



Geotechnical &
Environmental
Consultants

Aldi RDC
Bardon
Leicestershire

Ground Gas Verification Plan For Snowden Seamless Flooring Ltd

Project No: D43017		Date: 9 th February 2023	
Issue/revision	Prepared by	Checked By	Approved By
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Comments			



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This Ground Gas Verification Plan (GGVP) is intended to act as a stand-alone document which draws together the information relating to the ground gas risk assessment and gas protection system design proposals for the development. This GGVP has been prepared in general accordance with CIRIA C735 'Good practice on the testing and verification of protection systems for buildings against hazardous ground gases' (2014) and sets out our proposals to inspect the installed gas protection system and BS8485:2015 +A1:2019 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'. These guidance documents are hereinafter referred to as C735 and BS8485.

We would note that the responsibility for the design of the ground gas protection system rests with others. It is assumed that regulatory approval of the ground gas protection system has been gained, by others. This GGVP prepared by GeoDyne Ltd serves to summarise the ground gas protection system designed by others and provides a methodology for the verification of installed ground gas protection measures.

Client	Snowden Seamless Flooring Ltd		
Site Name	Aldi RDC, Bardon, Leicestershire		
Development Proposals	Construction of a large warehouse / distribution centre with internal offices and welfare facilities, together with a standalone gatehouse and vehicle maintenance garage.		
Previous Reports	The following report has previously been prepared by others in relation to the development site: - Craddys report entitled 'Aldi Bardon RDC – Gas Protection Strategy', Ref: 10462w0036, dated January 2021. The Craddys report summarises the ground gas regime at the site, based on ground gas monitoring reported within the following reports (relevant excerpts of which are included as Appendices within the Craddys report). - Environmental Resources Management (ERM) report 'Nailstone Colliery, Leicestershire – Site Investigation Report and Remedial Strategy', dated March 2010. - Capita report 'Former Nailstone Colliery, Leicestershire', dated November 2015, Revision B. The information within the above reports has been used herein, no further monitoring or assessment of the ground gases at the site has been carried out by GeoDyne, unless otherwise stated.		
Ground Gas Classification / Characteristic Situation		Min	Max
	Methane concentration	0.0 % v/v	52.5 % v/v (see below comments)
	Carbon Dioxide concentration	0.7 % v/v	10.1% v/v (see below comments)
	Flow	0.0 L/h	0.7L/h
	Calculated GSV (maximum for methane)	0.3556 L/h	
	Calculated GSV (maximum for carbon dioxide, GeoDyne calculation)	0.3024L/h	
	Derived Site Characteristic Situation	CS2	

Client	Snowden Seamless Flooring Ltd	
Site Name	Aldi RDC, Bardon, Leicestershire	
Comments regarding Characteristic Situation	The Craddys report notes that the gas regime at the site was classified as Characteristic Situation CS2 within the Capita report and noted this classification 'was primarily due to the peak flows recorded on site marginally exceeding the limitations set for CS1. The CS2 rating was specifically related to a capped slurry mound which was identified as needing to be remediated'. With regards to the site classification, the Craddys report further states 'No further gas testing was undertaken post the Capita 2015 regime. As such the site is currently (conservatively) classified as gas characteristic situation CS2 'low risk'. It is probable that site remediation outlined [summarised in a Bradbrook Consulting report, not currently available] above will have addressed the capped slurry lagoon and thus a reduction from CS2 is likely, however, at this time CS2 will be assumed in the absence of further testing'. It is noted that Capita reported a maximum carbon dioxide concentration of 14.4% v/v within the boreholes beyond the capped slurry lagoon. A methane concentration of 23.1% v/v was reported in a single borehole on a single location beyond the slurry lagoon although this elevated concentration was considered by Capita to potentially be an erroneous reading, a maximum methane concentration of 0.6% v/v was recorded in all other boreholes.	
Building Type	Warehouse space	Type D
	Office areas, welfare facilities and staircases (within warehouse footprint)	Type C
	Gatehouse and vehicle maintenance garage (external to warehouse footprint)	Type C
Required Ground Gas Protection Score (In accordance with Table 4, BS8485)	Type D buildings	1.5 points
	Type C buildings	2.5 points
Ground Gas Protection System Will Comprise:	Warehouse space	
	Structural barrier – reinforced cast in-situ monolithic floor, formed by continuous pour methods within minimal joints	1.5 points
	Pressure relief pathway – None proposed	0 points
	Gas resistant membrane – None proposed	0 points
	Total points achieved by proposed system (Type D building)	1.5 points
	Office areas, welfare facilities and staircases (within warehouse footprint)	
	Structural barrier - reinforced cast in-situ monolithic floor, formed by continuous pour methods within minimal joints	1.5 points
	Pressure relief pathway – None proposed	0 points
	Gas resistant membrane – Visqueen Gas Barrier to be installed throughout areas which fall into Building Type C (2 points achieved when well installed and validated by an independent third party)	2 points
	Total points achieved by proposed system (Type C building)	3.5 points
	Gatehouse and Vehicle Maintenance Garage (external to warehouse footprint)	
	Structural barrier – traditionally constructed reinforced ground bearing slab	0.5 points
	Pressure relief pathway – None proposed	0 points

