Next Generation Engineering Consultancy Services

Ground Gas Verification Report for Premier Inn Hotel Extension, Heaton Park, Middleton Road, Manchester.

Project No: NX353



Client

Triton Construction Ltd

Next Generation Engineering Consultancy Services

DOCUMENT VERIFICATION

Report Reference: **NX353** **Issue:** Final **Date:** 31st January 2019

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Revision History

Revision	Date	Description	Reviewed by	Approved by
Issue	31st October 2018	Final		

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1.0 THE COMMISSION & BRIEF

NX Consulting Limited (NX) have been commissioned by Triton Construction to undertake verification inspections and a review of available information from the installed propriety gas protection measures for a new extension to the Heaton Park Premier Inn Extension, Middleton Rd, Manchester, M8 4NB.

The existing Premier Inn hotel has been extended with the construction of a 39-room hotel extension, over 3 storeys including linen stores, plant rooms, lift shaft and reception works, and associated drainage, services and external works.

It is understood that the Main Contractor, Triton Construction Limited, are required to install the gas protection measures in line with Ciria C735 - "Good practice on the testing and verification or protection systems for buildings against hazardous ground gases and the manufacturers details.

The works are now complete, and a refined risk assessment is required to confirm the risk of potentially hazardous ground gas to future site receptors.

A site layout and photographs are presented on drawings in Appendix A.

1.1 Previous Studies

A Phase 1 and 2 site investigation report has been completed by JNP group (Report Reference: S10230 Ph1 & 2 GEO Rev B) dated January 2018 and submitted to Manchester City Council in support of a planning application to extend the Premier Inn.

The above report should be read in conjunction with this study.

A summary of the NX findings are summarised within Section 2 & 3 of this report.
No radon protection measures would be necessary for the development.

1.2 Limitations

NX Consulting were not appointed as clerk of works or verification engineer for this project, consequently our observations of the implementation work for remediation and/or gas verification was limited to information provided by Third Parties, rather than a full-time presence.

Therefore, the observations expressed in this report are based purely on information provided by the appointed Design Team and membrane manufacturer. In terms of serviceability and construction of the membrane/adopted protection measures, NX cannot take any liability for the detail/methods of construction adopted.

2.0 SITE DESCRIPTION & SETTING

This section summarises pertinent information gained obtained within the JNP Group report, referenced above.

Table 2.1 – Site location and Setting	
Site Location	Premier Inn, Middleton Road, Manchester M8 4NB. Access is gained via the Middleton Road to the north.
Site Description	The proposed development area is roughly rectangular in shape and is located within a car park to the rear of the existing Premier Inn hotel on Middleton Road, Heaton Park in Manchester.
Grid Reference	383822 403682
Site Area	0.04Ha.

Table 2.2 – Environmental Information	
Environmental permits, incidents and registers	• No records of IPC, IPPC Authorisations are held within c.250m. • No records of Water Industry Referrals are held within c.250m. • No records of Red List Discharge Consents are held within c.250m. • No records of List 1 Dangerous Substances Inventory sites are held within c.250m. No records of List 2 Dangerous Substances Inventory sites are held within c.250m. • There are two Part A (2)/Part B Activities and Enforcements within c.250m. These both relate to the same location which includes a petrol station c.173m south west. • No Activity is recorded within c.250m and is associated with a Service Station c.236m east of the site. • No records of Category 3 or 4 Radioactive Substances Authorisations are held within c.250m. No Licensed Discharge Consent is held within c.250m. • No records of Planning Hazardous Substance Consents or Enforcements are within c.250m. • No records of COMAH and NIHHS sites are held within c.250m. • There has been one Environment Agency Recorded Pollution Incident (List 2) within c.250m of the site. However, this relates to a minor incident c.117m south west and poses a negligible risk to the proposed development.
Landfill Sites and Other Waste Disposal Facilities	• No Environment Agency Registered Landfill Sites are recorded within c.250m. No Environment Agency Historic Landfill Sites are recorded within c.250m. • No BGS/DoE Landfill Survey Sites within c.250m. • No GroundSure Local Authority Landfill sites are recorded within c.250m. • No Operational and Non-Operational Waste Treatment, Transfer or Disposal Sites within c.250m. No Environment Agency Licensed Waste Sites are recorded within c.250m. • The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level. No Radon protection

	measures are required.
Geology	The site is recorded by the BGS as being underlain by Glacial Till and these deposits are classified as a Secondary 'A' Aquifer. The site is recorded as being underlain by the Chester Formation which is classified as a Principal Aquifer. During site investigation works, the surfacing was noted to be variable with some hardstanding (tarmacadam) and some soft landscaping (grass and planted borders) were recorded. Made ground was noted to depths of 2.50m bcgl's and comprised brick and concrete gravel and cobbles with occasional limestone and clinker gravel was recorded to 1.20m bcgl's before encountering medium dense slightly clayey sand with anthropogenic debris of clinker, concrete, brick, glass, wood, limestone, sandstone, slag, red shale and rubber pieces. Within BH01, a band of ash and clinker fill with brick, coal and concrete was noted between 1.90m to 2.50m bcgl's. There was some visual/olfactory evidence of potential organic contamination (i.e. creosote) was noted within BH02 (between 1.70m to 1.80m) as well as BH03 between 1.20m to 1.70m bcgl's). A possible relict topsoil was identified within BH's 01, 02 and 03 which comprised very sandy clayey topsoil with some fine brick and coal gravel with an organic odour. These materials were noted at depths of between 1.70m up to 2.50m bcgl's and was noted to be 0.30m and 0.35m thick. The underlying deposits identified comprised loose to medium dense fine to coarse sand with occasional gravel of sandstone and limestone, recorded to the base of the boreholes at 4.00m bcgl's. Due to the "geotechnically poor" soils encountered of low bearing capacity, the boreholes were extended from their base by-way of a Dynamic Probe Super Heavy (DPSH). The DPSH were completed to 8.00m, depth with ground conditions noted to improve from around 6.50m depth. No drift deposits were identified at TH01. GEO did not identify visual/olfactory evidence of fuel/oil type contamination (staining/odour) within the natural appearing soils. Bedrock was not encountered during the completion of these fieldwork's. During the progression of the fieldworks, water strikes were noted within all three boreholes at depths of 2.30m to 2.60m bcgl's with the relict topsoil layer (BH01) and within the granular deposits of BH's 02 and 03.
Ground Gas & Radon	The JNP report established that in accordance with CIRIA C665 the CO2 GSV of 0.0005 l/hr equates to a Characteristic Situation 1 / Green classification, therefore, ground gas protection measures were not considered necessary with respect to Carbon Dioxide and Methane. JNP confirmed that the development site is not located within a

	Radon Affected Area as defined by the Health Protection Agency (HPA), as less than 1% of properties are above the action level and in accordance with BR211 no radon protection measures are currently necessary. JNP confirmed that although the levels of hydrocarbons below the site do not represent a significant human health risk, there may be a potential risk from the VOC's identified within the soils testing and therefore the incorporation of a hydrocarbon type vapour barrier (i.e. gas protection measures resistant to organic vapours) within the proposed extension should be adopted

3.0 SUMMARY OF NX HAZARDOUS GROUND GAS ASSESSMENT

3.1 Asphyxiant, Noxious or Explosive Gases

The JNP report established that in accordance with CIRIA C665 the CO2 GSV of 0.0005 l/hr equates to a Characteristic Situation 1 / Green classification, therefore, ground gas protection measures were not considered necessary with respect to Carbon Dioxide and Methane.

