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**RADON GAS
PROTECTION MEASURES
VERIFICATION
IMPLEMENTATION PLAN**

For

**RADCLIFFE MARKET HALL
CHAMBERS,**

RADCLIFFE, MANCHESTER

Prepared for

VINCI BUILDING LTD

On Behalf of

BURY COUNCIL

Report No. 5238-G-R006

Date: November 2024

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RADHUB-POZ-ZZ-B1-DR-A-2000	Proposed Basement Layout Plans
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RADHUB-POZ-ZZ-B1-DR-A-2111	Proposed Basement Layout Plans
Third Party Drawings – Radon Gas Protection Design Details	
RADHUB-LAI-V3-B1-DR-Y-001	Gas Sections 01
RADHUB-LAI-V3-B1-DR-Y-002	Gas Sections 02
RADHUB-LAI-V3-B1-DR-Y-003	Ground Beam Option 1
RADHUB-LAI-V3-B1-DR-Y-004	Ground Beam Option 2
RADHUB-LAI-V3-B1-DR-Y-005	Internal Wall
RADHUB-LAI-V3-B1-DR-Y-006	Perimeter Beam Option 1
RADHUB-LAI-V3-B1-DR-Y-007	Perimeter Beam Option 2
RADHUB-LAI-V3-B1-DR-Y-008	Smoke Vent
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RADHUB-LAI-V3-B1-DR-Y-011	Render Penetration Sketch
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Appendix B – Gas Measures Product Specification Information

Appendix C – Gas Measures Inspection Proforma Example

Appendix D – Integrity Testing Proforma Example

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Revision History

From	Date	Comments
5238-G-R006	29 th November 2024	Original Report

RADON GAS PROTECTION MEASURES
VERIFICATION IMPLEMENTATION PLAN
For
RADCLIFFE MARKET HALL CHAMBERS, RADCLIFFE

1 GENERAL

1.1 The Commission and Brief

- 1.1.1 ID Geoenvironmental Limited (IDG) have been commissioned by Vinci Building Ltd on behalf of Bury Council (The Client) to undertake a Radon Gas Protection Measures Verification Implementation Plan for Radcliffe Market Hall Chambers, Radcliffe, hereafter referred to as 'the site'. Vinci Building Limited (Vinci) have been appointed by Bury Council as the Design & Build Contractor for the proposed development.
- 1.1.2 The purpose of this document is to satisfy the requirements of CIRIA C735 (Good Practice on the Testing and Verification of Protection Systems for Buildings against Hazardous Ground Gases) by setting out the verification activities and the integrity testing (if any) appropriate to the site-specific risk assessment, the development itself and design of the site-specific gas protection system.
- 1.1.3 This document also enables the client and potential contractors installing the gas protection measures to gain an appropriate understanding of the level of independent verification inspections and any associated integrity testing required for the development.

1.2 Previous Reports

- 1.2.1 IDG have previously issued the following reports relating to the site:
- Geoenvironmental Appraisal of Land at Radcliffe Civic Hub (Report Ref. 5238-G-R001 Rev B, dated August 2022).
 - Remediation Statement for Land at Radcliffe Civic Hub (Report Ref. 5238-G-R002, dated April 2023).
 - Remediation Verification Report for Land at Radcliffe Civic Hub (Report Ref. 5238-G-R003, dated September 2024).
 - Radon Gas Protection Measures Verification Implementation Plan for Radcliffe Civic Hub (Report Ref. 5238-G-R004, dated August 2024).

1.3 The Development

- 1.3.1 The proposed redevelopment of the Market Hall Chambers comprises conversion of the basement into a flexible event space, with access facilitated by demolition of the former TSB bank. The ground floor is to comprise a retail and food court, with first and second floors being redeveloped as office and studio space.
- 1.3.2 Drawing No's RADHUB-POZ-ZZ-B1-DR-A-2000, RADHUB-POZ-ZZ-B1-DR-A-2110 and RADHUB-POZ-ZZ-B1-DR-A-2111 presented in Appendix A shows the proposed Market Hall Chambers Basement layout.

1.4 Proposed Foundations and Floor Construction

- 1.4.1 The Market Hall Chambers basement redevelopment will incorporate new piling and ring beam sections to support new cast in-situ floor slabs, in conjunction with the pre-existing original foundations.

- 1.4.2 Foundations and floor construction details are shown on drawings presented in Appendix A.

2 THE GROUND GAS REGIME AND THE GAS PROTECTION SYSTEM

2.1 The Ground Gas Regime

- 2.1.1 As outlined in IDG's Geoenvironmental Appraisal (5238-G-R001 Rev B) and Remediation Statement (5238-G-R002), the ground gas regime at the site has been assessed in accordance with the methodologies advocated in current guidance (including but not limited to BS 8576:2013, BS8485:2015, CIRIA C665:2007 and BRE 211:2023).

- 2.1.2 With reference to conceptual model for the site:

- No significant risk from landfill or mines gas has been identified.
- No significant concentrations of hydrocarbons or Volatile Organic Compounds (VOCs) were identified during the site investigation of the development.
- A BGS site-specific radon report (December 2022 map) indicates the site lies within an area where between 3-5% of properties are affected by radon.
- Basic radon protection measures are required in new buildings.
- On consideration of the type of building to be constructed, employers must ensure the health and safety of employees and others who have access to their work environment. BRE document BR211:2023 states that an assessment of health and safety risks under national HSE regulations should include radon where the workplace is in a radon-affected area, or in any location where there is a basement that is regularly occupied, and both of these scenarios apply to this site. This assessment requires the monitoring of radon in the building post construction.

- 2.1.3 Based upon the factors presented above, the site is within a Radon affected area. Basic Radon Protection Measures are therefore required to be incorporated into the redevelopment of the Market Chambers building, along with post-construction Radon Monitoring to satisfy requirements of the Local Authority and HSE.

- 2.1.4 A copy of the BGS Radon Report is included in Appendix E.

- 2.1.5 No other hazardous ground gas sources have been identified and therefore gas protection measures do not need to be designed to be protective of gases such as carbon dioxide and methane, or hydrocarbon/ VOC vapour intrusion.

2.2 Basic Radon Protection System

- 2.2.1 BRE 211 (2023) recommends utilising a 400 micrometre virgin polyethylene DPM with a minimum number of sealed penetrations. A well installed and inspected radon membrane will also provide protection against moisture from the ground and satisfy the requirements of both radon protection and damp proofing.

- 2.2.2 British Standard 8485:2015 + A1:2019 states that "a polyethylene membrane material less than 400 microns is unlikely to withstand construction damage post installation. It is generally accepted that the robustness of a gas-resistant membrane is more critical to its performance than its permeation rate to challenge gases, therefore it is advisable to use a membrane of 400 microns or above according to construction conditions identified by the design. The membrane should be:

- Sufficiently strong to withstand in-service stresses (e.g. settlement if placed below a floor slab).
- 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.).

- Capable, after installation, of providing a complete barrier to the entry of relevant gas.
- Verified in accordance with CIRIA C735.

2.3 Typical Foundation/ Floor Details

- 2.3.1 Foundation and Floor construction design details which illustrate the gas protection details for the Market Hall Chambers basement are provided on drawings presented in Appendix A.

2.4 Gas Protection Measures – Materials Used

- 2.4.1 The products proposed for use to provide basic Radon gas protection measures at Radcliffe Market Hall Chambers redevelopment are summarised in the following table:

Basic Radon Gas Protection Measures	Products Used
Membrane Elements	
Gas Protection Membrane/DPM	SikaProof A-08 Membrane
Concrete Surfaces	SikaDur 32 Epoxy Liquid Barrier
Service Penetrations/ Steel Work Penetrations	SikaProof A-08 Membrane SikaProof Tape-150 SikaProof Patch200 SikaDur 32 Epoxy Liquid Barrier
Corner/ Threshold Detail	SikaProof Patch200 SikaProof FixTape50
Sealing Tape	SikaProof Tape-150 SikaProof ExTape 150
<i>Additional related Products (for waterproofing and/or surface preparation elements only)</i>	<i>Sikadur Combiflex Adhesive SikaDrain 850</i>

- 2.4.2 Product specification information for the materials to be used are presented in Appendix B.
- 2.4.3 IDG have reviewed the specifications of the above products and consider that, subject to correct installation, the above components and materials offer adequate Radon gas protection in accordance with the current guidance.

Change in Gas Protection Products Used

- 2.4.4 Should the gas protection products change throughout the construction programme, details of the different products must be provided to IDG to determine their suitability for use. Only after approval of the proposed gas protection products has been given by IDG may they be used at the development.
- 2.4.5 All of the details regarding any agreed changes to alternative products will be presented in the verification report.

3 THE INSPECTION/INTEGRITY TESTING REGIME

3.1 Requirements and Scope of Inspections and Verification

- 3.1.1 A number of factors should be taken into consideration when determining the scope of inspection and verification. Figure 3.1 in CIRIA C735 illustrates a risk-based approach to determining a scope of inspection and verification which is both appropriate and site specific. This takes into

consideration four main factors:

- Gas Regime
- Design Complexity
- Number of plots/ buildings
- Installation workforce (qualified/ skilled/ unskilled)

3.1.2 With regard to the four risk factors noted above IDG have undertaken a qualitative assessment of the risk presented in order to enable an inspection/testing frequency to be derived. This assessment is presented in the following table.

Risk Factor	Relevant Information	Degree of Risk
Gas Regime	Radon only – Basic Radon Protection Required	Low/Medium
Design Complexity	Complex sub-structure design includes a combination of piled foundations groundbeams, pre-existing external and internal substructure and foundations set at various levels. Multiple separate pours of ground beams and slabs creating need for high level detailing to ensure continuity of gas protection at substructure interfaces and joints, and floor slab interfaces. Use of liquid membrane on concrete surfaces in conjunction with taped connections and seals. Gas membrane and service penetrations to be sealed via tape. Detailing membrane to be used around penetrations.	High
No. of Blocks	Single building, albeit with multiple rooms and levels due to basement design	Medium
Installation Workforce	Lainton Services Ltd are a specialist installer, with relevant qualifications to NVQ L2 / CSCS Gas Membrane Installer.	Low/Medium

3.1.3 In consideration of the above risk factors, IDG consider the overall risk associated with the gas regime and installation of gas protection measures is medium to high, predominantly as a result of the design complexity.

3.1.4 It is understood that the installers for this development will be Lainton Services Ltd, a specialist installer with several years of experience of installing gas protection measures. At least one of their operatives holds a relevant qualification for membrane installation to NVQ L2 in Gas Protection Installation.

3.1.5 Should the level of skill/ experience of the installers change, revision to the scope of inspections and integrity testing will be required.

3.2 Inspection Requirements

3.2.1 Based on there being a medium to high risk associated with the quality of installation of the gas protection measures, the requirements for inspection and integrity testing are summarised in the following table:

Element of Gas Protection System	Independent Visual Inspections	Mechanical Point Stress Test	Air-Lance Integrity Test	Provision of Non-Independent information via Installer and Vinci QA Inspection reports
Sub-structure pile caps, ground beams, external wall detailing <i>(typically small areas of complex design incorporating SikaDur 32 liquid barrier, joined to SikaProof A08 membranes using Taped joints)</i>	Yes	Yes (where appropriate)	Not generally possible due to limited access, presence of steelwork etc	Yes
Floor slab areas <i>(typically incorporating larger areas of SikaProof A08 Membrane with taped joints being sealed to lapped membrane from sub-structure)</i>	Yes	Not required due to air-lance integrity testing	Yes	Yes
Remedial Actions	At discretion of Independent Verifier subject to complexity and nature of remedial action			Yes

3.3 Independence and Competency of Inspector

Independence

- 3.3.1 In accordance with C735 Section 3.3.2, conflicts of interest in verification should be avoided. A contractor or gas membrane supplier certifying their work or product is considered to be a conflict of interest and is not good practice. Verification should normally be carried out by an organisation independent of the gas membrane installation contractor or the developer/main contractor.
- 3.3.2 IDG are not, and are not affiliated with, a manufacturer or installer of gas protection measures, and as such are therefore appointed by Bury Council/ Vinci Building Ltd as an independent verification consultant.

Competency

- 3.3.3 IDG's Verification Engineers have the following training and experience with regard to validation of gas protection measures:
- An up-to-date working knowledge and understanding of current standards and guidance surrounding the assessment of hazardous ground gas, and the design, application, installation and verification of gas protection measure. This includes but is not limited to the following documents in the table below:

Document Reference	Guidance Document Title
CIRIA C665 - 2007	Assessing risks posed by hazardous ground gases to buildings.
CIRIA 716 - 2012	Remediating and mitigating risks from volatile organic compound (VOC) vapours from land affected by contamination.
CIRIA C735	Good practice on the testing and verification of protection systems for buildings against hazardous ground gases.
BS 8576:2013	Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs).
BS8485:2015+A1-2019	Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings.
BRE Report BR 211 2023	Guidance on protective measures for new buildings (including supplementary advice for extensions, conversions and refurbishment projects)
BRE Report BRE414	Protective measures for housing on gas-contaminated land
ASTM D4437	Standard Practice for Non-destructive Testing (NDT) for Determining the Integrity of Seams Used in Joining Flexible Polymeric Sheet Geomembranes.

- Have attending the following training courses relevant to the verification of gas protection measures:

Course Provider	Course and Key Aspects
PAG / GGS	A to Z of Ground Gas: - Introduction to Hazardous Ground Gas, Data Collection, Risk Assessment, Principles and Case Studies, Design and Practices of Gas Protection, Radon, The Verification Process, Verification in practice.
CIRIA	Verification of Gas Membranes: A 2016 Update

- Hold at least a senior engineer's position, with at least 10 years experience in the contaminated land industry, specifically with previous experience of Site Investigation, Hazardous Ground Gas Assessment, Validation of Remediation Works and Validation of Gas Protection Measures.

4 VISUAL INSPECTION/INTEGRITY TESTING PROCEDURE

4.1 Independent Visual Inspection Requirements

- 4.1.1 The visual inspections will require a suitably qualified engineer to visit the site to inspect the installation of ground gas protection measures.
- 4.1.2 The visit should be instructed by the installer via the site manager or project manager at the earliest opportunity following completion of each element/ area of the gas protection measures.
- 4.1.3 In order to properly inspect the membrane, the inspection must occur before placement of any obstructions such as insulation, reinforcement, sand blinding etc. to allow a thorough and unobstructed inspection of the entire membrane and associated gas protection products.
- 4.1.4 The verification inspection will include the following aspects:
- Gas Proof membrane to be suitable for application and conforming to specification (i.e. Gas resistant/ VOC resistant/ radon protective where required)
 - No punctures in membrane surface due to poorly prepared surface beneath
 - Adequate lapping of membrane joints
 - Adequate sealing of membrane penetrations and joints
 - Any sealing tape (double sided/ lapping) to be suitable for application and conforming to specification.
 - Overall continuity of gas protection system

4.2 Method of Recording and Reporting Inspections

- 4.2.1 In order to formally record and report the verification visit, the engineer will work through a number of elements (as above), with notes and comments recorded on a standard proforma on site. This will then be written up in a digital format upon return to the office.
- 4.2.2 A example of the proforma to be used is included in Appendix C for reference.
- 4.2.3 Following each inspection, the engineer will report back to the site manager / project manager on site, with recommendations made for any required remedial actions and to confirm whether inspected areas/ elements of the gas protection system have passed, allowing work and concrete pours to progress.
- 4.2.4 IDG will issue a digital copy of the completed proforma to the project manager for the site/

progress record. IDG will retain digital copies of the information for inclusion in the verification report that shall be issued after the last inspection and integrity test has occurred at the development.

4.3 Integrity Testing Scope and Methodology

4.3.1 Following review of all available guidance, and with consideration of the CSM, and design details, IDG have determined that the most appropriate methods of integrity testing to use for the development are a combination of mechanical point stress tests and air lance testing of membrane seams and joins.

4.3.2 Whilst air lance testing is the preferable method, in accordance with the CIRIA 735 guidance, Mechanical Point Stressing is more appropriate in hard-to-reach areas where it is not possible to air lance. IDG consider that the complexity of the substructure design is likely to result in a number of areas where air lance testing is not possible/ practical. Such areas are therefore more suited to mechanical point stress testing.

4.3.3 Mechanical Point Stressing is to be undertaken in accordance with relevant guidance document ASTM D4437-08:2013, (Standard Practice for Non-destructive Testing for Determining the Integrity of Seams Used in Joining Flexible Polymeric Sheet Geomembranes) utilising the following methodology:

'This test method shall be used as a qualitative measure of edge bonding. A blunt instrument (for example, a screwdriver) shall be run along the edge of the seam to find obvious unbonded areas. The procedure shall not puncture or otherwise damage the sheet material. Perform point stressing only after the seam has had sufficient time to cure in accordance with manufacturer's directions.'

4.3.4 Air Lance Testing is to be undertaken in accordance with relevant guidance document ASTM D4437-08:2013, (Standard Practice for Non-destructive Testing for Determining the Integrity of Seams Used in Joining Flexible Polymeric Sheet Geomembranes) utilising the following methodology:

'Inspect all seams for unbonded areas using an air nozzle directed on the upper seam edge and surface to detect loose edges, ripples indicating unbonded areas within the seam, or other undesirable seam conditions. Check all bonded seams using a minimum 50 psi (345 kPa) (gage) air supply directed through a 3/16 in. (4.8 mm) (typical) nozzle, held not more than 2 in. (51 mm) from the seam edge and directed at the seam edge'.

4.3.5 IDG have the required specialist equipment, conforming to the requirements of ASTM D4437-08:2013, to enable a competent engineer to complete the air lance integrity testing in accordance with the requirements of CIRIA C735.

4.4 Elements of Gas Protection Requiring Integrity Testing

4.4.1 IDG consider the element of gas membrane installation most commonly found to be unsatisfactory is where individual sheets of membrane are joined together, or where service penetrations and tophats have been bonded to the gas membrane. Creases, dampness, and poor workmanship often lead to poorly sealed joins, which results in a significant loss of continuity and therefore integrity across the gas membrane system as a whole.

4.4.2 IDG consider that mechanical point stressing and air lance testing will allow such weaknesses in the membrane installation to be highlighted quickly and transparently, enabling IDG to advise the installer of the need for any remedial work at the time of inspection.

4.4.3 The testing will therefore focus on:

- Integrity of joins/ seams and bonding between the gas membrane and DPM/ waterproofing elements
- Integrity testing of joins/ seams and bonding between Liquid Barrier and gas membrane sheets
- Integrity of joins/ seams and bonding between individual gas membrane sheets
- Integrity of joint/ seams and bonding between any additional potential discontinuities, including service penetrations (top hats), internal wall structures, around doorways etc.

4.5 Performance Requirements of Air Lance Integrity Testing

- 4.5.1 The air lance testing will highlight any areas where the joins or seams are inadequately bonded by an apparent ruffling of the membrane on the opposite site of the join as the air flow passes through the join and sealing tape. Where seams are very poorly bonded, the air lance is likely to visibly open the join.
- 4.5.2 Any locations where this occurs are considered to be an integrity failure and should be recorded on the proforma.
- 4.5.3 Upon completion of the testing, the engineer should walk around each block with the site manager and/ or installers, with each failure point highlighted and discussed, and remedial repair requirements instructed as necessary.
- 4.5.4 Following completion of any remedial repair works, the joins and seams should be re-tested using the same air lance methodology to ascertain that any remedial works have been successful and no further failures occur.
- 4.5.5 Areas of the gas protection should not be certified until the integrity testing has demonstrated sufficient conformity to the requirements for fully bonded joins and seams, thus ensuring continuity of the gas membrane protection.