Client	Snowden Seamless Flooring Ltd	
Site Name	Aldi RDC, Bardon, Leicestershire	
	Gas resistant membrane – Visqueen Gas Barrier to be installed throughout external Building Type C structures (2 points achieved when well installed and validated by an independent third party)	2 points
	Total points achieved by proposed system (Type C building)	2.5 points
Membrane Installers & Relevant Qualifications	Snowden Seamless Flooring Ltd – Not specialist/qualified installers.	
Membrane Installation, Jointing & Sealing	• Installation Type – Full lineout to the localised areas within the structure where membrane is identified to be necessary (see attached drawing). The membrane is to extend 2m beyond the perimeter of each area requiring membrane. • Joints in membrane – minimum overlap 150mm, taped and rolled using a silicone roller. Jointing tape is to comprise Visqueen Pro Double Sided Jointing Tape and sealed with Visqueen Gas Resistant Foil Lap Tape. • Corners – bespoke corners formed on site from Visqueen Pro Detailing (a self-adhesive gas resistant membrane - SAGRM, minimum overlap of 150mm with membrane). • Service Penetrations – bespoke collars formed on site from Visqueen Pro Detailing Strip (SAGRM) or preformed collars sealed with an appropriate jointing tape. • Steel columns – bespoke seals on site from Visqueen Pro Detailing Strip, based on industry good practice bituminous primer should be applied to base of column to improve adhesion, minimum overlap of SAGRM of 150mm with membrane and column. • Membrane to be installed following the Snowden Seamless Flooring Ltd Method Statement and the Visqueen Gas Barrier Datasheet (both attached).	
Sub-grade Preparation	The sub-grade should be inspected by the membrane installer prior to commencement of membrane installation. Where a suitably smooth / clean sub-grade cannot be achieved it will be necessary to use a sand blinding or fleece layer on top of the sub-grade to minimise the risk of damage to the underside of the membrane.	
Verification Proposals	We propose to inspect up to 100% of the installed ground gas resistant membrane within the proposed Type C areas (as indicated on the attached drawing). Verification within other areas of the structures (i.e. the Type D building areas) is considered not to be necessary as no membrane is proposed and is therefore beyond our current scope of works. Our verification will include the following as a minimum: • Obtain photographic records of the membrane during the installation process. An '<i>Inspection of Gas Protection Measures</i>' pro forma should be completed for each area of membrane, to maintain records of the installed membranes. • Visual inspection of the seams in the membrane to assess the continuity of membrane within each area. Mechanical point stress (pick) tests will be undertaken along the edge of the seams to identify any unbonded seams (as appropriate). • Visual inspection of the seals around the corners, stanchions and service pipe penetrations, with point stress testing adopted where appropriate. • Records of materials/components of the ground gas resistant membrane (inclusive of serial numbers, where possible/appropriate) should be obtained during each inspection. • Visual inspection of the installed membrane to identify any areas of damage (i.e. punctures, cuts, tears etc.). Should it become necessary for the membrane installers to deviate from the attached drawing during the membrane installation, the inspecting Engineer should be notified by the Client. Confirmation and approval of such changes should be sought by the Client from the inspecting Engineer and Local Authority prior to installation. Records and photographic evidence of any changes to the installation detail should be taken by the inspecting Engineer during the inspection visit.	