JNP confirmed that although the levels of hydrocarbons below the site do not represent a significant human health risk, there may be a potential risk from the VOC's identified within the soils testing and therefore the incorporation of a hydrocarbon type vapour barrier (i.e. gas protection measures resistant to organic vapours) within the proposed extension should be adopted

3.2 Radon

JNP confirmed that the development site is not located within a Radon Affected Area as defined by the Health Protection Agency (HPA), as less than 1% of properties are above the action level and in accordance with BR211 no radon protection measures are currently necessary.

4.0 VALIDATION, MONITORING INSPECTION & REFINED RISK ASSESSMENT

4.1 Proposed Protection Measures

Initial detailed drawings were provided by Roscoe Consulting engineers; within Drawing No - ROS_(10)_00_SD_100: Premier Inn, Heaton Park PIX Foundations Detail. Dated May '18 with ammended comments provided by Visqeen; on behalf of Triton Construction.

Proposed gas protection measures initially comprised the following:

- Precast beam and block suspended floor with visqueen HC Block vapour barrier membrane lapping onto external cavity/tray.
- HC Block/waterproofing barrier to lift pit Visqueen detail.
- All joints and penetrations sealed, to be installed strictly in accordance with manufacturer's details and to include all necessary ancillary components.
- Installation of air brick voids to all maintain ventilation cross flow.

The installation of the membrane was carried out by Triton Construction.

4.2 Verification Inspections & Adopted Protection Measures

Triton Construction have instructed NX to provide an indiependent final gas verification report and refined risk assessment to confirm the low risk status to identified receptors; post construction.

The Verification report to include the following:

- Site and development details.
- Summary of Gas Risk Assessment
- Details of who carried out installation.
- Details of who carried out verification.
- Description of protection measures installed with reference to method statements and drawings and manufacturers specification of the materials used.
- Details of the actual verification inspection/s.
- Supporting information, plans, photographs, drawings.
- Summary of verification data (completed proformas, inspection record sheets and non conformance/corrective action record sheets

The visual inspection and testing was to be undertaken by a suitably qualified and experienced engineer from NX Consulting ltd immediately after the installation of the membrane. NX were not requested to inspect the sub floor arrangement of the slab and lift pit and/or pipework. However, Triton Construction have confirmed that the works were carried out as per the designers details.

For the inspection, the seams along the propriety HC Block membrane were subjected to a visual inspection and pick test. It was recommended that the engineer should inspect the membrane and selected seams/penetration. Attention being paid to areas most likely to cause failure.

The visual inspection was recorded on a visual inspection/test sheet. Any failures were noted along with the corrective action to be undertaken by Triton Construction.

Verification inspections of the installed vapour membrane and the external face of the lift pit has been undertaken by NX Consulting. Verification proforma sheets of the inspections are included in Appendix B. Photographs from validation visits and repairs made by the contractor are included in Appendix A.

Inspections were carried out on the following dates:

- 15th October 2018
- 18th December 2018

During the initial a visual inspection and pick test on selected joints to the membrane were adopted. It was not possible to full inspect the lift pit as construction and blockwork had already been employed.

During the inspections the protection measures appeared to be generally installed with good workmanship. Cavity trays and lapping had not been adopted, however, the membrane was observed to fully lap over the cavity and eternal brick work and external ventilation adopted via air bricks on approximately 2m centres. It was also evident that the manufacturers detail had not been adopted within the lift pit.

It is understood by NX consulting, that due to site restrictions the external cavity trays we not utilised, and an alternative detail was adopted by Triton Construction and latterly acknowledged by Visqueen/Roscoe for the lift pit. This comprised:

- HC Block installed within a blockwork cavity around all sides of the lift pit to protect from being punctured from the fill.
- HC Block protected on top of the lift slab by insulation and screed.
- HC Block throughout the rest of ground floor is protected by floating floor installed as Architect detail
- The HC Block on the ground floor slab runs through the cavity into the outer brick course.

4.3 Conclusions & Refined Risk Assessment

The assessment completed by JNP Group has identified no elevated levels of ground gas and as a result the site is currently considered as Characteristic Situation 1 / Green and there is no requirement for ground gas protection measures for Carbon Dioxide and Methane in accordance with CIRIA C665 and BS8485. In addition, the site is not located in an area that requires radon protection measures within buildings or extensions.

JNP Group have stipulated that hydrocarbons below the site do not represent a significant human health risk and there may be a potential risk from low levels of VOC's identified within the soils testing. As such recommendations were made to incorporate a hydrocarbon type vapour barrier (i.e. gas protection measures resistant to organic vapours) within the proposed extension.

Triton Construction have installed a Visqueen HC Block vapour barrier and has confirmed that the manufacturer and design team are content with the amended construction methods, in relation to the lift pit and external cavity detail. NX Consulting's observations during the initial membrane inspection indicates that a general good level of workmanship has been adopted with taped joints, seals to all penetrations.

Based on the information provided to date, we consider that the probability of volatile compounds impacting identified receptors to be unlikely and a low risk exists to site occupiers.

We consider that the risk to identified receptors are sufficiently low to not warrant further remediation measures; in relation to potential hydrocarbon vapours identified during the site investigation works.

Appendices

A - Drawings and Photographs

B - Pro-forma Inspection Sheets

A - Drawings and Photographs

Technical Product Datasheet
Edition: 08/12/2016
Identification no. VBP010
Ultimate HC BLOK



VISQUEEN
ADVANCED BARRIER TECHNOLOGY

Visqueen Ultimate HC BLOK

The ultimate Methane & VOCs' vapour barrier

- Conforms to CIRIA C748 and BS8485:2015
- Excellent VOC (vapour) & methane barrier resistance
- Utilises Visqueen's Advanced Barrier Technology
- Exceptional flexibility and puncture resistance
- Comprehensively tested and validated test results
- Outstanding welding characteristics, saving time and costs

Description

Visqueen Ultimate HC BLOK is a highly flexible 0.5mm thick coextruded membrane designed to comply with current guidance on Volatile Organic Compounds (VOCs) vapours and ground gases. Manufactured using Visqueen's advanced membrane technology and drawing on our extensive knowledge and expertise in gas protection, Visqueen has developed a new flexible barrier membrane suitable in brownfield applications that are affected by aggressive chemicals (vapour phase) such as such as Naphthalene, Benzene, Toluene, Ethyl Benzene and Xylene (BTEX).

The product is available in large roll formats to minimise jointing and quick installation times. The membrane is gold and white, 2.44m x 41m x 0.5mm (100m^2), in single wound roll format and packaged in a white outer wrap. The membrane should be installed gold side up.