4.6 Method of Recording and Reporting Integrity Testing

- 4.6.1 In order to formally record and report the integrity testing, the engineer will complete an integrity testing proforma recording relevant diagrams, notes and comments on site. This will then be written up in a digital format upon return to the office.
- 4.6.2 An example of the proforma to be used is presented in Appendix D for reference.
- 4.6.3 Following each integrity testing visit, the engineer will report back to the site manager / project manager on site, with recommendations made for any required remedial actions and to confirm whether areas of the gas protection measures have passed, allowing work to progress.
- 4.6.4 IDG will issue a digital copy of the completed proforma to the project manager for the site progress record. IDG will retain digital copies of the information for inclusion in the verification report.

4.7 On-going Duty of Care and Verification

- 4.7.1 Notwithstanding the outcome of the inspections and integrity testing as detailed above, IDG understand that whilst the verification inspection and testing are applicable and robust at the time of reporting, there remains the potential for the integrity of the installed gas protection

measures to be compromised post-verification.

- 4.7.2 Compromise to the effectiveness of the installed gas measures can occur as a result of bad practice and lack of awareness of the significance of the gas protection measures. For example, puncturing of the membrane during placement of steel reinforcement, stressing/ tearing of the membrane by excessive footfall or trafficking, damage by follow-on trades including damage to membrane or blocking up ventilation air bricks etc.
- 4.7.3 Site staff and contractors have a duty of care to minimise post-verification damage to gas protection measures. Where such occurrences take place after independent or non-independent verification has occurred, both IDG and site staff have a duty of care to ensure that any damage is identified, reported and appropriate remediation is completed.
- 4.7.4 Should the engineer observe unacceptable practices or damage occurring on plots during later site visits or be provided with information from other parties that indicate the integrity of the gas protection measures has been compromised by follow on construction activities, IDG withhold the right to revoke a previous validation.

4.8 Non-Independent QA Inspections

- 4.8.1 Whilst IDG are to provide independent inspections and testing of the installed radon gas protection measures as outlined in the preceding sections of this document, The Design & Build Contractor (Vinci) will carry out their own QA inspections and produce bespoke QA records for the radon protection measures.
- 4.8.2 In addition, any QA records completed by the installers (Lainton Services Ltd) will be incorporated into the Vinci QA records.
- 4.8.3 QA Records prepared by the installers and design/build contractor are considered to be 'non-independent' (i.e. there is a conflict of interests that would typically deem the information unsuitable for standalone verification purposes).
- 4.8.4 For this project non-independent information will be largely supplementary to IDG's independent verification, and will serve to provide additional information, records and confidence throughout the installation.
- 4.8.5 The non-independent QA records should include details of the products, key aspects, and photographic records that demonstrate appropriate installation of the gas protection measures.
- 4.8.6 In certain circumstances, at the discretion of the IDG verification engineer, (and subject to the design complexity of a given element of the gas protection, and confidence in the quality of work), it may be considered appropriate that small simple sections of the gas protection installation or minor remedial works can be documented via non-independent verification.
- 4.8.7 All non-independent QA information should be issued to IDG in a timely manner and suitable digital format for review and approval before any further work is undertaken, to allow remedial works to be conducted should IDG's engineer have concerns or not be satisfied with the information provided.
- 4.8.8 Following satisfactory review, IDG will notify the site manager that the installed measures are deemed to be acceptable, and that follow on work (screeding/ concrete pours etc) can progress.
- 4.8.9 The non-independent QA information will be presented in the final gas protection measures verification report on completion of the works to supplement IDG's independent verification.

5 VERIFICATION

5.1 Verification Report

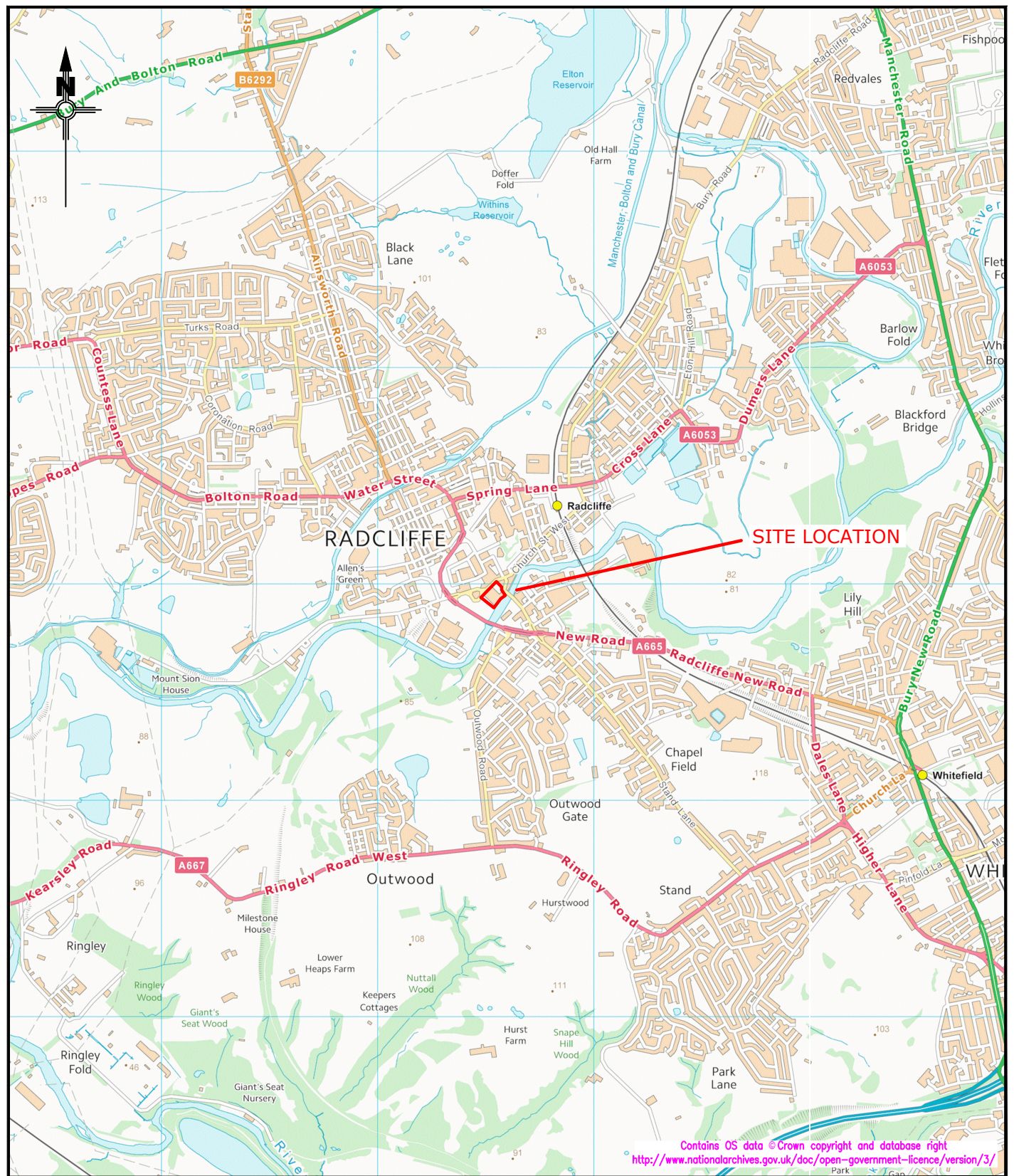
- 5.1.1 All above works should be documented by means of a verification report, however IDG consider it is neither practicable nor cost effective to produce individual verification reports for individual areas/ aspects of the gas protection measures.
- 5.1.2 Therefore, and as advocated in CIRIA C735, IDG propose that areas should be subject to individual certification initially by means of the completed inspection/ integrity testing proforma that will be issued to the Client and the relevant regulator.
- 5.1.3 Upon completion of the works, a final comprehensive Gas Protection Measures Verification Report will be produced, with reference made to completed proforma, which will be included as an Appendix in the verification report.

6 POST-CONSTRUCTION RADON MONITORING

6.1 Radon Monitoring Requirements

- 6.1.1 On consideration of the type of building to be constructed, employers must ensure the health and safety of employees and others who have access to their work environment and BRE document BR211:2023 notes that an assessment of health and safety risks under national HSE regulations should include radon where the workplace is in a radon-affected area, or in any location where there is a basement that is regularly occupied, with both of these scenarios applying to the site. This assessment requires the monitoring of radon in the building post construction.
- 6.1.2 Post-construction radon monitoring is outside of IDG's scope of works and expertise, and therefore will not be documented within IDG's Radon Protection Verification Report.
- 6.1.3 It is therefore recommended that consultation with a third-party specialist is undertaken at the earliest opportunity, to ensure that post-construction radon monitoring is appropriate to the proposed end-use environment and undertaken and reported in a timely manner by an appropriately qualified specialist in accordance with current relevant guidance.
- 6.1.4 Copies of the post-construction radon monitoring data and any associated reports should be issued to the Local Authority EHO for completeness.

Appendix A



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<http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>



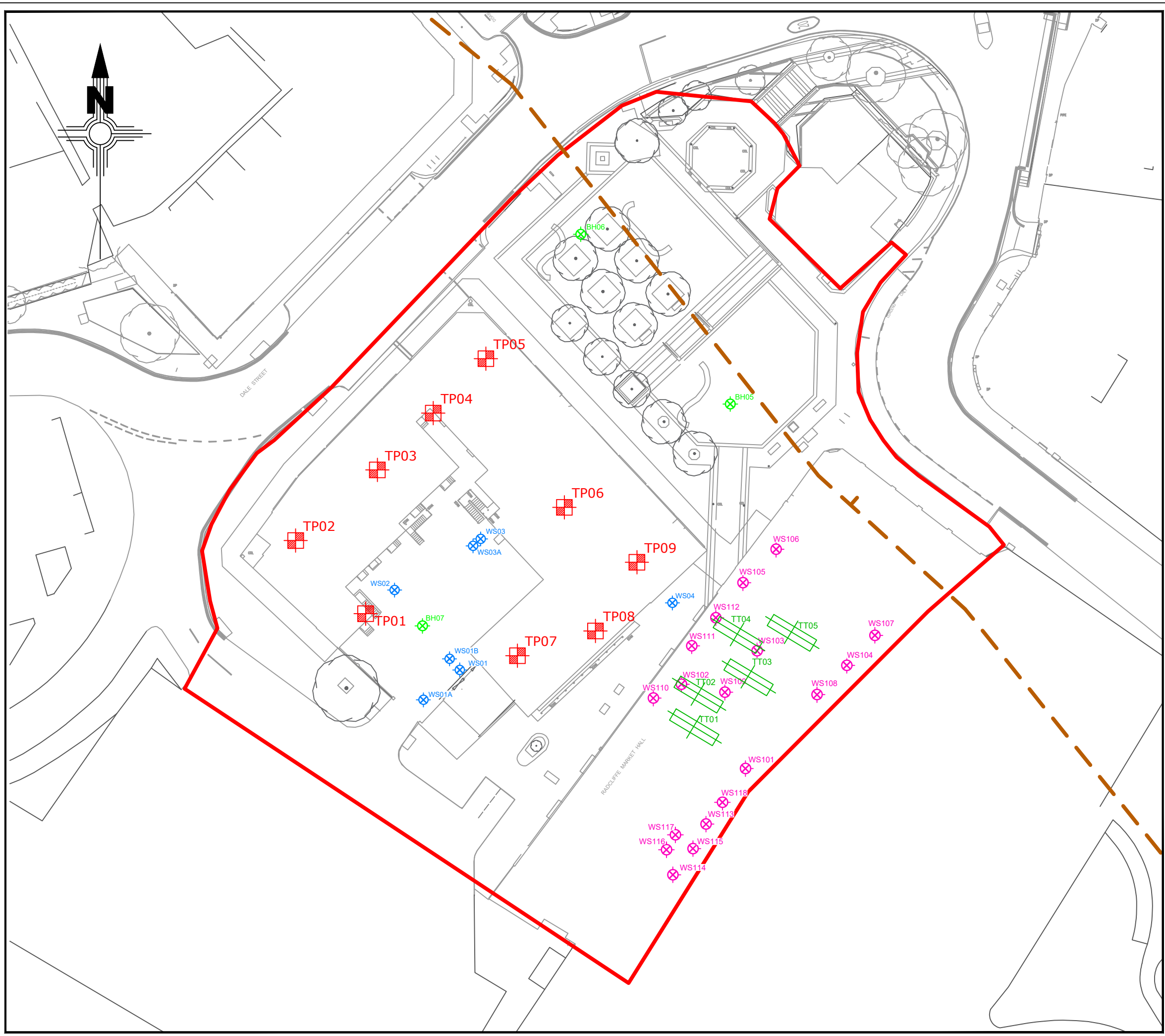
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CLIENT	BURY COUNCIL		
JOB TITLE	RADCLIFFE HUB		
DRAWING TITLE	SITE LOCATION PLAN		

DRAWN BY MJ	SIGNATURE	DATE 26/11/21	STATUS	
APPROVED BRB	SIGNATURE	DATE 26/11/21	SCALE 1:25,000@A4	DRG No. 5238-G-D001

A3 border: 309 X 273



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KEY

- Site Boundary
- IDG Trial Pit Location (Post-Demo - Jan 2024)
- IDG Window Sample Location 2022
- IDG Rotary Borehole Location 2022
- IDG Window Sample Location April-May 2024
- Vinci Trial Trench Location April 2024
- Approximate Location of Inferred Geological Fault
- Historical Site Feature - 1848 OS Plan
- Historical Site Feature - 1893 OS Plan

Revision	Description	Date
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iD GeoEnvironmental Limited

CLIENT

BURY COUNCIL

JOB TITLE

RADCLIFFE HUB

DRAWING TITLE

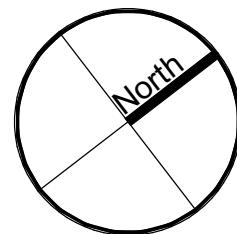
EXPLORATORY HOLE LOCATION PLAN

STATUS

FINAL

DRAWN BY LM	SIGNATURE	DATE 28-05-24
APPROVED BRB	SIGNATURE	DATE 28-05-24

SCALE 1:500@A3	DRG No. 5238-G-D004-RevG
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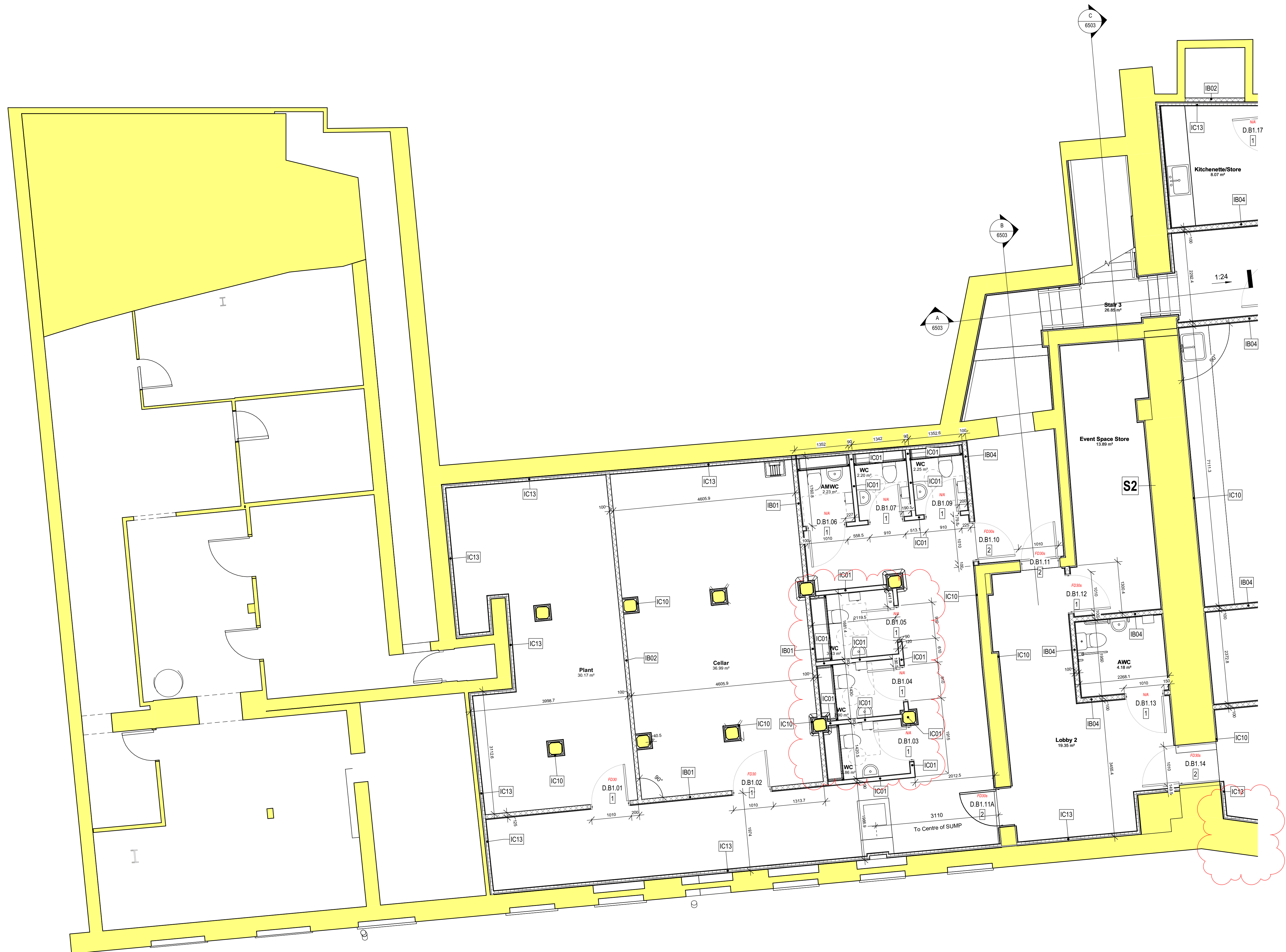


1 : 100

Item	Task	Start Date	End Date	Duration	Owner	Assignee	Status	Comments
	Wally assigned: WC layout updated to accommodate design & B&B sitting out to pre-lap kitchen, Dry Ice & Unit 2 to connect W/entrance. Construction issue.				MER		23.02.24	
P12	Stage 4: Stage 4: New Store in West of Plant Room, Down to Unit 4 & Unit 5 (Consider) open sublets; stairs limited to Star 1 Lobby	01/02/22	01/02/22	1	DAY		22.04.23	
P11	Updated for Planning				DAY		23.02.21	
P10	Columns omitted and grid lines added				DAY		10.02.22	
P09	Stage 3 Issue				AT		14.07.23	
P08	General Layout Planning				AT		08.09.22	
P07	Sanitary/water updates				DAS		17.08.22	
P06	General updates to comments				NM		12.08.22	
P05	Updated - new services added				NM		29.07.22	
P04	Updated to split fire strategy. Star 1, Stairs reduced. Stairs down to mirror event space changed to side hung door with wheel between room main event space and WC's widened.				DAS		23.06.22	
P03	Star 1 lobby with increased. Star 1 lobby layout revised				AS		09.06.22	
P02	Added WC's and B&B's				AS		15.06.22	
P01	Added WC's and B&B's				AS		15.06.22	
Item	Task	Start Date	End Date	Duration	Owner	Assignee	Status	Comments
	Vinci Construction UK Ltd							
	Radcliffe Market Chambers & Basement							
	Proposed Basement Plan							
	P5860 2000							C01
	RADHUB-POZ-ZZ-B1-DRA-2000							@ A0
01/02/22	1 : 100							
Item	Task	Start Date	End Date	Duration	Owner	Assignee	Status	Comments
	DM				TT		S5	
	Planning				Tender		Construction	
	Design				Contract		Record	

