



**Castledine  
Environmental**

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LAND CONTAMINATION SURVEYS

**Phase 4 Verification Report**  
for  
**The Proposed Development of 4  
No. Detached Dwellings**  
on the site of  
**Former Builders Yard, Cropwell  
Road, Langar, Nottinghamshire  
NG13 9HD**

**Date: February 2024**

Status: Final Report

Reference: 3606A P4 G S Dev Services – Langar

Date: 06/02/2024

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## 1.0 QUALITY ASSURANCE

Castledine Environmental confirm that all reasonable efforts have been made to ensure that the information outlined within this report is accurate.

Castledine Environmental would further confirm that due care, attention and technical skill were used in the creation of this report.

## 2.0 INTRODUCTION

Castledine Environmental have been appointed by G. S. Development Services Ltd to carry out a verification inspection on works carried out at Former Builders Yard, Cropwell Road, Langar, Nottinghamshire NG13 9HD.

The following reports previous reports on the site are:

- Castledine and Co. Phase 1 Risk Assessment for Cropwell Road, Langar, Nottinghamshire NG13 9HD, ref: 1321H and dated September 2018.
- Castledine Environmental Ltd Phase 2 Intrusive Investigation for Cropwell Road, Langar, Nottinghamshire NG13 9HD, ref: 3417D and dated December 2022.
- Castledine Environmental Ltd Phase 3 Remediation Strategy and Verification Plan for Cropwell Road, Langar, Nottinghamshire NG13 9HD, ref: 3435K and dated December 2022.

## 3.0 SCOPE

Castledine Environmental have prepared this report for the sole use and reliance of G. S. Development Services Ltd and their appointees for the purpose of ensuring compliance with:

- Paragraph(s) 174, 179, 183 & 184 of the National Planning Policy Framework 2021.
- Part C1 of the building regulations.
- Support of Planning Application No. 19/01500/FUL.

This report may not be used or relied upon by any unauthorised third party, or for any other proposed use than that specified above, without the explicit written agreement of Castledine Environmental.

- The report consists a Verification Report in accordance with BS 8485:2015+A1:2019 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings
- CIRIA: C735 good practice on the testing and verifications of protection systems for buildings hazardous ground
- CIRIA: C795 – Retrofitting Hazardous Ground Gas Protection Measures in Existing or Refurbished Buildings
- LCRM “Land Contamination Risk Management”.

#### **4.0 OVERVIEW OF FINDINGS AND RECOMMENDATIONS FROM PREVIOUS REPORTS**

The site is located in Langar, Nottinghamshire at National Grid Reference: 472200,334361 and is approximately 0.40ha in area.

The site is an irregular rectangle in shape and is orientated north to south. The site is located in a predominantly rural area on the southwestern extent of the village of Langar, which is approximately 153m north east of site. The site is then directly bounded by Cropwell Road with field beyond to the north, field to the east and west and Stroom Dyke forming the southern boundary of site, with further field beyond this.

#### **4.1 SUMMARY OF GROUND GAS REGIME**

Based upon the information collected during the Phase 1 Desk study and subsequent intrusive investigation, no significant sources of ground gases were identified; however, following the removal of an onsite fuel tank the Client opted to install ground gas protection measures within the proposed developments in lieu of ground gas monitoring with gas protection measures to be inline with Characteristic Situation CS2, as outlined within BS8485:2015+A1:2019.

## 4.2 SUMMARY OF WORKS CARRIED OUT

Due to the potential for ground gas ingress, a gas resistant membrane in line with Characteristic Situation CS2 has been installed within all plots. The membranes should extend across any cavities and sealed around joints/service entries. Joints can be heat welded or taped with Double sided butyl joint tape. Joints are to be overlapped by min 100mm and if joint tape is being used then it must be applied using a silicone roller.

The 'perimeter and fill' method is to be used. The manufacturers Gas resistant DPM will be fitted into each wall, including internal walls. This will entirely cover the cavity and extend into the room at least 150mm. This will then be covered to protect it from damage until the membrane is laid. An example of the recommended gas protection plan can be found in Appendix C.

The cavity should be filled to a level where it will support the membrane across the cavity. Any exposed sections across the cavity wall will be protected using sacrificial sheeting or DPM while any cavity work is undertaken.

When the membrane has been laid and verified then the insulation should be fitted for membrane protection and the screed placed upon it. This will protect it during the remainder of the build.

