

LAND AT GREENBROW SOCIAL CLUB, WYTHENSHAW, MANCHESTER

Gas Verification Plan



Prepared for:

Report Ref: BEK-24100-2



July 2024



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Project Quality Assurance Information Sheet

Site	Land at Greenbrow Social Club, Wythenshawe, Manchester
Report Title	Gas Verification Plan
Report Status	Final
Report No	BEK-24100-2
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REVISION STATUS / HISTORY

Rev	Date	Issue / Comment	Prepared	Checked

GENERAL REPORT LIMITATIONS

BEK Enviro Limited (BEK) has prepared this report for the sole use of the client, showing reasonable skill and care, for the intended purposes as stated in the agreement under which this work was completed. The report may not be relied upon by any other party without the express agreement of the client and BEK. No other warranty, expressed or implied, is made as to the professional advice included in this report.

Where any data supplied by the client or from other sources have been used, it has been assumed that the information is correct. No responsibility can be accepted by BEK for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report are based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.

No part of this report may be copied or duplicated without the express permission of BEK and the party for whom it was prepared. Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

Unless explicitly agreed otherwise, in writing, this report has been prepared under BEK's limited standard Terms and Conditions as included within our proposal to the Client. The report needs to be considered in the light of the BEK proposal and associated limitations of scope. The report needs to be read in full and isolated sections cannot be used without full reference to other elements of the report and any previous works referenced within the report.

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1. INTRODUCTION

1.1 Appointment

- 1.1.1 BEK Enviro (BEK) has been commissioned by The Casey Group to prepare a Gas Verification Plan for the implementation of the ground gas mitigation measures at the residential development located at the former Greenbrow Social Club, Greenbrow Road, Wythenshawe, Manchester, M23 2TU (hereafter referred to as 'the site').

1.2 Project Overview

- 1.2.1 The site occupies an irregularly shaped plot of land of some 0.3 hectares which contains a disused former social club (to be demolished) which is present in the centre of the site. Hardstanding car parking areas and a courtyard are present to the exterior of the social club building. Historical mapping shows a road was present on site between 1876 and 1960, whilst the social club was constructed circa 1992.
- 1.2.2 Manchester City Council has granted planning permission (subject to conditions) for the *'Erection of a three storey building to form fifteen flats (10 x 1 bed, 5 x 2 bed) and eight two storey dwellinghouses (2 x 2 bed, 4 x 3 bed, 2 x 4 bed) with associated landscaping and parking, following demolition of existing social club'* at the site located to the west of Greenbrow Road, Wythenshawe, Manchester, M23 2TU (Approval Ref: 137485/FO/2023).
- 1.2.3 The development layout plans are presented on BTP Architects Drawing Ref: GR-BTP-00-SP-DR-A-3953_203 entitled 'Proposed Site Plan', a copy of which is presented in Appendix B and an extract of which is presented below.



Figure 1: Extract from BTP Architects 'Proposed Site Plan'

1.3 Limitations

- 1.3.1 This report has been produced specifically to address remediation works required to mitigate potential risks associated with ground gas.
- 1.3.2 This report has been prepared in accordance with our understanding of current best practice. However, new information or legislation, or changes to best practice may necessitate revision of the report after the date of its issue.
- 1.3.3 BEK has prepared this report for the sole use and reliance of The Casey Group in accordance with our standard conditions & limitations. This report may not be used or relied upon by any unauthorised third party without the explicit written agreement from BEK.

2. REMEDIATION REQUIREMENTS

2.0.1 The site has been subjected to previous site investigation and contamination assessment, the details of which are provided within the following reports:

- Dice Environmental – Phase 1 Geo-Environmental Report, Ref: 100855, dated 19/12/2022
- E3P – Phase II Geoenvironmental Site Assessment, Ref: 17-305-R1-2, dated July 2024
- BEK – Remediation & Enabling Works Strategy, Ref: BEK-24100-1, dated July 2024

2.0.2 The above reports should be read in conjunction with this report.

2.1 **Summary of Previous Site Investigation**

2.1.1 Site investigation has been undertaken by E3P as part of the preparation of a 'Phase II Geoenvironmental Site Assessment' (Report Ref: 17-305-R1-2, dated July 2024).

2.1.2 The site investigation comprised the drilling of 6No. window sample boreholes to a maximum depth of 2.42 m. The previous site investigation provides information to characterise the shallow ground conditions across the site and is summarised in the sections below.

Summary of Ground Conditions

2.1.3 Made ground was encountered in all exploratory locations to depths between 0.3 m and 0.6 m bgl. The made ground in the south and east of the site comprised reworked topsoil described as 'dark brown slightly gravelly clay with brick, plastic, sandstone and coal fragments' to depths of between 0.2 m and 0.5 m BGL.