Woolfside House
2 Woolfside Road
Aireborough
WAF 214 2TH

441 81 9291 744
www.pozzi.co.uk
architect@pozzi.co.uk



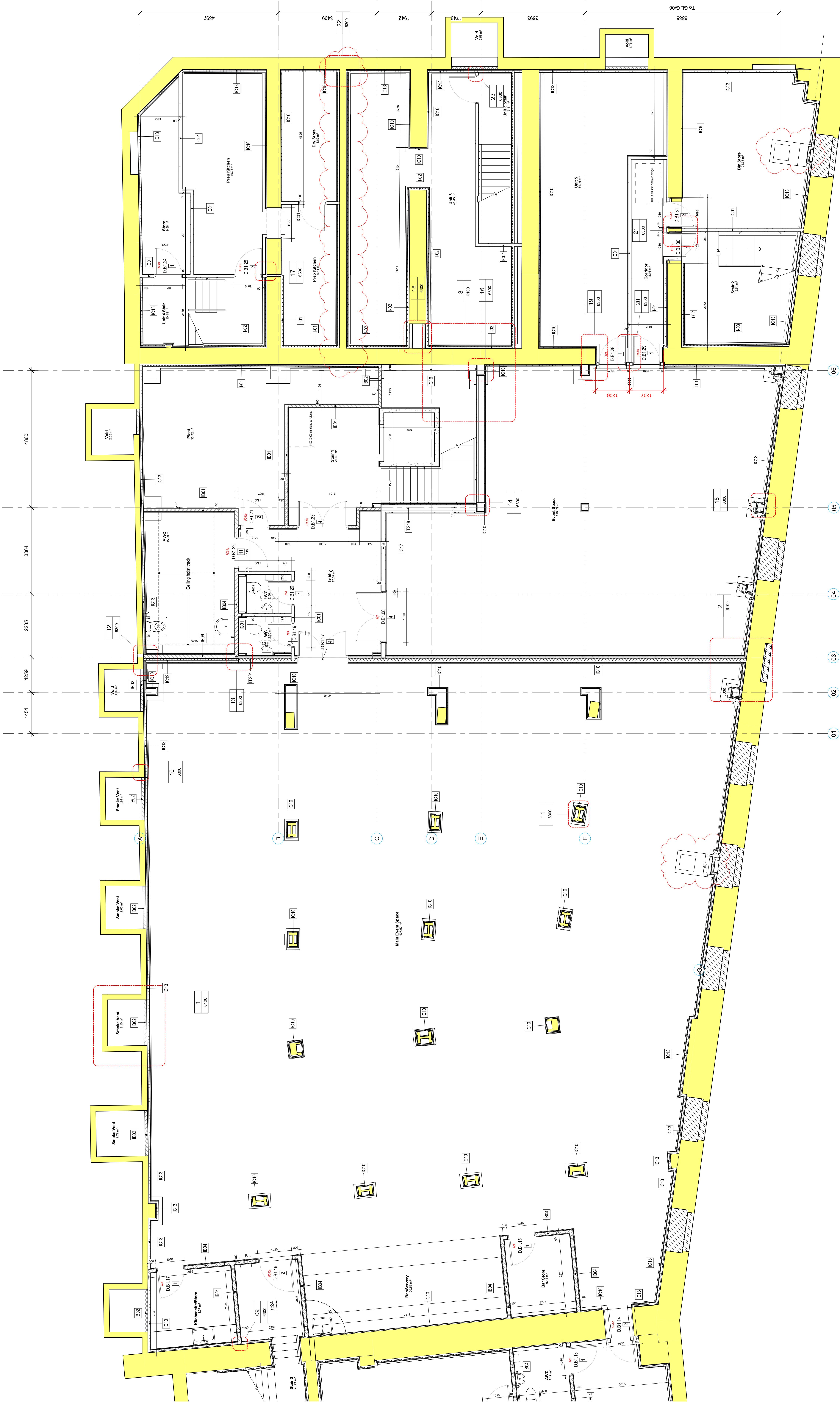
Scale Bars		TO BE USED ONLY AS GUIDANCE					
1:5	mm		50		150		250
1:10	mm		100		300		500
1:20	mm		500		800		
1:50	mm		500		1500		2500

Job	Radcliffe Market Chambers & Basement
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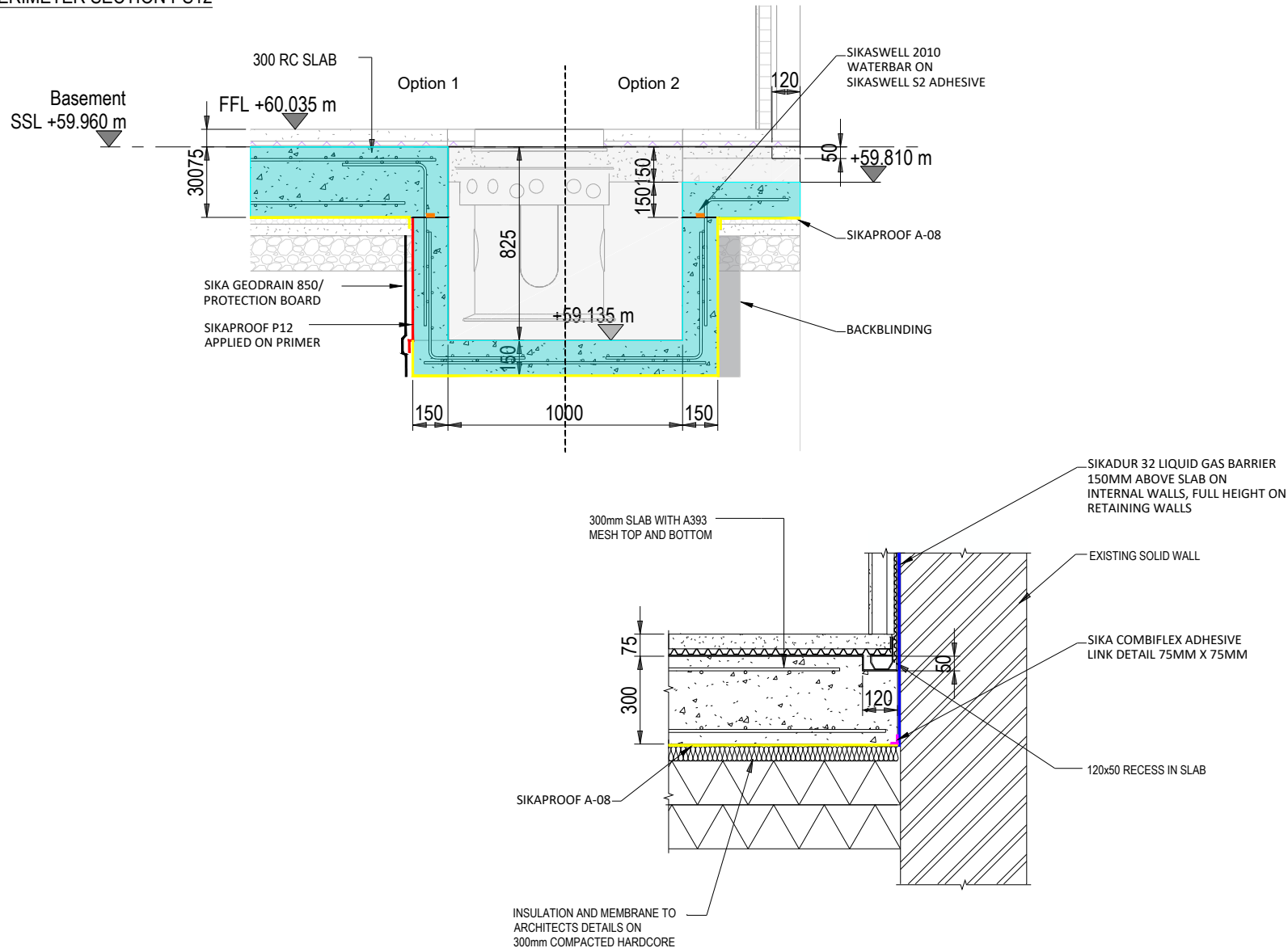
P5860_2110	Rev	C01
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DM	Approved	TT	STATUS	S5
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pozzi



PERIMETER SECTION PS12



TYPICAL GROUND BEARING SLAB DETAILS

NOTES:

SIKAPROOF A-08:-

SikaProof® A-08 is an embossed polyolefin FPO sheet membrane for pre-applied fully bonded below ground waterproofing of reinforced concrete structures. Membrane thickness 0,8 mm. SikaProof® A-08 is cold-applied without heat or open flames to prepared substrates or onto formwork before fixing reinforcement and concrete placement. The membrane has self-adhesive longitudinal strips for bonding overlap joints and is laminated with a unique sealant and a non-woven fleece backing layer which creates a bond with the cast concrete.

SIKADUR 32:-

Sikadur®-32 Normal is a moisture tolerant, structural, two part bonding agent, based on a combination of epoxy resins and special fillers, designed for use at temperatures between +10°C and +30°C.

SIKAPROOF P12:-

SikaProof® P-12 is a flexible polyolefin (FPO) self-adhesive sheet membrane for post-applied fully bonded below ground waterproofing of existing reinforced concrete structures. Membrane thickness 1,2 mm. SikaProof® P-12 is pre-coated with an adhesive sealant layer and is cold applied onto primed concrete structure by a simple peel and stick process by using SikaProof® Primer-01 as a system primer.

SIKA GEODRAIN 850:-

Sika® Drain-850 Geo is a high density polyethylene (HDPE), heavy duty drainage and protection sheet with 10 mm high dimples on the bottom layer and a bonded geotextile (PP) filtration layer on the top layer.

SIKA COMBIFLEX ADHESIVE:-

The Sikadur®-Combiflex® System is a high performance joint sealing system for construction, expansion and connection joints as well as for cracks. When fixed to the joint it allows irregular and high movement in more than one direction, whilst maintaining a high quality seal. Sikadur-Combiflex® System is post-applied tape systems adhered with epoxy resin onto the membrane, providing an ideal solution for construction and expansion joints, in particular to seal joints of precast components.

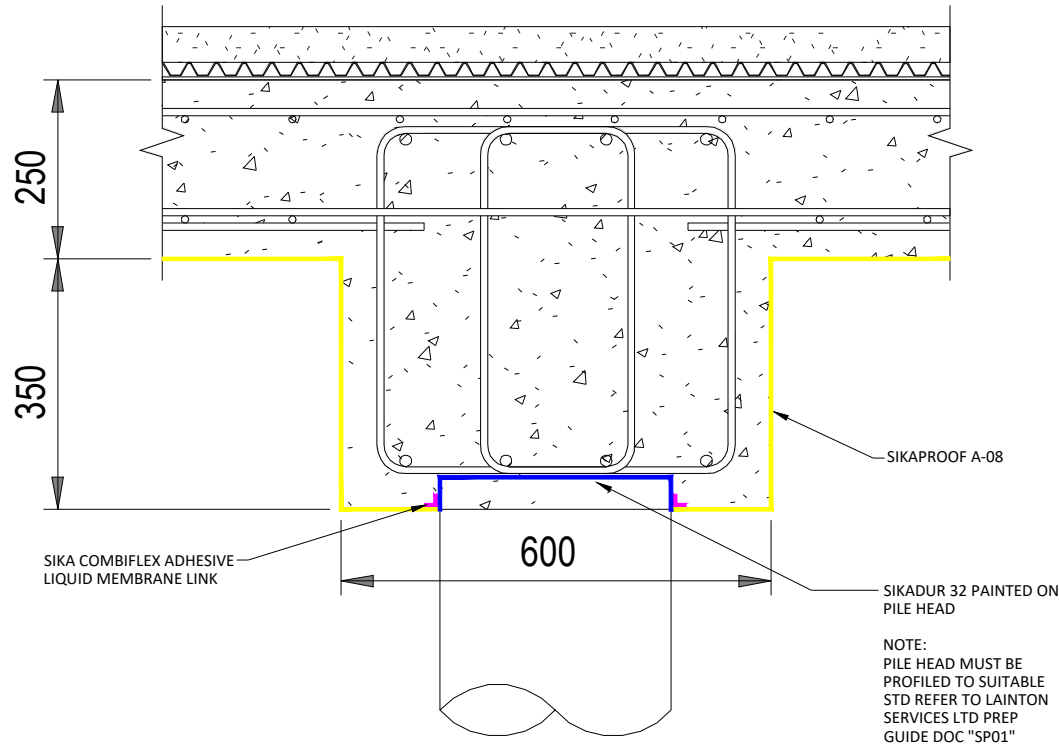
COLOUR LEGEND:

- SIKAPROOF A-08
- SIKADUR 32
- SIKAPROOF P12
- SIKA GEODRAIN 850
- SIKA COMBIFLEX ADHESIVE
- WATERPROOF CONCRETE

P01	01/10/2024	GASPROOFING SECTIONS 1	
Rev:	Date:	Description:	Eng:

Scale: NTS @ A4	Date: 10/09/24	Pepper House Business Centre, 1 Pepper Road, Hazel Grove, Stockport, SK7 5DP. T: 0161 483 7676 E: enquiries@laintonservices.com W: laintonservices.com	Project: RADCLIFFE MARKET & CHAMBERS	 Lainton Services National Waterproofing Specialists
Drawn: HHCD	Checked: JD		Client: VINCI CONSTRUCTION LTD	
Drawing No: RADHUB-LAI-V3-B1-DR-Y-0001 Project No: C7882			Title: GAS SECTIONS 1	

GROUND BEAM OPTION 1



TYPICAL INTERNAL GROUND BEAM

NOTES:

SIKAPROOF A-08:-

SikaProof® A-08 is an embossed polyolefin FPO sheet membrane for pre-applied fully bonded below ground waterproofing of reinforced concrete structures. Membrane thickness 0,8 mm. SikaProof® A-08 is cold-applied without heat or open flames to prepared substrates or onto formwork before fixing reinforcement and concrete placement. The membrane has self-adhesive longitudinal strips for bonding overlap joints and is laminated with a unique sealant and a non-woven fleece backing layer which creates a bond with the cast concrete.

SIKADUR 32:-

Sikadur®-32 Normal is a moisture tolerant, structural, two part bonding agent, based on a combination of epoxy resins and special fillers, designed for use at temperatures between +10°C and +30°C.

SIKAPROOF P12:-

SikaProof® P-12 is a flexible polyolefin (FPO) self-adhesive sheet membrane for post-applied fully bonded below ground waterproofing of existing reinforced concrete structures. Membrane thickness 1,2 mm. SikaProof® P-12 is pre-coated with an adhesive sealant layer and is cold applied onto primed concrete structure by a simple peel and stick process by using SikaProof® Primer-01 as a system primer.

SIKA GEODRAIN 850:-

Sika® Drain-850 Geo is a high density polyethylene (HDPE), heavy duty drainage and protection sheet with 10 mm high dimples on the bottom layer and a bonded geotextile (PP) filtration layer on the top layer.

SIKA COMBIFLEX ADHESIVE:-

The Sikadur®-Combiflex® System is a high performance joint sealing system for construction, expansion and connection joints as well as for cracks. When fixed to the joint it allows irregular and high movement in more than one direction, whilst maintaining a high quality seal. Sikadur-Combiflex® System is post-applied tape systems adhered with epoxy resin onto the membrane, providing an ideal solution for construction and expansion joints, in particular to seal joints of precast components.

COLOUR LEGEND:

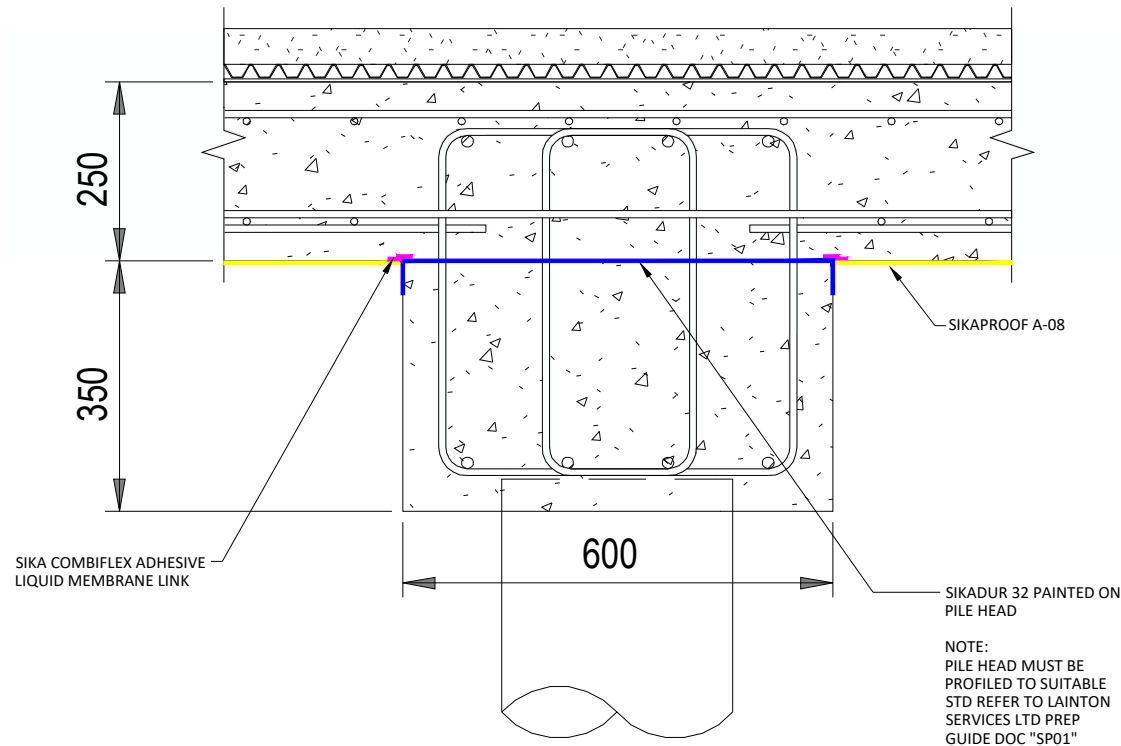
- SIKAPROOF A-08
- SIKADUR 32
- SIKAPROOF P12
- SIKA GEODRAIN 850
- SIKA COMBIFLEX ADHESIVE

P01	01/10/2024	GROUND BEAM GASPROOFING OPTION 1	
Rev:	Date:	Description:	Eng:

Scale: NTS @ A4	Date: 10/09/24	Pepper House Business Centre, 1 Pepper Road, Hazel Grove, Stockport, SK7 5DP. T: 0161 483 7676 E: enquiries@laintonservices.com W: laintonservices.com
Drawn: HHCD	Checked: JD	
Drawing No: RADHUB-LAI-V3-B1-DR-Y-0003	Project No: C7882	

Project:	RADCLIFFE MARKET & CHAMBERS
Client:	VINCI CONSTRUCTION LTD
Title:	GROUND BEAM OPTION 1

GROUND BEAM OPTION 2



TYPICAL INTERNAL GROUND BEAM

NOTES:

SIKAPROOF A-08:-

SikaProof® A-08 is an embossed polyolefin FPO sheet membrane for pre-applied fully bonded below ground waterproofing of reinforced concrete structures. Membrane thickness 0,8 mm. SikaProof® A-08 is cold-applied without heat or open flames to prepared substrates or onto formwork before fixing reinforcement and concrete placement. The membrane has self-adhesive longitudinal strips for bonding overlap joints and is laminated with a unique sealant and a non-woven fleece backing layer which creates a bond with the cast concrete.

SIKADUR 32:-

Sikadur®-32 Normal is a moisture tolerant, structural, two part bonding agent, based on a combination of epoxy resins and special fillers, designed for use at temperatures between +10°C and +30°C.

SIKAPROOF P12:-

SikaProof® P-12 is a flexible polyolefin (FPO) self-adhesive sheet membrane for post-applied fully bonded below ground waterproofing of existing reinforced concrete structures. Membrane thickness 1,2 mm. SikaProof® P-12 is pre-coated with an adhesive sealant layer and is cold applied onto primed concrete structure by a simple peel and stick process by using SikaProof® Primer-01 as a system primer.