The properties were to be observed to have a minimum 150mm clear ventilated sub floor void, with ventilation provided via telescopic air vents around the perimeter of each block at 2m centres. The number of telescopic vents meet or exceed the building regulations requirements of 1,500mm<sup>2</sup>/m run of wall.

The Client has chosen to excavate and replace existing soils within areas of the soft landscaping through the excavation and replacement of a minimum of 600mm of material from beneath finished ground levels. The details of these remedial works will be issued under a separate report after completion.

### 4.3 VERIFICATION VISITS

Castledine Environmental attended site on the following dates in order to conduct verification of the required plots:

#### Plot 1

Castledine initially attended site on the 25<sup>th</sup> July 2023 in order to inspect Plot 1; however, due to a number membrane repairs required within Plot 1, the membrane was unable to be passed. After a meeting with Dampotec, (the membrane installer for the development) on the 1<sup>st</sup> August 2023 and following recommendations from Castledine in order to remediate the situation, the membrane in Plot 1 was then re-examined following repairs and passed on the same date.

#### Plot 2

An inspection for Plot 2 was first conducted on the 17<sup>th</sup> August 2023; however, the plots were deemed to be incomplete and following recommendations from Castledine, a number of repairs were also required. These were completed and a second inspection was completed on the 4<sup>th</sup> September 2023, after which the membrane was deemed to have passed.

#### Plot 3

Plot 3 was initially inspected on the 20<sup>th</sup> November 2023; however, a number of repairs to the membrane was considered necessary. Castledine reattended site on the 22<sup>nd</sup> November, at which time repairs were still ongoing. Castledine remained onsite while final repairs were undertaken and the membrane was inspected and deemed to have passed on the same date.

#### Plot 4

Plot 4 was inspected on the 1<sup>st</sup> February 2024. Whilst repairs were required following an initial inspection, repairs were deemed to be necessary. Castledine remained onsite until repairs were completed, after which the membrane was passed.

**4.4 VERIFICATION PRO-FORMA (TAKEN FROM CIRIA C735)****Plot 1**

<b>Site Name:-</b> Cropwell Road, Langar, Nottinghamshire NG13 9HD		<b>Gas Characteristic situation:-</b> CS2
<b>Job No:-</b> 3606K		<b>Type of building:-</b> Domestic
<b>Date:-</b> 1 <sup>st</sup> August 2023		<b>Building Description:-</b> Two-storey Detached
<b>Visit by:-</b> KC		<b>Foundation type (floor):-</b> Beam and Block
<b>Weather:-</b> Clear, dry		<b>Gas protection type:-</b> Delta
No	Item	Comments
<b>1 Gas Membrane</b>		
1.1	Condition of sub-grade and underside of gas membrane	Membrane laid on beam and block floor – good condition
1.2	Gas membrane type	Delta
1.3	Gas membrane condition	Good
1.4	Joining tape product	Mentech Pro Gas Overtape
1.5	Lapping design	150mm overlap
1.6	Laps, welds and joints seals	Welded
1.7	Service entries seals	Taped entries
<b>2 Passive venting</b>		
2.1	Sub-floor void	Min. 150mm present
2.2	External wall airbricks	Present and properly installed
2.4	External vent trenches/ducts	Telescopic vents present
<b>Active venting</b>		
	System details	N/A
	Additional Notes:	

**Plot 2**

<b>Site Name:-</b> Cropwell Road, Langar, Nottinghamshire NG13 9HD		<b>Gas Characteristic situation:-</b> CS2
<b>Job No:-</b> 3606K		<b>Type of building:-</b> Domestic
<b>Date:-</b> 22 <sup>nd</sup> November 2023		<b>Building Description:-</b> Two-storey Detached
<b>Visit by:-</b> KC		<b>Foundation type (floor):-</b> Beam and Block
<b>Weather:-</b> Clear, dry		<b>Gas protection type:-</b> Delta
No	Item	Comments
<b>1 Gas Membrane</b>		
1.1	Condition of sub-grade and underside of gas membrane	Membrane laid on beam and block floor – good condition
1.2	Gas membrane type	Delta
1.3	Gas membrane condition	Good
1.4	Joining tape product	Mentech Pro Gas Overtape
1.5	Lapping design	150mm overlap
1.6	Laps, welds and joints seals	Welded
1.7	Service entries seals	Taped entries
<b>2 Passive venting</b>		
2.1	Sub-floor void	Min. 150mm present
2.2	External wall airbricks	Present and properly installed
2.4	External vent trenches/ducts	Telescopic vents present
<b>Active venting</b>		
	System details	N/A
	Additional Notes:	