2.1.4 Other made ground encountered at the site are described as follows:

- Tarmacadam
- Light orangish brown and greyish brown sandy gravel with limestone and sandstone
- Black slightly clayey gravel of slag and clinker
- Dark greyish brown slightly gravelly clay with brick, siltstone, sandstone and coal fragments

- 2.1.5 Superficial deposits were encountered below the made ground across the site to a depth of 2.0 m bgl and generally comprised 'Brown and grey slightly gravelly silty CLAY with sandstone and siltstone.
- 2.1.6 Bedrock was encountered at 2 m BGL and comprised 'Brown and light grey weathered siltstone' to a maximum proven depth of 2.42 m bgl.
- 2.1.7 No obstructions were noted during the site investigation, although all boreholes drilled refused on the shallow aforementioned bedrock.

Summary of Contamination Assessment

- 2.1.8 Samples recovered from the site investigation were tested for a wide range of contaminants in accordance with the information and recommendations presented in previous reports and based on the observations made by E3P during the site investigation. The chemical test results were compared to relevant generic assessment criteria to identify potential contaminants of concern.
- 2.1.9 With respect to the redevelopment of the site for a residential end use, elevated concentrations of non-volatile heavy metals (including mercury) and PAH compounds were encountered in the made ground at the site.
- 2.1.10 Given the elevated concentrations of mercury, it was recommended that speciated mercury analysis is undertaken in order to assess whether elemental mercury is present which may pose a risk to future site users through vapor inhalation.
- 2.1.11 Should elemental mercury be present then it may be necessary to delineate and excavate the soils as hotspots and place them in an area of low sensitivity, or remove the soils from site. Alternatively, it was concluded that if there is no elemental mercury present, then a clean cover system will be sufficient to mitigate the risks to end users.

Summary of Ground Gas Risk Assessment

- 2.1.12 E3P included a Ground Gas Risk Assessment within the most recent version of their 'Phase II Geoenvironmental Site Assessment Report' (Report Ref: 17-305-R1-2).
- 2.1.13 The potential impact on the development from ground gases has been assessed in accordance with guidelines published in CIRIA 665 (Assessing Risks Posed by Hazardous Ground Gases to Buildings, 2007) and BS8485:2015+A1:2019 (Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings).

- 2.1.14 It was concluded that due to consistently elevated concentrations of carbon dioxide within WS101 during monitoring visits 3-6, the location of WS101 (north-east of the site) was classified as Characteristic Situation 2 (low risk). This area of the site corresponds to the proposed apartment building and gas protection measures are required in the building in accordance with BS8485.
- 2.1.15 The remainder of the site was classified as Characteristic Situation 1 (very low risk), meaning gas protection measures are not likely to be required in these areas (residential dwellinghouses).

2.2 BEK Comments

- 2.2.1 The gas risk assessment has confirmed that gas mitigation measures in accordance with CS2 are required within the residential apartment building in the north-east of the site, whilst the remainder of the site is not likely to require gas mitigation measures (CS1). BEK agrees with these conclusions based on the available information.
- 2.2.2 CIRIA guidance entitled 'CIRIA C735 - Good practice on the testing and verification of protection systems for buildings against hazardous ground gases' and NHBC Guidance entitled 'Hazardous Ground Gas – an essential guide for housebuilders' recommend that gas mitigation measures should be installed in accordance with a Gas Verification Plan.
- 2.2.3 Therefore this Gas Verification Plan has been prepared to satisfy the relevant guidance.

3. DESIGN OF GROUND GAS PROTECTION MEASURES

3.1 General

3.1.1 In accordance with Table 4 of BS8485 (2015) + A1 (2019), the proposed apartment building represents a **Type B** building. In order to protect against the CS2 ground gas risks identified, a gas protection score of **3.5 points** must be achieved.

3.1.2 A combination of two or more of the following protection measures should be used to achieve the Gas Protection Score:

- Structural barrier (floor slab)
- Ventilation measures
- Gas resistant membrane

Site Specific Assessment of Foundation Design – Gas Protection Score Assessment

3.1.3 The proposed construction elements to achieve the required points of 3.5 points are given below:

- Beam and block floor construction is to be utilised. This achieves **0 points**.
- A ground gas resistant membrane is recommended. This achieves **2 points**.
- A clear void passive venting layer with ‘very good’ performance is recommended. This achieves **2.5 points**.

3.2 Floor Slab

3.2.1 This floor type (beam and block) contains many construction joints and discontinuities and can be affected by cracking. As such, it offers little resistance to the passage of ground gas and has high permeability.

3.2.2 Based on Table 6 of BS8485:2015+A1:2019, this will achieve a gas protection score of 0 points.

3.3 Ventilation Measures

3.3.1 For the proposed development, it is intended to include a minimum 150 mm deep ventilated sub-floor void with ventilation provided via air vents around the perimeter of the apartment building. The number of vents is to be confirmed but will meet or exceed the BS8485:2015+A1:2019 requirements of 1,500 mm²/m run of wall on at least two opposite sides. This should be sufficient to provide very good performance.

