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**HAZARDOUS GAS
PROTECTION MEASURES
VERIFICATION
IMPLEMENTATION PLAN**

for

**PHASE 4, EDGEHILL
PARK, WHITEHAVEN**

**Prepared for
STORY HOMES**

Report No. 4046-G-R036

Date: June 2024

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APPENDICES

Appendix A – Drawings

Drawing No.	Title
4946-G-D038	Site Location Plan
4046-G-D040 Rev F	Exploratory Hole Location Plan on Topographic Survey
4046-G-D040 Rev G	Exploratory Hole Location Plan on Development Layout
20095.90.9.GA Rev C2	Story Homes General Arrangement
SD010	Story Homes Foundations & Ground Floors Details A20 – Issue (05)

Appendix B – Gas Measures Specification Information

Appendix C – Gas Measures Inspection Proforma

Appendix D – Integrity Testing Proforma

Appendix E – Non-Independent Inspection Proforma

**HAZARDOUS GAS PROTECTION MEASURES
VERIFICATION IMPLEMENTATION PLAN
For
PHASE 4, EDGEHILL PARK, WHITEHAVEN**

1 GENERAL

1.1 The Commission and Brief

- 1.1.1 ID Geoenvironmental Limited (IDG), were commissioned Story Homes Ltd (the Client) to prepare a Verification Implementation Plan for the installation of hazardous ground gas protection measures within properties at their new development, Phase 4 Edgehill Park, Whitehaven, hereafter referred to as the site.
- 1.1.2 The purpose of this document is to satisfy the requirements of CIRIA C735 (Good Practice on the Testing and Verification of Protection Systems for Buildings against Hazardous Ground Gases) by setting out the verification activities and the integrity testing (if any) appropriate to the site-specific risk assessment, the development itself and the design of the gas protection system.
- 1.1.3 This document also enables the client and potential contractors installing the gas protection measures to gain an appropriate understanding of the level of independent verification inspections and any associated integrity testing required for the development.

1.2 Previous Reports

- 1.1.1 IDG have previously issued the following reports which relate to Phase 4:
- Preliminary Geoenvironmental Investigation & Coal Mining Risk Assessment, Edgehill Park Whitehaven, Reference 4046-G-R015, dated October 2020 (Rev A issued November 2021)
 - Hazardous Ground Gas Risk Assessment- Phase 4, Edgehill Park, Whitehaven, Cumbria, reference 4046-G-LR014, dated December 2020.
 - Geoenvironmental Appraisal & Supplementary Mining Investigation of land at Phase 4 Edgehill Park, Whitehaven reference 4046-G-R024, dated December 2021.
 - Supplementary Rotary Probehole Investigation Phase 4 Edgehill Park Whitehaven – Findings & Recommendations, letter report reference 4046-G-L020 dated 16th June 2022.
 - Supplementary Hazardous Ground Gas Risk Assessment – Phase 4 Edgehill Park, Whitehaven, Cumbria reference 4046-G-L026 dated 8th November 2022.
- 1.2.1 Mining investigation established that unrecorded abandoned shallow mineworkings are present beneath the site which come to outcrop east of the site and an abandoned shaft was present in the southwest of the site. While the shaft has been treated and capped, there was no requirement to treat the abandoned workings. The Supplementary Hazardous Ground Gas Assessment reference 4046-G-L026 concluded that the site could be classified Characteristic Situation 1 (CS1). However, given evidence of pumping within the abandoned workings it was considered prudent to install CS2 gas protection measures in properties in the east of the site where workings were shallowest and in proximity to the shaft in the SW of the site.
- 1.2.2 However, the mining investigation also concluded that there was a risk of groundworks exposing unrecorded shafts and Story Homes concluded that it was prudent to install CS2 ground gas protection measures in all plots.
- 1.2.3 With respect to Radon gas, at the time of IDG's reports the site was not located in a Radon Affected Area, as less than 1% of properties within the 1km grid were above the action level. The BGS updated the UK Radon Maps in December 2023 and as a consequence the site was subsequently deemed to be within a Radon Affected Area with between 1-3% of properties being above the action level. While English Building Control consider there is no requirement for radon protection measures in zones where between 1 - 3% of properties are above the action level, the

UKHSA recommends that properties located within Radon Affected Areas be tested for the presence of radon or that basic radon protection measures be fitted to avoid retrofitting. However, the proposed site wide CS₂ gas protection measures are also satisfactory radon protection measures.

1.3 The Development

1.1.2 Story Homes General Arrangement reference 20095.90.9.GA Rev C2 presented in Appendix A shows that the development comprises 107 two/three storey domestic dwellings, associated gardens, Public Open Space (POS) areas and adoptable roads and sewers.

1.1.3 Full Planning Permission (ref 4/22/2332/0F1) was granted on 5th August 2023.

1.4 Proposed Foundations and Floor Construction

1.4.1 Structensor Consulting Project Number 6258, Foundation Zoning Plan & Plot Foundation Schedule reference FZP4-S-DWG-A001 dated May 23 shows that foundations at the development will include:

- Reinforced strip & trenchfill foundations for the majority of plots.
- Bespoke deep trenchfill with reinforced strip foundations on top for plots 71-72 and plot 69's garage.

1.4.2 Details of the foundations and floor construction are shown on Story Homes Foundation & Ground Floor details provided in Story Homes SD010 – Foundations & Ground Floors A20 – Issue (05) in Appendix A. Details show that properties will be constructed on reinforced strip or trenchfill foundations, with a suspended precast reinforced concrete floorslab, and a minimum 150mm sub floor void, or greater where heave protection is required.

1.4.3 On the basis of medium volume change soils identified at the site, actual void height should be a minimum of 250mm.

2 THE GROUND GAS REGIME AND THE GAS PROTECTION SYSTEM

2.1 The Ground Gas Regime

2.1.1 As stated in IDG Supplementary Ground Gas Risk Assessment report 4046-G-L026 Rev A, the ground gas regime at the site has been assessed in accordance with the methodologies advocated in current guidance (including but not limited to BS 8576:2013, BS8485:2015 and CIRIA C665:2007).

2.1.2 With reference to conceptual model for the site:

General

- The site is located within a Radon Affected Area as between 1 - 3% of properties are above the Action Level.
- Potential sources of ground gas (i.e. shallow mines & a former shaft) have been identified on-site, or in proximity to the site.
- No hydrocarbon impact to soils has been identified during IDG's investigation. No further consideration of hydrocarbon or VOC vapours is required.

2.1.3 The Supplementary Ground Gas Risk Assessment report 4046-G-L026 Rev A determined the gas regime for the site based on an assessment for worst case scenario of the results available (i.e. highest carbon dioxide/methane concentrations and highest flow rate recorded) and engineering judgement and should be referred to for further details.

- 2.1.4 A summary of the classification of the site in relation to the development layout is presented in table 2.1.

Table 2.1: Site Classification

Classification	Plots	Gas Protection Measures Required
Radon (1-3% of plots medium risk)	Plots 1 to 107	Non, but gas protection measures to meet requirements of CS2 classification are equivalent to full protection measures.
Site-wide Characteristic Situation 2	Plots 1 to 107	Yes – gas protection measures to meet requirements of CS2 classification.

- 2.1.5 All 107 new properties will be installed with gas protection measures in accordance with Characteristic Situation 2 during construction.
- 2.1.6 Hydrocarbon vapour protection is not required for any plots at the development.
- 2.1.7 Story Homes Drawing No. 20095.90.9.GA Rev C2 indicates that plots comprise a combination of single detached, semi-detached and terraced properties each one being a single construction unit or 'block'. Given the nature of construction it is considered the most appropriate methodology for inspection and testing will be to inspect on a block by block basis. Therefore from this point onwards the inspection and testing requirements will be discussed on a 'block' basis.

2.2 The Gas Protection System

- 2.2.1 In order to determine the level of gas protection measures required for properties at the development reference has been made to the relevant tables in the British Standard (BS8485:2015).
- 2.2.2 Table No. 3 of BS8485 indicates that the proposed residential properties to be constructed at the site are classified as a Type A building.
- 2.2.3 Table No. 4 of BS8485 indicates that for Type A Buildings:
- Properties within a Characteristic Situation 2 classification require a minimum gas protection score of 3.5 points. In addition, the score of 3.5 must be made up of at least two different elements.
- 2.2.4 For properties determined to require Characteristic Situation 2 protection measures, review of Table No.'s 5, 6 and 7 in BS8485 indicates that a score of 3.5 can be made up from the following elements which have been specified for properties at the proposed development requiring Characteristic Situation 2 Protection measures:

Structural Barrier Element

- Cast in situ reinforced suspended floor slab with minimal penetrations; Scores 1.5

Gas Resistant Membrane Element

- Gas resistant membrane; Scores 2.0
 - Sufficiently impervious to the gases with a methane gas transmission rate <40.0 ml/day/m²/atm (average) for sheet and joints (tested in accordance with BS ISO 15105-1).
 - Sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions.
 - Sufficiently strong to withstand in-service stresses (e.g. settlement if placed below a floor slab).
 - Sufficiently strong to withstand the installation process and following trades until covered

(e.g. penetration from steel fibres in fibre reinforced concrete, penetration of reinforcement ties, tearing due to working above it, dropping tools, etc.).

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

2.3 Typical Foundation/Ground Floor Details

- 2.3.1 Copies of the typical design details are presented in SD010 – Foundations & Ground Floors A20 – Issue (05) in Appendix A which illustrate the gas protection details for properties at the site.

2.4 Gas Protection Measures – Materials Used

- 2.4.1 The products proposed for use for gas protection measures are summarised in table 2.2:

Table 2.2: Approved Gas Protection Products

Gas Protection Measure (CS2)	Product Used
Membrane Elements	
Gas Protection Membrane/DPM	Solshield Ultra Gas barrier 2 X 50MT Solcourse GR 900mm x 20MT
Sealing Tape	Solco Double Sided Butyl Jointing Tape – 50mm x 10mm Solco GR Foil Lap Tape 75mm x 50mm
Service Penetrations	Solco GR Flexi MDPE Preformed Top Hat units And/ Or Solsheet GR Self Adhesive Membrane 1 X 20MT
Corner/ Threshold Detail (where required)	Solco Internal & External Cloak Preformed units Solseal HP Emulsion/Primer

- 2.4.2 Product specification information for the materials to be used are presented in Appendix B.

- 2.4.3 IDG have reviewed the specifications of the above products and consider that, subject to correct installation, the above components and materials offer adequate gas protection in accordance with the guidance for the assigned Characteristic Situation.

Change in Gas Protection Products Used

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

3 THE INSPECTION/INTEGRITY TESTING REGIME

3.1 Requirements and Scope of Inspections and Verification

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

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

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

Table 3.1: Testing Factors

Risk Factor	Relevant Information	Degree of Risk
Gas Regime	Characteristic Situation 2	Low/Medium
Design Complexity	Gas membrane, Gas resistant DPC, and service penetrations to be sealed/ joined with tape, using tophats and any other preformed details as appropriate.	Medium/ High
No. of Plots/ Blocks	71	Medium
Installation Workforce	RHI are an experienced installer, IDG have experience of reviewing quality of RHI's installation at two other sites.	Low

3.1.3 It is understood that the proposed installers for this development will be RH Irving Ltd (RHI) who are experienced installers and have experience of installing gas protection measures. IDG have also had experience of inspecting and validating membranes installed by RHI.

3.1.4 Installation method statements should be provided by RHI.

3.1.5 Should the proposed installers change, or the level of skill/ experience of the installers change, revision to the scope of inspections and integrity testing will be required and IDG should be notified immediately.

3.2 Inspection Frequency

3.2.1 On the basis of there being a medium risk with regard to the adequate installation of the gas protection measures the requirements for inspection and integrity testing of CS2 plots are summarised in table 3.2:

Table 3.2: Verification Testing Frequency

Stage	No. of Blocks on Development	% of Blocks Requiring Inspection/ Integrity Testing	No. of Blocks to be subjected to Inspection / Integrity Testing
Membrane			
Visual Inspection and Initial Stage of Integrity Testing	71	First 15% of Blocks	11
Visual Inspection and Secondary Stage of Integrity Testing	60	25% of all remaining Blocks	15
Non-independent Inspections		75% of all remaining Blocks	45

3.2.2 Upon completion of the initial stage of inspections and integrity tests, blocks shall be inspected/tested at a minimum ratio of 1 in 4.

3.2.3 However, progression to the secondary stage of inspections and integrity testing will only occur if IDG are satisfied that the level of workmanship is sufficient. If IDG are not satisfied with the

standard of installation of the gas protection measures after the first 15% of blocks have been inspected, the blocks will continue to be inspected and tested at a frequency of 100% until IDG are satisfied the gas protection measures are being installed correctly.

- 3.2.4 Should a block of plots fail the inspection during the secondary stage of inspection/testing then the frequency of independent inspections will be increased to 100% for the next 2 blocks. Should all of these 2 blocks pass the inspection/testing then the frequency of independent inspections will revert to 1 in 4 blocks.
- 3.2.5 This process of increasing the inspections/testing frequency will occur every time a block fails the inspection/testing process.

3.3 Independence and Competency of Inspector

Independence

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

Competency

- 3.3.3 IDG's Verification Engineers have the following training and experience with regard to validation of gas protection measures:
- An up-to-date working knowledge and understanding of current standards and guidance surrounding the assessment of hazardous ground gas, and the design, application, installation and verification of gas protection measure. This includes but is not limited to the following documents in table 3.3:

Table 3.3: Ground Gas Guidance

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

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

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

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

4 VISUAL INSPECTION/INTEGRITY TESTING PROCEDURE

4.1 Independent Visual Inspection Requirements

- 4.1.1 The visual inspections will require a suitably qualified engineer to visit the site to inspect the installation of ground gas protection measures on blocks.
- 4.1.2 The visit should be instructed by the installer via the site manager or project manager at the earliest opportunity following completion of each element of the gas protection measures (i.e. an inspection to check the ventilation elements of the protection system including subfloor void and airbricks, and an inspection to check the installation of the gas membrane).
- 4.1.3 In order to properly inspect the ventilation elements of the design, the inspection must occur before placement of any obstructions such as blocks, screed, membrane etc. to allow a thorough and unobstructed inspection of the void, airbricks, sleeper wall ventilation, and telescopic vents.
- 4.1.4 In order to properly inspect the membrane, the inspection must occur before placement of any obstructions such as insulation, reinforcement, sand blinding etc. to allow a thorough and unobstructed inspection of the entire membrane.
- 4.1.5 The verification inspection will include the following aspects:
- Damp proof course and gas proof damp proof membrane (continuous across cavities)
 - Damp proof membrane to be suitable for application and conforming to specification (i.e. Gas resistant/ VOC resistant/ radon protective where required)
 - Gas Proof membrane to be suitable for application and conforming to specification (i.e. Gas resistant/ VOC resistant/ radon protective where required)
 - No punctures in membrane surface due to poorly prepared surface beneath
 - Adequate lapping of membrane joints
 - Adequate sealing of membrane penetrations and joints
 - Any sealing tape (double sided/ lapping) to be suitable for application and conforming to specification.

4.2 Method of Recording and Reporting Inspections

- 4.2.1 In order to formally record and report the verification visit, the engineer will work through a number of elements (as above), with notes and comments recorded on a standard proforma on site. This will then be written up in a digital format upon return to the office.

- 4.2.2 A copy of the proforma to be used is included in Appendix C for reference.
- 4.2.3 Following each inspection, the IDG engineer will report back to the site manager / project manager on site, with recommendations made for any required remedial actions and to confirm whether individual plots have passed, allowing work to progress.
- 4.2.4 IDG will issue a digital copy of the completed proforma to the project manager for the site/ progress record. IDG will keep digital copies of the information for inclusion in the verification report that shall be issued after the last inspection and integrity test has occurred at the development.

4.3 Requirements and Scope of Integrity Testing

- 4.3.1 The required scope for integrity testing is as follow:
- All joints, pipe penetrations, seams and joints to be air lanced to ASTM D4437.

4.4 Integrity Testing Methodology

- 1.4.4 Following review of all available guidance, and with consideration of the CSM, and design details, IDG have determined that the most appropriate form of integrity testing to use is air lance testing of membrane seams and joins.
- 1.4.5 Air Lance Testing is to be undertaken in accordance with relevant guidance document ASTM D4437-08:2013, (Standard Practice for Non-destructive Testing for Determining the Integrity of Seams Used in Joining Flexible Polymeric Sheet Geomembranes) utilising the following methodology:

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

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

4.5 Elements of Gas Protection Requiring Integrity Testing

- 4.5.1 IDG consider the element of gas membrane installation most commonly found to be unsatisfactory is typically where individual sheets of membrane are joined together, or where service penetrations and top hats have been bonded to the gas membrane. Creases, dampness, and poor workmanship often lead to poorly sealed joins, which results in a significant loss of continuity and therefore integrity across the gas membrane system as a whole.
- 4.5.2 IDG consider that air lance testing will allow such weaknesses in the membrane installation to be highlighted quickly and transparently, enabling IDG to advise the installer of the need for any remedial work at the time of inspection. The testing will therefore focus on:
- Integrity of joins/ seams and bonding between the gas membrane and DPM
 - Integrity of joins/ seams and bonding between individual gas membrane sheets
 - Integrity of joint/ seams and bonding between any additional potential discontinuities, including service penetrations (top hats), internal wall structures, around doorways etc.

4.6 Performance Requirements of Integrity Testing

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

4.7 Method of Recording and Reporting Integrity Testing

- 4.7.1 In order to formally record and report the integrity testing, the engineer will complete an integrity testing proforma recording relevant diagrams, notes and comments on site. This will then be written up in a digital format upon return to the office.
- 4.7.2 A copy of the proforma to be used is included in Appendix D for reference.
- 4.7.3 Following each integrity testing visit, the IDG engineer will report back to the site manager / project manager on site, with recommendations made for any required remedial actions and to confirm whether individual plots have passed, allowing work to progress.
- 4.7.4 IDG will issue a digital copy of the completed proforma to the project manager for the site progress record. IDG will keep digital copies of the information for inclusion in the verification report.

4.8 On-going Duty of Care and Verification

- 4.8.1 Notwithstanding the outcome of the inspections and integrity testing as detailed above, IDG understand that whilst the verification inspection and testing are applicable and robust at the time of reporting, there remains the potential for the integrity of the installed gas protection measures to be compromised post-verification.
- 4.8.2 Compromise to the effectiveness of the installed gas measures can occur as a result of bad practice and lack of awareness of the significance of the gas protection measures. For example, puncturing of the membrane during placement of steel reinforcement, stressing/ tearing of the membrane by excessive footfall or trafficking, damage by follow-on trades including damage to membrane or blocking up ventilation air bricks etc.
- 4.8.3 Site staff and contractors have a duty of care to minimise post-verification damage to gas protection measures. Where such occurrences take place after independent or non-independent verification has occurred, both IDG and site staff have a duty of care to ensure that any damage is

identified, reported and appropriate remediation is completed.

- 4.8.4 Should an IDG engineer observe unacceptable practices or damage occurring on plots during later site visits or be provided with information from other parties that indicate the integrity of the gas protection measures has been compromised by follow on construction activities, IDG reserve the right to revoke a previous validation and request that remedial works be undertaken followed by further inspections and integrity testing of the affected block.

4.9 Non-Independent Inspection Requirements (Secondary Stage of Verification)

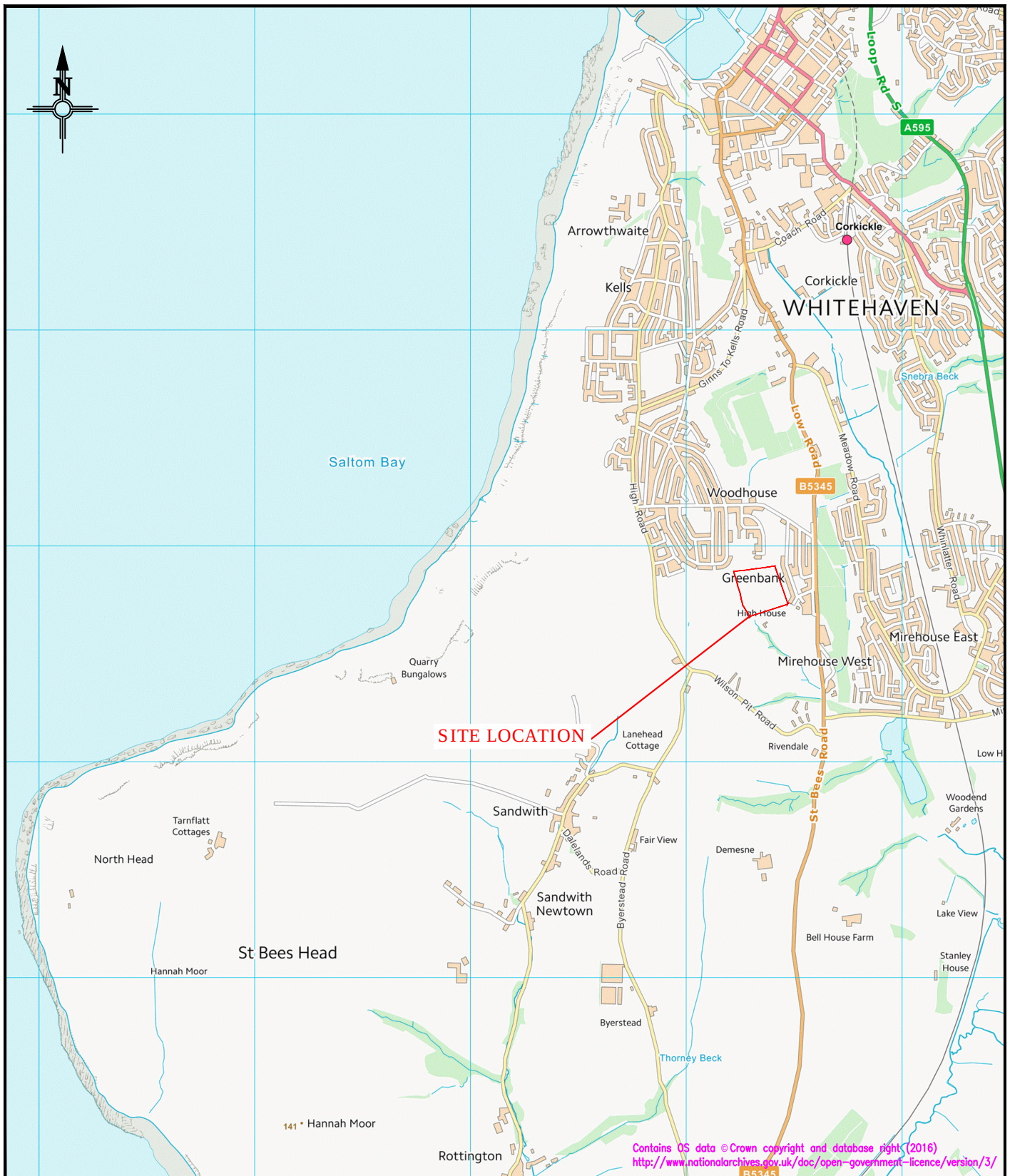
- 4.9.1 Where the gas membrane for a particular plot or block does not require independent inspections/ integrity testing of the membrane, there remains a requirement for the Client and Contractor to record that installation of gas protection measures has been undertaken to an appropriate standard.
- 4.9.2 This falls under the remit of a 'non-independent inspection and verification', which is to be undertaken by either the installer or, more preferably by the site manager, with an appropriate duty of care.
- 4.9.3 In order to document a non-independent verification, the appointed person (i.e. Client Site Manager, Contractor Site Foreman) should record the required details of the key aspects as per the non-independent verification proforma and obtain a selection of photographs that demonstrate appropriate installation of the gas protection measures.
- 4.9.4 This information should then be issued to IDG for review and approval before any further work is undertaken (i.e. floor slab construction), to allow remedial works to be conducted should IDG's engineer not be satisfied with the information provided.
- 4.9.5 Following satisfactory review, IDG will notify the site manager that the installed measures are deemed to be acceptable, and that follow on work (screeding/ concrete slab pour) can progress. The non-independent proforma will be written up in a digital format by IDG for subsequent inclusion in the final verification document.
- 4.9.6 A copy of the proforma to be used for non-independent inspections is included in Appendix E for reference.

5 VERIFICATION

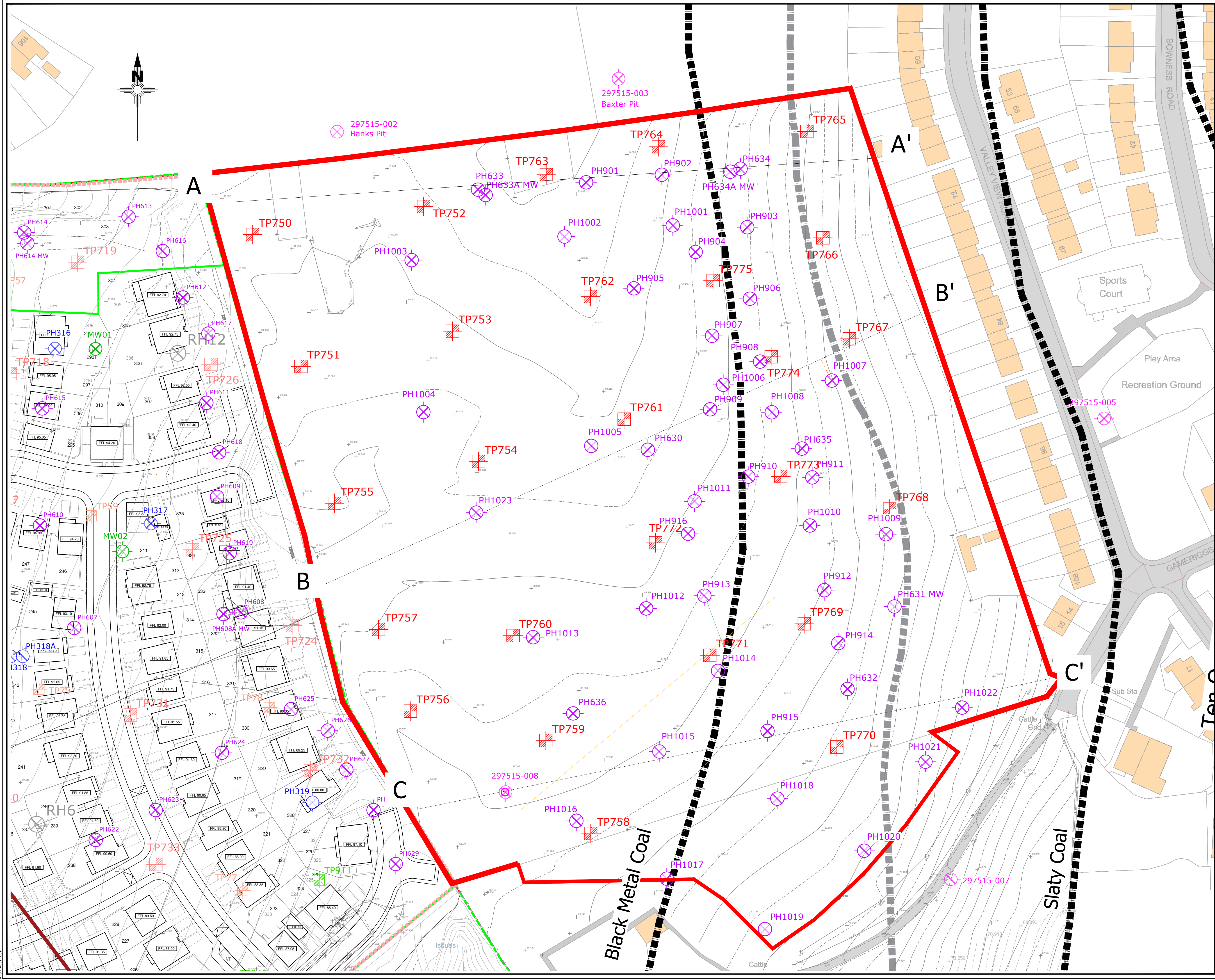
5.1 Verification Report

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

APPENDIX A



 iGeo iD GeoEnvironmental Limited ☒ North West & Midlands: Caledonian House Tatton Street Knutsford, Cheshire WA16 6AG Tel: 01565 755557 Fax: 01565 740263 ☐ North East & Yorkshire: The Stables, Aske Hall Aske, Richmond Yorkshire, DL10 5HG Tel: 01748 889015 Fax: 01565 740263 iD GeoEnvironmental Consulting Engineers		CLIENT		Story Homes	
		JOB TITLE		Phase 4, Edgehill Park, Whitehaven	
		DRAWING TITLE		Site Location Plan	
DRAWN BY	SIGNATURE	DATE	STATUS		
NW		5-10-20	FINAL		
APPROVED	SIGNATURE	DATE	SCALE	DRG No.	
BRB		5-10-20	1:25,000@A4	4046-G-D038	



The Employer must not amend any drawing, design or other intellectual property produced by IDG, without permission in writing from IDG in advance of any amendments being made. In the event that such written permission is not obtained in advance of the amendments being made, IDG shall not be liable for any damage and/or losses occurring as a result of the amended drawing, design or other intellectual property.

KEY

- Phase 4 Boundary
- PH1000 IDG Probehole 2022
- PH900 IDG Probehole 2021
- PH600 IDG Probehole 2020
- TP750- IDG Trial Pit 2021
- PH300 IDG Probehole Dec 2016
- A-A' Geological Cross Section (Drawing 4046-G-D054 Rev A)
- BGS Inferred Coal Outcrop
- IDG Inferred Un-Named Coal Outcrop
- CA Recorded Mine Shaft

Revision	Description	Date
F	Final PH1000 positions depicted.	28-10-22
E	Proposed PH1000 series depicted.	19-12-21
D	Geological Section A-A', B-B' & C-C'	15-12-21
C	Final Exploratory Hole Positions	29-9-21
B	Revised Proposed RH NO. & Positions	5-7-21
A	Supplementary Probeholes & Trial Pits	6-6-20

Revision

Revision	Description	Date
F	Final PH1000 positions depicted.	28-10-22
E	Proposed PH1000 series depicted.	19-12-21
D	Geological Section A-A', B-B' & C-C'	15-12-21
C	Final Exploratory Hole Positions	29-9-21
B	Revised Proposed RH NO. & Positions	5-7-21
A	Supplementary Probeholes & Trial Pits	6-6-20

Client

Story Homes

Job Title

Phase 4 Edgehill Park, Whitehaven

Drawing Title

Exploratory Hole Location Plan

Status

FINAL

Drawn By	Signature	Date
NW		3-10-20

Approved By	Signature	Date
BRB		5-10-20

Scale

1:500@A1

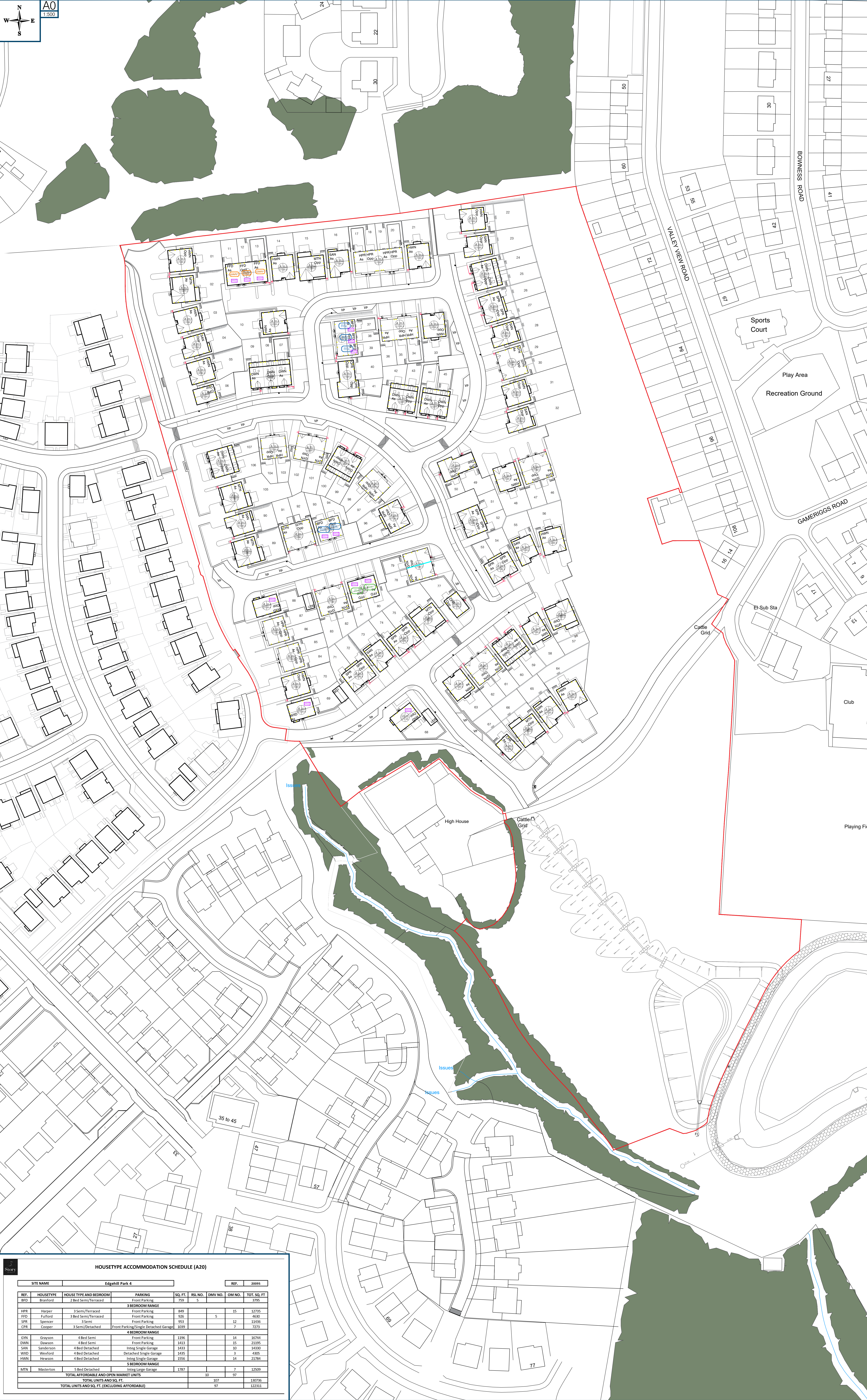
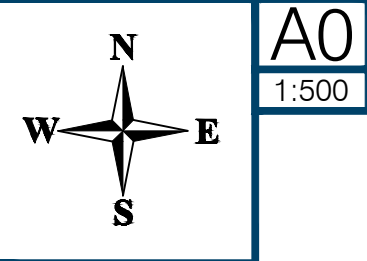
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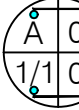
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ID GeoEnvironmental Limited

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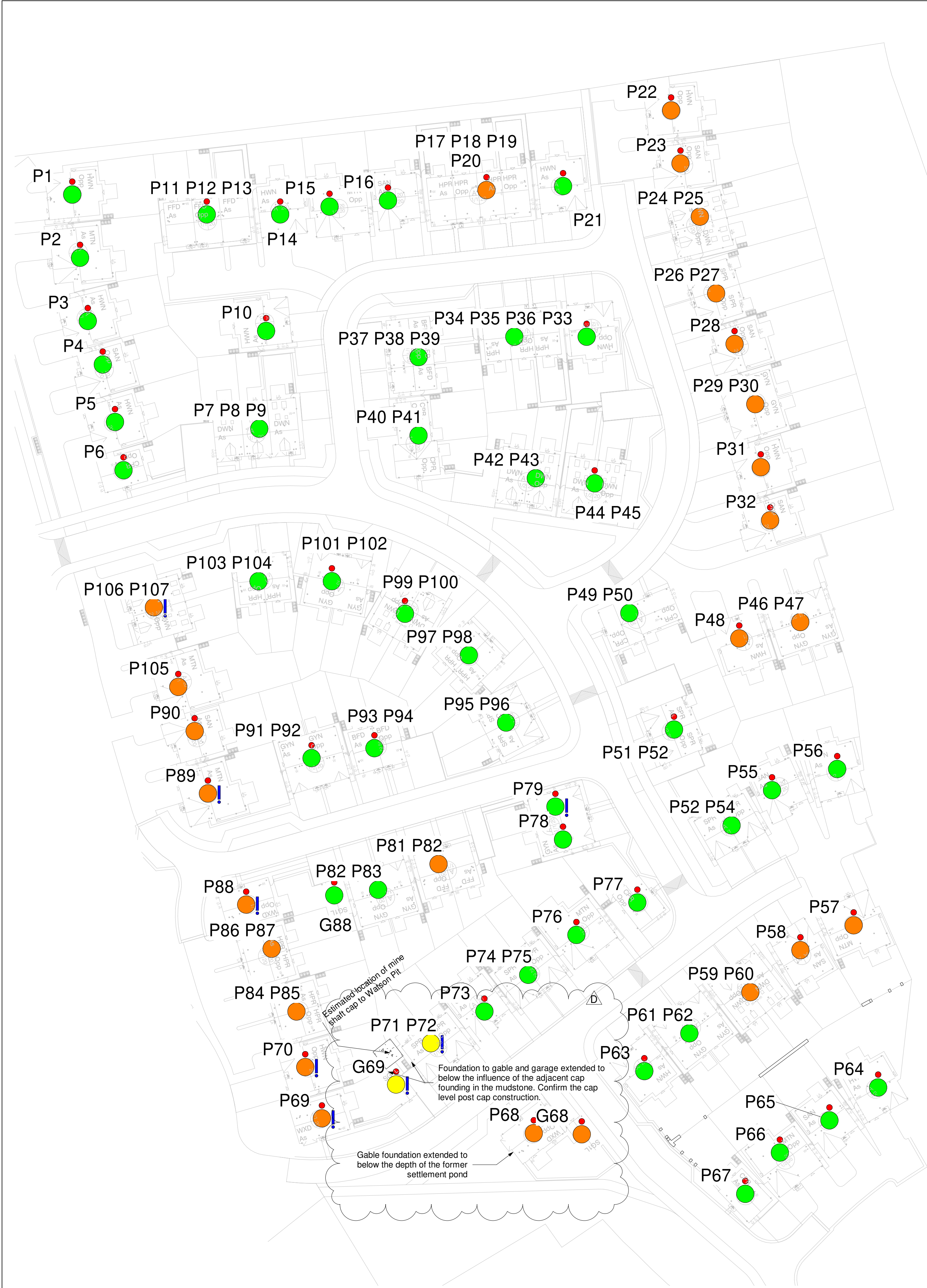


HOUSEHOLD ACCOMMODATION SCHEDULE (A20)									
SITE NAME							REF.		
Edgellish Park 4							20095		
REF.	HOUSE TYPE	HOUSE TYPE AND BEDROOM	PARKING	SQ. FT.	BSL NO.	DMV NO.	OM NO.	TOT. SQ. FT.	
BFD	Brاندford	2 Bed Semi/Terraced	Front Parking	759	5			3795	
3 BEDROOM RANGE									
HPR	Harper	3 Semi/Terraced	Front Parking	849		5	15	12755	
FDF	Fulford	3 Bed Semi/Terraced	Front Parking	926				4630	
SPR	Spencer	3 Semi	Front Parking	953			12	11656	
CGP	Croft Green	3 Semi/Detached	Front Parking/Single Detached Garage	1039			7	7273	
4 BEDROOM RANGE									
GYN	Gayton	4 Bed Semi	Front Parking	1156			14	16744	
DWN	Dawson	4 Bed Semi	Front Parking	1413			25	21395	
SAN	Sanderson	4 Bed Detached	Integ Single Garage	1413			10	14330	
WDX	Wardlaw	4 Bed Detached	Detached Single Garage	1435			3	4385	
HTN	Hewton	4 Bed Detached	Integ Single Garage	1554			14	23784	
5 BEDROOM RANGE									
MHN	Masterton	5 Bed Detached	Integ Large Garage	1787		10	7	21509	
TOTAL AFFORDABLE AND OPEN MARKET UNITS									
TOTAL UNITS AND SQ. FT.							107	130736	
TOTAL UNITS AND SQ. FT. (EXCLUDING AFFORDABLE)							97	122313	

Site Boundaries:	SH Red Line Boundary
HouseType Pack Information:	 - House Type Version - Construction Pack Ref. - Elevation Pack Ref. - Elevation Code
To find out which revision a chosen Plot is at, please refer to the BMWF 'Bought' figure within each Plot on either the GA or EFBT Plans.	
Affordable Units:	
	Denotes RSL Unit (Total 5 No.) For Space Use to RSL Shared Application Labour
	Denotes Discounted Unit (Total 3 No.) For Space Use to Shop Collector Master Specification Main
	Denotes First Homes' Unit (Total 2 No.) For Space Use to Shop Collector Master Specification Main
	Denotes M4(2) Compliant Unit (Total 13 No.) For Space Use to Shop Collector Master Specification Main
Other Information:	
	Visitor Parking Space (Total 18 No.)
	External Step to Plot Path/Patio
	Level Access
	Garden Batter
	Underfloor Vents
	Stepped Plot
	Street Lighting



DEVELOPMENT		
EDGEHILL PARK PHASE 4		
DRAWING		
GENERAL ARRANGEMENTS		
DRAWN BY	MQ	DATE 10-02-2023
CHECKED BY		SCALE 1:500 @A0
DWG PACK	DRAWING NUMBER	REVISION
CON.	20095.90.9.GA	C2
Revisions	Notes	Date
REV	COMMENTS	BY/APP/DATE
C1	Initial issue.	06/12/2023
C2	Drawing pack revisions updated.	02/05/2024



- Plot has a beam and block floor
- Where present see comment schedule
- Mass concrete strip foundation
- Mass concrete trench fill
- Deep Trench Fill with Reinforced Strip on top. Refer to bespoke drawings A006 and A007 to Comply with NHBC Technical Requirement R5.

Foundation Types

1 : 500

Foundation Schedule - Plots														
Plot Number	Plot FFL	Geo Depth	Original GL	Proposed GL A	Proposed GL B	Proposed GL C	Proposed GL D	Founding Level	Founding Level B	Founding Level C	Founding Level D	Average FFL to Found Level	Foundation Type	Founding Stratum
P1	92	0.6	91.45	91.85	91.85	91.85	91.85	90.85	90.85	90.85	90.85	1.15	Strip	Firm or Stiff Clay
P2	91.7	0.6	91.3	91.55	91.55	91.55	91.55	90.65	90.65	90.65	90.65	1.05	Strip	Firm or Stiff Clay
P3	91.47	0.6	90.9	91.32	91.32	91.32	91.32	90.3	90.3	90.3	90.3	1.17	Strip	Firm or Stiff Clay
P4	91.1	0.5	90.65	90.95	90.95	90.95	90.95	90.05	90.05	90.05	90.05	1.05	Strip	Firm or Stiff Clay
P5	90.8	0.5	90.55	90.65	90.65	90.65	90.65	89.75	89.75	89.75	89.75	1.05	Strip	Firm or Stiff Clay
P6	90.5	0.5	90.3	90.35	90.35	90.35	90.35	89.45	89.45	89.45	89.45	1.05	Strip	Firm or Stiff Clay
P7 P8 P9	90.95	0.4	90.3	90.8	90.8	90.8	90.8	89.9	89.9	89.9	89.9	1.05	Strip	Siltstone
P10	92	0.4	91.1	91.85	91.85	91.85	91.85	90.7	90.7	90.7	90.7	1.3	Strip	Siltstone
P11 P12 P13	91.85	0.4	91.15	91.7	91.7	91.7	91.7	90.75	90.75	90.75	90.75	1.1	Strip	Siltstone
P14	92.3	0.4	91.95	92.15	92.15	92.15	92.15	91.25	91.25	91.25	91.25	1.05	Strip	Siltstone
P15	92.45	0.4	92.45	92.3	92.3	92.3	92.3	91.4	91.4	91.4	91.4	1.05	Strip	Siltstone
P16	92.45	0.4	93	92.3	92.3	92.3	92.3	91.4	91.4	91.4	91.4	1.05	Strip	Firm or Stiff Clay
P17 P18 P19 P20	92.15	0.4	91	92	92	92	92	90.6	90.6	90.6	90.6	1.55	Trench	Firm or Stiff Clay
P21	91.55	0.4	92	91.4	91.4	91.4	91.4	90.5	90.5	90.5	90.5	1.05	Strip	Firm or Stiff Clay
P22	91.15	0.4	90.1	91	91	91	91	89.7	89.7	89.7	89.7	1.45	Trench	Firm or Stiff Clay
P23	90.85	0.4	89.5	90.7	90.7	90.7	90.7	89.1	89.1	89.1	89.1	1.75	Trench	Firm or Stiff Clay
P24 P25	90.65	0.4	89.05	90.5	90.5	90.5	90.5	88.65	88.65	88.65	88.65	2	Trench	Firm or Stiff Clay
P26 P27	89.85	0.4	88.7	89.7	89.7	89.7	89.7	88.3	88.3	88.3	88.3	1.55	Trench	Firm or Stiff Clay
P28	89.7	0.4	88.25	89.55	89.55	89.55	89.55	87.85	87.85	87.85	87.85	1.85	Trench	Firm or Stiff Clay
P29 P30	89.8	0.4	88.05	89.65	89.65	89.65	89.65	87.65	87.65	87.65	87.65	2.15	Trench	Firm or Stiff Clay
P31	89.95	0.4	87.85	89.8	89.8	89.8	89.8	87.45	87.45	87.45	87.45	2.5	Trench	Firm or Stiff Clay
P32	89.8	0.4	87.8	89.65	89.65	89.65	89.65	87.4	87.4	87.4	87.4	2.4	Trench	Firm or Stiff Clay
P33	90.75	0.4	91.05	90.6	90.6	90.6	90.6	89.7	89.7	89.7	89.7	1.05	Strip	Firm or Stiff Clay
P34 P35 P36	91.5	0.4	92	91.2	91.2	91.35	91.35	90.3	90.3	90.45	90.45	1.125	Strip	Firm or Stiff Clay
P37 P38 P39	91.7	0.4	91.6	91.55	91.55	91.55	91.55	90.65	90.65	90.65	90.65	1.05	Strip	Firm or Stiff Clay
P40 P41	90.7	0.4	90.9	90.55	90.55	90.55	90.55	89.65	89.65	89.65	89.65	1.05	Strip	Firm or Stiff Clay
P42 P43	90.6	0.4	91.25	90.45	90.45	90.45	90.45	89.55	89.55	89.55	89.55	1.05	Strip	Firm or Stiff Clay
P44 P45	90.45	0.4	90.55	90.3	90.3	90.3	90.3	89.4	89.4	89.4	89.4	1.05	Strip	Firm or Stiff Clay
P46 P47	89.05	0.4	87.1	88.9	88.9	88.9	88.9	86.7	86.7	86.7	86.7	2.35	Trench	Mudstone
P48	89.15	0.4	88.05	89	89	89	89	87.65	87.65	87.65	87.65	1.5	Trench	Mudstone
P49 P50	89.95	0.4	89.35	89.8	89.8	89.8	89.8	88.9	88.9	88.9	88.9	1.05	Strip	Mudstone
P51 P52	88.9	0.4	88.25	88.75	88.75	88.75	88.75	87.85	87.85	87.85	87.85	1.05	Strip	Mudstone
P52 P54	86.9	0.4	87	86.75	86.75	86.75	86.75	85.85	85.85	85.85	85.85	1.05	Strip	Firm or Stiff Clay
P55	86.9	0.4	86.7	86.75	86.75	86.75	86.75	85.85	85.85	85.85	85.85	1.05	Strip	Firm or Stiff Clay
P56	86.7	0.4	86.05	86.55	86.55	86.55	86.55	85.65	85.65	85.65	85.65	1.05	Strip	Firm or Stiff Clay
P57	86	0.4	84.45	85.85	85.85	85.85	85.85	84.05	84.05	84.05	84.05	1.95	Trench	Firm or Stiff Clay
P58	86.15	0.4	85.05	86	86	86	86	84.65	84.65	84.65	84.65	1.5	Trench	Firm or Stiff Clay
P59 P60	86.6	0.4	85.35	86.45	86.45	86.45	86.45	84.95	84.95	84.95	84.95	1.65	Trench	Firm or Stiff Clay
P61 P62	86.5	0.4	85.6	86.35	86.35	86.35	86.35	85.2	85.2	85.2	85.2	1.3	Strip	Firm or Stiff Clay
P63	86.45	0.4	85.65	86.3	86.3	86.3	86.3	85.25	85.25	85.25	85.25	1.2	Strip	Firm or Stiff Clay
P64	83.35	0.4	82.6	83.2	83.2	83.2	83.2	82.2	82.2	82.2	82.2	1.15	Strip	Firm or Stiff Clay
P65	83.3	0.4	82.9	83.15	83.15	83.15	83.15	82.25	82.25	82.25	82.25	1.05	Strip	Firm or Stiff Clay
P66	83.1	0.4	82.75	82.95	82.95	82.95	82.95	82.05	82.05	82.05	82.05	1.05	Strip	Firm or Stiff Clay
P67	83	0.4	82.65	82.85	82.85	82.85	82.85	81.95	81.95	81.95	81.95	1.05	Strip	Firm or Stiff Clay
P68	86.15	0.4	85.7	86	86	86	86	85.1	85.1	84	84	1.6	Strip	Firm or Stiff Clay
P69	86.45	1.7	86.45	86.3	86.3	86.3	86.3	84.75	84.75	84.75	84.75	1.7	Trench	Firm or Stiff Clay
P70	87.05	1.7	86.9	86.9	86.9	86.9	86.9	85.2	85.2	85.2	85.2	1.85	Trench	Firm or Stiff Clay
P84 P85	88.1	0.4	86.95	87.95	87.95	87.95	87.95	86.55	86.55	86.55	86.55	1.55	Trench	Firm or Stiff Clay
P71 P72	86.9	1.7	87.15	86.75	86.75	86.75	86.75	85.85	83.95	85.85	85.85	1.525	Deep Trench	Firm or Stiff Clay
P73	87.25	0.4	87.35	87.1	87.1	87.1	87.1	86.2	86.2	86.2	86.2	1.05	Strip	Firm or Stiff Clay
P74 P75	87.25	0.4	87.4	87.1	87.1	87.1	87.1	86.2	86.2	86.2	86.2	1.05	Strip	Firm or Stiff Clay
P76	87.4	0.4	87.55	87.25	87.25	87.25	87.25	86.35	86.35	86.35	86.35	1.05	Strip	Firm or Stiff Clay
P77	87.6	0.4	87.5	87.45	87.45	87.45	87.45	86.55	86.55	86.55	86.55	1.05	Strip	Firm or Stiff Clay
P79	88.9	0.4	88.6	88.75	88.75	88.75	88.75	87.85	87.85	87.85	87.85	1.05	Strip	Firm or Stiff Clay
P81 P82	89.05	0.4	88.1	88.9	88.9	88.9	88.9	87.7	87.7	87.7	87.7	1.35	Trench	Firm or Stiff Clay
P82 P83	88.95	0.4	88.25	88.8	88.8	88.8	88.8	87.85	87.85	87.85	87.85	1.1	Strip	Firm or Stiff Clay
P86 P87	88.85	0.4	87.3	88.7	88.7	88.7	88.7	86.9	86.9	86.9	86.9	1.95	Trench	Firm or Stiff Clay
P88	89	1.7	87.75	88.85	88.85	88.85	88.85	86.05	87.35	87.35	86.05	2.3	Pile	Firm or Stiff Clay
P89	89.5	1.7	89.1	89.35	89.35	89.35	89.35	87.4	87.4	87.4	87.4	2.1	Trench	Mudstone
P90	89.8	1.4	89.15	89.65	89.65	89.65	89.65	87.75	87.75	87.75	87.75	2.05	Trench	Mudstone
P91 P92	89.55	0.4	88.95	89.4	89.4	89.4	89.4	88.5	88.5	88.5	88.5	1.05	Strip	Firm or Stiff Clay
P93 P94	89.7	0.4	89.05	89.55	89.55	89.55	89.55	88.65	88.65	88.65	88.65	1.05	Strip	Firm or Stiff Clay
P95 P96	89.35	0.4	89.25	89.2	89.2	89.2	89.2	88.3	88.3	88.3	88.3	1.05	Strip	Firm or Stiff Clay
P97 P98	89.9	0.4	89.8	89.75	89.75	89.75	89.75	88.85	88.85	88.85	88.85	1.05	Strip	Firm or Stiff Clay
P99 P100	90.2	0.4	90.05	90.05	90.05	90.05	90.05	89.15	89.15	89.15	89.15	1.05	Strip	Firm or Stiff Clay
P101 P102	90.5	0.4	90.15	90.35	90.13	90.35	90.35	89.45	89.23	89.45	89.45	1.105	Strip	Firm or Stiff Clay
P103 P104	90.65	0.4	90.55	90.5	90.5	90.5	90.5	89.6	89.6	89.6	89.6	1.05	Strip	Firm or Stiff Clay
P106 P107	90.55	1.7	89	90.4	90.4	90.32	90.25	87.3	87.3	87.3	87.3	3.25	Pile	Siltstone
P105	90.25	1.4	89	90.1	90.1	90.1	89.65	87.6	87.6	87.6	87.6	2.65	Trench	Mudstone
P78	88.9	0.4	88.4	88.75	88.75	88.75	88.75	87.85	87.85	87.85	87.85	1.05	Strip	Firm or Stiff Clay

For strip width and standard foundation details refer to Story Homes standard details based on an allowable bearing capacity of 150kPa.