**Plot 3**

<b>Site Name:-</b> Cropwell Road, Langar, Nottinghamshire NG13 9HD		<b>Gas Characteristic situation:-</b> CS2
<b>Job No:-</b> 3606K		<b>Type of building:-</b> Domestic
<b>Date:-</b> 22th November 2023		<b>Building Description:-</b> Two-storey Detached
<b>Visit by:-</b> AL & KC		<b>Foundation type (floor):-</b> Beam and Block
<b>Weather:-</b> Clear, dry		<b>Gas protection type:-</b> Delta
No	Item	Comments
<b>1 Gas Membrane</b>		
1.1	Condition of sub-grade and underside of gas membrane	Membrane laid on beam and block floor – good condition
1.2	Gas membrane type	Delta
1.3	Gas membrane condition	Good
1.4	Joining tape product	Mentech Pro Gas Overtape
1.5	Lapping design	200mm overlap
1.6	Laps, welds and joints seals	Welded
1.7	Service entries seals	Taped entries
<b>2 Passive venting</b>		
2.1	Sub-floor void	Min. 150mm present
2.2	External wall airbricks	Present and properly installed
2.4	External vent trenches/ducts	Telescopic vents present
<b>Active venting</b>		
	System details	N/A
	Additional Notes:	

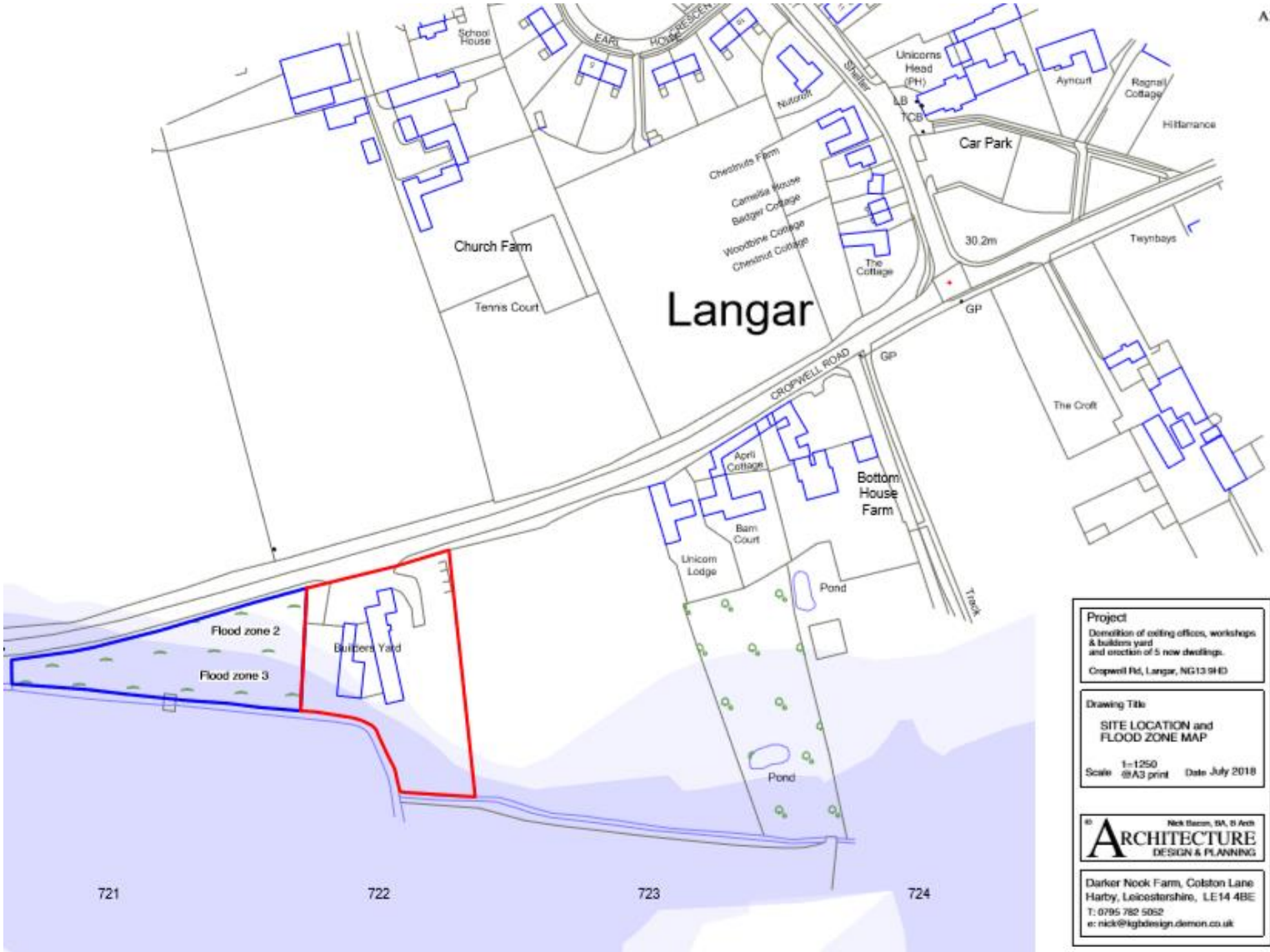
**Plot 4**

<b>Site Name:-</b> Cropwell Road, Langar, Nottinghamshire NG13 9HD		<b>Gas Characteristic situation:-</b> CS2
<b>Job No:-</b> 3606k		<b>Type of building:-</b> Domestic
