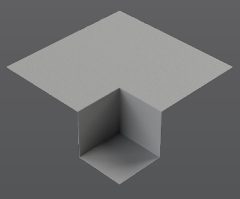
Product Range Accessories

- Our Technical Department is available to advise on individual projects and to prepare or assist in the preparation of schedules and issue drawings.

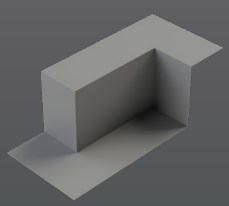
Description	Roll width	Length	Thickness	M²/roll
Rhinoplast Evolution VOC/Methane Gas Barrier	1.65m	61m	0.4mm	100m²
Rhinoplast GR Single Sided Detail Lap Tape	75mm	20m		
Rhinoplast LT Jointstrip Double Sided Tape	50mm	15m		
Rhinoplast Gas Resistant Detailing Strip	300mm	20m		
Rhinoplast Butyl Joint Tape	100mm	15m		
Rhinoplast Evolution GAS DPC 300mm – 1200mm	various	20m	0.5mm	various
Preformed Accessories				
Description	**Size variation - Diameter**			
Top Hat Pipe Collar	Ø110mm	Ø135mm	Ø160mm	
Overall Cavity Wall Options – 300mm/325mm/350mm/375mm	**Size variation - Rise**			
Gas Barrier Internal 90° Corner	75mm	150mm	225mm	
Gas Barrier External 90° Corner	75mm	150mm	225mm	
Gas Barrier Step Door Cloak Pair	75mm	150mm	225mm	
Telescopic Vent Top Hat	Sized for cavity wall			
Telescopic Vent T/Frame	75mm	150mm	225mm	
Load Bearing Wall – 100mm/140mm	**Size variation - Rise**			
Gas Barrier Load Bearing Wall universal Corner	75mm	150mm	225mm	
Gas Barrier Load Bearing Wall T Junction Single Skin	75mm	150mm	225mm	
Gas Barrier Load Bearing Wall T Junction Double Skin	75mm	150mm	225mm	
Gas Barrier Load Bearing Wall End Cap	75mm	150mm	225mm	
Membrane Protection				
Protection Board	1m	2m	3mm	
Geotextile Protection Fleece 300gsm	2m	75m		



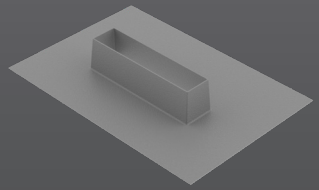
External Corner



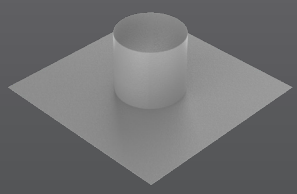
Internal Corner



Step Door Cloak



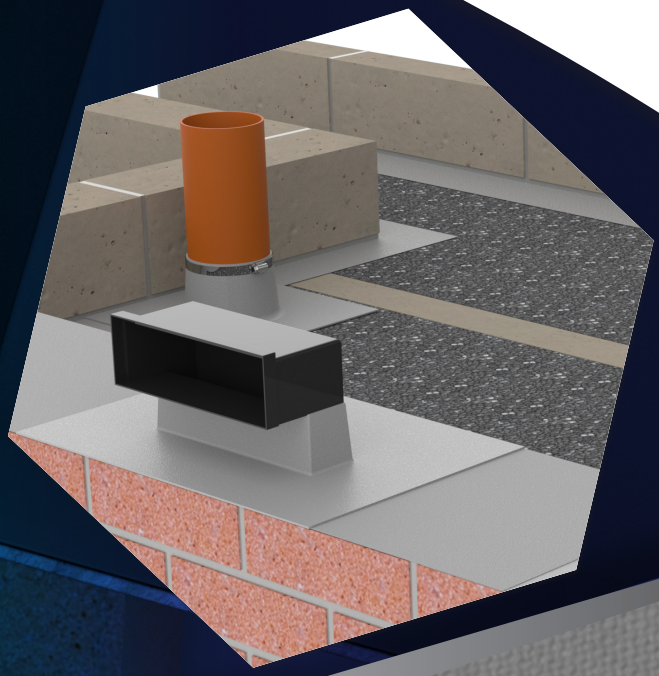
Telescopic Vent Top hat



Soil Pipe Top Hat

RHINOPLAST EVOLUTION GAS DPC

GAS/VOC DAMP PROOF COURSE



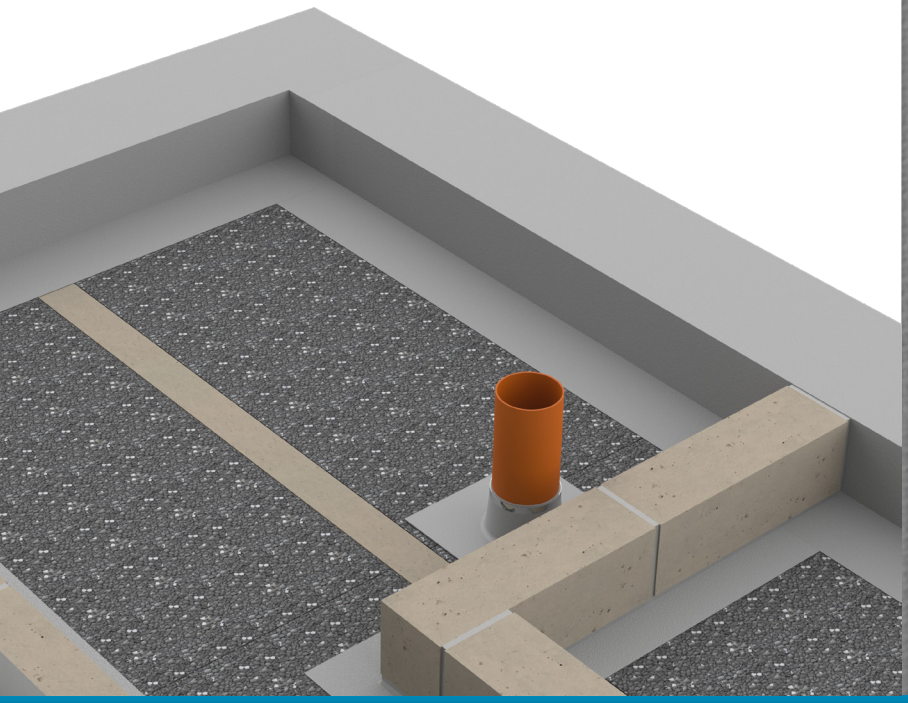
Roll Length: 20m

Roll Widths: From 300mm - 1200mm

500µm Thickness

Grey Colour

Rhinoplast Evolution GAS DPC is a high specification embossed multi-layer damp proof course (DPC) specifically developed for use on brownfield and contaminated construction sites. Designed to be sufficiently durable to build into perimeter cavity and load bearing walls as part of a gas barrier membrane system to resist moisture and ground gasses, including Volatile Organic Compounds (VOC's), Hydrocarbons and others, such as Methane, Radon and CO^2.