Applications

Visqueen Ultimate HC BLOK is suitable for the following applications

- VOC/Hydrocarbon (gaseous phase) contaminated sites in accordance with CIRIA C748
- Carbon dioxide and methane sites in accordance with BS8485:2015
- Radon affected sites in accordance with BRE211:2015
- Damp protection in accordance with Building Regulations part C

Due to a diverse range of applications, site conditions and variations in attack chemicals we strongly advise contacting Visqueen's technical department for correct specification and detailing – 0333 202 6800

The innovative Visqueen's Advanced Barrier Technology

1. An advanced gas barrier structure
2. Superior physical and chemical resistant properties
3. Easy & rapid welding
4. Flexibility for uneven ground contours
5. Good environmental stress crack resistance

Advanced barrier technology utilises Visqueen's extensive manufacturing technical expertise and experience to ensure buildings and occupants are safe from hazardous ground gases and VOCs.

VISQUEEN BUILDING PRODUCTS
Part of RPC bpi group

ULTIMATE GAS MEMBRANES

VISQUEEN

Specific Approvals/ Standards	■ **CIRIA C748** – Guidance on the use of plastic membranes as VOC vapour barriers ■ **BS8485:2015** – Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings ■ **CE Mark EN13967** – Flexible sheets for waterproofing. Plastic and rubber damp proof sheets including plastic and rubber basement tanking sheet. Definitions and characteristics
Validated test data and compliance to the latest standards	CIRIA C748 and BS8485:2015 are the latest and most relevant standards and codes of practice for protecting buildings on contaminated land. These documents ensure any risks are mitigated by using best practice in design and selection of gas membranes. The documents intend to **harmonise test methods and result units** for the industry and to mirror the application in order that the appropriate membrane can be selected. Visqueen embarked on an extensive testing regime to ensure its membranes are the best in class and comply with the new standards. Visqueen's Ultimate range have all passed the stringent **methane 40ml/m²/day/atm** (ISO15105-1 to BS8485:2015 requirement) threshold and physical property requirements. CIRIA C748 states a VOC membrane must be tested as a minimum to the below challenge chemicals. Visqueen have conducted VOC vapour testing to these challenge chemicals below in accordance with C748. The actual test results by a 3rd party approved laboratory are shown in the performance table on page 4. ■ benzene ■ toluene ■ ethyl benzene ■ (m,p, and o) xylenes ■ Hexane ■ vinyl chloride ■ tetrachloroethene ■ trichloroethylene ■ naphthalene
System Components:	■ Visqueen GX Double Sided Bonding Tape ■ Visqueen Gas Resistant Lap Tape ■ Visqueen Surface DPC Fixing System ■ Visqueen GX DPC ■ Visqueen GX Top Hat Units ■ Visqueen Detailing strip Please note that the membrane can be welded as a preferred alternative to using tapes.
Installation	Visqueen Ultimate HC BLOK and ancillary components must be installed in accordance with the recommendations of CIRIA C748 and BS8485:2015. The membrane should be installed on a blinded or smooth surface allowing adequate overlap for jointing between the sheets and avoiding bridging (i.e. areas of unsupported membrane). In areas where high levels of unsupported membrane such as settlement applications occur it is recommended that Visqueen Ultimate GeoSeal is used. Visqueen Ultimate HC BLOK is normally installed above the concrete slab (vented void) but can be used below the slab in certain conditions. Please contact Visqueen for further information on foundation types and membrane suitability – 0333 202 6800 Technical Department.

ULTIMATE GAS MEMBRANES

VISQUEEN

Installation cont.	For taped joints, overlap the membranes by at least 150mm and bond together using Visqueen Double Sided Jointing tape. Secure the lap using Visqueen GR Foil Tape. Punctures to the membrane can only be repaired by using a patch of the same membrane and lapped at least 150mm beyond the limits of the puncture. Bond and seal the patch using Visqueen jointing tape system When a welded joint system is being used, punctures to the membrane can only be repaired by welding a patch of membrane with identical thickness and lapped at least 150mm beyond the limits of the puncture. Where this is not possible and the three dimensional shapes are complex it is recommended a preformed unit is used. The membrane has been designed to perform in circumstances where linear expansion could occur, however in high temperatures the membrane should be covered immediately after installation. The membrane should not be taken through any masonry wall. The relevant Visqueen damp proof or gas proof course should be taken through and extended beyond the wall by a minimum of 250mm where it can be jointed to the membrane.
Service penetrations, corners and junctions	All service pipe penetrations should be fully sealed using welded membrane or Visqueen GX Preformed Top Hat Units. The base and collar of the preformed unit should be bonded using Visqueen GX Double Sided Jointing Tape and sealed with Visqueen Gas Resistant Lap Tape. The collar should be secured with a mechanical fastening. To ensure system integrity, all internal and external corners should be provided with either welded corners or Visqueen Preformed Units bonded to the membrane using Visqueen Double Sided Jointing Tape and sealed with Visqueen GR Single Sided Lap Tape. Complex or awkward junctions should be sealed using either welded membrane or Visqueen Detailing Strip.
Ventilation	When high levels of ground gases and VOCs are present in accordance with BS8485:2015 and CIRIA C716 or when the generation of gases still occurs, then an open void beneath the ground floor should be constructed as ventilation beneath the ground floor will dilute and disperse the gases to atmosphere. Open voids are normally restricted to beam and block floors or other precast concrete floor systems. An alternative for providing ventilation to in situ concrete floor slabs is to install a Visqueen Gas Venting System. Please visit Visqueen Gas Venting System
Storage and Handling	Visqueen Ultimate HC BLOK is classified as non-hazardous when used in accordance with the relevant British Standards. The product is chemically inert and is not affected by acids and alkalis that may be present in the sub-soils. The product should be stored in a warm dry environment and not exposed to long periods of sunlight. A roll weighs 50 kilos and should be handled with care following on-site health and safety procedures.

ULTIMATE GAS MEMBRANES

VISQUEEN

Product & Performance Data: All tests are conducted by a 3rd party approved laboratory

Characteristic	Test Method	Units	Criteria	Result
Colour				Gold/White
Weight		kg		50
Length	EN 1848-2	m	-0/+10%	41
Width	EN 1848-2	m	-0/+10%	2.44
Thickness	EN 1848-2	mm	+/-10%	0.5

BS8485 and C748 physical test results				
Punture	BS EN ISO 12236:2006	N	MDV	1640
Impact resistance Method A hard surface	EN12691	mm	MDV	200
Impact resistance Method B soft surface	EN12691	mm	MDV	1250
Tensiles Yield strength MD 1	ASTM D4885-01	kN/m	MDV	5.1
Tensiles Yield strength CD 1	ASTM D4885-01	kN/m	MDV	4.91
Yield elongation @ break MD 1	ASTM D4885-01	%	MDV	76
Yield elongation @ break CD 1	ASTM D4885-01	%	MDV	62
Tear resistance - trouser method A - MD	BS ISO 34-1	kN/m	MDV	60.2
Tear resistance - trouser method A - CD	BS ISO 34-1	kN/m	MDV	66.1
Tear resistance - angle method B - MD	BS ISO 34-1	N	MDV	48.7
Tear resistance - angle method B - CD	BS ISO 34-1	N	MDV	49.6