3.3.2 Where there are multiple internal obstructions to air flow (caused by beams) there should be at least four (to five) times the area of the side vents provided to the internal obstruction.

3.3.3 Based on Table 6 of BS8485:2015+A1:2019, this will achieve gas protection score of **2.5 points**.

3.4 Gas Resistant Membrane

3.4.1 A low permeability methane and carbon dioxide resistant membrane (also protective against ingress of radon) which meets all of the requirements of Table 7 of BS8485:2015+A1:2019 will achieve a score of **2 points**. The membrane should:

- Be made from virgin polymer and have a methane transmission rate of less than 40.0 ml/day/m²/atm (average)
- be chemically resistant to degradation by other contaminants that may be present
- be sufficiently impervious, both in the sheet material and in the sealing of sheets and sealing around sheet penetrations, to prevent any significant passage of methane and/or carbon dioxide through the membrane
- be sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions
- be sufficiently strong to withstand the installation process and following trades until covered (e.g. penetration from steel fibres in fibre reinforced concrete, penetration of reinforcement ties, tearing due to working above it, dropping tools, etc); and to withstand in-service stresses (e.g. settlement if placed below a floor slab)
- be capable, after installation, of providing a complete barrier to the entry of the relevant gas
- be verified in accordance with CIRIA C735

3.4.2 The performance of membranes is heavily dependent on the quality and design of the installation, resistance to damage after installation and integrity of joints. If a membrane is installed that does not meet all the criteria above then the score is zero.

4. INSTALLATION OF GROUND GAS PROTECTION MEASURES

4.1 General Comments

4.1.1 In concurrence with the NHBC guidance 'Hazardous Ground Gas – an essential for housebuilders – April 2023', BEK has advised the client that the welded solution is the preferred method for sealing gas membranes at critical junctions including laps and joints.

4.2 Components of the Membrane System

4.2.1 The manufacturer of the membrane and its associated components has yet to be confirmed by the client. The installed membrane and its associated components will need to meet the requirements of BS8485:2015+A1:2019.

4.2.2 BEK recommends two membranes which are considered suitable for use as a gas barrier and these are:

- JUTA GP1
- Visqueen Gas Barrier

4.2.3 All membrane installation must be undertaken to the manufacturers' specification.

4.2.4 Installation accessories will also be necessary (the exact components will depend on the installation method and the exact design of the building). Components to be used in the installed membrane system include but are not limited to:

- Jointing tape (double sided butyl tape, gas resistant foil tape)
- Pre-formed top hats
- Jubilee clips
- Liquid Gas Barrier
- Self-Adhesive Gas Resistant Membrane
- Primer – must be applied to masonry, concrete or metal surfaces when sealing the self-adhesive membrane directly to these substrates

4.2.5 All products utilised in the gas membrane system will need to be pre-approved by BEK. Any additional products utilised will need to be re-reviewed to confirm they meet the requirements of BS8485:2015+A1:2019.

4.3 Ventilation Measures

Sub-Floor Void

4.3.1 The beam and block system should incorporate a void depth of a minimum 150 mm free from debris and obstructions.

Air Bricks

- 4.3.2 The number of vents will meet or exceed the BS8485:2015+A1:2019 requirements of 1,500 mm²/m run of wall on at least two opposite sides. A typical air brick provides (6,000 mm² vent area).
- 4.3.3 Regardless of ground gas protection requirements, the NHBC advise for protection against moisture is that void ventilation should be provided to whichever gives the greater opening area of either (i) 1500 mm² per metre run of external wall or (ii) 500 mm² per m² of floor area. Therefore, minimum NHBC requirements are likely to be appropriately protective in terms of ground gases for low rise housing. It is outside the BEK remit to confirm whether the NHBC standards/building regulations are met with regards to protection against moisture.
- 4.3.4 BEK will validate that the number of vents will meet or exceed the BS8485:2015+A1:2019 requirements of 1,500 mm²/m run of wall on at least two opposite sides. The Casey Group will take on the detailed design to ensure even flow across the air void.

Internal Sleeper Walls

- 4.3.5 Where there are multiple internal obstructions to air flow caused by beams and sleeper walls, cross vents will need to be installed. These need to provide a minimum of 6,000 mm²/m.
- 4.3.6 The simplest approach is to use short sections of 100 mm diameter PVC drainage pipe through the sleeper wall or construct it with gaps in the blockwork.