FEATURES & BENEFITS

- Advanced Fourteen Layer DPC
- Contains no hazardous pitch or bitumen
- Will not extrude under load
- Two layers of Ethylene Vinyl Alcohol Co-Polymer (EVOH)
- Embossed surface finish
- Flexible and easy to install on site
- Provides protection against radon, carbon dioxide, methane, Hydrocarbons and VOCs
- Lap joints can be taped or heat sealed/ welded
- CE Mark to EN 14909:2012 type A
- Meets guidance and all recommendations set out in BS8485:2015 + A1:2019 (Table 7)
- Incorporates guidance outlined in CIRIA C748 for VOC protection
- Suitable for all characteristic Gas Situation (CS) ground gas regimes
- Conforms to the specification requirements of NHBC Amber 1 & Amber 2 applications.
- Preformed Components and Tapes available

Web: www.pbpltd.co.uk | Tel: 01709728150

Principal Building Products Ltd, Barbot Hall Ind Est. Mangham Road, Rotherham. S614RJ

Technical Data

Material Properties			Test Method	Value	
Thickness				0.5mm	
Material			Polyethylene/ Ethylene Vinyl Alcohol	PE/EVOH	
Colours				Grey	
Width (Various)			300mm, 450mm, 550mm 600mm, 650mm, 750mm, 900mm, 1200mm NB. Other sizes on request.		
Length				20m	
Mass				483g.m²	
Reaction to fire			DIN EN ISO 11925-2/EN 13501-1	E	
Water tightness @ 60kPa 24h & 500kPa 72h			DIN EN 1928 – Method B	Watertight	
Resistance to impact			DIN EN 12691 – 350mm drop	Watertight	
Resistance to static loading			DIN EN 12730	20kg (Pass)	
Durability against thermal ageing @ 60kPa			DIN EN 1296/DIN EN1928	Watertight	
Durability against chemicals @ 60kPa			DIN EN 1847/DIN EN 1928	Watertight	
Durability against alkaline environment @ @ 60kPa			DIN EN 1847/DIN EN 1928	Watertight	
Durability against sulphurous acid @ 60kPa			DIN EN 1847/DIN EN 1928	Watertight	
Compatibility with bitumen @ 60kPa			DIN EN 1548/DIN EN 1928	Watertight	
3mm Puncture Force			ASTM D2582	36.9 N	
3mm Puncture Deflection			ASTM D2582	3.63mm	
Tensile strength	MD	CMD	DIN EN 12311-2/DIN EN ISO 291-23/50-2	20.9 N/mm²	21.5 N/mm²
Elongation	MD	CMD	DIN EN12311-2/DIN EN ISO 291-23/50-2	606%	686%
Tear resistance -nail shank	MD	CMD	DIN EN 12310-1/DIN EN ISO 291-23/50-2	428 N	404 N
Shear resistance of tapped joint seam – 50mm double sided			DIN EN 12317-2	228 N/50mm	166 N/50mm
Water vapour permeability			DIN EN 1931 – Method B	0.054g/m²/day	
Oxygen transmission rate			ASTM F 1927, 20°C 60% RH	<0.75cc/m²/day	
Methane permeability			ISO 15105-1	≤0.09 ml/m²/day.atm	
Radon permeability			SP Method 3873	$<1.2 \cdot 10^{-12}$ m²/s	
Carbon Dioxide transmission			ISO 15105-1	0.37ml/m²·d·atm	

CE

EN 14909:2012

C748:2014 - Permeation vapour tests – 100% concentration

Material Properties	Test Method	Value
Benzene transmission rate	EN ISO 15105-2	≤0.0001 ml/m²·d
Toluene transmission rate	EN ISO 15105-2	≤0.0001 ml/m²·d
Ethyl Benzene transmission rate	EN ISO 15105-2	≤0.0002 ml/m²·d
Xylene transmission rate	EN ISO 15105-2	≤0.0001 ml/m²·d
Hexane transmission rate	EN ISO 15105-2	≤0.0001 ml/m²·d
Tetrachloroethene (PCE) transmission rate	EN ISO 15105-2	≤0.0001 ml/m²·d
Trichloroethylene (TCE) transmission rate	EN ISO 15105-2	>1.29 ml/m²·d
Naphthalene transmission rate	EN ISO 15105-2	≤0.0001 ml/m²·d

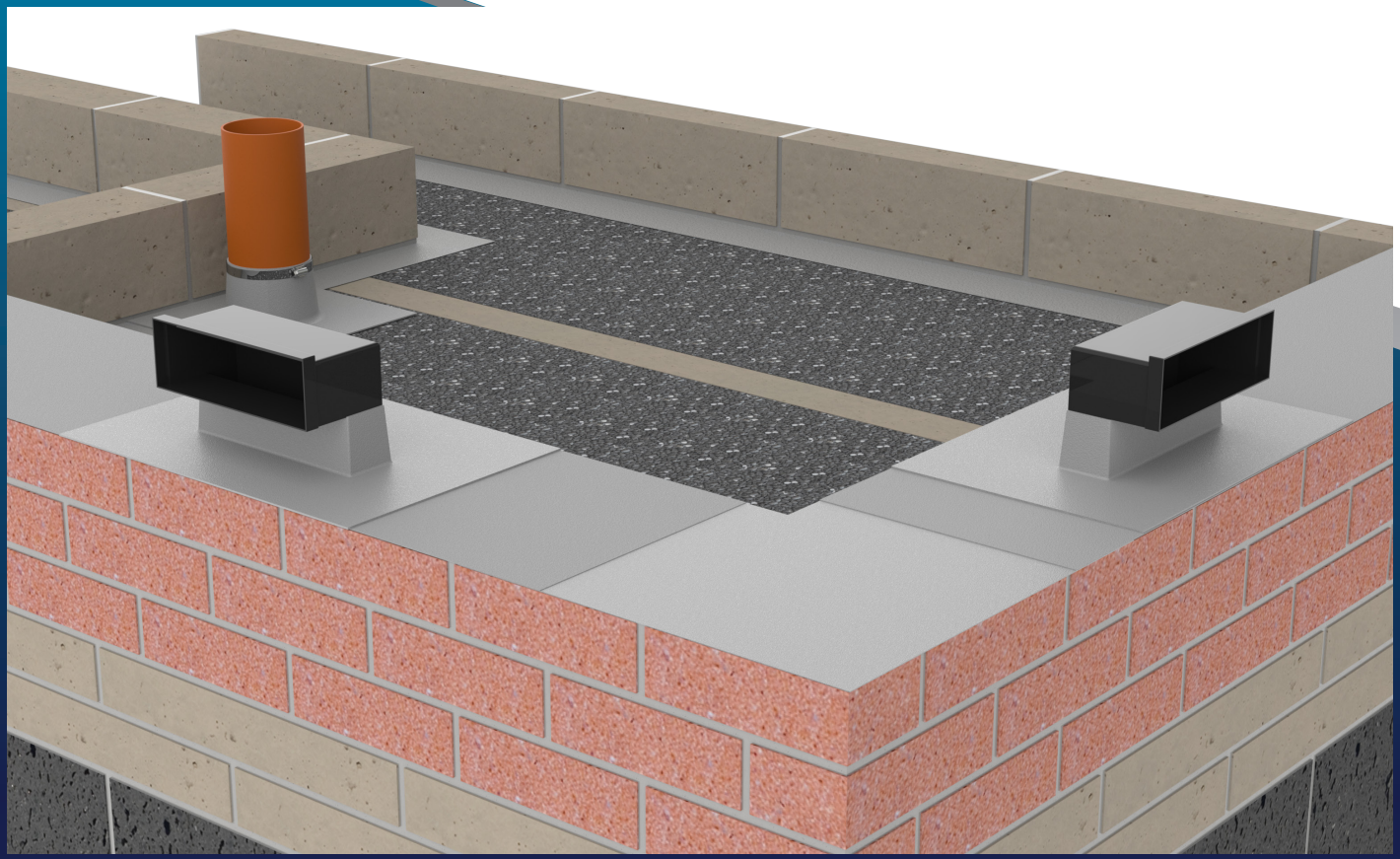
C748:2014 – Chemical immersion resistance testing