<b>Date:-</b> 01/02/2023		<b>Building Description:-</b> Two-storey Detached
<b>Visit by:-</b> AL & DW		<b>Foundation type (floor):-</b> Beam and Block
<b>Weather:-</b> Clear, dry		<b>Gas protection type:-</b> Delta
No	Item	Comments
<b>1 Gas Membrane</b>		
1.1	Condition of sub-grade and underside of gas membrane	Membrane laid on beam and block floor – good condition
1.2	Gas membrane type	Delta
1.3	Gas membrane condition	Good
1.4	Joining tape product	Mentech Pro Gas Overtape
1.5	Lapping design	150mm overlap
1.6	Laps, welds and joints seals	Tested Good
1.7	Service entries seals	Taped entries
<b>2 Passive venting</b>		
2.1	Sub-floor void	Min. 150mm present
2.2	External wall airbricks	Present and properly installed
2.4	External vent trenches/ducts	Telescopic vents present
<b>Active venting</b>		
	System details	N/A
	Additional Notes:	

**5.0 APPENDICES**

APPENDIX A

PROPOSED AND CURRENT SITE PLANS



<b>Project</b>
Demolition of existing offices, workshops & builders yard and erection of 5 new dwellings.
Croppwell Rd, Langar, NG13 9HD
<b>Drawing Title</b>
SITE LOCATION and FLOOD ZONE MAP
Scale 1:1250 Date July 2018
<b>ARCHITECTURE</b> DESIGN & PLANNING
Darker Nook Farm, Colston Lane Harby, Leicestershire, LE14 4BE T: 0795 782 5052 e: nick@tgbdesign.demon.co.uk