Client	Snowden Seamless Flooring Ltd
Site Name	Aldi RDC, Bardon, Leicestershire
Non-Compliances	Should any non-compliances (i.e. punctures / tears to the membrane, defective joints/seals etc.) be encountered during the inspection, corrective action should be carried out in accordance with the Visqueen Gas Barrier Technical Datasheet '<i>If the barrier is punctured or perforated a patch of the same material should be lapped at least 150mm beyond the limits of the puncture and bonded with Visqueen Pro Double Sided Jointing Tape and sealed with Visqueen Gas Resistant Foil Lap Tape. Alternatively a patch can be formed using Visqueen Pro Detailing Strip and lapped at least 150mm beyond the extents of the puncture</i>'. Where breaks are identified in the taped joints between membrane sheets, the breaks should be repaired by welding application of additional double sided jointing tape or repaired with a SAGRM patch fully adhered over the break in the joint. A photographic record will be obtained of the defective / damaged areas of the membrane and subsequent repair works.
Service Pipe Penetrations	Should there be any instances where service pipe penetrations are to act as ducting for smaller service pipes (i.e. water supply etc.), we would anticipate that these smaller pipes would be installed at a later stage during the construction process and therefore we are unable to inspect the seals of the pipes within the ducting at the time of our inspection visits. An appropriate method of sealing the ducting should be adopted by the Client (such as closed cell expanding foam, liquid membrane or an appropriately sealed bung) to minimise the risk of the duct acting as a conduit for ground gases to enter the building.
Floor Pours & Shuttering	Should it be proposed to use temporary formwork during construction for the floor slab the membrane should extend beyond the edge of the floor slab area (for the current pour) to enable the membrane to be lapped and joined onto the membrane installed in the later stages, forming a continuous barrier. Therefore, where shuttering is to be used to form the edge of the floor slab it will be necessary to ensure that any damage caused to the membrane from the shuttering pegs is repaired in an appropriate manner, during follow-on stages of the membrane installation. Where pegs are to remain in-situ following removal of the shuttering, an appropriate method of sealing the pegs should be adopted. These seals are typically formed by a layer of SAGRM or double-sided tape stuck to the membrane at the location of the peg (with backing paper removed on both sides), to form a seal around the peg as the peg is inserted or using self-adhesive membrane to fully seal each peg to the membrane.
Post Inspection Membrane Protection	Any damage to the membrane will compromise the efficacy of the membrane and should be appropriately repaired. The Site Manager should make all follow-on trades aware of the importance of the membrane and they should be requested to minimise the number of times the membrane is traversed prior to pouring the floor slab. Should any damage occur to the membrane following inspection, the Client should ensure that appropriate remedial action, in accordance with industry good practice is undertaken prior to pouring the slab. Any damage incurred should be revalidated in accordance with the established methodology. The ground gas membrane should at all times be suitably protected against the possibility of inadvertent puncture (such as from reinforcement fibres within the concrete where the concrete is to be poured directly onto the membrane). Where required, a protective fleece/geotextile or similar may be employed to protect the membrane, as appropriate. The concrete should be poured as soon as possible following the installation and validation of the membrane, to minimise the opportunity for damage to the membrane from both follow on trades and the elements. Where the membrane is left exposed to the elements for prolonged periods of the membrane and SAGRM may start to degrade. Please note that we cannot validate a membrane that has been covered over by concrete (or is otherwise not visible) prior to our attendance to site.
Validation Report	A single validation report will be prepared following completion of inspection of the gas protection measures within all required areas of the building. Certificates to confirm the suitability of the membrane installation will be issued following completion of each area of the membrane.
General Comments	

Client	Snowden Seamless Flooring Ltd
Site Name	Aldi RDC, Bardon, Leicestershire
	- For a membrane to achieve a score 2 points, the specification and properties of the membrane must be considered based on the criteria of Table 7 BS8485:2015 +A1:2019, inclusive of third-party verification in accordance with CIRIA C735 (2014). - Our findings and comments will reflect the suitability of the membrane on the days of our visits and are limited to areas completed, physically accessible and visible to the naked eye. No responsibility will be taken for any areas of membrane that could not be inspected or for any damage which occurs to the membranes after our inspections. - Responsibility for providing, installing the membrane and maintaining the integrity of the membrane in an appropriate manner rests solely with the Client. For lapped and taped membranes the 'lap' tape should be installed after our inspection, it is the joint between the membrane panels, corner details, stanchions and service pipe penetrations that we need to inspect. Where lap tape is applied prior to our inspection it will be necessary for us to remove some/all of the tape to inspect the joints.
Attachments	Gas Protection Drawing Membrane Technical Details – Visqueen Gas Barrier Snowden Seamless Flooring Ltd Method Statement Verification Proforma – Template GeoDyne Conditions and Limitations

Visqueen Gas Barrier

Features and benefits

- BBA certified - third party accreditation
- Complies with BS 8485:2015 + A1:2019 - industry standard for methane and carbon dioxide protection
- Flexible - easy to detail and install on site
- Multi functional - also acts as a radon and damp proof membrane
- Dual jointing methods - lap joints can be taped or heat welded

Product description

Visqueen Gas Barrier is a multi-layer reinforced polyethylene gas barrier with a 20 micron aluminium foil. The barrier is coloured blue on the upper surface and silver on the reverse. The product is supplied in single wound rolls (not folded), 2m x 50m.

Approvals and standards

- Third party accreditation (BBA 13/5069)
- Conforms to the specification requirements of BS 8485:2015 + A1:2019
- Suitable for all Characteristic Gas Situation (CS) ground gas regimes
- Conforms to the specification requirements of NHBC Amber 1 and Amber 2 applications
- Conforms to the specification requirements of BR 211:2015
- CE Mark EN 13967:2017
- Quality Management System ISO 9001:2015
- Occupational Health and Safety System ISO 18001:2007
- Environmental Management System ISO 14001:2015

Usage

Visqueen Gas Barrier is suitable for use in all types of buildings to prevent the ingress of harmful levels of ground gases e.g. methane, carbon dioxide and radon.

The barrier can be positioned above or below a solid concrete ground floor slab or above a precast suspended segmental ground floor system, e.g. beam and block floor.