BS8485:2015 - Methane testing				
Methane permeability	ISO 15105-1	ml/m²/day/atm	<40	1.3

C748 - Permeation vapour tests - 100% concentration				
Benzene	ISO 15105-2	ml/m²/day	MDV	<1
Toluene	ISO 15105-2	ml/m²/day	MDV	<1
Ethyl benzene	ISO 15105-2	ml/m²/day	MDV	<1
(m,p, and o) xylenes	ISO 15105-2	ml/m²/day	MDV	<1
Hexane	ISO 15105-2	ml/m²/day	MDV	<1
Vinyl chloride	ISO 15105-2	ml/m²/day	MDV	<1
tetrachloroethene	ISO 15105-2	ml/m²/day	MDV	<1
Trichloroethylene	ISO 15105-2	ml/m²/day	MDV	<1
Naphthalene	ISO 15105-2	ml/m²/day	MDV	<1

Please contact Visqueen for more information on additional chemical vapour testing

The Visqueen Ultimate Gas Membrane range

Visqueen's NEW Ultimate range offers an unrivalled choice for protection against dangerous gases and chemicals in compliance to the latest regulations and standards. The new range utilises Visqueen's advanced membrane technology and consist of the following products:



- Ultimate VOC Blok – A flexible, puncture resistant and durable membrane designed to protect buildings from dangerous chemicals in liquid and vapour phases.



- Ultimate HC Blok – A highly flexible coextruded 0.5mm membrane that protects buildings from methane and other aggressive chemicals in vapour phase



- Ultimate GeoSeal – A flexible, gas resistant membrane that adheres to concrete in pre-applied tanking applications.

Find your local stockist

Search our directory of Visqueen specification Stocking Centres to locate your nearest Visqueen Partner, click here

Technical support throughout your project

We are specialists in our field and can help you specify the correct solutions with the necessary performance levels, in accordance with building regulations.

- Nationwide site support team
- Specification advice
- Installation guidance & project sign off
- System design including CAD details
- NBS clauses
- BIM Objects
- CPD seminars
- Installation videos

Product selector

	BRE211	Amber 1	BS8485/Amber 2	C748	C748	BS8102
	Radon	CO_2/CH_4	CO_2/CH_4	VOC Vapours	VOC Immersions	Waterproof
Ultimate GeoSeal	✔	✔	✔	✔	✔	✔
Ultimate VOC BLOK	✔	✔	✔	✔	✔	
Ultimate HC BLOK	✔	✔	✔	✔		
Gas Barrier	✔	✔	✔			
LPGM500	✔	✔				
Radon Barrier	✔					

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For our full range of products, visit www.visqueenbuilding.co.uk

VISQUEEN BUILDING PRODUCTS
Part of RPC bpi group

VISQUEEN GX DPC

GX Hydrocarbon DPC

CE Mark to Damp Proof Course EN 14909



- **Suitable for use on hydrocarbon contaminated sites**
- **Tested against harmful gases, chemicals and hydrocarbons**
- **High puncture & tear resistance**
- **Independently tested against harmful gases, chemicals and hydrocarbons**
- **Proven track record on gas and hydrocarbon contaminated sites**

Description

Visqueen GX DPC is a blend of ethylene co-polymers suitable for use on brownfield sites that require protection from dangerous contaminants such as hydrocarbons and methane, together with excellent damp proofing properties. GX DPC is available in 30m lengths and in two widths, 600mm or 850mm.

Application

Visqueen GX DPC has a proven track record as a barrier membrane on gas contaminated and hydrocarbon contaminated brownfield sites. Visqueen
GX DPC combines high strength with flexibility.

Testing for Chemical Resistance (EN 14414 and EN 14415)

The membrane has been tested against various harmful gases and dangerous contaminants such as hydrocarbons. In addition to this, GX DPC has been subjected to accelerated life immersion tests. EN 14414 and EN 14415 - Chemical resistance to leachates and aggressive chemicals - are designed to stress the membrane at a higher level of chemical concentration and temperature than it would experience in normal use. Changes in weight, volume, tensile strength and visual degradation are recorded to obtain the membrane's suitability to the challenge chemical.

These results are published below and assist designers and engineers in the suitability of GX DPC in various applications.

System Components:

- Visqueen GX Geomembrane
- Visqueen Gas Resistant Lap Tape
- Visqueen Surface DPC Fixing System
- Visqueen GX Double Sided Bonding Tape

Installation

All joints in lengths of DPC must be a minimum of 100mm lapped and sealed with Visqueen GX Jointing Tape. Visqueen GX DPC should be installed in accordance with BS 8215: 1991, BS 8000: Part 3, 2001 and BS 5628: Part 3: 2005. Visqueen GX DPC must be bedded on both sides with fresh mortar and must project through the full width of the wall, including any externally applied rendering, and project 5mm beyond the finished external face.

Storage and Handling

Visqueen GX DPC is classified as nonhazardous when used in accordance with the relevant British Standards. The product is chemically inert and is not affected by acids and alkalis that may be present in the sub-soils.

Technical Data and CE Mark

Heanor Gate | Heanor | Derbyshire DE75 7RG
Email: enquiries@visqueenbuilding.co.uk
Tel: 0333 202 6800 | Web: www.visqueenbuilding.co.uk

GX Hydrocarbon DPC

CE Mark to Damp Proof Course EN 14909

Visqueen GX Hydrocarbon Damp Proof Course complies with the requirements and clauses of EN 14909 - Flexible sheets for waterproofing - Plastic and rubber damp proof courses - Definitions and characteristics.

Visqueen GX Hydrocarbon Damp Proof Course products are manufactured under a Quality Management System (IS0 9001) - Certificate of Compliance reference no. 4560-3 by Knight International applies.