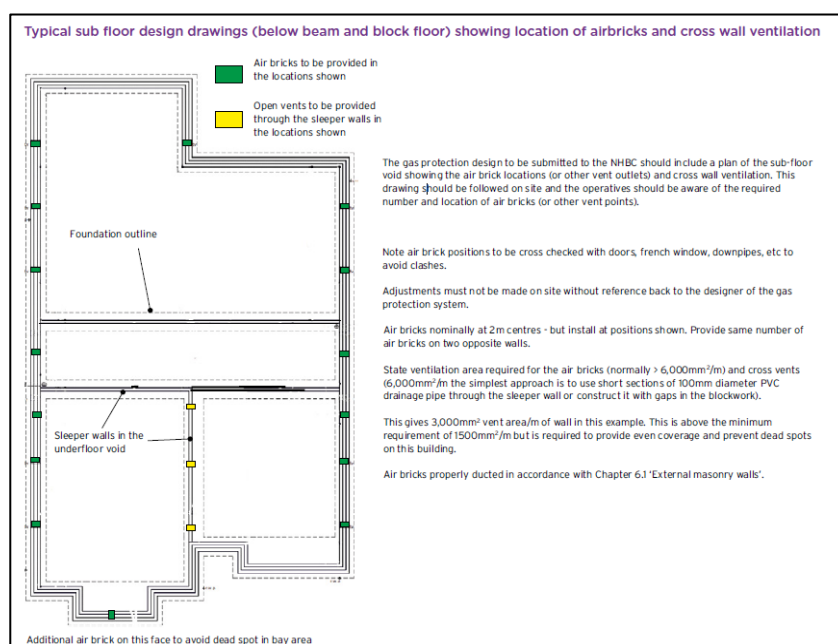


Figure 2: Example Drawing Showing Air Brick Locations

4.4 Ground Gas Membrane Installation – Outline Methodology

Preparation of the surface underlying the membrane

- 4.4.1 The surface underlying membrane should have a smooth finish - free from voids, projections, and mortar deposits.
- 4.4.2 The gaps between the block and beams should be filled with a sand cement screed brushed into the joint. In many instances blocks are cut leaving gaps around pipe penetrations, these should be filled with expanding foam or sand and cement to ensure that the gas membrane is fully supported.
- 4.4.3 The beam and block floor should be prepared as per the manufacturer's specification (e.g. a sand blinding layer, protection fleece, or a smooth concrete float finish).

Laying of the Gas Membrane System

- 4.4.4 The membrane system shall be laid loosely extended across cavities and sealed around joints/service entries as per the manufacturers specification. This will typically require 150 mm membrane overlaps with proprietary double-sided tape within the joint and single sided proprietary tape over the top of the joint. A cross section showing the installation of the membrane is presented in Figure 3.