All plots to have Amber 1 / CS2 gas protection measures incorporated within the ground floor construction. Refer to Story Homes standard details.

This drawing is to be read in conjunction with all other architectural and engineering drawings. For set out refer to the engineering drawings by others. For handing refer to the architectural site layout.

All dimensions are in millimetres unless noted otherwise.

All concrete is specified in accordance with BS 8500-1. Concrete to be batched and supplied in accordance with BS 8500-2.

Concrete strips foundation with clays to be from GEN1 concrete. Strips founded in mudstone or siltstone to be from FND3 concrete. Mass fill trench fill in cohesive soils to be GEN1. Mass fill in mudstone or siltstone to be FND3.

Foundations are not to found in coal. If exposed refer to Structensor for additional guidance.

All concrete work to be in accordance with the National Concrete Specification and to have a basic finish and a curing class of 2.

Strip foundations are to be founded in the target strata noted capable of sustaining an allowable bearing capacity of 150kPa being founded in the underlying natural firm to stiff clays. Strip widths are from Story Homes standard details to suit an allowable bearing capacity of 150kPa.

The foundation zoning information presented on this drawing is based on the site investigation information presented by ID Geoenvironmental. For detailed information on the sub soil conditions refer to the site investigation report. Any variation in this founding strata is to be reported to Structensor Consulting prior to construction of the foundation.

Minimum foundation depths are based on Medium Volumetric Change Potential.

Foundation zoning on this plan assumes that site enabling works have been completed to form suitable construction platforms. Specification of foundations in uplift zones assumes that foundation construction will commence from near proposed ground level surface. Foundation excavation is assumed to commence from 450 mm below FFL.

Foundation depth information is based on conjectured interpretation of the site investigation information and the topographical survey. It is possible that conditions at specific locations are not indicative of those at the known investigation points. If foundation conditions vary for those noted on this drawing consult Structensor Consulting for additional guidance prior to foundation construction.

Blockwork below DPC to have a minimum unit compressive strength of 7.3MPa set in M6 mortar. Aggregate units should be exposed to external air for a minimum of 10 days from production to back filling (surface carbonated). Block aggregate to be to BS EN 12620. Mortar to be from CEM II cements to BS EN 998-2 National Annex 1.2 (portland-fly ash cement or similar).

D	Plot 69G, 68 and 71 foundation levels amended	03/05/24
C	Levels amended and additional walls added. Some walls added to FOE.	27/02/24
B	Issued for construction	27/02/24
A	Plot sequence amended. FFL's amended. Foundation solutions amended to suit. Garages added.	01/08/23

Rev	Revision Description	Date
	Revision Schedule	

Project Title:

Proposed Residential Development Phase 4 Edgehill Park

Drawing Title:

Foundation Zoning Plan and Plot Foundation Schedule

Client:

Story Homes

Scale	Drawn Date	Status	Rev
1 : 500	May 23	Construction	D

Project No	Sheet No
6258	FZP4-S-DWG-A001

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SD010 - Foundations & Ground Floors A20 - Issue (05)

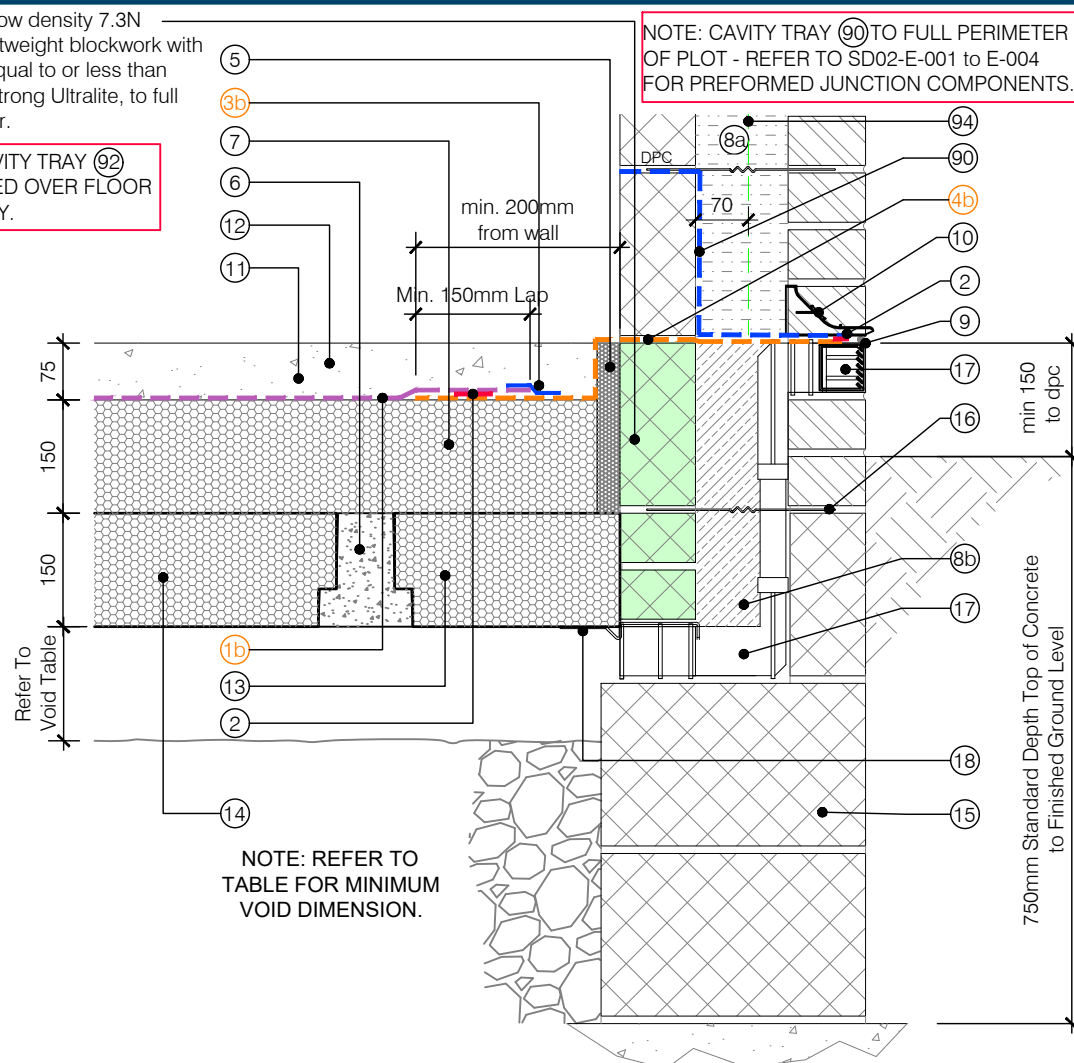
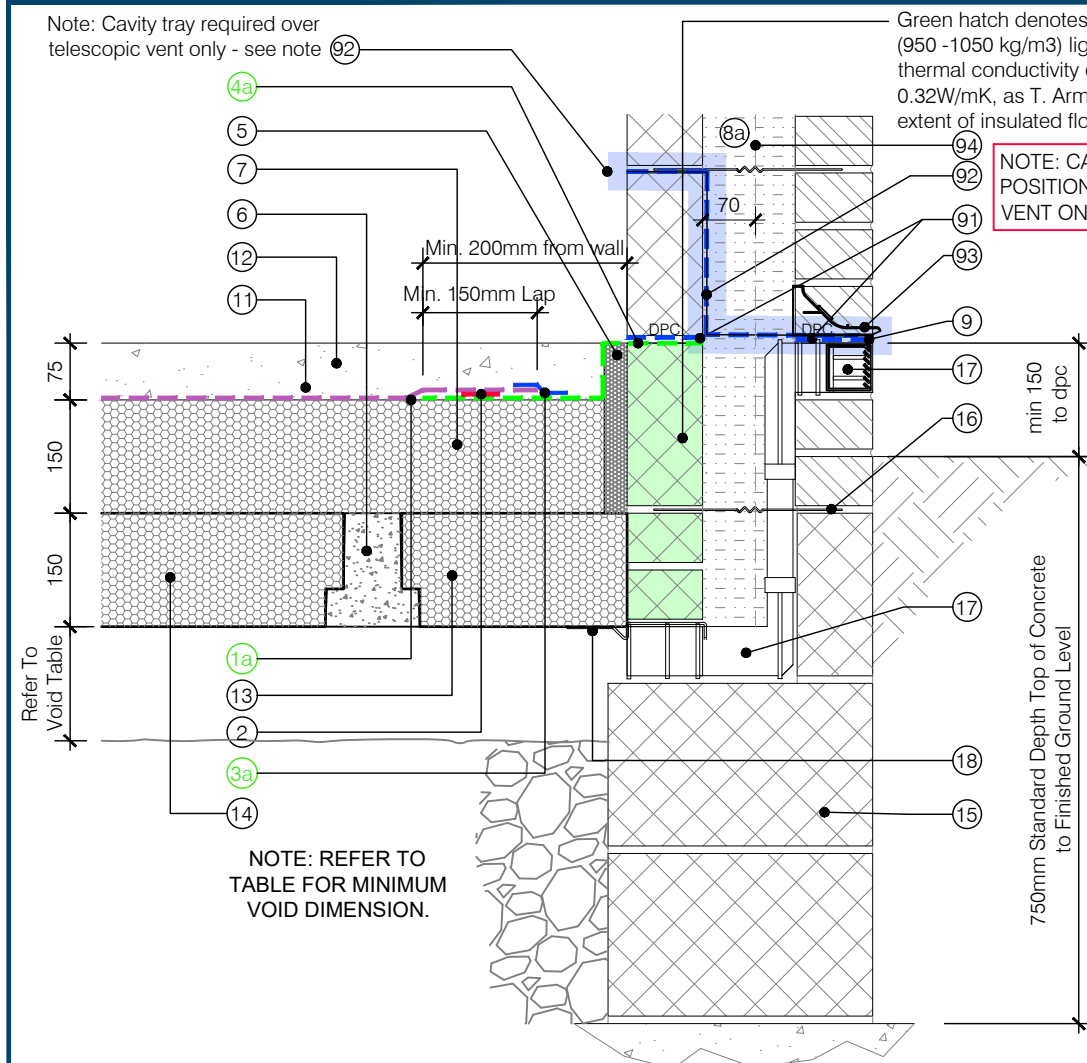
Standard Construction Details

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Story House, Lords Way, Kingmoor Business Park,
Carlisle, Cumbria. CA6 4SL.

Tel 01228 404550

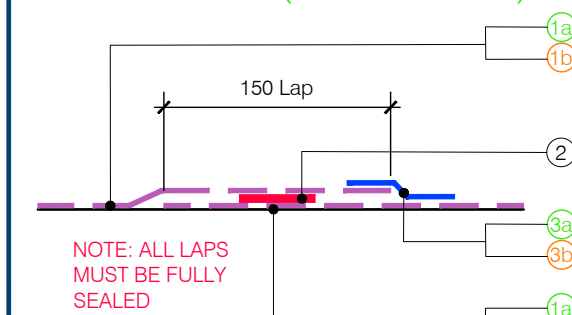
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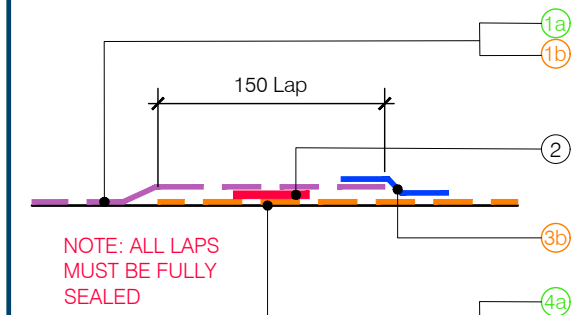
- 11 Slab reinforcement to be either (dependant on topping):
- Structural Concrete
 - One layer of A142 mesh (to BS 4483:2005) with a characteristic yield strength of 500N/mm² set at mid-point to the depth of the concrete topping.
 - Self Compacting (Reinforcement dependant of supplier of self compacting concrete)
 - Steel Fibres
 - Novomesh B&BA: Dosage rate 17.5kg/m³, steel flat end, steel fibres, 50mm long, 1mm diameter, tensile strength of 1150N/mm².
 - Adfil SF86: Dosage rate 13.33kg/m³, 60mm long, 0.75mm diameter, modulus of elasticity of 200000N/mm², tensile strength of 1225N/mm².
 - Macro-Polymer
 - Novomesh B&BA: Dosage rate 3.84kg/m³, continuously deformed, 60mm long, 0.56mm diameter, modulus of elasticity of 7000N/mm², tensile strength of 600N/mm².
 - Durus Easy Finish: Dosage rate 3kg/m³, 40mm long, 0.7mm diameter (equivalent), modulus of elasticity of 6000N/mm², tensile strength of 470N/mm².
- 12 75mm Structural concrete topping to be either:
- Standard - C28/35 with maximum aggregate size 20mm and reinforcement selected from Note 11. Slump should be Class S3 (100 to 150mm) or S4 (for spot samples taken from initial discharge, 140 to 230mm). Aggregate to comply with BS EN12620: 2013.
 - Self Compacting - C28/35 with maximum aggregate size 10mm and reinforcement selected from the options below. Slump flow class should be SF1 (550 to 650mm) or SF2 (660 to 750mm). The sand content should be greater than 45%. Aggregate to comply with BS EN12620: 2013.
- 13 Lynx Warmfloor 'Grey' 150mm EPS Starter/ End Block 300mm or 178mm with thermal conductivity equal to 0.031W/mK
- 14 Lynx Warmfloor 'Grey' 150mm EPS Infill Block 540mm/340mm with thermal conductivity equal to 0.031W/mK
- 15 2 course of 350wide x 215 deep Trench Blocks, 450mm below Finished Floor Level, 7.3kN/mm² Strength
- 16 Bottom row of wall ties to be at 600mm centres.
- 17 Glidevale or similar approved Telescopic underfloor ventilator, comprising MV250 Airbrick (6000mm² free area), and MV251 periscope vent with MV254 vertical adaptor, colour Terracotta or Buff to match house specific external finish. Position as required on house type specific foundation layout plans. NOT TO BE POSITIONED UNDER CONCRETE BEAM BEARING.
- 18 Lynx Precast Warmfloor Wall Clip LWF10 2.95 Galv Spring Wire. Min 2 per EPS Starter/ End block.
- 90 600m wide IKO Hyload or similar approved Stepped Dpc cavity tray. Complex junctions to be made using preformed components - refer to SD030-E-001 to E-004. Complex junctions include:
- External Corner.
 - Internal Corner.
 - Party Wall.
 - Steps between plots.
 - Windpost base.
 - Door thresholds.
- 91 100mm Visqueen Zedex DPC
- 92 600m wide IKO Hyload or similar approved Stepped DPC cavity tray over underfloor vent positions. DPC to extend min.150mm past vent with ends turned up
- 93 Manthorpe G951 clear peep weep vents either end of cavity tray over underfloor vent
- 94 70mm PIR partial fill cavity insulation - Developments designated 'Very Severe Exposure' and natural stone elevations only.

- NOTES
- 1a 1200 gauge polythene DPM lapped under Visqueen DPC
- 1b Visqueen Gas Membrane, see adjacent Gas Membrane Schedule, level of protection specified by site development engineer. Gas Membrane is to be installed by a competent personnel with suitable qualifications in accordance with best practice, and guidance contained within BS8485 2015: A1 2019 - See adjacent Gas Membrane Schedule for level of protection.
- 2 Visqueen Pro 50mm x 10m double sided jointing tape positioned 50mm approx from membrane edge with min 150mm lap
- 3a Visqueen Pro single sided tape
- 3b Visqueen jointing/lap tape - see adjacent Gas Membrane Schedule table for level of protection
- 4a Visqueen Zedex CPT DPC to BS EN 14909:2012
- 4b Visqueen Gas Resistant DPC to BS 8485:2015 + A1:2019
- 5 Lynx Warmfloor 'Grey' EPS Perimeter edge strip with thermal conductivity equal to 0.031W/mK - 30x225x1200mm
- 6 150mm Pre-stressed Beam
- 7 Lynx Warmfloor 'Grey' 150mm EPS structural grade topsheet with thermal conductivity equal to 0.031W/mK
- 8a Cavity full fill / partial fill insulation, refer to site exposure level and site specification
- 8b 120mm thick 450mm wide EPS insulation sheets (0.034W/mK) below DPC. Cut to fit around telescopic vents
- 9 VERY SEVERE EXPOSURE COASTAL AREAS ONLY - Seal with Low Modulus Silicone Sealant to ISO 11600-F&G-25LM, colour to match mortar.
- 10 Manthorpe G951 clear peep weep vents @450 ctrs.

Standard Detail to Perimeter Wall - WarmFloor Insulated Flooring System (CS1 - Green)



Typical DPM Jointing Detail



DPM To DPC Perimeter Jointing Detail

Note

Telescopic underfloor vents are to be positioned as indicated within the house type booklets and are not to be positioned below floor beam end bearings.

Minimum Void Dimensions Under Suspended Precast Concrete Floors

Voids should be provided to accommodate movement due to heave forces acting on foundations and suspended ground floors as set out in the table below in accordance with NHBC (As indicated in Chapter 5.2.10, Ventilation).

Void Dimension Under Suspended Precast Concrete Floors	
Volume Change Potential in clay sub soils	Min. Void Depth (mm)
None	150
Low (10-20%)	200
Medium (20-40%)	250
High (40-60%)	300

NOTE: Void dimension is measured from the underside of the beam to the ground level and includes 150mm ventilation allowance.

Positioning of Weep Vents

Bottom of weep vent to be placed directly on to cavity tray to ensure complete drainage of tray with no possibility for standing water. Ensure weep holes do not become blocked with mortar during installation / pointing.

Standard Detail to Perimeter Wall - WarmFloor Insulated Flooring System (CS2/Amber 1/CS3/Amber 2/Radon - See Table)

Floor Membrane Schedule			
NHBC Rating	Membrane	Jointing	Designation
CS2/Amber 1	Visqueen Low Permeability Gas Membrane (yellow) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015+A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Gas Resistant foil lap tape 75mmx50m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
CS3/Amber 2	Visqueen Gas Barrier (blue) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015 + A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Gas Resistant foil lap tape 75mmx50m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
Basic/Full Radon	Visqueen R400 Gas Membrane (red) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015 + A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Pro single sided tape 75mmx25m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations

REFER TO SITE SPECIFIC SITE ENGINEERS REPORTS FOR SPECIFIC PLOT GAS MEMBRANE/RADON REQUIREMENTS

TYPICAL DETAILS ARE BASED ON VISQUEEN REQUIREMENTS AT TIME OF DRAUGHTING - ARRANGEMENT TO BE IN FULL ACCORDANCE WITH MANUFACTURERS DETAILS AT TIME OF INSTALLATION

ALTERNATIVE MANUFACTURERS MAY BE USED SEE REGIONAL TECHNICAL TEAM FOR APPROVAL

LYNX PRECAST

Details are to be used for Lynx Precast "WarmFloor" Insulated Flooring system only.



Foundations & Ground Floors A20

DRAWING Perimeter Wall Details Lynx Warmfloor (Beams parallel with wall)

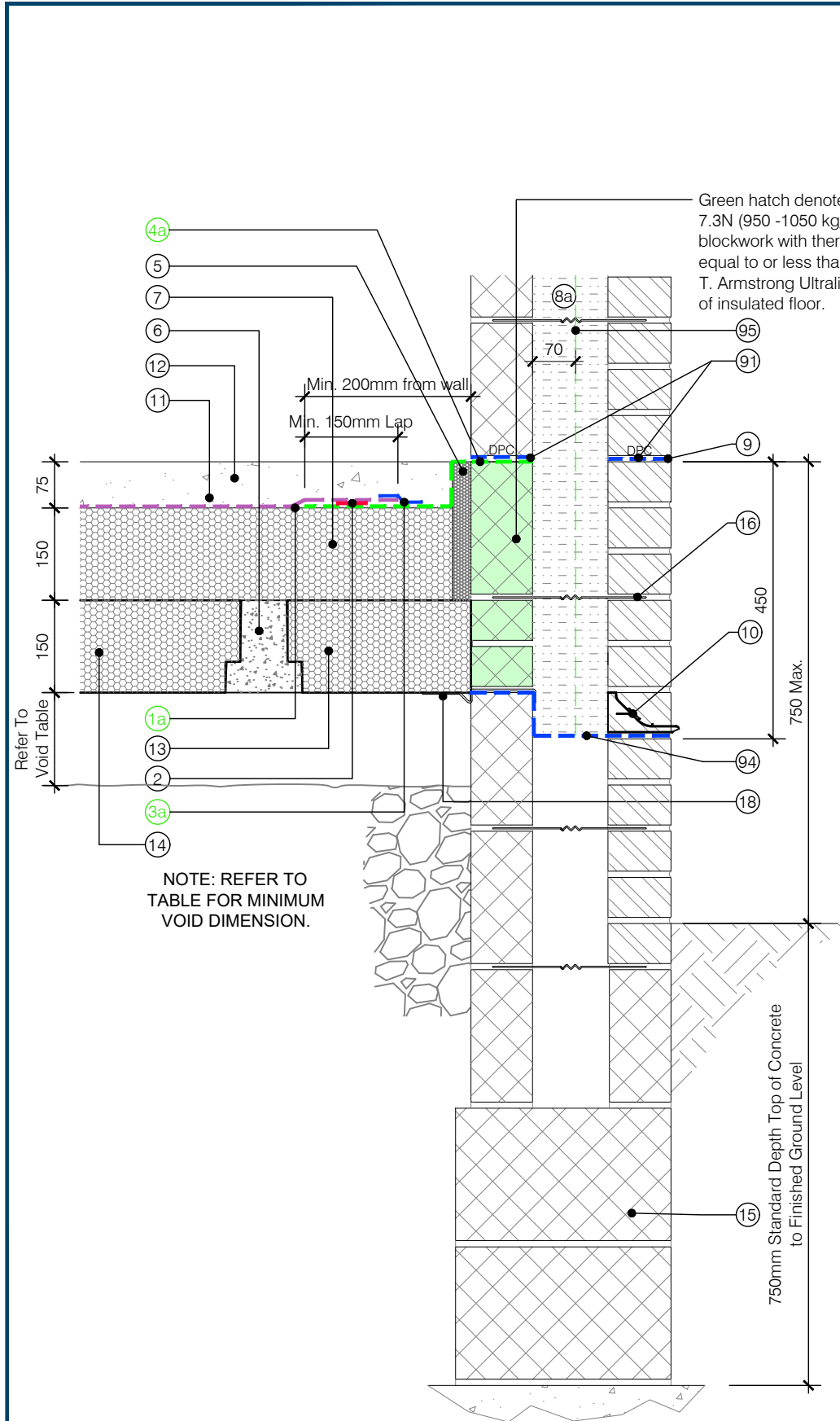
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CHECKED BY	AH	SCALE	1:10
ISSUE	DRAWING NUMBER	REVISION	
(05)	SD010-A-001.1	D	
Revisions	Notes	Date	
B	DPC added over underfloor vent positions & telescopic vent noted to require vertical adaptor. Drawing renumbered from A-001 to A-001.1. Note added re positioning of underfloor vents.	23.10.23	
C	Note added re positioning of weep vents. Notes added re over vent cavity tray and use of preformed junctions to perimeter cavity tray in gas installations. Line of very severe exposure partial fill insulation indicated - refer to site specification.	27.11.23	
D		07.05.24	

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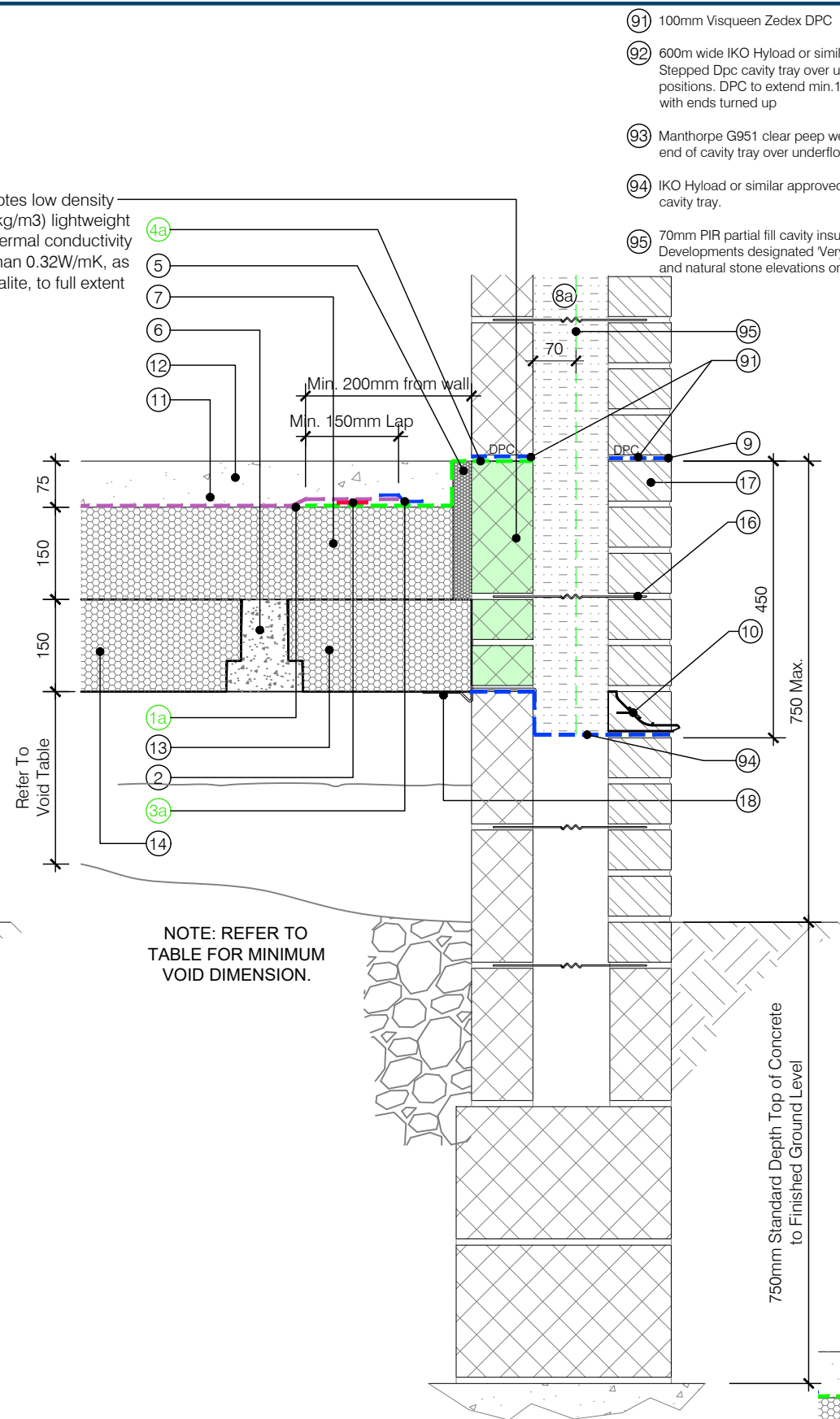
Fax 01228 404551



Perimeter Wall Detail with Underbuild
(Raised Solum Level) - WarmFloor
Insulated Flooring System
(CS1 - Green)

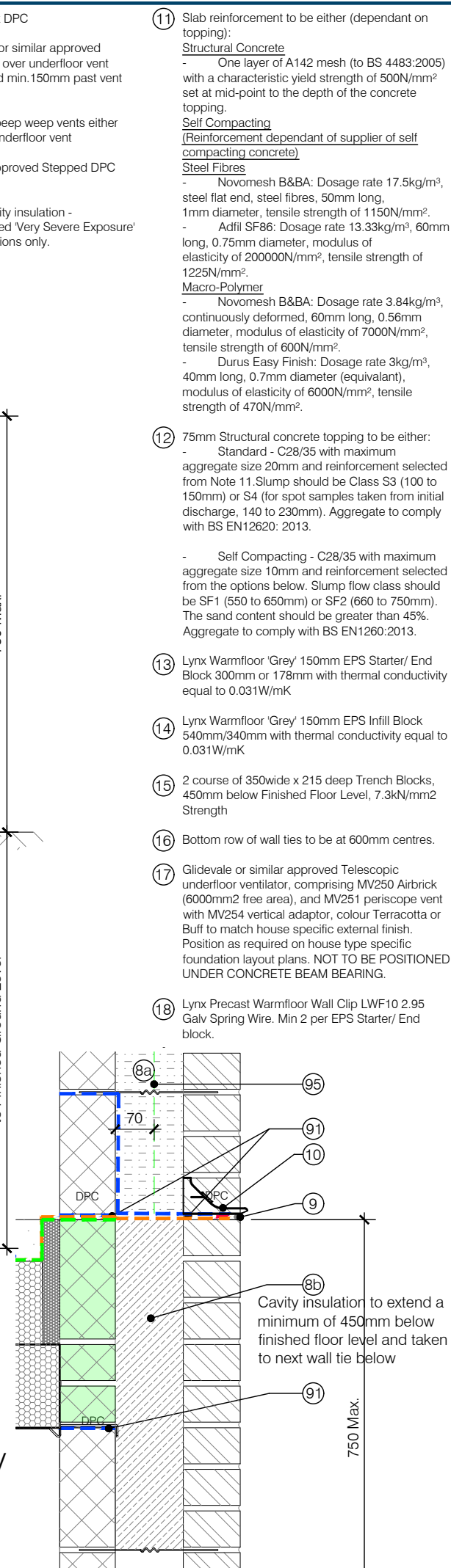
Note
Telescopic underfloor vents are to be positioned as indicated within the house type booklets and are not to be positioned below floor beam end bearings.

Positioning of Weep Vents
Bottom of weep vent to be placed directly on to cavity tray to ensure complete drainage of tray with no possibility for standing water. Ensure weep holes do not become blocked with mortar during installation / pointing.



Perimeter Wall Detail with Underbuild
(Reduced Solum Level) - WarmFloor
Insulated Flooring System
(CS1 - Green)

Part Detail Showing EPS
Insulation Below Cavity Tray
(CS2/Amber 1/CS3/Amber
2/Radon - See Table)



- 91 100mm Visqueen Zedex DPC
- 92 600mm wide IKO Hyloard or similar approved Stepped Dpc cavity tray over underfloor vent positions. DPC to extend min.150mm past vent with ends turned up
- 93 Manthorpe G951 clear peep weep vents either end of cavity tray over underfloor vent
- 94 IKO Hyloard or similar approved Stepped DPC cavity tray.
- 95 70mm PIR partial fill cavity insulation - Developments designated 'Very Severe Exposure' and natural stone elevations only.

- 11 Slab reinforcement to be either (dependant on topping):
Structural Concrete
- One layer of A142 mesh (to BS 4483:2005) with a characteristic yield strength of 500N/mm² set at mid-point to the depth of the concrete topping.
Self Compacting (Reinforcement dependant of supplier of self compacting concrete)
Steel Fibres
- Novomesh B&BA: Dosage rate 17.5kg/m³, steel flat end, steel fibres, 50mm long, 1mm diameter, tensile strength of 1150N/mm².
- Adfil SF86: Dosage rate 13.33kg/m³, 60mm long, 0.75mm diameter, modulus of elasticity of 200000N/mm², tensile strength of 1225N/mm².
Macro-Polymer
- Novomesh B&BA: Dosage rate 3.84kg/m³, continuously deformed, 60mm long, 0.56mm diameter, modulus of elasticity of 7000N/mm², tensile strength of 600N/mm².
- Durus Easy Finish: Dosage rate 3kg/m³, 40mm long, 0.7mm diameter (equivalent), modulus of elasticity of 6000N/mm², tensile strength of 470N/mm².
- 12 75mm Structural concrete topping to be either:
- Standard - C28/35 with maximum aggregate size 20mm and reinforcement selected from Note 11. Slump should be Class S3 (100 to 150mm) or S4 (for spot samples taken from initial discharge, 140 to 230mm). Aggregate to comply with BS EN12620: 2013.
- Self Compacting - C28/35 with maximum aggregate size 10mm and reinforcement selected from the options below. Slump flow class should be SF1 (550 to 650mm) or SF2 (660 to 750mm). The sand content should be greater than 45%. Aggregate to comply with BS EN1260:2013.
- 13 Lynx Warmfloor 'Grey' 150mm EPS Starter/ End Block 300mm or 178mm with thermal conductivity equal to 0.031W/mK
- 14 Lynx Warmfloor 'Grey' 150mm EPS Infill Block 540mm/340mm with thermal conductivity equal to 0.031W/mK
- 15 2 course of 350wide x 215 deep Trench Blocks, 450mm below Finished Floor Level, 7.3kN/mm² Strength
- 16 Bottom row of wall ties to be at 600mm centres.
- 17 Glidevale or similar approved Telescopic underfloor ventilator, comprising MV250 Airbrick (6000mm² free area), and MV251 periscope vent with MV254 vertical adaptor, colour Terracotta or Buff to match house specific external finish. Position as required on house type specific foundation layout plans. NOT TO BE POSITIONED UNDER CONCRETE BEAM BEARING.
- 18 Lynx Precast Warmfloor Wall Clip LWF10 2.95 Galv Spring Wire. Min 2 per EPS Starter/ End block.

- NOTES**
- 1a 1200 gauge polythene DPM lapped under Visqueen DPC
 - 1b Visqueen Gas Membrane, see adjacent Gas Membrane Schedule, level of protection specified by site development engineer. Gas Membrane is to be installed by a competent personnel with suitable qualifications in accordance with best practice, and guidance contained within BS8485 2015: A1 2019 - See adjacent Gas Membrane Schedule for level of protection.
 - 2 Visqueen Pro 50mm x 10m double sided jointing tape positioned 50mm approx from membrane edge with min 150mm lap
 - 3a Visqueen Pro single sided tape
 - 3b Visqueen jointing/lap tape - see adjacent Gas Membrane Schedule table for level of protection
 - 4a Visqueen Zedex CPT DPC to BS EN 14909:2012
 - 4b Visqueen Gas Resistant DPC to BS 8485:2015 + A1:2019
 - 5 Lynx Warmfloor 'Grey' EPS Perimeter edge strip with thermal conductivity equal to 0.031W/mK - 30x225x1200mm
 - 6 150mm Pre-stressed Beam
 - 7 Lynx Warmfloor 'Grey' 150mm EPS structural grade topsheet with thermal conductivity equal to 0.031W/mK
 - 8a Cavity full fill / partial fill insulation, refer to site exposure level and site specification
 - 8b 120mm thick 450mm wide EPS insulation sheets (0.034W/mK) below DPC. Cut to fit around telescopic vents
 - 9 VERY SEVERE EXPOSURE COASTAL AREAS ONLY - Seal with Low Modulus Silicone Sealant to ISO 11600-F&G-25LM, colour to match mortar.
 - 10 Manthorpe G951 clear peep weep vents @450 ctrs.



Details are to be used for Lynx Precast "WarmFloor" Insulated Flooring system only.

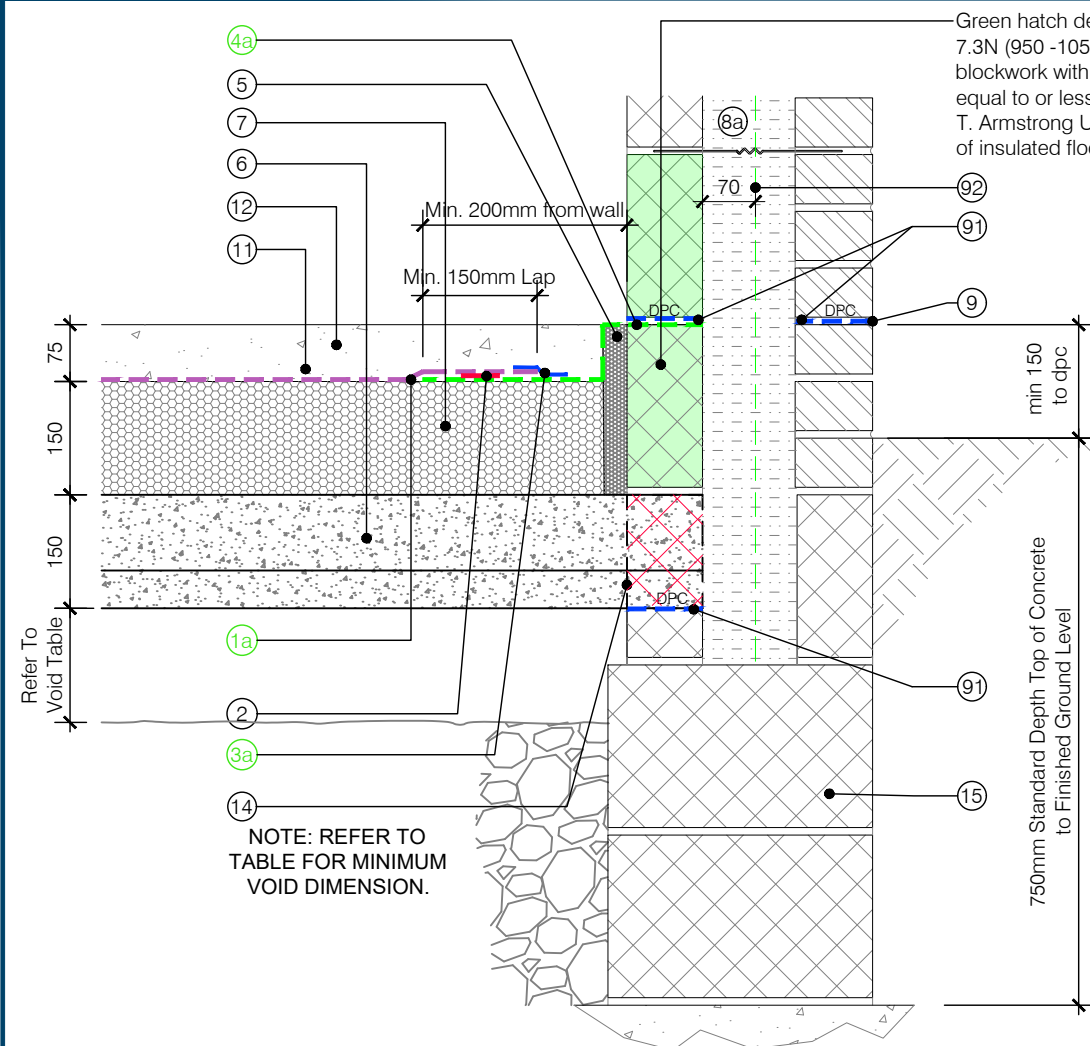
TITLE Foundations & Ground Floors A20

DRAWING Perimeter Wall Details With Underbuild Lynx Warmfloor (Beams parallel with wall)

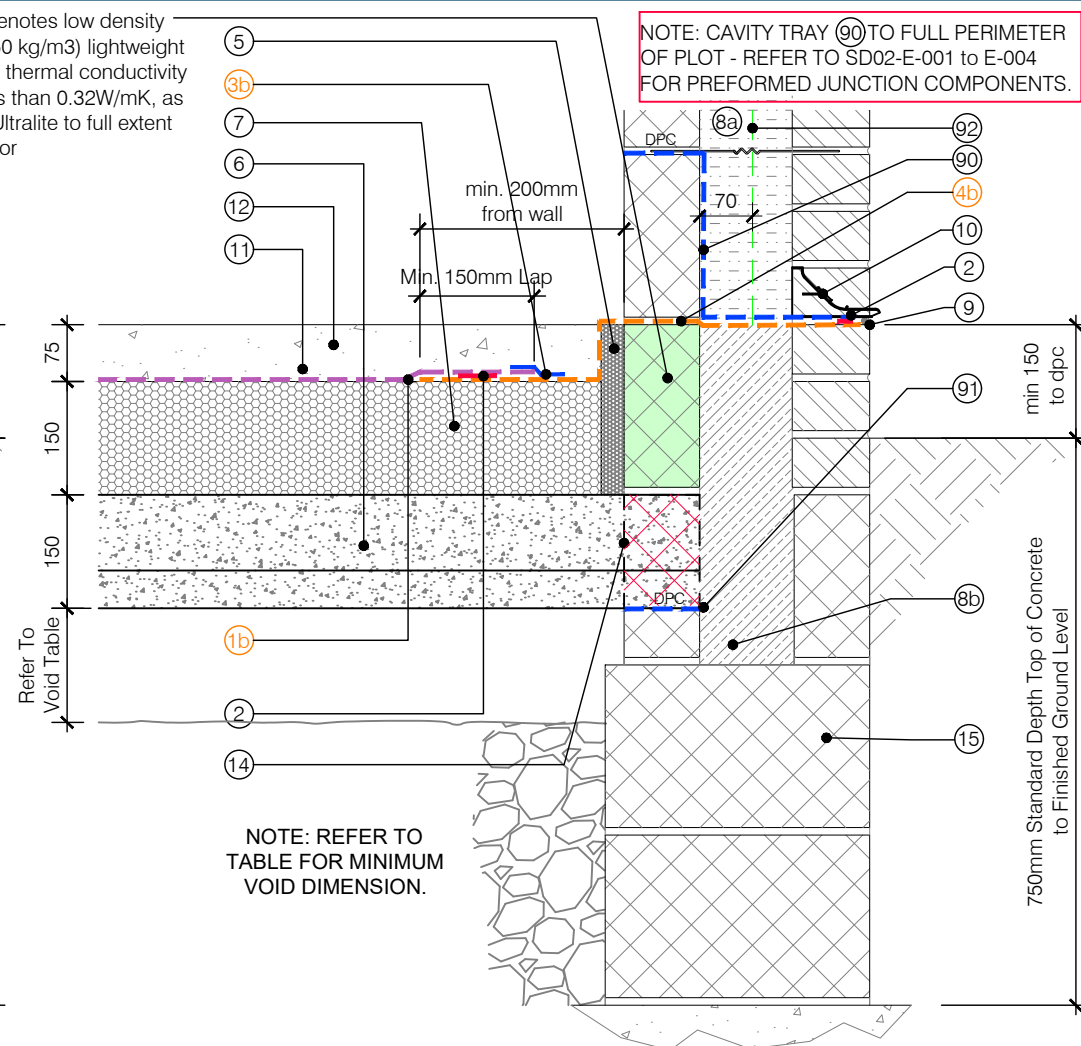
DRAWN BY AA DATE 16/09/22
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ISSUE (05) DRAWING NUMBER SD010-A-001.2 REVISION B

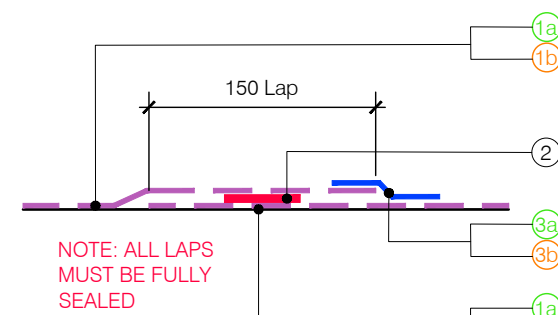
Revisions	Notes	Date
A	Note added re positioning of weep vents.	27.11.23
B	Line of very severe exposure partial fill insulation indicated - refer to site specification.	07.05.24



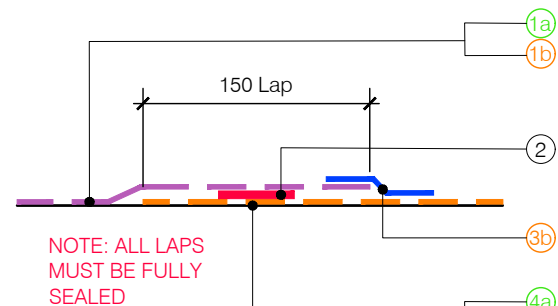
Standard Detail to Perimeter Wall -
WarmFloor Insulated Flooring System
(CS1 - Green)



Standard Detail to Perimeter Wall -
WarmFloor Insulated Flooring System
(CS2/Amber 1/CS3/Amber 2/Radon - See Table)



Typical DPM Jointing Detail



DPM To DPC Perimeter
Jointing Detail

Note
Telescopic underfloor vents are to be positioned as indicated within the house type booklets and are not to be positioned below floor beam end bearings.