SIKA GEODRAIN 850:-

Sika® Drain-850 Geo is a high density polyethylene (HDPE), heavy duty drainage and protection sheet with 10 mm high dimples on the bottom layer and a bonded geotextile (PP) filtration layer on the top layer.

SIKA COMBIFLEX ADHESIVE:-

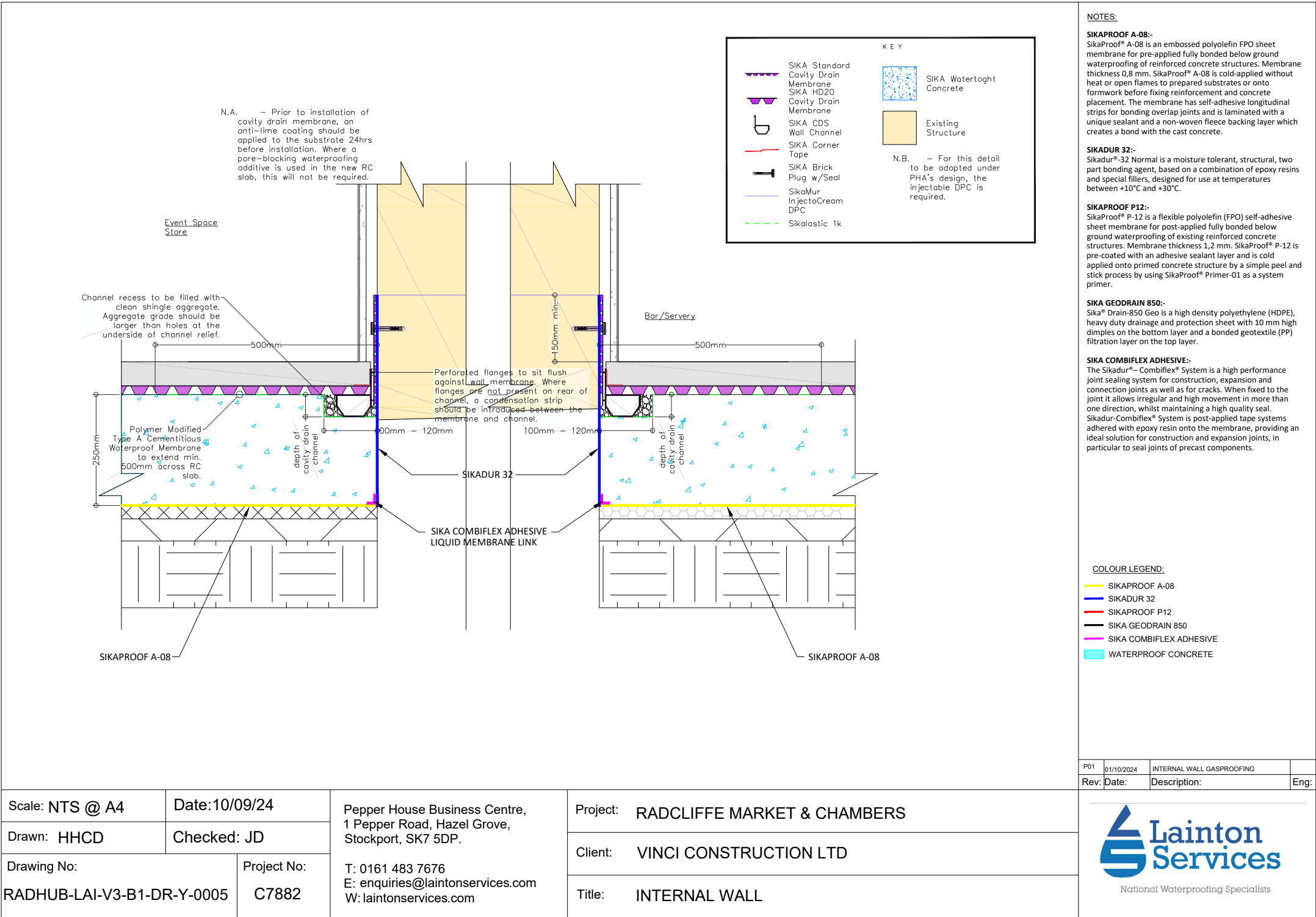
The Sikadur®-CombiFlex® System is a high performance joint sealing system for construction, expansion and connection joints as well as for cracks. When fixed to the joint it allows irregular and high movement in more than one direction, whilst maintaining a high quality seal. Sikadur-CombiFlex® System is post-applied tape systems adhered with epoxy resin onto the membrane, providing an ideal solution for construction and expansion joints, in particular to seal joints of precast components.

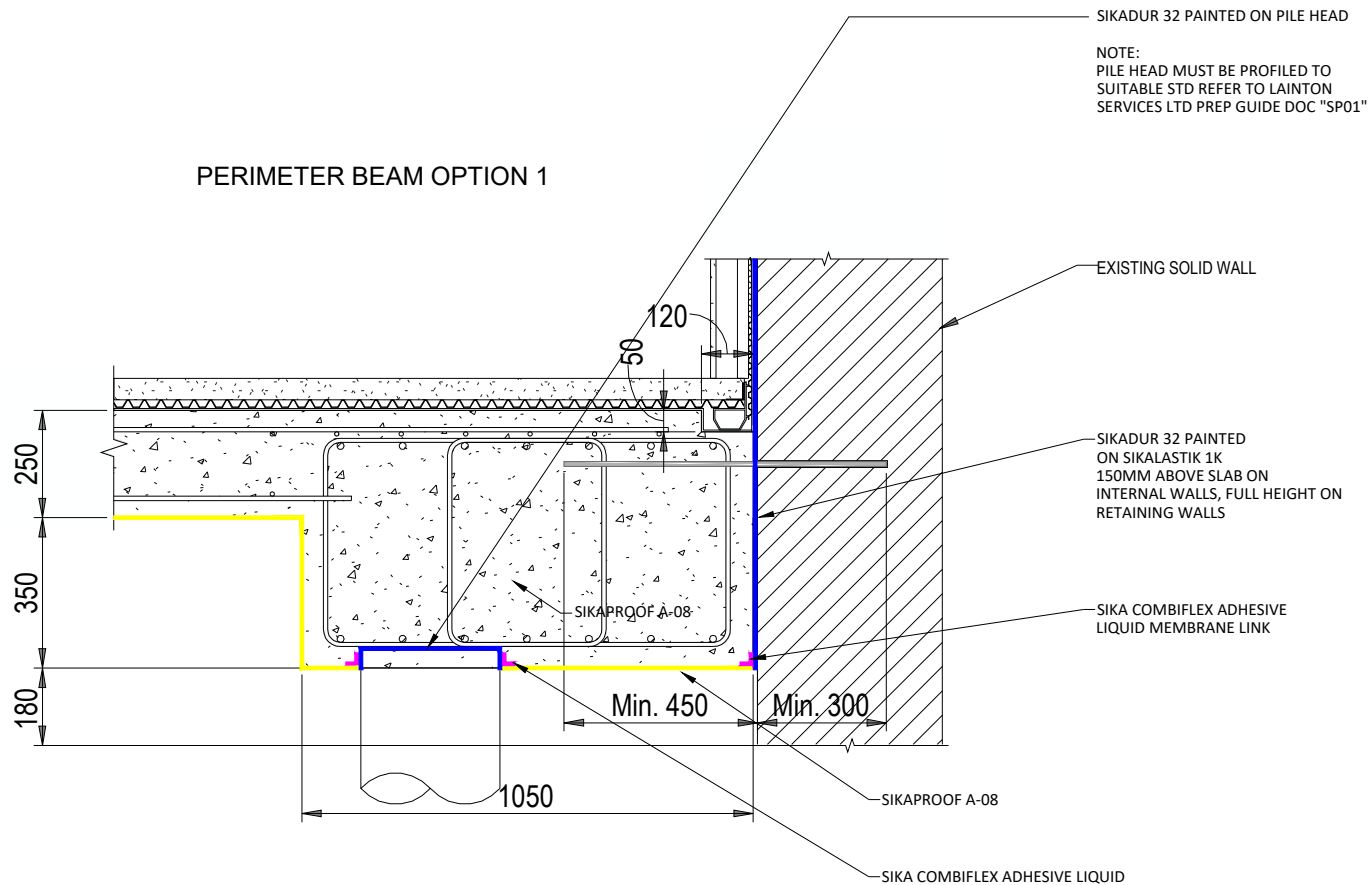
COLOUR LEGEND:

- SIKAPROOF A-08
- SIKADUR 32
- SIKAPROOF P12
- SIKA GEODRAIN 850
- SIKA COMBIFLEX ADHESIVE

P01	01/10/2024	GROUND BEAM GASPROOFING OPTION 2	
Rev:	Date:	Description:	Eng:

Scale: NTS @ A4	Date: 10/09/24	Pepper House Business Centre, 1 Pepper Road, Hazel Grove, Stockport, SK7 5DP. T: 0161 483 7676 E: enquiries@laintonservices.com W: laintonservices.com	Project: RADCLIFFE MARKET & CHAMBERS	 Lainton Services National Waterproofing Specialists
Drawn: HHCD	Checked: JD		Client: VINCI CONSTRUCTION LTD	
Drawing No: RADHUB-LAI-V3-B1-DR-Y-0004	Project No: C7882		Title: GROUND BEAM OPTION 2	





NOTES:

SIKAPROOF A-08:-

SikaProof® A-08 is an embossed polyolefin FPO sheet membrane for pre-applied fully bonded below ground waterproofing of reinforced concrete structures. Membrane thickness 0,8 mm. SikaProof® A-08 is cold-applied without heat or open flames to prepared substrates or onto formwork before fixing reinforcement and concrete placement. The membrane has self-adhesive longitudinal strips for bonding overlap joints and is laminated with a unique sealant and a non-woven fleece backing layer which creates a bond with the cast concrete.

SIKADUR 32:-

Sikadur® 32 Normal is a moisture tolerant, structural, two part bonding agent, based on a combination of epoxy resins and special fillers, designed for use at temperatures between +10°C and +30°C.

SIKAPROOF P12:-

SikaProof® P-12 is a flexible polyolefin (FPO) self-adhesive sheet membrane for post-applied fully bonded below ground waterproofing of existing reinforced concrete structures. Membrane thickness 1,2 mm. SikaProof® P-12 is pre-coated with an adhesive sealant layer and is cold applied onto primed concrete structure by a simple peel and stick process by using SikaProof® Primer-01 as a system primer.

SIKA GEODRAIN 850:-

Sika® Drain-850 Geo is a high density polyethylene (HDPE), heavy duty drainage and protection sheet with 10 mm high dimples on the bottom layer and a bonded geotextile (PP) filtration layer on the top layer.

SIKA COMBIFLEX ADHESIVE:-

The Sikadur®-Combiflex® System is a high performance joint sealing system for construction, expansion and connection joints as well as for cracks. When fixed to the joint it allows irregular and high movement in more than one direction, whilst maintaining a high quality seal. Sikadur-Combiflex® System is post-applied tape systems adhered with epoxy resin onto the membrane, providing an ideal solution for construction and expansion joints, in particular to seal joints of precast components.

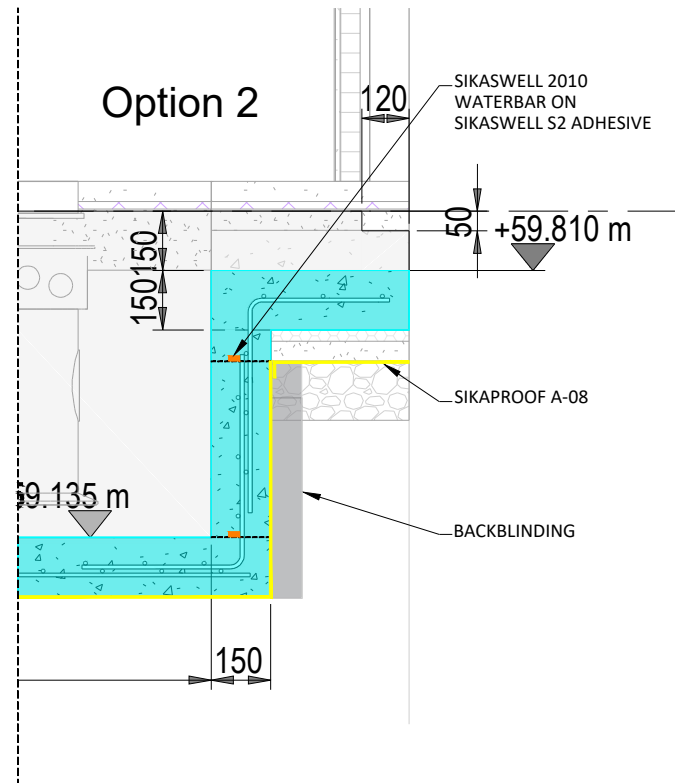
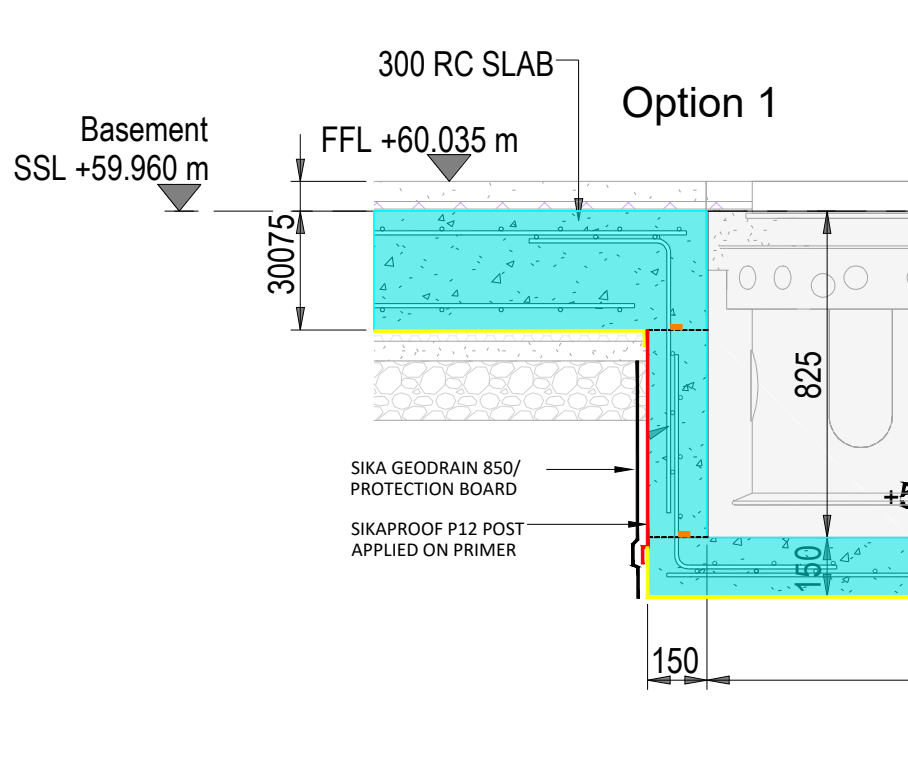
COLOUR LEGEND:

- SIKAPROOF A-08
- SIKADUR 32
- SIKAPROOF P12
- SIKADRAIN 850
- SIKACOMBIFLEX ADHESIVE
- WATERPROOF CONCRETE

P01	01/10/2024	PERIMETER BEAM OPTION 1	
Rev:	Date:	Description:	Eng:

Scale: NTS @ A4	Date: 10/09/24	Pepper House Business Centre, 1 Pepper Road, Hazel Grove, Stockport, SK7 5DP. T: 0161 483 7676 E: enquiries@laintonservices.com W: laintonservices.com
Drawn: HHCD	Checked: JD	
Drawing No: RADHUB-LAI-V3-B1-DR-Y-0006	Project No: C7882	

Project:	RADCLIFFE MARKET & CHAMBERS
Client:	VINCI CONSTRUCTION LTD
Title:	PERIMETER BEAM OPTION 1



NOTES:

SIKAPROOF A-08:-

SikaProof® A-08 is an embossed polyolefin FPO sheet membrane for pre-applied fully bonded below ground waterproofing of reinforced concrete structures. Membrane thickness 0.8 mm. SikaProof® A-08 is cold-applied without heat or open flames to prepared substrates or onto formwork before fixing reinforcement and concrete placement. The membrane has self-adhesive longitudinal strips for bonding overlap joints and is laminated with a unique sealant and a non-woven fleece backing layer which creates a bond with the cast concrete.

SIKADUR 32:-

Sikadur®-32 Normal is a moisture tolerant, structural, two part bonding agent, based on a combination of epoxy resins and special fillers, designed for use at temperatures between +10°C and +30°C.

SIKAPROOF P12:-

SikaProof® P-12 is a flexible polyolefin (FPO) self-adhesive sheet membrane for post-applied fully bonded below ground waterproofing of existing reinforced concrete structures. Membrane thickness 1.2 mm. SikaProof® P-12 is pre-coated with an adhesive sealant layer and is cold applied onto primed concrete structure by a simple peel and stick process by using SikaProof® Primer-01 as a system primer.

SIKA GEODRAIN 850:-

Sika® Drain-850 Geo is a high density polyethylene (HDPE), heavy duty drainage and protection sheet with 10 mm high dimples on the bottom layer and a bonded geotextile (PP) filtration layer on the top layer.

SIKA COMBIFLEX ADHESIVE:-

The Sikadur®-Combiflex® System is a high performance joint sealing system for construction, expansion and connection joints as well as for cracks. When fixed to the joint it allows irregular and high movement in more than one direction, whilst maintaining a high quality seal. Sikadur-Combiflex® System is post-applied tape systems adhered with epoxy resin onto the membrane, providing an ideal solution for construction and expansion joints, in particular to seal joints of precast components.

COLOUR LEGEND:

- SIKAPROOF A-08
- SIKADUR 32
- SIKAPROOF P12
- SIKA GEODRAIN 850
- SIKA COMBIFLEX ADHESIVE
- WATERPROOF CONCRETE

P01	01/10/2024	GASPROOFING OF SUMP	
Rev:	Date:	Description:	Eng:

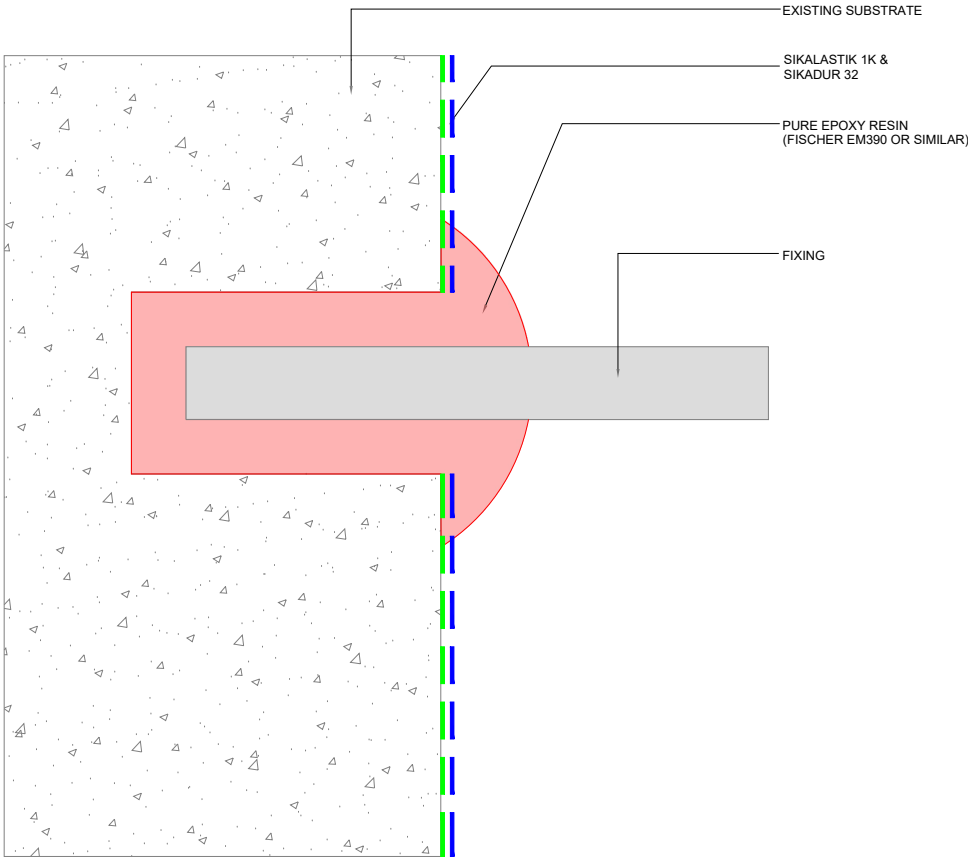
Scale: NTS @ A4	Date:10/09/24	Pepper House Business Centre, 1 Pepper Road, Hazel Grove, Stockport, SK7 5DP. T: 0161 483 7676 E: enquiries@laintonservices.com W: laintonservices.com
Drawn: HHCD	Checked: JD	
Drawing No: RADHUB-LAI-V3-B1-DR-Y-0009	Project No: C7882	

Project:	RADCLIFFE MARKET & CHAMBERS
Client:	VINCI CONSTRUCTION LTD
Title:	SUMP SECTION OPTIONS

NOTES:

SIKALASTIK 1K:-
Sikalastic®-1K GB is a one-component, crack-bridging, fibre-reinforced mortar, based on cement modified with special alkali-resistant polymers.