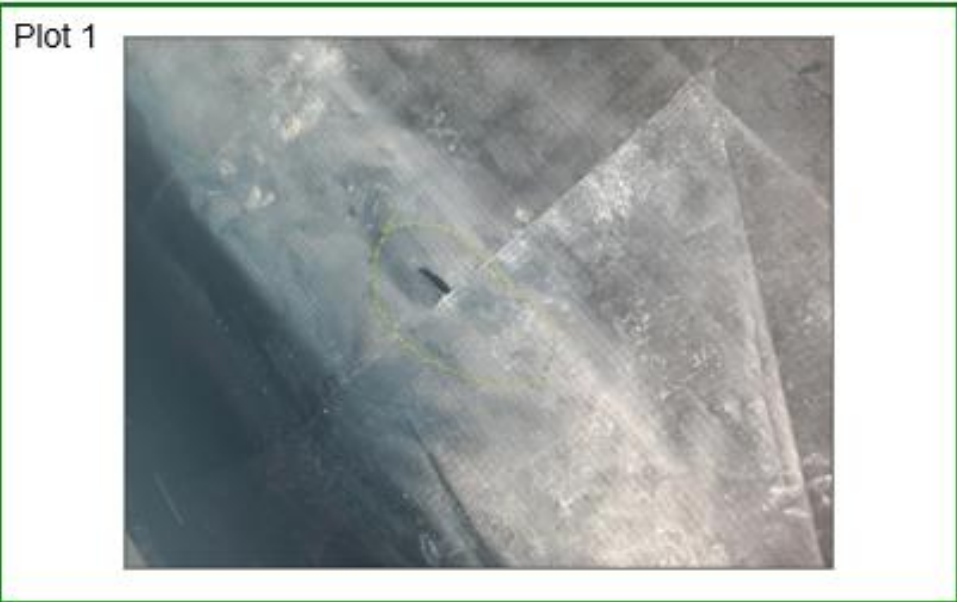
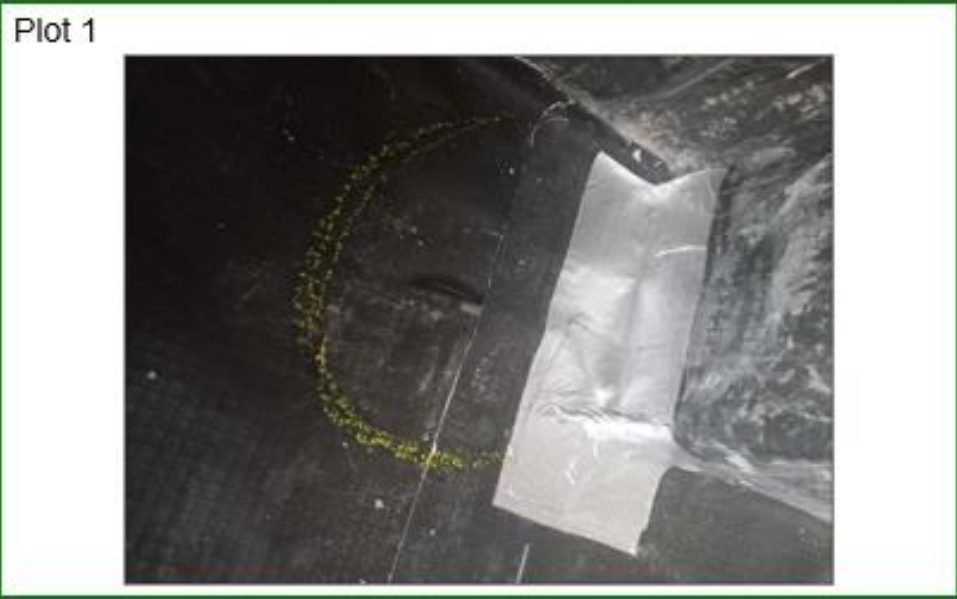
APPENDIX B

MEMBRANE INSPECTION PHOTOGRAPHS



Client:GS Development Services Ltd  
Address: Former Builders Yard, Cropwell Road, Langar

Membrane Repairs

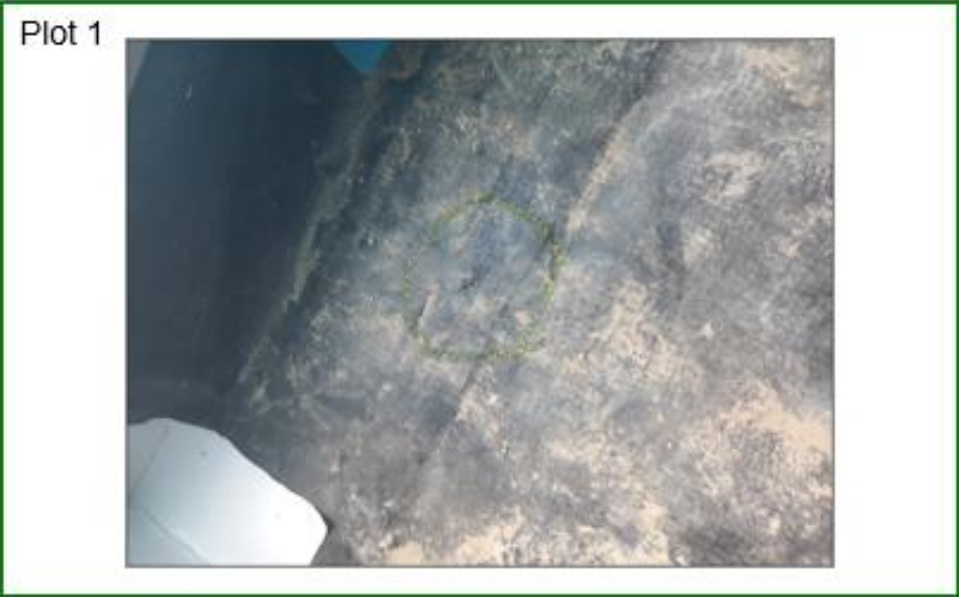


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Loughborough, Leicestershire. LE12 5SN  
Telephone: 01509 880399 Email: [info@castledineenvironmental.co.uk](mailto:info@castledineenvironmental.co.uk)