Material Properties	Test Method	Tensile Strength retained		Result
		MD	CMD	
Benzene	EN ISO 14414	101%	97%	Pass
Toluene	EN ISO 14414	103%	100%	Pass
Ethyl Benzene	EN ISO 14414	104%	102%	Pass
Xylene	EN ISO 14414	104%	98%	Pass
Hexane	EN ISO 14414	104%	100%	Pass
Tetrachloroethene (PCE)	EN ISO 14414	105%	102%	Pass
Trichloroethylene (TCE)	EN ISO 14414	102%	99%	Pass
Naphthalene	EN ISO 14414	102%	98%	Pass
Sulfuric Acid (10% solution)	EN ISO 14414 A	91%	101%	Pass
Calcium Hydroxide	EN ISO 14414 B	94%	101%	Pass
Solvents (35% Diesel, 35% Paraffin, 30% Oil	EN ISO 14414 C	102%	97%	Pass
Synthetic Leachate (Acids, Chlorides, Sulphates & Phosphates)	EN ISO 14414 D	104%	102%	Pass

Technical Background

The Evolution Gas Damp Proof Course was developed for all masonry wall construction types and is manufactured at 0.5mm thick using latest co-extrusion technology to produce a flexible 14-layer combination of high-performance engineering polymers that cannot de-laminate containing 2 independent layers of gas resistant polymer (EVOH) to offer exceptional gas protection and moisture resistance into buildings.

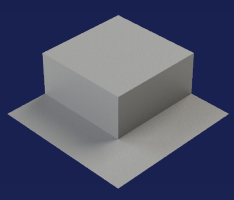
The Evolution GAS DPC provides gas resistance, robustness, and exceptional strength without the requirement for reinforcement or containing aluminium layers and will maintain maximum durability in application. It is supplied in 20mtr rolls and in standard widths 300mm, 450mm, 550mm, 600mm, 650mm, 750mm, 900mm and 1200mm. The system incorporates an extensive range of preformed components to maintain the integrity of the system to be installed in accordance with the relevant sections of BS 8215:1991, PD6697:2019 and BS 8000-3:2020 and joined using sealing tapes or easily heat sealed/welded for VOC applications.



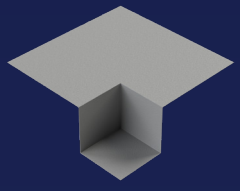
Product Range Accessories

- Our Technical Department is available to advise on individual projects and to prepare or assist in the preparation of schedules and issue drawings.

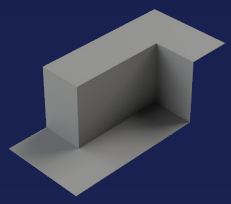
Description	Roll width	Length	Thickness	M²/roll
Rhinoplast Evolution GAS DPC - GAS/VOC Damp Proof Course	300mm	20m	0.5mm	6m²
Rhinoplast Evolution GAS DPC - GAS/VOC Damp Proof Course	450mm	20m	0.5mm	9m²
Rhinoplast Evolution GAS DPC - GAS/VOC Damp Proof Course	550mm	20m	0.5mm	11m²
Rhinoplast Evolution GAS DPC - GAS/VOC Damp Proof Course	600mm	20m	0.5mm	12m²
Rhinoplast Evolution GAS DPC - GAS/VOC Damp Proof Course	650mm	20m	0.5mm	13m²
Rhinoplast Evolution GAS DPC - GAS/VOC Damp Proof Course	750mm	20m	0.5mm	15m²
Rhinoplast Evolution GAS DPC - GAS/VOC Damp Proof Course	900mm	20m	0.5mm	18m²
Rhinoplast Evolution GAS DPC - GAS/VOC Damp Proof Course	1200mm	20m	0.5mm	24m²
Rhinoplast Evolution GAS BARRIER	1.65m	61m	0.4mm	100m²
Rhinoplast Single Sided Detail Strip	75mm	20m		
LT Jointstrip Double Sided Tape	50mm	15m		
Gas Resistant Detailing Strip	300mm	20m		
Overall Cavity Wall (Options – 300mm/325mm/350mm/375mm)	**Size variation - Rise**			
Gas Barrier Internal 90° Corner	75mm	150mm	225mm	
Gas Barrier External 90° Corner	75mm	150mm	225mm	
Gas Barrier Step Door Cloak Pair	75mm	150mm	225mm	
Telescopic Vent Top Hat	425mm x 375mm (trim to size)			
Telescopic Vent T/Frame	75mm	150mm	225mm	
Load Bearing Wall (Options – 100mm/150mm)	**Size variation - Rise**			
Gas Barrier Load Bearing Wall Corner	75mm	150mm	225mm	
Gas Barrier Load Bearing Wall T Junction (300mm-375mm)	75mm	150mm	225mm	
Gas Barrier Load Bearing Wall End Cap	75mm	150mm	225mm	
Wall Junction T Junctions	**Cavity wall**	**L/Bearing wall**	**Drop**	
Separating Wall Robust T Junction	TBC	TBC	TBC	



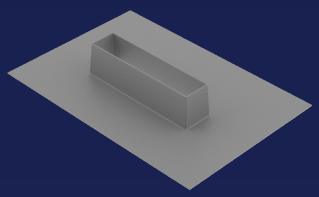
External Corner



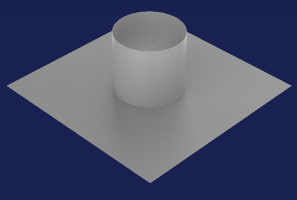
Internal Corner



Step Door Cloak



Telescopic Vent Top hat



Soil Pipe Top Hat

Design Drawings

T: 0191 378 6380
E: admin@arc-environmental.com
W: www.arc-environmental.com
Registered in England No. 05539784

The general contractor is responsible for the verification of all dimensions on site and the architect is to be informed of any discrepancy.

The status of information contained in a computer copy of this drawing shall be limited to that conveyed by the paper copy.

Revisions:

Rev P1 23.01.2022 DRP/JDK
First Issue

Rev P2 23.02.2022 DRP/JDK
External paving updated and plots 61-62 along with garages serving plots 61 & 63 relocated.