The barrier can also be used as a high performance radon membrane and/or damp proof membrane.

The product is not intended for use where there is a risk of hydrostatic pressure.

System components

- VisqueenPro Double Sided Jointing Tape, 50mm x 10m
- Visqueen Gas Resistant Foil Lap Tape, 75mm x 50m
- Visqueen GR Lap Tape, 150mm x 10m
- Visqueen Ultimate Top Hat Units
- Visqueen Preformed Units
- VisqueenPro Detailing Strip, 300mm x 10m, 500mm x 10m
- Visqueen TreadGUARD 300, 2m x 75m
- Visqueen TreadGUARD 1500, 1m x 2m

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Visqueen Gas Barrier

Storage and handling

Visqueen Gas Barrier should be stored horizontally, under cover in its original packaging.

Care should be taken when handling the product in line with current manual handling regulations.

Preparation

Visqueen Gas Barrier should be installed on a smooth continuous surface e.g. grouted beam and block floor, a compacted blinding layer e.g. 50mm thick sand blinding, or smooth concrete blinding. The substrate should be free from irregularities such as voids or protrusions.

The barrier can be cut with a sharp retractable safety knife or robust scissors.

When installing the membrane in demanding site conditions, use Visqueen GR Lap Tape in place of Visqueen Gas Resistant Foil Lap Tape.

Installation

Visqueen Gas Barrier should be loose laid on the substrate with the blue side up so as to avoid sunlight glare.

The barrier should be clean and dry at the time of jointing. It should be overlapped by at least 150mm, bonded with Visqueen Pro Double Sided Jointing Tape and sealed with Visqueen Gas Resistant Foil Lap Tape.

Alternatively lap joints can be heat welded to achieve an effective seal. Welded lap joints can be less than 150mm provided the joint integrity is not compromised.

Airtight seals should be formed around all service entry points. Visqueen Preformed Top Hat Units should be used for sealing service entry pipes. The base of the top hat and the upstand should be bonded using Visqueen Pro Double Sided Jointing Tape and sealed with Visqueen Gas Resistant Foil Lap Tape. The upstand should be secured with the supplied jubilee clip.

Forming an effective barrier to gases may give rise to complex three-dimensional detailing where, it is recommended Visqueen Preformed Units are used e.g. corners. Alternatively Visqueen Pro Detailing Strip can be used to seal awkward junctions.

If the barrier is punctured or perforated a patch of the same material should be lapped at least 150mm beyond the limits of the puncture and bonded with Visqueen Pro Double Sided Jointing Tape and sealed with Visqueen Gas Resistant Foil Lap Tape. Alternatively a patch can be formed using Visqueen Pro Detailing Strip and lapped at least 150mm beyond the extents of the puncture.

Long periods of exposure to ultraviolet light will reduce the effectiveness of the membrane. The membrane should be covered by a protective layer immediately after installation to prevent damage from following trades, ultraviolet light, etc. Care should be taken to ensure that the membrane is not punctured, stretched or displaced when applying a screed or final floor covering. A minimum thickness of 50mm screed is recommended. When reinforced concrete is to be laid over the barrier the wire reinforcements and spacers must be prevented from puncturing the barrier. Where there is a high risk of potential damage, the barrier should be covered with Visqueen TreadGuard protection, screed, or other approved protection material before positioning the reinforcement.

Usable temperature range

It is recommended that Visqueen Gas Barrier and all associated system components should not be installed below 5°C.

Additional information

When used in accordance BS8485:2015 + A1:2019 a subfloor ventilation system or pressure relief maybe required
Where hydrocarbon or VOC contamination is present use Visqueen Ultimate VOC or HC Blok gas protection systems
To assist build sequencing, Visqueen GR DPC is available for gas protection through the wall constructions
For suspended beam and block floor detailing see GB-01
Visqueen Preformed Top Hat Units should be used at service pipe penetrations see GB-51
For internal and external corners Visqueen Ultimate Preformed Units should be used see PFU-553
To seal around steel columns use Visqueen Pro Detailing Strip see GB-52
For additional detailing information, contact Visqueen Technical Services +44 (0) 333 202 6800

The information in this datasheet was correct at the time of publication. It is the user's responsibility to obtain the latest version of the datasheet as it is updated on a regular basis. The information contained in the latest datasheet supersedes all previously published editions.