SIKADUR 32:-
Sikadur®-32 Normal is a moisture tolerant, structural, two part bonding agent, based on a combination of epoxy resins and special fillers, designed for use at temperatures between +10°C and +30°C.



COLOUR LEGEND:

— SIKALASTIK 1K
— SIKADUR 32
— PURE EPOXY RESIN (FISCHER EM390 OR SIMILAR)

C01	18/11/24	For Construction	JB
Rev:	Date:	Description:	Eng:

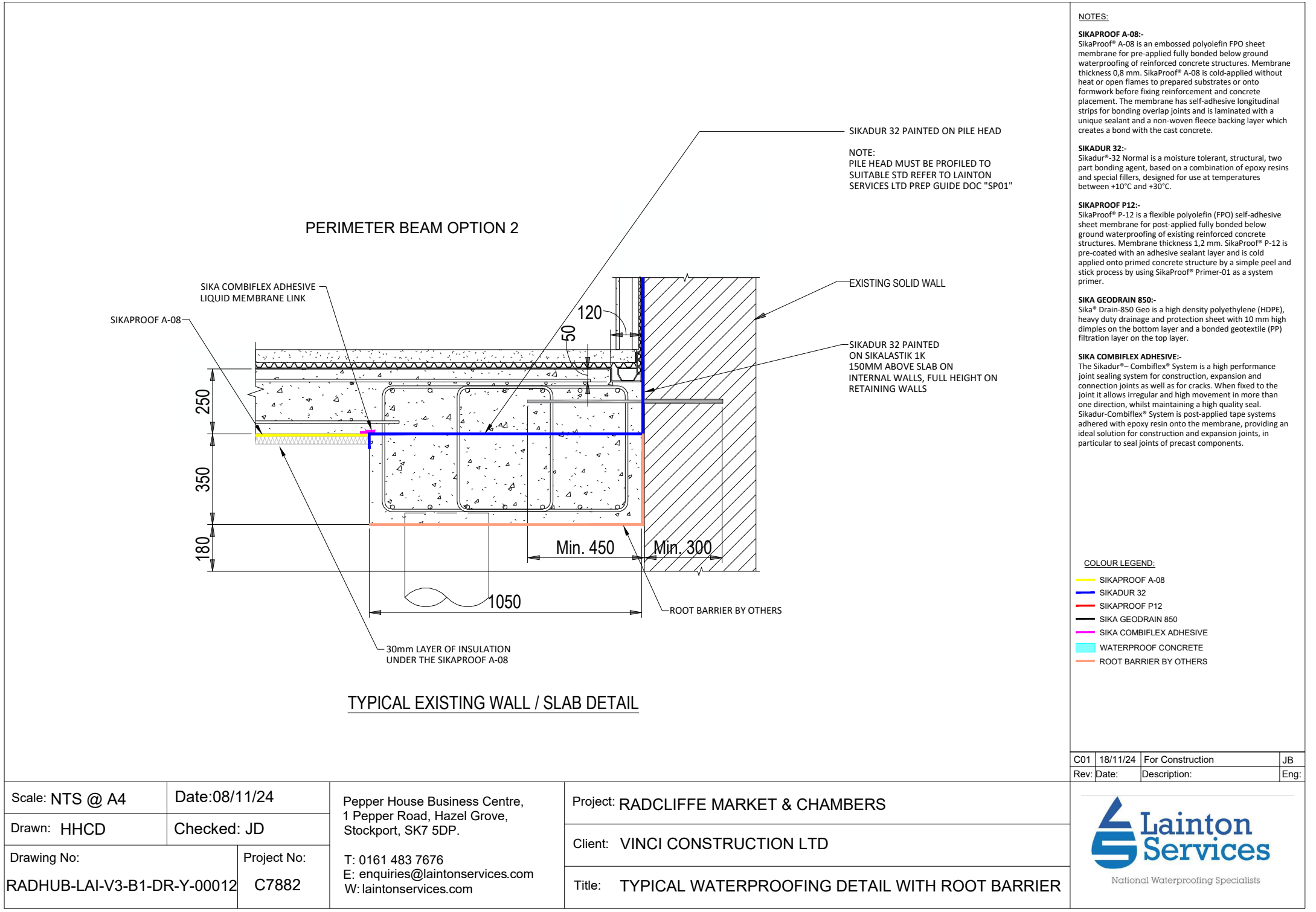
Scale: NTS @ A4	Date:11/10/24
Drawn: HHCD	Checked: JD
Drawing No: RADHUB-LAI-V3-B1-DR-Y-00011	Project No: C7882

Pepper House Business Centre,
1 Pepper Road, Hazel Grove,
Stockport, SK7 5DP.

T: 0161 483 7676
E: enquiries@laintonservices.com
W: laintonservices.com

Project:	RADCLIFFE MARKET & CHAMBERS
Client:	VINCI CONSTRUCTION LTD
Title:	RENDER PENETRATION SKETCH





- - Option 2
- - Option 1



Appendix B

SikaProof® A-05/-08/-12

Fully bonded FPO sheet membrane waterproofing system for basement and other below ground structures

Product Description

SikaProof® A-05/-08/-12 is a fully and permanently bonded, self-adhesive, composite sheet membrane waterproofing system. It consists of an embossed polyolefin (FPO) membrane laminated with a sealant grid and a non-woven fleece. SikaProof® A-05/-08/-12 is cold-applied and pre-applied, as it is installed without heat or open-flames, and before the steel reinforcement is fixed and the concrete is poured.

Uses

Damp-proofing, concrete protection and waterproofing for basements and other below ground concrete structures against ground water ingress:

- Below ground concrete slabs
- Below ground walls with both single and double -faced formwork
- Extensions and reconstruction works
- For prefabricated constructions

Characteristics / Advantages

- Cold-applied (no pre-heating or open flames) and pre-applied, before the reinforcement is fixed and the concrete is poured
- Fully and permanently bonded to the concrete structure
- No lateral water underflow or migration between the concrete structure and the membrane system
- High watertightness tested according various standards
- Easy to install with fully adhered joints (no welding required)
- Weathering resistant with temporary UV-stability
- Resistant to ageing
- High flexibility and crack-bridging ability
- Resistant to aggressive mediums in natural ground water and soil
- Can be combined with other approved Sika waterproofing systems including:
 - Sikaplan® WT membranes, FPO-based sheet waterproofing membranes
 - Sikadur-Combiflex SG system, FPO-based joint sealing system

Tests

Approval / Standards

- Product Declaration EN 13967 – Flexible sheets for waterproofing. CE Certificate No. 1349-CPD-065, 16.08.2011
- DoP - SikaProof A05 - 02 07 04 10 300 0 000001 1193
- DoP - SikaProof A08 - 02 07 04 10 300 0 000002 1193
- DoP - SikaProof A12 - 02 07 04 10 300 0 000003 1193
- Radon permeability, Slovak Medical University, for SikaProof A-12, test report No. E-215/2011, 15.11.2011
- Radon permeability, Slovak Medical University, for SikaProof A-08, test report No. E-214/2011, 07.12.2011



Product Data

Form

Appearance / Colours	Light yellow sheet membrane, laminated with a fleece layer		
Packaging	SikaProof® A-05/-08/-12 rolls are wrapped individually in a yellow PE-foil.		
		Roll width	Roll length
	SikaProof® A-05	1 m and 2 m	30 m
	SikaProof® A-08	1 m and 2 m	25 m
	SikaProof® A-12	1 m and 2 m	20 m

Storage

Storage Conditions / Shelf life	SikaProof® A-05/-08/-12 membrane rolls have a shelf-life of 18 months from date of production if stored properly in unopened, undamaged, original packaging, in a horizontal position, in dry conditions and at temperatures between +5°C and +30°C. They must be protected from direct sunlight, rain, snow and ice, etc. Do not stack pallets of the rolls on top of each other, or under pallets of any other materials during transport or storage.
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Technical Data

Chemical Base	Membrane Layer:	Flexible Polyolefin (FPO)			
	Sealant grid:	Polyolefin (PO)			
	Fleece layer:	Polypropylene (PP)			
Product Declaration	EN 13967, mandatory for European countries				
Visible Defects	Pass				EN 1850-2
Straightness	≤ 50 mm / 10 m				EN 1848-2
Mass per Unit Area	SikaProof® A-05	0.80 kg/m ²	(-5 /+10%)		EN 1849-2
	SikaProof® A-08	1.15 kg/m ²	(-5 /+10%)		
	SikaProof® A-12	1.50 kg/m ²	(-5 /+10%)		
Thickness		Total Thickness (=deff)	Master Membrane Thickness	Deviation	EN 1849-2
	SikaProof® A-05	1.10 mm	0.50 mm	(-5 /+10%)	
	SikaProof® A-08	1.35 mm	0.80 mm	(-5 /+10%)	
	SikaProof® A-12	1.70 mm	1.20 mm	(-5 /+10%)	
Watertightness to Liquid Water	Pass				EN 1928 B (24 h/60 kPa)
Resistance to Impact	SikaProof® A-05	≥ 150 mm			EN 12691
	SikaProof® A-08	≥ 250 mm			
	SikaProof® A-12	≥ 350 mm			
Durability of Watertightness against Ageing	Pass				EN 1296 (12 weeks) EN 1928 B (24h / 60 kPa)
Durability of Watertightness against Chemicals	Pass				EN 1847 (28 d/+23 °C) EN 1928 B (24h / 60 kPa)
Accelerated Ageing in an Alkaline Environment, Tensile Strength	Pass				EN 1847 (28 d/+23 °C) EN 1928 B (24 h/60 kPa)

Resistance to Tear - Nail Shank (Machine Direction)	SikaProof® A-05	≥ 275 N	EN 12310-1
	SikaProof® A-08	≥ 400 N	
	SikaProof® A-12	≥ 550 N	
Resistance to Tear - Nail Shank (Cross Direction)	SikaProof® A-05	≥ 275 N	EN 12310-1
	SikaProof® A-08	≥ 400 N	
	SikaProof® A-12	≥ 550 N	
Joint Strength	SikaProof® A-05	≥ 175 N / 50 mm	EN 12317-2
	SikaProof® A-08	≥ 250 N / 50 mm	
	SikaProof® A-12	≥ 250 N / 50 mm	
Tensile Strength (Machine Direction)	SikaProof® A-05	≥ 250 N / 50 mm	EN 12311-1
	SikaProof® A-08	≥ 400 N / 50 mm	
	SikaProof® A-12	≥ 675 N / 50 mm	
Tensile Strength (Cross Direction)	SikaProof® A-05	≥ 250 N / 50 mm	EN 12311-1
	SikaProof® A-08	≥ 375 N / 50 mm	
	SikaProof® A-12	≥ 550 N / 50 mm	
Elongation (Machine Direction)	SikaProof® A-05	≥ 300 %	EN 12311-1
	SikaProof® A-08	≥ 450 %	
	SikaProof® A-12	≥ 475 %	
Elongation (Cross Direction)	SikaProof® A-05	≥ 500 %	EN 12311-1
	SikaProof® A-08	≥ 500 %	
	SikaProof® A-12	≥ 550 %	
Water Vapour Transmission	SikaProof® A-05	0.75 – 0.95 g/m² x 24 h 34'500 – 36'600 m	EN 1931 (+23°C/75% r.h.)
	SikaProof® A-08	0.75 – 0.95 g/m² x 24 h 35'500 – 37'600 m	
	SikaProof® A-12	0.50 – 0.75 g/m² x 24 h 45'100 – 47'800 m	
Resistance to Static Load	≥ 20 kg	EN 12730 (Method B, 24 h/20 kg)	
Reaction to Fire	Class E	EN 13501-1:2000	
Additional Data (not CE relevant)			
Radon Permeability	SikaProof® A-08	(2.0 +/- 0.3) x 10 ⁻¹² m²/s	Certificate E-214/2011
	SikaProof® A-12	(5.3 +/- 0.7) x 10 ⁻¹² m²/s	Certificate E-215/2011
Water resistance to lateral water underflow of membrane system	SikaProof® A-08	≥ 7.0 bar	ASTM D 5385 mod.
	SikaProof® A-12	≥ 7.0 bar	

System Information

System Components

- SikaProof® A-05, membrane in rolls of widths 1.0 and 2.0 m
- SikaProof® A-08, membrane in rolls of widths 1.0 and 2.0 m
- SikaProof® A-12, membrane in rolls of widths 1.0 and 2.0 m
- SikaProof® Tape-150, self-adhesive tape for internal jointing, based on butyl-rubber, in 150 mm width
- SikaProof® ExTape-150, self-adhesive tape for external jointing, based on butyl-rubber, in 150 mm width

Accessories

- SikaProof® A -08 / -12 Edge, preformed sheet in L-shape, to form the waterproofing system edges, corners and connections
- SikaProof® Patch-200, external membrane patching tape for sealing any local damage or penetrations, supplied in 200 mm width
- SikaProof® FixTape-50, for fixing and repairing around details and penetrations
- SikaProof® MetalSheet, to create special details, such as pile heads

Application Details

Recommended System	General criteria	SikaProof® A-05	SikaProof® A-08	SikaProof® A-12
	Typical use	Damp-proofing / concrete protection / waterproofing	Waterproofing for civil engineered structures	Waterproofing for civil engineered structures
	Typical application	Slab on ground/ Walls / Precast elements	Base slabs / Walls / Precast elements	Base slab / Walls / Precast elements
	Max. head of water (pressure)	< 5 m (0.5 bar)	< 10 m (1.0 bar)	< 15 m (1.5 bar)
	Crack-bridging ability	Not tested	≤ 1 mm	≤ 2 mm

This spreadsheet is not exhaustive. It can be used as general selection guide for specific decision criteria.

For further more information how to choose the appropriate Sika solution for basement waterproofing contact your local Sika representative.

Substrate Quality

The substrate for the SikaProof® A-05/-08/-12 membrane needs sufficient stability to avoid movement during the construction works.

A smooth, uniform and clean substrate surface is essential to prevent membrane damage. Large gaps and voids (> 12-15 mm) be closed before installation of the SikaProof® A-05/-08/-12 membrane system. The substrate can be damp or slightly wet, but ponding water must be avoided.

Suitable substrates to fix the SikaProof® A-05/-08/-12 membrane system onto are:

- Concrete blinding
- Formwork
- Rigid thermal insulation
- Geotextile
- Compacted soil/fill with geotextile (only for low requirements)
- Plywood

Application Conditions / Limitations

Substrate Temperature +5°C min. / + 35°C

Ambient Air Temperature +5°C min. / + 35 °C

Application Instructions

Application Method

SikaProof® A-05/-08/-12 is a cold-applied and pre-applied sheet membrane waterproofing system, installed before the reinforcement is fixed and the concrete is poured.

The joints of SikaProof® A-05/-08/-12 membranes are not welded, they are fully adhered by self-adhesive strips prefabricated on the membrane sheet or with detailing tapes.

Installation procedure:

1. Ensure the substrate is correctly constructed and prepared, see Section 5.1.
2. Install the pre-formed SikaProof® A Edge sheet for the perimeters and terminations / connections.
3. Form the corners with the same pre-fabricated Edge sheet and adhere them externally with SikaProof® ExTape-150 and internally with SikaProof® Tape-150.
4. Lay the SikaProof® A-05/-08/-12 membranes on the horizontal and vertical surfaces using the 1.0 or 2.0 m width rolls (as appropriate) and adhere the overlap joints with the self-adhesive strips lengthways and for cross joints using the SikaProof® Tape-150 inside and SikaProof® ExTape-150 outside.
5. Form standard details, such as pipe penetrations, shaft connections, pits, pile heads, expansion joints and shuttering anchors use the appropriate accessory products.
6. Finally, check all the overlap joints, connections and details, to ensure they are correctly and fully adhered using the SikaProof® Tape-150 and SikaProof® ExTape-150.
7. After the SikaProof® membrane system is applied the reinforcement will be fixed and the concrete will be poured.
8. After removing the formwork penetrations, such as shuttering anchors, any membrane damage and any construction joints can be sealed on the external side (on the membrane) with the SikaProof® Patch-200 or by Sikadur® Combiflex SG system.

For further more detailed information about the installation procedure, please refer to the SikaProof® A-05/-08/-12 Method Statement or Application Manual.

Notes on Application / Limitations

SikaProof® A-05/-08/-12 membranes must only be installed by trained and approved Sika contractors.

SikaProof® A-05/-08/-12 membranes are not UV stabilised and cannot be installed on structures permanently exposed to UV light and weathering.

Do not apply SikaProof® A-05/-08/-12 membranes during continuous or prolonged rainfall.

Value Base

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

Local Restrictions

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

Ecology, Health and Safety Information

A Safety Data Sheet following EC- Regulation 1907/2006, Article 31 is not needed to bring the product to the market, to transport or to use it. The product does not damage the environment when used as specified.

REACH

European Community Regulation on chemicals and their safe use (REACH: EC 1907/2006)

This product is an article within the meaning of Regulation (EC) No 1907/2006 (REACH). It contains no substances which are intended to be released from the article under normal or reasonably foreseeable conditions of use. Therefore, there are no registration requirements for substances in articles within the meaning of Article 7.1 of the Regulation.

Based on our current knowledge, this product does not contain SVHC (substances of very high concern) from the candidate list published by the European Chemicals Agency in concentrations above 0.1 % (w/w).

Legal Notes

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.



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Certificate No. EMS 4308



Certificate No. FM 12504

PRODUCT DATA SHEET

Sikadur®-32+

2-part Structural Epoxy Adhesive for Bonding, Fixing and Anchoring with Sustainable Benefits

PRODUCT DESCRIPTION

Sikadur®-32+ is a moisture tolerant, structural, 2-part adhesive, based on a combination of epoxy resins and special fillers, designed for use at temperatures between +10 °C and +30 °C.

USES

Structural adhesive for bonding:

- Concrete elements (including bonding fresh to hardened concrete).
- Hard natural stone.
- Ceramics, fibre cement.
- Mortar, bricks, masonry, render.
- Steel, iron, aluminium.
- Wood.
- Polyester, epoxy, polyurethane (PU) grouts (e.g. Icos-it KC Range).
- Polyester / fibreglass and epoxy resin materials.

Fixing and anchoring for:

- Small anchors.
- Fasteners.
- Railway fasteners.

CHARACTERISTICS / ADVANTAGES

- Application temperature range +10 °C to +30 °C.
- Suitable for dry and damp concrete substrates.
- Easy to mix and apply.
- Very good adhesion to a range of construction materials.