Rev P3 13.04.2022 DRP/JDK
Patios increased for 8no Goodridge house types.

Rev P4 21.04.2023 JDK/DRP
Updates following comments from Countryside. Plot 42 moved East by 300mm. Plot 53 garage repositioned. Rear fence / retainment of plots 46-54 adjusted. All retainment shown as Adept latest levels drawings.

Rev P5 25.04.2023 JDK/DRP
Sheet changed to 'overview' site layout.

Rev P6 26.05.2023 JDK/DRP
RWP locations updated to suit contractor comments.

Rev P7 29.06.2023 JDK/DRP
Plot 24 front entrance path adjusted to suit engineer levels.

Rev P8 16.08.2023 JDK/DRP
Garage sizes adjusted in line with floor plans.

Rev P9 24.08.2023 DRP/JDK
Rediroc wall to front of site updated to suit engineers details.

Rev P10 06.09.2023 MWC/JDK
Air source heat-pump omitted from layout and paths amended as per contractor instruction. Plot 77 moved across to achieve 1m clearance between adjacent plot. Steps added to front of plots 1-12. Highway updated to suit latest S38 layout.

Rev P11 26.09.2023 JDK/DRP
Plots 1-12 moved back to accommodate footpath, Rediroc wall & external steps. EVCP (fence / post mounted) colour changed to red. Plots 41 & 42 rear gardens adjusted.

Rev P12 10.10.2023 JDK/DRP
Plots 1 & 2 moved towards plots 3 & 4, in order to increase distance to Rediroc wall.

Rev P13 30.10.2023 JDK/DRP
Gabion wall to rear of plots 50-53 updated.

Rev P14 10.01.2024 JDK/DRP
Gabion retainment & attenuation position updated inline with engineers drawings. Plot 24 moved 350mm South, to increase distance between ploits 24 & 25.

Phase 1 of development
Phase 2 of development

Gross site area phase 1	
Hectares	2.61 ha
Acres	6.45 acres

Net developable area phase 1	
Hectares	1.94 ha
Acres	4.79 acres

Phase 1:

House Type	Type	Bedrooms	Persons	Amount	%	Sq.ft	Sq. m	Total sq. ft	Total sq. m
CARTWRIGHT	Terrace	2	3	7	9.1	768.80 ft²	71.43m²	5381.60 ft²	500.01m²
ELMSLIE	Semi-det	3	4	26	33.7	933.90 ft²	86.77m²	24281.40 ft²	2256.02m²
MOUNTFORD	Detached	3	4	6	7.8	970.60 ft²	90.18m²	5823.60 ft²	541.08m²
BLOOMFIELD	Terrace	3	6	19	24.7	1170.46 ft²	108.75m²	22238.74 ft²	2066.25m²
GOODRIDGE	Detached	4	5	8	10.4	1111.76 ft²	103.30m²	8894.08 ft²	826.40m²
MYLNE	Detached	4	6	11	14.3	1136.00 ft²	105.58m²	12496.00 ft²	1161.38m²
			Total units:	77	100%		Total area:	79115.42ft²	7351.14m²

Key

- Private driveways & Adopted highway- tarmacadam finish. Concrete pin kerb to drives.
- Adoptable roads- block paving
- Paving- Marshall or similar grey concrete flags. Size to be agreed.
- Type A: 1.8m High timber fence with lockable timber gate
- Type B: 1.5m High fence with 0.3m trellis
- Type C: 1.5m High fence
- Type D: 1.1m High galvanized steel railings fence powder coated finish (colour black)
- Type E: 2.0m High acoustic fence specification subject to noise report recommendations. Concrete gravel boards to be used along fence line where required.
- Type F: 0.45m Knee rail. Square timber posts with circular powder coated galvanized steel rails.
- Type G: 1.5m High open boarded fence with 0.3m trellis
- Tree to be retained - Category B
- Tree to be retained - Category C
- Tree to be retained - Category U
- Root Protection Area (RPA)
- Tree to be removed
- Proposed landscaped areas subject to landscape design
- Proposed POS areas
- Existing PROW SPE/14/10 to be retained
- Existing PROW SPE/14/10 to be diverted
- Proposed route of diverted PROW
- New 2m wide PROW route
- New PROW route- 20mm dust aggregate with timber edging
- Indicative location of gabion wall retaining structure
- Indicative location of the Contig retaining structure
- Indicative location of the Redi-Rock retaining structure
- Potential retaining structure TBC
- Proposed bin hard standing area.
- Bicycle store - timber lockable shed with ground anchor (Albany Sheds - Cottage) or within garage where applicable.
- Electric vehicle charging point exact type / model TBC - - Dwelling external wall mounted - Post / Fence Mounted
- A: Affordable unit
- Precast concrete or timber stair. Number of risers subject to confirmation of the height of adjacent banking.1.1m high metal balustrade face fixed to steps where level changes are greater than 600mm in height.

Notes

Layout based on topographical survey by Survey Association drw no sss-8779-Blue Hill Farm

Any change in external levels greater than 0.6m to have edge protection.
Level access to front and back of houses to be provided.

Existing services and street furniture to be identified by main contractor and capped off/grubbed up/diverted as required.

1:500 SCALE BAR
0 5 10 20 30 Metres

Based on Site Layout 4035.20.105X

Overview Site Layout

Blue Hills Estate Farm, Birkenshaw

Vistry Partnerships

Scale	1:500
Date	23.01.2022
Drawn\Checked	DRP/JDK
4035-20-AWSM-XX-XX-DR-A-1000	
Status S0	Rev P14

ACANTHUS ARCHITECTS
Studio 11, The Basilica, 2 King Charles Street, Leeds LS1 6LS. TEL. 0113 239 3414. E-Mail.. architects@acanthuswsm.com

Revisions:

Rev P1	17.03.23	DP/JDK
First Issue.		
Rev P2	20.03.23	DP/JDK
Details updated to include gas protection measures and comments from CSY.		
Rev P3	04.05.23	DP/JDK
Details updated following comments dated 28th April 23		
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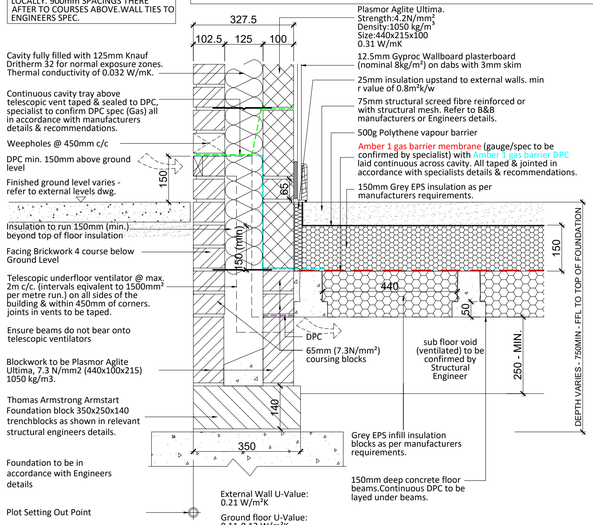
Details updated to suit coursing section.		
Rev P5	13.10.23	JDK/DP
Details updated to suit SAP specification sheet.		
Rev P6	18.10.23	JDK/DP
Details updated to suit contractor comments.		