Client:GS Development Services Ltd  
Address: Former Builders Yard, Cropwell Road, Langar

Membrane Repairs



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Membrane Inspection Photos



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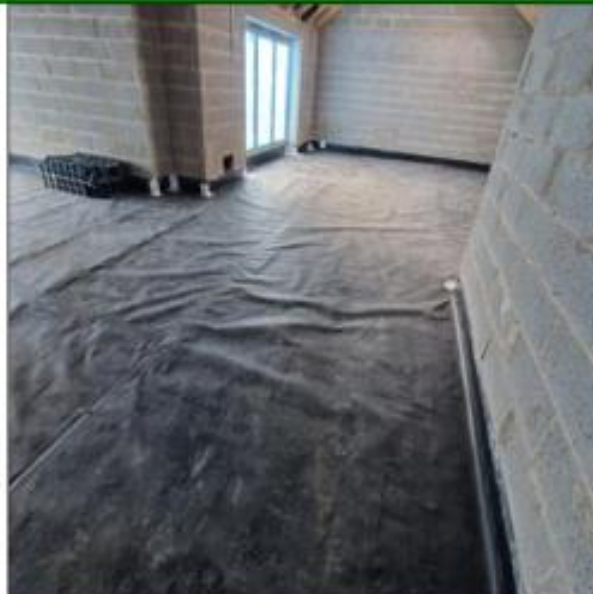
Client:GS Development  
Services Ltd  
Address: Former Builders  
Yard, Cropwell Road, Langar

### Membrane Inspection Photos

Plot 1



Plot 1



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## Membrane Repairs

Plot 2



Plot 2



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Membrane Repairs



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LAND CONTAMINATION SURVEYS

Client:GS Development Services Ltd

Address: Former Builders Yard, Cropwell Road, Langar

### Membrane Inspection Photos

Plot 2



Plot 2



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### Membrane Inspection Photos

Plot 2



Plot 2

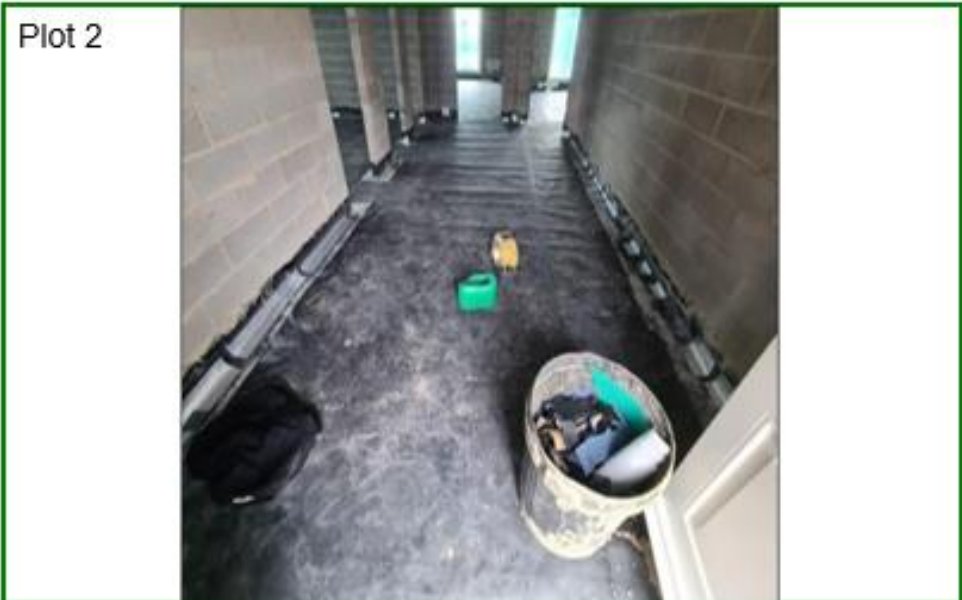


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**Client:**GS Development  
Services Ltd

**Address:** Former Builders  
Yard, Cropwell Road, Langar

## Membrane Repairs

Plot 3



Plot 3



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Plot 3



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### Membrane Inspection Photos