Visqueen Gas Barrier

Property	Test method	Units	Compliance criteria	Result
Dimensions	EN 1848-2	m		2 x 50
Overall thickness including scrim mesh	EN 1849-2	mm	+/-10%	0.52
Mass	EN 1849-2	g/m ²	-0%/+5%	400
Tensile strength - MD	EN 12311	N	MLV	350
Tensile strength - CD	EN 12311	N	MLV	350
Tensile elongation - MD	EN 12311	%	MLV	20
Tensile elongation - CD	EN 12311	%	MLV	21
Joint strength	EN 12317-2	N	MLV	332
Watertightness 2kPa	EN 1928	-	Pass/Fail	Pass
Resistance to impact	EN 12691	mm	MDV	150
Dart impact	BS 2782	g	MDV	731
Low temperature flexibility	EN 495-5	°C	MDV	-40
Durability against ageing	EN 1296 and EN 1928	-	Pass/Fail	Pass
Durability chemical resistance	EN 1847	-	Pass/Fail	Pass
Resistance to tearing (nail shank) CD	EN 12310-1	N	MDV	358
Resistance to tearing (nail shank) MD	EN 12310-1	N	MDV	368
Resistance to static loading	EN 12730	kg	MLV	20
Water vapour transmission - resistance	EN 1931	MNs/g	MDV	7000
Water vapour transmission - permeability	EN 1931	g/m ² /d	MDV	0.03
Visible defects	EN 1850 -2	-	Pass/Fail	Pass
Reaction to fire	EN 13501-1	Class	MDV	F
BS 8485:2015 + A1:2019 testing requirements				
Mass	EN 1849-2	g/m ²	Average >370	400
Methane permeability	ISO 15105-1	mls/m ² /d/atm	Pass/Fail	<0.15
Puncture CBR	BS EN ISO 12236	N	MDV	1114
Tensiles yield strength MD	ASTM D4885-01	kN/m	MDV	12.5
Tensiles yield strength CD	ASTM D4885-02	kN/m	MDV	7.3
Resistance to static loading	EN 12730	kg	>MLV	20
Yield elongation CD	ASTM D4885-04	%	MDV	19
Tear resistance - trouser method A - MD	BS ISO 34-1	kN/m	MDV	48.2
Tear resistance - trouser method A - CD	BS ISO 34-1	kN/m	MDV	44.8
Tear resistance - angle method B - MD	BS ISO 34-1	N	MDV	53.5
Tear resistance - angle method B - CD	BS ISO 34-1	N	MDV	60.6

Health and safety information

Refer to the Visqueen Gas Barrier material safety datasheet (MSDS).

Visqueen Gas Barrier

About Visqueen

The Visqueen name has long been recognised as one of the leading manufacturers of high quality advanced membrane technologies and design based solutions by specifiers, distributors, builders merchants and contractors throughout the UK and Europe.

For further guidance on the Visqueen services shown below, please refer to the relevant section of the Visqueen website (www.visqueen.com) or contact Visqueen Technical Services on +44 (0) 333 202 6800 or enquiries@visqueen.com

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Visqueen Technical Support

Visqueen combine an extensive product portfolio with industry leading levels of service and support which includes guidance over the phone, bespoke CAD drawings to help with complex detailing, electronic NBS specifications and access to a dedicated team of highly knowledgeable and experienced field based Technical Support Managers.

Visqueen Technical Support is available to all our customers including architects, specifiers, distributors, builders merchants, contractors and end users. All of our technical team have been awarded the industry recognised qualification Certificated Surveyor in Structural Waterproofing (CSSW).

Visqueen CPD Seminars

The Visqueen Continuing Professional Development (CPD) Seminars provide up-to-date information on changes within Building Regulations/Building Standards and nationally recognised industry guidance affecting damp proofing, water vapour control, hazardous ground gas protection and below ground structural waterproofing.

The one hour seminars have been produced for design specialists within the construction sector and are delivered by our team of Technical Support Managers.

Visqueen PI designs and special projects

From initial design to the completed project, Visqueen are with you every step of the way. Whether it be hazardous ground gas protection and/or below ground waterproofing protection employing barrier, structurally integral or drained systems, Visqueen can offer professional indemnity (PI) insurance for bespoke Visqueen design solutions.

Visqueen Technical Support Managers work with all stakeholders to provide cost effective Visqueen solutions offering complete peace of mind throughout the construction phase and beyond.

Visqueen Training Academy

Based at our manufacturing facility in Derbyshire, the Visqueen Training Academy is available to support Visqueen customers throughout the UK by providing a wide range of both theory and practical skills related training.

Courses include one day product awareness training for our distributors and builders merchants to help them in their day-to-day jobs, through to intensive three day courses giving detailed hands-on training in the practical skills required for safe and robust product installation.

Safe System of Work

This form may be used for developing a safe method of work for an individual work package or alternatively a whole project, so long as procedures are in place to control the unavoidable risks which were highlighted in the project and work risk assessments.