- Hardens without shrinkage.
- Different coloured components (for mixing control).
- No primer needed.
- High initial and ultimate mechanical strength.
- Impermeable to liquids and water vapour.
- Good chemical resistance.

ENVIRONMENTAL INFORMATION

- Conforms with LEED v4 MR credit: Building product disclosure and optimization — Environmental Product Declarations (Option 1).
- Conforms with LEED v4 MR credit: Building product disclosure and optimization — Material ingredients (Option 2).
- Environmental Product Declaration (EPD) in accordance with EN 15804. EPD independently verified by Institut für Bauen und Umwelt e.V. (IBU).

APPROVALS / STANDARDS

- CE / UKCA marking and declaration of performance based on EN 1504-4 Products and systems for the protection and repair of concrete structures — Structural bonding.
- CE / UKCA marking and declaration of performance based on EN 1504-6 Products and systems for the protection and repair of concrete structures — Anchoring reinforcing steel bar.

PRODUCT INFORMATION

Product Declaration	EN 1504-4: Structural bonding EN 1504-6: Anchoring	
Chemical Base	Epoxy resin	
Packaging	1.0 kg (A+B) metal tin 8 × 1.0 kg carton boxes	4.5 kg (A+B) plastic pail Pre-batched unit
Shelf Life	24 months from date of production	
Storage Conditions	The product must be stored in original, unopened and undamaged packaging in dry conditions at temperatures between +5 °C and +30 °C. Always refer to packaging.	
Colour	Part A	Light grey
	Part B	Dark grey
	Parts A+B mixed	Concrete grey
Density	Mixed resin: (1.5 ± 0.1) kg/l. Value at +23 °C.	

TECHNICAL INFORMATION

Compressive Strength	61 N/mm ²	(EN 12190)		
	Curing time	+10 °C	+23 °C	+30 °C
	1 day	~5 N/mm ²	~35 N/mm ²	-
	3 days	~40 N/mm ²	~42 N/mm ²	~55 N/mm ²
	7 days	~45 N/mm ²	~48 N/mm ²	~60 N/mm ²
	14 days	~51 N/mm ²	~52 N/mm ²	-
Modulus of Elasticity in Compression	~3300 N/mm ² (14 days at +23 °C)			(ASTM D695)
	~5000 N/mm ²			(EN 13412)
Flexural Strength	Curing time	+10 °C	+23 °C	+30 °C
	1 day	~10 N/mm ²	~18 N/mm ²	-
	3 days	~35 N/mm ²	~37 N/mm ²	-
	7 days	~40 N/mm ²	~40 N/mm ²	~35 N/mm ²
	14 days	~42 N/mm ²	~42 N/mm ²	-
				(EN ISO 178)
Flexural E-Modulus	~3700 N/mm ² (14 days at +23 °C)			(EN ISO 178)
Tensile Strength	Curing time	+10 °C	+23 °C	+30 °C
	1 day	~10 N/mm ²	~16 N/mm ²	-
	3 days	~28 N/mm ²	~30 N/mm ²	-
	7 days	~34 N/mm ²	~35 N/mm ²	-
	14 days	~36 N/mm ²	~37 N/mm ²	-
				(EN ISO 527-2)
Tensile Modulus of Elasticity	~3800 N/mm ² (14 days at +23 °C)			(EN ISO 527-2)
Elongation at Break	(1.4 ± 0.1) % (14 days at +23 °C)			(EN ISO 527-2)
Shear Strength	~11 MPa			(EN 12615)
Tensile adhesion strength	Pull-Out Resistance	≤ 0.60 mm at load of 75 kN		(EN 1881)
	Pull-Out railway applications	No damage at 60 kN		(EN 13146-10)
	Fastening systems	~100 kN		
	Bond/adhesion strength	Pass		(EN 12636)

	Curing time	Substrate	Curing temperature	Adhesion strength	(EN 12188; EN 1542; EN ISO 4624)
	7 days	Concrete dry	+10 °C	> 3 N/mm² *	
	7 days	Concrete moist	+10 °C	> 3 N/mm² *	
	7 days	Steel	+25 °C	~15 N/mm²	
	*100 % concrete failure				
Creep	Durability/Creep under tensile loads		≤ 0.6 mm at load of 50 kN after 3 months		(EN 1544)
Shrinkage	< 0.1 %				(EN 12617-1)
Coefficient of Thermal Expansion	(8.7 × 10 ⁻⁵ ± 0.1 × 10 ⁻⁵) 1/K (linear expansion between +23 °C and +60 °C)				(EN 1770)
Electrical Resistivity	4.3 GΩ				(EN 50122-2)
Glass transition temperature	64 °C				(EN 12614)
Heat deflection temperature	Curing time	Curing temperature	HDT		(ASTM D648)
	7 days	+23 °C	+47 °C		
Thermal Compatibility	Durability		Pass		(EN 13733)
Resistance to moisture	Sensitivity to water		Pass		(EN 12636)
Reaction to Fire	Class C–s1,d0 Class B _{FL} –s1				(EN 13501-1)

APPLICATION INFORMATION

Mixing Ratio	Part A : Part B = 1 : 2 by weight or volume																												
Consumption	~1.5 kg/m² per mm of thickness, if used as a continuous layer. 0.7 kg/m² – 1.0 kg/m² is the quantity normally needed for bonding wet fresh concrete to hardened prepared concrete. For small anchors or fasteners (consumption in grams per hole): <table> <tr> <th>Hole / Re-bar Diameter</th><th>50 mm depth</th><th>80 mm depth</th><th>100 mm depth</th><th>120 mm depth</th><th>150 mm depth</th></tr> <tr> <td>10 mm / 6 mm</td><td>3.8 g</td><td>6.0 g</td><td>7.5 g</td><td>9.0 g</td><td>11.3 g</td></tr> <tr> <td>12 mm / 8 mm</td><td>4.7 g</td><td>7.5 g</td><td>9.4 g</td><td>11.3 g</td><td>14.1 g</td></tr> <tr> <td>14 mm / 10 mm</td><td>5.7 g</td><td>9.0 g</td><td>11.3 g</td><td>13.6 g</td><td>17.0 g</td></tr> </table> These figures are theoretical and do not take into account for any additional material due to surface porosity, surface profile, variations in level or wastage, etc.					Hole / Re-bar Diameter	50 mm depth	80 mm depth	100 mm depth	120 mm depth	150 mm depth	10 mm / 6 mm	3.8 g	6.0 g	7.5 g	9.0 g	11.3 g	12 mm / 8 mm	4.7 g	7.5 g	9.4 g	11.3 g	14.1 g	14 mm / 10 mm	5.7 g	9.0 g	11.3 g	13.6 g	17.0 g
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Layer Thickness	~1 mm maximum																												
Sag Flow	Non-sag up to ~1 mm thickness on vertical surfaces				(EN 1799)																								
Product Temperature	Maximum		+30 °C																										
	Minimum		+10 °C																										
Ambient Air Temperature	Maximum		+30 °C																										
	Minimum		+10 °C																										

Dew Point

Beware of condensation.

Steel substrate temperature during application must be at least +3 °C above dew point.

Substrate Temperature

Maximum	+30 °C
Minimum	+10 °C

Pot Life

Temperature	Pot Life (200 g)	(ISO 9514)
+10 °C	~120 minutes	
+23 °C	~45 minutes	
+30 °C	~35 minutes	

The pot-life begins when Parts A+B are mixed. It is shorter at high temperatures and longer at low temperatures. The greater the quantity mixed, the shorter the pot-life. To obtain longer workability at high temperatures, the mixed adhesive may be divided into smaller quantities. Another method is to chill Parts A+B before mixing (although not below +5 °C).

Open Time

Temperature	Open Time	(EN 12189)
+10 °C	~150 minutes	
+23 °C	~90 minutes	
+30 °C	~60 minutes	

VALUE BASE

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

LIMITATIONS

- Sikadur® resins are formulated to have low creep under permanent loading. However due to the creep behaviour of all polymer materials under load, when using adhesive for structural applications, the long term structural design load must account for creep. Generally, the long term structural design load must be lower than 20–25 % of the failure load. A structural engineer must be consulted for design calculations for specific structural applications.
- When using multiple units during application, do not mix the following unit until the previous one has been used in order to avoid a reduction in workability and handling time.
- For heavy components positioned vertically or overhead, provide temporary support.

ECOLOGY, HEALTH AND SAFETY

User must read the most recent corresponding Safety Data Sheets (SDS) before using any products. The SDS provides information and advice on the safe handling, storage and disposal of chemical products and contains physical, ecological, toxicological and other safety-related data.

APPLICATION INSTRUCTIONS**SUBSTRATE QUALITY****CONCRETE / MASONRY / MORTAR / STONE**

Concrete and mortar must be at least 3–6 weeks old. Substrate surfaces must be sound, clean, dry or matt damp. Free from standing water, ice, dirt, oil, grease, coatings, laitance, efflorescence, old surface treatments, all loose particles and any other surface contaminants that could affect adhesion of the bonding agent.

STEEL

Surfaces must be clean, dry, free from oil, grease, coatings, rust, scale, all loose particles and any other surface contaminants that could affect adhesion of the bonding agent.

WOOD

Substrate surfaces must be sound, clean, dry and free from dirt, oil, grease, coatings, all loose particles and any other surface contaminants that could affect adhesion of the bonding agent.

POLYESTER / EPOXY / CERAMICS / GLASS

Surfaces must be clean, dry, free from oil, grease and any other surface contaminants that could affect adhesion of the bonding agent.

SUBSTRATE PREPARATION**CONCRETE / MASONRY / MORTAR / STONE**

Substrates must be prepared mechanically using suitable abrasive blast cleaning, needle gunning, light scabbling, bush hammering, grinding or other suitable equipment to achieve an open-textured, gripping surface profile.

STEEL

Surfaces must be prepared mechanically using suitable abrasive blast cleaning, grinding, rotating wire brush or other suitable equipment to achieve a bright metal finish with a surface profile to satisfy the necessary tensile adhesion strength requirement. Avoid dew point conditions before and during application.

WOOD

Surfaces must be prepared by planing, sanding or other suitable equipment.

POLYESTER / EPOXY

Surfaces must be prepared by abrading using suitable equipment.

CERAMICS / GLASS

Surfaces must be prepared by abrading using suitable equipment. Do not apply to siliconised substrates.

ALL SUBSTRATES

All dust and loose material must be completely removed from all substrate surfaces before application of the product by vacuum / dust removal equipment.

APPLICATION

1. Apply the mixed Sikadur®-32+ to the prepared substrate by brush, roller, spray or trowel, ensuring uniform and complete coverage.
2. For optimum adhesion, apply adhesive to both substrates that require bonding. On damp prepared concrete substrates, always apply by brush and work the product well into the substrate.
3. For bonding wet fresh concrete to hardened prepared concrete, place the concrete whilst the resin layer is still 'tacky'. If the product becomes glossy and loses 'tackiness', apply another coat and proceed to place concrete.
4. For small anchors or fasteners, clean the hole thoroughly with a special round steel brush and with compressed air (minimum pressure 6 bar), starting from the bottom.
5. Once the hole is completely clean and free of any loose particles or dust, pour Sikadur®-32+ in the hole, avoiding entrapping air.
6. Insert the anchor / fastener with a rotary motion within the adhesive open time. Some of the adhesive must flow out of the hole.
7. During the resin hardening time, the anchor must not be moved or loaded

CLEANING OF TOOLS

Clean all tools and application equipment with Sika® Thinner C immediately after use. Hardened / cured material can only be mechanically removed.

LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

LEGAL NOTES

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

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Product Data Sheet

Sikadur®-32+

June 2022, Version 01.01
020204030010000299

Sikadur-32+-en-GB-(06-2022)-1-1.pdf

PERMEABILITY LABORATORY TEST REPORT

Laboratory Report Number: LR2512
Customer Reference Number: Sikadur-32+
Issue Date: 22 March 2023

Prepared For: Sika Limited
Watchmead, Welwyn Garden City, Herts, AL7 1BQ.
UK.

Contact: Chris Mossman-Monk

PRIVATE AND CONFIDENTIAL

Versaperm Limited, 10 Rawcliffe House, Howarth Road, Maidenhead, Bucks, SL6 1AP, UK
Tel +44 1628 777668
www.versaperm.com

Sample Identification

A sample of Sikadur -32+ was received in 2-pack liquid form.

Equipment used

Versaperm Permeability Meter MK IV, configured to run ISO15105-1 differential pressure method.

Test Conditions

Test Gas: Methane CP Grade. CO2 CP grade

Temperature: 23°C

Atmospheric Pressure: Tested over 4 days ending 22/03/23 where pressure ranged 1004-1018 mbar.

Sample Preparation

The 2-pack was mixed in the 2:1 ratio described in the data sheet and drawn down on release paper and plain paper. The release paper was found to be effective and this is the sample set that was tested. After overnight curing, samples were stored for 7 days in a desiccator at 23°C to reduce out-gassing.

Test Methods

Methane and Carbon Dioxide Transmission Rate.

This test was carried out using the method ISO 15105-1 *Plastics - Film and sheeting - Determination of gas-transmission rate - Part 1: Differential-pressure methods*. After conditioning, each sample was placed in the standard film measuring chamber and controlled temperature environment, evacuating the gas from both sides of the sample, then supplying the test gas upstream of the sample at 1.0 bar differential pressure. The pressure downstream was monitored as the rate of change is proportional to the permeation rate. An additional set of tests was performed under vacuum without any differential pressure to compensate for any leaks on the surfaces in the rig, or out-gassing that had not been completed. Results are expressed as ml.mm/m².day

Test Results

Trade Name/ Identification	Test Gas	Nominal Thickness /mm	Gas Transmission Rate (GTR) / ml.mm/m ² .day			
			1	2	3	Average
Sikadur 32+	Methane	2.85	11.3	10.7	11.0	11.0
Sikadur 32+	Carbon Dioxide	2.85	7.1	7.1	7.3	7.1

Conclusions

The results are presented for the interpretation by the customer.



Christopher Roberts
Technical Director

PRODUCT DATA SHEET

SikaProof® Patch-200 B

Self-adhesive tape for external sealing of the SikaProof® waterproofing system

PRODUCT DESCRIPTION

SikaProof® Patch-200 B is a single-sided, self-adhesive tape based on SikaProof® membrane, laminated with a butyl adhesive covered with a release liner.

USES

SikaProof® Patch-200 B may only be used by experienced professionals.

- Sealing and bonding overlap joints, connections and details within the SikaProof® waterproofing system.

CHARACTERISTICS / ADVANTAGES

- Good watertightness
- Weather resistant with temporary UV-stability
- Good adhesion and durability of the Butyl-adhesive
- Self adhesion allows easy and fast installation

PRODUCT INFORMATION

Packaging	1 roll packed in a box
Appearance / Colour	White release liner over black adhesive on a light yellow membrane.
Shelf Life	24 months from date of production
Storage Conditions	Product must be stored in original unopened and undamaged sealed packaging in dry conditions and temperatures between +5 °C and +30 °C. Always refer to packaging.
Length	20 m
Width	200 mm
Thickness	2,20 mm (-5/+10 %)

SYSTEM INFORMATION

System Structure	SikaProof® Patch-200 B is a system accessory for jointing and sealing details within the SikaProof® waterproofing system. For more detailed information, refer to Sika Method Statement: SikaProof® A / SikaProof® A+.
Compatibility	For materials in direct contact (such as any synthetics etc.) the compatibility must be evaluated before full project application. Contact Sika Technical Services for additional information.

APPLICATION INFORMATION

Ambient Air Temperature	+5 °C min. / +45 °C max.
Substrate Temperature	+5 °C min. / +60 °C max.

VALUE BASE

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

FURTHER DOCUMENTS

- Sika Method Statement: SikaProof® A / SikaProof® A+
- Sika Application Manual: SikaProof® A / SikaProof® A+

LIMITATIONS

Installation work must only be carried out by Sika® trained, approved or competent contractors experienced in this type of application.

- Refer to the Sika Method Statement: SikaProof® A / SikaProof® A+
- Product Data Sheet: SikaProof® A / SikaProof® A+

ECOLOGY, HEALTH AND SAFETY

REGULATION (EC) NO 1907/2006 - REACH

This product is an article as defined in article 3 of regulation (EC) No 1907/2006 (REACH). It contains no substances which are intended to be released from the article under normal or reasonably foreseeable conditions of use. A safety data sheet following article 31 of the same regulation is not needed to bring the product to the market, to transport or to use it. For safe use follow the instructions given in the product data sheet. Based on our current knowledge, this product does not contain SVHC (substances of very high concern) as listed in Annex XIV of the REACH regulation or on the candidate list published by the European Chemicals Agency in concentrations above 0,1 % (w/w).

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY

The contact surfaces must be dry, clean and free of materials that could impair the adhesion. Contaminants, such as dirt, dust, oil, bitumen and de-bonding agents, such as surfactants and silicones must be removed.

APPLICATION METHOD / TOOLS

Strictly follow installation procedures as defined in method statements, application manuals and working instructions which must always be adjusted to the actual site conditions.

SikaProof® Patch-200 B is a cold-applied and post-applied self-adhesive tape to seal joints, connections, penetrations. Additionally it repairs any damage to the external side of the SikaProof® system membrane. Reference must be made to the Sika Method Statement: SikaProof® A / SikaProof® A+.

LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

LEGAL NOTES

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Product Data Sheet

SikaProof® Patch-200 B
November 2021, Version 02.02
020720308000000005

SikaProofPatch-200B-en-GB-(11-2021)-2-2.pdf

PRODUCT DATA SHEET

SikaProof® ExTape-150

SELF-ADHESIVE TAPE FOR EXTERNAL JOINTING OF SIKAPROOF A WATERPROOFING SYSTEM

PRODUCT DESCRIPTION

SikaProof® ExTape-150 is a self-adhesive tape based on a butyl adhesive for external jointing and detailing on SikaProof® A & P membrane systems. The tape is composed of a yellow carrier film and a divided release liner.

USES

SikaProof® ExTape-150 may only be used by experienced professionals.

- Sealing transverse overlap joints, connections and details within the SikaProof® A & P membrane systems.

CHARACTERISTICS / ADVANTAGES

- High adhesion and sealing ability
- Simple and fast to install
- Divided release liner for easy installation

PRODUCT INFORMATION

Packaging	4 rolls packed in one box. Individual roll size: Length 20 m/ Width 150 mm
Appearance / Colour	Top layer yellow carrier film coated with black butyl adhesive and bottom layer white divided release liner.
Shelf Life	24 months from date of production
Storage Conditions	Product must be stored in original unopened and undamaged sealed packaging in dry conditions and temperatures between + 5 °C and + 30 °C. Always refer to packaging.
Thickness	1,10 mm

SYSTEM INFORMATION

System Structure	System Components ▪ SikaProof® A-05 or A-08 /HC or A-12 /HC sheet membranes ▪ SikaProof P-12 self-adhesive sheet membrane ▪ SikaProof® Tape-150 A self-adhesive tape for internal jointing ▪ SikaProof® ExTape-150 self-adhesive tape for external jointing
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APPLICATION INFORMATION

Ambient Air Temperature	+5 °C min. / +35 °C max.
Substrate Temperature	Substrate bonding surface: Minimum +5 °C (Refer to important considerations for more information)

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY

The contact surface is the light yellow SikaProof® membrane side. It must be dry, clean and free of any materials that could impair adhesion. If the substrate requirements are not achieved, suitable measures must be taken. Contact Sika® Technical Services for more information.

APPLICATION METHOD / TOOLS

Reference must be made to further documentation where applicable, such as relevant method statement, application manual and installation or working instructions.

Remove the release liner, apply onto the outside / membrane side of the membrane and press tape firmly using a pressure roller. For the SikaProof® A system, SikaProof® ExTape-150 is used together with SikaProof® Tape-150 A for easy, fast and secure double bonding of joints and connections.