Plot 3



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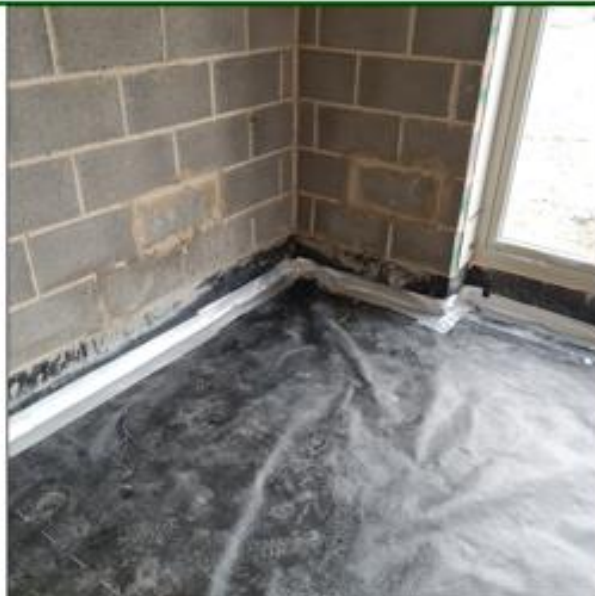
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### Membrane Inspection Photos

Plot 3



Plot 3



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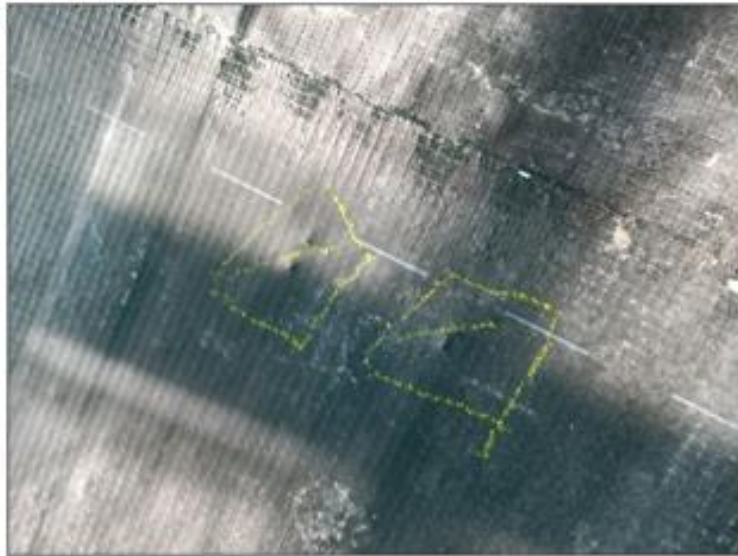




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## Membrane Repairs

Plot 4



Plot 4



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### Membrane Inspection Photos