Minimum Void Dimensions Under Suspended Precast Concrete Floors
Voids should be provided to accommodate movement due to heave forces acting on foundations and suspended ground floors as set out in the table below in accordance with NHBC (As indicated in Chapter 5.2.10, Ventilation).

Void Dimension Under Suspended Precast Concrete Floors	
Volume Change Potential in clay sub soils	Min. Void Depth (mm)
None	150
Low (10-20%)	200
Medium (20-40%)	250
High (40-60%)	300

NOTE: Void dimension is measured from the underside of the beam to the ground level and includes 150mm ventilation allowance.

Positioning of Weep Vents
Bottom of weep vent to be placed directly on to cavity tray to ensure complete drainage of tray with no possibility for standing water. Ensure weep holes do not become blocked with mortar during installation / pointing.

Floor Membrane Schedule			
NHBC Rating	Membrane	Jointing	Designation
CS2/Amber 1	Visqueen Low Permeability Gas Membrane (yellow) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015+A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Gas Resistant foil lap tape 75mmx50m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
CS3/Amber 2	Visqueen Gas Barrier (blue) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015 + A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Gas Resistant foil lap tape 75mmx50m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
Basic/Full Radon	Visqueen R400 Gas Membrane (red) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015 + A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Pro single sided tape 75mmx25m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations

REFER TO SITE SPECIFIC SITE ENGINEERS REPORTS FOR SPECIFIC PLOT GAS MEMBRANE/RADON REQUIREMENTS
TYPICAL DETAILS ARE BASED ON VISQUEEN REQUIREMENTS AT TIME OF DRAUGHTING - ARRANGEMENT TO BE IN FULL ACCORDANCE WITH MANUFACTURERS DETAILS AT TIME OF INSTALLATION
ALTERNATIVE MANUFACTURERS MAY BE USED SEE REGIONAL TECHNICAL TEAM FOR APPROVAL

- Slab reinforcement to be either (dependant on topping):
Structural Concrete
- One layer of A142 mesh (to BS 4483:2005) with a characteristic yield strength of 500N/mm² set at mid-point to the depth of the concrete topping.
Self Compacting
(Reinforcement dependant of supplier of self compacting concrete)
Steel Fibres
- Novomesh B&BA: Dosage rate 17.5kg/m³, steel flat end, steel fibres, 50mm long, 1mm diameter, tensile strength of 1150N/mm².
- Adfil SF86: Dosage rate 13.33kg/m³, 60mm long, 0.75mm diameter, modulus of elasticity of 20000N/mm², tensile strength of 1225N/mm².
Macro-Polymer
- Novomesh B&BA: Dosage rate 3.84kg/m³, continuously deformed, 60mm long, 0.56mm diameter, modulus of elasticity of 7000N/mm², tensile strength of 600N/mm².
- Durus Easy Finish: Dosage rate 3kg/m³, 40mm long, 0.7mm diameter (equivalent), modulus of elasticity of 6000N/mm², tensile strength of 470N/mm².
- 75mm Structural concrete topping to be either:
- Standard - C28/35 with maximum aggregate size 20mm and reinforcement selected from Note 11. Slump should be Class S3 (100 to 150mm) or S4 (for spot samples taken from initial discharge, 140 to 230mm). Aggregate to comply with BS EN12620: 2013.
- Self Compacting - C28/35 with maximum aggregate size 10mm and reinforcement selected from the options below. Slump flow class should be SF1 (550 to 650mm) or SF2 (660 to 750mm). The sand content should be greater than 45%. Aggregate to comply with BS EN1260:2013.
- Lynx Warmfloor 'Grey' 150mm EPS Starter/ End Block 300mm or 178mm with thermal conductivity equal to 0.031W/mK
- Lynx Lightweight concrete closure block 540mm & 340mm to separating beams when beams are built into wall. Read with beam layout plan.
- 2 course of 350wide x 215 deep Trench Blocks, 450mm below Finished Floor Level, 7.3kN/mm2 Strength
- Bottom row of wall ties to be at 600mm centres.
- Lynx Precast Warmfloor Wall Clip LWF10 2.95 Galv Spring Wire. Min 2 per EPS Starter/ End block.
- 600m wide IKO Hyload or similar approved Stepped Dpc cavity tray. Complex junctions to be made using preformed components - refer to SD030-E-001 to E-004. Complex junctions include:
• External Corner.
• Internal Corner.
• Party Wall.
• Steps between plots.
• Windpost base.
• Door thresholds.
- 100mm Visqueen Zedex DPC
- 70mm PIR partial fill cavity insulation - Developments designated 'Very Severe Exposure' and natural stone elevations only.

- NOTES
- 1200 gauge polythene DPM lapped under Visqueen DPC
 - Visqueen Gas Membrane, see adjacent Gas Membrane Schedule, level of protection specified by site development engineer. Gas Membrane is to be installed by a competent personnel with suitable qualifications in accordance with best practice, and guidance contained within BS8485 2015: A1 2019 - See adjacent Gas Membrane Schedule for level of protection.
 - Visqueen Pro 50mm x 10m double sided jointing tape positioned 50mm approx from membrane edge with min 150mm lap
 - Visqueen Pro single sided tape
 - Visqueen jointing/lap tape - see adjacent Gas Membrane Schedule table for level of protection
 - Visqueen Zedex CPT DPC to BS EN 14909:2012
 - Visqueen Gas Resistant DPC to BS 8485:2015 + A1:2019
 - Lynx Warmfloor 'Grey' EPS Perimeter edge strip with thermal conductivity equal to 0.031W/mK - 30x225x1200mm
 - 150mm Pre-stressed Beam
 - Lynx Warmfloor 'Grey' 150mm EPS structural grade topsheet with thermal conductivity equal to 0.031W/mK
 - Cavity full fill / partial fill insulation, refer to site exposure level and site specification
 - 120mm thick 450mm wide EPS insulation sheets (0.034W/mK) below DPC. Cut to fit around telescopic vents
 - VERY SEVERE EXPOSURE COASTAL AREAS ONLY - Seal with Low Modulus Silicone Sealant to ISO 11600-F&G-25LM, colour to match mortar.
 - Manthorpe G951 clear peep weep vents @450 ctrs.



Details are to be used for Lynx Precast "WarmFloor" Insulated Flooring system only.



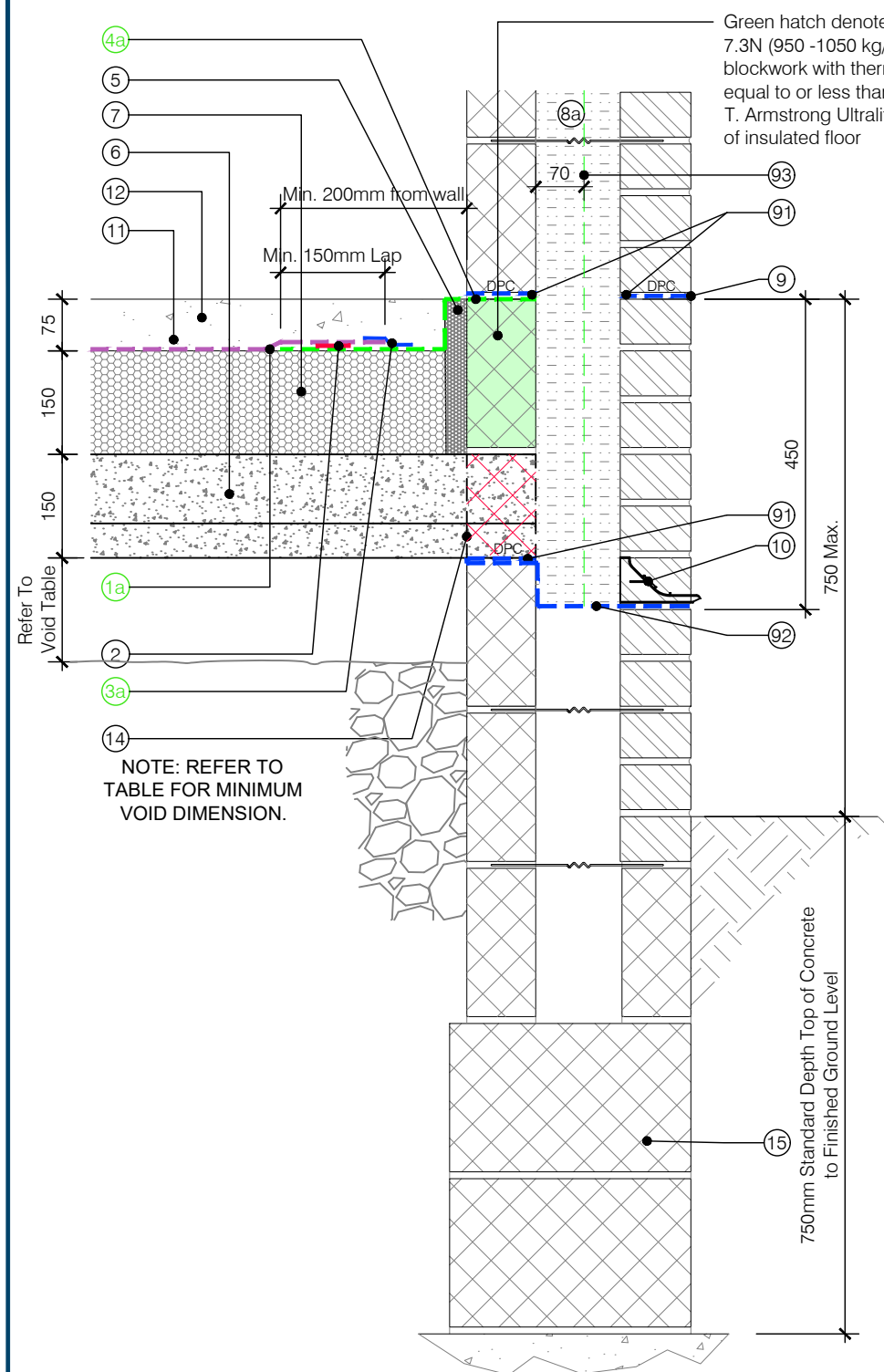
Foundations & Ground Floors A20

DRAWING Perimeter Wall Details
Lynx Warmfloor
(Beams spanning onto wall)

DRAWN BY	AA	DATE	16/09/22
CHECKED BY	AH	SCALE	1:10
ISSUE	DRAWING NUMBER	REVISION	
(05)	SD010-A-002.1	D	
Revisions	Notes	Date	
A	Green hatch Ultralite blockwork below DPC to full extent of insulated floor amended to 7.3N. Thermal conductivity of perimeter edge insulation specified. Drawing renumbered from A-002 to A-002.1	10.08.23	
B	Note added re positioning of weep vents. Notes added re over vent cavity tray and use of preformed junctions to perimeter cavity tray in gas installations. Line of very severe exposure partial fill insulation indicated - refer to site specification.	23.10.23	
C		27.11.23	
D		07.05.24	

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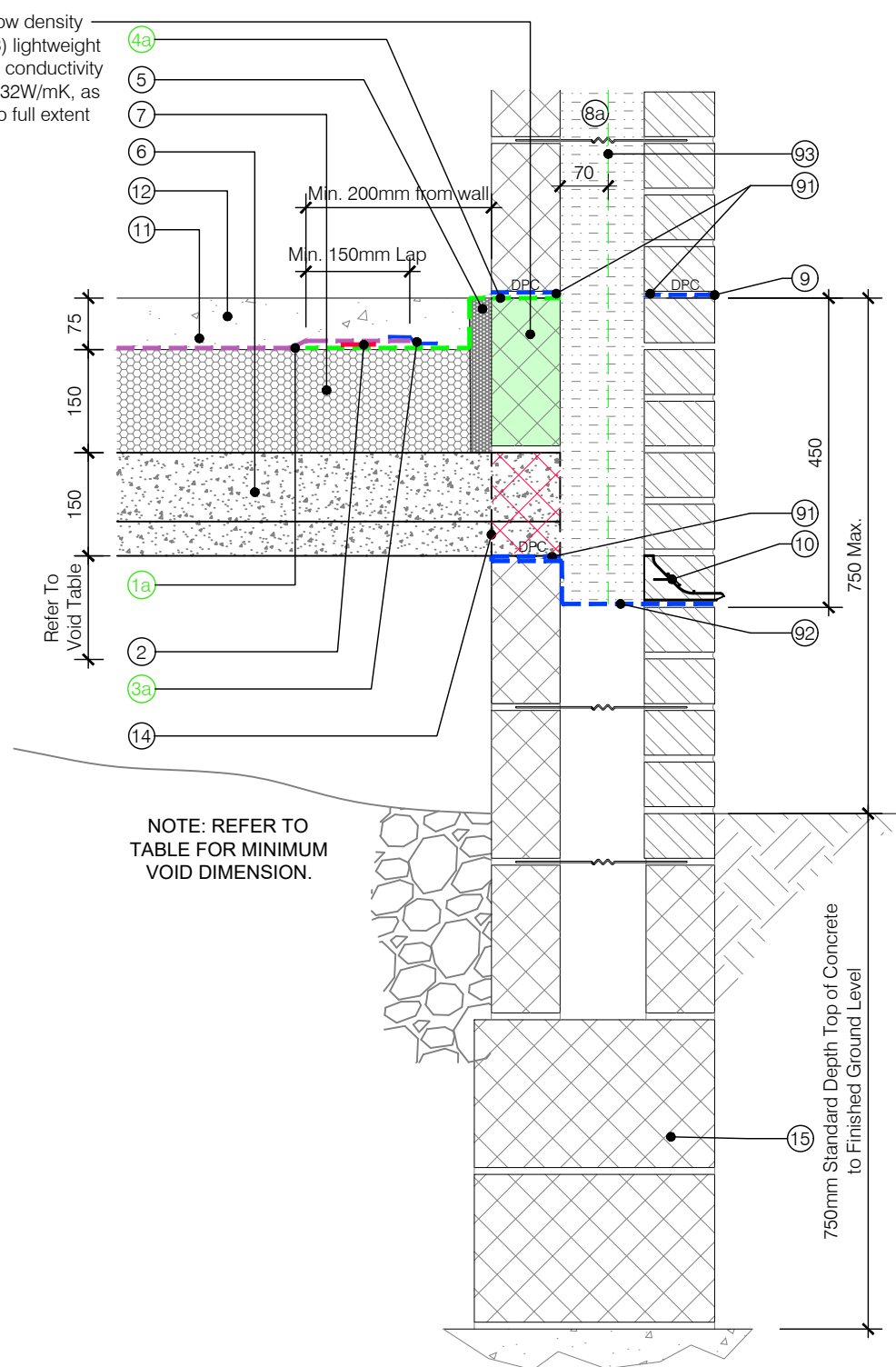
Story House, Lords Way, Kingmoor Business Park, Carlisle, Cumbria. CA6 4SL
Tel 01228 404550 Fax 01228 404551



Perimeter Wall Detail with Underbuild (Raised Solum Level) - WarmFloor Insulated Flooring System (CS1 - Green)

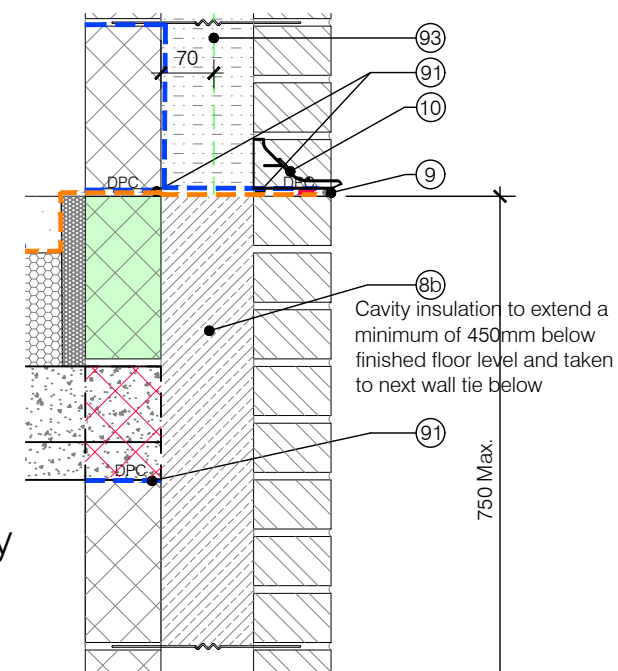
Note
Telescopic underfloor vents are to be positioned as indicated within the house type booklets and are not to be positioned below floor beam end bearings.

Positioning of Weep Vents
Bottom of weep vent to be placed directly on to cavity tray to ensure complete drainage of tray with no possibility for standing water. Ensure weep holes do not become blocked with mortar during installation / pointing.



Perimeter Wall Detail with Underbuild (Reduced Solum Level) - WarmFloor Insulated Flooring System (CS1 - Green)

Part Detail Showing EPS Insulation Below Cavity Tray (CS2/Amber 1/CS3/Amber 2/Radon - See Table)



- 11 Slab reinforcement to be either (dependant on topping):
Structural Concrete
 - One layer of A142 mesh (to BS 4483:2005) with a characteristic yield strength of 500N/mm² set at mid-point to the depth of the concrete topping.
Self Compacting
 (Reinforcement dependant of supplier of self compacting concrete)
Steel Fibres
 - Novomesh B&BA: Dosage rate 17.5kg/m³, steel flat end, steel fibres, 50mm long, 1mm diameter, tensile strength of 1150N/mm².
 - Adfil SF86: Dosage rate 13.33kg/m³, 60mm long, 0.75mm diameter, modulus of elasticity of 20000N/mm², tensile strength of 1225N/mm².
Macro-Polymer
 - Novomesh B&BA: Dosage rate 3.84kg/m³, continuously deformed, 60mm long, 0.56mm diameter, modulus of elasticity of 7000N/mm², tensile strength of 600N/mm².
 - Durus Easy Finish: Dosage rate 3kg/m³, 40mm long, 0.7mm diameter (equivalent), modulus of elasticity of 6000N/mm², tensile strength of 470N/mm².
- 12 75mm Structural concrete topping to be either:
 - Standard - C28/35 with maximum aggregate size 20mm and reinforcement selected from Note 11. Slump should be Class S3 (100 to 150mm) or S4 (for spot samples taken from initial discharge, 140 to 230mm). Aggregate to comply with BS EN12620: 2013.
 - Self Compacting - C28/35 with maximum aggregate size 10mm and reinforcement selected from the options below. Slump flow class should be SF1 (550 to 650mm) or SF2 (660 to 750mm). The sand content should be greater than 45%. Aggregate to comply with BS EN1260:2013.
- 13 Lynx Warmfloor 'Grey' 150mm EPS Starter/ End Block 300mm or 178mm with thermal conductivity equal to 0.031W/mK
- 14 Lynx Lightweight concrete closure block 540mm & 340mm to separating beams when beams are built into wall. Read with beam layout plan.
- 15 2 course of 350wide x 215 deep Trench Blocks, 450mm below Finished Floor Level, 7.3kN/mm² Strength
- 16 Bottom row of wall ties to be at 600mm centres.
- 18 Lynx Precast Warmfloor Wall Clip LWF10 2.95 Galv Spring Wire. Min 2 per EPS Starter/ End block.
- 91 100mm Visqueen Zedex DPC
- 92 IKO Hyload or similar approved Stepped DPC cavity tray.
- 93 70mm PIR partial fill cavity insulation - Developments designated 'Very Severe Exposure' and natural stone elevations only.

- NOTES
- 1a 1200 gauge polythene DPM lapped under Visqueen DPC
 - 1b Visqueen Gas Membrane, see adjacent Gas Membrane Schedule, level of protection specified by site development engineer. Gas Membrane is to be installed by a competent personnel with suitable qualifications in accordance with best practice, and guidance contained within BS8485 2015: A1 2019 - See adjacent Gas Membrane Schedule for level of protection.
 - 2 Visqueen Pro 50mm x 10m double sided jointing tape positioned 50mm approx from membrane edge with min 150mm lap
 - 3a Visqueen Pro single sided tape
 - 3b Visqueen jointing/lap tape - see adjacent Gas Membrane Schedule table for level of protection
 - 4a Visqueen Zedex CPT DPC to BS EN 14909:2012
 - 4b Visqueen Gas Resistant DPC to BS 8485:2015 + A1:2019
 - 5 Lynx Warmfloor 'Grey' EPS Perimeter edge strip with thermal conductivity equal to 0.031W/mK - 30x225x1200mm
 - 6 150mm Pre-stressed Beam
 - 7 Lynx Warmfloor 'Grey' 150mm EPS structural grade topsheet with thermal conductivity equal to 0.031W/mK
 - 8a Cavity full fill / partial fill insulation, refer to site exposure level and site specification
 - 8b 120mm thick 450mm wide EPS insulation sheets (0.034W/mK) below DPC. Cut to fit around telescopic vents
 - 9 VERY SEVERE EXPOSURE COASTAL AREAS ONLY - Seal with Low Modulus Silicone Sealant to ISO 11600-F&G-25LM, colour to match mortar.
 - 10 Manthorpe G951 clear peep weep vents @450 ctrs.

LYNX PRECAST

Details are to be used for Lynx Precast "WarmFloor" Insulated Flooring system only.



TITLE Foundations & Ground Floors A20

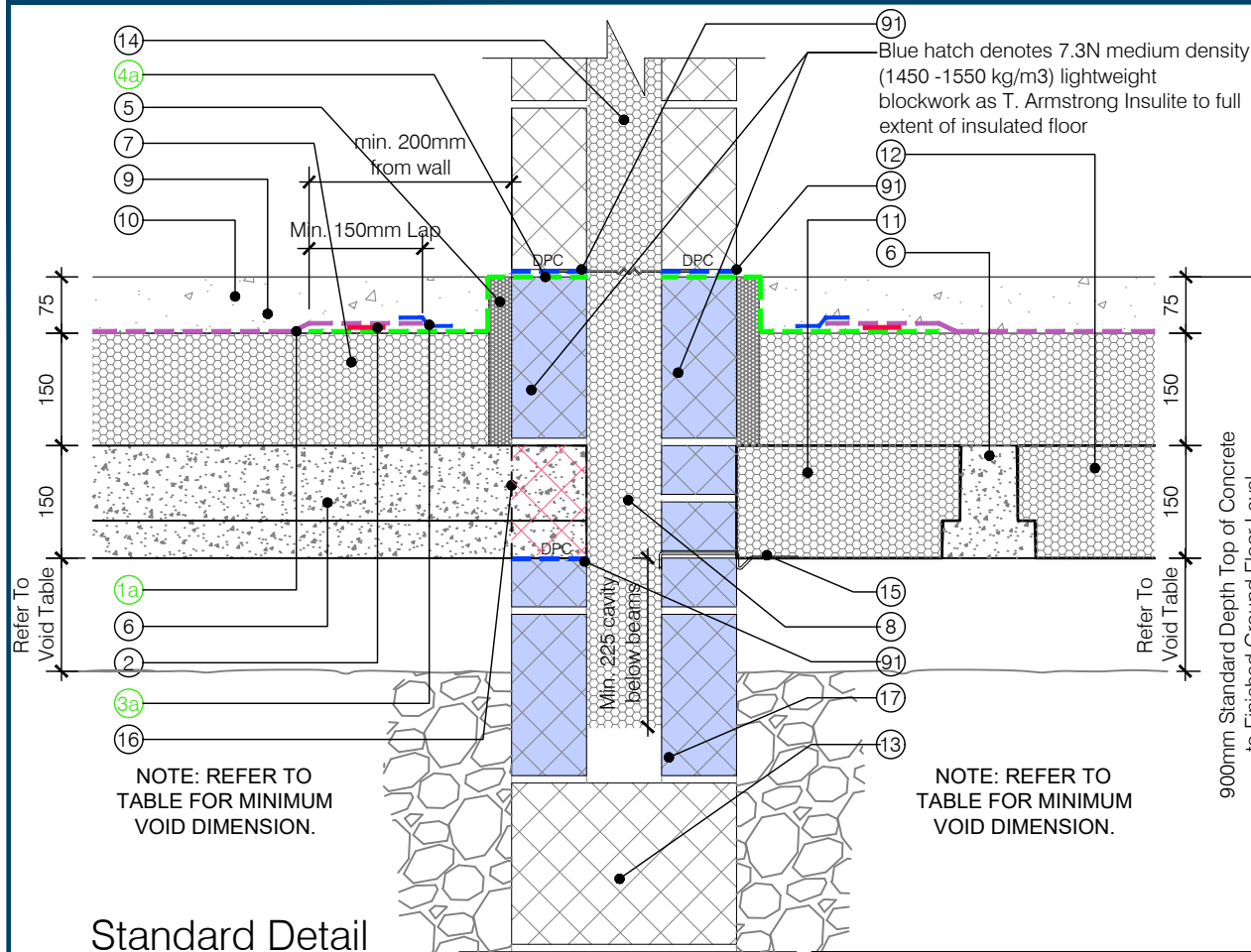
DRAWING Perimeter Wall Details With Underbuild Lynx Warmfloor (Beams spanning onto wall)

DRAWN BY AA DATE 16/09/22

CHECKED BY AH SCALE 1:10

ISSUE (05) DRAWING NUMBER SD010-A-002.2 REVISION B

Revisions	Notes	Date
A	Note added re positioning of weep vents.	27.11.23
B	Line of very severe exposure partial fill insulation indicated - refer to site specification.	07.05.24



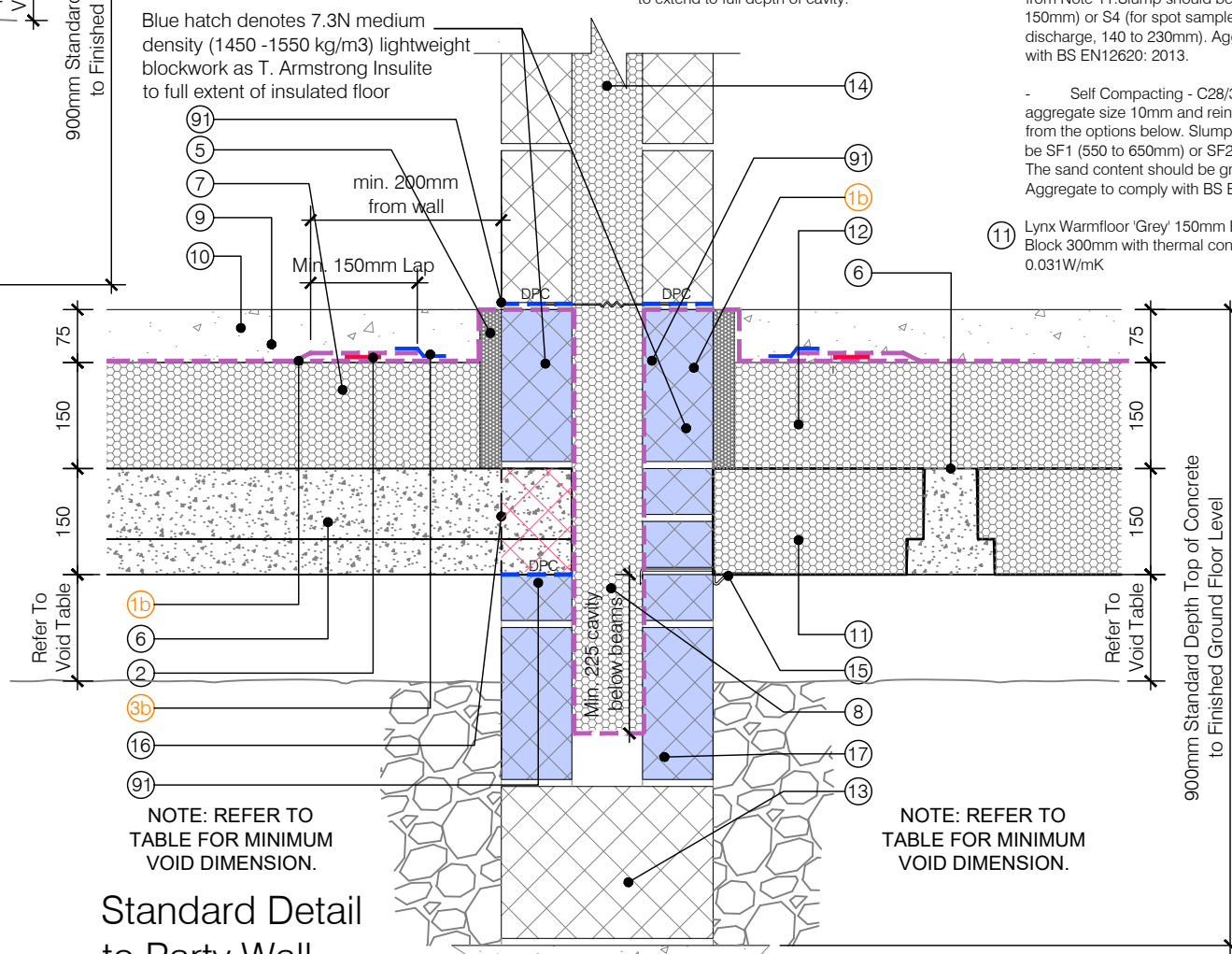
Minimum Void Dimensions Under Suspended Precast Concrete Floors

Voids should be provided to accommodate movement due to heave forces acting on foundations and suspended ground floors as set out in the table below in accordance with NHBC (As indicated in Chapter 5.2.10, Ventilation).

Void Dimension Under Suspended Precast Concrete Floors	
Volume Change Potential in clay sub soils	Min. Void Depth (mm)
None	150
Low (10-20%)	200
Medium (20-40%)	250
High (40-60%)	300

NOTE: Void dimension is measured from the underside of the beam to the ground level and includes 150mm ventilation allowance.

Blue hatch denotes 7.3N medium density (1450 -1550 kg/m³) lightweight blockwork as T. Armstrong Insulite to full extent of insulated floor



- 11 Lynx Warmfloor 'Grey' 150mm EPS Starter/End Block 300mm with thermal conductivity equal to 0.031W/mK
- 12 Lynx Warmfloor 'Grey' 150mm EPS Infill Block 540mm/340mm with thermal conductivity equal to 0.031W/mK
- 13 1 course of 300wide x 215 deep Trench Blocks, 675mm below Finished Floor Level, 7.3kN/mm² Strength
- 14 Refer to SD020-C-001 Party wall Details for wall construction
- 15 Lynx Precast Warmfloor Wall Clip LWF10 2.95 Galv Spring Wire. Min 2 per EPS Starter/End block
- 16 Lynx Lightweight concrete closure block 540mm & 340mm to separating beams when beams are built into wall. Read with beam layout plan.
- 17 2nd course of foundation course - 300mm cavity wall to allow 225mm clear cavity below floor beams.
- 91 100mm Visqueen Zedex DPC.
- 95 Flexible 300mm wide cavity barrier to provide effective edge sealing giving min ½ hr. fire resistance, suitable for 125mm cavity - fire barrier to extend to full depth of cavity.

- 9 Slab reinforcement to be either (dependant on topping):
 - Structural Concrete
 - One layer of A142 mesh (to BS 4483:2005) with a characteristic yield strength of 500N/mm² set at mid-point to the depth of the concrete topping.
 - Self Compacting (Reinforcement dependant of supplier of self compacting concrete)
 - Steel Fibres
 - Novomesh B&BA: Dosage rate 17.5kg/m³, steel flat end, steel fibres, 50mm long, 1mm diameter, tensile strength of 1150N/mm².
 - Adfil SF86: Dosage rate 13.33kg/m³, 60mm long, 0.75mm diameter, modulus of elasticity of 200000N/mm², tensile strength of 1225N/mm².
 - Macro-Polymer
 - Novomesh B&BA: Dosage rate 3.84kg/m³, continuously deformed, 60mm long, 0.56mm diameter, modulus of elasticity of 7000N/mm², tensile strength of 600N/mm².
 - Durus Easy Finish: Dosage rate 3kg/m³, 40mm long, 0.7mm diameter (equivalent), modulus of elasticity of 6000N/mm², tensile strength of 470N/mm².
- 10 75mm Structural concrete topping to be either:
 - Standard - C28/35 with maximum aggregate size 20mm and reinforcement selected from Note 11. Slump should be Class S3 (100 to 150mm) or S4 (for spot samples taken from initial discharge, 140 to 230mm). Aggregate to comply with BS EN12620: 2013.
 - Self Compacting - C28/35 with maximum aggregate size 10mm and reinforcement selected from the options below. Slump flow class should be SF1 (550 to 650mm) or SF2 (660 to 750mm). The sand content should be greater than 45%. Aggregate to comply with BS EN1260:2013.
- 11 Lynx Warmfloor 'Grey' 150mm EPS Starter/End Block 300mm with thermal conductivity equal to 0.031W/mK

NOTES

- 1a 1200 gauge polythene DPM lapped under Visqueen DPC
- 1b Visqueen Gas Membrane, see adjacent Gas Membrane Schedule, level of protection specified by site development engineer. Gas Membrane is to be installed by a competent personnel with suitable qualifications in accordance with best practice, and guidance contained within BS8485 2015: A1 2019 - See adjacent Gas Membrane Schedule for level of protection.
- 2 Visqueen Pro 50mm x 10m double sided jointing tape positioned 50mm approx from membrane edge with min 150mm lap
- 3a Visqueen Pro single sided tape
- 3b Visqueen jointing/lap tape - see adjacent Gas Membrane Schedule table for level of protection
- 4a Visqueen Zedex CPT DPC to BS EN 14909:2012
- 4b Visqueen Gas Resistant DPC to BS 8485:2015 + A1:2019
- 5 Lynx Warmfloor 'Grey' EPS Perimeter edge strip with thermal conductivity equal to 0.031W/mK - 30x225x1200mm
- 6 150mm Pre-stressed Beam - Beam layout indicative, refer to house type drawing.
- 7 Lynx Warmfloor 'Grey' 150mm EPS structural grade top sheet with thermal conductivity equal to 0.031W/mK
- 8 Refer to site specification for party wall cavity fill

Note: Flexible 300mm wide cavity barrier required to to full depth of perimeter wall cavity at junction with external wall - barrier to provide effective edge sealing giving min ½ hr. fire resistance, suitable for 125mm cavity. Where plots are complete with ground gas protection measures, cavity barrier is to abutt tightly to underside of gas protection membrane. Refer to SD010-A-003 for typical detail.

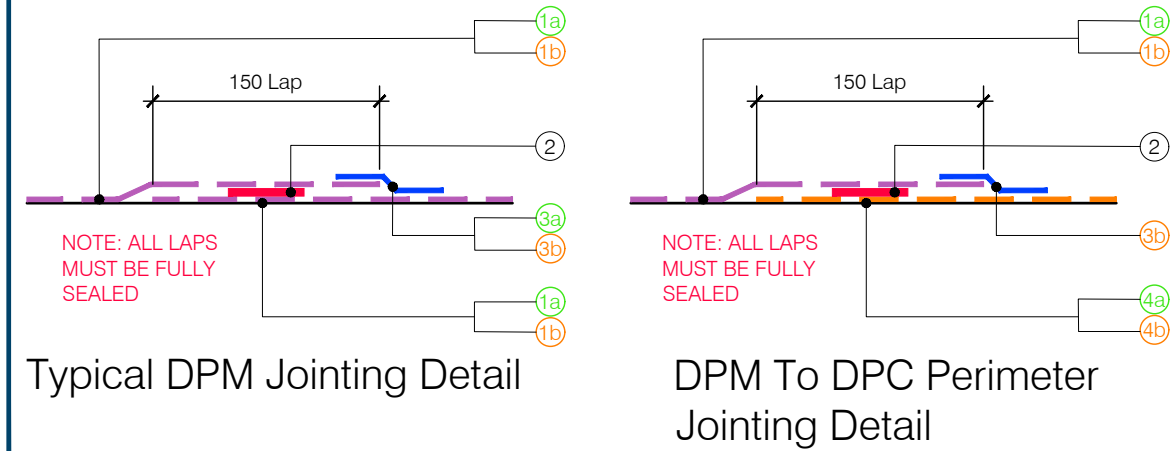


Details are to be used for Lynx Precast "WarmFloor" Insulated Flooring system only.

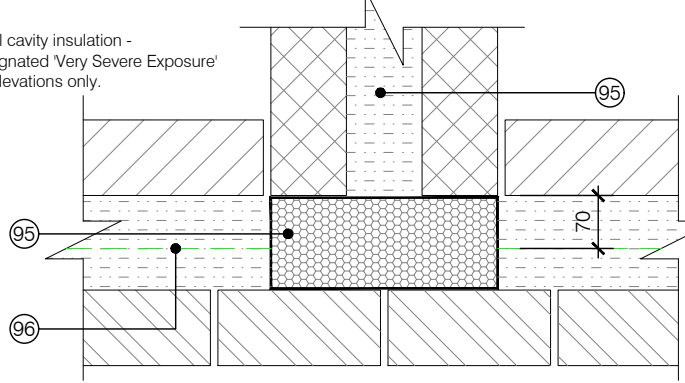


Foundations & Ground Floors A20

DRAWING		
Party Wall Details Lynx Warmfloor		
DRAWN BY	AA	DATE 16/09/22
CHECKED BY	AH	SCALE 1:10
ISSUE	DRAWING NUMBER	REVISION
(05)	SD010-A-003	B
Revisions	Notes	Date
A	Thermal conductivity of floor and perimeter edge insulation specified.	10.08.23
B	Detail and note added for cavity fire barrier at junction with perimeter wall - fire barrier to extend full height of cavity below DPC. Line of very severe exposure partial fill insulation indicated - refer to site specification.	07.05.24



- 96 70mm PIR partial fill cavity insulation - Developments designated 'Very Severe Exposure' and natural stone elevations only.



Note: Cavity barrier, 95, is to extend to full depth of cavity below perimeter DPC level. Where plots are complete with ground gas protection measures, cavity barrier is to abutt tightly to underside of gas protection membrane.



The image contains two side-by-side diagrams illustrating the correct and incorrect methods for sealing a 150 Lap joint. Both diagrams show a horizontal line representing a joint with a 150 Lap distance marked. The left diagram shows a correct seal with a continuous purple sealant line. The right diagram shows an incorrect seal with a gap in the sealant line. Both diagrams include a 'NOTE: ALL LAPS MUST BE FULLY SEALED'.

Left Diagram (Correct Seal): Shows a 150 Lap joint with a continuous purple sealant line. The sealant is applied in a continuous line, ensuring full coverage of the joint. The diagram is labeled with 1a, 1b, 2, 3a, 3b, 1a, and 1b.

Right Diagram (Incorrect Seal): Shows a 150 Lap joint with a gap in the sealant line. The sealant is applied in two separate segments, leaving a gap between them. The diagram is labeled with 1a, 1b, 2, 3b, 4a, and 4b.

NOTE: ALL LAPS MUST BE FULLY SEALED

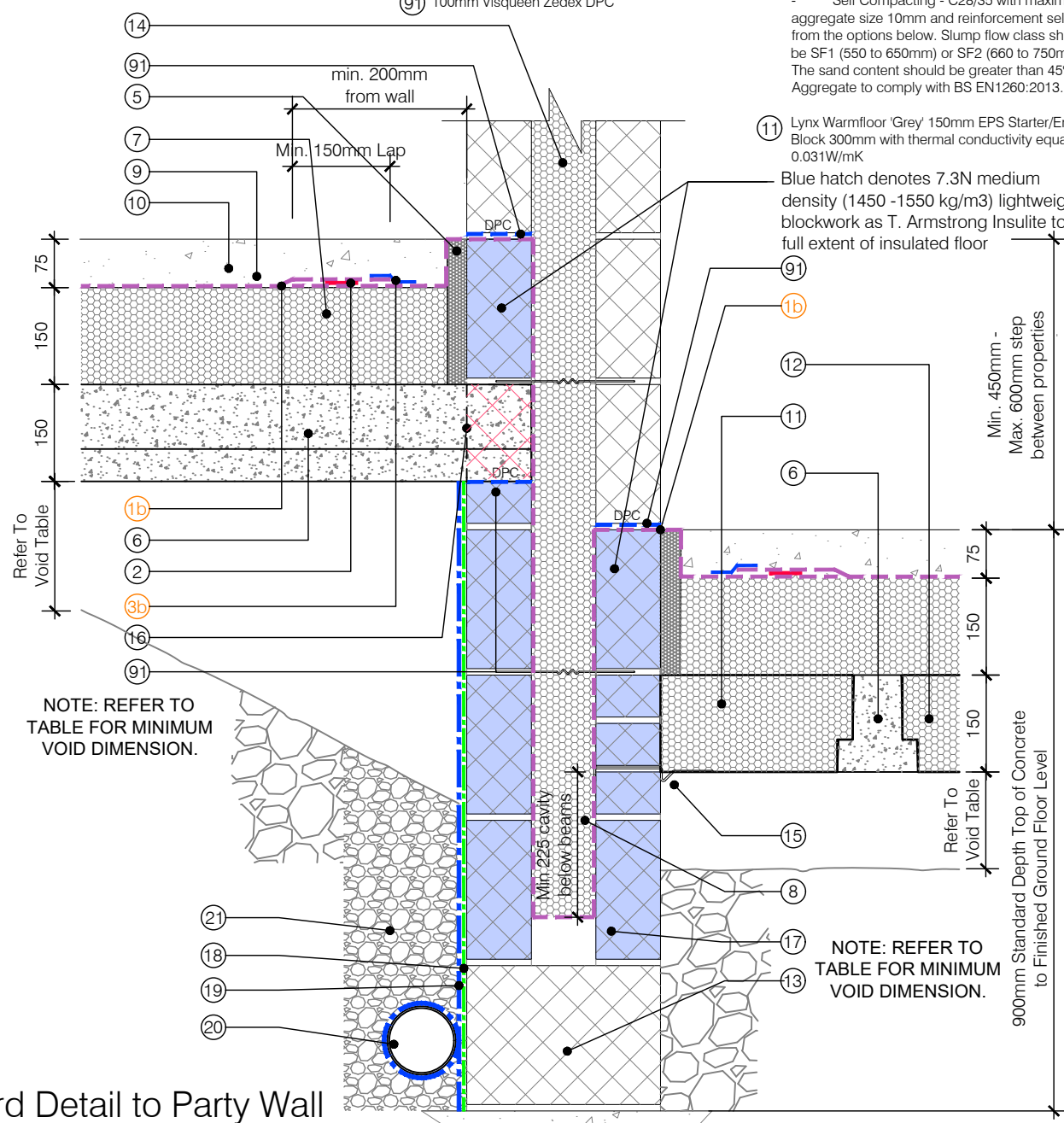
Typical DPM Jointing Detail

DPM To DPC Perimeter Jointing Detail

Voids should be provided to accommodate movement due to heave forces acting on foundations and suspended ground floors as set out in the table below in accordance with NHBC (As indicated in Chapter 5.2.10, Ventilation).

NOTE: Void dimension is measured from the underside of the beam to the ground level and includes 150mm ventilation allowance.

- ⑫ Lynx Warmfloor 'Grey' 150mm EPS Infill Block 540mm/340mm with thermal conductivity equal to 0.031W/mK
 - ⑬ 1 course of 300wide x 215 deep Trench Blocks, 675mm below Finished Floor Level, 7.3kN/mm2 Strength
 - ⑭ Refer to SD020-C-001 Party wall Details for wall construction
 - ⑮ Lynx Precast Warmfloor Wall Clip LWF10 2.95 Gaiv Spring Wire. Min 2 per EPS Starter/End block
 - ⑯ Lynx Lightweight concrete closure block 540mm & 340mm to separating beams when beams are built into wall. Read with beam layout plan.
 - ⑰ 2nd course of foundation course - 300mm cavity wall to allow 225mm clear cavity below floor beams.
 - ⑱ Visqueen Liquid Gas Membrane (2 coats) on Visqueen Liquid Gas Membrane primer, applied as required by manufacturer
 - ⑲ Visqueen 12mm Protect & Drain taken a min. 450mm below base of lower floor beams, and wrapped around land drain.
 - ⑳ 100mm Ø rigid land drain to be maintainable by means of rodding access to head.
 - ㉑ Free draining rounded gravel back fill against Visqueen tanking and around land drain
 - ㉒ 100mm Visqueen Zedex DPC
 - ⑩ Slab reinforcement to be either (dependent on topping):
Structural Concrete
 - One layer of A142 mesh (to BS 4483:2005) with a characteristic yield strength of 500N/mm² set at mid-point to the depth of the concrete topping.
Self Compacting
(Reinforcement dependant of supplier of self compacting concrete)
Steel Fibres
 - Novomesh B&BA: Dosage rate 17.5kg/m³, steel flat end, steel fibres, 50mm long, 1mm diameter, tensile strength of 1150N/mm².
 - Adfil SF86: Dosage rate 13.33kg/m³, 60mm long, 0.75mm diameter, modulus of elasticity of 200000N/mm², tensile strength of 1225N/mm².
Macro-Polymer
 - Novomesh B&BA: Dosage rate 3.84kg/m³, continuously deformed, 60mm long, 0.56mm diameter, modulus of elasticity of 7000N/mm², tensile strength of 600N/mm².
 - Durus Easy Finish: Dosage rate 3kg/m³, 40mm long, 0.7mm diameter (equivalent), modulus of elasticity of 6000N/mm², tensile strength of 470N/mm².
 - ⑩ 75mm Structural concrete topping to be either:
 - Standard - C28/35 with maximum aggregate size 20mm and reinforcement selected from Note 11. Slump should be Class S3 (100 to 150mm) or S4 (for spot samples taken from initial discharge, 140 to 230mm). Aggregate to comply with BS EN12620: 2013.
 - Self Compacting - C28/35 with maximum aggregate size 10mm and reinforcement selected from the options below. Slump flow class should be SF1 (550 to 650mm) or SF2 (660 to 750mm). The sand content should be greater than 45%. Aggregate to comply with BS EN1260:2013.



Standard Detail to Party Wall
(CS2/Amber 1/CS3/Amber 2/Radon - See Table)

- NOTES
- 1a) 1200 gauge polythene DPM lapped under Visqueen DPC
 - 1b) Visqueen Gas Membrane, see adjacent Gas Membrane Schedule, level of protection specified by site development engineer. Gas Membrane is to be installed by a competent person with suitable qualifications in accordance with best practice, and guidance contained within BS8485 2015: A1 2019 - See adjacent Gas Membrane Schedule for level of protection.
 - 2) Visqueen Pro 50mm x 10m double sided jointing tape positioned 50mm approx from membrane edge with min 150mm lap
 - 3a) Visqueen Pro single sided tape
 - 3b) Visqueen jointing/lap tape - see adjacent Gas Membrane Schedule table for level of protection
 - 4a) Visqueen Zedex CPT DPC to BS EN 14909:2012
 - 4b) Visqueen Gas Resistant DPC to BS 8485:2015 + A1:2019
 - 5) Lynx Warmfloor 'Grey' EPS Perimeter edge strip with thermal conductivity equal to 0.031W/mK - 30x225x1200mm
 - 6) 150mm Pre-stressed Beam - Beam layout indicative, refer to house type drawing.
 - 7) Lynx Warmfloor 'Grey' 150mm EPS structural grade top sheet with thermal conductivity equal to 0.031W/mK
 - 8) Refer to site specification for party wall cavity fill

Note:
Flexible 300mm wide cavity barrier required to to full depth of perimeter wall cavity at junction with external wall - barrier to provide effective edge sealing giving min $\frac{1}{2}$ hr. fire resistance, suitable for 125mm cavity.
Where plots are complete with ground gas protection measures, cavity barrier is to abutt tightly to underside of gas protection membrane.
Refer to **SD010-A-003** for typical detail.



Details are to be used for Lynx Precast
"WarmFloor" Insulated Flooring system only.