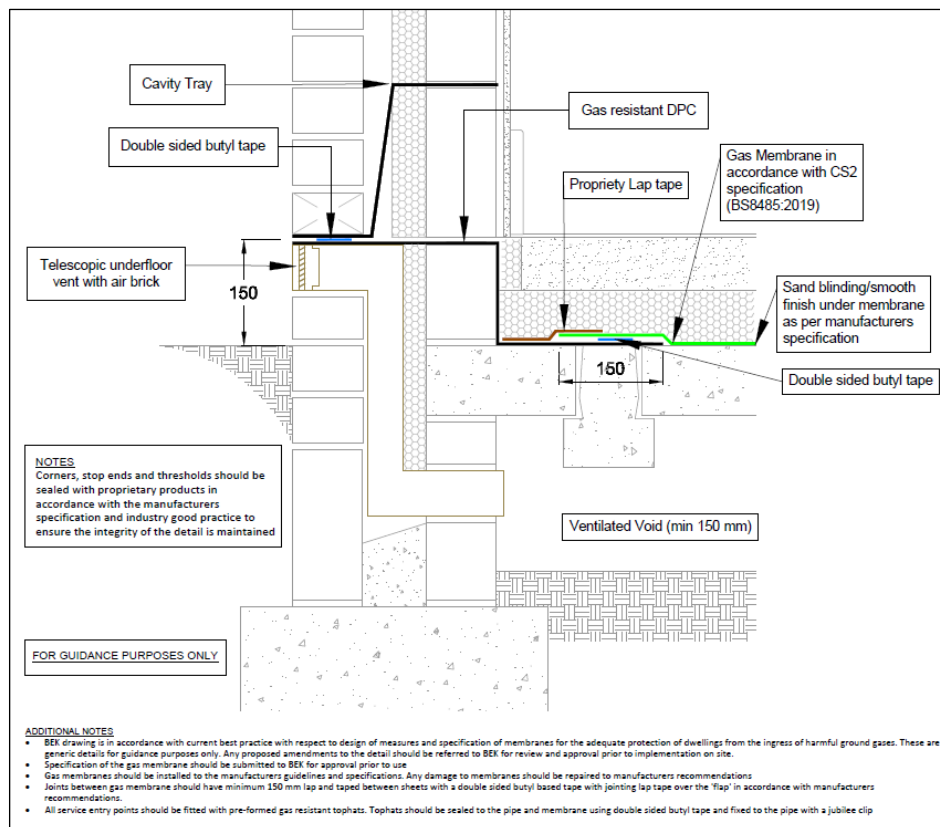


Figure 3: Typical Gas Membrane Edge Detail

- 4.4.5 Service penetrations shall be sealed with proprietary ‘top hats’ to the membrane and service pipe using propriety products in accordance with the manufacturer’s specification. Top hats should be sealed to the pipe and gas membrane utilising double sided jointing tape and fixed with a jubilee clip. A schematic showing the installation of a top hat as per the manufacturer’s specification is shown in Figure 4.

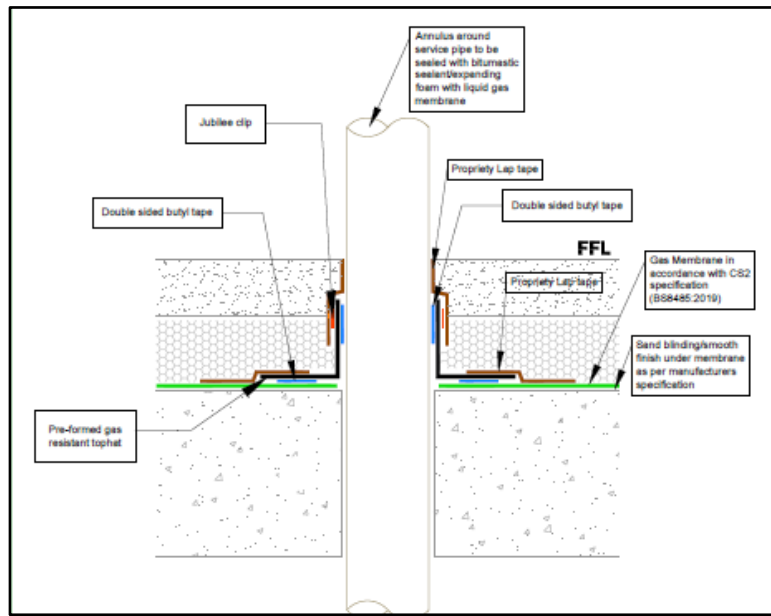


Figure 4: Typical Penetration Detail for Pre-Formed Tophats

- 4.4.6 Corners and non-standard service entries will be preferentially sealed utilising Gas Resistant Self-Adhesive Membrane. Corners and block ends can also be sealed with pre-formed units.

Protection of the Gas Membrane System

- 4.4.7 BEK recommends that the gas membrane is protected through placement of the insulation and/or fleece protection above the membrane within one working day of a passed inspection (as per the manufacturers specification).

Sealing of Internal Annulus around Service Pipe

- 4.4.8 In terms of the internal annulus of the duct holding each of the service pipes and conduits (electric cables and water pipes in some areas etc.) this will be filled with expanding foam and liquid applied gas membrane. The detail for this is provided in Figure 5.

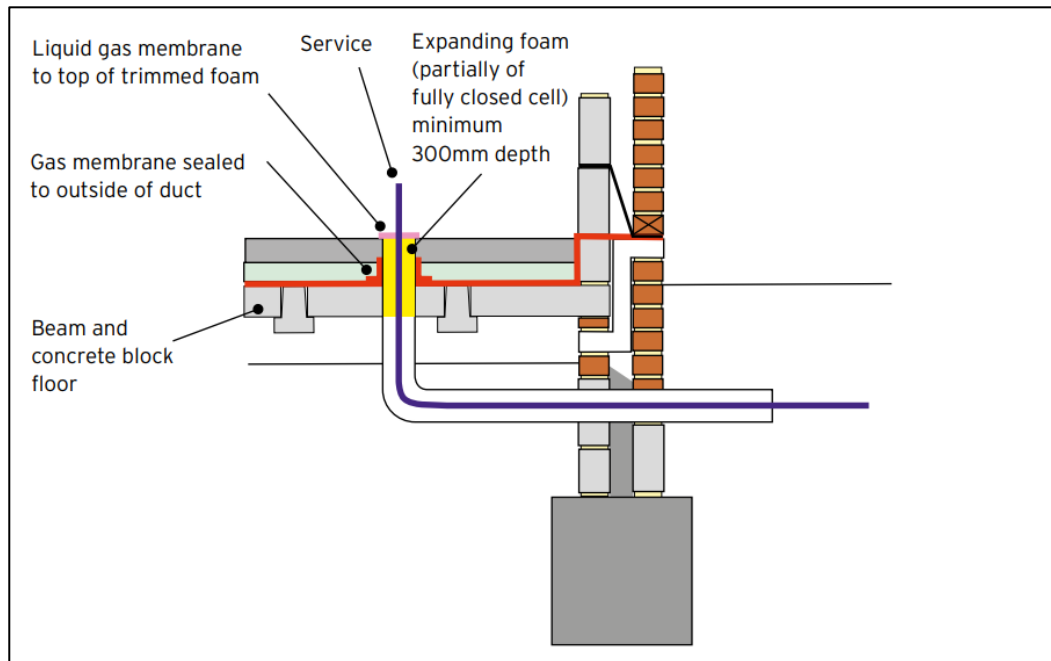


Figure 5: Sealing of the Internal Annulus of the Service Duct (extracted from NHBC – an essential guide for house builders – April 2023)