CONTINUOUS STRIP OF ADHESIVE AROUND ALL OPENINGS, ALONG THE TOP AND BOTTOM OF THE WALL AND AT INTERNAL AND EXTERNAL CORNERS

WALL TIES TO BE SPACED 750mm HORIZONTALLY ABOVE & BELOW DPC LOCALLY. 900mm SPACINGS THERE AFTER TO COURSES ABOVE.WALL TIES TO ENGINEERS SPEC.

DPCs & CAVITY TRAYS
- DPCs TO COMPLY WITH BS 6515:1984. FOR GUIDANCE ON THE DESIGN & INSTALLATION OF DPCs, THE CODE OF PRACTICE BS 8215:1991 SHOULD BE REFERRED TO.
- CAVITY TRAYS TO MEET THE REQUIREMENTS OF BS EN 14909 & HAVE THIRD PARTY CERTIFICATION TO CONFIRM THEIR SUITABILITY OF A CAVITY TRAY. CAVITY TRAYS CONFORMING TO BS 6515 ALONE ARE NOT SUITABLE AS CAVITY TRAYS.



150mm DEEP BEAM - DPC DETAIL - BRICKWORK (WITH AMBER 1 GAS PROTECTION)

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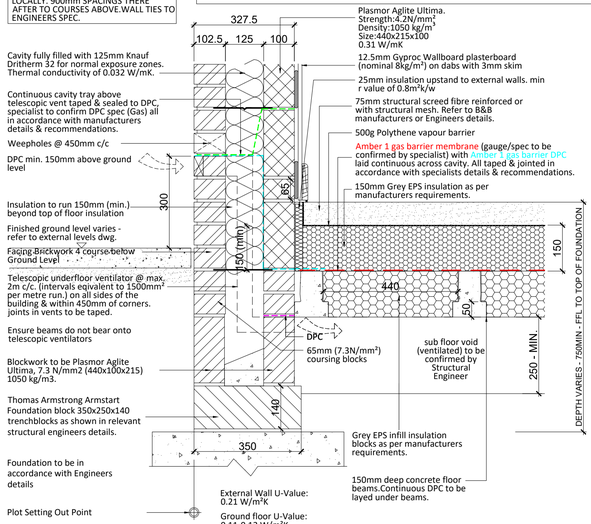

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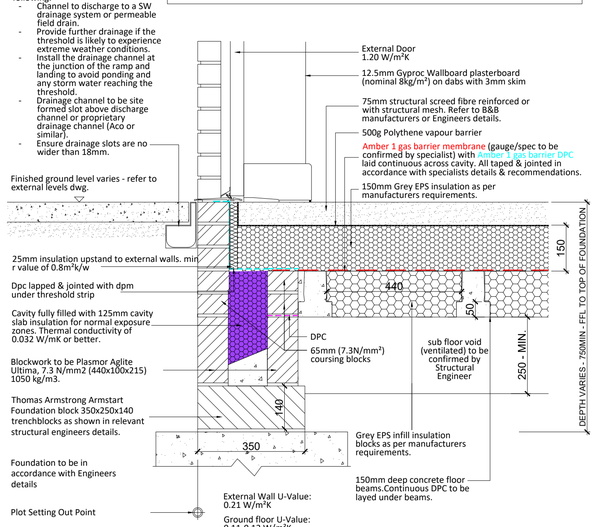
Drainage channel local to door threshold only, to adhere to the following:
- Channel to discharge to a SW drainage system or permeable field drain.
- Provide further drainage if the threshold is likely to experience extreme weather conditions.
- Install the drainage channel at the junction of the ramp and landing to avoid ponding and any storm water reaching the threshold.
- Drainage channel to be site formed slot above discharge channel or proprietary drainage channel (Aco or similar).
- Ensure drainage slots are no wider than 18mm.



150mm DEEP BEAM - LEVEL THRESHOLD DETAIL - BRICKWORK (WITH AMBER 1 GAS PROTECTION)

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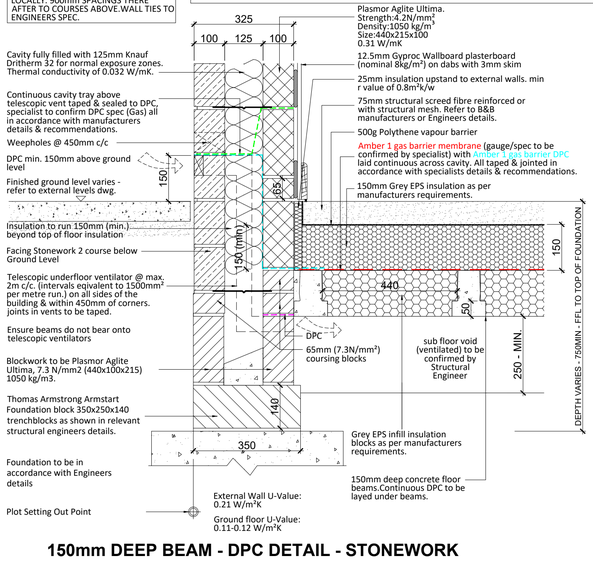

150mm DEEP BEAM - DPC DETAIL - STONEWORK (WITH AMBER 1 GAS PROTECTION)

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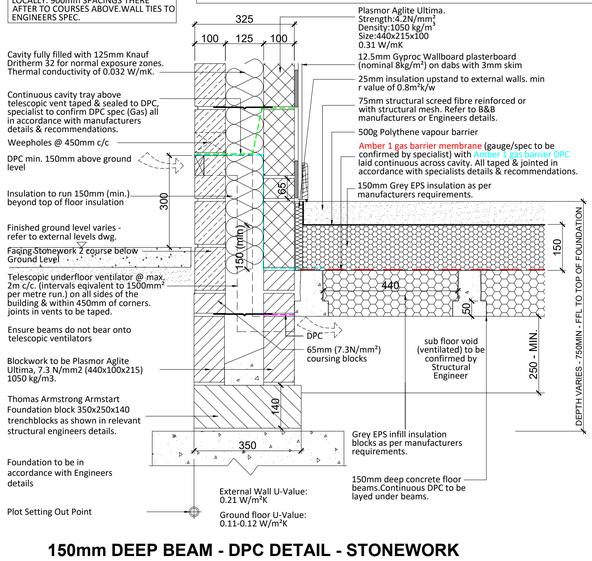

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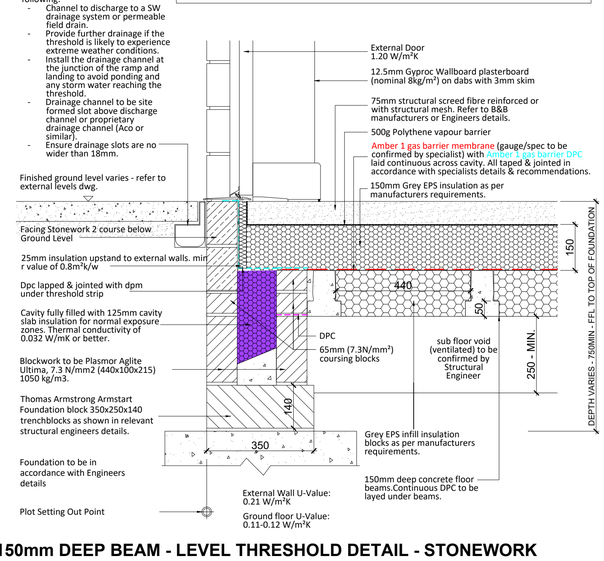