TITLE Foundations &
Ground Floors A20

DRAWING

Stepped Party Wall Details

Lynx Warmfloor

DRAWN BY	AA	DATE	16/09/22
CHECKED BY	AH	SCALE	1:10

ISSUE	DRAWING NUMBER	REVISION
(05)	SD010-A-004	B

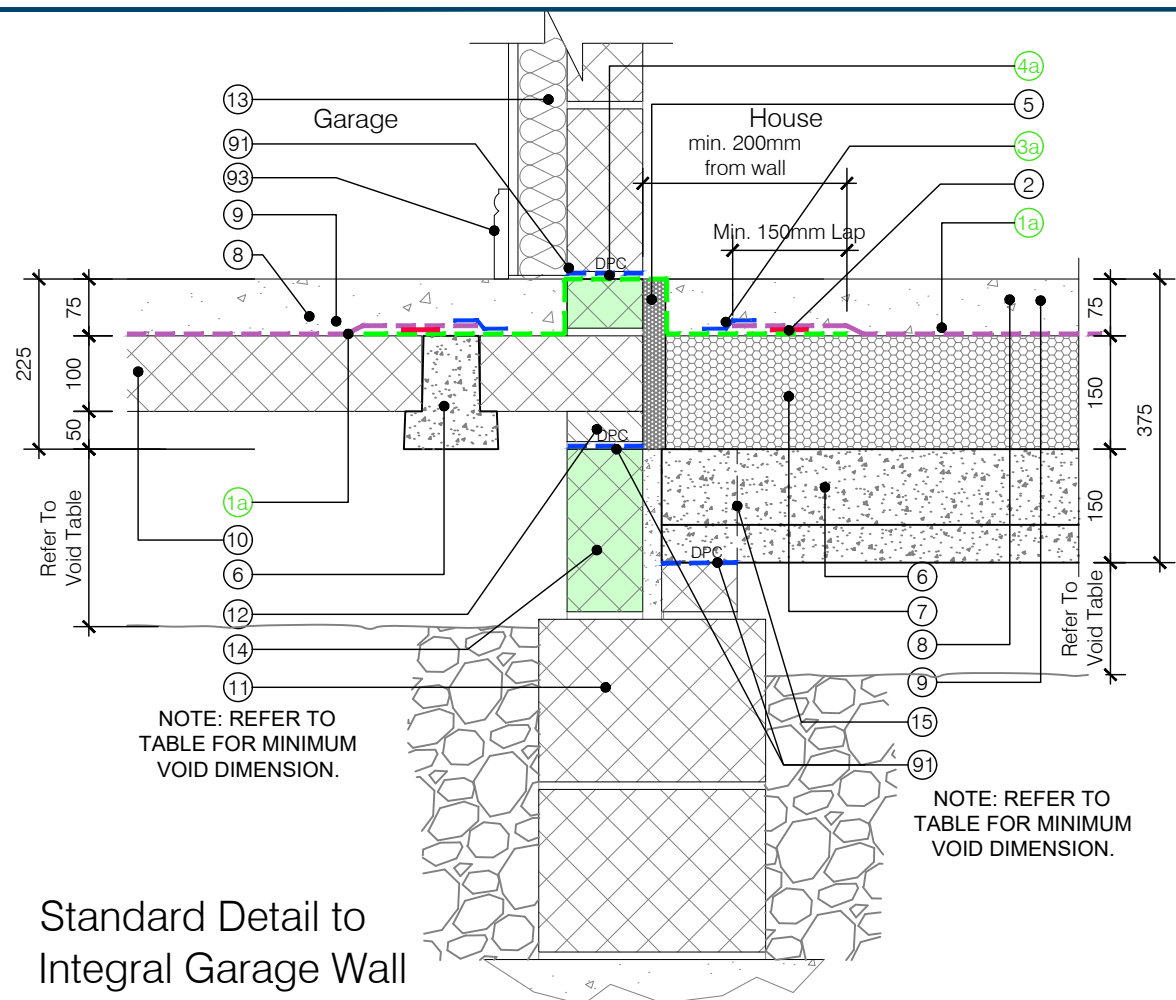
Revisions	Notes	Date
A	Thermal conductivity of floor and perimeter edge insulation specified.	10.08.23
B	Note added re fire barrier to perimeter cavity at junction with party wall - fire barrier to extend full height of cavity below DPC.	07.05.24

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Tel 01228 404550

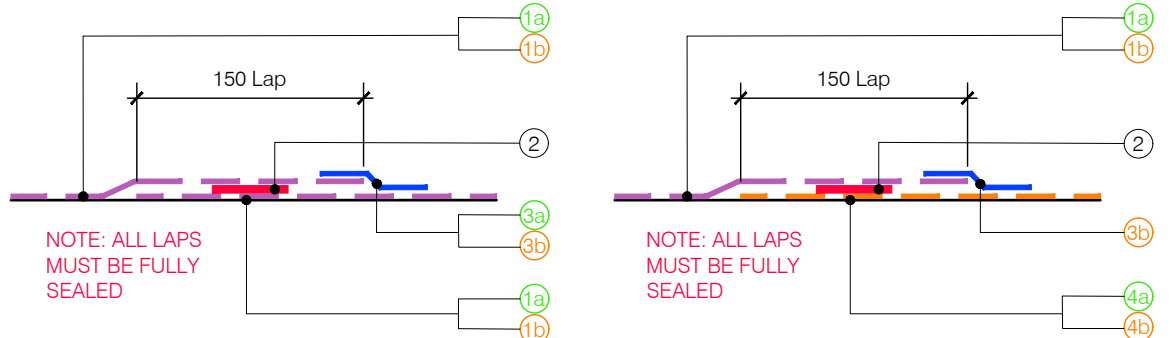
Fax 01228 404551



Standard Detail to
Integral Garage Wall
(CS1 - Green)

Floor Membrane Schedule			
NHBC Rating	Membrane	Jointing	Designation
CS2/Amber 1	Visqueen Low Permeability Gas Membrane (yellow) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015+A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Gas Resistant foil lap tape 75mmx50m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
CS3/Amber 2	Visqueen Gas Barrier (blue) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015 + A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Gas Resistant foil lap tape 75mmx50m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
Basic/Full Radon	Visqueen R400 Gas Membrane (red) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015 + A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Pro single sided tape 75mmx25m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations

REFER TO SITE SPECIFIC SITE ENGINEERS REPORTS FOR SPECIFIC PLOT GAS MEMBRANE/RADON REQUIREMENTS
TYPICAL DETAILS ARE BASED ON VISQUEEN REQUIREMENTS AT TIME OF DRAUGHTING - ARRANGEMENT TO BE IN FULL ACCORDANCE WITH MANUFACTURERS DETAILS AT TIME OF INSTALLATION
ALTERNATIVE MANUFACTURERS MAY BE USED SEE REGIONAL TECHNICAL TEAM FOR APPROVAL



Typical DPM Jointing Detail

DPM To DPC Perimeter
Jointing Detail

Minimum Void Dimensions Under Suspended Precast Concrete Floors

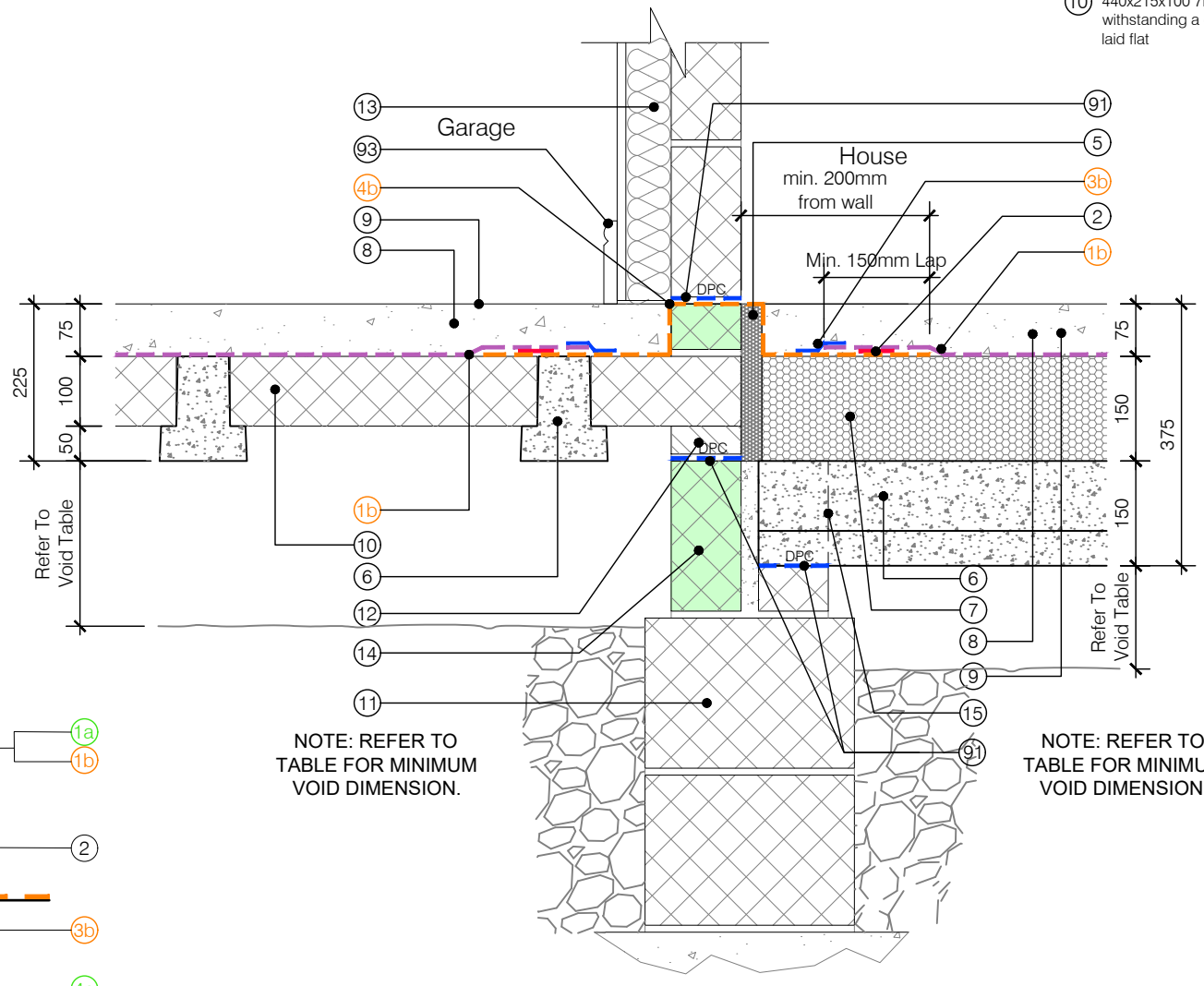
VOIDS should be provided to accommodate movement due to heave forces acting on foundations and suspended ground floors as set out in the table below in accordance with NHBC (As indicated in Chapter 5.2.10, Ventilation).

Volume Change Potential in clay sub soils	Min. Void Depth (mm)
None	150
Low (10-20%)	200
Medium (20-40%)	250
High (40-60%)	300

NOTE: Void dimension is measured from the underside of the beam to the ground level and includes 150mm ventilation allowance.

Note: Where house types are detailed to have Garage floor laid to falls, refer to Standard detail SD110-A-006.

- 11 2 course of 300wide x 215 deep Trench Blocks, 450mm below Finished Floor Level, 7.3kN/mm2 Strength
- 12 40 x 100mm slip brick, supplied by Lynx Warmfloor
- 13 63mm Thermaline insulated plasterboard dot and dabbed to blockwork
- 14 Green hatch denotes low density 7.3N (950 -1050 kg/m3) lightweight blockwork with thermal conductivity equal to or less than 0.32W/mk, to Semi Exposed internal wall between Garage and House Living Spaces as T. Armstrong Ultralite to full extent of insulated floor
- 15 Lightweight concrete closure block 540mm & 340mm to separating beams when beams are built into wall. Read with beam layout plan.
- 91 100mm Visqueen Zedex DPC
- 93 MDF skirting to full perimeter of integral Garage
- 8 Slab reinforcement to be either (dependant on topping):
Structural Concrete
- One layer of A142 mesh (to BS 4483:2005) with a characteristic yield strength of 500N/mm2 set at mid-point to the depth of the concrete topping.
Self Compacting
(Reinforcement dependant of supplier of self compacting concrete)
Steel Fibres
- Novomesh B&BA: Dosage rate 17.5kg/m3, steel flat end, steel fibres, 50mm long, 1mm diameter, tensile strength of 1150N/mm2.
- Adfil SF86: Dosage rate 13.33kg/m3, 60mm long, 0.75mm diameter, modulus of elasticity of 200000N/mm2, tensile strength of 1225N/mm2.
Macro-Polymer
- Novomesh B&BA: Dosage rate 3.84kg/m3, continuously deformed, 60mm long, 0.56mm diameter, modulus of elasticity of 7000N/mm2, tensile strength of 600N/mm2.
- Durus Easy Finish: Dosage rate 3kg/m3, 40mm long, 0.7mm diameter (equivalent), modulus of elasticity of 6000N/mm2, tensile strength of 470N/mm2.
- 9 75mm Structural concrete topping to be either:
- Standard - C28/35 with maximum aggregate size 20mm and reinforcement selected from Note 11. Slump should be Class S3 (100 to 150mm) or S4 (for spot samples taken from initial discharge, 140 to 230mm). Aggregate to comply with BS EN12620: 2013.
- Self Compacting - C28/35 with maximum aggregate size 10mm and reinforcement selected from the options below. Slump flow class should be SF1 (550 to 650mm) or SF2 (660 to 750mm). The sand content should be greater than 45%. Aggregate to comply with BS EN1260:2013.
- 10 440x215x100 7N/mm2 infill blocks capable of withstanding a central point load of 3.5KN when laid flat



NOTE: REFER TO
TABLE FOR MINIMUM
VOID DIMENSION.

NOTE: REFER TO
TABLE FOR MINIMUM
VOID DIMENSION.

Standard Detail to Integral Garage Wall
(CS2/Amber 1/CS3/Amber 2/Radon - See Table)

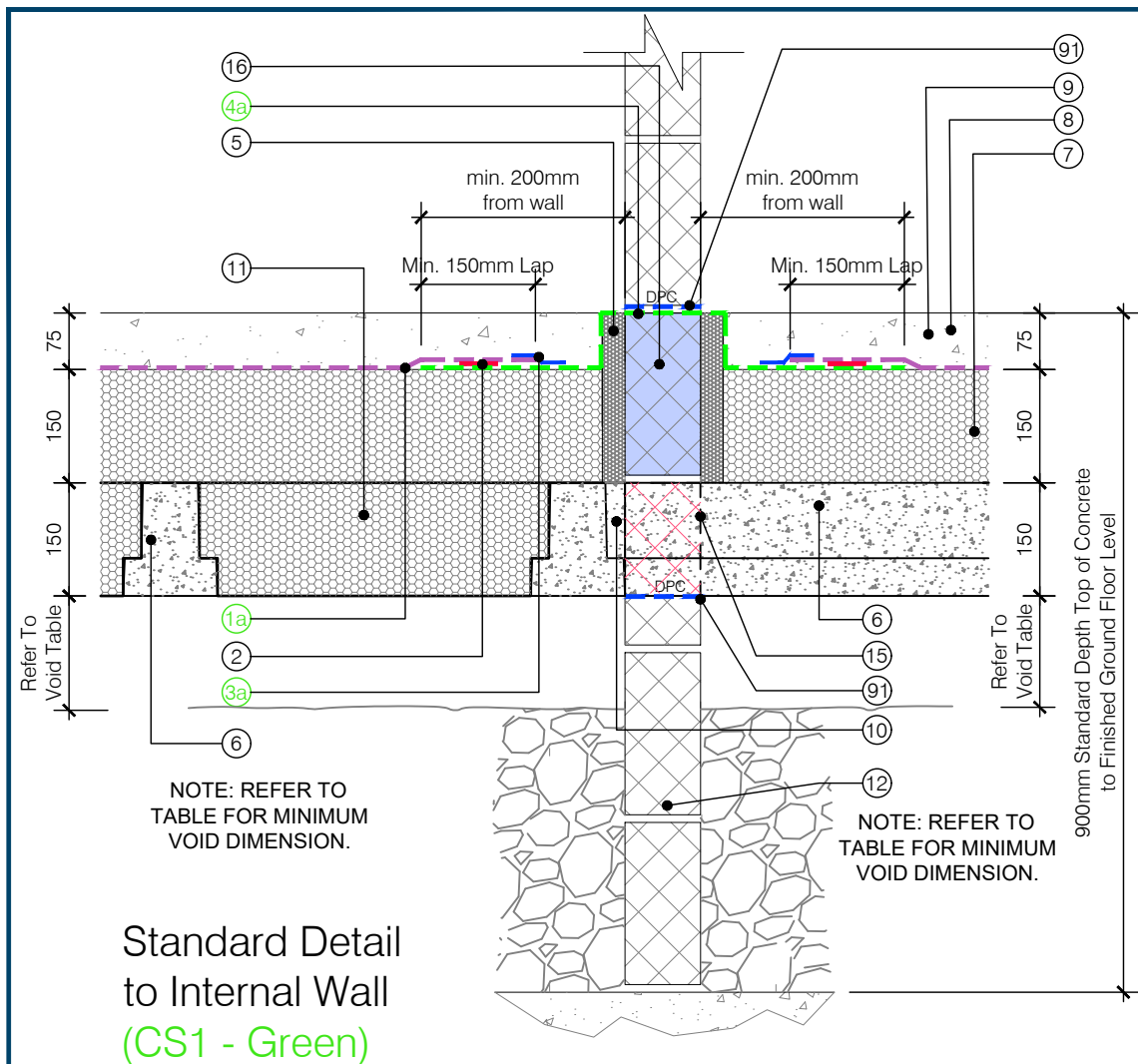
- NOTES
- 1a 1200 gauge polythene DPM lapped under Visqueen DPC
 - 1b Visqueen Gas Membrane, see adjacent Gas Membrane Schedule, level of protection specified by site development engineer. Gas Membrane is to be installed by a competent personnel with suitable qualifications in accordance with best practice, and guidance contained within BS8485:2015: A1 2019 - See adjacent Gas Membrane Schedule for level of protection.
 - 2 Visqueen Pro 50mm x 10m double sided jointing tape positioned 50mm approx from membrane edge with min 150mm lap
 - 3a Visqueen Pro single sided tape
 - 3b Visqueen jointing/lap tape - see adjacent Gas Membrane Schedule table for level of protection
 - 4a Visqueen Zedex CPT DPC to BS EN 14909:2012
 - 4b Visqueen Gas Resistant DPC to BS 8485:2015 + A1:2019
 - 5 Lynx Warmfloor 'Grey' EPS Perimeter edge strip with thermal conductivity equal to 0.031W/mK - 30x225x1200mm
 - 6 150mm Pre-stressed Beam - Beam layout indicative, refer to house type drawing.
 - 7 Lynx Warmfloor 'Grey' 150mm EPS structural grade top sheet with thermal conductivity equal to 0.031W/mK



Details are to be used for Lynx Precast "WarmFloor" Insulated Flooring system only.

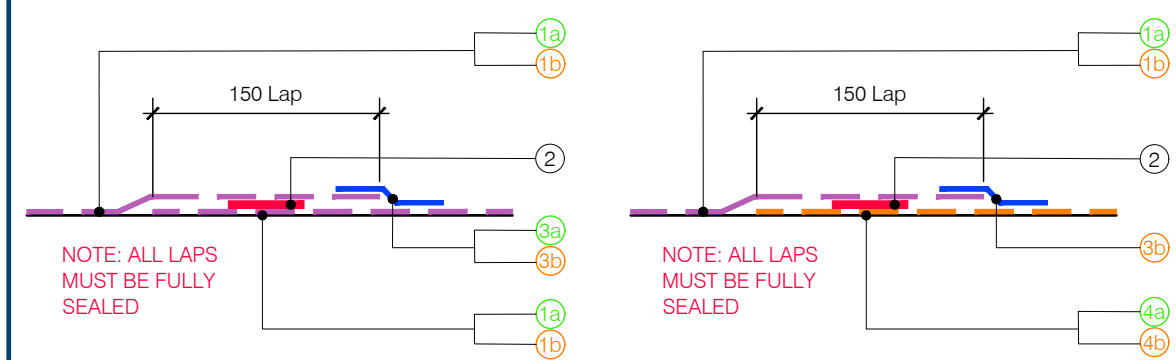


TITLE Foundations & Ground Floors A20		
DRAWING Semi Exposed Wall - Integral Garage - Twin Leaf Sub Wall Lynx Warmfloor		
DRAWN BY AA	DATE 16/09/22	
CHECKED BY AH	SCALE 1:10	
ISSUE (05)	DRAWING NUMBER SD010-A-005.1	REVISION B
Revisions	Notes	Date
A	Green hatch Ultralite blockwork below DPC to full extent of insulated floor amended to 7.3N. Thermal conductivity of perimeter edge insulation specified.	10.08.23
B	Note added regarding garage floors laid to falls.	07.05.24



Floor Membrane Schedule			
NHBC Rating	Membrane	Jointing	Designation
CS2/Amber 1	Visqueen Low Permeability Gas Membrane (yellow) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015+A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Gas Resistant foil lap tape 75mmx50m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
CS3/Amber 2	Visqueen Gas Barrier (blue) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015 + A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Gas Resistant foil lap tape 75mmx50m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
Basic/Full Radon	Visqueen R400 Gas Membrane (red) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015 + A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Pro single sided tape 75mmx25m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations

REFER TO SITE SPECIFIC SITE ENGINEERS REPORTS FOR SPECIFIC PLOT GAS MEMBRANE/RADON REQUIREMENTS
TYPICAL DETAILS ARE BASED ON VISQUEEN REQUIREMENTS AT TIME OF DRAUGHTING - ARRANGEMENT TO BE IN FULL ACCORDANCE WITH MANUFACTURERS DETAILS AT TIME OF INSTALLATION
ALTERNATIVE MANUFACTURERS MAY BE USED SEE REGIONAL TECHNICAL TEAM FOR APPROVAL



Typical DPM Jointing Detail

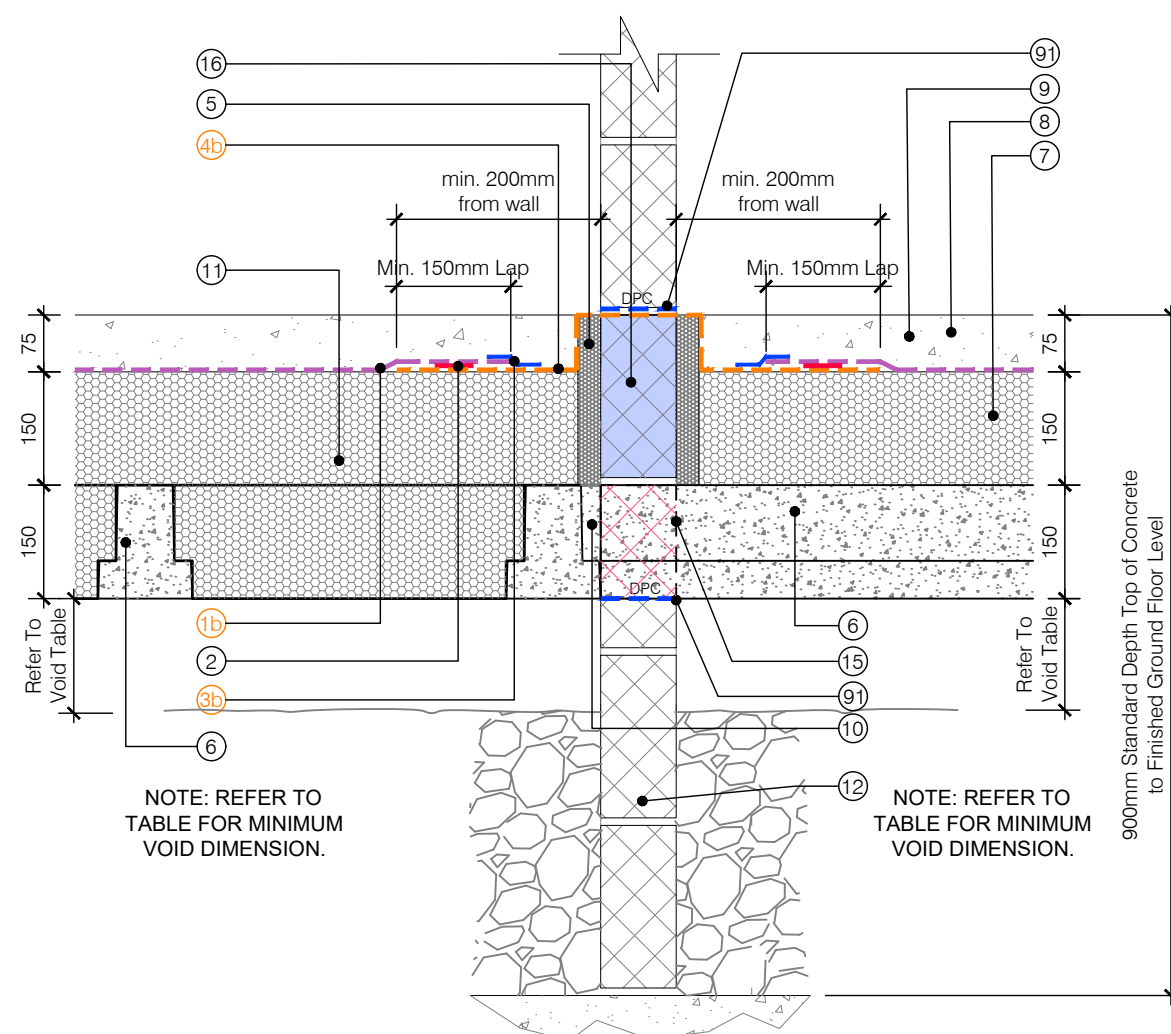
DPM To DPC Perimeter Jointing Detail

Minimum Void Dimensions Under Suspended Precast Concrete Floors

Voids should be provided to accommodate movement due to heave forces acting on foundations and suspended ground floors as set out in the table below in accordance with NHBC (As indicated in Chapter 5.2.10, Ventilation).

Void Dimension Under Suspended Precast Concrete Floors	
Volume Change Potential in clay sub soils	Min. Void Depth (mm)
None	150
Low (10-20%)	200
Medium (20-40%)	250
High (40-60%)	300

NOTE: Void dimension is measured from the underside of the beam to the ground level and includes 150mm ventilation allowance.



Standard Detail to Internal Wall

(CS2/Amber 1/CS3/Amber 2/Radon - See Table)

- ⑩ Weak mix concrete to void
- ⑪ Lynx Warmfloor 'Grey' 150mm EPS Infill Block 540mm/340mm with thermal conductivity equal to 0.031W/mK
- ⑫ 2 course of 100wide x 215 deep 7N/mm² light weight blocks, 450mm below Finished Floor Level,
- ⑬ Lynx Precast Warmfloor Wall Clip LWF10 2.95 Galv Spring Wire. Min 2 per EPS Starter/End block.
- ⑭ Ensure DPC upstand is a min. width of 525mm to avoid sagging within cavity and is tight to face of block as indicated.
- ⑮ Lynx Lightweight concrete closure or end block 540mm & 340mm to separating beams when beams are built into wall. Read with beam layout plan.
- ⑯ Blue hatch denotes 7.3N medium density (1450 - 1550 kg/m³) lightweight blockwork as T. Armstrong Insulte to full extent of insulated floor
- ⑨1 100mm Visqueen Zedex DPC
- ⑧ Slab reinforcement to be either (dependant on topping):
Structural Concrete
- One layer of A142 mesh (to BS 4483:2005) with a characteristic yield strength of 500N/mm² set at mid-point to the depth of the concrete topping.
Self Compacting
(Reinforcement dependant of supplier of self compacting concrete)
Steel Fibres
- Novomesh B&BA: Dosage rate 17.5kg/m³, steel flat end, steel fibres, 50mm long, 1mm diameter, tensile strength of 1150N/mm².
- Adfil SF86: Dosage rate 13.33kg/m³, 60mm long, 0.75mm diameter, modulus of elasticity of 200000N/mm², tensile strength of 1225N/mm².
Macro-Polymer
- Novomesh B&BA: Dosage rate 3.84kg/m³, continuously deformed, 60mm long, 0.56mm diameter, modulus of elasticity of 7000N/mm², tensile strength of 600N/mm².
- Durus Easy Finish: Dosage rate 3kg/m³, 40mm long, 0.7mm diameter (equivalent), modulus of elasticity of 6000N/mm², tensile strength of 470N/mm².
⑨ 75mm Structural concrete topping to be either:
- Standard - C28/35 with maximum aggregate size 20mm and reinforcement selected from Note 11. Slump should be Class S3 (100 to 150mm) or S4 (for spot samples taken from initial discharge, 140 to 230mm). Aggregate to comply with BS EN12620: 2013.
- Self Compacting - C28/35 with maximum aggregate size 10mm and reinforcement selected from the options below. Slump flow class should be SF1 (550 to 650mm) or SF2 (660 to 750mm). The sand content should be greater than 45%. Aggregate to comply with BS EN1260:2013.

NOTES

- ①a 1200 gauge polythene DPM lapped under Visqueen DPC
- ①b Visqueen Gas Membrane, see adjacent Gas Membrane Schedule, level of protection specified by site development engineer. Gas Membrane is to be installed by a competent personnel with suitable qualifications in accordance with best practice, and guidance contained within BS8485 2015: A1 2019 - See adjacent Gas Membrane Schedule for level of protection.
- ② Visqueen Pro 50mm x 10m double sided jointing tape positioned 50mm approx from membrane edge with min 150mm lap
- ③a Visqueen Pro single sided tape
- ③b Visqueen jointing/lap tape - see adjacent Gas Membrane Schedule table for level of protection
- ④a Visqueen Zedex CPT DPC to BS EN 14909:2012
- ④b Visqueen Gas Resistant DPC to BS 8485:2015 + A1:2019
- ⑤ Lynx Warmfloor 'Grey' EPS Perimeter edge strip with thermal conductivity equal to 0.031W/mK - 30x225x1200mm
- ⑥ 150mm Pre-stressed Beam - Beam layout indicative, refer to house type drawing.
- ⑦ Lynx Warmfloor 'Grey' 150mm EPS structural grade top sheet with thermal conductivity equal to 0.031W/mK



Details are to be used for Lynx Precast "WarmFloor" Insulated Flooring system only.



Foundations & Ground Floors A20

DRAWING
Internal Load bearing Wall
Lynx Warmfloor

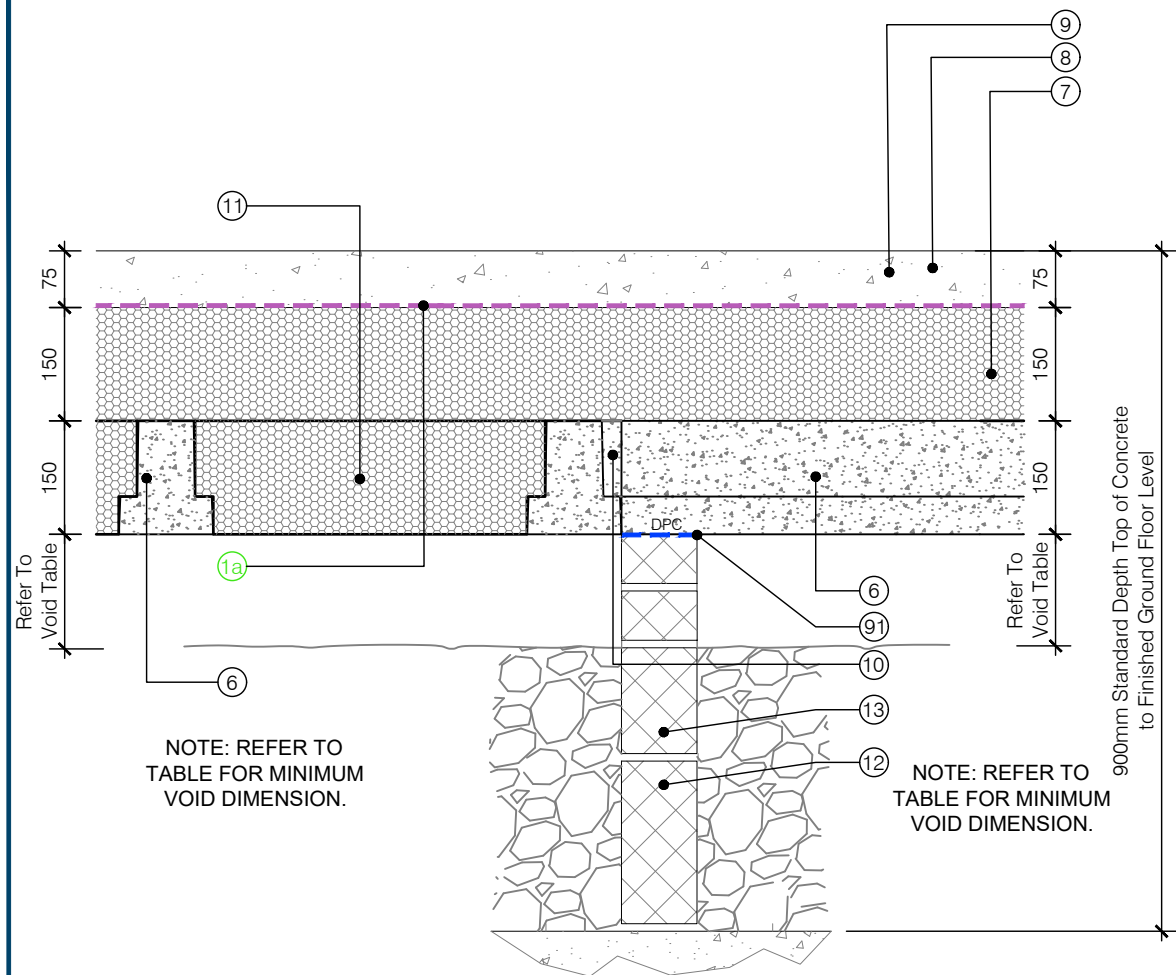
DRAWN BY	AA	DATE	16/09/22
CHECKED BY	AH	SCALE	1:10
ISSUE	(05)	DRAWING NUMBER	SD010-A-006
		REVISION	A
Revisions	Notes	Date	
A	Thermal conductivity of floor and perimeter edge insulation specified.	10.08.23	

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Standard Detail to Internal Wall
(CS1 - Green)

Floor Membrane Schedule			
NHBC Rating	Membrane	Jointing	Designation
CS2/Amber 1	Visqueen Low Permeability Gas Membrane (yellow) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015+A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Gas Resistant foil lap tape 75mmx50m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
CS3/Amber 2	Visqueen Gas Barrier (blue) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015 + A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Gas Resistant foil lap tape 75mmx50m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
Basic/Full Radon	Visqueen R400 Gas Membrane (red) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015 + A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Pro single sided tape 75mmx25m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations

REFER TO SITE SPECIFIC SITE ENGINEERS REPORTS FOR SPECIFIC PLOT GAS MEMBRANE/RADON REQUIREMENTS
TYPICAL DETAILS ARE BASED ON VISQUEEN REQUIREMENTS AT TIME OF DRAUGHTING - ARRANGEMENT TO BE IN FULL ACCORDANCE WITH MANUFACTURERS DETAILS AT TIME OF INSTALLATION
ALTERNATIVE MANUFACTURERS MAY BE USED SEE REGIONAL TECHNICAL TEAM FOR APPROVAL

Minimum Void Dimensions Under Suspended Precast Concrete Floors

Voids should be provided to accommodate movement due to heave forces acting on foundations and suspended ground floors as set out in the table below in accordance with NHBC (As indicated in Chapter 5.2.10, Ventilation).

Void Dimension Under Suspended Precast Concrete Floors	
Volume Change Potential in clay sub soils	Min. Void Depth (mm)
None	150
Low (10-20%)	200
Medium (20-40%)	250
High (40-60%)	300

NOTE: Void dimension is measured from the underside of the beam to the ground level and includes 150mm ventilation allowance.

- 9 75mm Structural concrete topping to be either:
- Standard - C28/35 with maximum aggregate size 20mm and reinforcement selected from Note 11.Slump should be Class S3 (100 to 150mm) or S4 (for spot samples taken from initial discharge, 140 to 230mm). Aggregate to comply with BS EN12620: 2013.
 - Self Compacting - C28/35 with maximum aggregate size 10mm and reinforcement selected from the options below. Slump flow class should be SF1 (550 to 650mm) or SF2 (660 to 750mm). The sand content should be greater than 45%. Aggregate to comply with BS EN1260:2013.
- 10 Weak mix concrete to void
- 11 Lynx Warmfloor 'Grey' 150mm EPS Infill Block 540mm/340mm with thermal conductivity equal to 0.031W/mK
- 12 1 course of 100wide x 215 deep 7.3N/mm² light weight blocks, 675mm below Finished Floor Level,
- 13 Cut block or bricks as required to maintain coursing
- 91 100mm Visqueen Zedex DPC

NOTES

- 1a 1200 gauge polythene DPM lapped and sealed with Visqueen DPC
- 1b Visqueen Gas Membrane, see adjacent Gas Membrane Schedule, level of protection specified by site development engineer. Gas Membrane is to be installed by a competent personnel with suitable qualifications in accordance with best practice, and guidance contained within BS8485 2015: A1 2019 - See adjacent Gas Membrane Schedule for level of protection.
- 6 150mm Pre-stressed Beam - Beam layout indicative, refer to house type drawing.
- 7 Lynx Warmfloor 'Grey' 150mm EPS structural grade top sheet with thermal conductivity equal to 0.031W/mK
- 8 Slab reinforcement to be either (dependant on topping):
- Structural Concrete
 - One layer of A142 mesh (to BS 4483:2005) with a characteristic yield strength of 500N/mm² set at mid-point to the depth of the concrete topping.
 - Self Compacting
(Reinforcement dependant of supplier of self compacting concrete)
 - Steel Fibres
 - Novomesh B&BA: Dosage rate 17.5kg/m³, steel flat end, steel fibres, 50mm long, 1mm diameter, tensile strength of 1150N/mm².
 - Adfil SF86: Dosage rate 13.33kg/m³, 60mm long, 0.75mm diameter, modulus of elasticity of 200000N/mm², tensile strength of 1225N/mm².
 - Macro-Polymer
 - Novomesh B&BA: Dosage rate 3.84kg/m³, continuously deformed, 60mm long, 0.56mm diameter, modulus of elasticity of 7000N/mm², tensile strength of 600N/mm².
 - Durus Easy Finish: Dosage rate 3kg/m³, 40mm long, 0.7mm diameter (equivalent), modulus of elasticity of 6000N/mm², tensile strength of 470N/mm².



Details are to be used for Lynx Precast "WarmFloor" Insulated Flooring system only.



TITLE Foundations & Ground Floors A20

DRAWING Sleeper Wall
Lynx Warmfloor

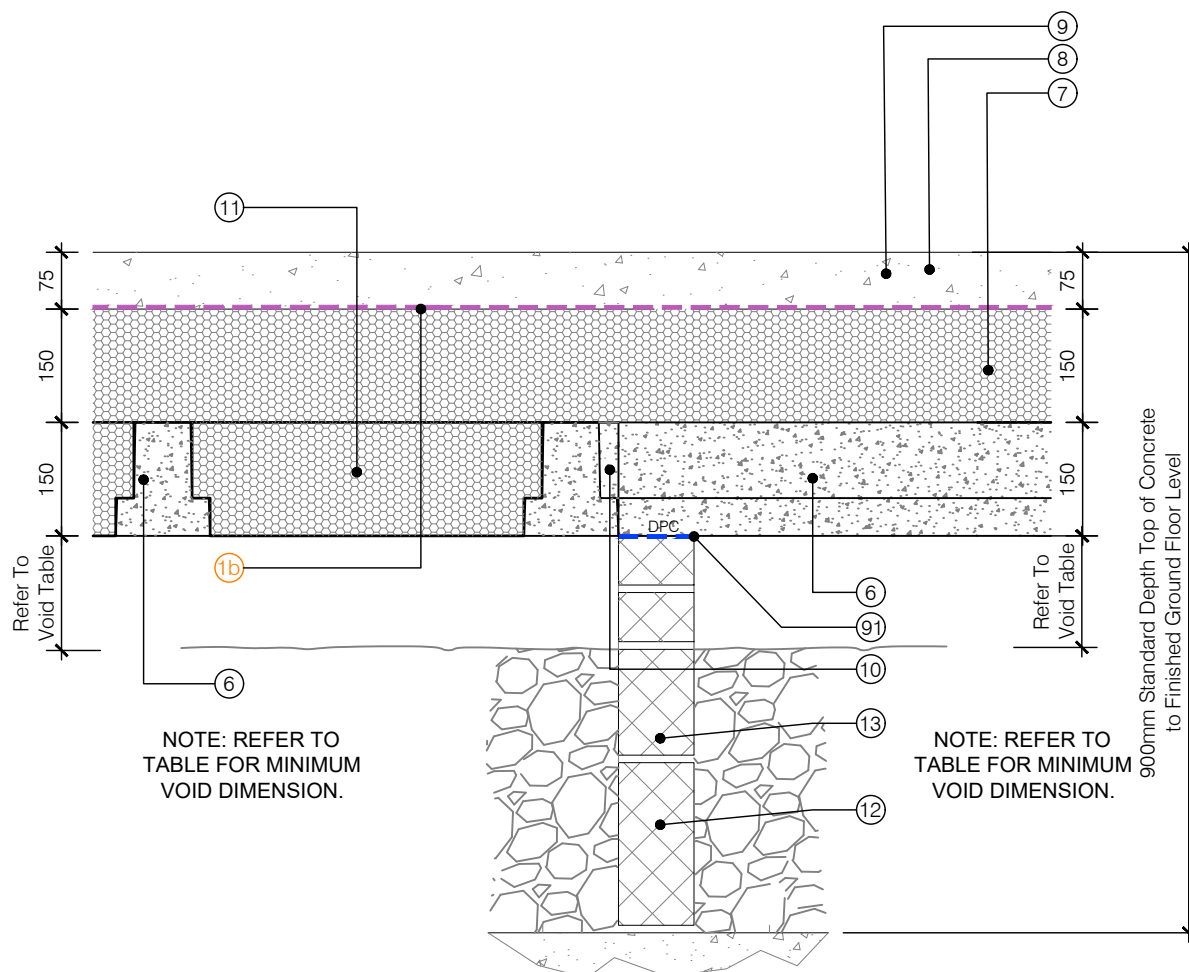
DRAWN BY	AA	DATE	16/09/22
CHECKED BY	AH	SCALE	1:10
ISSUE	DRAWING NUMBER	REVISION	
(05)	SD010-A-007	A	
Revisions	Notes	Date	
A	Note 12 - Compressive strength of lightweight blockwork amended from 7N to 7.3N. Thermal conductivity of floor insulation specified	10.08.23	

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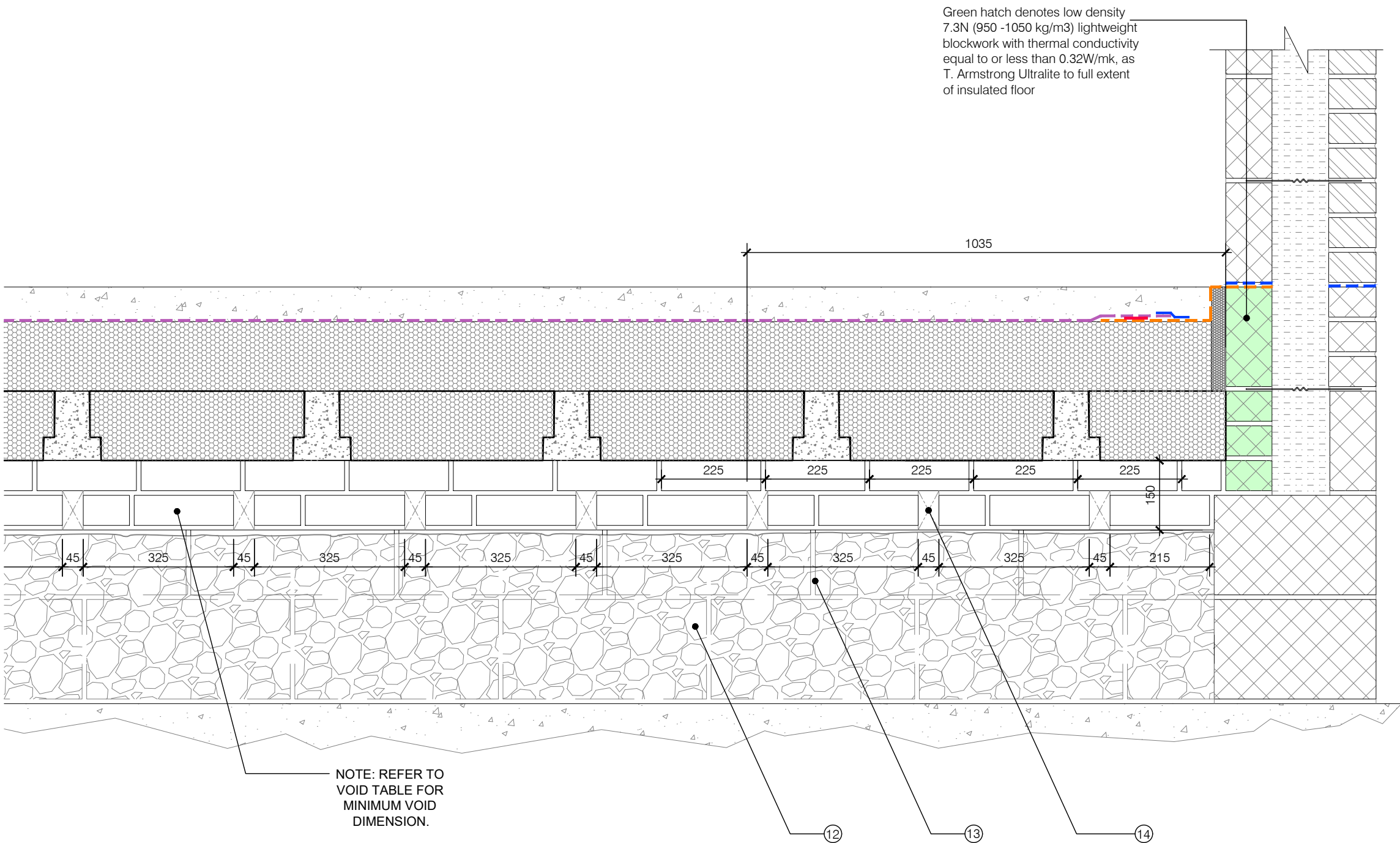
Story House, Lords Way, Kingmoor Business Park,
Carlisle, Cumbria. CA6 4SL

Tel 01228 404550

Fax 01228 404551



Standard Detail to Internal Wall
(CS2/Amber 1/CS3/Amber 2/Radon - See Table)



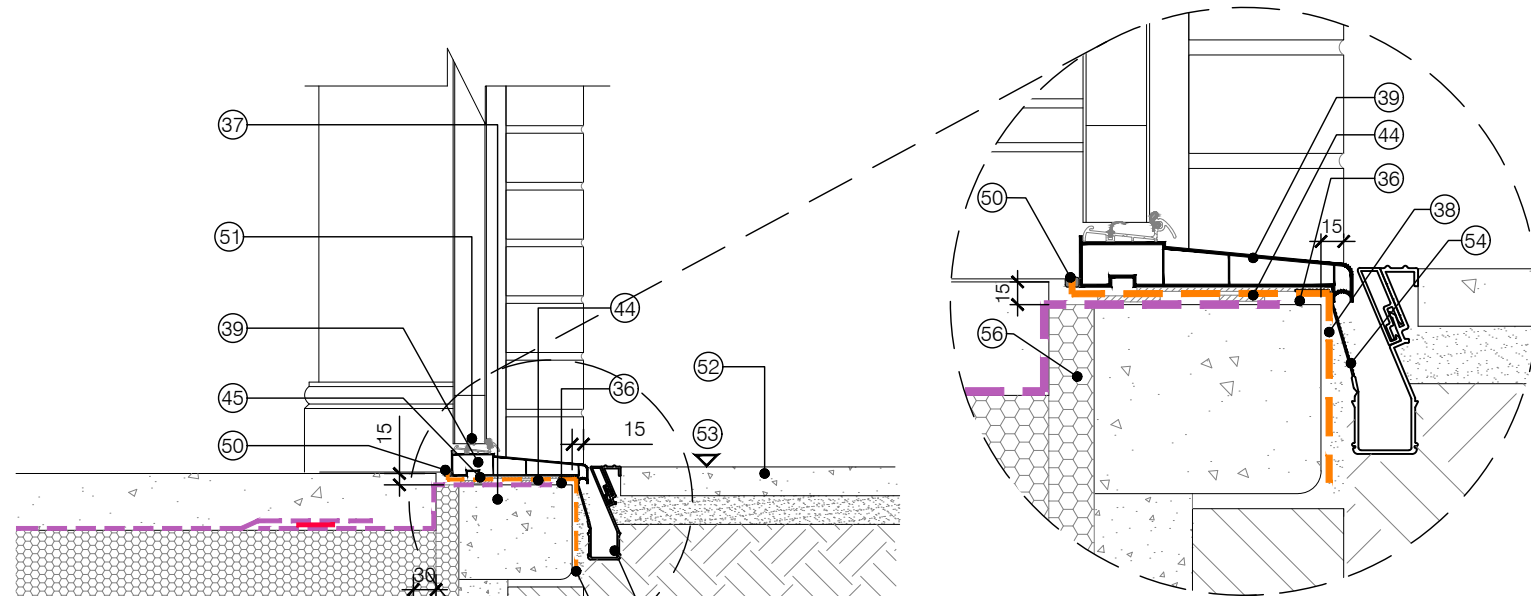
- NOTES
- 12 1 course of 100wide x 215 deep 7.3N/mm² light weight blocks, 675mm below Finished Floor Level
 - 13 Cut block or bricks as required to maintain coursing
 - 14 Ventilation voids (45 x 85mm at 370mm centres) in sleeper walls to provide 11475mm²/m run. 1500mm²/m required as a minimum per meter run.