4.5 Installer of Ground Gas Measures

4.5.1 The exact construction company appointed to install the gas protection measures is unknown at the time of writing. The installers should be trained and experienced in the installation of ground gas resistant membranes.

4.5.2 BEK has recommends that the installation of the gas membrane system should be carried out by a specialist gas membrane installation company (specialist installer) with at least 50% of staff holding an NVQ level 2 (gas membrane installation) and/or TWI/CSWIP plastic welding accreditation with the remaining staff are working towards one of those qualifications.

4.5.3 If non-specialist groundworkers are utilised to install the ground gas mitigation measures, BEK recommends that the general contractor doing the installation should receive adequate training from the suppliers of materials and be suitably qualified to carry out the installation.

4.6 Verification

4.6.1 The installation of the membrane will be independently validated by an appointed environmental consultant from BEK. Michael Buckley (BSc (Hons) MSc MEnSci CEnv), owner and Managing Director at BEK Enviro Ltd has over 20 years' experience in the verification of ground gas mitigation measures. Michael Buckley is responsible for the appointment/training of suitably qualified staff to verify gas measures and the ultimate sign off of all verified gas mitigation measures.

- 4.6.2 All staff involved in the verification of ground gas mitigation measures are degree qualified and a number of employees at have attended the 'Verification of Gas Protection Systems Course' delivered by CL:AIRE. In house training has been delivered to all BEK employees involved the verification of ground gas mitigation measures.

5. GAS MEASURES VALIDATION PLAN

5.1 Supervision of Works

5.1.1 The verification as described herein follows the recommendations set out in CIRIA C735 'Good practice on the testing and verification of protection systems for buildings against hazardous ground gases'. The works will be verified in accordance with CIRIA 735 (2014) by an experienced, suitably qualified verifier.

5.1.2 The installation of the gas protection measures (ventilation system and gas membrane installation) will be checked and verified by the Engineer at key stages during the works.

5.2 Key Verification Responsibilities & Hold Points

5.2.1 Verification lines of evidence need to be collated at a number of hold points. Such lines of evidence are required to ensure that the gas mitigation measures have been installed in accordance with the methodology presented in the Gas Verification Plan report herein.

5.2.2 However, it will not always be possible (or practicable) for BEK to be present for every stage of the remediation works in every plot and therefore some degree of verification will need to be undertaken by the developer. However, this should only be done following communication with BEK to ensure that appropriate validation records are maintained.

5.2.3 In all cases, it will be the responsibility of the developer to ensure that the verifier is contacted to collate verification evidence/in house verification evidence is collated at the below mentioned hold points.

Verification Hold Point	Evidence Requirement and Party Responsible for collation of such evidence
Verify depth of sub-floor void	Verification Consultant &/or Developer (Developer can only provide these records when BEK is confident appropriate evidence has been collated) – Provide location referenced example photos
Spacing of air bricks, inspection underside of membrane placement sealing of the gas membrane across the entire building footprint	Verification Consultant – is to conduct a thorough visual inspection of 100% of the membrane area prior to it being overlain by insulation and a concrete screed poured to ensure all joint/penetrations are sealed appropriately. BEK is also to verify that the air bricks have been installed at the locations specified in the design drawings.
Placement of the insulation and/or fleece protection above the membrane.	Developer – is to ensure that the membrane insulated within 1 working day of the inspection passing on a given plot. This should be considered for periods of site closures (ie the Christmas break).
Watch brief following inspection of the membrane and prior to concrete pour to ensure gas membrane is not punctured/ damaged by follow on trades	Developer – is to ensure that follow on trades are aware of the presence and purpose of the gas membrane, and who they should contact if they believe their actions have had the potential to compromise it. A watch brief should be maintained by the developer to ensure that the membrane is damaged by follow on trades. BEK should be contacted if the developer has reason to believe the measures have been compromised.
Sealing of service ducts (prior to occupation)	Developer - is to provide confirmation that the internal annulus of any open portion of any service annulus has been sealed in accordance with the design drawings. Plot specific location referenced photos to be collated for all seals and to be provided to the local authority on request
Ground level checks at airbricks (prior to occupation).	Developer - is to inspect the placement of airbricks with reference to finished ground levels after completion of landscaping works to ensure these have not been obscured.