Project reference:	Site address:
Laserscreed & Dry-shake Topping	Aldi RDC, Bardon, Leicestershire.
Section 1 Sections of work to be covered by this method statement	
1. Site familiarisation	5. Applying Finish
2. Setting levels and formwork	6. Cure Membrane
3. Installing Gas Membrane and integration of steel fibres.	7. Forming floor joints
4. Placing of concrete ground floor slab	
Section 2 Details of the work supervisory arrangements	
Work will be supervised by Snowden's Site Supervisor (NAME TBC) with man operation.	
Section 3 Plant, tools and equipment (List all the plant to be used in each section of the work, refer to section 1 above)	
1. Concrete mixer trucks	6. Vibrating poker
2. Laserscreed.	7. Power- floats
3. Dry-shake topping Spreader.	8. Hand Tools
4. Hand held Stihl and floor saw	9. Additional lighting
5. Laser screeding equipment	10. Fibre Integrator.
Section 4 Work sequence procedures (Indicate all safety precautions and control measures for each section of the work)	
1. Attend site induction familiarising operatives with PC sites rules, welfare, site traffic routes and emergency procedures. Supervisor to determine a datum and co-ordinate works with the PC's Site Manager. It has been identified prior to attending site that the wearing of safety footwear, hi-vis jackets, gloves and safety spectacles is an absolute minimum and that any one not complying may be asked to leave site. Note safety spectacle will <u>not</u> be sufficient when using abrasive wheels, goggles complying with BSEN 166 B must be worn.	

2. APPLY MIOTHENE AND SPLASH PROTECTION TO WALL/ CLADDING

Miothene will be fixed to all column bases and slab intrusions, corners will be cut to form neat square edges to the joint.

DPM or similar will be taped to the cladding to a height of approximately 1500mm prior to the commencement of pours offering protection against concrete splashes.

3. SUPPLY AND FIX JOINTS.

Joint positions will be as determined and shown on the drawing issued for construction. The proprietary armoured joints will be installed using purpose made fixings that enable the joint be lined and levelled. After the concrete has been poured and vibrated along the joints edge the levels will be checked by an optical level and adjusted if necessary.

4. PREPARATION: MEMBRANE AND FIBRE REINFORCEMENT

Place Gas Membrane allowing an overlap of 400mm, allow for turning membrane up face of perimeter of the slab so as to act as a bond breaker between the concrete and the perimeter edge.

Apply the double sided adhesive tape the edge of the bottom sheet and press top sheet down to seal joint. Apply foil tape to the edge of the top sheet and stick down onto the bottom sheet. An adhesive Detailing tape will be used to fix the membrane in place around columns and intrusion through the membrane. The same tape will be used to fix the membrane to perimeter walls and cladding.

An independent Validator will inspect the membrane, as the work proceeds. Before any concrete is poured he will confirm that the membrane has been correctly installed.

The concrete will be checked on arrival on site to ensure the correct Slump. A "Superplastciser" will then be introduced by a metered pump to bring the slump to between 150 to 175mm in order for the steel fibres to be added without serious balling.

To ensure the fibres are mixed into the concrete correctly a fibre integrator is used. This is a machine that force blow the fibres into the concrete trucks. Fibres are loaded into the hopper of the machine by a hydraulic arm and are blown into the trucks drum. Once the correct dosage of 40Kg/m³ have been blown into the drum it will then be rotated to ensure the fibres are mixed throughout the concrete.

5. PLACING CONCRETE/DRY SHAKE TOPPING

Designated Banksman (nominated by supervisor) will be responsible for directing mixer trucks to the discharge point, working from left to right.

Datum points supplied by the PC will be fed into the onboard computer of the laser screed.

The first load of concrete will be deposited in the required position and spread manually using shovels and rakes to approximately 25mm above the required level. Particular attention will be made to ensure that the edges of the bays are vibrated with a vibrating poker.

The laser screed will then be brought into operation to strike off the first pull.

The operator will check the levels and any adjustments will be made.

The levels will then be re-checked and verified as correct by the supervisor using a dumpy level, levels will be checked regularly throughout the day. This will then be followed by a Topp and Screed Spreader. This is a 4 wheel drive vehicle which drives to the face of the concrete extends a telescopic arm that drops topping onto the surface of the wet concrete. The arm then retracts and the boom is filled up from the hopper.

The topping is applied at a dosage of 3kgs/m². The topping is then worked into the wet concrete by a lightweight Fresno.

The laser screed driver will be trained and authorised and is responsible for the pre use inspection of the machine and its safe operation especially as others are working close by and there lies a constant risk of collision. The spreader driver will be trained and authorised and is responsible for the pre use inspection of the machine and its safe operation especially as others are working close by and there lies a constant risk of collision.

All operatives concerned with the pouring of concrete are fully aware of the dangers of contact with wet concrete and the topping. Protective clothing of rubber gloves, wellington boots and eye protection will be provided where operatives come into contact with wet concrete and topping.

5. POWER FLOATING

Power floating operations will start as soon as the concrete has stiffened sufficiently to support the weight of a man leaving a footprint of 3mm or less.

The finishing operations will commence with a panning machine to raise the "fat" sufficiently to have a working medium and further flatten the surface. As the operations progress bladed machines will be brought into action to work the surface until the required finish is achieved.

All edges will be made good with a 1.00 metre straightedge and hand trowelled.