LYNX
PRECAST

Details are to be used for Lynx Precast "WarmFloor" Insulated Flooring system only.

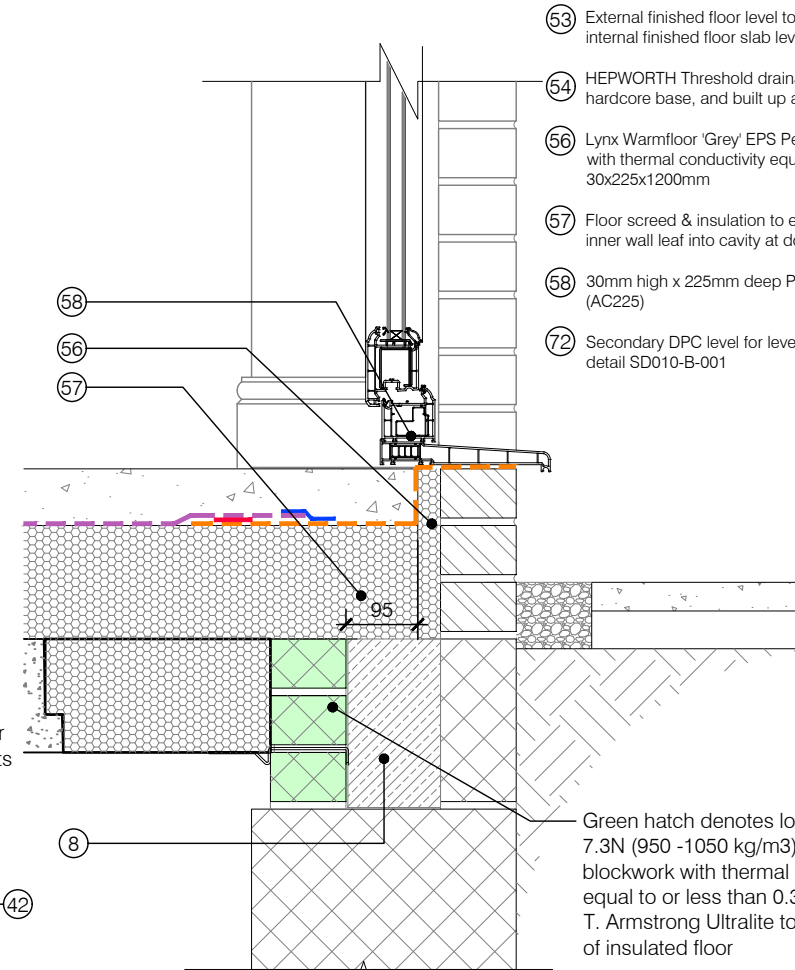
Story
HOMES

TITLE Foundations & Ground Floors A20		
DRAWING Sleeper Wall Details - Elevation Lynx Warmfloor		
DRAWN BY	AA	DATE 16/09/22
CHECKED BY	AH	SCALE 1:10
ISSUE (05)	DRAWING NUMBER SD010-A-008	REVISION A
Revisions	Notes	Date
A	Green hatch Ultralite blockwork below DPC to full extent of insulated floor amended to 7.3N. Annotation rationalised to indicate only sleeper wall requirements.	10.08.23
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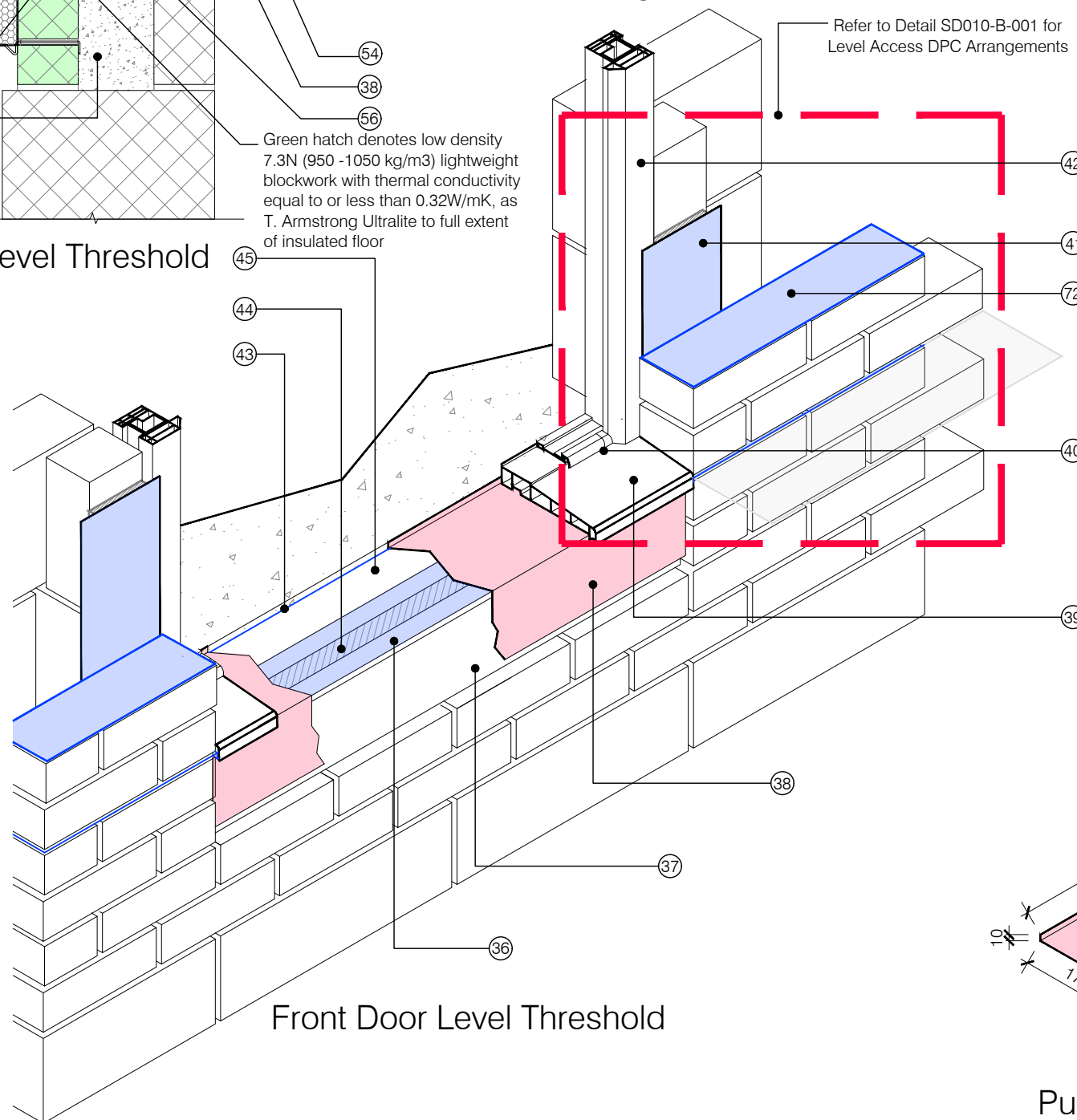


1:5 View on Membrane Arrangement

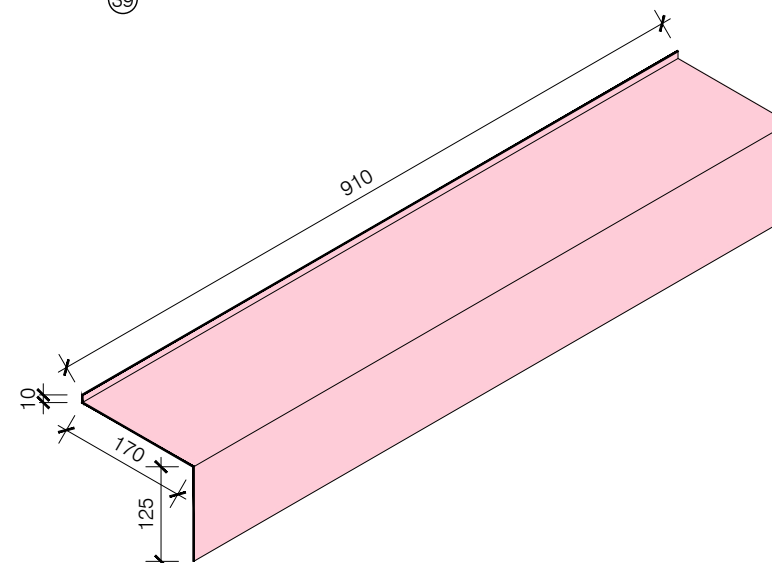
Front Door Level Threshold



Stepped Secondary Door Threshold



Front Door Level Threshold



Purpose made profiled Dpc by Cavity Tray

DPM arrangements for Radon / Gas refer to Perimeter Wall Details SD010-A-001 & 002

- 53 External finished floor level to be max 10mm above internal finished floor slab level.
- 54 HEPWORTH Threshold drainage channel, set on hardcore base, and built up around.
- 56 Lynx Warmfloor 'Grey' EPS Perimeter edge strip with thermal conductivity equal to 0.031W/mK - 30x225x1200mm
- 57 Floor screed & insulation to extend 100mm beyond inner wall leaf into cavity at door threshold.
- 58 30mm high x 225mm deep PVCu sill by Eurocell (AC225)
- 72 Secondary DPC level for level access areas. See detail SD010-B-001

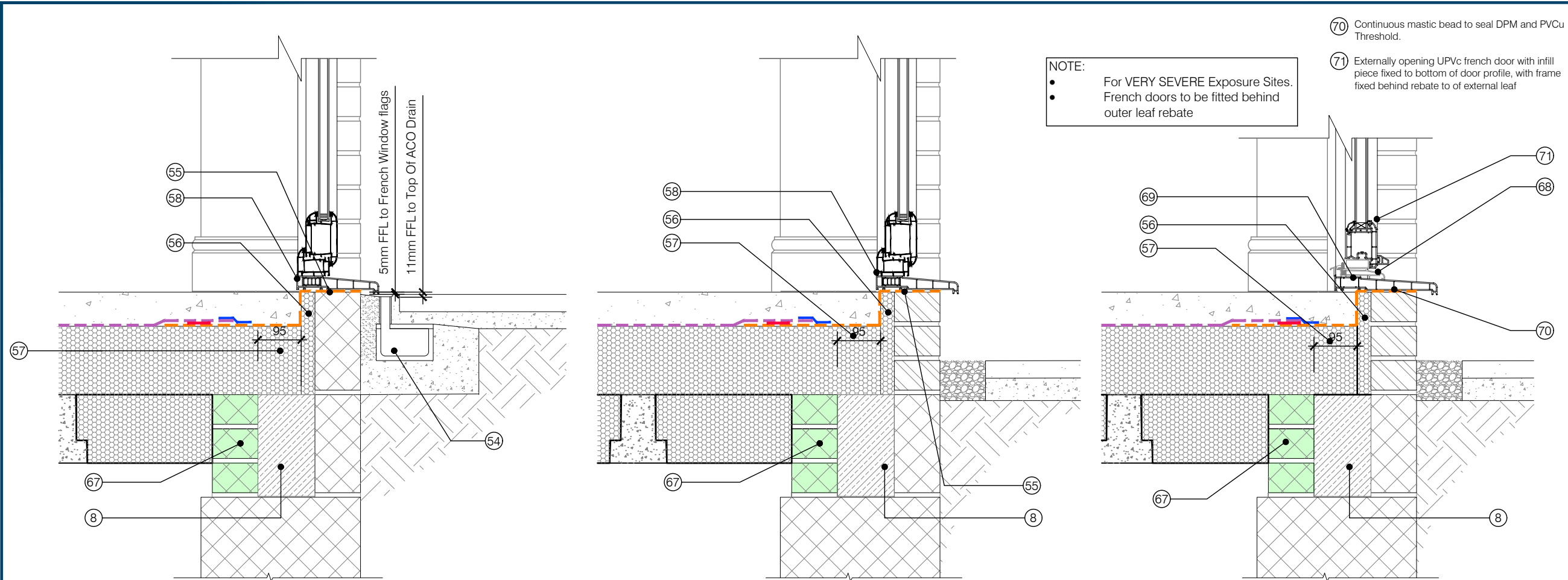
- NOTES
- 8 120mm x 225mm wide EPS insulation (0.034W/mK)
 - 35 1200 Gauge DPM taken up behind purpose made Dpc Tray
 - 36 Brick course Dpc stepped down and continued over threshold
 - 37 150 x 125 concrete bullnose kerb set 15mm below finished floor level and 15mm back from external brick face
 - 38 DPC Pre-formed profiled threshold door sill by Cavity Tray
 - 39 180mm wide 30mm deep PVCu door sill with full seal bed to DPC profiled threshold door sill
 - 40 Stormguard Slimline Aluminium door 'low Threshold' sealed to PVCu sill
 - 41 Vertical insulated DPC to block return at doorway taken a minimum 65mm below external wall DPC, maintaining a forward position to lapped up DPM
 - 42 PVCu door jamb
 - 43 15mm up-stand between floor and door threshold
 - 44 Double sided jointing tape.
 - 45 Full mastic bed seal between kerb and Dpc tray.
 - 47 Cavity fill of lean mix concrete
 - 49 Floor screed & insulation to extend 30mm beyond inner wall leaf into cavity at door threshold.
 - 50 Continuous mastic bead to seal DPM / Profiled Dpc and PVCu Threshold.
 - 51 Stormguard Slimline or similar approved low rise threshold with max total upstand of 15mm bedded on mastic seal to PVCu sill.
Note: Mastic sealant not to obstruct threshold drainage holes.
 - 52 Minimum 1200 x 1200mm flat landing (min. 1200mm long), immediately in front of entrance door for wheelchair access. Flat landing to fall away from entrance at a gradient of 1:60 (20mm over 1200mm)



Details are to be used for Lynx Precast "WarmFloor" Insulated Flooring system only.



TITLE Foundations & Ground Floors A20		
DRAWING Access Door Thresholds Lynx Warmfloor		
DRAWN BY	AA	DATE 16/09/22
CHECKED BY	AH	SCALE 1:10
ISSUE (05)	DRAWING NUMBER SD010-A-011	REVISION A
Revisions	Notes	Date
A	Green hatch Ultralite blockwork below DPC to full extent of insulated floor amended to 7.3N. Thermal conductivity of perimeter edge insulation specified.	10.08.23
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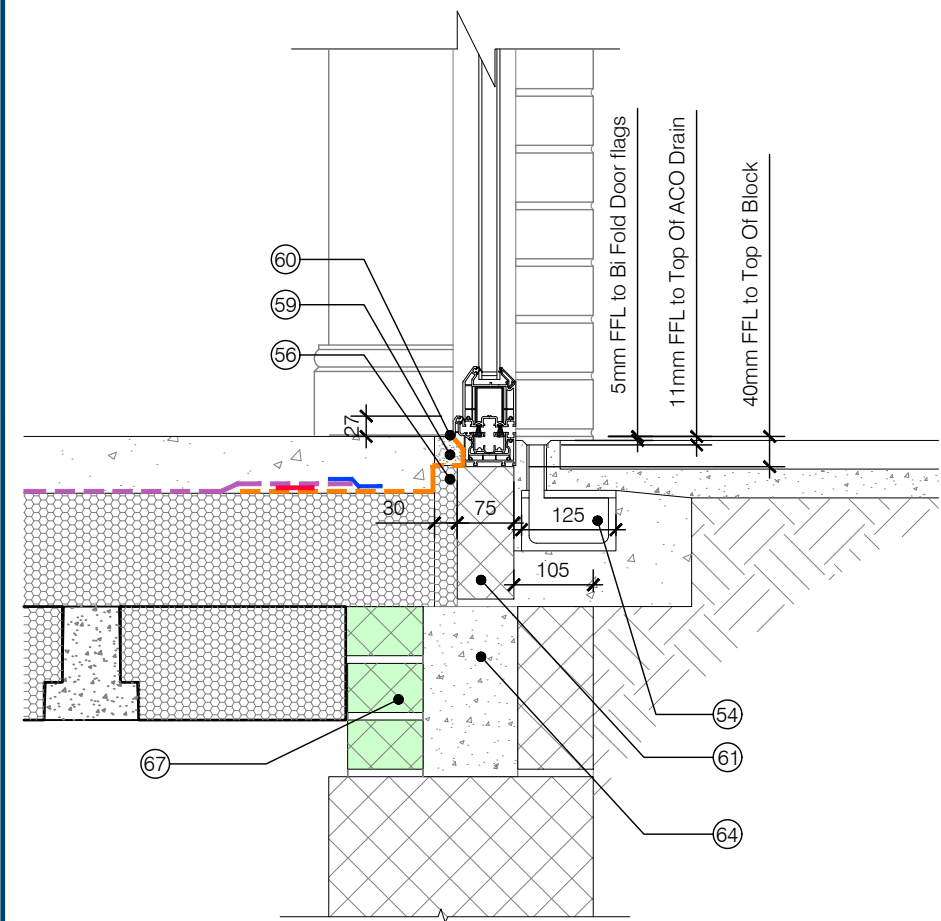


Level French Window Door
Threshold Detail (Site specific)

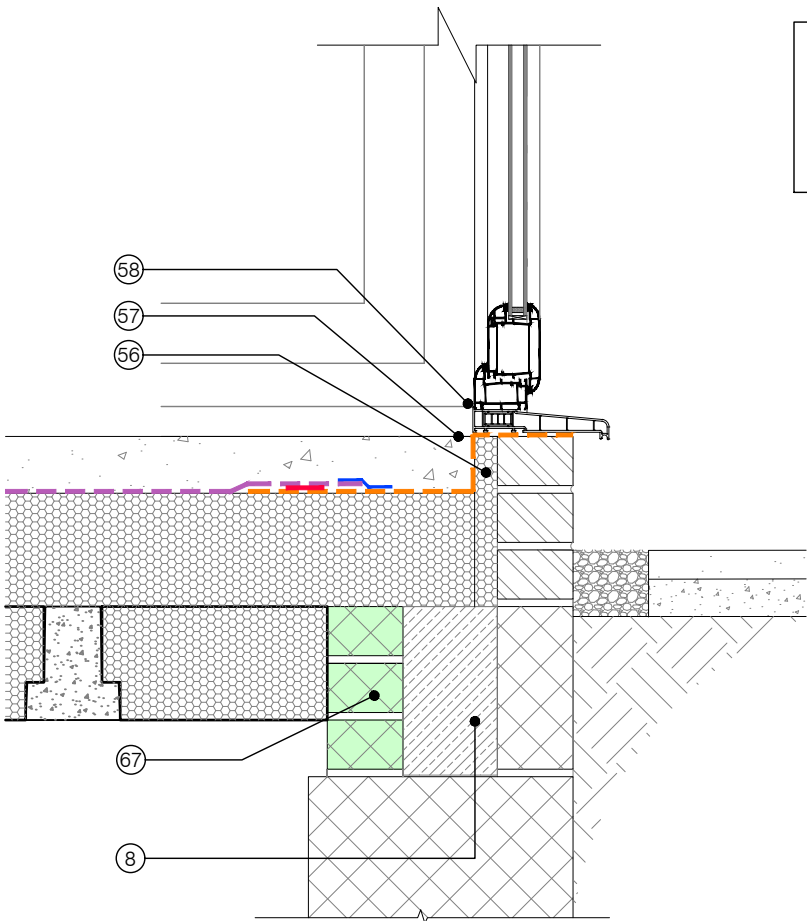
Stepped French Window Door
Threshold Detail

Stepped French Window Door
Threshold Detail - Very severe exposure

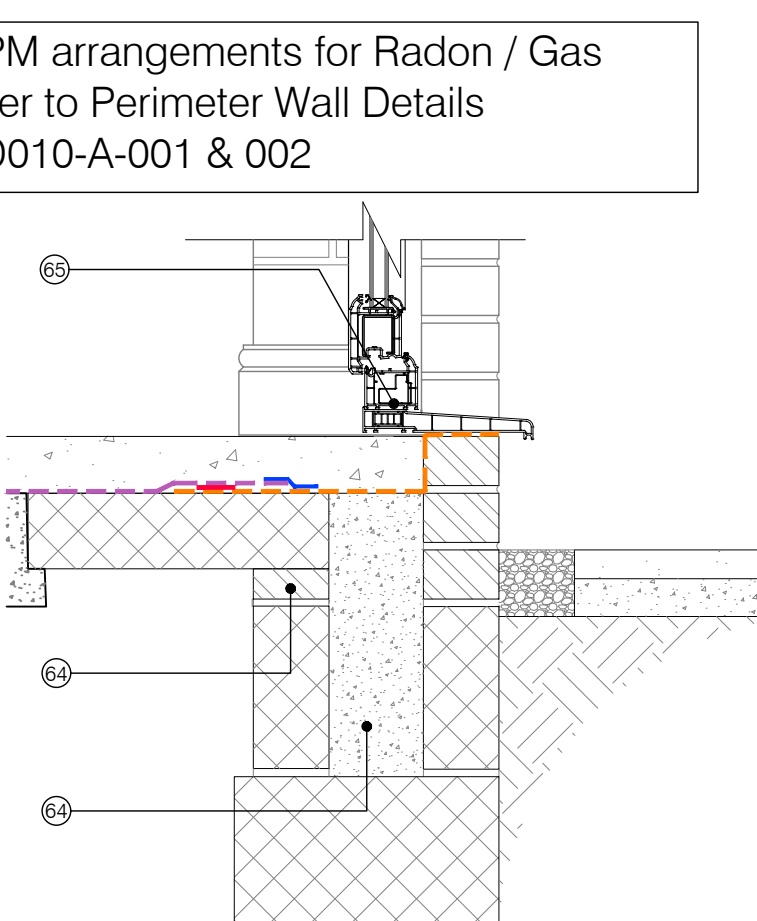
DPM arrangements for Radon / Gas
refer to Perimeter Wall Details
SD010-A-001 & 002



Bi-Fold Door Threshold Detail



Rear Flat Roof Bay Threshold Detail



Stepped Garage Secondary
Door Threshold

- NOTES
- 8 120mm thick 225mm wide EPS insulation sheets (0.034W/mK) below DPC.
 - 47 Cavity fill of lean mix concrete
 - 54 ACO HexDrain Brickslot drainage channel, set in concrete bed and haunch to full width of all level thresholds. In exceptional circumstances it may be necessary to provide a discharge pipe into permeable ground or drainage system
 - 55 DPM taken up under PVCu sill
 - 56 Lynx Warmfloor 'Grey' EPS Perimeter edge strip with thermal conductivity equal to 0.031W/mK - 30x225x1200mm
 - 57 Floor screed & insulation to extend over cavity to 25mm upstand insulation at door / window threshold.
 - 58 30mm high x 180mm deep PVCu sill by Eurocell (AC180)
 - 59 Infill void ensuring DPM is tight against door set
 - 60 Mastic seal to doorset
 - 61 440x215x75 block cut to 175mm height
 - 64 Weak mix concrete
 - 65 30mm high x 225mm deep PVCu sill by Eurocell (AC225)
 - 66 100x40mm concrete slip/coursing block
 - 67 Green hatch denotes low density 7.3N (950 -1050 kg/m3) lightweight blockwork with thermal conductivity equal to or less than 0.32W/mk, as T. Armstrong Ultralite to full extent of insulated floor
 - 68 Stormguard Proline AM5Ex Subcill Part M compliant Threshold bedded on mastic seal to PVCu sill.
Note: Mastic sealant not to obstruct threshold drainage holes.
 - 69 225mm wide 30mm deep PVCu door sill with full seal bed to DPC profiled threshold door sill

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Details are to be used for Lynx Precast "WarmFloor" Insulated Flooring system only.

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TITLE Foundations & Ground Floors A20

DRAWING Secondary Garage Door & Bi-fold & French Door Threshold Details Lynx Warmfloor

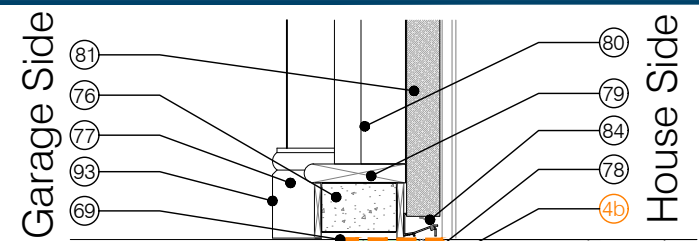
DRAWN BY	AA	DATE	16/09/22
CHECKED BY	AH	SCALE	1:10
ISSUE	(05)	DRAWING NUMBER	SD010-A-012
		REVISION	A

Revisions	Notes	Date
A	Green hatch Ultralite blockwork below DPC to full extent of insulated floor amended to 7.3N. Thermal conductivity of perimeter edge insulation specified.	10.08.23

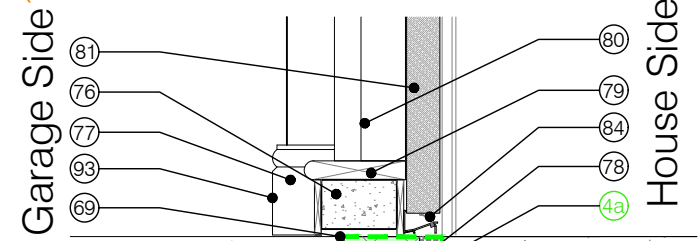
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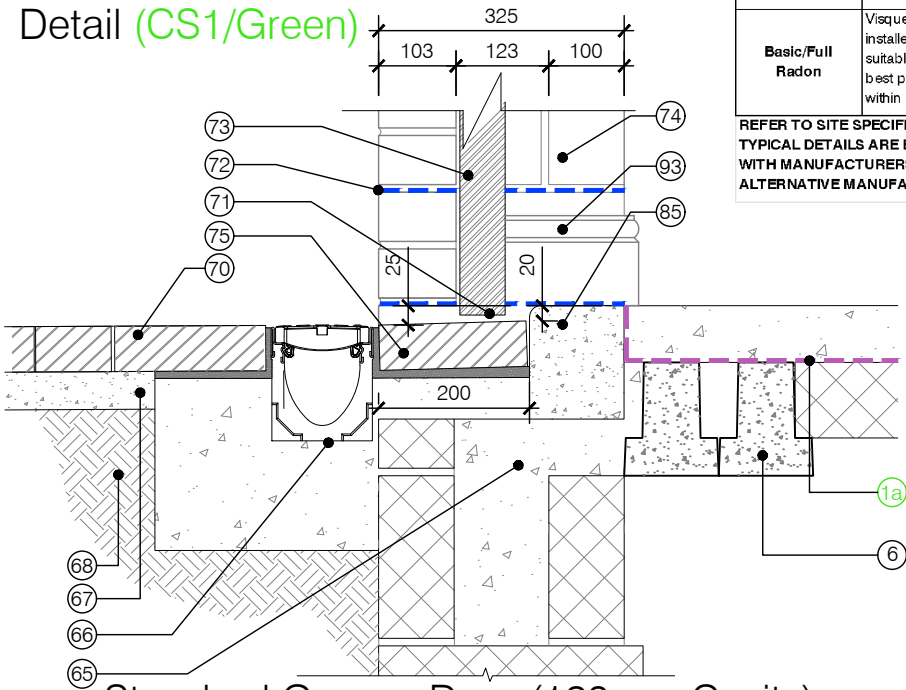
Tel 01228 404550 Fax 01228 404551



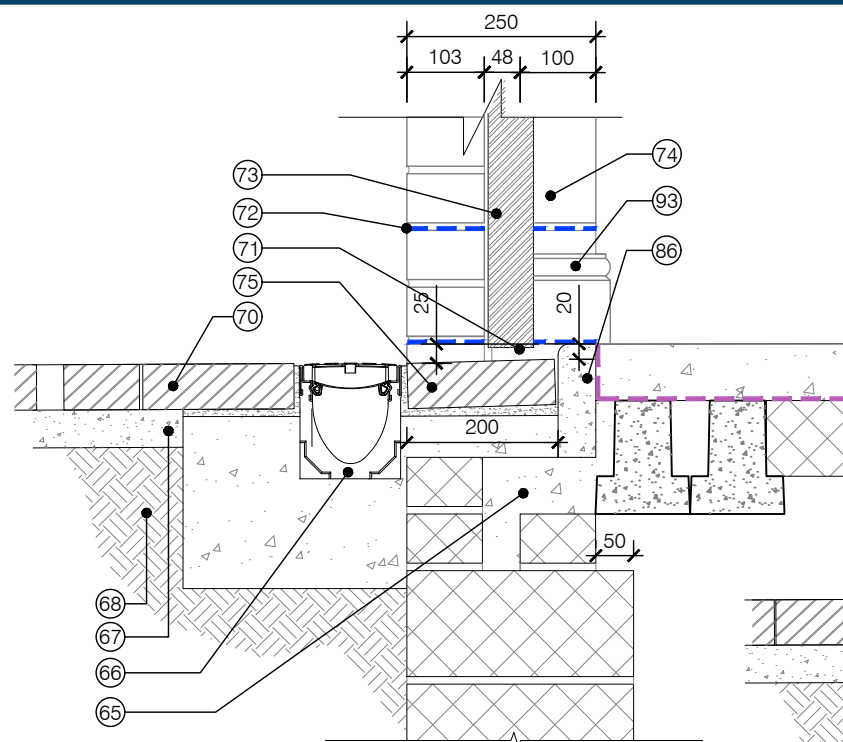
Internal Garage Door Threshold Detail
(CS2/Amber 1/CS3/Amber 2/Basic Radon)



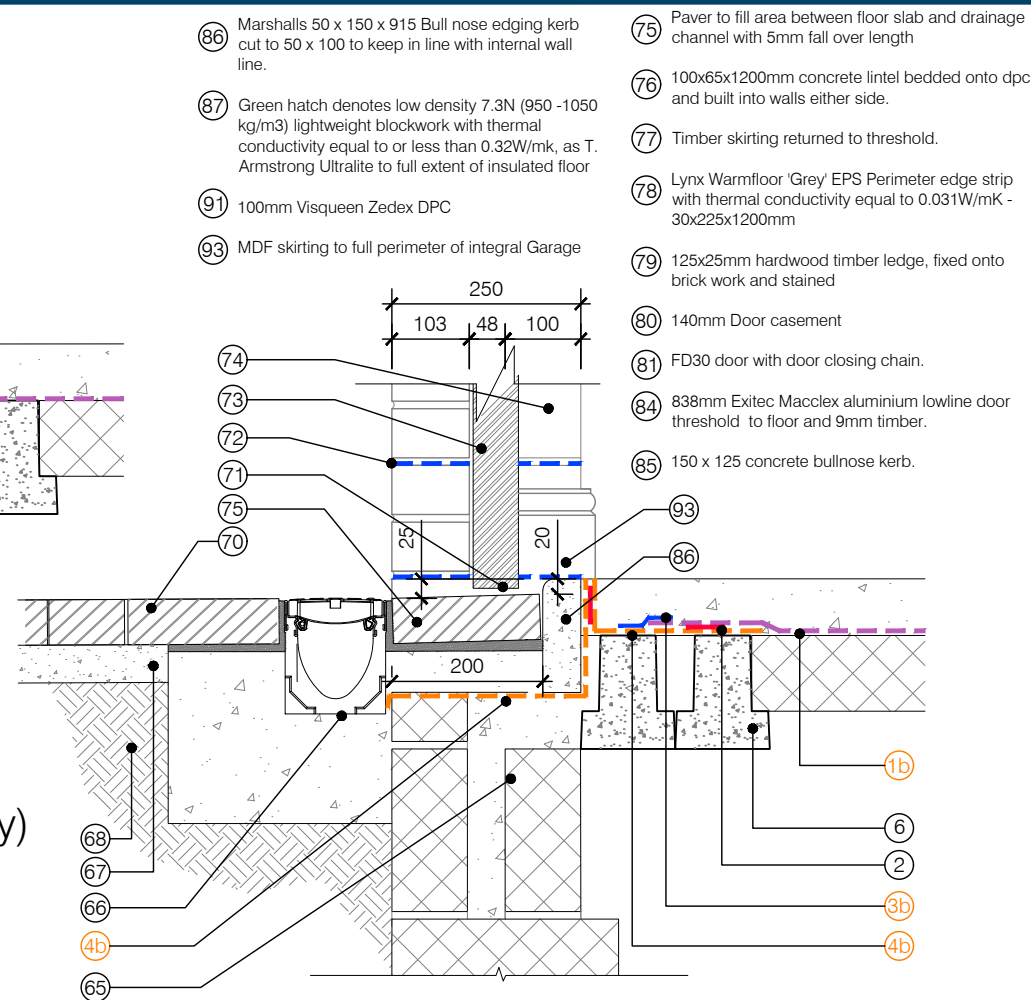
Internal Garage Door Threshold Detail (CS1/Green)



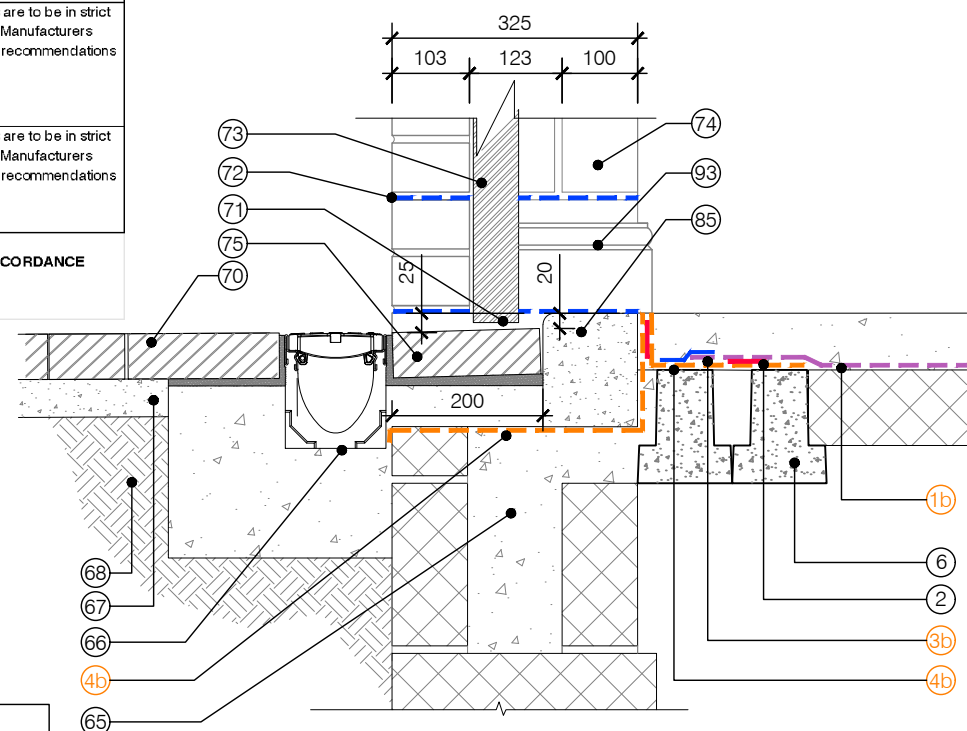
Standard Garage Door (123mm Cavity) Threshold Detail (CS1/Green)



Standard Garage Door (48mm Cavity) Threshold Detail (CS1/Green)



Basic Gas & Basic Radon Detail to Garage Door (48mm Cavity) Threshold Detail (CS2/Amber 1/CS3/Amber 2/Basic Radon)



Basic Gas & Basic Radon Detail to Garage Door (123mm Cavity) Threshold Detail (CS2/Amber 1/CS3/Amber 2/Basic Radon)

Floor Membrane Schedule			
NHBC Rating	Membrane	Jointing	Designation
CS2/Amber 1	Visqueen Low Permeability Gas Membrane (yellow) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015+A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Gas Resistant foil lap tape 75mmx50m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
CS3/Amber 2	Visqueen Gas Barrier (blue) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015 + A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Gas Resistant foil lap tape 75mmx50m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
Basic/Full Radon	Visqueen R400 Gas Membrane (red) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015 + A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Pro single sided tape 75mmx25m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations

REFER TO SITE SPECIFIC SITE ENGINEERS REPORTS FOR SPECIFIC PLOT GAS MEMBRANE/RADON REQUIREMENTS
TYPICAL DETAILS ARE BASED ON VISQUEEN REQUIREMENTS AT TIME OF DRAUGHTING - ARRANGEMENT TO BE IN FULL ACCORDANCE WITH MANUFACTURERS DETAILS AT TIME OF INSTALLATION
ALTERNATIVE MANUFACTURERS MAY BE USED SEE REGIONAL TECHNICAL TEAM FOR APPROVAL

Note: Where house types are detailed to have Garage floor laid to falls, refer to Standard detail SD110-A-004.

DPM arrangements for Radon / Gas refer to Perimeter Wall Details SD010-A-001 & 002

- NOTES
- 1a 1200 gauge polythene DPM lapped under Visqueen DPC
 - 1b Visqueen Gas Membrane, see adjacent Gas Membrane Schedule, level of protection specified by site development engineer. Gas Membrane is to be installed by a competent personnel with suitable qualifications in accordance with best practice, and guidance contained within BS8485 2015: A1 2019 - See adjacent Gas Membrane Schedule for level of protection.
 - 2 Visqueen Pro 50mm x 10m double sided jointing tape positioned 50mm approx from membrane edge with min 150mm lap
 - 3b Visqueen jointing/lap tape - see adjacent Gas
 - 4b Visqueen Gas Resistant DPC to BS 8485:2015 + A1:2019
 - 6 150mm Pre-stressed Beam - NOTE: PRE-STRESSED BEAMS TO GARAGE MUST BE INSTALLED +150MM ABOVE THOSE TO DWELLING
 - 22 385 x 40 x 100mm slip brick, supplied by Lynx
 - 65 WarmfloorCavity fill of lean mix concrete
 - 66 ACO drainage channel, set on concrete bed, to full width of garage opening.
 - 67 Sand Bedding
 - 68 MOT Type 1
 - 69 DPC over threshold jointed to DPM's
 - 70 Block pavers laid to fall away from garage, or; Drainage channel installed (shown) to front of facing wall
 - 71 20mm Step down to pavers with 5mm fall to drain
 - 72 Secondary DPC level for level access areas. See detail SD010-B-001
 - 73 Garage Door recessed behind outer leaf
 - 74 Garage door jamb. Returned block work shown

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Details are to be used for Lynx Precast "WarmFloor" Insulated Flooring system only.

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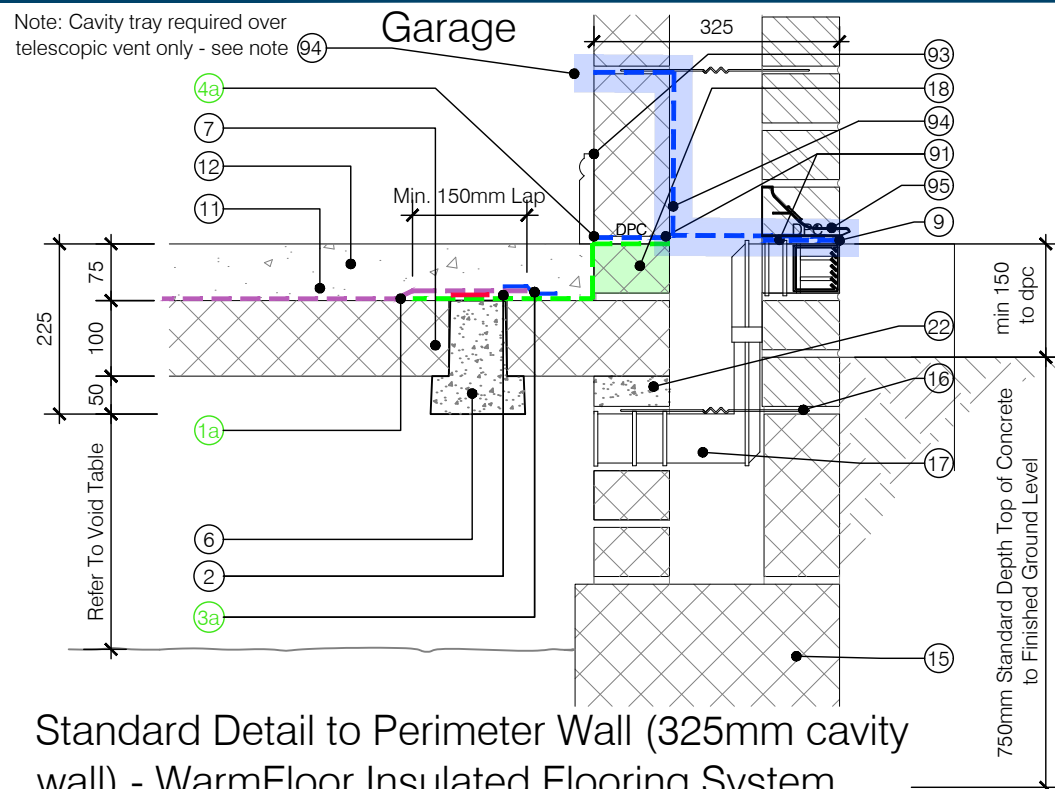
Foundations & Ground Floors A20

DRAWING Garage and Internal Access Door Threshold Details
Lynx Warmfloor

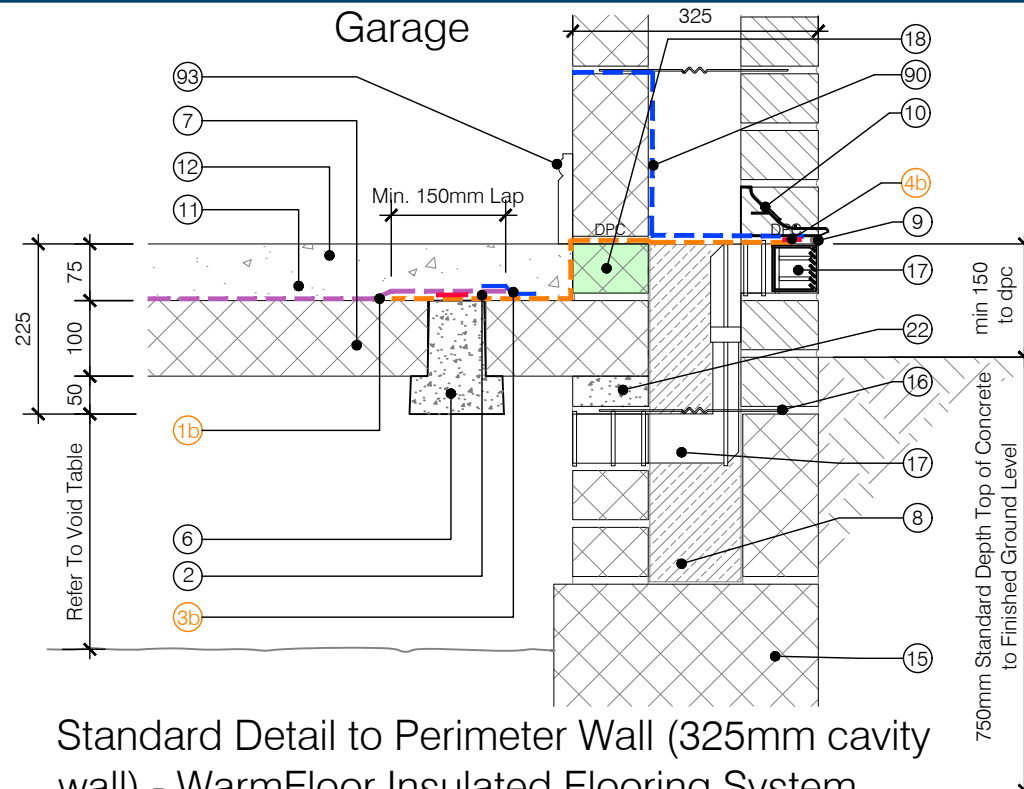
DRAWN BY AA DATE 16/09/22
CHECKED BY AH SCALE 1:10

ISSUE (05) DRAWING NUMBER SD010-A-013 REVISION B

Revisions	Notes	Date
A	Green hatch Ultralite blockwork below DPC to full extent of insulated floor amended to 7.3N. Thermal conductivity of perimeter edge insulation specified.	10.08.23
B	Note added regarding garage floors laid to falls.	07.05.24



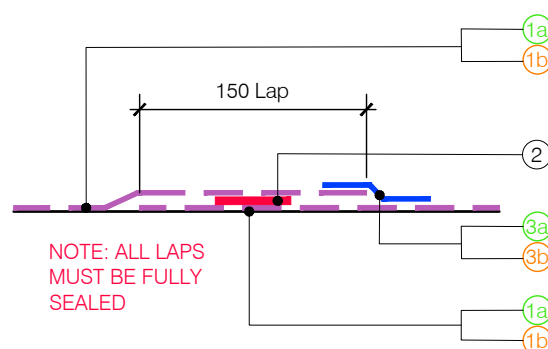
Standard Detail to Perimeter Wall (325mm cavity wall) - WarmFloor Insulated Flooring System (CS1 - Green)



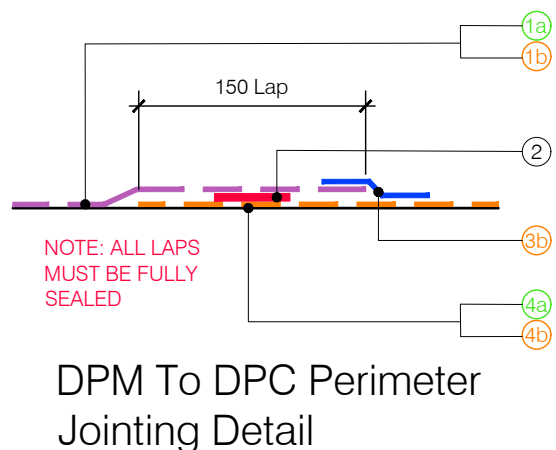
Standard Detail to Perimeter Wall (325mm cavity wall) - WarmFloor Insulated Flooring System (CS2/Amber 1/CS3/Amber 2/Radon - See Table)

Floor Membrane Schedule			
NHBC Rating	Membrane	Jointing	Designation
CS2/Amber 1	Visqueen Low Permeability Gas Membrane (yellow) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015+A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Gas Resistant foil lap tape 75mmx50m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
CS3/Amber 2	Visqueen Gas Barrier (blue) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015 + A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Gas Resistant foil lap tape 75mmx50m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
Basic/Full Radon	Visqueen R400 Gas Membrane (red) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015 + A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Pro single sided tape 75mmx25m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations

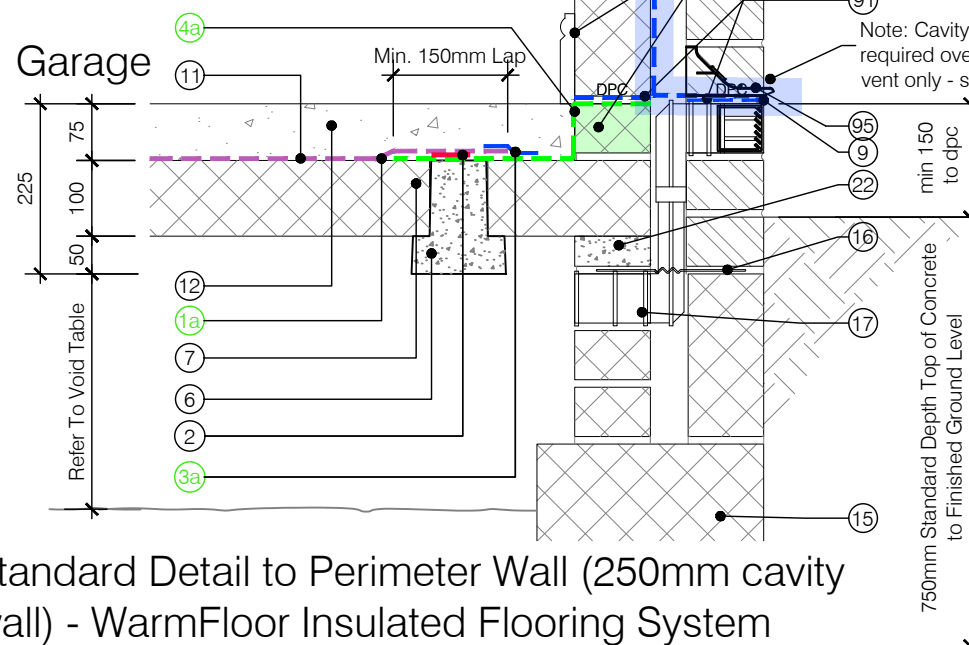
REFER TO SITE SPECIFIC SITE ENGINEERS REPORTS FOR SPECIFIC PLOT GAS MEMBRANE/RADON REQUIREMENTS
TYPICAL DETAILS ARE BASED ON VISQUEEN REQUIREMENTS AT TIME OF DRAUGHTING - ARRANGEMENT TO BE IN FULL ACCORDANCE WITH MANUFACTURERS DETAILS AT TIME OF INSTALLATION
ALTERNATIVE MANUFACTURERS MAY BE USED SEE REGIONAL TECHNICAL TEAM FOR APPROVAL



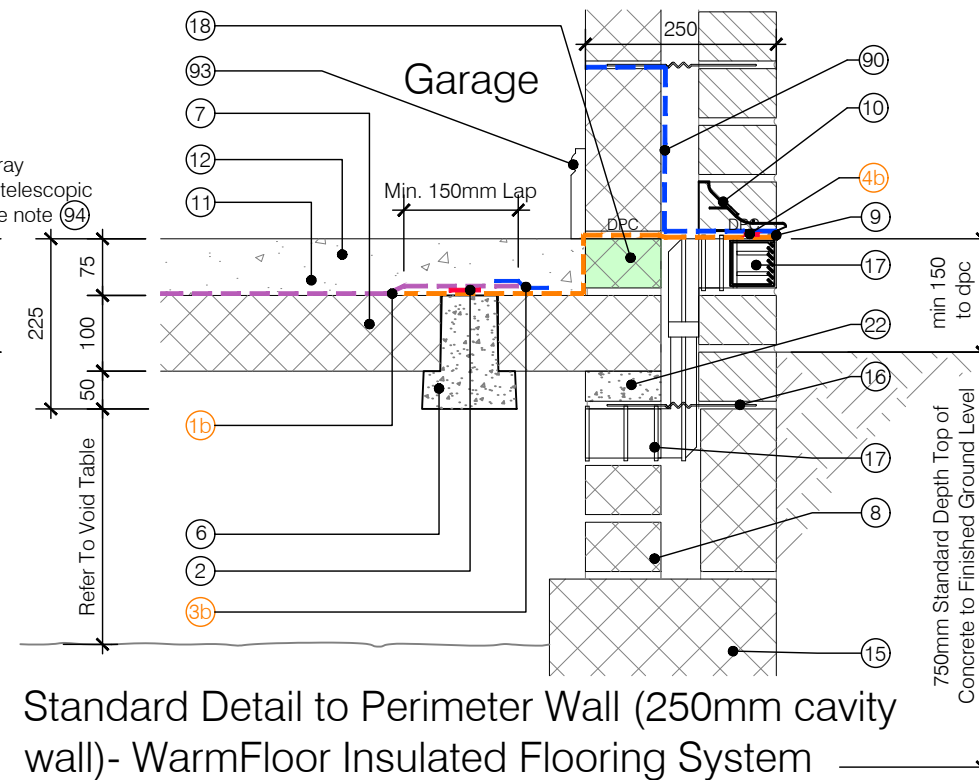
Typical DPM Jointing Detail



DPM To DPC Perimeter Jointing Detail



Standard Detail to Perimeter Wall (250mm cavity wall) - WarmFloor Insulated Flooring System (CS1 - Green)



Standard Detail to Perimeter Wall (250mm cavity wall) - WarmFloor Insulated Flooring System (CS2/Amber 1/CS3/Amber 2/Radon - See Table)

- 11 Slab reinforcement to be either (dependant on topping):
Structural Concrete
- One layer of A142 mesh (to BS 4483:2005) with a characteristic yield strength of 500N/mm² set at mid-point to the depth of the concrete topping.
Self Compacting
(Reinforcement dependant of supplier of self compacting concrete)
Steel Fibres
- Novomesh B&BA: Dosage rate 17.5kg/m³, steel flat end, steel fibres, 50mm long, 1mm diameter, tensile strength of 1150N/mm².
- Adfil SF86: Dosage rate 13.33kg/m³, 60mm long, 0.75mm diameter, modulus of elasticity of 200000N/mm², tensile strength of 1225N/mm².
Macro-Polymer
- Novomesh B&BA: Dosage rate 3.84kg/m³, continuously deformed, 60mm long, 0.56mm diameter, modulus of elasticity of 7000N/mm², tensile strength of 600N/mm².
- Durus Easy Finish: Dosage rate 3kg/m³, 40mm long, 0.7mm diameter (equivalent), modulus of elasticity of 6000N/mm², tensile strength of 470N/mm².
- 12 75mm Structural concrete topping to be either:
- Standard - C28/35 with maximum aggregate size 20mm and reinforcement selected from Note 11. Slump should be Class S3 (100 to 150mm) or S4 (for spot samples taken from initial discharge, 140 to 230mm). Aggregate to comply with BS EN12620: 2013.
- Self Compacting - C28/35 with maximum aggregate size 10mm and reinforcement selected from the options below. Slump flow class should be SF1 (550 to 650mm) or SF2 (660 to 750mm). The sand content should be greater than 45%. Aggregate to comply with BS EN1260:2013.
- 15 2 course of 350wide x 215 deep Trench Blocks, 450mm below Finished Floor Level, 7.3kN/mm² Strength
- 16 Bottom row of wall ties to be at 600mm centres.
- 17 Glidevale or similar approved Telescopic underfloor ventilator, comprising MV250 Airbrick (600mm² free area) and MV251 periscope vent, colour Terracotta or Buff to match house specific external finish. Position as required on house type specific foundation layout plans. NOT TO BE POSITIONED UNDER CONCRETE BEAM BEARING.
- 18 Green hatch denotes low density 7.3N (950 -1050 kg/m³) lightweight blockwork with thermal conductivity equal to or less than 0.32W/mk, as T. Armstrong Ultralite

- NOTES
- 1a 1200 gauge polythene DPM lapped under Visqueen DPC
- 1b Visqueen Gas Membrane, see adjacent Gas Membrane Schedule, level of protection specified by site development engineer. Gas Membrane is to be installed by a competent personnel with suitable qualifications in accordance with best practice, and guidance contained within BS8485 2015: A1 2019 - See adjacent Gas Membrane Schedule for level of protection.
- 2 Visqueen Pro 50mm x 10m double sided jointing tape positioned 50mm approx from membrane edge with min 150mm lap
- 3a Visqueen Pro single sided tape
- 3b Visqueen jointing/lap tape - see adjacent Gas Membrane Schedule table for level of protection
- 4a Visqueen Zedex CPT DPC to BS EN 14909:2012
- 4b Visqueen Gas Resistant DPC to BS 8485:2015 + A1:2019
- 6 150mm Pre-stressed Beam - NOTE: PRE-STRESSED BEAMS TO GARAGE MUST BE INSTALLED + 150MM ABOVE THOSE TO DWELLING
- 7 Concrete slip/infill blocks
- 8 120mm thick 450mm wide EPS insulation sheets (0.034W/mK) below DPC. Cut to fit around telescopic vents
- 9 VERY SEVERE EXPOSURE COASTAL AREAS ONLY - Seal with Low Modulus Silicone Sealant to ISO 11600-F&G-25LM, colour to match mortar.
- 10 Manthorpe clear G951 peep weep vents @ 450mm ctrs

Note: Where house types are detailed to have Garage floor laid to falls, refer to Standard detail SD110-A-004.