FURTHER DOCUMENTS

- Sika® Method Statement: SikaProof® A/HC
- Sika® Method Statement: SikaProof® P

LIMITATIONS

Installation work must only be carried out by Sika® trained, approved or competent contractors experienced in this type of application.

- The substrate quality and conditions must be fulfilled.
- If SikaProof® ExTape-150 has to be applied under wet conditions or temperatures below +5 °C. Exceptions are possible under special circumstances with appropriate precautions. Contact Sika® Technical Services for more information.
- The SikaProof® ExTape-150 is not permanently UV and weather resistant. Therefore the membrane system must not be installed on structures permanently exposed to UV light and weathering.
- SikaProof® ExTape-150 has to be protected as soon as possible or at the latest after 90 days or before the backfilling, whichever occurs first.

VALUE BASE

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

ECOLOGY, HEALTH AND SAFETY

REGULATION (EC) NO 1907/2006 - REACH

This product is an article as defined in article 3 of regulation (EC) No 1907/2006 (REACH). It contains no substances which are intended to be released from the article under normal or reasonably foreseeable conditions of use. A safety data sheet following article 31 of the same regulation is not needed to bring the product to the market, to transport or to use it. For safe use follow the instructions given in this product data sheet. Based on our current knowledge, this product does not contain SVHC (substances of very high concern) as listed in Annex XIV of the REACH regulation or on the candidate list published by the European Chemicals Agency in concentrations above 0.1 % (w/w)

LEGAL NOTES

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Product Data Sheet
SikaProof® ExTape-150
November 2018, Version 01.01
020704210220000002

SikaProofExTape-150-en-GB-(11-2018)-1-1.pdf

PRODUCT DATA SHEET

SikaProof® Tape-150 A

FULLY BONDED, SELF-ADHESIVE TAPE FOR INTERNAL JOINTING OF SIKAPROOF A WATERPROOFING SYSTEM

PRODUCT DESCRIPTION

SikaProof® Tape-150 A is a self-adhesive tape, based on a polyacrylate adhesive on a yellow carrier film coated with the SikaProof A fully bonded system.

USES

SikaProof® Tape-150 A may only be used by experienced professionals.

SikaProof® Tape-150 A is used for sealing transverse overlap joints, connections and details within the SikaProof A membrane system (internal / fleece side) in combination with the SikaProof ExTape-150.

CHARACTERISTICS / ADVANTAGES

- Fully bonded to the concrete structure
- No lateral water underflow (like SikaProof® A system)
- High adhesion and sealing ability, especially in cool and damp conditions
- Easy and fast to install

APPROVALS / STANDARDS

Approved under BBA Certificate 13/5075 (SikaProof A Membranes) as an ancillary material for use with SikaProof A Membranes

PRODUCT INFORMATION

Packaging	2 rolls packed in one cardboard box, each roll 25 m long and 150 mm width. Rolls sold separately
Appearance / Colour	Top layer with white fleece and sealant (SikaProof® fully bonded system) coated on a yellow carrier film. Bottom layer with polyacrylate adhesive cover with a white release film.
Shelf Life	18 months shelf life from date of production if stored properly in undamaged, unopened, original sealed packaging. (For expiry date see label)
Storage Conditions	Dry storage at temperatures from +5 °C up to +30 °C. Protect from direct sunlight, rain, snow, ice, humidity, etc. Store in a horizontal position. Do not stack pallets of the rolls on top of each other, or under pallets of any other materials during transport or storage.
Thickness	1.70 mm

SYSTEM INFORMATION

System Structure	SikaProof® Tape-150 A is a system component for internal jointing of the SikaProof® A membrane system in combination with SikaProof® ExTape-150 for external jointing. For more detailed information please refer to the current Method Statement.
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APPLICATION INFORMATION

Ambient Air Temperature	minimum +5 °C / maximum +35 °C
Substrate Temperature	Surface to be bonded: Minimum +5 °C, if below appropriate measures must be applied.

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY

The contact surface among others is the white fleece layer of SikaProof® A sheet membrane. It must be dry (or slightly damp), clean and free of any materials that could impair adhesion.

APPLICATION METHOD / TOOLS

Apply the SikaProof® Tape-150 A to the fleece side of the SikaProof® A sheet membrane:

- remove the release liner
- adhere the self-adhesive side of the tape to the fleece side of the membrane
- press it firmly using a pressure roller

SikaProof® Tape-150 A is used together with SikaProof® ExTape-150 for easy and secure double bonding of joints and connections.

For more detailed information about the installation method please refer to the Method Statement of the SikaProof® A system.

LIMITATIONS

The SikaProof® Tape-150 A must be used in compliance with the current Method Statement of the SikaProof® A system. It must only be installed by trained and approved Sika contractors.

- Do not install SikaProof® Tape-150 A during continuous or prolonged rain- or snowfall.
- The substrate quality and condition must be fulfilled or appropriate measure must be taken.
- SikaProof® Tape-150 A is not permanently UV resistant. Therefore the structural concrete must be placed within 4 weeks (28 days) after the SikaProof® A membrane system is installed.

For more detailed information and guidance refer to the current Method Statement for the SikaProof® A membrane system.

VALUE BASE

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

ECOLOGY, HEALTH AND SAFETY

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LEGAL NOTES

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Product Data Sheet
SikaProof® Tape-150 A
July 2018, Version 01.01
020704210220000017

SikaProofTape-150A-en-GB-(07-2018)-1-1.pdf

PRODUCT DATA SHEET

SikaProof® Fix Tape-50

Double-sided adhesive tape for the SikaProof® Waterproofing System

PRODUCT DESCRIPTION

SikaProof® Fix Tape-50 is a double-sided, self-adhesive tape based on a butyl rubber adhesive covered with a release liner

USES

SikaProof® Fix Tape-50 may only be used by experienced professionals.

- Sealing and bonding of details within the SikaProof® Waterproofing System.

CHARACTERISTICS / ADVANTAGES

- Good adhesion and sealing capability
- Good durability
- Self adhesion allows easy and fast installation

PRODUCT INFORMATION

Packaging	5 rolls packed in one box
Shelf Life	24 months from date of production
Storage Conditions	Product must be stored in original unopened and undamaged sealed packaging in dry conditions and temperatures between +5 °C and +30 °C. Always refer to packaging.
Appearance / Colour	White release liner over black butyl rubber adhesive.
Length	20 m
Width	50 mm
Thickness	1.50 mm (-5/+10 %)

SYSTEM INFORMATION

System Structure	SikaProof® FixTape-50 is a system accessory for sealing specific details within the SikaProof® Waterproofing System. For more detailed information, refer to the Sika Method Statement: SikaProof® A / SikaProof® A+.
Compatibility	For materials in direct contact (such as any synthetics etc.) the compatibility must be evaluated before full project application. Contact Sika Technical Services for additional information.

APPLICATION INFORMATION

Ambient Air Temperature +5 °C min. / +45 °C max.

Substrate Temperature +5 °C min. / +60 °C max.

VALUE BASE

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

FURTHER DOCUMENTS

- Sika Method Statement: SikaProof® A / SikaProof® A+
- Sika Application Manual: SikaProof® A / SikaProof® A+

LIMITATIONS

Installation work must only be carried out by Sika® trained, approved or competent contractors experienced in this type of application.

- Refer to the Sika Method Statement: SikaProof® A / SikaProof® A+
- Product Data Sheet: SikaProof® A / SikaProof® A+

ECOLOGY, HEALTH AND SAFETY

REGULATION (EC) NO 1907/2006 - REACH

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APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY

The contact surfaces of the membrane must be dry, clean and free of materials that could impair adhesion. Contaminants, such as dirt, dust, oil, bitumen and debonding agents, such as surfactants and silicones must be removed.

APPLICATION METHOD / TOOLS

Strictly follow installation procedures as defined in method statements, application manuals and working instructions which must always be adjusted to the actual site conditions.

Reference must be made to the Sika® Method Statement: SikaProof® A / SikaProof® A+.

LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

LEGAL NOTES

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Product Data Sheet

SikaProof® Fix Tape-50
March 2024, Version 02.02
020720308000000004

SikaProofFixTape-50-en-GB-(03-2024)-2-2.pdf

PRODUCT DATA SHEET

Sikadur-Combiflex® CF Adhesive Normal

2-part epoxy adhesive for the Sikadur-Combiflex® SG System

PRODUCT DESCRIPTION

Sikadur-Combiflex® CF Adhesive Normal is a 2-part epoxy based thixotropic adhesive for bonding the Sikadur-Combiflex® SG modified flexible Polyolefin (FPO) waterproofing tapes to different substrates. Internal and external use. Application temperature range +10 °C to +30 °C. It is part of the Sikadur-Combiflex® SG System.

USES

- Adhesive for the Sikadur-Combiflex® SG System

CHARACTERISTICS / ADVANTAGES

- Easy to mix and apply
- Excellent adhesion to many materials
- Performs well within a wide temperature range

- Good resistance to many chemicals
- No primer needed
- High mechanical resistance

ENVIRONMENTAL INFORMATION

- Conformity with LEED v4 MRc 2 (Option 1): Building Product Disclosure and Optimization – Environmental Product Declarations
- Conformity with LEED v4 MRc 4 (Option 2): Building Product Disclosure and Optimization – Material Ingredients
- IBU Environmental Product Declaration (EPD)

APPROVALS / STANDARDS

- Conforms to the requirements of EN 1504-4 - Structural bonding
- Methane gas transmission rate, ISO 15105-1, Versaperm, Report No. LR2282

PRODUCT INFORMATION

Chemical Base	Epoxy resin and selected fillers	
Packaging	6 kg (A+B) pre-batched unit	Pallets of 432 kg (72 × 6 kg)
	15 kg bulk container	Part A, pallets of 390 kg (39 × 10 kg)
	10 kg Part A + 5 kg Part B	Part B, pallets of 500 kg (100 × 5 kg)
	30 kg bulk container	Part A, pallets of 780 kg (39 × 20 kg)
	20 kg Part A + 10 kg Part B	Part B, pallets of 390 kg (39 × 10 kg)
	Refer to current price list for packaging variations.	
Colour	Resin-Part A	White
	Hardener-Part B	Dark grey
	Part A+B mixed	Light grey
Shelf Life	24 months from date of production	
Storage Conditions	The product must be stored in original, unopened and undamaged packaging in dry conditions at temperatures between +5 °C and +30 °C.	

Always refer to packaging.

Density	Part A	~1,7 kg/l
	Part B	~1,7 kg/l
	Mixed resin	~1,7 kg/l
	All Density values at +23 °C.	
Product Declaration	EN 1504-4 - Structural bonding	

TECHNICAL INFORMATION

Compressive Strength	Curing time	Curing temperature			(ASTM D 695-96)
		+10 °C	+23 °C	+30 °C	
	3 days	~35 N/mm²	~48 N/mm²	~52 N/mm²	
	7 days	~41 N/mm²	~50 N/mm²	~54 N/mm²	
	14 days	~43 N/mm²	~54 N/mm²	~55 N/mm²	
Modulus of Elasticity in Compression	at +5 °C		~4200 N/mm²		(ASTM D 695)
	at +23 °C		~3500 N/mm²		
Tensile adhesion strength	Substrate	Adhesion strength			(EN 1542)
	Concrete dry	> 4 N/mm² *			
	Concrete (mat damp)	> 4 N/mm² *			
	Steel (blast cleaned)	> 10 N/mm²			
	*failure in concrete				
Coefficient of Thermal Expansion	5,3 × 10 ⁻⁵ (± 0,2 × 10 ⁻⁵) 1/K (linear expansion between -20 °C and +40 °C)				(EN ISO 1770)
Chemical Resistance	Refer to Sikadur-Combiflex® SG System system data sheet or contact Sika Technical Services for specific information.				
Service Temperature	-30 °C min. / +38 °C max.				

SYSTEM INFORMATION

System Structure	Refer to Sikadur-Combiflex® SG System data sheet or contact Sika Technical Services for specific information.
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APPLICATION INFORMATION

Mixing Ratio	Part A:B = 2:1 parts by weight or volume
Consumption	Refer to Sikadur-Combiflex® SG System data sheet. Depends on type of tape or strip.
Product Temperature	+10 °C min. / +30 °C max.
Ambient Air Temperature	+10 °C min. / +30 °C max.
Dew Point	Beware of condensation. Steel substrate temperature during application must be at least +3 °C above dew point.
Substrate Temperature	+10 °C min. / +30 °C max.
Substrate Moisture Content	Cementitious substrates: Substrate must be dry or matt damp (no standing water). Brush the adhesive well into the substrate if matt damp.

Temperature	Pot life	Open time
+10 °C	~125 minutes	–
+23 °C	~50 minutes	~70 minutes
+30 °C	~25 minutes	–

If larger quantities are being mixed the temperature of Sikadur-Combiflex® CF Adhesive Normal will increase due to the chemical reaction, resulting in a reduced pot life.

Waiting Time / Overcoating

Sikadur-Combiflex® CF Adhesive Normal may be overcoated with an epoxy coating. If this is required, do not smooth the adhesive with detergent. If waiting time between application of adhesive and overcoating is to be longer than 2 days, the adhesive must be blinded to excess with quartz sand immediately after application.

VALUE BASE

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

ECOLOGY, HEALTH AND SAFETY

User must read the most recent corresponding Safety Data Sheets (SDS) before using any products. The SDS provides information and advice on the safe handling, storage and disposal of chemical products and contains physical, ecological, toxicological and other safety-related data.

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY

Concrete/masonry/mortar/stone

Note: Concrete and mortar must be at least 3–6 weeks old.

Substrate surfaces must be sound, clean, dry or matt damp. Free from standing water, ice, dirt, oil, grease, coatings, laitance, efflorescence, old surface treatments, all loose particles and any other surface contaminants that could affect adhesion of the adhesive.

Steel

Surfaces must be clean, dry, free from oil, grease, coatings, rust, scale, all loose particles and any other surface contaminants that could affect adhesion of the adhesive.

SUBSTRATE PREPARATION

Concrete/masonry/mortar/stone

Substrates must be prepared mechanically using suitable abrasive blast cleaning, needle gunning, light scabbling, bush hammering, grinding or other suitable equipment to achieve an open textured gripping surface profile.

Steel

Surfaces must be prepared mechanically using suitable abrasive blast cleaning, grinding, rotating wire brush or other suitable equipment to achieve a bright metal finish with a surface profile similar to aluminium oxide paper medium grade. Avoid dew point conditions before and during application.

All substrates

All dust and loose material must be completely removed from all substrate surfaces before application of the product by vacuum / dust removal equipment.

MIXING

IMPORTANT

Avoid over mixing to minimise air entrainment.

Note: Use a spiral paddle in an electric single or double paddle mixer (Bulk container) at a maximum speed of 300 rpm.

Pre-batched unit

1. Mix Part A (resin) for ~60 seconds.
2. Add Part B (hardener) to Part A (resin).
3. Mix Parts A+B continuously for ~3 minutes until a uniformly smooth, coloured mix is achieved.
4. To ensure thorough mixing, pour materials into another clean container and mix again to achieve a smooth and uniform mix.

Bulk container

Note: For large volume mixing a suitable pan mixer can be used.

Note: Mix only the quantity which can be used within its pot life.

Add both parts in the correct proportion into a suitable clean, dry container and mix in the same way as for the pre-batched unit.

APPLICATION METHOD / TOOLS

Refer to Sikadur-Combiflex® SG System data sheet.

CLEANING OF TOOLS

Clean all tools and application equipment with Sika® Colma-Cleaner immediately after use. Hardened or cured material can only be removed mechanically.

LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

LEGAL NOTES

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Product Data Sheet
Sikadur-Combiflex® CF Adhesive Normal
March 2021, Version 03.01
020703151000000002

Sikadur-CombiflexCFAdhesiveNormal-en-GB-(03-2021)-3-1.pdf

PRODUCT DATA SHEET

Sika® Drain-850 Geo

Dimpled drainage and protection sheet with integral filtration layer

PRODUCT DESCRIPTION

Sika® Drain-850 Geo is a high density polyethylene (HDPE), heavy duty drainage and protection sheet with 10 mm high dimples on the bottom layer and a bonded geotextile (PP) filtration layer on the top layer.

USES

As a protection and drainage sheet for:

- Preformed sheet and liquid applied membrane waterproofing systems
- Sika® White Box concept for waterproofing retaining walls and heavy duty use roofs/podiums

CHARACTERISTICS / ADVANTAGES

- High drainage capacity
- High mechanical/impact resistance
- Integral filtration layer
- Resistant to natural aggressive substances in ground water and soil
- Suitable for contact with soft water (aggressive to concrete)
- Can be installed on damp and wet substrates
- Forms a drainage channel in the space between the structural elements and the backfilling/soil/substrate to allow water to be drained away

APPROVALS / STANDARDS

Conforms to the requirements of EN 13252:2016 – Geotextiles and geotextile-related products intended - For use as filtration and separation (F+S+D) in drainage systems
DoP 79308994, certified by Factory Production Control Body 1213 and provided with the CE mark

PRODUCT INFORMATION

Packaging	Roll size	
	Length	~12,50 m
	Width	~2,44 m
	Refer to current price list for packaging variations	
Appearance / Colour	Top layer	Bonded filtration geotextile / White
	Bottom layer	HDPE sheet with 10 mm deep dimples / Brown or black



Shelf Life	5 years from date of production
Storage Conditions	Product must be stored in original unopened and undamaged packaging in dry conditions and temperatures between +5 °C and +35 °C. Always refer to packaging.

Thickness	10,0 (±1,0) mm (at 2 kPa pressure)	(EN ISO 9863-1)
Weight	120 (±12) g/m ² (geotextile)	(ISO 9864)

TECHNICAL INFORMATION

Resistance to Static Puncture	1,6 (-0,32) kN (geotextile)			(EN ISO 12236)
Tensile Strength	Machine direction	12 (-2) kN/m		(EN ISO 10319)
	Cross machine direction	10 (-2) kN/m		
Elongation	Machine direction	50 (±20) %		(EN ISO 10319)
	Cross machine direction	50 (±20) %		
Ambient Maximum Temperature of Li-liquids	+32 °C (water)			
Drain flow capacity	Horizontal applic- ation*	(S/R, i= 0,04)	0,60 (-20 %) l/(m·s)	(EN ISO 12958)
	Vertical applica- tion*	(S/R, i= 1)	3,5 (-20 %) l/(m·s)	
	*Values at at 20 kPa pressure			
Resistance to dynamic perforation	32 (+6) mm (geotextile, cone drop test)			(EN ISO 13433)
Compression resistance	400 (± 20 %) kPa			
Water flow capacity	110 (-33) l/(m²·s)			(EN ISO 11058)
Protection efficiency	Compressive creep after 1000 h at 50 kPa (equival- ent to 2 m of concrete)	~5 %		(ISO 25619-1)

APPLICATION INFORMATION

Ambient Air Temperature	-10 °C min. / +55 °C max.
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VALUE BASE

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

LIMITATIONS

- Do not expose to permanent weathering and UV-light.
- When used in combination with PVC membranes, a separation (geotextile) must be used between the materials.
- Maximum installation depth: 10 m.

ECOLOGY, HEALTH AND SAFETY

This product is an article as defined in article 3 of regulation (EC) No 1907/2006 (REACH). It contains no substances which are intended to be released from the article under normal or reasonably foreseeable conditions of use. A safety data sheet following article 31 of the same regulation is not needed to bring the product to the market, to transport or to use it. For safe use follow the instructions given in the product data sheet. Based on our current knowledge, this product does not contain SVHC (substances of very high concern) as listed in Annex XIV of the REACH regulation or on the candidate list published by the European Chemicals Agency in concentrations above 0,1 % (w/w).

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY

All substrates must be clean and free of all contaminants such as dirt, oil, grease, dust and loose friable particles to allow full capacity water flow.