Table 1: Summary of Key Verification Hold Points and Lines of Evidence Required at Each Hold Point

5.3 Visual Inspection & Integrity Testing

- 5.3.1 A **visual inspection** method is recommended to be carried out by BEK. This should be undertaken following laying of the beam and block floor and laying of gas membrane on top, but prior to laying of insulation and pouring of the screed.

5.3.2 Integrity testing is not required. However, pick testing may be carried out on site at the discretion of the BEK engineer.

5.4 Verifier Checklist

5.4.1 The BEK verifier or other suitably qualified verifier should:

- Confirm that the correct membrane has been used, including sealing / jointing tape and preformed components e.g. top hats, corners, self adhesive gas membrane.
- Confirmation that the underside of the membrane has been install prepared as per the manufacturer's specification with the underside of the membrane being free from voids, projections, and mortar deposits.
- Inspect the general condition of the membrane for punctures, rips and tears
- Check that joints and laps have been sealed in accordance with manufacturers specification.
- Check that the membrane has been installed correctly across cavities, including correct jointing in these areas.
- Check that top hats have been correctly installed around service entries, including jubilee clips around the pipe and correct sealing arrangements to the membrane/pipe infrastructure as per the manufacturer's specification.
- Check that vents have been installed around the perimeter of the building in sufficient number and in the correct locations, including inspecting the condition i.e., not blocked or otherwise restricted.
- Check the presence of a passive ventilation system (clear >150mm void), including measuring that this is of a sufficient depth and the void has not been filled or otherwise compromised.
- Check that internal sleeper walls are also vented to provide adequate flow-through within the void so that none of the walls are blocking off unvented sections within the void.

5.4.2 Any sections of the gas membrane displaying a flaw, failing a visual inspection or failing integrity testing (if required) should be repaired under the supervision of the verification consultant until rectifications are considered acceptable. The verification consultant should record the type and result of the repairs on the gas proforma.

5.4.3 If the verification consultant leaves the site without rectifications being made then the inspection will be failed subject to re-inspection at a later date.

5.4.4 Photographic evidence will be recorded during all inspections and a suitable record of the validation will be included within a validation report.

5.4.5 A gas measures proforma sheet will be completed detailing the inspection for each inspection visit. An example of the gas pro-forma to be used is presented in Appendix A.

6. VERIFICATION PLAN

6.1 The following information should be included within the Verification Report to demonstrate the successful installation of ground gas protection on the site:

- Site details and objectives of verification
- A summary of the original site conditions and the ground gas regime.
- A description of the gas measures installed
- Details of the gas-resistant membrane manufacturer and type used (including sealing / jointing tape and pre-formed components e.g. top hats, corners). This shall include the manufacturer specification / datasheet.
- Installer and verifier and credentials of such organisations, i.e. level of competency of installer– NVQ Level 2 or general groundworker.
- Detailed description of any variations from the specification provided in this report, with explanation and justification of such deviations.
- As-built construction drawings (if available).
- A description of the verification approach – in this case visual inspection.
- Verification lines of evidence – including contractor records, proformas and photographic evidence.
- Details of all relevant communications held with regulatory bodies during implementation
- Verification conclusions, including any future gas monitoring or management requirements to manage residual hazards (anticipated none in this case due to passive approach)
- Any limitations to the measures installed/verified

APPENDIX A

Example Gas Pro Forma

BEK Ground Gas Validation Inspection Record

Site:				Inspected by:	
Plot No:		Date:		Inspection Method:	

	Inspected Item	Y/N	Comments/Defects/Remedials requested	Photo? Y/N
1.1	External Wall Airbricks			
1.2	Sub-Floor Void/ Pressure Relief / Passive Venting			
1.3	Any internal sleeper walls – require appropriate ventilation			
1.4	External vent trenches/ducts			
2.1	Condition of subgrade and underside of membrane			
2.2	Gas Membrane type including associated components			
2.3	Gas Membrane Condition			
2.4	Lapping Design/Seals of Laps and Joints			
2.5	Perimeter Installation/Cavities and Corners			
2.6	Service Entries			
2.7	Are there any level changes/steels/abnormals?			