150mm DEEP BEAM - LEVEL THRESHOLD DETAIL - STONEWORK (WITH AMBER 1 GAS PROTECTION)

1:10 SCALE BAR

0 .1 .2 .5 1 Metres

Countryside Partnerships

Scale	1:10
Date	March 2023
Drawn/Checked	DRP/JDK
4035-20-AWSM-XX-XX-DR-A-3000	
Status S0	Rev P6

Assembly Details
Sheet 1
Blue Hills Farm
Birkenshaw

ACANTHUS ARCHITECTS

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Revisions:

Rev P1	17.03.23	DP/JDK
First Issue.		
Rev P2	20.03.23	DP/JDK
Details updated to include gas protection measures and comments from CSY.		
Rev P3	04.05.23	DP/JDK
Details updated following comments dated 28th April 23		
Rev P4	22.08.23	DP/JDK
Garage details changed to 'integral' garage.		
Rev P5	22.09.23	JDK/DP
Details updated to suit coursing section.		
Rev P6	13.10.23	JDK/DP
Details updated to suit SAP specification sheet.		
Rev P7	18.10.23	JDK/DP
Details updated to suit contractor comments.		
Rev P8	08.02.24	JDK/DP
Integral garage floor details updated to show block infills.		

CONTINUOUS STRIP OF ADHESIVE AROUND ALL OPENINGS, ALONG THE TOP AND BOTTOM OF THE WALL AND AT INTERNAL AND EXTERNAL CORNERS

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- Drainage channel to be site formed slot above discharge channel or proprietary drainage channel (Aco or similar).
- Ensure drainage slots are no wider than 18mm.

External Door
1.20 W/m²K

Facing Brickwork 4 course below Ground Level

25mm insulation upstand to external walls. min r value of 0.8m²k/w

Finished ground level varies - refer to external levels dwg.

Dpc lapped & jointed with dpm under threshold strip

Cavity fully filled with 125mm cavity slab insulation for normal exposure zones. Thermal conductivity of 0.032 W/mK or better.

Blockwork to be Plasmor Aglite Ultima, 7.3 N/mm2 (440x100x215) 1050 kg/m3.

Thomas Armstrong Armstart Foundation block 350x250x140 trenchblocks as shown in relevant structural engineers details.

Foundation to be in accordance with Engineers details

Plot Setting Out Point

12.5mm Gyproc Wallboard plasterboard (nominal 8kg/m²) on dabs with 3mm skim

75mm structural screed fibre reinforced or with structural mesh. Refer to B&B manufacturers or Engineers details.

500g Polythene vapour barrier

Amber 1 gas barrier membrane (gauge/spec to be confirmed by specialist) with Amber 1 gas barrier DPC laid continuous across cavity. All taped & jointed in accordance with specialists details & recommendations.

150mm Grey EPS insulation as per manufacturers requirements.

DPC

65mm (7.3N/mm²) coursing blocks

sub floor void (ventilated) to be confirmed by Structural Engineer

Grey EPS infill insulation blocks as per manufacturers requirements.

150mm deep concrete floor beams.Continuous DPC to be layed under beams.

External Wall U-Value: 0.21 W/m²K

Ground floor U-Value: 0.11-0.12 W/m²K

440 | 50 | 150 | 250 - MIN. | 140 | 350

DEPTH VARIES - 750MIN - FFL TO TOP OF FOUNDATION

150mm DEEP BEAM - STEPPED THRESHOLD DETAIL - BRICKWORK (WITH AMBER 1 GAS PROTECTION)

CONTINUOUS STRIP OF ADHESIVE AROUND ALL OPENINGS, ALONG THE TOP AND BOTTOM OF THE WALL AND AT INTERNAL AND EXTERNAL CORNERS

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External Door
1.20 W/m²K

Facing Stonework 2 course below Ground Level

25mm insulation upstand to external walls. min r value of 0.8m²k/w

Finished ground level varies - refer to external levels dwg.

Dpc lapped & jointed with dpm under threshold strip

Cavity fully filled with 125mm cavity slab insulation for normal exposure zones. Thermal conductivity of 0.032 W/mK or better.

Blockwork to be Plasmor Aglite Ultima, 7.3 N/mm2 (440x100x215) 1050 kg/m3.

Thomas Armstrong Armstart Foundation block 350x250x140 trenchblocks as shown in relevant structural engineers details.

Foundation to be in accordance with Engineers details

Plot Setting Out Point

12.5mm Gyproc Wallboard plasterboard (nominal 8kg/m²) on dabs with 3mm skim

75mm structural screed fibre reinforced or with structural mesh. Refer to B&B manufacturers or Engineers details.

500g Polythene vapour barrier

Amber 1 gas barrier membrane (gauge/spec to be confirmed by specialist) with Amber 1 gas barrier DPC laid continuous across cavity. All taped & jointed in accordance with specialists details & recommendations.

150mm Grey EPS insulation as per manufacturers requirements.

DPC

65mm (7.3N/mm²) coursing blocks

sub floor void (ventilated) to be confirmed by Structural Engineer

Grey EPS infill insulation blocks as per manufacturers requirements.

150mm deep concrete floor beams.Continuous DPC to be layed under beams.

External Wall U-Value: 0.21 W/m²K

Ground floor U-Value: 0.11-0.12 W/m²K

440 | 50 | 150 | 250 - MIN. | 140 | 350

DEPTH VARIES - 750MIN - FFL TO TOP OF FOUNDATION

150mm DEEP BEAM - STEPPED THRESHOLD DETAIL - STONEWORK (WITH AMBER 1 GAS PROTECTION)

CONTINUOUS STRIP OF ADHESIVE AROUND ALL OPENINGS, ALONG THE TOP AND BOTTOM OF THE WALL AND AT INTERNAL AND EXTERNAL CORNERS

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125mm mineral wool roll, quilt or batt with a density of 12-24 kg/m³

12.5mm plasterboard on dabs (nominal 8kg/m²) with 3mm skim

Continuous bead of adhesive to perimeter

75mm structural screed fibre reinforced or with structural mesh. Refer to B&B manufacturers or Engineers details.

Cavity must be kept to be clear of any debris, mortar snots or material that can cause a sound bridge to a min. 225mm below structural floor

EDGE SEALING TO BE PROVIDED AROUND THE PERIMETER / EXPOSED EDGES OF PARTY WALL BY USE OF SLEEVED FLEXIBLE CAVITY BARRIER UNDER 15MM COMPRESSION.

Foundation to be in accordance with Engineers details

Plasmor Aglite Ultima. Strength:4.2N/mm² Density:1050 kg/m³ Size:440x215x100 0.31 W/mK

12.5mm Gyproc Wallboard plasterboard (nominal 8kg/m²) on dabs with 3mm skim

25mm insulation upstand to external walls. min r value of 0.8m²k/w

75mm structural screed fibre reinforced or with structural mesh. Refer to B&B manufacturers or Engineers details.