Ride-on and handheld powerfloats will be used by authorised persons only.

In case of mechanical breakdown two supplementary ride-on powerfloats will be provided.

6. CURE MEMBRANE

Please note that this is not a harmful or flammable product.

As areas are completed the spray cure membrane will be applied with a motorised mist-blower sprayer having a 1200mm long lance to ensure that curing is started at the earliest possible moment.

All operatives will work in accordance with the appropriate COSHH sheets.

Section 5

Occupational health and safety considerations

Noise/vibration:

- Does the work involve the use of extremely loud or vibrating plant? **Yes –Saw/ laser screed/ powerfloats**
- Is the work to be undertaken adjacent to extremely loud or vibrating plant? **yes**
- Will any ear protection zones be designated on the site? **Yes**
- Will ear defenders be freely available for use? **Yes**

Details:

Noise

Despite our best efforts in silencing etc it is envisaged that noise levels will be in excess of what is considered to be acceptable due to the number of pieces of equipment being used in close proximity.

It is envisaged that all site operatives will need to wear hearing protection and not just the persons operating the equipment.

Vibration:

No operatives must exceed these times - anti vibration gloves supplied

Floor Saw:

max daily exposure 2 ½ hours

Petrol cut off:

max daily exposure 1 hour

Vibrating Poker:

max daily exposure 1 hour

Power Float:

max daily exposure 2 hours precautionary limit until info becomes available

Manual handling:

- Are there any specifically high risk manual operations highlighted in the RA? **Yes**
- Does the design take into consideration manual handling as far as you can see (size of components etc.)? **N/A**
- Does this project require a specific manual handling assessment? **N/A**

Details:

The placement of the mesh could create a problem due to weight, shape and flexibility. Forklift truck to be used where possible or team lifting to be considered if the operative feels the load is too heavy.

Hazardous substances (COSHH):

- Does the pre-tender plan include information regarding hazardous materials in the design?
- Have you identified any hazardous materials which could be replaced by alternative products?
- Have/ will you obtain safety data sheets (re: CHIP II) for all known hazardous materials to be used on the project? **Yes – included with this package**

Details:

Concrete – contains cements hazardous to skin
Proseal – see COSHH sheet
Dry shake topping – hazardous to skin

Personal protective equipment (PPE):

- Have all the work areas requiring PPE been identified? **Yes**
- What PPE will be readily available on site?

Details:

Site Specific: Hard Hats, safety boots and Hi-Viz vest.

Job Specific: Eye Protection, Hearing Protection, dust mask and Gloves

EYE/EAR & FOOT Protection required with: Hand Tools, and Stihl saw

Demarcation from clients undertaking:

- Will the client have his employees on or adjacent to the site? **Yes**
- Is the site part of a client occupied area with on going activities? **Yes**
- What demarcation measures will be taken? To be agreed with

Details:

Snowden Seamless Floors Ltd requires sole occupancy of the building whilst laying the floor slab. Site Supervisor to liaise with PC regarding this matter.

Section 6

Emergency procedures

Procedures:	Details:
Evacuation	To induction procedure
Fire	As above
Accidents	Immediately report to Snowden site supervisor who in return will report to the Site Manager and Snowden's head office Pat Snowden 07860 891 979 Sean Snowden 07971 544 147
Dangerous occurrence	Immediately report to Snowden site supervisor who in return will report to the Site Manager and Snowden's head office as above
Hot works permits	N/A
Excavation permits	None specified in contract documents
(Other site specific procedures)	

Signature(s) of Supervisor and Operatives detailed to carry out works associated with this method statement.	
1.	7.
2.	8.
3.	9.
4.	10.
5.	11.
6.	12.

Note: You are signing to indicate that you understand and will comply with this method statement.

If you feel that you can not work to this method statement for whatever reasons it is your legal duty to inform the Supervisor so as the method statement/task can be re-evaluated.

Author: JOHN STEWART Signed: *J Stewart.*

Date: 07 /02 /2023

INSPECTION OF GAS PROTECTION MEASURES

Site name	Aldi RDC Bardon	Client	Snowden Seamless Floors
Project number	D43017	Date	
Plot number		Visit by	

In general accordance with Appendix A5 of CIRIA C735 'Good practice on the testing and verification of protection systems for buildings against hazardous ground gas' (2014)