DATASHEET

Technical Support: 0333 202 6800
LAST UPDATED: 10.07.2017

VISQUEEN GX DPC

GX Hydrocarbon DPC

Product Data

CE Mark to Damp Proof Course EN 14909

Product Data

heading	Characteristic	Test method	Units	Compliance criteria	Value or Statement
	Length	EN 1848-2	m	-0/+10%	30
	Width	EN 1848-2	m	-0/+10%	600 850
	Thickness	EN 1849-2	mm	+/-20%	1
	Mass	EN 1849-2		-12%/+12%	974
	Tensile Strength - MD	EN EN12311	N/mm2	>MLV	22
	Tensile Strength - CD	EN EN12311	N/mm2	>MLV	20
	Tensile Elongation - MD	EN EN12311	%	>MLV	799
	Tensile Elongation - CD	EN EN12311	%	>MLV	848
	Joint Strength	EN12317-2	N	>MLV	515
	Watertightness - 2kPa	EN 1928	-	Pass/Fail	Pass
	Resistance to impact	EN 12691	mm	>=MLV	600
	Resistance to static loading	EN 12730	kg	MLV	Pass-20
	Resistance to Nail tear - MD	EN 12310-1	N	>=MLV	705
	Resistance to Nail tear - CD	EN 12310-1	N	>=MLV	745
	Durability-Heat ageing	EN 1296	-	Pass/Fail	Pass
	Durability-Chemical resistance	EN 1847	-	Pass/Fail	Pass
	Resistance to Low temperature	EN 495-5		MDV	Pass at - 40oC
	Water vapour transmission - resistance	EN 1931	MNs/g	MDV	1171
	Water vapour permeability	EN 1932		MDV	0.11
	Reaction to Fire	EN 13501-1	Class	MDV	F
	Methane Permeability	ISO2782		MDV	0.198
	Diesel Permeability	ISO 6179		MDV	0.4
	Petrol Permeability	ISO 6179		MDV	8.6
	Xylene Permeability	ISO 6179		MDV	14.6
	Toluene Permeability	ISO 6179		MDV	23
	Chemical Resistance - Acids	EN 14414-A	-	Pass/Fail	Pass
	Chemical Resistance - Alkalies	EN 14414-B	-	Pass/Fail	Pass
	Chemical Resistance - Organic Solvents	EN 14414-C	-	Pass/Fail	Pass
	Chemical Resistance - Visual Defects	EN 14414	-	Pass/Fail	Pass
	Resistance to Leaching - Hot Water	EN 14415-A	-	Pass/Fail	Pass
	Resistance to Leaching - Aqueous alkaline liquids	EN 14415-B	-	Pass/Fail	Pass
	Resistance to Leaching - Organic alcohols	EN 14415-C	-	Pass/Fail	Pass
	Resistance to Leaching - Visual Defects	EN 14415-A	-	Yes/No	No

Heanor Gate | Heanor | Derbyshire DE75 7RG
Email: enquiries@visqueenbuilding.co.uk
Tel: 0333 202 6800 | Web: www.visqueenbuilding.co.uk

DATASHEET

Technical Support: 0333 202 6800
LAST UPDATED: 10.07.2017

VISQUEEN GX DPC

GX Hydrocarbon DPC

Appendix A

CE Mark to Damp Proof Course EN 14909

Visqueen Building Products
Visqueen is the market leader in the manufacture and supply of structural waterproofing and gas protection systems. Visqueen offers the complete package - a proven, reliable range backed by a technical support service that goes unmatched in the market - everything you would expect from a reputable and ethical company.

System Accessories
To ensure full waterproofing protection please use the following certified system components:

- Visqueen High Performance (HP) Tanking Primer
- Visqueen TreadGUARD1500
- Visqueen Protect&Drain
- Visqueen Top Hat Unit

Downloads Library
- Technical Datasheet
- Declaration of Performance
- Visqueen's Guide to CE Marking

Find your local stockist
Search our directory of Visqueen specification Stocking Centres to locate your nearest Visqueen Partner.

Distributor Support
Our specification Stocking Centres can access a free library of sales support tools, bespoke catalogues and more, click here.

Technical support throughout your project
We are specialists in our field and can help you specify the correct solutions with the necessary performance levels, in accordance with building regulations.

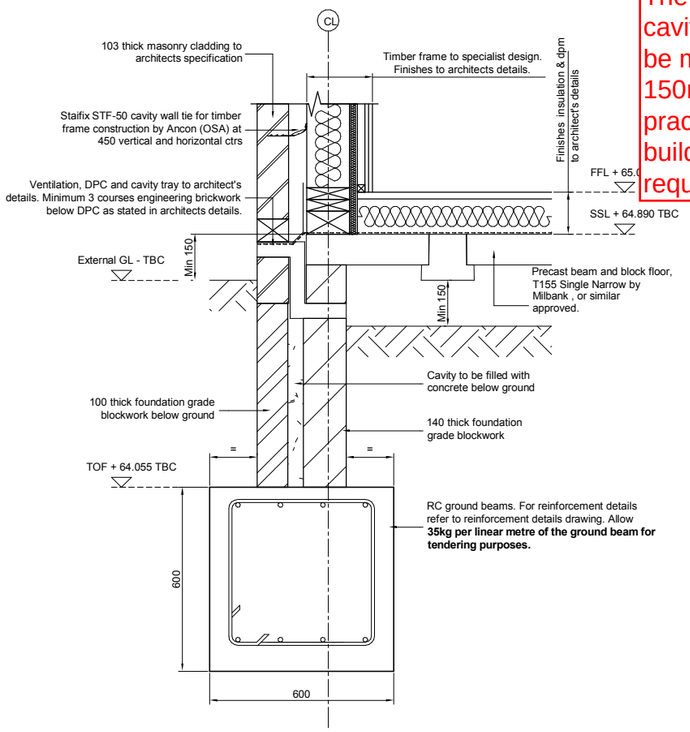
- Nationwide site support team
- Specification advice
- Installation guidance & project sign off
- System design including CAD details

Heanor Gate | Heanor | Derbyshire DE75 7RG
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Tel: 0333 202 6800 | Web: www.visqueenbuilding.co.uk

DO NOT SCALE

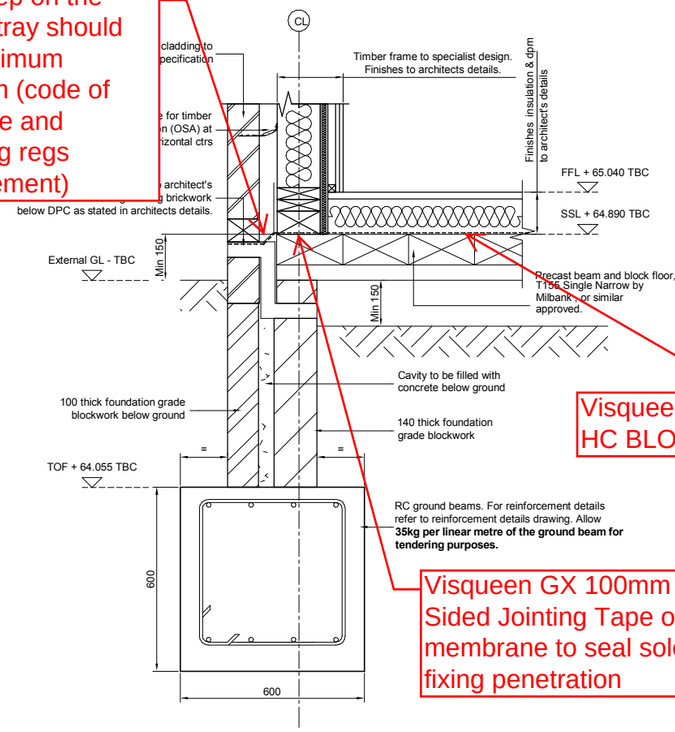
GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE LATEST EDITION OF ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS.
2. ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THE LATEST EDITION OF BUILDING REGULATIONS, BSI CODES OF PRACTICE AND LOCAL AUTHORITY REQUIREMENTS.
3. ARCHITECT IS TO CONFIRM ALL SETTING OUT
4. GROUND FLOOR SLAB HAS BEEN DESIGNED AS SUSPENDED AS PER THE ADVICE WITHIN SITE INVESTIGATION REPORT.
5. FOR DPM AND GROUND INSULATION DETAILS REFER TO ARCHITECTS INFORMATION.
6. THE CONTRACTOR IS TO GIVE CONSIDERATION FOR ALL SEQUENCING AND TEMPORARY PROPPING OF STRUCTURE THROUGHOUT THE I NSTALLATION OF THE NEW WORKS. ALL SEQUENCING PROPOSALS TO BE REVIEWED BY THE STRUCTURAL ENGINEER.
7. NO STRUCTURAL INFORMATION FOR THE EXISTING BUILDING IS AVAILABLE. ALL EXISTING STRUCTURE TO BE EXPOSED AND MEASURED ON SITE AND CONFIRMED TO THE STRUCTURAL ENGINEER PRIOR TO CONFIRMATION OF FINAL DETAILS.
8. REFER TO ARCHITECTS GROUND FLOOR DRAWINGS FOR ANY ADDITIONAL SLAB RECESSES OR PENETRATIONS.