LYNX
PRECAST

Details are to be used for Lynx Precast "WarmFloor" Insulated Flooring system only.



Foundations & Ground Floors A20

DRAWING
Perimeter Garage wall Details
Lynx Warmfloor

DRAWN BY	AA	DATE	16/09/22
CHECKED BY	AH	SCALE	1:10
ISSUE	(05)	DRAWING NUMBER	SD010-A-014
		REVISION	D

Revisions	Notes	Date
A	Green hatch Ultralite blockwork below DPC to full extent of insulated floor amended to 7.3N.	10.08.23
B	DPC added over underfloor vent positions & telescopic vent noted to require vertical adaptor. Length of telescopic vent amended.	23.10.23
C	Note added re positioning of weep vents.	27.11.23
D	Note added regarding garage floors laid to falls.	07.05.24

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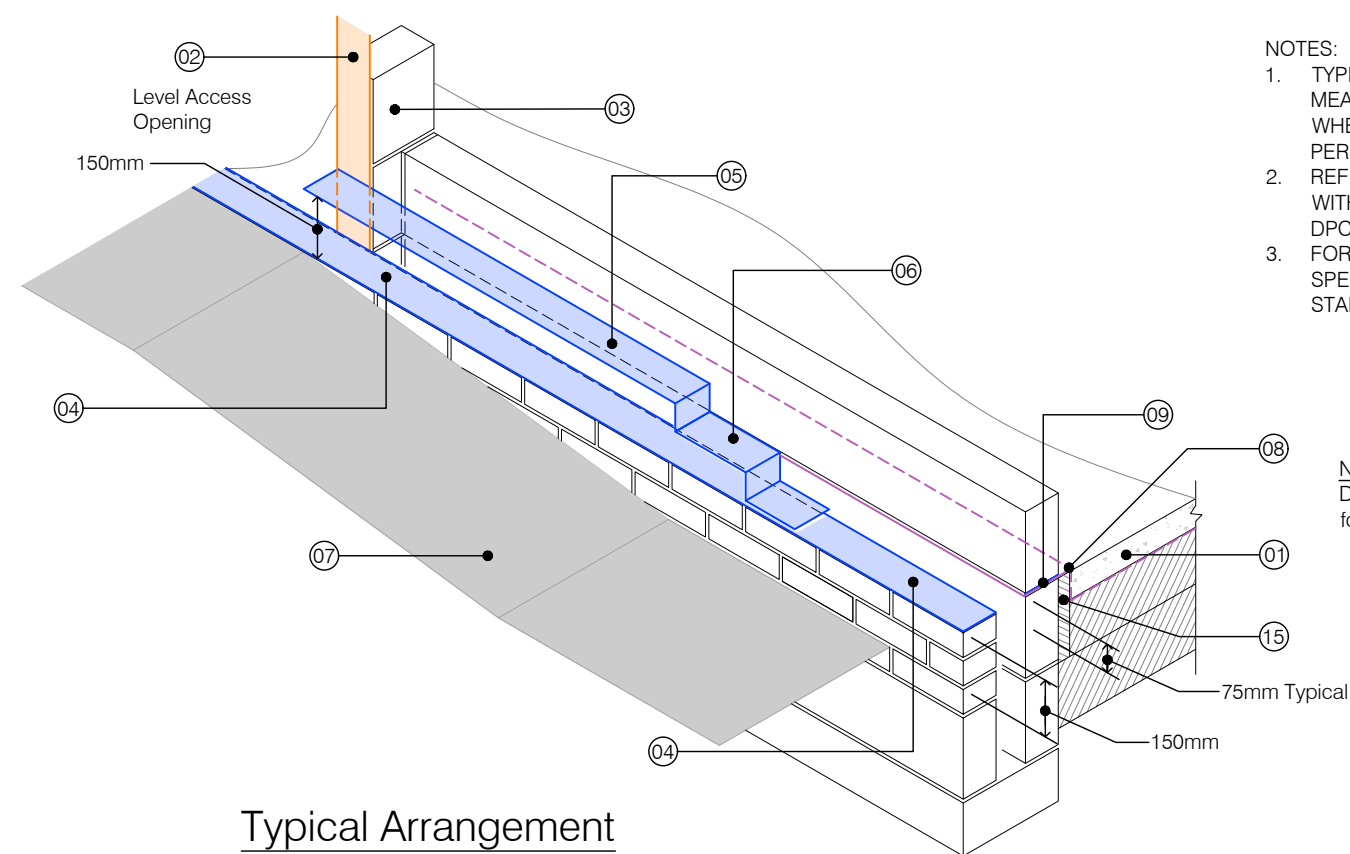
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Tel 01228 404550

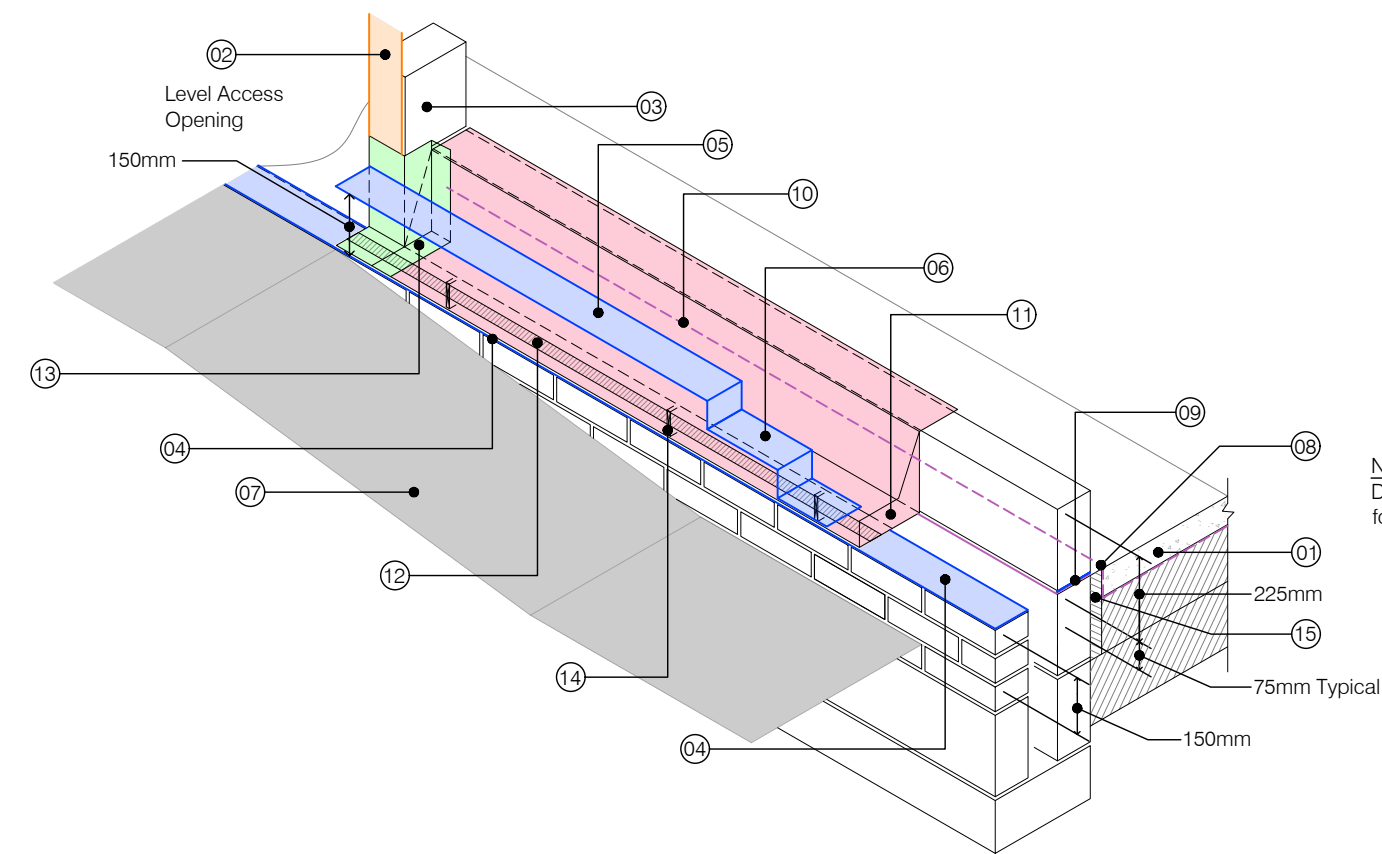
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Positioning of Weep Vents

Bottom of weep vent to be placed directly on to cavity tray to ensure complete drainage of tray with no possibility for standing water. Ensure weep holes do not become blocked with mortar during installation / pointing.



Typical Arrangement



Typical Arrangement: Very Severe Exposure Rating Only

- NOTES:
1. TYPICAL DETAILS ONLY TO SHOW ADDITIONAL PROTECTION MEASURES REQUIRED TO PREVENT MOISTURE PENETRATION WHERE EXTERNAL GROUND LEVELS RISES WITHIN 150MM OF PERIMETER DPC.
 2. REFER TO HOUSE TYPE ELEVATION DRAWINGS TOGETHER WITH PLOT LEVELS TO ASCERTAIN EXTENTS OF SECONDARY DPC REQUIRED.
 3. FOR THRESHOLD ARRANGEMENTS AND MATERIAL SPECIFICATION READ IN CONJUNCTION WITH RELEVANT STANDARD DETAILS.

Note
DPM indicative only - see SD010-A-002
for details of DPM/DPC jointing

Note
DPM indicative only - see SD010-A-002
for details of DPM/DPC jointing

- NOTES
- 01 75mm structural concrete topping on DPM on 150mm EPS Structural grade topsheet on 150mm pre-stressed floor beams with EPS Infill blocks
 - 02 Vertical insulated DPC to block return at doorway. DPC to extend a minimum 65mm past internal finished floor level.
 - 03 Block Return.
 - 04 Perimeter DPC to external leaf extending to full perimeter of building installed @ top of ground floor slab level - minimum 150mm above external ground floor level.
 - 05 Secondary Linear DPC installed to external leaf 150mm above floor level.
 - 06 Secondary DPC to be stepped down and lapped with perimeter DPC once ground level permits - in all locations secondary DPC is to be a minimum of 150mm above adjacent ground level.
 - 07 150mm Ramp to level access landing.
 - 08 DPM to be taken up face of perimeter insulation and returned over top of perimeter insulation through blockwork & lapped below internal leaf DPC.
 - 09 Internal leaf DPM.
 - 10 Formed stepped DPC cavity tray extending from block return to doorway to minimum 225mm past end of secondary DPC.
 - 11 Folded stop end to cavity tray (as NHBC Technical Guidance Note 6.1/29).
 - 12 Visqueen double sided tape to lap between Cavity tray and perimeter DPC.
 - 13 Vertical barrier DPC to front face of insulated DPC folded to lap with perimeter DPC and stop end to cavity tray - all laps and joints to be taped.
 - 14 Weep holes at max. 900mm c/c's - minimum 2 No per tray.
 - 15 Lynx Warmfloor 'Grey' perimeter edge strip with thermal conductivity equal to 0.031W/Mk - 30 x 225x1200mm



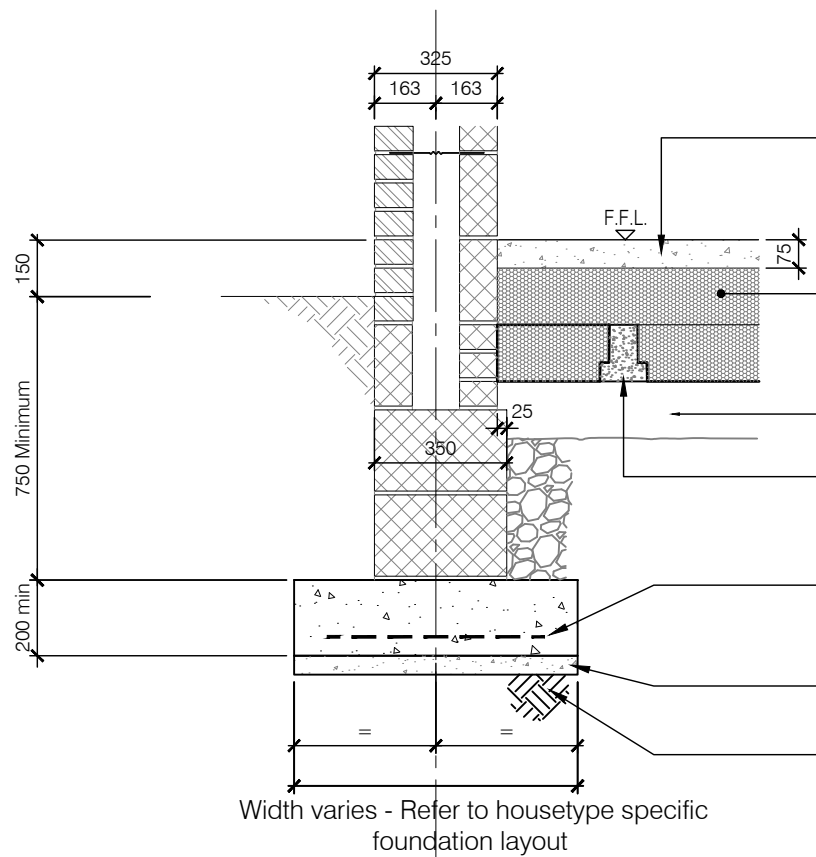
TITLE Foundations & Ground Floors A20

DRAWING Level Access DPC Arrangements

DRAWN BY	AA	DATE	16/09/22
CHECKED BY	AH	SCALE	1:20
ISSUE	DRAWING NUMBER	REVISION	
(05)	SD010-B-001	A	

Revisions	Notes	Date
A	Thermal conductivity of perimeter edge insulation specified.	10.08.23

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Detail A
External wall / Ground floor Junction
 (Scale 1:20)

75mm Structural concrete topping - for specification refer to house type specific beam and block floor designs.

For DPM, vapour control layer, insulation and finishes refer to site specification.
 Gas membrane to specialists specification & details. Refer to general foundation note 6.

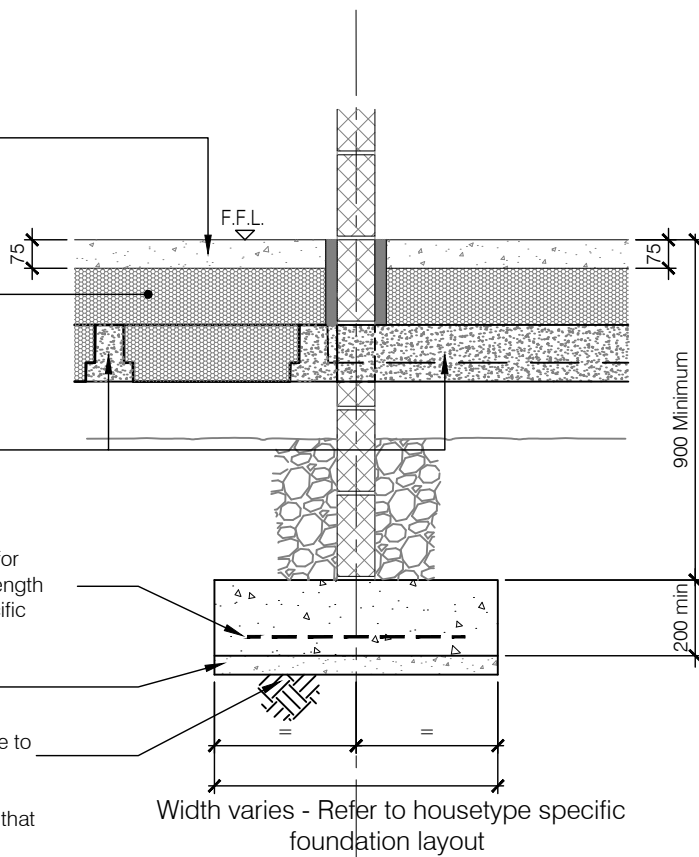
Min 150. void (increased as necessary subject to clay plasticity)

155mm Deep reinforced concrete floor beams - refer to house type specific beam and block floor designs for general arrangement and specification.

1 Layer B785 mesh in bottom (50mm cover). Nominal mesh required for sites with variable strata. Where formation strata is uniform in both strength and material across a plot mesh may be omitted TBC by the site specific geotechnical engineer/site investigation.

50 concrete blinding when reinforced

Footings to found in consistent, competent material. Any soft spots are to be removed and replaced with Grade GEN 1 (ST1 if site mixed) consistence class S3 concrete. Foundation inspection regime to be confirmed. Formation level of foundation is likely to comprise material that will deteriorate if exposed to wetting / drying cycles. Hence concrete blinding must be placed immediately after excavation.



Detail B
Internal Wall / Ground floor Junction
 (Scale 1:20)

Foundation Widths (mm)	Minimum Thickness (mm)
450	200
600	200 (250)
750	225
900	300
1050	375
Vibro (all widths)	300
(250) indicates minimum thickness for 600 internal walls	

- NOTES
- General Foundation Notes:**
- This drawing is to be read in conjunction with all relevant Architect's, Civil Engineering, M&E designer's, and Engineer's drawings.
 - DPM and finished shown indicative only. Refer to architects / story homes sections and details for exact specifications.
 - The details indicated on this drawing are in accordance with sites classified as CS1 when utilising NHBC's current guidance for assessing gas risks. Refer to the site specific site investigation. For sites outside of the above specification site specific details shall need to be sought.
 - All concrete to be a suitable for minimum class DC1 to satisfy design sulphate class DS-1 and ACEC aggressive chemical class AC-1 of BRE Special Digest 1 (2005) U.N.O. site specific site investigations must be reviewed for the required design chemical and design sulphate classes of concrete.
 - This drawing should be read in conjunction with the latest Geo-environmental report. Any discrepancies should be reported to the engineer at the earliest opportunity before work commences on site.
 - Membrane to gas specialist specification and details in accordance with the requirements and table 7 of BS 8485:2015, installed in accordance with manufacturers' instructions in line with current good practice (continuous across all cavities, suitably lapped and taped at all joints, junctions and service penetrations using proprietary "top hat" pre-formed units with integrity testing and independent validation).
 - All sub-wall block strengths to be 7.3 kN/mm².
 - Min. thickness of unreinforced strip/trench foundations. Wide reinforced foundations may be designed on a site specific basis.

75mm Structural concrete topping - for specification refer to house type specific beam and block floor designs.

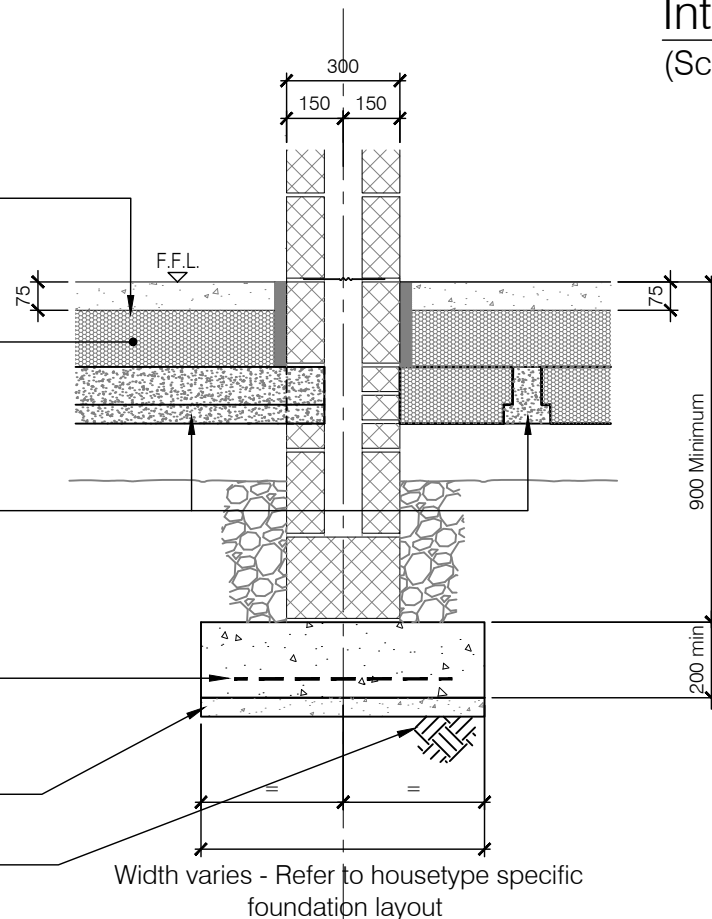
For DPM, vapour control layer, insulation and finishes refer to site specification.
 Gas membrane to specialists specification & details. Refer to general foundation note 6.

155mm Deep reinforced concrete floor beams - refer to house type specific beam and block floor designs for general arrangement and specification.

1 Layer B785 mesh in bottom (50mm cover). Nominal mesh required for sites with variable strata. Where formation strata is uniform in both strength and material across a plot mesh may be omitted TBC by the site specific geotechnical engineer/site investigation.

50 concrete blinding when reinforced

Footings to found in consistent, competent material. Any soft spots are to be removed and replaced with Grade GEN 1 (ST1 if site mixed) consistence class S3 concrete. Foundation inspection regime to be confirmed. Formation level of foundation is likely to comprise material that will deteriorate if exposed to wetting / drying cycles. Hence concrete blinding must be placed immediately after excavation.



Detail C
Party Wall / Ground floor Junction
 (Scale 1:20)

Strip Foundations

Strip Foundation Notes:

- Allowable ground bearing pressure in accordance with site specific Geo-environmental site investigation.
- Concrete mix for reinforced strip foundations - RC35

NOTE:

Sections are indicative only:

- For DPM and finishes refer to architects sections and details
- For gas protection requirements refer to gas specialists sections and details

Detail Specification for Minimum Foundation Depths and Strip Foundation Make up only



TITLE Foundations & Ground Floors A20

DRAWING Foundation Details - Strip

DRAWN BY DB DATE 16/09/22

CHECKED BY AH SCALE 1:20

ISSUE (05) DRAWING NUMBER SD010-C-001 REVISION A

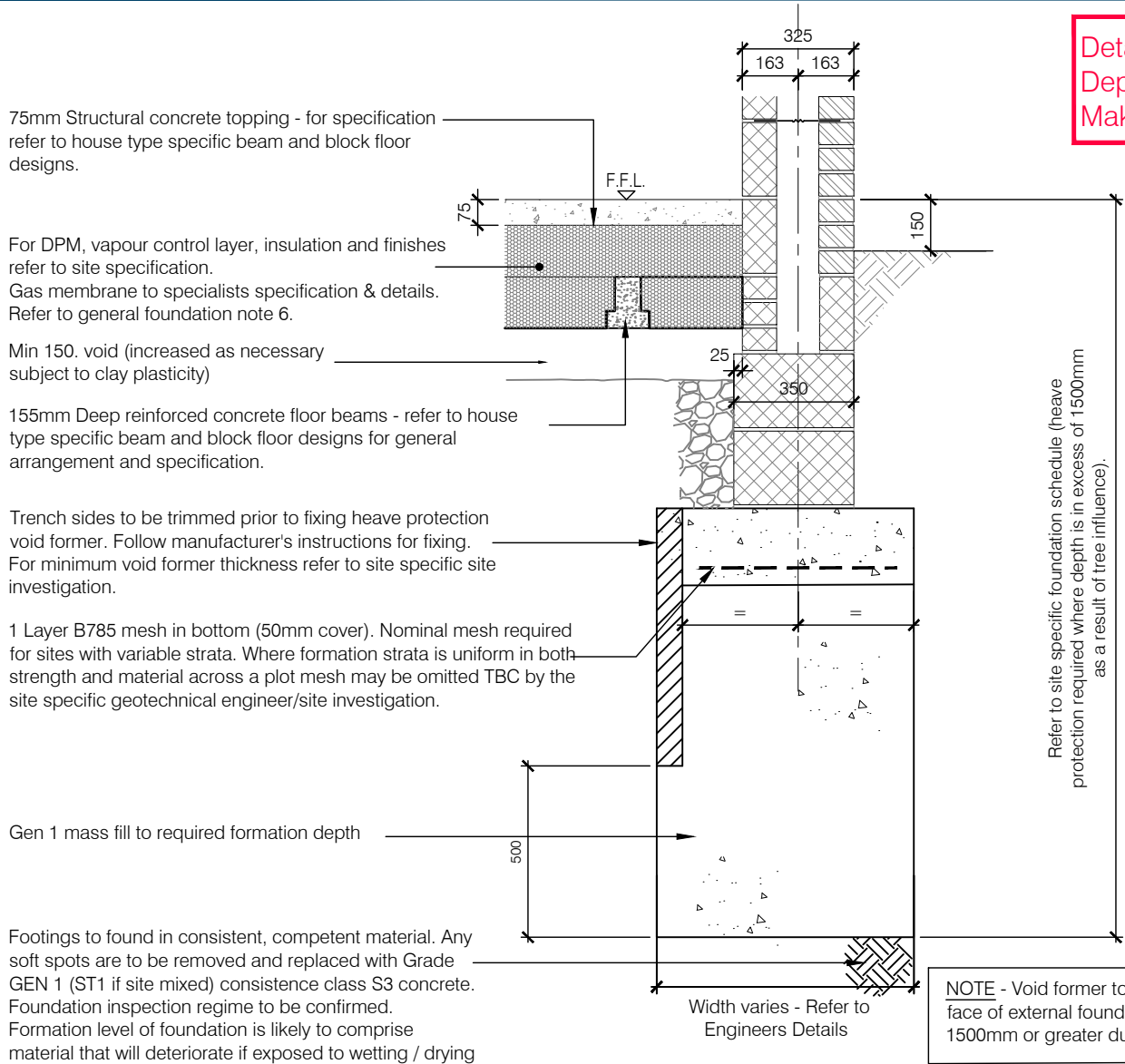
Revisions Notes Date
 A Details updated to reflect beam & block floor. 23.10.23

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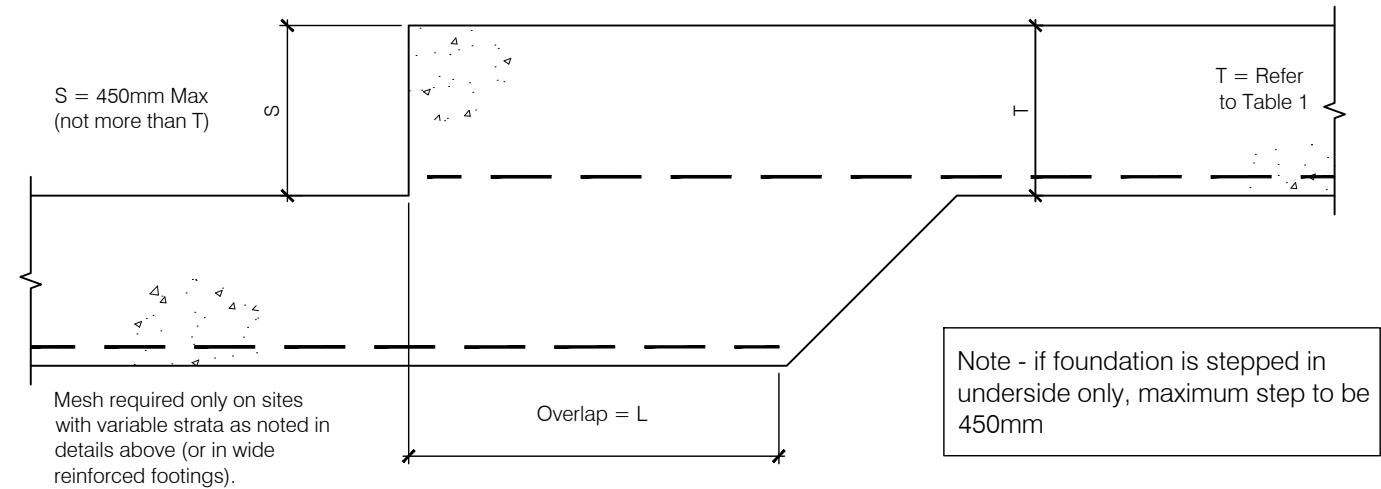


Detail Specification for Minimum Foundation Depths and Strip /Trench Fill Foundation Make up only

NOTE:
ALL HEAVE DETAILS TO BE
CONFIRMED BY ENGINEER
FOR EACH SITE

NOTE - Void former to be fixed to the internal face of external foundations only (where depth 1500mm or greater due to influence of trees).

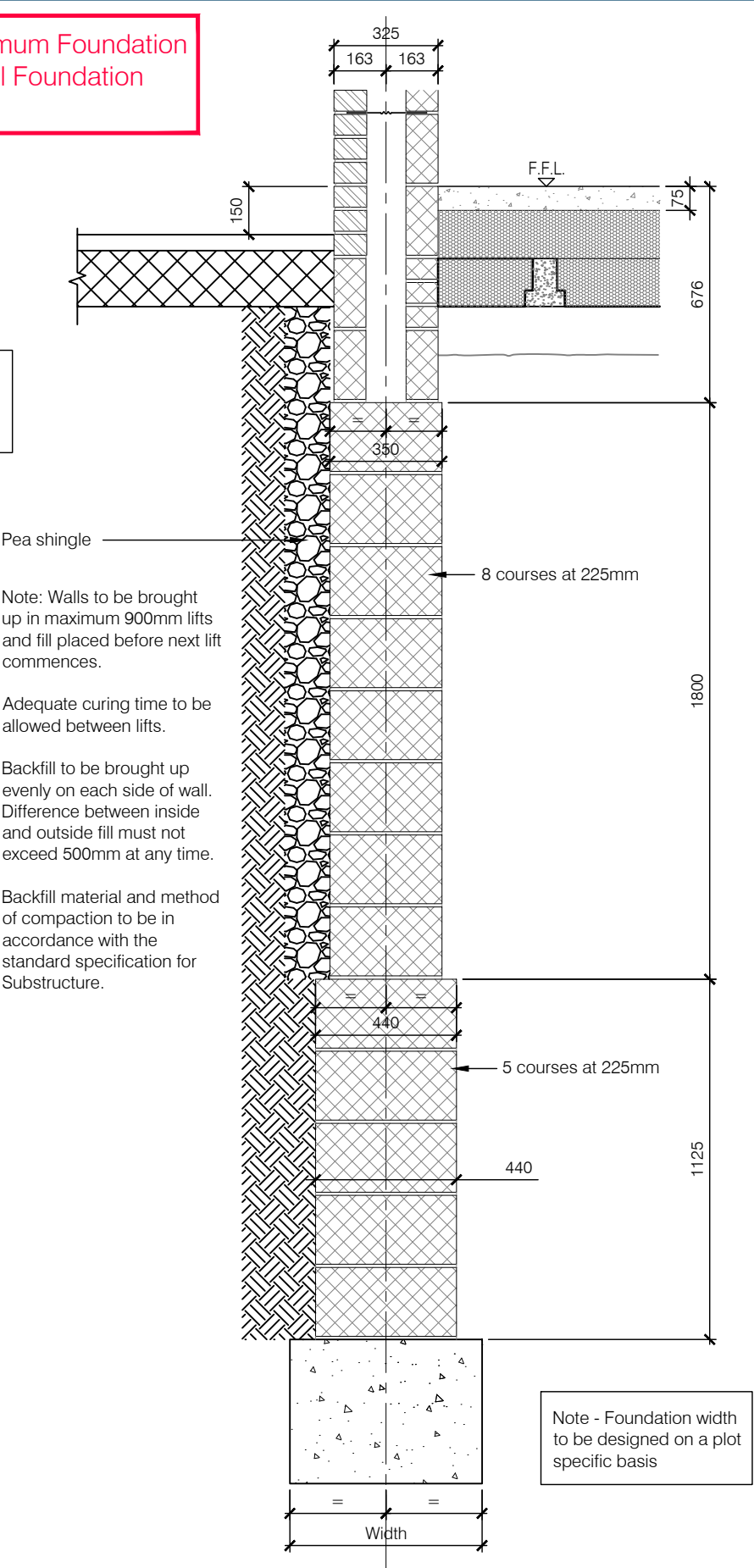
Detail D
External Wall / Ground floor Junction where
heave precautions are required for cohesive sites
(Scale 1:20)



Detail L - Strip/Trenchfill
Typical Detail for Step in Top and Underside of Foundation
(Scale 1:20)

Table 1: Foundation Overlap

	Strip Foundations	Trench Fill Foundations
The overlap 'L' should not be less than:	2 x S, or - T (maximum 450mm), or 300mm, whichever is largest.	2 x S, or - One metre, whichever is largest.



Detail H - Strip/Trenchfill
Deep Sub-wall Trench Detail where Proposed FFL/External
Ground Levels Are Significantly Higher than Existing Ground
Level
(Scale 1:20)

- NOTES
- General Foundation Notes:
- This drawing is to be read in conjunction with all relevant Architect's, Civil Engineering, M&E designer's, and Engineer's drawings.
 - DPM and finished shown indicative only. Refer to architects / story homes sections and details for exact specifications.
 - The details indicated on this drawing are in accordance with sites classified as CS1 when utilising NHBC's current guidance for assessing gas risks. Refer to the site specific site investigation. For sites outside of the above specification site specific details shall need to be sought.
 - All concrete to be a suitable for minimum class DC1 to satisfy design sulphate class DS-1 and ACEC aggressive chemical class AC-1 of BRE Special Digest 1 (2005) U.N.O. site specific site investigations must be reviewed for the required design chemical and design sulphate classes of concrete.
 - This drawing should be read in conjunction with the latest Geo-environmental report. Any discrepancies should be reported to the engineer at the earliest opportunity before work commences on site.
 - Membrane to gas specialist specification and details in accordance with the requirements and table 7 of BS 8485:2015, installed in accordance with manufacturers' instructions in line with current good practice (continuous across all cavities, suitably lapped and taped at all joints, junctions and service penetrations using proprietary "top hat" pre-formed units with integrity testing and independent validation).
 - All sub-wall block strengths to be 7.3 kN/mm².
 - Min. thickness of unreinforced strip/trench foundations. Wide reinforced foundations may be designed on a site specific basis.

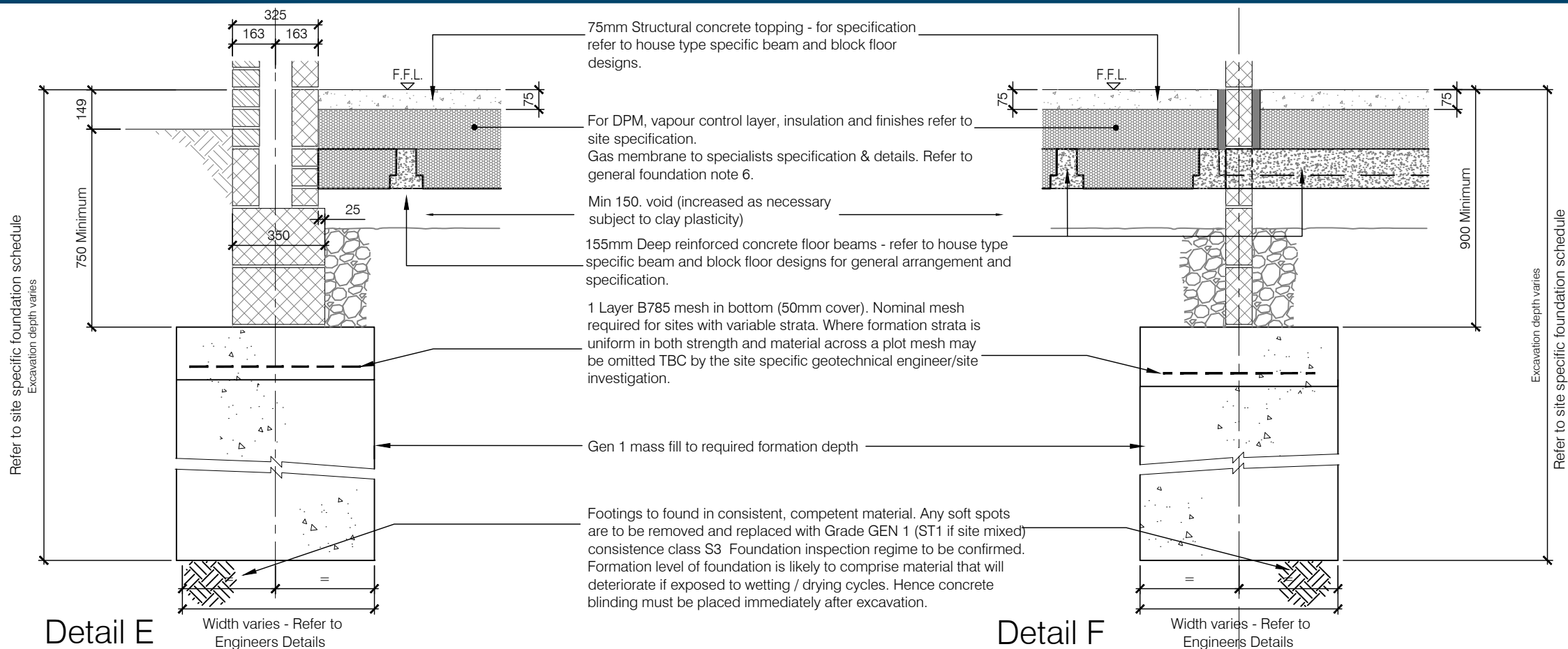


TITLE Foundations & Ground Floors A20

DRAWING Foundation Details - Strip / Trenchfill

DRAWN BY	DB	DATE	16/09/22
CHECKED BY	AH	SCALE	1:20
ISSUE	(05)	DRAWING NUMBER	SD010-C-002
		REVISION	A

Revisions	Notes	Date
A	Details updated to reflect beam & block floor.	23.10.23



Detail E

Typical External Wall Detail for Trench fill foundations

(Scale 1:20)

Detail F

Typical Internal Wall Detail for Trench fill foundations

(Scale 1:20)

75mm Structural concrete topping - for specification refer to house type specific beam and block floor designs.

For DPM, vapour control layer, insulation and finishes refer to site specification. Gas membrane to specialists specification & details. Refer to general foundation note 6.

155mm Deep reinforced concrete floor beams - refer to house type specific beam and block floor designs for general arrangement and specification.

1 Layer B785 mesh in bottom (50mm cover). Nominal mesh required for sites with variable strata. Where formation strata is uniform in both strength and material across a plot mesh may be omitted TBC by the site specific geotechnical engineer/site investigation.

Gen 1 mass fill to required formation depth

Footings to found in consistent, competent material. Any soft spots are to be removed and replaced with Grade GEN 1 (ST1 if site mixed) consistence class S3 concrete. Foundation inspection regime to be confirmed. Formation level of foundation is likely to comprise material that will deteriorate if exposed to wetting / drying cycles. Hence concrete blinding must be placed immediately after excavation.

Detail G

Typical Party Wall Detail for Trench fill foundations

(Scale 1:20)

Detail Specification for Minimum Foundation Depths and Trench Fill Foundation Make up only

Trench-Fill Foundations

Trench Fill Foundation Notes:

- Allowable ground bearing pressure in accordance with site specific Geo-environmental site investigation.
- Concrete mix for reinforced trench fill foundations - RC35

NOTE:

Sections are indicative only:

- For DPM and finishes refer to architects sections and details
- For gas protection requirements refer to gas specialists sections and details

NOTES

General Foundation Notes:

- This drawing is to be read in conjunction with all relevant Architects, Civil Engineering, M&E designer's, and Engineer's drawings.
- DPM and finished shown indicative only. Refer to architects / story homes sections and details for exact specifications.
- The details indicated on this drawing are in accordance with sites classified as CS1 when utilising NHBC's current guidance for assessing gas risks. Refer to the site specific site investigation. For sites outside of the above specification site specific details shall need to be sought.
- All concrete to be a suitable for minimum class DC1 to satisfy design sulphate class DS-1 and ACEC aggressive chemical class AC-1 of BRE Special Digest 1 (2005) U.N.O. site specific site investigations must be reviewed for the required design chemical and design sulphate classes of concrete.
- This drawing should be read in conjunction with the latest Geo-environmental report. Any discrepancies should be reported to the engineer at the earliest opportunity before work commences on site.
- Membrane to gas specialist specification and details in accordance with the requirements and table 7 of BS 8485:2015, installed in accordance with manufacturers' instructions in line with current good practice (continuous across all cavities, suitably lapped and taped at all joints, junctions and service penetrations using proprietary "top hat" pre-formed units with integrity testing and independent validation).
- All sub-wall block strengths to be 7.3 kN/mm².
- Min. thickness of unreinforced strip/trench foundations. Wide reinforced foundations may be designed on a site specific basis.