Additional Notes:

BEK Ground Gas Validation Inspection Record

	Inspected Item	Comments/Defects/Remedials requested
1.1	External Wall Airbricks	Meet or exceed the BS8485:2015+A1:2019 requirements of 1,500 mm ² /m run of wall on at least two opposite sides. A typical air brick provides (6,000mm ² vent area). Check design
1.2	Sub-Floor Void/ Pressure Relief / Passive Venting	Check the presence of a vented void / pressure relief pathway, including measuring that this is of a sufficient depth and not been filled or otherwise compromised. Subfloor Void minimum 150 mm for residential properties with beam and block construction (unless otherwise specified by design drawing)
1.3	Any internal sleeper walls	Venting of sleeper walls to provide adequate flow-through within the void (6,000 mm ² /m for low rise residential). Ventilation holes (honeycomb brickwork/pipe crossings?) – size, spacing, location in accordance with design? Check that none of the walls are blocking off unvented sections within the void
1.4	External vent trenches/ducts	Located and constructed in accordance with design drawings? If open-topped gravel – gravel type/presence of fines? If pipe or other vent, check position and construction for functionality and absence of blockages. Ability of void former to withstand bearing of the superstructure?
2.1	Condition of subgrade and underside of membrane	Check that the subgrade does not contain rough/uneven surfaces, is appropriately clean and that there are no sharp object E.g. projections, and mortar deposits. Check protective sand blinding layer or geotextile (if specified) is present and meets design specification
2.2	Gas Membrane Type including associated components	Ensure that the correct membrane have been used including components eg sealing/jointing tape, self-adhesive gas membrane, pre-formed tophats, corners, damp proof course
2.3	Gas Membrane Condition	Inspect for rips/tears/punctures/stretching of membrane. Confirm that the membrane is free from dirt, evidence of heavy foot traffic and building materials. Specify and photograph any repairs carried out during inspection
2.4	Lapping Design/Seals of Laps and Joints	Minimum lap as per manufacturers specification of 150 mm. Are joints lapped and sealed in accordance with manufacturers requirements/specification? Check double sided tape is sufficiently stuck and that lap tape isn't lifting/no fish mouths
2.5	Perimeter Installation/Cavities and Corners	Check that membrane goes across the cavity or that membrane jointed correctly to corners, stop ends and threshold (preformed corners/SAGM). Cavity should be free from debris and water.
2.6	Service Entries	Weld sealed using SAM or Tophats need to be correctly installed with no gaps between tophat and membrane and no lifting of tape. Double sided tape should be used around tophat and service entry. Jubilee clips around the pipe and correct sealing arrangements to the membrane/pipe infrastructure as per the manufacturers specification
2.7	Are there any level changes/steels/abnormals?	Changes of level are complex and should be undertaken in accordance with a site specific 3D drawing of the gas membrane detail. Steels require primer with liquid gas membrane and/or self-adhesive membrane

APPENDIX B

Drawings

Key

3000 x 6000mm parking space

Pavement

Block Paved Parking Space

Private Garden

Front Garden

Access Road - Tarmac

Shed (Cycle Storage)

Easement

Schedule of Accommodation

Social Rent
10no 1B2P Flats @ 50m²
5no 2B3P Flats @ 61m²
2no 2B4P Houses Semi-Detached @ 83m²
4no 3B5P Houses Semi-Detached @ 96m²
2no 4B6P Houses Detached @ 108m²

23no Total

28 no parking spaces
Flats - 100% parking spaces
2B4P Houses - 100% parking spaces
3B5P Houses - 100% parking spaces
4B6P Houses - 200% parking spaces
1no - parking space for 27 Newell Road
1no - parking space for 29 Newell Road
1no - parking space for 33 Newell Road

Site Area: 3010m²

Caveats

- Overlooking distances subject to LPA Approval
- Density and parking mix subject to LPA Approval

20 0 2 4 6 8 10

SCALE

1: 200

N

Layout subject to confirmation of red line boundary, all statutory approvals including highways, planning and building regulations, relevant surveys and reports such as topographical, ecology, trees, ground investigation and flood risk.

Area Schedule		
Type	Description	Area
Car Parking	Salmon	330 m²
Front Garden	Dark Green	618 m²
Plot Hardstanding	Light Grey	525 m²
Private Garden	Light Green	343 m²
Tactile Paving	Brown	4 m²
Unadopted Drive	Red Fleck	400 m²
Total: 39		2221 m²

Fence Schedule		
Type	Fence Height	Length
440x440x1800mm		0.0
1800mm Wall & Railing	1.250	88.2
Fence - TSW 1100mm	1.100	56.3
Fence - TSW 1800mm Trellis	1.800	61.7
Fence - TSW 2100mm	2.100	149.5
Total: 53		375.7

00 Proposed Site Plan
1 : 200

DO NOT SCALE FROM THIS DRAWING
ALL DIMENSIONS MUST BE CHECKED ON SITE BY CONTRACTOR
PRIOR TO CONSTRUCTION

RevDateIntDescription

btp

ARCHITECTS

RIBA

Chartered Practice

CLIENT:

WCHG

PROJECT:

Greenbrow Social Club

DESCRIPTION:

Proposed Site Plan

PURPOSE OF ISSUE:

Building Regulations

DRAWN BY:CHECKED BY:DATE:SCALE @ A1:

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