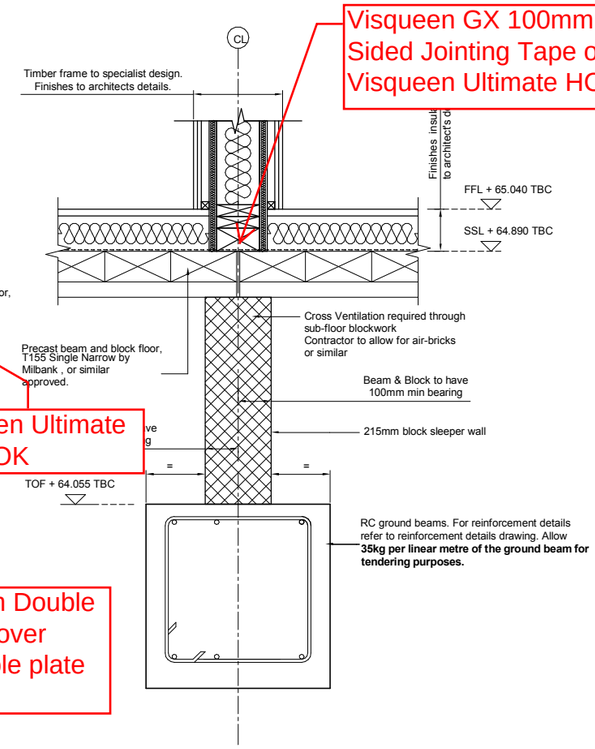
Section A-A

(SCALE 1:10)



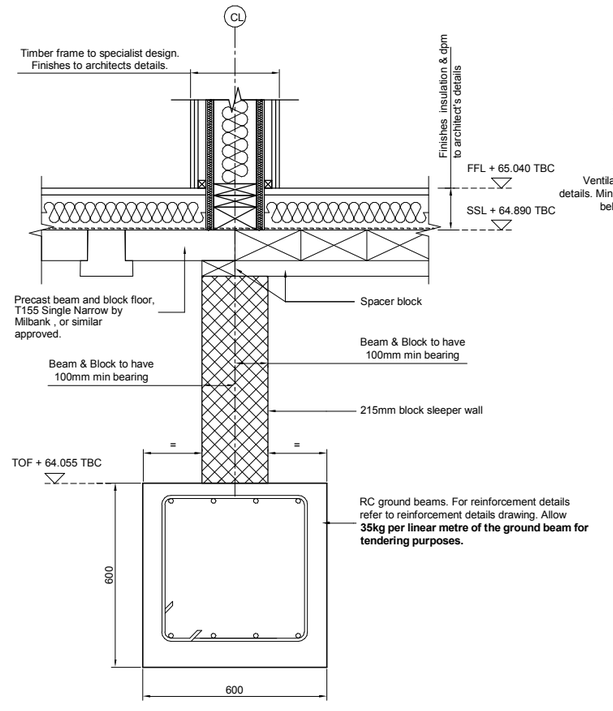
Section B-B

(SCALE 1:10)



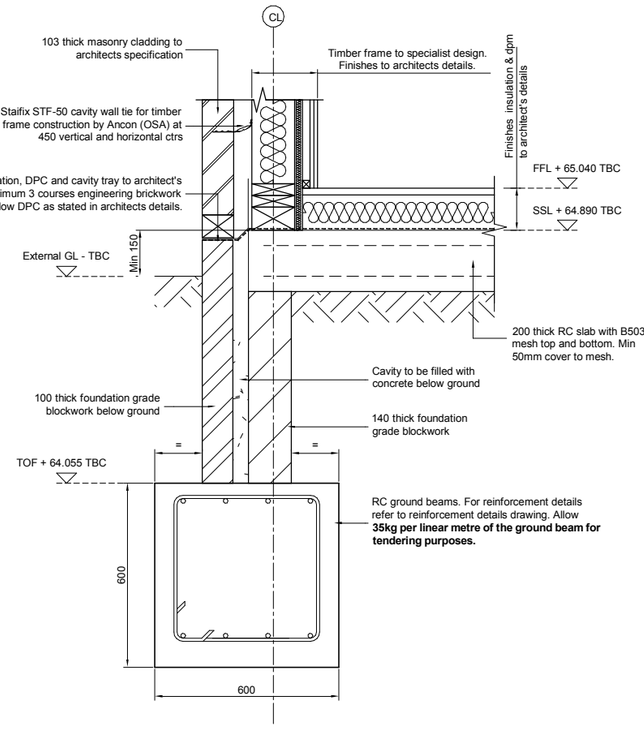
Section C-C

(SCALE 1:10)



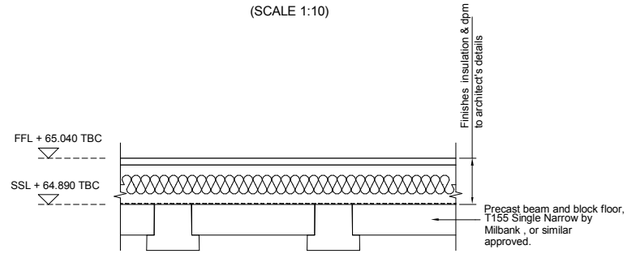
Section D-D

(SCALE 1:10)



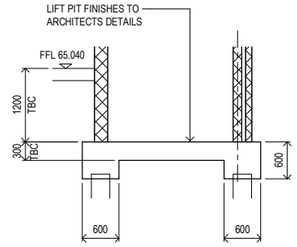
Section E-E

(SCALE 1:10)



Typical section through slab

(SCALE 1:10)