500g Polythene vapour barrier

Amber 1 gas barrier membrane (gauge/spec to be confirmed by specialist) with Amber 1 gas barrier DPC laid continuous across cavity. All taped & jointed in accordance with specialists details & recommendations.

150mm Grey EPS insulation as per manufacturers requirements.

DPC

sub floor void (ventilated) to be confirmed by Structural Engineer

Party Wall U-Value: 0.00 W/m²K

Ground floor U-Value: 0.11-0.12 W/m²K

Grey EPS infill insulation blocks as per manufacturers requirements.

150mm deep concrete floor beams.Continuous DPC to be layed under beams.

325 | 100 | 125 | 100 | 65 | 150 (min) | 150 | 250 - MIN.

DEPTH VARIES - 750MIN - FFL TO TOP OF FOUNDATION

PARTY WALL / GROUND FLOOR DETAIL (BASED ON E-WM-34) (WITH AMBER 1 GAS PROTECTION)

CONTINUOUS STRIP OF ADHESIVE AROUND ALL OPENINGS, ALONG THE TOP AND BOTTOM OF THE WALL AND AT INTERNAL AND EXTERNAL CORNERS

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125mm mineral wool roll, quilt or batt with a density of 12-24 kg/m³

12.5mm plasterboard on dabs (nominal 8kg/m²) with 3mm skim

Continuous bead of adhesive to perimeter

75mm structural screed fibre reinforced or with structural mesh. Refer to B&B manufacturers or Engineers details.

Cavity must be kept to be clear of any debris, mortar snots or material that can cause a sound bridge to a min. 225mm below structural floor

EDGE SEALING TO BE PROVIDED AROUND THE PERIMETER / EXPOSED EDGES OF PARTY WALL BY USE OF SLEEVED FLEXIBLE CAVITY BARRIER UNDER 15MM COMPRESSION.

Foundation to be in accordance with Engineers details

Plasmor Aglite Ultima. Strength:4.2N/mm² Density:1050 kg/m³ Size:440x215x100 0.31 W/mK

12.5mm Gyproc Wallboard plasterboard (nominal 8kg/m²) on dabs with 3mm skim

25mm insulation upstand to external walls. min r value of 0.8m²k/w

75mm structural screed fibre reinforced or with structural mesh. Refer to B&B manufacturers or Engineers details.

500g Polythene vapour barrier

Amber 1 gas barrier membrane (gauge/spec to be confirmed by specialist) with Amber 1 gas barrier DPC laid continuous across cavity. All taped & jointed in accordance with specialists details & recommendations.

150mm Grey EPS insulation as per manufacturers requirements.

DPC

sub floor void (ventilated) to be confirmed by Structural Engineer

Party Wall U-Value: 0.00 W/m²K

Ground floor U-Value: 0.11-0.12 W/m²K

Grey EPS infill insulation blocks as per manufacturers requirements.

150mm deep concrete floor beams.Continuous DPC to be layed under beams.

325 | 100 | 125 | 100 | 65 | 150 (min) | 150 | 250 - MIN.

DEPTH VARIES - 750MIN - FFL TO TOP OF FOUNDATION

STEPPED PARTY WALL / GROUND FLOOR DETAIL (BASED ON E-WM-34) CHANGE IN LEVEL VARIES (WITH AMBER 1 GAS PROTECTION)

CONTINUOUS STRIP OF ADHESIVE AROUND ALL OPENINGS, ALONG THE TOP AND BOTTOM OF THE WALL AND AT INTERNAL AND EXTERNAL CORNERS

WALL TIES TO BE SPACED 750mm HORIZONTALLY ABOVE & BELOW DPC LOCALLY, 900mm SPACINGS THERE AFTER TO COURSES ABOVE.WALL TIES TO ENGINEERS SPEC.

DPCs & CAVITY TRAYS
- DPCs TO COMPLY WITH BS 6515:1984. FOR GUIDANCE ON THE DESIGN & INSTALLATION OF DPCs, THE CODE OF PRACTICE BS 8215:1991 SHOULD BE REFERRED TO.
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Continuous cavity tray above telescopic vent taped & sealed to DPC specialist to confirm DPC spec (Gas) all in accordance with manufacturers details & recommendations.

Weepholes @ 450mm c/c

DPC min. 150mm above ground level

Finished ground level varies - refer to external levels dwg.

Telescopic underfloor ventilator @ max. 2m c/c. (intervals eqivalent to 1500mm² per metre run.) on all sides of the building & within 450mm of corners. joints in vents to be taped.

Ensure beams do not bear onto telescopic ventilators

Blockwork to be Plasmor Aglite Ultima, 7.3 N/mm2 (440x100x215) 1050 kg/m3.

Thomas Armstrong Armstart Foundation block 350x250x140 trenchblocks as shown in relevant structural engineers details.

Foundation to be in accordance with Engineers details

Plot Setting Out Point

Plasmor Aglite Ultima. Strength:4.2N/mm² Density:1050 kg/m³ Size:440x215x100 0.31 W/mK

75mm structural screed fibre reinforced or with structural mesh. Refer to B&B manufacturers or Engineers details.

Amber 1 gas barrier membrane (gauge/spec to be confirmed by specialist) with Amber 1 gas barrier DPC laid continuous across cavity. All taped & jointed in accordance with specialists details & recommendations.

Garage FFL is 150mm below the house FFL.

DPC

65mm (7.3N/mm²) coursing blocks

sub floor void (ventilated) to be confirmed by Structural Engineer

External Wall U-Value: 0.21 W/m²K

Ground floor U-Value: 0.11-0.12 W/m²K

150mm deep concrete floor beams.Continuous DPC to be layed under beams.

327.5 | 102.5 | 125 | 100 | 65 | 525 | 300 | 440 | 50 | 140 | 350 | 250 - MIN.

150mm DEEP BEAM - INTEGRAL GARAGE DPC DETAIL BRICKWORK (WITH AMBER 1 GAS PROTECTION)

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150mm DEEP BEAM - INTEGRAL GARAGE DPC DETAIL STONEWORK (WITH AMBER 1 GAS PROTECTION)

1:10 SCALE BAR

0 .1 .2 .5 1 Metres

Countryside Partnerships

Scale	1:10
Date	March 2023
Drawn/Checked	DRP/JDK
4035-20-AWSM-XX-XX-DR-A-3005	
Status S0	Rev P8

Assembly Details
Sheet 2
Blue Hills Farm
Birkenshaw

ACANTHUS ARCHITECTS

Studio 11, The Basilica, 2 King Charles Street, Leeds LS1 6LS. TEL. 0113 239 3414. E-Mail.. architects@acanthuswsm.com

Revisions:

Rev P1 17.03.23 DP/JDK
First Issue.

Rev P2 20.03.23 DP/JDK
Details updated to include gas protection measures and comments from CSY.