TITLE Foundations & Ground Floors A20

DRAWING Foundation Details - Trenchfill

DRAWN BY DB DATE 16/09/22

CHECKED BY AH SCALE 1:20

ISSUE (05) DRAWING NUMBER SD010-C-003 REVISION A

Revisions Notes Date

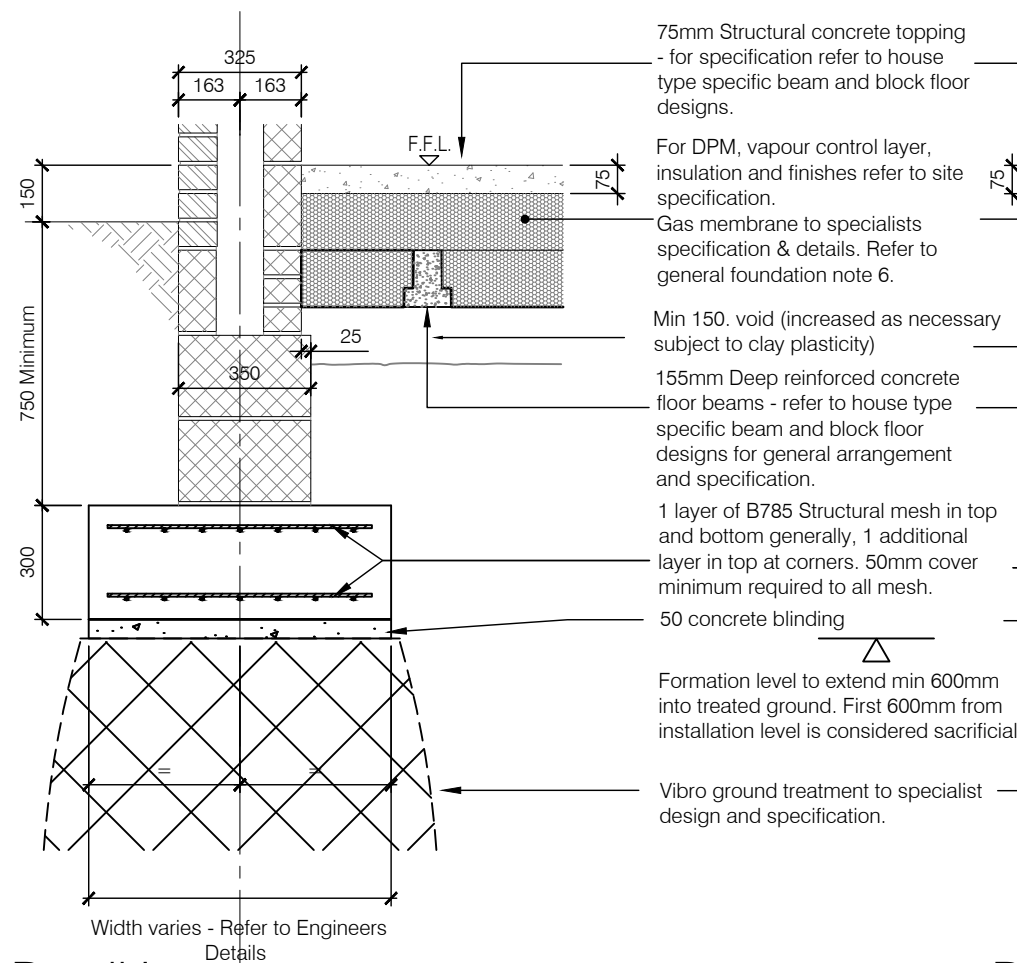
A Details updated to reflect beam & block floor. 23.10.23

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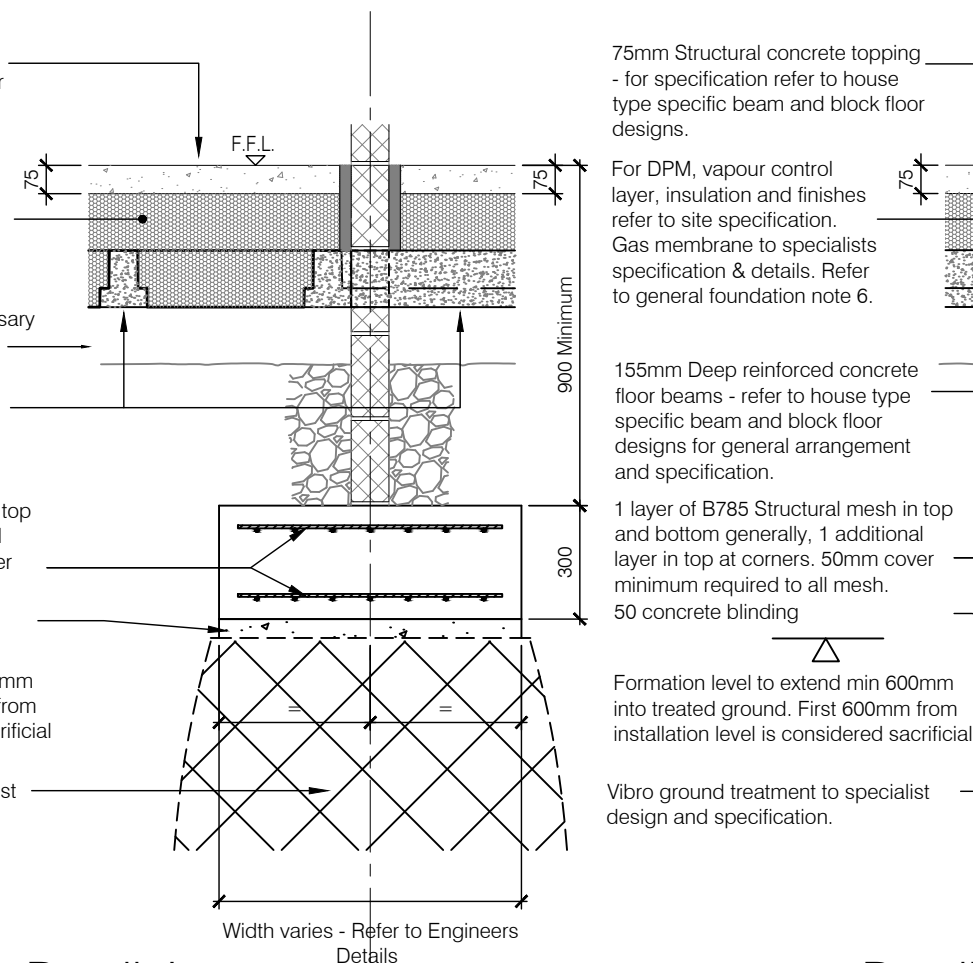
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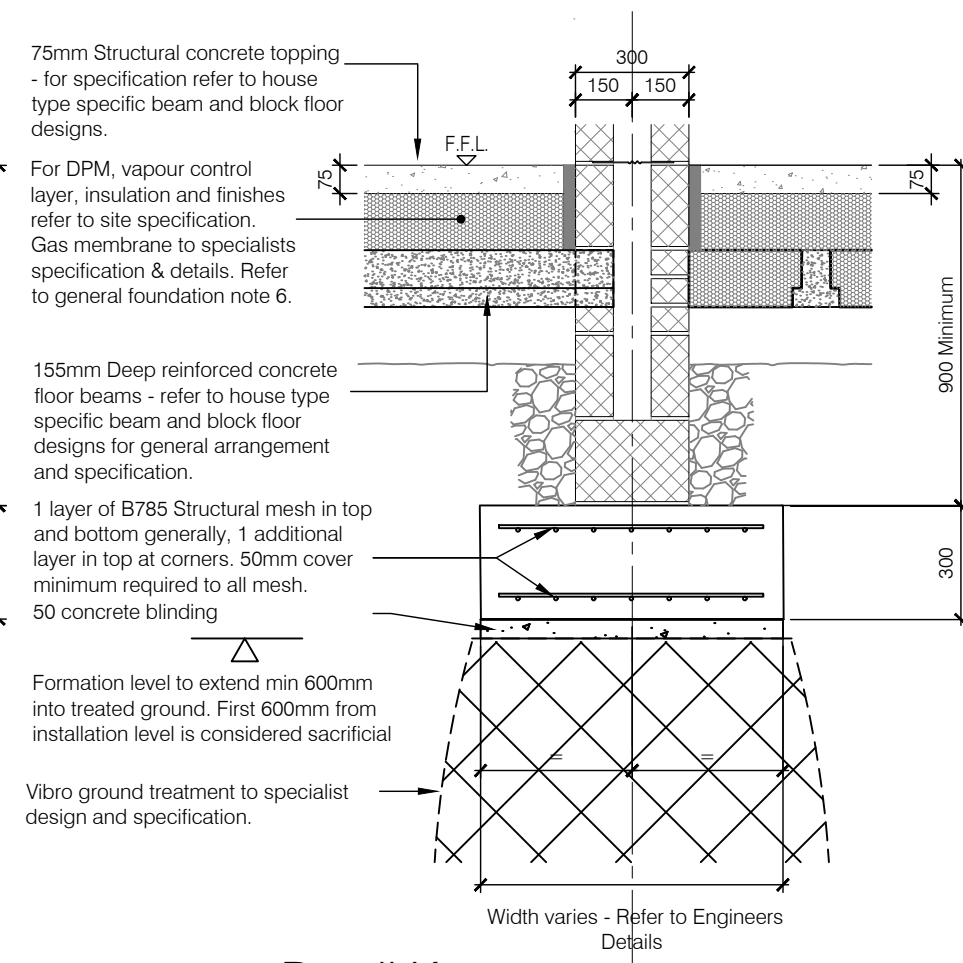
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Detail I
Typical External Wall Detail for RC Strip Footing on Vibro Stone columns
Minimum depth FFL to Formation Level = 1250mm
 (Scale 1:20)



Detail J
Typical Internal Wall Detail for RC Strip Footing on Vibro Stone Columns
Minimum depth FFL to Formation Level = 1100mm
 (Scale 1:20)



Detail K
Typical External Wall Detail for RC Strip Footing on Vibro Stone Columns
Minimum depth FFL to Formation Level = 1250mm
 (Scale 1:20)

Vibro case foundation width schedule	
Foundations sizing to 125KN/m ² safe bearing pressure (TBC by ground improvement specialist)	
Line Load (KN/m)	Min. foundation sizing (mm)
Up to 56 KN/m	600 x 300 deep
Up to 75KN/m	800 x 300 deep
Up to 85KN/m	900 x 300 deep
Up to 94KN/m	1000 x 300 deep
Up to 104KN/m	1100 x 300 deep
Foundations sizing in accordance with a maximum 2m span between adjacent vibro stone columns (suitability TBC by NHBC) Vibro columns should be placed at all corners and junctions.	

NOTE:
 Sections are indicative only:

- For DPM and finishes refer to architects sections and details
- For gas protection requirements refer to gas specialists sections and details

Detail Specification for Minimum Foundation Depths and Vibro Foundation Make up only

NOTE:
 For vibro foundations > 900 wide:

- Site specific design required for lateral bending.
- Vibro contractor to confirm a single row of treatment is suitable.

Vibro-stone column foundation solution

Vibro Stone Column Foundation Notes:

- This drawing is to be read in conjunction with all relevant Architect's, Civil Engineering, Mechanical and Electrical, and Engineer's drawings.
- All vibro stone columns to be designed to ground conditions and recommendations described within the site specific Geo-environmental Site Assessment.
- For vibro stone column (V.S.C.) layout refer to Subcontractors drawings and specification.
- Allowable ground bearing pressure assumed to be confirmed by ground improvement specialist.

NOTES

General Foundation Notes:

- This drawing is to be read in conjunction with all relevant Architect's, Civil Engineering, M&E designer's, and Engineer's drawings.
- DPM and finished shown indicative only. Refer to architects / story homes sections and details for exact specifications.
- The details indicated on this drawing are in accordance with sites classified as CS1 when utilising NHBC's current guidance for assessing gas risks. Refer to the site specific site investigation. For sites outside of the above specification site specific details shall need to be sought.
- All concrete to be a suitable for minimum class DC1 to satisfy design sulphate class DS-1 and ACEC aggressive chemical class AC-1 of BRE Special Digest 1 (2005) U.N.O. site specific site investigations must be reviewed for the required design chemical and design sulphate classes of concrete.
- This drawing should be read in conjunction with the latest Geo-environmental report. Any discrepancies should be reported to the engineer at the earliest opportunity before work commences on site.
- Membrane to gas specialist specification and details in accordance with the requirements and table 7 of BS 8485:2015, installed in accordance with manufacturers' instructions in line with current good practice (continuous across all cavities, suitably lapped and taped at all joints, junctions and service penetrations using proprietary "top hat" pre-formed units with integrity testing and independent validation).
- All sub-wall block strengths to be 7.3 kN/mm².
- Min. thickness of unreinforced strip/trench foundations. Wide reinforced foundations may be designed on a site specific basis.



TITLE Foundations & Ground Floors A20

DRAWING Foundation Details - Vibro-stone column

DRAWN BY DB DATE 16/09/22

CHECKED BY AH SCALE 1:20

ISSUE (05) DRAWING NUMBER SD010-C-004 REVISION A

Revisions Notes Date

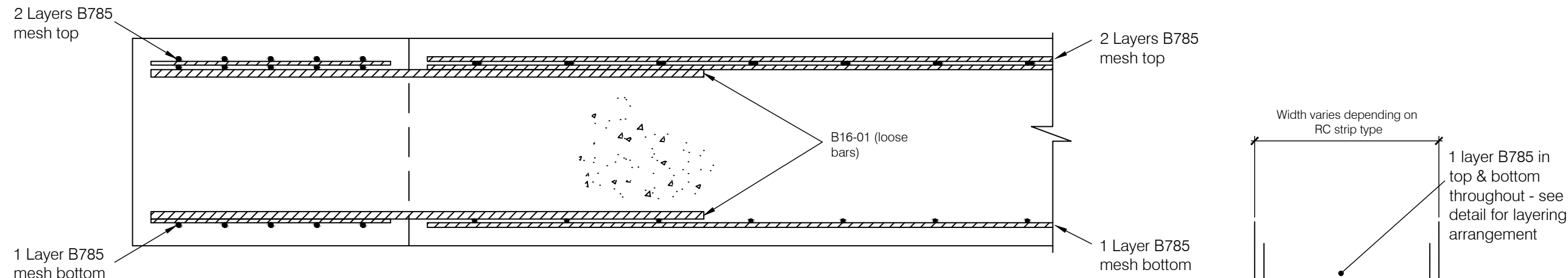
A Details updated to reflect beam & block floor. 23.10.23

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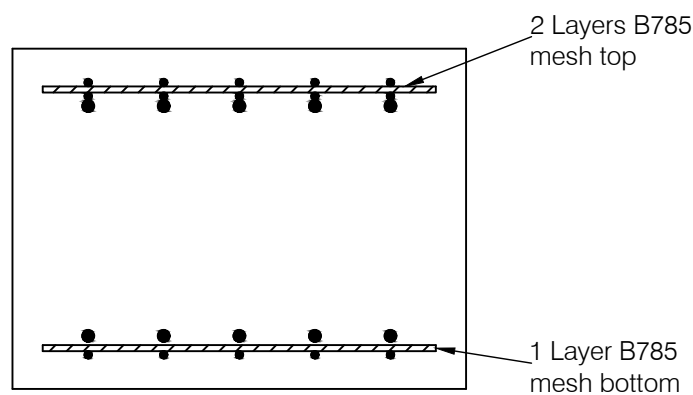
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Section A
(Scale 1:10)



Section B
(Scale 1:10)

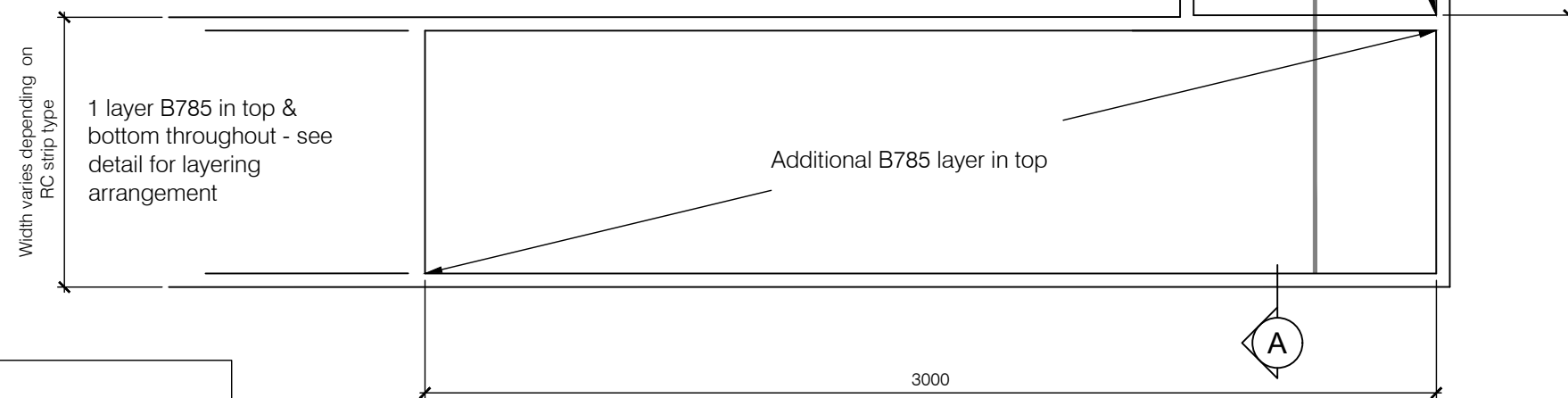
Foundations to have minimum reinforcement as below	
Foundation Width (mm)	Minimum no. of bars along the length of the footing
600	5
800	7
900	8
1000	9
1350	13

Vibro Strip Minimum Bar Number
Requirements

Scale 1:20

Detail Specification for Vibro
Foundation Make up only

B16-01-100 T4 & B4
(no of bars depends on beam width) (Length = 2xbeam width)



Typical Plan of
Reinforcement at Corners - Vibro case
(Scale 1:20)

NOTE:

- 50mm concrete cover required to all mesh reinforcement.

NOTES

General Foundation Notes:

- This drawing is to be read in conjunction with all relevant Architect's, Civil Engineering, M&E designer's, and Engineer's drawings.
- DPM and finished shown indicative only. Refer to architects / story homes sections and details for exact specifications.
- The details indicated on this drawing are in accordance with sites classified as CS1 when utilising NHBC's current guidance for assessing gas risks. Refer to the site specific site investigation. For sites outside of the above specification site specific details shall need to be sought.
- All concrete to be a suitable for minimum class DC1 to satisfy design sulphate class DS-1 and ACEC aggressive chemical class AC-1 of BRE Special Digest 1 (2005) U.N.O. site specific site investigations must be reviewed for the required design chemical and design sulphate classes of concrete.
- This drawing should be read in conjunction with the latest Geo-environmental report. Any discrepancies should be reported to the engineer at the earliest opportunity before work commences on site.
- Membrane to gas specialist specification and details in accordance with the requirements and table 7 of BS 8485:2015, installed in accordance with manufacturers' instructions in line with current good practice (continuous across all cavities, suitably lapped and taped at all joints, junctions and service penetrations using proprietary "top hat" pre-formed units with integrity testing and independent validation).
- All sub-wall block strengths to be 7.3 kN/mm².
- Min. thickness of unreinforced strip/trench foundations. Wide reinforced foundations may be designed on a site specific basis.



TITLE Foundations &
Ground Floors A20

DRAWING Foundation Details -
Vibro-strip details

DRAWN BY DB DATE 16/09/22

CHECKED BY AH SCALE 1:20

ISSUE (05) DRAWING NUMBER SD010-C-005 REVISION A

Revisions Notes Date
A Details updated to reflect beam & block floor. 23.10.23

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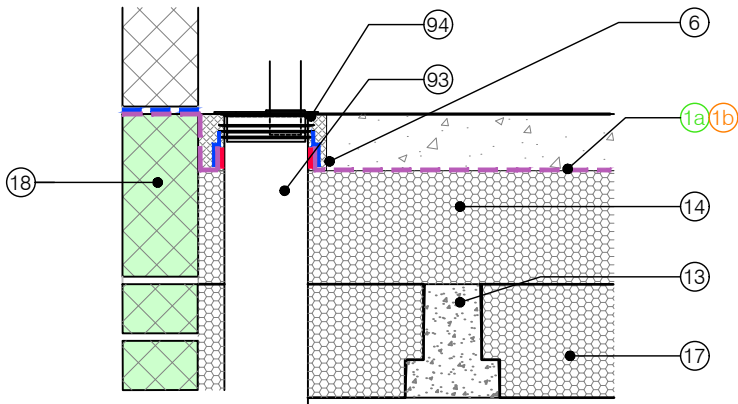
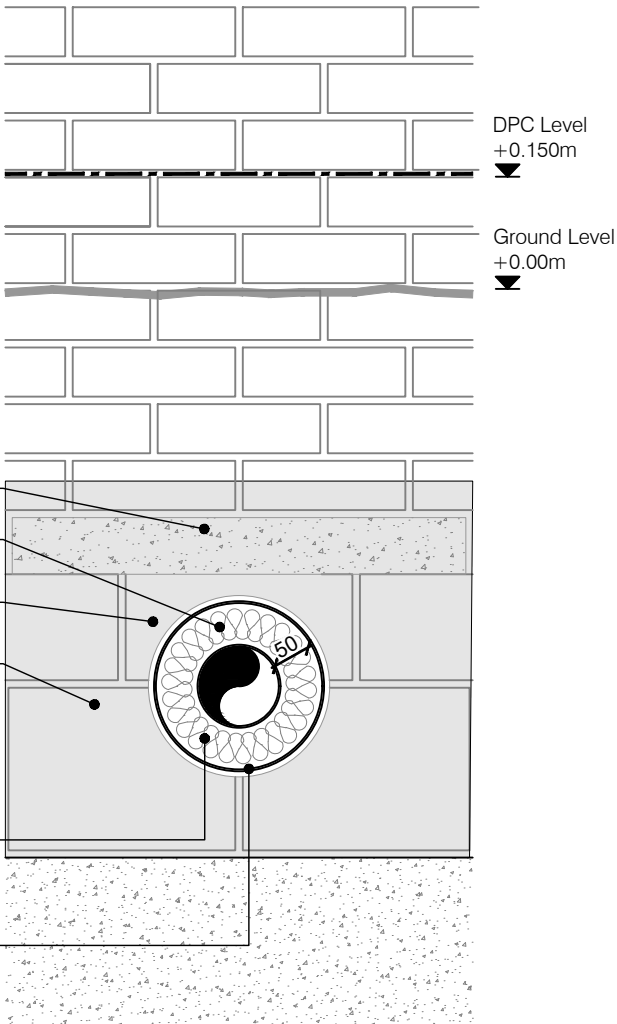
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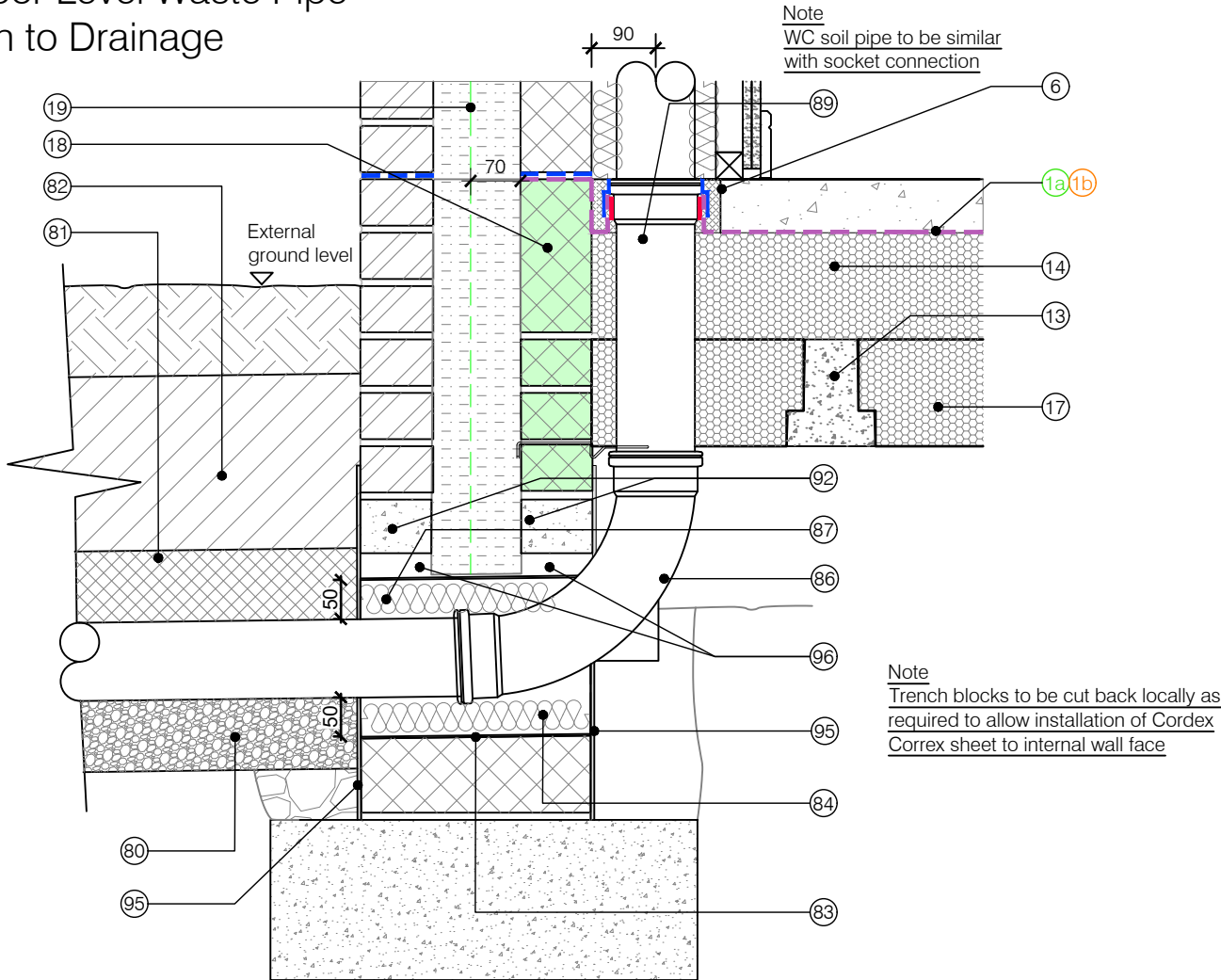


Pop-Ups to SVP and WC connections to have Osma Soil PVC-U ring seal joint single socket finished at floor level and capped off prior to pouring concrete.
Pop-Ups to Sink and WB wastes to have plain pipe and Osma Drain Adaptor-waste-BN 110 x 40 DS finished at floor level and capped off prior to pouring concrete.

NOTE
SEE SD010-E-003 FOR DETAILS OF
WATERPROOFING/SEALING AROUND
SERVICE PENETRATIONS



Typical Floor Level Waste Pipe connection to Drainage



Svp Through Lynx Warmfloor

Gas Membrane Schedule			
NHBC Rating	Membrane	Jointing	Designation
CS2/Amber 1	Visqueen Low Permeability Gas Membrane (yellow) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015:A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Gas Resistant foil lap tape 75mmx50m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
CS3/Amber 2	See SD010-D001 - D014		
Basic Radon	Visqueen R400 Gas Membrane (red) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015 + A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Pro single sided tape 75mmx25m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
Full Radon	See SD010-D001 - D014		
REFER TO SITE SPECIFIC SITE ENGINEERS REPORTS FOR SPECIFIC PLOT GAS MEMBRANE/RADON REQUIREMENTS TYPICAL DETAILS ARE BASED ON VISQUEEN REQUIREMENTS AT TIME OF DRAUGHTING - ARRANGEMENT TO BE IN FULL ACCORDANCE WITH MANUFACTURERS DETAILS AT TIME OF INSTALLATION ALTERNATIVE MANUFACTURERS MAY BE USED SEE REGIONAL TECHNICAL TEAM FOR APPROVAL			

- NOTES
- 80 100mm min bed depth in usual soil conditions and 150mm in rock or hard conditions of 10mm single sized aggregate with no sharp edges (pea gravel) in accordance with BS EN 12620: 2015 and BS 8000-14: 1989 and Approved Document H Diagram 10b - Flexible Bedding Pipes. 150mm min wide sidefill to each side of pipe (regardless of pipe diameter) and placed evenly on both sides to avoid displacement
 - 81 Granular Fill (required when depth >2m or stones >40mm above pipe crown) Where the backfill above the pipe contains stones larger than 40mm or where the pipework is deeper than 2m in poor ground, the selected granular material (same specification as bedding material) must extend 100mm min above the pipe crown
 - 82 First 300mm backfill to be free from stones exceeding 40mm (unless granular material exceeds 100mm above the pipe crown), lumps of clay over 100mm, timber, frozen material and vegetable matter. Sidefill to be compacted and placed in layers no deeper than 300mm. Mechanical compacting should only be used when compacting backfill is over 450mm above the crown of the pipe
 - 83 225Ø PVC preformed sleeve providing a continuous duct through wall
 - 84 Fill void with mineral wool insulation to prevent entry of gas
 - 86 Polypipe Drain D/S Long Radius Bend - 87.5° Ref: UG412 (110Ø)
 - 87 Minimum 50mm space around pipe
 - 89 OsmaSoil PVC-U Ring Seal Joint Single Socket - 110Ø Must be capped off prior to pouring concrete
 - 92 Spanlite concrete lintel over opening
 - 93 110mm Polypipe PVC-U Drain pop-up - plain pipe.
 - 94 Osma eccentric drain adaptor -waste-BN 110 x 40DS at floor level for connection to 38mm dia sink or wb wastes
 - 95 Mask around pipework openings through external walls internally and externally with Cordek Correx 5mm twin walled polypropylene protection sheet or similar approved
 - 96 Gap between spanlite lintel and pre-formed sleeve filled with cut blocks/mortar or expanding foam to fill gap



TITLE
Foundations & Ground Floors A20

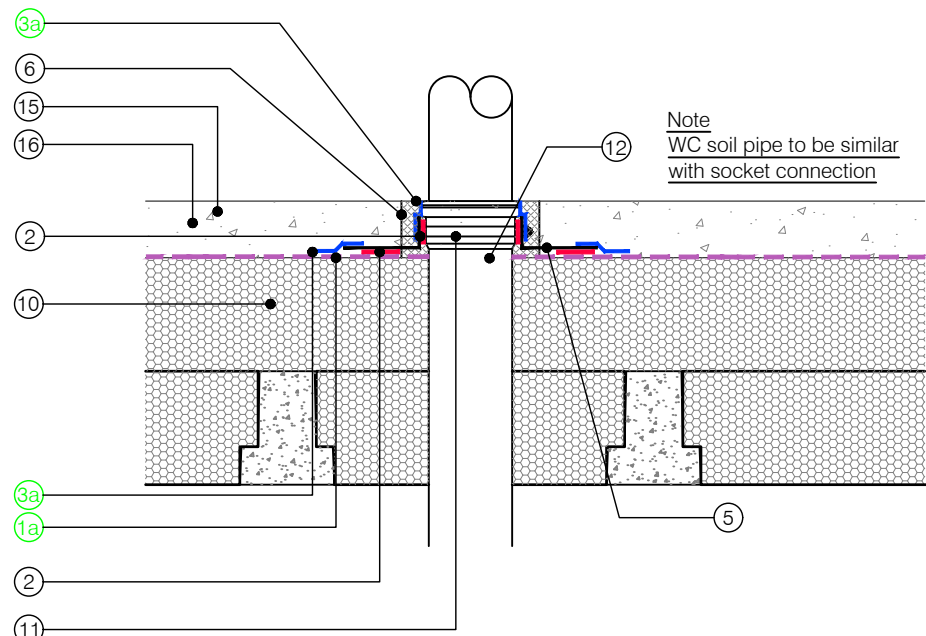
DRAWING
Drainage Through Floor Details

DRAWN BY	AA	DATE	16/09/22
CHECKED BY	AH	SCALE	1:10

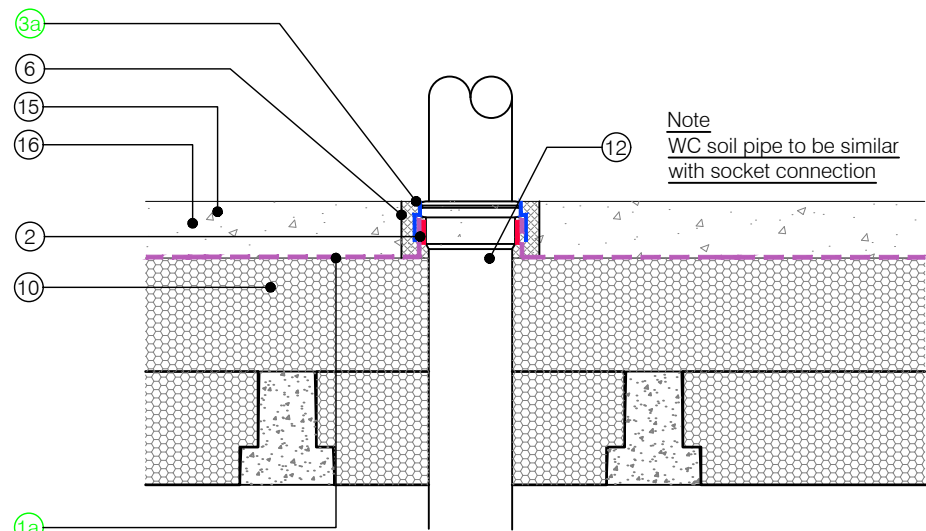
ISSUE	DRAWING NUMBER	REVISION
(05)	SD010-E-001	B

Revisions	Notes	Date
A	Green hatch Ultralite blockwork below DPC to full extent of insulated floor amended to 7.3N.	10.08.23
B	Line of very severe exposure partial fill insulation indicated - refer to site specification.	07.05.24

Floor Membrane Schedule			
NHBC Rating	Membrane	Jointing	Designation
CS2/Amber 1	Visqueen Low Permeability Gas Membrane (yellow) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015+A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Gas Resistant foil lap tape 75mmx50m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
CS3/Amber 2	Visqueen Gas Barrier (blue) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015 + A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Gas Resistant foil lap tape 75mmx50m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
Basic/Full Radon	Visqueen R400 Gas Membrane (red) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015 + A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Pro single sided tape 75mmx25m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
REFER TO SITE SPECIFIC SITE ENGINEERS REPORTS FOR SPECIFIC PLOT GAS MEMBRANE/RADON REQUIREMENTS TYPICAL DETAILS ARE BASED ON VISQUEEN REQUIREMENTS AT TIME OF DRAUGHTING - ARRANGEMENT TO BE IN FULL ACCORDANCE WITH MANUFACTURERS DETAILS AT TIME OF INSTALLATION ALTERNATIVE MANUFACTURERS MAY BE USED SEE REGIONAL TECHNICAL TEAM FOR APPROVAL			



Standard Detail SVP Through Warmfloor Insulated Flooring System (CS1 / Green) Top Hat Option



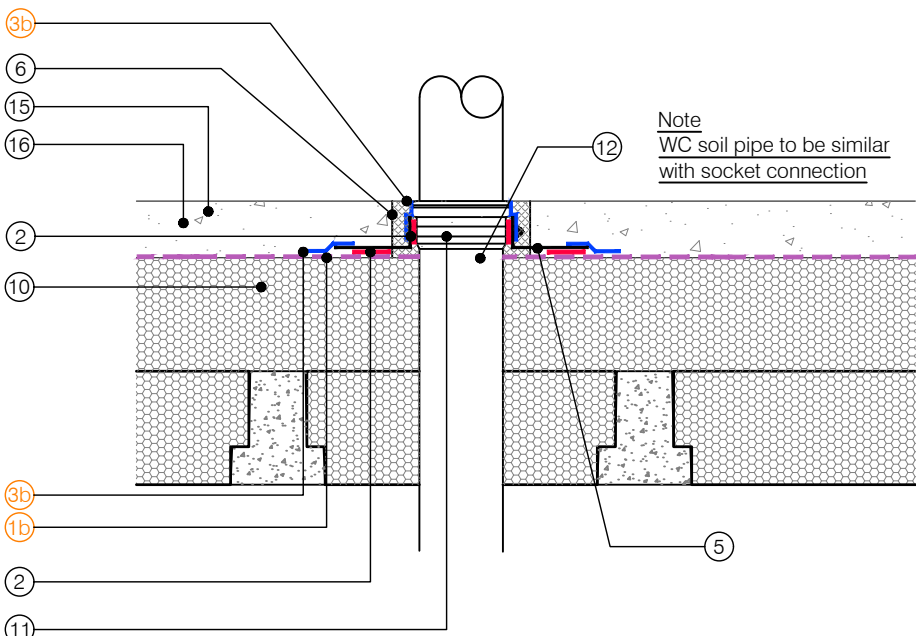
Standard Detail SVP Through Warmfloor Insulated Flooring System (CS1 / Green) DPM Option

Minimum Void Dimensions Under Suspended Precast Concrete Floors

Voids should be provided to accommodate movement due to heave forces acting on foundations and suspended ground floors as set out in the table below in accordance with NHBC (As indicated in Chapter 5.2.10, Ventilation).

Void Dimension Under Suspended Precast Concrete Floors	
Volume Change Potential in clay sub soils	Min. Void Depth (mm)
None	150
Low (10-20%)	200
Medium (20-40%)	250
High (40-60%)	300

NOTE: Void dimension is measured from the underside of the beam to the ground level and includes 150mm ventilation allowance.



Standard Detail SVP Through Warmfloor Insulated Flooring System (CS2 / Amber 1/CS3/Amber 2/Radon - See Table)

Pop-Ups to SVP and WC connections to have Osma Soil PVC-U ring seal joint single socket finished at floor level and capped off prior to pouring concrete.
Pop-Ups to Sink and WB wastes to have plain pipe and Osma Drain Adaptor-waste-BN 110 x 40 DS finished at floor level and capped off prior to pouring concrete.

- 15 Slab reinforcement to be either (dependant on topping):
Structural Concrete
- One layer of A142 mesh (to BS 4483:2005) with a characteristic yield strength of 500N/mm² set at mid-point to the depth of the concrete topping.
Self Compacting (Reinforcement dependant of supplier of self compacting concrete)
Steel Fibres
- Novomesh B&BA: Dosage rate 17.5kg/m³, steel flat end, steel fibres, 50mm long, 1mm diameter, tensile strength of 1150N/mm².
- Adfil SF86: Dosage rate 13.33kg/m³, 60mm long, 0.75mm diameter, modulus of elasticity of 200000N/mm², tensile strength of 1225N/mm².
Macro-Polymer
- Novomesh B&BA: Dosage rate 3.84kg/m³, continuously deformed, 60mm long, 0.56mm diameter, modulus of elasticity of 7000N/mm², tensile strength of 600N/mm².
- Durus Easy Finish: Dosage rate 3kg/m³, 40mm long, 0.7mm diameter (equivalent), modulus of elasticity of 6000N/mm², tensile strength of 470N/mm².
- 16 75mm Structural concrete topping to be either:
- Standard - C28/35 with maximum aggregate size 20mm and reinforcement selected from Note 11. Slump should be Class S3 (100 to 150mm) or S4 (for spot samples taken from initial discharge, 140 to 230mm). Aggregate to comply with BS EN12620: 2013.
- Self Compacting - C28/35 with maximum aggregate size 10mm and reinforcement selected from the options below. Slump flow class should be SF1 (550 to 650mm) or SF2 (660 to 750mm). The sand content should be greater than 45%. Aggregate to comply with BS EN12620:2013.

NOTES

- 1a 1200 gauge polythene DPM lapped under Visqueen DPC
- 1b Visqueen Gas Membrane, see adjacent Gas Membrane Schedule, level of protection specified by site development engineer. Gas Membrane is to be installed by a competent personnel with suitable qualifications in accordance with best practice, and guidance contained within BS8485 2015: A1 2019 - See adjacent Gas Membrane Schedule for level of protection.
- 2 Visqueen Pro 50mm x 10m double sided jointing tape positioned 50mm approx from membrane edge with min 150mm lap
- 3a Visqueen Pro single sided tape
- 3b Visqueen jointing/lap tape - see adjacent Gas Membrane Schedule table for level of protection
- 5 Visqueen Ultimate pre-formed top hat
- 6 Temporary wrap around SVP with perimeter insulation. Remove on completion and make good with concrete
- 10 Floor make up - Refer to SD010-A
- 11 Jubilee clip
- 12 OsmaSoil PVC-U Ring Seal Joint Single Socket - 110Ø
Must be capped off prior to pouring concrete

LYNX
PRECAST

Details are to be used for Lynx Precast "WarmFloor" Insulated Flooring system only.



Foundations & Ground Floors A20

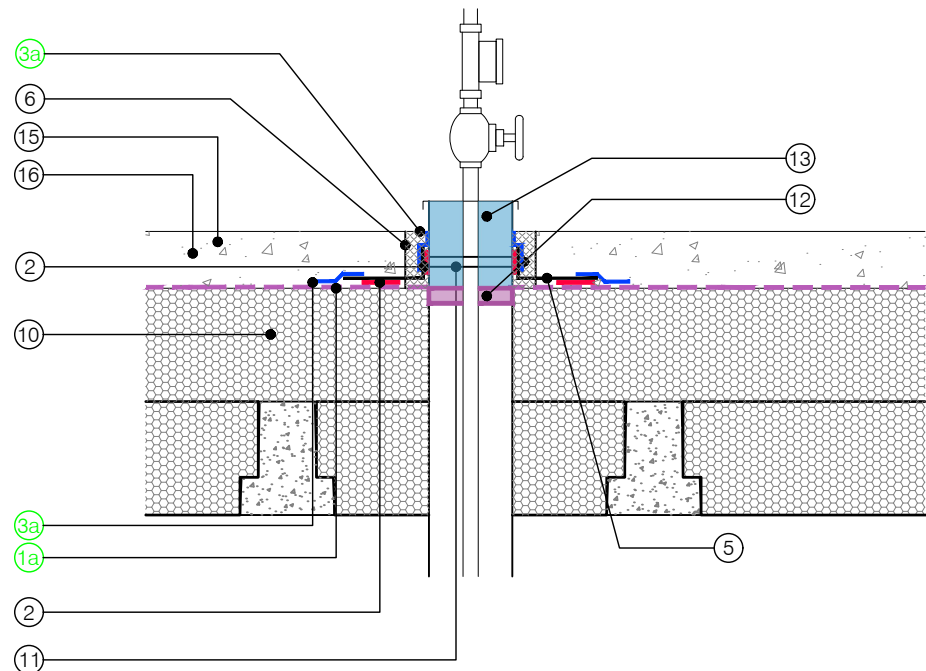
DRAWING
SVP Through Beam and Block Floor Details

DRAWN BY AA DATE 16/09/22

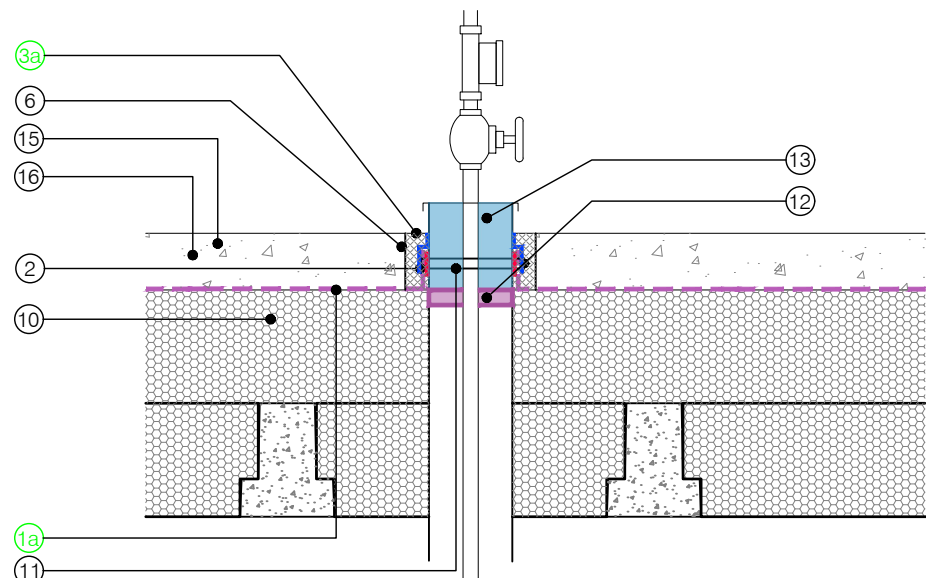
CHECKED BY AH SCALE 1:10

ISSUE (05) DRAWING NUMBER SD010-E-003 REVISION A

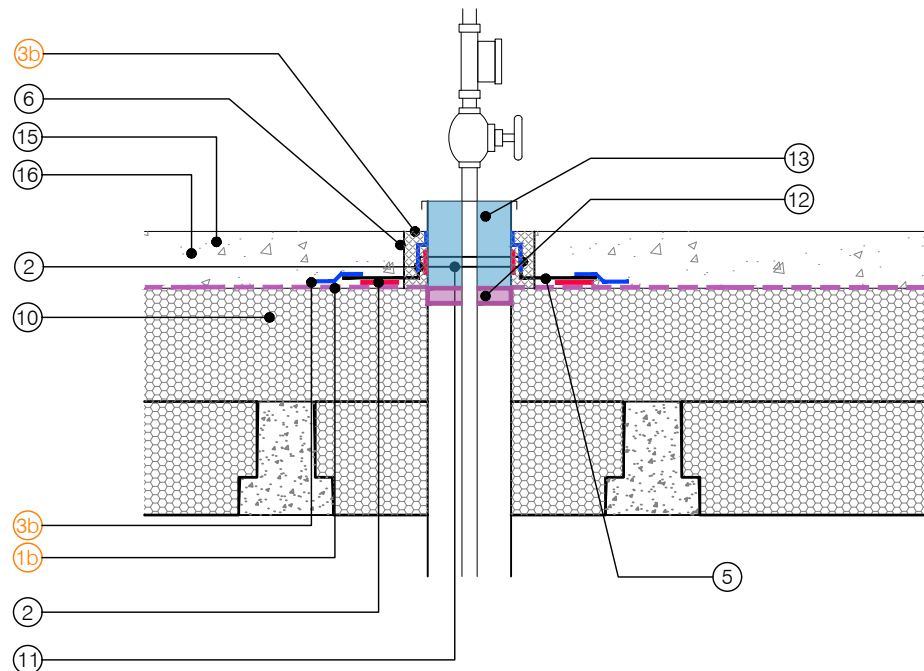
Revisions Notes Date
A Floor make up reference note added. 10.08.23



Standard Detail Water Duct Through Warmfloor Insulated Flooring System (CS1 / Green) Top Hat Option



Standard Detail Water Duct Through Warmfloor Insulated Flooring System (CS1 / Green) DPM Option



Standard Detail Water Duct Through Warmfloor Insulated Flooring System (CS2 / Amber 1/CS3/Amber 2/Radon - See Table)

- (15) Slab reinforcement to be either (dependant on topping):
Structural Concrete
- One layer of A142 mesh (to BS 4483:2005) with a characteristic yield strength of 500N/mm² set at mid-point to the depth of the concrete topping.
Self Compacting (Reinforcement dependant of supplier of self compacting concrete)
Steel Fibres
- Novomesh B&BA: Dosage rate 17.5kg/m³, steel flat end, steel fibres, 50mm long, 1mm diameter, tensile strength of 1150N/mm².
- Adfil SF86: Dosage rate 13.33kg/m³, 60mm long, 0.75mm diameter, modulus of elasticity of 200000N/mm², tensile strength of 1225N/mm².
Macro-Polymer
- Novomesh B&BA: Dosage rate 3.84kg/m³, continuously deformed, 60mm long, 0.56mm diameter, modulus of elasticity of 7000N/mm², tensile strength of 600N/mm².
- Durus Easy Finish: Dosage rate 3kg/m³, 40mm long, 0.7mm diameter (equivalent), modulus of elasticity of 6000N/mm², tensile strength of 470N/mm².
- (16) 75mm Structural concrete topping to be either:
- Standard - C28/35 with maximum aggregate size 20mm and reinforcement selected from Note 11. Slump should be Class S3 (100 to 150mm) or S4 (for spot samples taken from initial discharge, 140 to 230mm). Aggregate to comply with BS EN12620: 2013.
- Self Compacting - C28/35 with maximum aggregate size 10mm and reinforcement selected from the options below. Slump flow class should be SF1 (550 to 650mm) or SF2 (660 to 750mm). The sand content should be greater than 45%. Aggregate to comply with BS EN12620:2013.

NOTES

- (1a) 1200 gauge polythene DPM lapped under Visqueen DPC
- (1b) Visqueen Gas Membrane, see adjacent Gas Membrane Schedule, level of protection specified by site development engineer. Gas Membrane is to be installed by a competent personnel with suitable qualifications in accordance with best practice, and guidance contained within BS8485 2015: A1 2019 - See adjacent Gas Membrane Schedule for level of protection.
- (2) Visqueen Pro 50mm x 10m double sided jointing tape positioned 50mm approx from membrane edge with min 150mm lap
- (3a) Visqueen Pro single sided tape
- (3b) Visqueen jointing/lap tape - see adjacent Gas Membrane Schedule table for level of protection
- (5) Visqueen Ultimate pre-formed top hat
- (6) Temporary wrap around SVP with perimeter insulation. Remove on completion and make good with concrete
- (10) Floor make up - Refer to SD010-A
- (11) Jubilee clip
- (12) Foam Flange pushed below level of screed.
- (13) MD 111 Expanding resin poured into the duct after service is installed and connected.

LYNX
PRECAST

Details are to be used for Lynx Precast "WarmFloor" Insulated Flooring system only.