F - F

REV	DATE	BY	DESCRIPTION	CHK	APP
T1	08.06.18	JF	TENDER ISSUE	AW	DJG

DRAWING STATUS: TENDER

Roscoe
CIVIL & STRUCTURAL ENGINEERS
INSPIRING BUILT ENVIRONMENTS
TEL: 0113 380 5345

CLIENT: WHITBREAD

ARCHITECT: ALLISON PIKE

PROJECT: PREMIER INN HEATON PARK

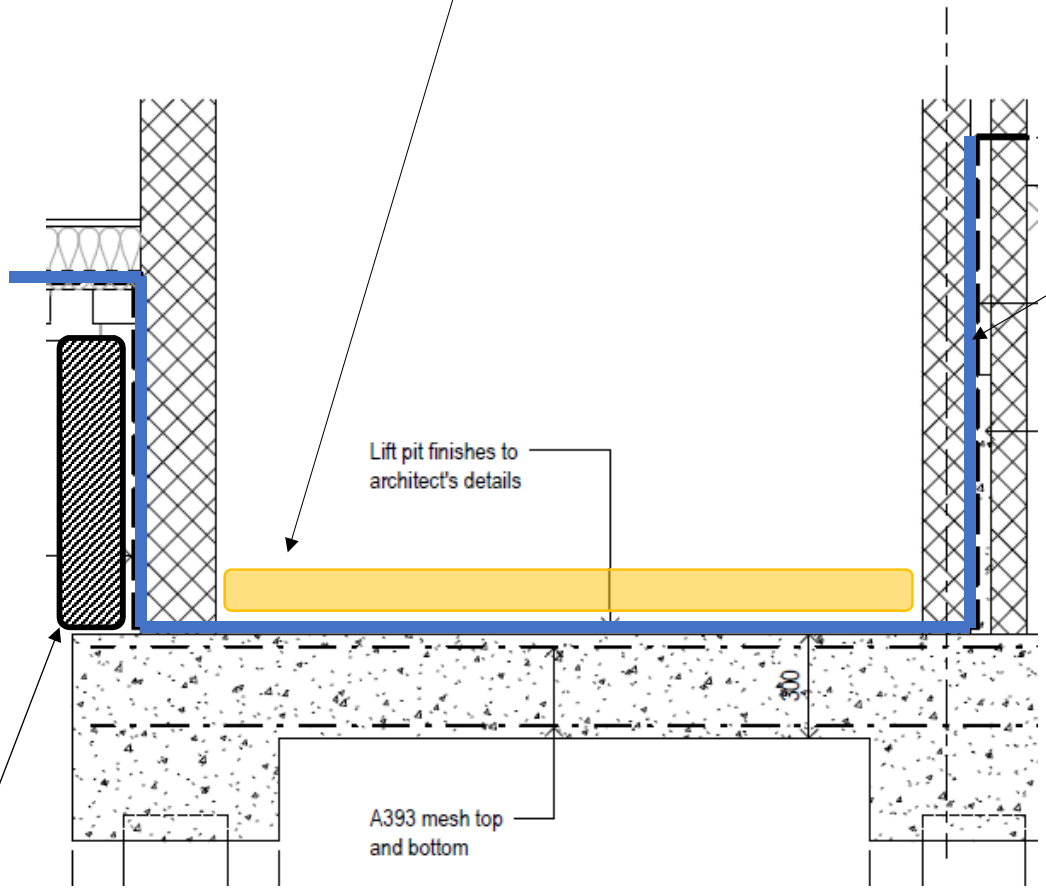
TITLE: FOUNDATION DETAILS

SCALE @ A1:	CHECKED:		APPROVED:
AS NOTED	AW		DJG
PROJECT NUMBER:	DESIGNED:	DRAWN:	DATE:
2018L818	AW	JF	MAY 2018

DRAWING No: ROS_(10)_00_SD_100 REV: T1

Insulation and screed on top of HC Blok membrane in bottom of lift pit

HC Blok Membrane



Masonry wall to form cavity for HC Blok membrane to prevent puncture from fill

PI Heaton Park
Gas Membrane Detail
30/01/19

Triton

Gas verification Photofile



Plate 1 – Visqueen Ultimate HC Blok Adopted within Extension



Plate 2 – Membrane with typical Service Entry Penetration Entry Detail



Plate 3 – Membrane with typical Service Entry Penetration Entry Detail





Plate 4 – None Conformance (NC 1) - Insufficient Lapping & Patch Repair





Plate 5 – None-conformance (NC 2) - Insufficient Lapping & Fishmouth



Plate 6 – NC 3 Repair To service Penetration





Plate 7 – NC 6 Replacement of lapping tape



Plate 8 – Subfloor Ventilation



Plate 9 – HB Blok to Lift pit

B - Pro-forma Inspection Sheets

Next Generation Engineering Consultancy Services

Gas Verification Record Sheet

Record sheet to be completed for each property and inspected by a NX Consulting engineer

job number & date	NX354 – 15th October 2018
site name / location	Heaton Park PIX
plot number/s	N/A
compiled by:	MN

Sub-floor & Ventilation

	Notes/recommendations (see guide notes)
State void former type and whether present	None - Precast beam and block suspended floor
State void space & height if present	Present. Unable to measure. Minimum 100mm.
State nature of subgrade	
State if ventilation pipe present and size/spacing	N/A. Suspended floor
State if external wall airbricks constructed and spacing	N/a
State if internal sleeper walls & if pipework vents present	Yes. Circa 2m centres following inspection on 18th December 2018.
State if any vents/ trenches / ducts	NX not requested to inspect. Site agent confirmed present.

Membrane Details

	Notes/recommendations
State membrane manufacturer & specification	Ultimate HC Blok vapour barrier membrane lapping across external cavity. No tray utilised.
State extent of coverage	Full
State nature of slab/sub-base below membrane	Precast beam and block suspended floor

State slab/membrane condition	Generally good condition. Area of non-conformance listed below
State if laps and joints are as per manufacturers detail	Yes where visible and access possible.

damp-proof course	Gas Barrier acts as DPM.
service entries and seals	Top hat and seals present. Areas of non-conformance listed below and repairs as per photographs in main report.
cavity Inspection	N/a

Guide notes:

void former details	proprietary type - manufacturer and specification, in accordance with design?, installed properly without damage?
Void depth details	height of proprietary former or constructed ventilation space below suspended floor - note any debris on void / obstructions to air flow, note formation surface soil type (e.g. crushed concrete/brick), any evidence of flooding
Sub-grade	gravel type, if used (limestone / granite etc.) and any specification (e.g. 6F2), typical particle dimensions (mm), apparent fines content (low/high), compaction (loose/dense), waterlogging / contamination by clay, organic matter, other debris. Take photographs of stockpile close up shot of stone with tape measure. Alternatively check details on delivery tickets for stone. Take photographs of adjacent plots if at this stage of construction. Check depth of stone conforms to at least 300mm if visible.
Ventilation spacing	diameter in mm; material type (e.g. PVC); slotted or perforated; positioning and spacing / separation and jointing as on design drawing - if not sketch arrangement - do pipes connect with external (telescopic / swan-neck) vents? Take photographs of vents on external walls for each plot. (May be possible to photograph other plots on site which are at stage of installing vents. Will be useful for these plots later on).
airbricks	check numbers, size and positions as design drawing (if not shown, make sketch; check for blockage, e.g. by mortar, or soil / pavings etc.
internal sleeper walls	check for ventilation holes - e.g. honeycombe brickwork or pipe crossings - note size, spacing and location - in accordance with design?
Vents, ducts/ trenches	check whether located and constructed in accordance with design drawings; if open-topped gravel, note gravel type and presence of fines / contamination; if pipe or other vents - check positions and construction for functionality and absence of blockages - vents may be built over
Membrane details	note manufacturer and product specification, including batch / roll numbers if present - in accordance with specification? Check stock storage arrangements - protected from dirt and damage?
Coverage	if membrane is incomplete, further inspection will be required - note areas completed / incomplete - is membrane fully visible or have internal walls been constructed over membrane / screed placed?
Underside of membrane	Where necessary , for example, when using a granular blanket as a ventilation layer, check the underside of the membrane has adequate protection e.g. minimum 50mm no fines concrete blinding layer or appropriate geo-textile (see also below)