Rev P3 04.05.23 DP/JDK
Details updated following comments dated 28th April 23

Rev P4 12.05.23 DP/JDK
Sub floor void dim updated

Rev P5 22.08.23 DP/JDK
Details changed to concrete slab for attached garages.

Rev P6 22.09.23 JDK/DP
Details updated to suit coursing section.

Rev P7 13.10.23 JDK/DP
Details updated to suit SAP specification sheet.

Rev P8 18.10.23 JDK/DP
Details updated to suit contractor comments.

Rev P9 08.02.24 JDK/DP
Integral garage floor details updated to show block infills.

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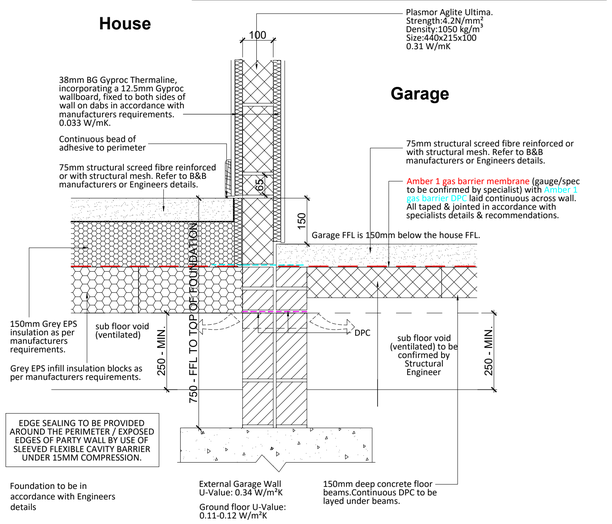

150mm DEEP BEAM
INTEGRAL GARAGE / GROUND FLOOR DETAIL
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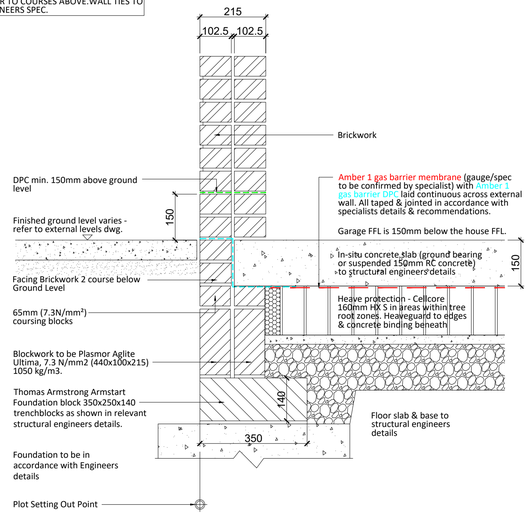

150mm DEEP BEAM - ATTACHED GARAGE
DPC DETAIL - BRICKWORK
(WITH AMBER 1 GAS PROTECTION)

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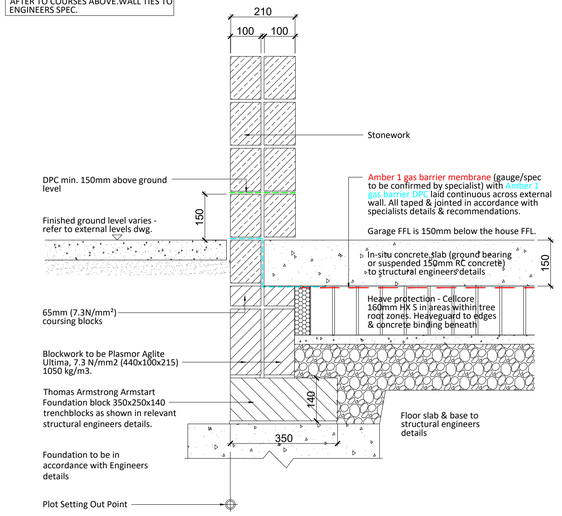

150mm DEEP BEAM - ATTACHED GARAGE
DPC DETAIL - STONEWORK
(WITH AMBER 1 GAS PROTECTION)

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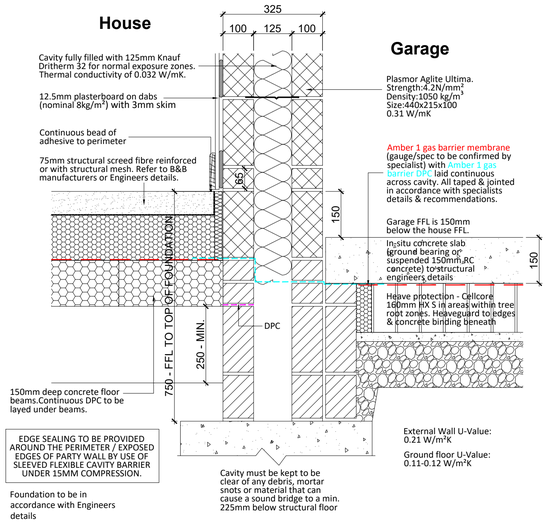

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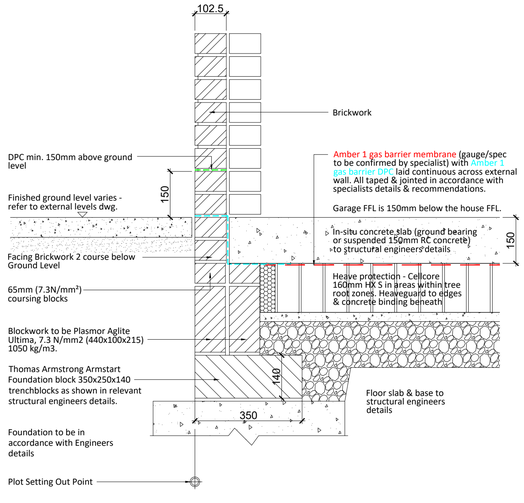

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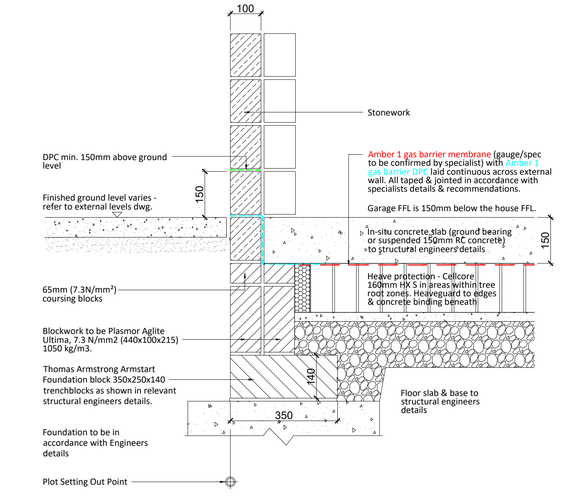

150mm DEEP BEAM - ATTACHED GARAGE
DPC DETAIL - STONEWORK
(WITH AMBER 1 GAS PROTECTION)

1:10 SCALE BAR
0 .1 .2 .5 1 Metres

Assembly Details
Sheet 3
Blue Hills Farm
Birkenshaw

Countryside Partnerships

Scale	1:10
Date	March 2023
Drawn/Checked	DRP/JDK
4035-20-AWSM-XX-XX-DR-A-3010	
Status S0	Rev P9

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