Plot 4



Plot 4

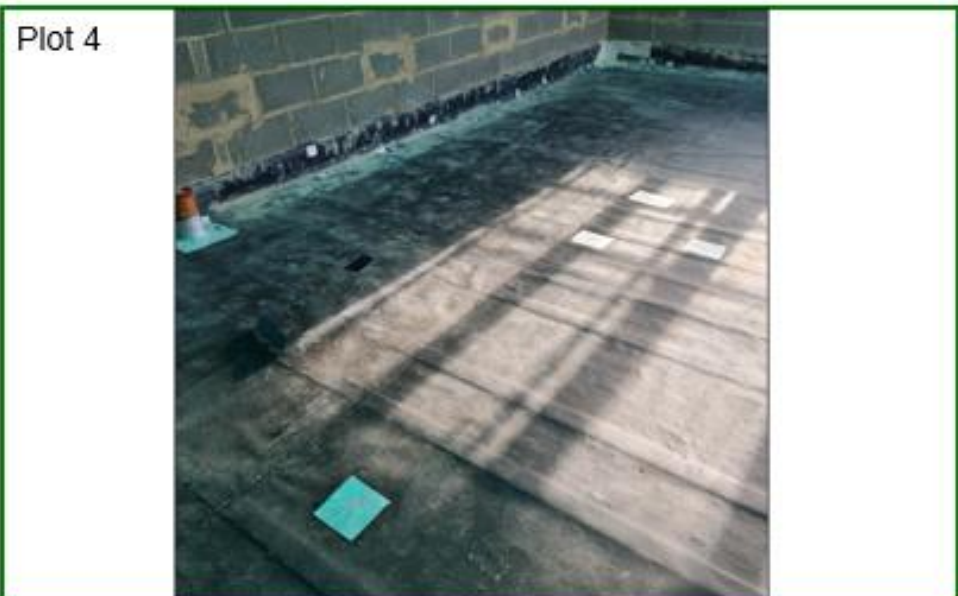


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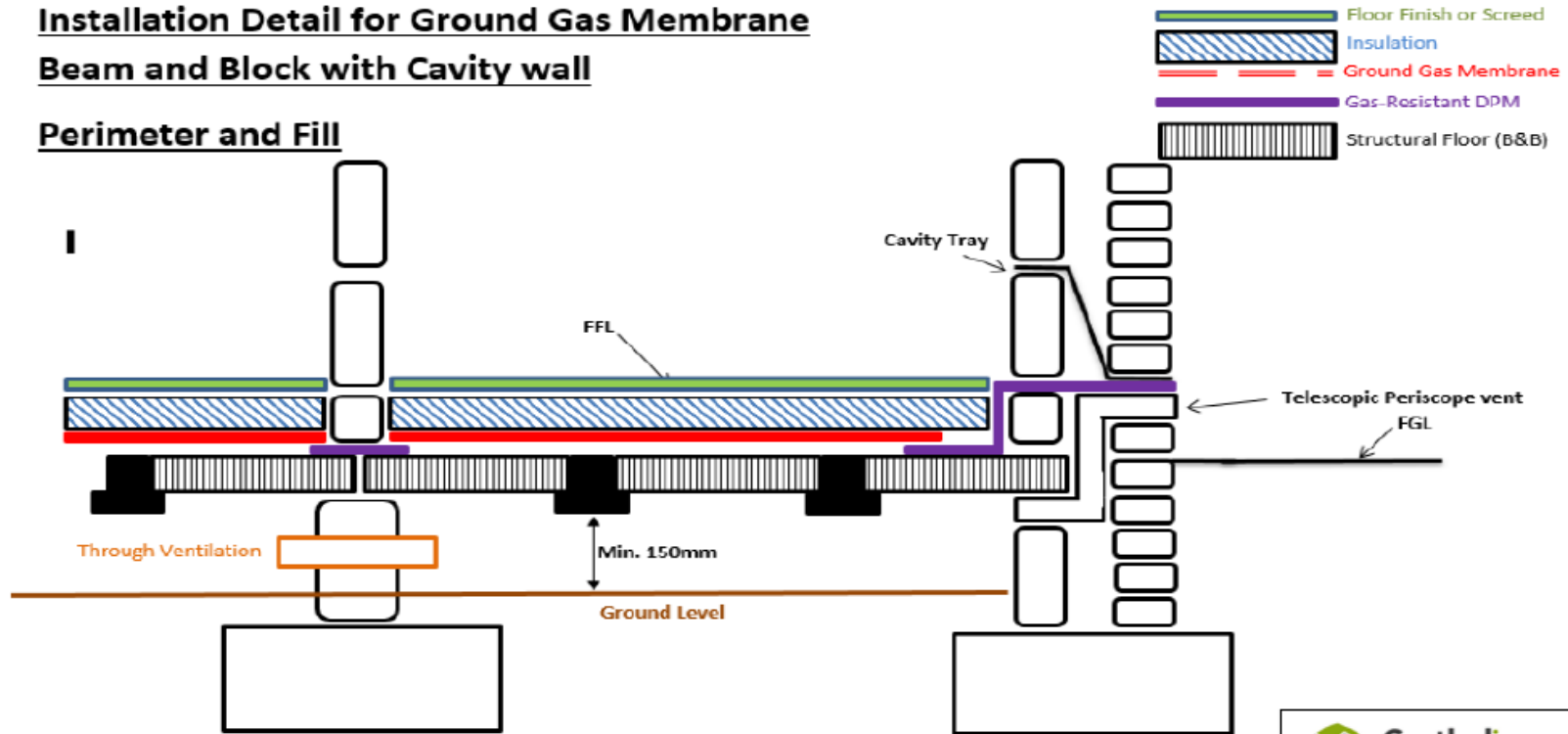


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APPENDIX C RECOMMENDED GAS PROTECTION PLAN

**Installation Detail for Ground Gas Membrane  
Beam and Block with Cavity wall**

**Perimeter and Fill**



All structural detail to be confirmed by Architect  
Note: All DPC / Membranes through masonry bed joints are required to be bedded both above and below with mortar

**Castledine Environmental**  
LAND CONTAMINATION SURVEYS  
Beam and Block over  
150mm Void Space  
Drawing not to scale