APPLICATION

Installation procedure

Strictly follow installation procedures as defined in method statements, application manuals and working instructions which must always be adjusted to the actual site conditions.

Installation method – General

The waterproofing membrane is installed by loose laying and mechanically fastening

LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

LEGAL NOTES

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Product Data Sheet

Sika® Drain-850 Geo
October 2024, Version 08.01
020720702000000018

SikaDrain-850Geo-en-GB-(10-2024)-8-1.pdf

Appendix C

GAS PROTECTION MEASURES VERIFICATION VISUAL INSPECTION RECORD



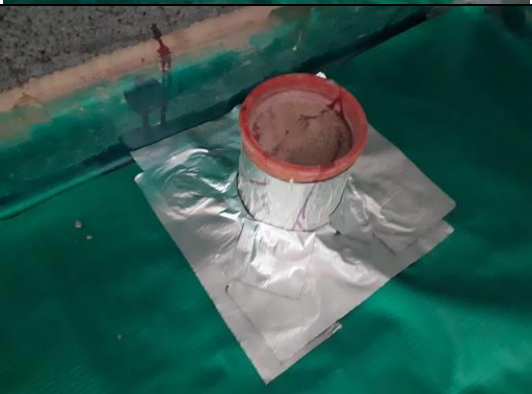
Site Name:		Gas Characteristic Situation:	
Job Number:		Type of development: (Residential/ commercial/ other)	
Date:		Building Description:	
Verification Engineer:		Foundation Type: (suspended floor/ raft/ other)	
Weather during inspection:		Gas Protection Type: (passive/ active)	
Plot number(s):			

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

No.	Item	Comments (see notes)
1 - Passive Venting		
1.1	Sub-floor void	Exceeds minimum 200mm (typically >250mm) clear subfloor void beneath plot and garage, no significant obstructions identified.
1.2	External wall airbricks	Adequate number of airbricks on all four external walls, no obstructions.
1.3	Internal sleeper walls	Sleeper wall ventilation included although not required due to adequate front to rear external vents.
1.4	External vent trenches/ ducts	Telescopic vents in place, correctly aligned across cavity with airbricks to provide free flow of air to subfloor void. No obstructions identified.
2 - Active Venting		
2.1	Active venting System details	N/A

No.	Item	Comments (see notes)
3 - Gas Membrane		
3.1	Condition of sub-grade and underside of membrane	<i>Generally acceptable, swept clean prior to membrane placement, although still significant dust present in places.</i>
3.2	Details of gas membrane product used	<i>Fosroc Proofex Total Membrane Installers used green and silver Proofex Total in Plot 3. In Plot 2 an older version of Proofex membrane was used which was black and silver. IDG checked the roll and confirmed the specifications to be identical. Batch number/Manufacture time/date unknown.</i>
3.3	Gas membrane condition (rips/ tears/ penetrations)	<i>Generally very good. No punctures/rips or tears identified.</i>
3.4	Details of joining/ lapping tape products used	<i>Fosroc Proofex Double Sided Butyl Jointing tape 50mm Fosroc Proofex 3000MR Self Adhesive Membrane</i>
3.5	Lapping design	<i>Overlaps adequate (meet min. 150mm recommended by manufacturer).</i>
3.6	Laps, welds and joint seals	<i>All joints and seams completed to sufficient standard with both Fosroc Proofex Double Sided Butyl Jointing tape and Fosroc Proofex 3000MR Self Adhesive Membrane. Proven by air lancing.</i>
3.7	Service entry seals	<i>All Top Hat seals installed to a high standard using Fosroc Proofex 3000MR Self Adhesive Membrane.</i>
4 – Other comments/ considerations		
4.1		
4.2		
5 - Photographs		
Photograph		Description
		<i>Photograph showing the beam and block floor on Plots 2 & 3 complete, including attached garages. Minimum 200mm void verified beneath floor.</i>
		<i>Photograph showing clear void of minimum 200mm height beneath the beam and block floor on Plots 2 & 3.</i>

	Photograph showing external Airbricks connected to telescopic vents on Plots 2 & 3.
	Photograph showing first fit gas membrane in place on Plots 2 & 3. Continuous across external cavity walls and internal walls, with appropriate corner/ doorway threshold detailing tape.
	Photograph showing sealing around service entry points utilising Fosroc 3000MR self-adhesive membrane on Plots 2 & 3.
	Photograph showing gas membrane in place on Plots 2 & 3 with all joints lapped and welded. Tophat fittings visible.

	Photograph showing gas membrane in place on Plots 2 & 3 with all joints lapped and welded. Tophat fittings visible.
	Photographs showing membrane join with min. 150mm overlap of membrane on Plots 2 & 3.
	Photograph showing sealing around service entry points utilising Fosroc 3000MR self-adhesive membrane on Plots 2 & 3.
	Photograph showing sealing around service entry points utilising Fosroc 3000MR self-adhesive membrane on Plots 2 & 3.

REMEDIAL ACTIONS REQUIRED

N/A

CERTIFICATION

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

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

Inspection Checklist Notes:

1.1	Sub-floor void	Is a check possible? Void former? Gravel (type/ specification)? Height of void space? Is it clear?
1.2	External wall airbricks	Numbers, size, positions as per design drawing?
1.3	Internal sleeper walls	Ventilation holes (honeycomb brickwork/ pipe crossings)? Size, spacing, location in accordance with design?
1.4	External vent trenches/ ducts	Located/ construction in accordance with design? If open-topped – gravel type, presence of fines? If pipe or other vent, check position and construction for functionality and absence of blockages. Ability of void former to withstand bearing of superstructure?
2.1	System details	Type of air supply: mechanical, natural, combined? Location/ condition/ number of fans and vents? Location and size of inlets? Provision of air-cleaning devices? Supply and exhaust ducting? Alarm provision/ installation? Gas monitoring system in under-floor void?
3.1	Condition of sub-grade and underside of membrane	Check that the sub-grade does not contain rough/uneven surfaces, is appropriately clean and that there are no hard/sharp objects. That protective sand blinding or geotextile (if specified) is present?
3.2	Details of gas membrane product used	Manufacturer and product specification, gauge, colour, brand/name, material, batch/ roll numbers, storage arrangements (to protect from dirt/damage).
3.3	Gas membrane condition (rips/ tears/ penetrations)	Open punctures, tears, rips, stretching? Excessive footprints/ evidence of traffic? Presence of debris? Repairs? Signs of weakness such as raised or sunken indentations? Protection plan in place to restrict access to lain gas membrane?
3.4	Details of joining/ lapping tape products used	Product type, brand, thickness, material, width, colour? Foil backed? Double sided?
3.5	Lapping design	Joints lapped and sealed in accordance with manufacturers requirements/ specification? Minimum overlap ensured? Sections taped twice (double sided and lapping)?
3.6	Laps, welds and joint seals	Welds complete? Appropriate jointing tape used? No creases or folds in sheet edges? Adequately bonded? (confirm by air lance integrity testing as necessary in accordance with the verification plan)
3.7	Service entry seals	Top hats seal arrangements fixed around service entries? Use of jubilee clips? Adequately taped to membrane at joins with double-sided and lapping tape?

Appendix D

GAS PROTECTION MEASURES VERIFICATION AIR LANCE INTEGRITY TESTING RECORD



Site Name:		Gas Characteristic Situation:	
Job Number:		Type of development: (Residential/ commercial/ other)	
Date:		Building Description:	
Integrity Testing Engineer:		Foundation Type: (suspended floor/ raft/ other)	
Weather during inspection:		Gas Protection Type: (passive/ active)	
Plot number(s):			

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

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

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

Report Reference *****

4 - Photographs	
Photograph	Description
	IDG's typical Air lance kit set up for integrity testing of the seams/ joins and tophat seals, and compliant with ASTM D4437.
	Air lance testing of joint between two membrane sheets on Plots 2 and 3, with pressure gauge showing maintained pressure of 57psi. (Above minimum of 60psi advocated by ASTM D4437-08:2013).
	Air lance testing of joint between two membrane sheets on Plots 2 and 3, with pressure gauge showing maintained pressure of 60psi. (Above minimum of 50psi advocated by ASTM D4437-08:2013).
	Air lance testing of joint between gas membrane and Tophat at service penetration on Plots 2 and 3 with pressure gauge showing maintained pressure of 57psi. (Above minimum of 50psi advocated by ASTM D4437-08:2013).

REMEDIAL ACTIONS REQUIRED

N/A

CERTIFICATION

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

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

Appendix E

BRANDON RICE-BIRCHALL
I D GEO ENVIRONMENTAL LTD
CALEDONIAN HOUSE
TATTON STREET
KNUTSFORD
WA16 6AG

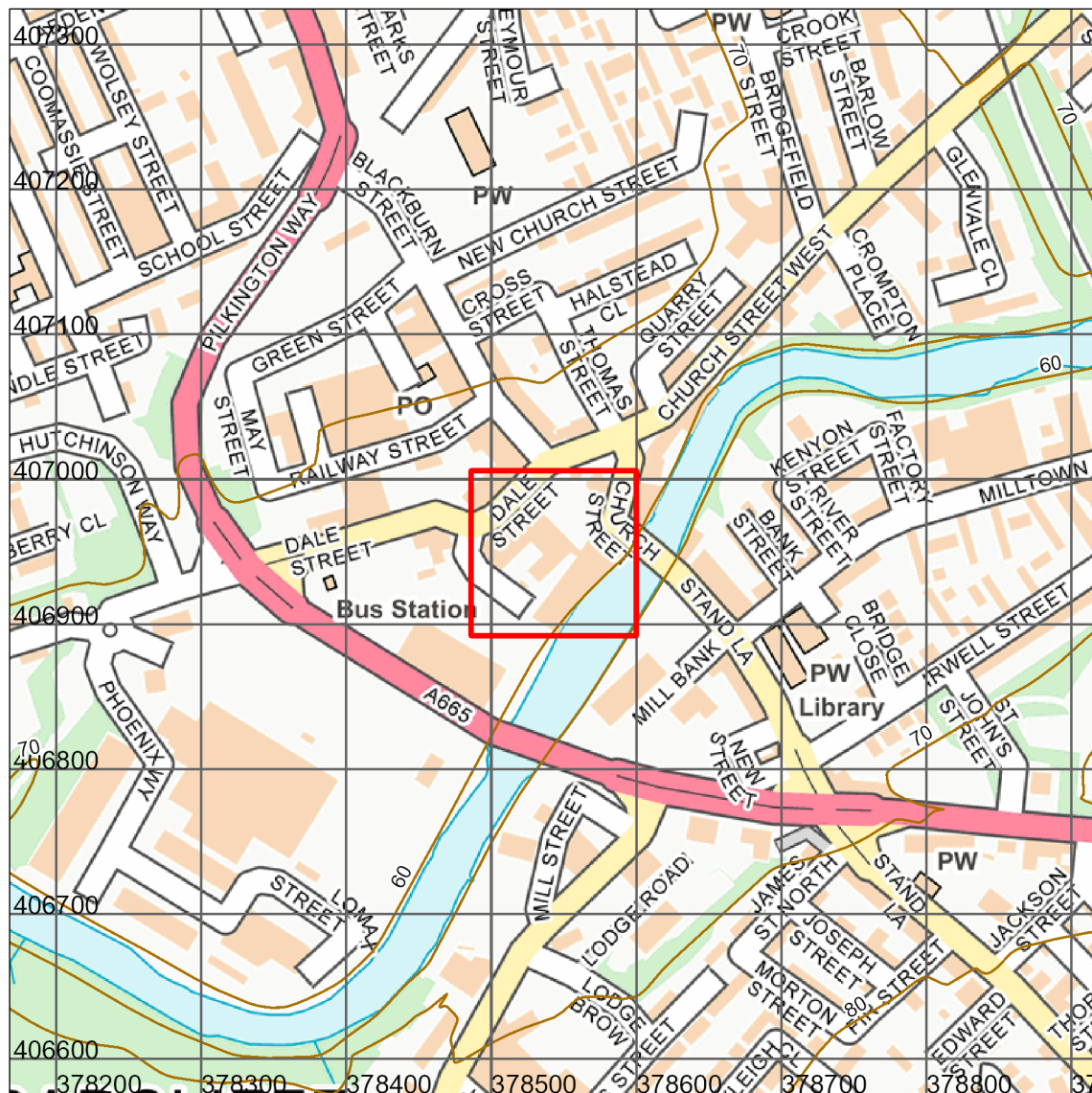
Radon Report

Advisory report on the requirement for radon protective measures in new buildings, conversions and extensions to existing buildings. The report also indicates whether a site is located within a radon Affected Area

Report Id: *BGS_332484/44389*

Client reference: 5238

Search location



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Search location indicated in red

*This report describes a site located at National Grid Reference 378543, 406949.
Note that for sites of irregular shape, this point may lie outside the site boundary.
Where the client has submitted a site plan the assessment will be based on the area given.*

Radon Report: UK

When extensions are made to existing buildings in high radon areas, or new buildings are constructed in these areas, the Building Regulations for England, Wales, Scotland and Northern Ireland require that protective measures are taken against radon entering the building.

This report provides information on whether radon protective measures are required. Depending on the probability of buildings having high radon levels, the Regulations may require either:

1. No protective measures
2. Basic protective measures
3. Full protective measures

This is an advisory report on the requirement for radon protective measures in new buildings, conversions and extensions. The report also indicates whether a site is located within a radon Affected Area

Requirement for radon protective measures

The determination below follows advice in *BR211 Radon: Guidance on protective measures for new buildings (2015 edition)*, which also provides guidance on what to do if the result indicates that protective measures are required.

Is the property in an area where radon protective measures are required for new buildings or extensions to existing ones as described in publication BR211 (2015 edition) Radon: Guidance on protective measures for new buildings?

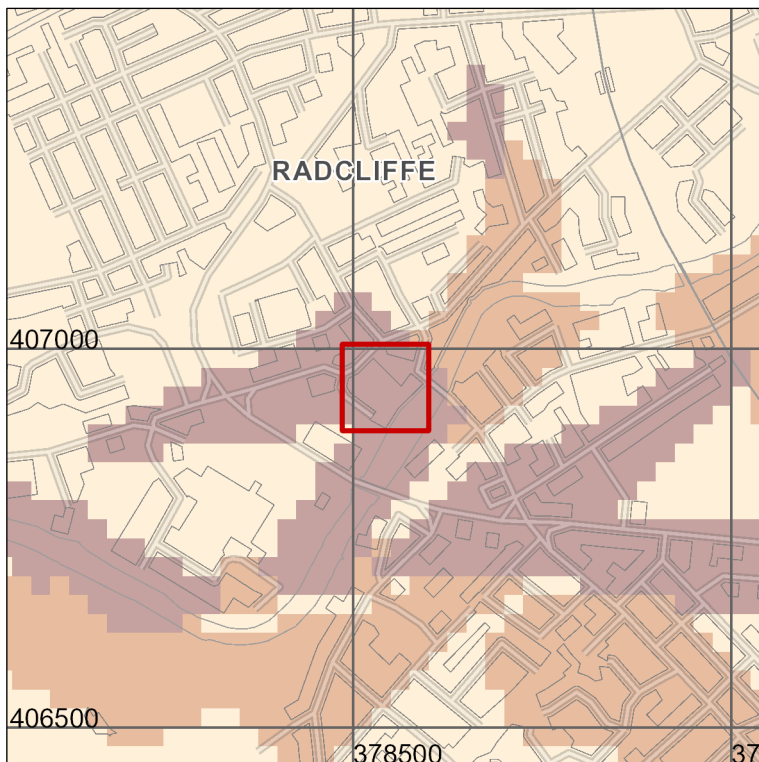
BASIC RADON PROTECTIVE MEASURES ARE REQUIRED FOR THE REPORT AREA.

More details of the protective measures required are available in *BR211 Radon: Guidance on protective measures for new buildings (2015 Edition)*. Additional information and guidance is available from the Building Research Establishment website (<http://www.bre.co.uk/radon/>).

Whether or not the radon level in a building is above or below the radon Action Level can only be established by having the building tested. The UKHSA provides a radon testing service which can be accessed at www.ukradon.org or by telephone (01235 822622).

If you require further information or guidance, you should contact your local authority building control officer or approved inspector.

Radon Affected Area



% Homes estimated to be at or above the action level
0-1%
1-3%
3-5%
5-10%
10-30%
30-100%

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Scale: 1:10 000 (1cm = 100 m)

Search area indicated in red

Is the property in a radon Affected Area as defined by the UK Health Security Agency (UKHSA) and if so what percentage of homes are estimated to be at or above the Action Level? YES

Additional Information

THE PROPERTY IS IN A RADON AFFECTED AREA WHERE 3 TO 5% OF HOMES ARE ESTIMATED TO BE AT OR ABOVE THE ACTION LEVEL.

The UKHSA recommends a radon 'Action Level' of 200 Becquerels per cubic metre of air (Bq m^{-3}) for the annual average of the radon gas concentration in a home. Where 1% or more of homes are estimated to be at or above the Action Level the area should be regarded as a radon Affected Area.

This report informs you whether the property is in a radon Affected Area and the percentage of homes that are estimated to be at or above the radon Action Level at this location. Being in an Affected Area does not necessarily mean there is a high radon level within the property; the only way to determine the radon level is to carry out a radon measurement.

The UKHSA advises that radon gas should be measured in all properties within radon Affected Areas and that homes with radon levels at or above the Action Level (200 Bq m⁻³) should be remediated. Householders with levels between the Target Level (100 Bq m⁻³) and Action Level should seriously consider reducing their radon level, especially if they are at greater risk, such as if they are current or ex smokers. Whether or not a home is in fact above or below the Action Level or Target Level can only be established by having the building tested. The UKHSA provides a validated radon testing service which can be accessed at www.ukradon.org.

The information in this report provides an answer to one of the standard legal enquiries on house purchase in England and Wales, known as Law Society CON29 Enquiries of the Local Authority (2016); 3.14 Radon Gas: Do records indicate that the property is in a “Radon Affected Area” as identified by the UKHSA. The data can also be used to advise house buyers and sellers in Scotland and Northern Ireland.

If you are buying a new build property in a Radon Affected Area, you should ask the builder whether radon protective measures were incorporated in the construction of the property.

If you are buying a currently occupied property in a radon Affected Area, you should ask the present owner whether radon levels have been measured in the property. If they have, ask whether the results were at or above the radon Action Level and if so, whether remedial measures were installed, radon levels were re-tested, and if the results of re-testing confirmed the effectiveness of the measures.

Further information on radon is available from the UKHSA at www.ukradon.org.

What is radon?

Radon is a naturally occurring radioactive gas, which is produced by the radioactive decay of radium which, in turn, is derived from the radioactive decay of uranium. Uranium is found in small quantities in all soils and rocks, although the amount varies from place to place. Radon released from rocks and soils is quickly diluted in the atmosphere. Concentrations in the open air are normally very low and do not present a hazard. Radon that enters enclosed spaces such as some buildings (particularly basements), caves, mines, and tunnels may reach high concentrations in some circumstances. The construction method and degree of ventilation will influence radon levels in individual buildings. A person's exposure to radon will also vary according to how particular buildings and spaces are used.

Inhalation of the radioactive decay products of radon gas increases the chance of developing lung cancer. If individuals are exposed to high concentrations for significant periods of time, there may be cause for concern. In order to limit the risk to individuals, the Government has adopted an Action Level for radon in homes of 200 becquerels per cubic metre (Bq m^{-3}). The Government advises householders that, where the radon level is at or above the Action Level, measures should be taken to reduce the concentration.

Radon in workplaces

The Ionising Radiation Regulations 2017 require employers to take action when radon is present above a defined level in the workplace. Advice may be obtained from your local Health and Safety Executive Area Office or the Environmental Health Department of your local authority. The BRE publishes a guide (BR293): **Radon in the workplace**. BRE publications may be obtained from the BRE Bookshop, Tel: 01923 664262, email: bookshop@bre.co.uk website: www.brebookshop.com

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