11	slab/membrane condition	record presence of debris / rough surfaces, in particular sharp projections, below or above membrane; record locations of all punctures or repairs, note arrangements to protect membrane surface from traffic / tools and equipment / materials, and temporary weighting down of membrane, e.g. use of boards - record evidence of footprints / tracks on membrane surface, creases or water/wind damage. Take photographs of each plot inspected.
12	laps and joints	check the all joints are lapped and sealed in accordance with manufacturer's requirements / specification, particularly where creases/folds are present (usually minimum 150mm laps with double-sided tape between sheets, and single-sided tape on top surface; note size of sheets and frequency of edge seals). Take photographs of jointing for each plot.
13	damp-proof course	record DPC manufacturer and product code - usually integrated with the membrane; measure the DPC projection from external wall in mm; check laps and seals between membrane and DPC - note any potential stress points and tension between the two; check for damage to DPC
14	service entries and seals	note number, position and diameter of service entries - check top hat seal arrangements in accordance with design / specification (laps and seals between top hat and floor membrane, pipe upstand is usually a minimum 150mm) check , with jubilee clips to secure top hat seal to pipe - note presence of clips and tightness of connections. Take photographs for all plots inspected.
15	cavity Inspection	check gas membrane or gas resistant dpc is taken across cavity. Check for rips across cavity. Check for jointing detail of gas resistant dpc or membrane across cavity to main membrane. Take photographs for all plots inspected.

Non - Conformance Record			Repair Record			Photo
Non - Conformance Reference (NC)	Type of Non - Conformance	Description of Non - Conformance	Repair Type	Pass	Repairs	NC
NC2, NC3,	Potential Failure	Repair made around drain vent	Re-seal as per manufacturers Detail	Y	Contractor notified, and photographs of repair provided.	Page 1

NC4	Potential failure	No top hat construction around larger service entry	New Unit	Y	Contractor notified, and photographs of repair provided.	P2
NC5	Potential failure	Fishmouth caused by membrane folding	Patch	Y	Patched over fishmouth	P2

Next Generation Engineering Consultancy Services

Gas Verification Record Sheet

Record sheet to be completed for each property and inspected by a NX Consulting engineer

job number & date	NX354 – 18th December 2018
site name / location	Heaton Park, premier Inn
plot number/s	N/A
compiled by:	MN

Sub-floor & Ventilation

	Notes/recommendations (see guide notes)
State void former type and whether present	None - Precast beam and block suspended floor
State void space & height if present	Present. Unable to measure. Minimum 100mm.
State nature of subgrade	N/A. Suspended floor
State if ventilation pipe present and size/spacing	N/a
State if external wall airbricks constructed and spacing	Yes. Circa 2m centres following inspection on 18th December 2018.
State if internal sleeper walls & if pipework vents present	NX not requested to inspect. Site agent confirmed present.
State if any vents/ trenches / ducts	N/a

Membrane Details

	Notes/recommendations
State membrane manufacturer & specification	Ultimate HC Blok vapour barrier membrane lapping across external cavity. No tray utilised.
State extent of coverage	Full
State nature of slab/sub-base below membrane	Precast beam and block suspended floor

Lift Pit Inpsection	Not as per Visqueen detail. Unable to review as constructed. Where HC Blok.
State if laps and joints are as per manufacturers detail	Yes where visible and access possible.

damp-proof course	Gas Barrier acts as DPM.
service entries and seals	Top hat and seals present. Areas of non-conformance listed below and repairs as per photographs in main report.
cavity Inspection	N/a

Guide notes:

void former details	proprietary type - manufacturer and specification, in accordance with design?, installed properly without damage?
Void depth details	height of proprietary former or constructed ventilation space below suspended floor - note any debris on void / obstructions to air flow, note formation surface soil type (e.g. crushed concrete/brick), any evidence of flooding
Sub-grade	gravel type, if used (limestone / granite etc.) and any specification (e.g. 6F2), typical particle dimensions (mm), apparent fines content (low/high), compaction (loose/dense), waterlogging / contamination by clay, organic matter, other debris. Take photographs of stockpile close up shot of stone with tape measure. Alternatively check details on delivery tickets for stone. Take photographs of adjacent plots if at this stage of construction. Check depth of stone conforms to at least 300mm if visible.
Ventilation spacing	diameter in mm; material type (e.g. PVC); slotted or perforated; positioning and spacing / separation and jointing as on design drawing - if not sketch arrangement - do pipes connect with external (telescopic / swan-neck) vents? Take photographs of vents on external walls for each plot. (May be possible to photograph other plots on site which are at stage of installing vents. Will be useful for these plots later on).
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Coverage	if membrane is incomplete, further inspection will be required - note areas completed / incomplete - is membrane fully visible or have internal walls been constructed over membrane / screed placed?
Underside of membrane	Where necessary , for example, when using a granular blanket as a ventilation layer, check the underside of the membrane has adequate protection e.g. minimum 50mm no fines concrete blinding layer or appropriate geo-textile (see also below)

11	slab/membrane condition	record presence of debris / rough surfaces, in particular sharp projections, below or above membrane; record locations of all punctures or repairs, note arrangements to protect membrane surface from traffic / tools and equipment / materials, and temporary weighting down of membrane, e.g. use of boards - record evidence of footprints / tracks on membrane surface, creases or water/wind damage. Take photographs of each plot inspected.
12	laps and joints	check the all joints are lapped and sealed in accordance with manufacturer's requirements / specification, particularly where creases/folds are present (usually minimum 150mm laps with double-sided tape between sheets, and single-sided tape on top surface; note size of sheets and frequency of edge seals). Take photographs of jointing for each plot.
13	damp-proof course	record DPC manufacturer and product code - usually integrated with the membrane; measure the DPC projection from external wall in mm; check laps and seals between membrane and DPC - note any potential stress points and tension between the two; check for damage to DPC
14	service entries and seals	note number, position and diameter of service entries - check top hat seal arrangements in accordance with design / specification (laps and seals between top hat and floor membrane, pipe upstand is usually a minimum 150mm) check , with jubilee clips to secure top hat seal to pipe - note presence of clips and tightness of connections. Take photographs for all plots inspected.
15	cavity Inspection	check gas membrane or gas resistant dpc is taken across cavity. Check for rips across cavity. Check for jointing detail of gas resistant dpc or membrane across cavity to main membrane. Take photographs for all plots inspected.

Non - Conformance Record			Repair Record			Photo
Non - Conformance Reference (NC)	Type of Non - Conformance	Description of Non - Conformance	Repair Type	Pass	Repairs	NC
NC1	Unable to verify whether fully as per visqueen detail			x	Client to confirm with manufacturer that acceptable	

Next Generation Engineering Consultancy Services

Gas Verification Record Sheet