No.	Item	Comments (see notes)	No.	Item	Comments (see notes)				
1	Gas Membrane		2	Passive Venting					
1.1	Condition of sub-grade and underside of gas membrane		2.1	Sub-floor void					
1.2	Gas membrane type		2.2	External wall airbricks					
1.3	Gas membrane condition		2.3	Internal sleeper walls					
1.4	Joining tape product		2.4	External vent trenches/ducts					
1.5	Lapping design		3	Active Venting					
1.6	Laps, welds, joints and seals		3.1	System details					
1.7	Service entries seals		Areas Unavailable for Inspection		Material Batch Numbers				
Installers Name & Company:		NVQ Level 2 Qualified?		Photographic Evidence Requested from Site Manager/Installer YES/NO					
		Yes	No			Ongoing			
		Yes	No			Ongoing			
		Yes	No	Ongoing					
Non-Conformance/Corrective Measures Sheet Completed?		Yes	No	The gas protection measures inspected: A – Are acceptable and comply with the specification B – Are acceptable but attention is drawn to issues related to item No. C – Are not acceptable due to the issues related to item No.					
Additional Notes -			Photographs, As A Minimum & Where Applicable (✓)			Test Weld & Material Samples			
			Overall Plot / Area		Membrane Joint / Welds	Corner Details	Defects ALL	Test Weld Obtained A	YES/NO
			Stanchions		Air Bricks / Venting	Service Pipe Seals	Repairs ALL	Material Samples Obtained	YES/NO
Name			Signature				Date		

NON-CONFORMANCE/CORRECTIVE MEASURES SHEET



Site Name	Aldi RDC, Bardon	Project No.	D43017	Client	Snowden Seamless Floors
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Ground Floor Layout (Identify location of Non-Compliance on Layout)	Area		Ref. No.	Description: Weld failure (WF) Puncture (P) Corner seal failure (CSF) Service penetration failure (SPF) Tear (T) Cut (C) Patch failure (PF) Other (O) – please detail	Repair: Patch (P) Reweld (R) Other (O)	Photo Ref.	
						Defect	Repair
			1				
			2				
			3				
			4				
			5				
			6				
			7				
			8				
			9				
			10				
			11				
			12				
			13				
			14				
			15				
			16				
			17				
			18				
			19				
			20				

Date of Initial inspection		Initial Inspection Visit by		Date of Re-Inspection		Re-Inspection Visit By	
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Conditions & Limitations

Phase I Desk Studies

1. Works undertaken to provide the basis of the Phase I Desk Study report comprise a review of information available from a number of sources/parties (potentially also including the Client) together with a walk over of the site (where applicable and included within the quotation). The opinions given in the Phase I Desk Study are based on the information available from third parties/sources that has been obtained within the available timeframe. GeoDyne Limited assumes all third party information to be true and correct and therefore cannot accept liability for the accuracy of such information supplied.
2. Should additional information become available that may affect the comments and opinions made within the Phase I Desk Study, GeoDyne Limited reserves the right to review such information and make modifications to comments/opinions as appropriate.
3. It should be borne in mind that a Phase I Desk Study collates available information to generate a conceptual model of the site. The actual geotechnical and environmental considerations can only be fully quantified by intrusive investigation works to confirm the accuracy of the conceptual site model.

Phase II Intrusive Investigations

1. Our quotation assumes that access to the site will be arranged by others at no cost to ourselves.
2. We have assumed that free access is available throughout to the entire site and that works can be undertaken during a single mobilisation. Where restricted access is encountered, or where additional unscheduled mobilisations are required, additional costs may be incurred to the client.
3. We have assumed that all available information relating to buried services will be supplied by the Client at no cost to ourselves. No responsibility will be accepted for damage to underground services that have not been brought to our prior attention by the Client.
4. All excavations/boreholes will be backfilled with compacted arisings upon completion, with any excess arisings left proud of ground levels. Excess arisings will not be removed from the site unless specifically requested by the Client. Where we are requested to remove excess arisings, all associated costs will be passed to the Client.
5. We will attempt to leave the site in a clean and tidy state, however, it must be understood that some disturbance of the site is unavoidable during intrusive works.
6. Exploratory holes are positioned approximately on site by GeoDyne Limited. Should the client require precise locations of all exploratory points, additional fees will be incurred. It must be borne in mind that backfilled trial pits can create 'soft spots', therefore, should the Client wish to designate 'no dig' zones, for example under the footprint of proposed structures, these must be brought to our attention prior to commencement of works.
7. Groundwater observations relate to conditions encountered at the time of investigation. It must be understood that groundwater levels may vary as a result of recent climatic conditions or seasonal variation.
8. Trial pits and boreholes examine only a small proportion of the total site area. No liability can be accepted for conditions not revealed in exploratory holes, particularly between positions. All extrapolations of available data are given in good faith.

Payment

1. Payment terms are strictly 28 days from the invoice date.
2. Prior to commencement of works, we require receipt of formal written instruction from the party accepting full financial responsibility for the work. In the absence of such an instruction, we would expect the instructing Consulting Engineers/Architects to accept full financial responsibility for the works.
3. Receipt of instruction to commence work shall be taken as acceptance and compliance of the foregoing conditions.

Liability

1. GeoDyne Limited offer £5,000,000.00 Professional Indemnity Insurance (in aggregate over the year). This shall be the limit of our liability for works undertaken. No individual liability shall be implied to, or accepted by, any employee for works undertaken for and on the behalf of GeoDyne Limited.