TITLE Foundations & Ground Floors A20

DRAWING Water Service Entry Through Beam and Block Floor Details

DRAWN BY	JB	DATE	13/09/23
CHECKED BY	AH	SCALE	1:10
ISSUE	(05)	DRAWING NUMBER	SD010-E-004
		REVISION	-

Revisions	Notes	Date

Floor Membrane Schedule			
NHBC Rating	Membrane	Jointing	Designation
CS2/Amber 1	Visqueen Low Permeability Gas Membrane (yellow) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015:A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Gas Resistant foil lap tape 75mmx50m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
CS3/Amber 2	Visqueen Gas Barrier (blue) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015 + A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Gas Resistant foil lap tape 75mmx50m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
Basic/Full Radon	Visqueen R400 Gas Membrane (red) installed by competent personnel with suitable qualifications in accordance with best practice and guidance contained within BS8485:2015 + A1:2019	Membrane joints to be overlapped by min150mm and bonded with Visqueen Pro double sided jointing tape 50mmx10m and sealed with Visqueen Pro single sided tape 75mmx25m. In demanding site conditions seal lap joints with Visqueen Ultimate GR lap tape 150mmx10m	All joints and laps are to be in strict accordance with Manufacturers specification and recommendations
REFER TO SITE SPECIFIC SITE ENGINEERS REPORTS FOR SPECIFIC PLOT GAS MEMBRANE/RADON REQUIREMENTS TYPICAL DETAILS ARE BASED ON VISQUEEN REQUIREMENTS AT TIME OF DRAUGHTING - ARRANGEMENT TO BE IN FULL ACCORDANCE WITH MANUFACTURERS DETAILS AT TIME OF INSTALLATION ALTERNATIVE MANUFACTURERS MAY BE USED SEE REGIONAL TECHNICAL TEAM FOR APPROVAL			

APPENDIX B

Solco Double Sided Butyl Tape

Description:

Solco Double Sided Butyl Tapes are preformed high performance polyisobutylene (PIB) based sealing tape with enhanced adhesive characteristics for more demanding applications where there are requirements for a high degree of bonding such as cavity trays and polythene membranes.

Solco Double Sided Butyl Tape has excellent adhesion to a wide range of substrates, with good UV resistance, and remains flexible throughout its service life.

Typical Uses:

- Bonding membranes to DPCs.
- Bonding and sealing cavity Trays & Top Hats.
- Bonding and sealing waterproof & gas protection membranes at overlaps.

Installation:

- Solco Single Sided Butyl Tape should be applied to surfaces at a temperature range of between +5°C and +40°C.
- For best performance, the surfaces should be clean, dry, and grease free.
- Apply tape to the lap area of the laid sheet starting approx 50mm from the membrane edge. The product should be unwound and lightly pressed into position leaving the release paper in place.
- Overlap adjoining membrane by 150mm.
- On forming the joint, the release paper is removed and the closing surface pushed firmly in place, Pressure is applied along the length of the joint and mechanically fixed if necessary.
- When the weather is cold, store tape in a warm, dry place until required.
- Installation is not recommended below 5°C.

Technical Data:

Property	Value
Life Expectancy	>25 years
UV Resistance	Excellent
Service Temperature	-40°C to +90°C
Joint Movement	Up to 15%
Dynamic Tensile Tension (Separation Rate of 100mm/min at 20°C)	20 N/cm ²
Dynamic Shear (Separation Rate of 200mm/min at 20°C)	22 N/cm ²
Gas / Vapour Permeability	
Methane Permeability [BS ISO EN 15105-1]	1.97 ml/m ² /day/atm
Carbon Dioxide Permeability [BS ISO EN 15105-1]	1.01 ml/m ² /day/atm
Radon Permeability [SP3873]	7.1x10 ⁻⁷ m ² /s
Water Vapour Permeability [BS 15106-3]	0.006 g/m ² /day



- Solventless formulation.
- Instant seal.
- Direct control over the quantity of sealant used in the joint.
- Environmentally friendly.
- Ease of use.
- Good adhesion on both faces to most building materials.
- High pumping resistance.

Storage:

- Keep rolls stored in a cool dry place.
- Shelf life of 24 months in ambient conditions.

Roll Sizes

50mm x 10m

100mm x 10m

Solco, Unit 51, Portmanmoor Road Industrial Estate, Ocean Park, Cardiff, CF24 5HB

Solco GR Foil Tape (BS8485)

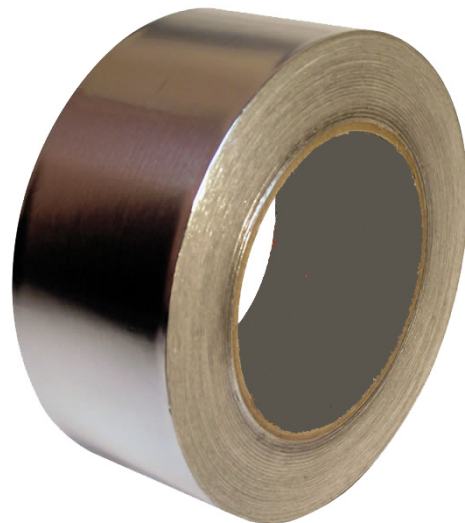
Description:

Solco Gas resistant Foil Backed Jointing Tape is a very strong laminated single sided tape for securing laps & joints. It can be used for bonding Solco Waterproofing and Gas Protection Membranes at overlaps and for bonding membranes to DPC's.

Technical Data:

Property	Value
Thickness	0.090 mm
Adhesion to Steel	16 N/mm
Tack Rolling Ball	50 cm
Tensile Strength	100 N/25mm
Elongation	20%
Service Temperature	-30°C to + 120°C
Application Temperature	5°C to +40°C
Methane Transmission Rate*	<0.20

*ISO 15105-1 AT 23°C, and 0% r.F. MI m²



- Complies with BS 8485:2015 + A1:2019.
- Protects against CO₂ and CH₄.
- Good Ageing Resistance.
- Simple Application.
- Low moisture transmission rate.
- Excellent sealing performance.

Applications:

Tape for sealing waterproofing and gas protection membranes at overlaps and for bonding membranes to DPCs at junctions with internal and external walls.

Installation:

- Ensure that surfaces are clean and dry.
- Apply tape equidistant over the bonded membrane lap.
- Apply pressure to the tape to ensure adhesion.
- When the weather is cold, store tape in a warm, dry place until required. Installation is not recommended below 5°C.

Declaration of Conformity:

BS EN8485+A1:2019: Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings - ISO 15105.

REACH SVHC Status:

- NO SHVC present according to candidates list of 20th June 2016.

Storage:

- Recommended shelf life of 12 months from date of despatch at the moderate temperature and humidity environment.

Solco, Unit 51, Portmanmoor Road Industrial Estate, Ocean Park, Cardiff, CF24 5HB

Solco GR Flexi Top Hat Units

Description:

Solco Gas Resistant Flexible Top Hat Units are made from a number of different membranes that are used for waterproofing and/or gas protection schemes. They are designed to form an effective seal where a pipe, duct or service penetrates a construction membranes. The top hat unit is selected to suit the membrane type being used, in order to provide continuous VOC, ground gas and/or damp proof protection.

Top Hat Units can be prefabricated to any diameter ranging from 20mm up to any size. The most common size used are for 110mm pipe, other sizes include : 55mm, 80mm, 110mm, 120mm, 135mm and 160mm. Jubilee clips are available with Top Hats up to 135mm & available as an extra on larger sizes.

The 110mm top hat is slightly tapered to allow for a smooth fitting over tape. Most other diameter come with a 90° up-stand.

Other bespoke designs are : Conical Top Hat, 45° Top Hat, Periscope Top Hat, Square Top Hat, Multi Entry Point Top Hat.



Std Top Hat Unit



Conical Top Hat Unit



45° Top Hat, Unit



Multi Entry Point Top Hat Unit



Periscope Top Hat Unit



Jubilee Clip



Square Top Hat Unit

Solcourse GR DPC

Description:

Solcourse Gas Resistant DPC is a flexible sheet comprising a mixture of three thermoplastic polymers and other additives, extruded into a sheet form with an embossed surface to assist mortar adhesion. Solcourse GR DPC provides protection against ingress of Hydrocarbons, resistance to Radon, Carbon Dioxide, and Methane gases as well as water vapour. This design feature will also provide a highly effective barrier for the lifetime of the building. Solcourse GR DPC is fully compliant to BS 8485:2015+A1:2019 and ISO 15105-1 test standard.

The prominent key on the Solcourse GR DPC creates superior mortar adhesion which is essential when being used in 3+ storey applications. Solcourse GR DPC is compliant to BS EN 14909:2012.

Solcourse GR DPC is suitable for use in walls as a horizontal, vertical or stepped gas-resistant damp-proof course (including cavity trays), in either solid or cavity walls of brick, block, stone or concrete

Installation:

Solcourse DPC must be installed in accordance with the guidelines laid out in BS 8215:1991, BS 8000: part 3, and BS 5628. It can be used in most common floor constructions and is installed in a similar manner to standard DPMs.

For external walls, the DPC should be applied 150mm above the adjoining surface and should be linked to a damp-proof membrane or gas barrier in solid floors. Solcourse DPC should be applied to a fresh bed of mortar, completely free of projections that may puncture the material or impede the DPC from lying flat.

Jointing:

Solcourse GR DPC's tri-polymer structure delivers excellent mechanical properties while maintaining outstanding resistance to Radon, Carbon Dioxide, and Methane gases as well as water vapour. This design feature will also provide a highly effective barrier for the lifetime of the building. Solcourse GR DPC is fully compliant to BS 8485:2015

A1:2019 and ISO 15105-1 test standard.

The prominent key on the Solcourse GR DPC creates superior mortar adhesion which is essential when being used in 3+ storey applications. Solcourse GR DPC is compliant to BS EN 14909:2012 and can be used in both vertical and horizontal applications.

As part of the extensive testing Solcourse GR DPC has undergone, it was subjected to accelerated life immersion tests. These tests, EN 14414 and EN 14415, require the membrane to be subjected to a range of challenging chemicals at 50°C and then retested to establish any effects these chemicals have had on the integrity of the membrane.

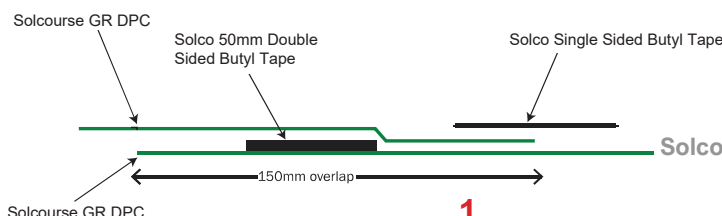
All service entry points must have airtight seals. Top hats and corner pre-forms must be sealed using Solco D/S Butyl Tape. As an alternative to using jointing tapes, the DPC can be welded providing this is done to a high standard by trained installers.



- Complies to BS 8485:2015+A1:2019.
- CE Marked.
- Outstanding water vapour resistance.
- Gas Resistant to VOC, Rn, CO₂, and CH₄ gases.
- Very high strength, puncture and tear resistance.
- Flexible at low temperatures and good mortar resistance.
- Suitable for site welding.
- Suitable for use on NHBC Amber 1 and 2 sites.

Roll Sizes

100mm to 1200mm x 20m



Solco, Unit 51, Portmanmoor Road Industrial Estate, Ocean Park, Cardiff, CF24 5HB

Technical Data:

Property	Test Method	Value
Thickness	EN 1849-2	0.80mm
Mass	EN 1849-2	0.77 kg/m ²
Tensile Strength - MD	EN 12311	24 N/mm ²
Tensile Strength - CD	EN 12311	22 N/mm ²
Tensile Elongation - MD	EN 12311	398%
Tensile Elongation - CD	EN 12311	446%
Joint Strength	EN 12317-2	520 N
Watertightness at 2 kPa	EN 1928	Pass
Resistance to Impact	EN 12691	660mm
Resistance to Static Loading	EN 12730	20kg
Resistance to Nail Tear - MD	EN 12310-1	725 N
Resistance to Nail Tear - CD	EN 12310-1	750 N
Durability - Heat Ageing	EN 1926	Pass
Durability - Chemical Resistance	EN 1847	Pass
Water Vapour Permeability	EN 1932	0.09 g/m ² /day
Reaction to Fire	EN 13501-1	F
Resistance to Low Temperature	EN 495-5	Pass (At -20°C)
Methane Permeability	EN 15105-1	33.9 ml (m ² /day/atm)
Radon Permeability*		6x10 ⁻¹² m ² /s
Chemical Resistance - Acidic	EN 14414-A	MD - 367% CD - 488%
Chemical Resistance - Basic	EN 14414-B	MD - 388% CD - 487%
Chemical Resistance - Solvents	EN 14414-C	MD - 388% CD - 518%
Resistance to Leaching - Hot Water	EN 14415-A	MD - 377% CD - 404%
Resistance to Leaching - Aqueous Alkaline	EN 14415-B	MD - 361% CD - 428%
Resistance to Leaching - Organic Material	EN 14415-C	MD - 338% CD - 449%
Water Vapour Transmittance	EN 14415-C	0.1 g/m ² /day

Characteristic Shear Strength	
Pre-Compression (N.mm ⁻²)	Characteristic Shear Strength (N.mm ⁻²)
0.2	0.14
0.6	0.34
1.0	0.52

Storage & Handling on Site:

Solcourse GR DPC is classified as non-hazardous (code of practice CP102 1973). The product is chemically inert and any acids or alkalis present in the subsoil will not affect the product. It is not recommended for use when exposed to sunlight and general outdoor weather conditions for long periods of time, and weathering will not occur when installed. Rolls should be stored on end and under cover and on a flat, level surface. Contact with organic solvents must be avoided.

The product is handled and cut using the same techniques as traditional DPCs. It retains sufficient flexibility when used at the lowest temperatures at which walls are normally built and does not become tacky in warm, ambient weather conditions. However, if stored at low temperatures, Solcourse GR DPC should be left in a warm place before use to improve handling.

Difficulties may occur when forming certain details, particularly when bending the product through two angles at the same time. In such cases, care must be taken to achieve a satisfactory seal, and, where necessary, preformed cloaks should be used. Care should be taken at temperatures below 5°C to avoid the risk of condensation on jointed surfaces, which may affect the efficiency of the self-adhesive tapes.

Solcourse GR DPC System Accessories

Solco Top Hats	Form an effective seal where a pipe, duct, or service penetrates Solco membranes.	Units
Solco Double Sided Butyl Tape	A double-sided synthetic butyl mastic tape, used for securing joints and laps in DPC's, Cavity trays & pre-formed Cloaks.	Rolls
Solco Single Sided Butyl Tape	A single-sided butyl tape for securing laps & joints.	Rolls
Solco Venting Accessories	Allows the effective venting of gas from beneath a building.	Units
Solco Int / Ext Corners	Preformed units that ensure protection at corners.	Units
Solco DPC Fixing Strips	Used to surface fix Solcourse DPC cavity trays and preformed cloak units to the inner leaf.	Packs
Solco DPC Fixing Strips (Masonry)	Used for surface fixing Solcourse high performance DPC systems to any solid internal substrate such as brick, stone, and concrete.	Packs
Solco DPC Fixing Strips (Insulation)	Used for surface fixing to the rigid insulation of composite inner skins.	Packs
Solco HP Insulation Fixing	For applications requiring high pull out resistance, or for fixing to poor quality base materials.	Packs
Solco Insulation Panel Fixing	Recommended for securing rigid insulation, EPS, High-Density Rockwool and Composites, to solid base materials.	Packs
Solco Insulation Retaining Washers	Used in conjunction with screws to secure insulation to timber, sheet steel, and other non-standard base materials.	Packs
Solco DPC Blanking Plug	Offers a solution to the problem of sealing holes drilled in bricks and mortar for the installation of DPC Chemicals.	Packs
Solco Soft Washer Fixing	For securing Solco drainage & waterproof applications to concrete etc by hand nailing or shot-firing.	Packs
Solco Membrane Fixing Plugs	Used in damp proofing applications to secure the specialist membranes to the base material - usually brickwork and concrete.	Packs
Solco DPC Joint Support System	Polypropylene Support Boards used in conjunction with Solco Butyl DPC Jointing Tape.	System

Solsheet GR Self-Adhesive Membrane

Description:

Solsheet GR Self-Adhesive Membrane is a 1.5mm thick preformed, cold applied, waterproofing system, compatible with concrete, smooth brickwork, and blockwork or screeded substrates and is resistant to those chemicals likely to be present in normal service conditions.

Solsheet GR Self-Adhesive Membrane is manufactured from an aluminium and cross-oriented HDPE film laminated to a layer of rubber modified bitumen adhesive. The advanced backing film suppresses Methane, Carbon Dioxide, and Radon gases. The membrane also offers good conformability for site application.

Solsheet Gas Resistant Self-Adhesive Membrane conforms to the requirements of BS:8485 and BS:8102. Substrates should be primed with Solseal HP Primer prior to application. Solsheet Gas Resistant Self-Adhesive Membrane can be used with Solcourse GR DPC and other Solshield Gas Membranes

After installation, the membrane should be covered as soon as possible with a cementitious screed or similar protective layer.



- **Roll Dimensions:** 1m x 20m (20m²/roll).
- **Roll Weight:** 34kg.

Features:

- Resistant to Rn, CH₄, CO₂, and Hydrocarbon Vapours.
- Cross-laminated film – provides dimensional stability, high tear strength, puncture, and impact resistance.
- Polymer modified bitumen coating.
- Cold applied – no heating via flames or hot bitumen on site.
- Flexible – will accommodate minor settlement and shrinkage.
- Comprehensive range of accessories and ancillary products.
- Full design and on-site technical support.
- Specification compliant with BS 8102:2022, BS8485:2015+A1:2019, and EN ISO 15105-1.
- CE Marked.
- Non-hazardous and resistant to dilute acids and alkalis.
- Compliant with NHBC Standards.
- Easy Application.
- Provides high-performance protection against the surface and groundwater and soluble salts such as chlorides, sulfates, alkalis, and acids.

Typical Uses:

For general waterproofing where gas protection is required:

- Internal and external tanking of underground structures.
- Land-fill sites and specific geographical locations.
- Car parks and retaining walls.
- Subways and lift shafts.

Substrate Compatibility:

- Wood.
- Brick.
- Concrete.
- Metal.
- Other construction materials.

Solco, Unit 51, Portmanmoor Road Industrial Estate, Ocean Park, Cardiff, CF24 5HB

Technical Data:

Property	Test Method	Value
Thickness (Total Thickness)	EN 1849-1	1.5mm
Thickness (Backing Thickness)	EN 1849-1	0.1mm
Thickness (Adhesive)	EN 1849-1	1.4mm
Mass per Unit Area	EN 1849-1	1.3 kg/m ²
Resistance to Static Load	EN 12730	< 5 kg
Tensile Properties	EN 12311-1	Transverse - 230 N/50mm, 200% Longitudinal - 230 N/50mm, 180%
Watertightness to Liquid Water	EN 1928	Watertight at 2 kPa
Durability of Watertightness (Against Artificial Ageing)	EN 1928	Watertight at 2 kPa
Durability of Watertightness (Against Chemicals)	EN 1928	Watertight at 2 kPa
Resistance to Tear (Nail Shank) (Trans. / Long.)	EN 12310-1	140 N / 150 N
Impact Resistance	EN 12691	200mm
Low Temperature Flexibility	EN 1109	-25°C
Joint Strength	EN 12317-1	Transverse - 160 N Longitudinal - 170 N
Water Vapour Transmission	EN 1931	0.22 g/m ² /24hrs
Reaction to Fire	EN 13501-1	Pass
Ignitability	BS EN ISO 11952-2	Pass
Fire Rating	EN 13501-1	E/EFL
Storage Temperature Range		+5°C to 35°C
Application Temperature Range		+5°C to +35°C
Service Temperature Range		-20°C to +80°C
Gas Transmission Rate	ISO 15105-1	CH ₄ (single layer and joint): <10 ml/m ² /day CO ₂ (single layer and joint): <10 ml/m ² /day

Storage:

- The membrane rolls must be stacked on end and stored in dry, well-ventilated buildings, out of direct sunlight, or other major sources of heat.
- Storage conditions should be adjusted before application to bring the temperature of the rolls to within the relevant specified application range.
- The stock should be rotated on a first in/first out basis.
- Solsheet GR Self Adhesive Membrane is classified as non-hazardous (code of practice CP102 1973). The product is chemically inert and any acids or alkalis present in the subsoil will not affect the membrane.
- It is not recommended for use when exposed to sunlight and general outdoor weather conditions for long periods of time. Weathering will not occur when installed.
- Rolls should be stored undercover.
- Quality control during the laying of the membrane is extremely important.
- The membrane should be protected either through the use of temporary boarding over its whole area or the immediate laying of the concrete slab.

Installation:

Surface Preparation:

- All surfaces should be smooth, clean, and dry. Loosely adhering material and sharp protrusions should be removed by mechanical means.
- Concrete or renders should be allowed to dry before applying Solsheet membranes.

Priming:

All vertical surfaces should be primed using Solseal HP Emulsion/Primer. Horizontal surfaces do not require priming where the membrane is covered with a screed, floor slab, etc. Priming should be carried out as follows:

1. Roll can well before use.
2. Apply at the rate of approximately 2m²/L. Only prime the area which is to be covered with Solsheet within the next 4 hours. Allow to dry for at least 1 hour until touch dry. Keep free from dust.
3. On very porous surfaces, use two coats of primer.

Application:

- Internal angles must always be provided with an adequate sand/cement fillet.
- After priming as previously described a 300mm wide reinforcing strip of Solsheet must be applied with 150mm on either side of the centre of the fillet.
- External angles or corners must be provided with a 25mm x 25mm splay and this covered with a 300mm wide strip of Solsheet, applied equidistant from the centre of the splay.

Horizontal Membrane:

- This should preferably be laid prior to the application of the vertical membrane, adequately protected from damage by a minimum 25mm screed or protection board, with the membrane bonded to the vertical surface at least 200mm above the top of the screed so that the vertical Solsheet can be overlaid.
- If it is not possible to apply the screed over the membrane before the application of the vertical membrane, full and adequate protection must be given to the horizontal membrane to prevent damage.

Vertical Membrane:

- Cut off the appropriate length of membrane, then starting at the top of the area to be waterproofed, peel off at least 200mm of release sheet and bond the Solsheet firmly to the surface, tucking the end of the material into the appropriate DPC or chase.
- Gradually peel off the remainder of the release sheet downwards, at the same time rolling the material against the surface until the bottom of the wall is reached. At the base, the vertical membrane must
- overlap the horizontal membrane by at least 100mm.
- All subsequent sheets must overlap the preceding sheet by 50mm at the edges and by 100mm at ends. Overlaps must be thoroughly rolled to ensure adequate bonding.

Backfilling:

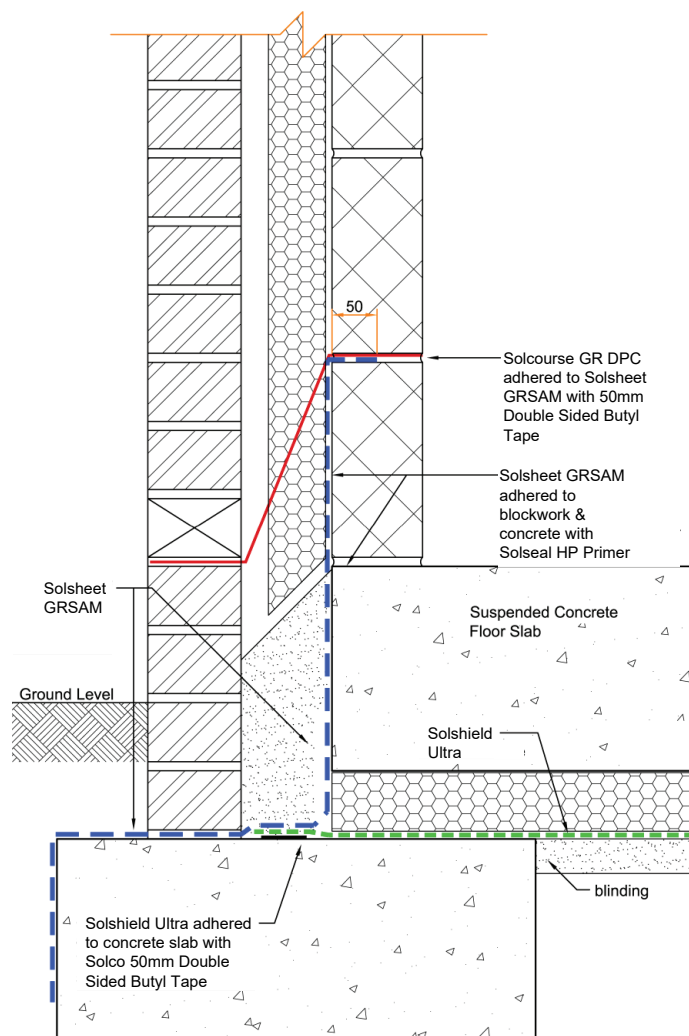
On vertical applications where an abrasive backfill is to be used the Solsheet membrane should be protected by a concrete outer skin, brick skin or Solco HD Protection Board, the latter being held in place by Solco 50mm Butyl tape.

Precautions:

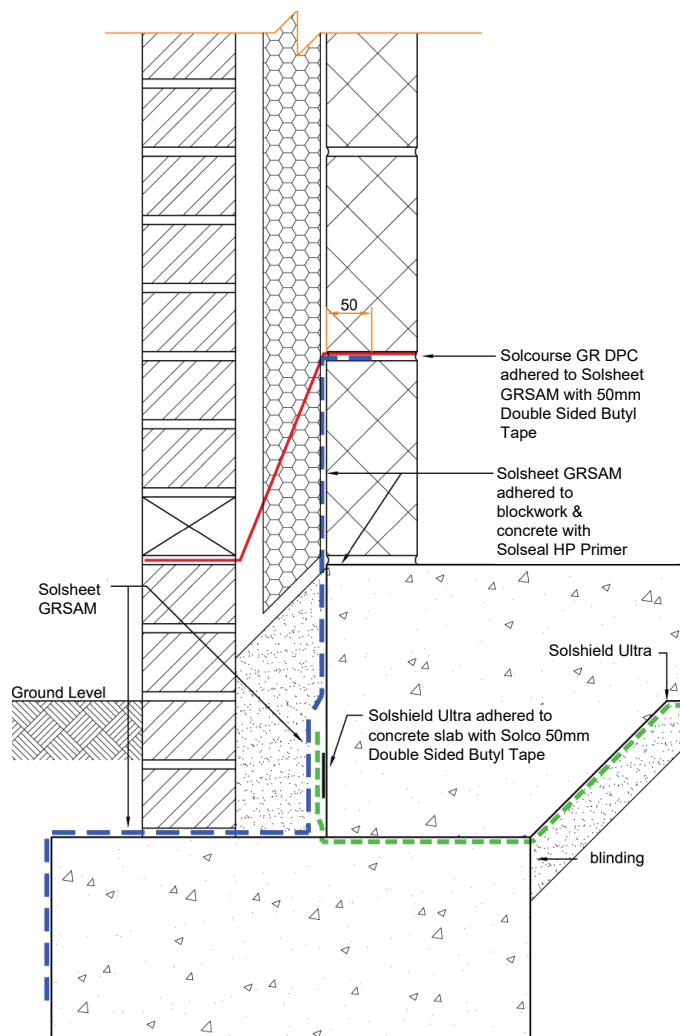
- Solsheet and Solseal HP Primer must not be applied when the surface temperature of the substrate falls below 5°C.
- When a brick-skin is applied to the face of the vertical Solsheet, care must be taken not to damage the membrane and a gap of 40mm should be left, which is filled with sand/cement mortar as work proceeds.
- Only sufficient Solsheet should be laid which can be protected as work proceeds.
- When areas of Solsheet are left exposed for any length of time ensure that all edges are held in place by battens.

Solsheet GRSAM System Accessories

Solseal HP Primer	A quick drying primer that promotes the adhesion of self-adhesive membranes. Used prior to the application of Solsheet Membranes.	Tubs
Solco HD Protection Board	A tough, reinforced flexible board, used to protect waterproofing membranes against damage by abrasive backfill materials and poured concrete.	Sheets
Solco Protection Fleece	Protects Solco membranes against mechanical or chemical damage. Can be used as a separating layer between membranes and overlying components.	Rolls
Solco XL Jointing Tape	A self-adhesive tape used for securing waterproofing membranes at overlaps edge and corner details.	Rolls
Solco Foil Tape	A single-sided tape for securing laps & joints.	Rolls
Solco Double Sided Butyl Tape	A double-sided synthetic butyl mastic tape, used for bonding waterproofing membranes. Also used for bonding SA membranes to DPCs and fixing other accessories.	Rolls
Solco Top Hats	Form an effective seal where a pipe, duct, or service penetrates Solsheet membranes.	Units



**Typical Slab Edge Detail (Suspended)
Standard Construction**



**Typical Slab Edge Detail (Ground Bearing)
Standard Construction**

Please contact our Technical department for project specific application details

Solco, Unit 51, Portmanmoor Road Industrial Estate, Ocean Park, Cardiff, CF24 5HB

Solshield Ultra Gas Barrier

Description:

Solshield Ultra Gas Barrier is a multi-layer low density polyethylene (LDPE) gas barrier and damp-proof membrane reinforced with a polypropylene grid with an integral aluminium foil. The membrane is designed for use in concrete ground floors, above and below slab not subject to hydrostatic pressure.

Solshield Ultra protects buildings against Moisture, Radon, Carbon Dioxide, and Methane from the ground.

Air & Moisture protection system.

Resistance to puncture - the membrane has a strong resistance to puncture and on smooth surfaces will not be damaged by foot/site traffic.

Durability - the membrane remains effective against the ingress of water and water vapour, will restrict the ingress of radon, methane, and carbon dioxide during the lifetime of the flooring construction in which it is installed.

Compliance:

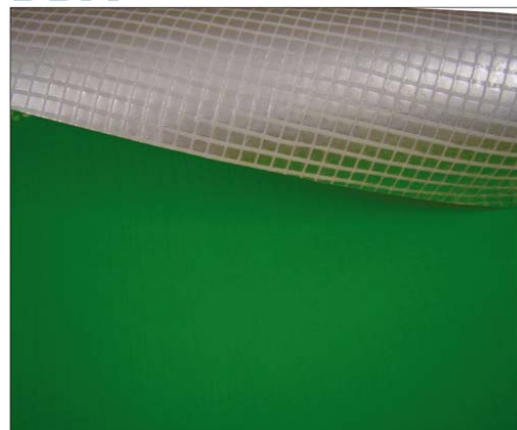
- NHBC Standards 2019, Chapters 4.1/5.1.
- CE Marking Standard EN13967:2012
- BS 8485:2015+A1:2019.
- CP 102:1973, Section 2.
- BS8000-4:1989.
- BBA Certificate No. 20/5737.

General:

- Solshield Ultra Gas Membrane should not be installed at temperatures below 5°C, to prevent the risk of surface condensation.
- The membrane must be installed and fixed in accordance with the relevant clauses in BRE Report BR 211:2015, and guidance given in BS 8485:2015+A1:2019.
- The membrane should be installed on a sand blinding layer, Solshield P30 protection fleece, or a smooth concrete float finish. In order to provide a continuous barrier across the cavity, Solshield Ultra Gas Barrier should be taken through the blockwork and incorporated below the damp proof course cavity tray in the outer leaf.
- Solshield Ultra Gas Membrane is suitable for installation with:
 - Beam and block floor application with 150mm clear void in an Amber 2 category projects.
 - Reinforced raft foundation and in situ suspended slab, providing the membrane is laid above the ground and not in direct contact with any source of hydrocarbon/VOC vapour.
- Long periods of exposure to ultraviolet light will reduce the effectiveness of the membrane.

Venting:

- Solshield Ultra can be used on site where passive or active ventilation is required.
- Solshield Geocomposite Drainage & Venting Mat should be used in conjunction with the relative vent connectors where required. These types of systems are designed on a bespoke site specific nature.
- Please contact us for our design advice.



- Complies with latest codes of practice as published by BRE, BSI & CIRIA.
- BBA Certified, NHBC Compliant & CE Marked.
- Suitable to protect against the ingress of Rn, CO₂, and CH₄.
- BS 8485:2015+A1:2019 Accordant.
- Suitable for use as gas protection for NHBC Green, Amber 1, and Amber 2 site situations.
- High resistance to puncture.
- Also acts as a damp proof membrane.

Solco, Unit 51, Portmanmoor Road Industrial Estate, Ocean Park, Cardiff, CF24 5HB

Technical Data:

Property	Test Method	Value
Thickness	EN 1849-2	0.60mm
Thickness - Between Scrim	BS EN ISO 9863-1:2016	0.40mm
Width	EN 1849-2	2.0m
Length	EN 1849-2	50m
Weight	EN 1849-2	370 g/m ²
Hydraulic Properties		
Water Column Test	EN 20811	> 300
Resistance to Water Penetration	EN 13967 / EN 1928	Pass
Watertightness	EN 1296 / EN 1367 / EN 1928	Pass
Mechanical Properties		
Resistance to Static Load	EN 12730-B	20 kg
Tensile Strength (MD)	EN 12311 - 1	600 N/50mm
Tensile Strength (CMD)	EN 12311 - 1	480 N/50mm
Tensile Elongation (MD)	EN 12310 - 1	20%
Tensile Elongation (CMD)	EN 12310 - 1	20%
Puncture Resistance	EN 12236	1.25 kN
Resistance to Tearing (Nail Shank) (MD)	EN 12310 - 1	330 N
Resistance to Tearing (Nail Shank) (CMD)	EN 12310 - 1	400 N
Durability and Chemical Resistance		
Transmission Rate of Volatile Liquids (Diesel)	ISO 6179:2010 (B)	0.246 g/m ² /hr
Transmission Rate of Volatile Liquids (Xylene)	ISO 6179:2010 (B)	0.571 g/m ² /hr
Transmission Rate of Volatile Liquids (Toluene)	ISO 6179:2010 (B)	0.583 g/m ² /hr
Transmission Rate of Volatile Liquids (Petrol)	ISO 6179:2010 (B)	0.135 g/m ² /hr
Gas Permeability		
Methane Permeability	BS EN ISO 15105-1	< 0.09 ml/m ² /day/atm
Carbon Dioxide Permeability	BS EN ISO 15105-1	< 0.09 ml/m ² /day/atm
Radon Permeability	K124/02/95	8.0x10 ⁻¹⁵ m ² /s

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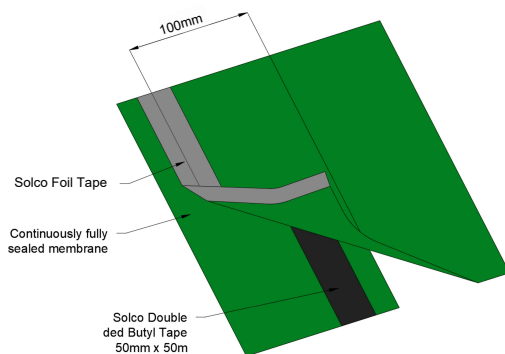
Installation:

1. The membrane must only be applied to surfaces that have a smooth finish - free from voids, projections, and mortar deposits. Surfaces should be dry and free from dust and frost. In order to provide a continuous barrier across the cavity, Solshield Ultra should be taken through the blockwork and incorporated below the damp proof course cavity in the outer leaf.
2. Concrete surfaces should be dense. Vertical surfaces of brickwork and blockwork must be dry and rendered to provide an even surface. Brickwork or blockwork not rendered must be flush pointed to give a smooth surface without sudden changes in level.
3. Solshield Ultra is rolled out with the coloured side up, ensuring that it is properly aligned. All end and side overlaps should be a minimum of 100mm and prepared.
4. When the membrane is laid below the concrete slab, it should be loose-laid to accommodate any small movements.
5. All surfaces must be dried thoroughly prior to joining. Roll edges can be welded or taped.
6. The continuity of the damp proofing must extend over the footprint of the building, and the membrane must be sealed to a damp-proof course where required.
7. The membrane should be covered by a screed or other protective layer, such as Solco Protection Fleece, as soon as possible after installation. If blockwork protection is used, care must be taken to avoid damage to the membrane during construction. Care should be taken when handling building materials over the exposed surface.

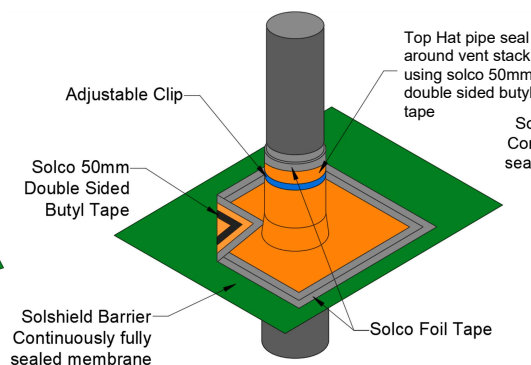
Jointing Detail:

1. Apply Solco Double Sided Butyl Tape around 50mm from the membrane edge, leaving the backing paper on.
2. Lay the next membrane, overlapping the first by a minimum of 100mm.
3. Remove the backing paper from the double sided butyl tape and join the top sheet to the bottom sheet, by applying pressure with a hand roller to remove trapped air.
4. Where the membranes overlap, apply Solco Single Sided Foil Tape, equidistant on both membranes (see detail). All service entry points must have airtight seals. Top hats and corner pre-forms must be sealed using double sided butyl tape.

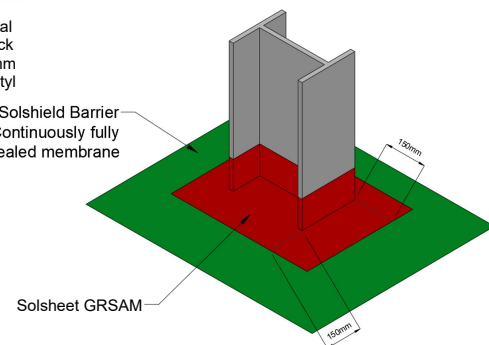
Typical Jointing Details for Solshield Ultra



Typical Lap Detail



Typical Penetration Detail

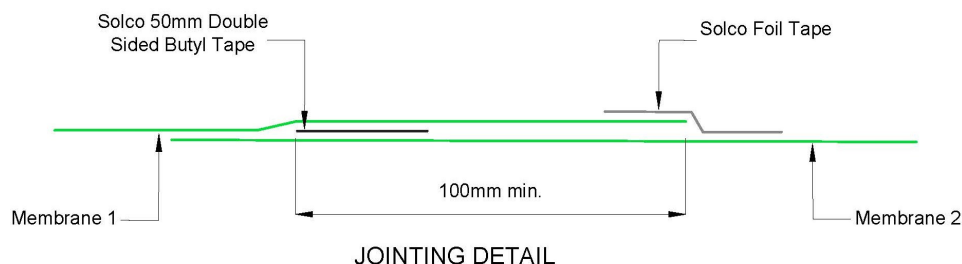


Typical Column Detail

Solco, Unit 51, Portmanmoor Road Industrial Estate, Ocean Park, Cardiff, CF24 5HB

Note:

All service entry points must have airtight seals. Top hats and corner pre-forms must be sealed using double sided butyl tape.



Solshield Ultra System Accessories

Solco Top Hats	Form an effective seal where a pipe, duct, or service penetrates Solsheet membranes.	Units
Solco Double Sided Butyl Tape	A double-sided synthetic butyl mastic tape, used for securing joints and laps in DPC's, Cavity trays & pre-formed Cloaks.	Rolls
Solco Foil Tape	A single-sided tape for securing laps & joints.	Rolls
Solco Venting Accessories	Allows the effective venting of gas from beneath a building.	Units
Solco Int / Ext Corners	Preformed units that ensure protection at corners.	Units
Solco GR DPC	A gas resistant tri-polymer damp proof course.	Rolls
Solco P30 Protection Fleece	Forms a protective layer to prevent damage to the membrane.	Rolls
Solsheet GR Self-Adhesive Membrane	A gas resistant self-adhesive membrane.	Rolls
Solseal HP Primer	Used to provide adhesion to bitumen enhanced geomembranes.	Tins
Solshield Venting Mat	Cuspated (HDPE) drainage mat for providing a drainage / venting channel.	Rolls
Solseal Liquid Gas Barrier	A gas resistant liquid applied membrane	Tins

Storage and Handling on Site:

- Solshield Ultra is classified as non-hazardous (code of practice CP102 1973).
- Rolls should be stored on a flat surface, kept under cover, and protected from sunlight and mechanical damage. The product is chemically inert and any acids or alkalis present in the subsoil will not affect the membrane.
- Do not use when exposed to sunlight and general outdoor weather conditions for long periods of time.
- Quality control during the laying of the membrane is extremely important.
- The membrane should be protected either through the use of temporary protection over its whole area or the immediate laying of the concrete slab. Care should be taken when handling building materials over the exposed surface.

Solco, Unit 51, Portmanmoor Road Industrial Estate, Ocean Park, Cardiff, CF24 5HB

APPENDIX C

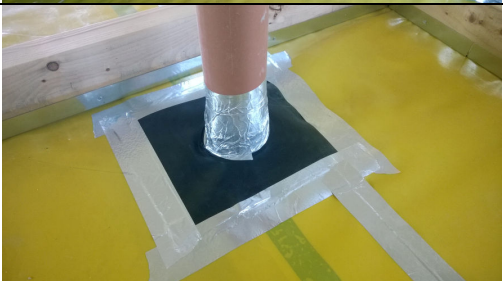
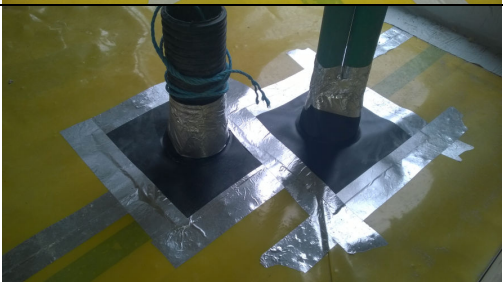
GAS PROTECTION MEASURES VERIFICATION VISUAL INSPECTION RECORD



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

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

No.	Item	Comments (see notes)
1 - Passive Venting		
1.1	Sub-floor void	
1.2	External wall airbricks	
1.3	Internal sleeper walls	
1.4	External vent trenches/ ducts	
2 - Active Venting		
2.1	Active venting System details	

No.	Item	Comments (see notes)
3 - Gas Membrane		
3.1	Condition of sub-grade and underside of membrane	
3.2	Details of gas membrane product used	
3.3	Gas membrane condition (rips/ tears/ penetrations)	
3.4	Details of joining/ lapping tape products used	
3.5	Lapping design	
3.6	Laps, welds and joint seals	
3.7	Service entry seals	
4 – Other comments/ considerations		
4.1		
4.2		
5 - Photographs		
Photograph		Description
		Example**Photograph showing gas membrane in place across floor slab with all joints lapped and sealed.
		Example**Photograph showing tophat and sealing around simple single service entry point.
		Example**Photograph showing tophats and sealing around complex multi-service entry points.
		Example**Photograph showing positions of air-bricks.

REMEDIAL ACTIONS REQUIRED

CERTIFICATION

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

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

Inspection Checklist Notes:

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

APPENDIX D

GAS PROTECTION MEASURES VERIFICATION AIR LANCE INTEGRITY TESTING RECORD



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

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

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

- Each seam/ joint line tested should be numbered on the sketch plan, with corresponding comments and testing details should be recorded in the numbered table below.
- Failure points in seams or joints should be marked sequentially 'F₁', 'F₂' etc with approximate dimensions.
- Seams and joints deemed to be satisfactory should be marked with an S. All relative testing details/comments should be recorded in the table below.

No.	Item	Comments (see notes)
A - Air Lancing Equipment		
	Air Lance with outflow nozzle of 4.8mm	
B - Membrane, Joints and Seals		
	Details of gas membrane product used	
	Details of joining/ lapping tape products used	
	Joint/ Lapping design used	
	External vent trenches/ ducts	
No.	Item	Comments (see notes)
C – Air Lance Integrity Test Results		
Test No.	Failed or Satisfactory (F or S)	Detail, comments and recommendations
1	S	**Example** Seam adequately bonding – application of air stream did not highlight any loose joins, lifting of membrane, joints or lapping tape.
2	F	**Example** F ₁ – Seam lifting due to poor bonding of lapping and double sided tape F ₂ – Riffles of air passing through seal due to small fold in membrane F ₃ – Top hat poorly sealed to membrane, lapping tape lifting
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4 - Photographs		
Photograph	Description	
		Example** Photograph showing integrity testing of seam on plot No. #
		Example** Photograph showing integrity testing of top hat join on plot No. #

REMEDIAL ACTIONS REQUIRED

****Examples****

F₁ – Seam to be re-bonded and re-tested

CERTIFICATION

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

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

APPENDIX E

GAS PROTECTION MEASURES VERIFICATION NON-INDEPENDENT (CLIENT/ INSTALLER) VALIDATION RECORD

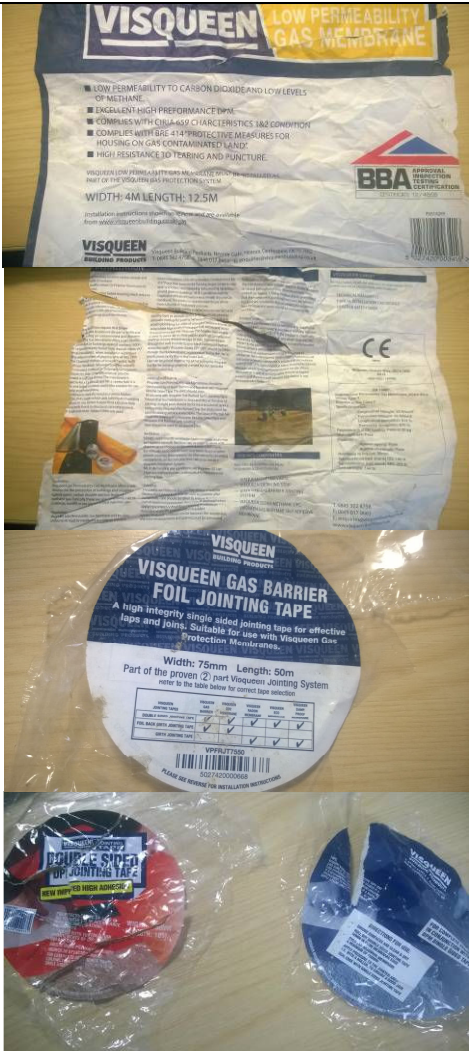


Site Name:		Gas Characteristic Situation:	CS2
Job Number:		Type of development: (Residential/ commercial/ other)	RESIDENTIAL
Date:		Building Description:	SINGLE DETACHED PLOT
Evidence Submitted By:		Foundation Type: (suspended floor/ raft/ other)	SUSPENDED SLAB
Weather during installation/ validation:		Gas Protection Type: (passive/ active)	PASSIVE
Plot number(s):			

This proforma should be used to record any non-independent evidence submitted by the installer or client to document the adequate installation of gas protection measures for Plots where installation is required but independent inspection and testing is not undertaken. This should only occur where inspection and testing frequencies set out by the site-specific Gas Protection Measures Verification Plan allow.

All relative inspection details/comments should be recorded in the table below where provided/ applicable.

No.	Item	Comments (see notes)
1 - Passive Venting		
1.1	Sub-floor void	N/A
1.2	External wall airbricks	N/A
1.3	Internal sleeper walls	N/A
1.4	External vent trenches/ ducts	N/A
2 - Active Venting		
2.1	Active venting System details	N/A
3 - Gas Membrane		
3.1	Condition of sub-grade and underside of membrane	
3.2	Details of gas membrane product used	
3.3	Gas membrane condition (rips/ tears/ penetrations)	
3.4	Details of joining/ lapping tape products used	
3.5	Lapping design	
3.6	Laps, welds and joint seals	
3.7	Service entry seals	

4 – Other comments/ considerations		
4.1		
4.2		
5 - Photographs		
Photograph		Description
		Photographs showing details of products used for membrane, lapping tape and jointing tape, along with the on-site product specification sheet.
		Photograph showing gas membrane in place on Plot 1 with all joints lapped and sealed.



Photograph showing gas membrane in place on Plot 1 with all joints lapped and sealed.



Photograph showing tophats and sealing around service entry points.



Photograph showing tophats and sealing around complex multi-service entry points. Jubilee clips in place and tightened up.

IDG CONCERNS REGARDING EVIDENCE SUBMITTED/ REMEDIAL ACTIONS REQUIRED

- *None Required*

CERTIFICATION

The above evidence was submitted by a non-independent person (client/ installer), and has been reviewed by a suitably competent IDG verification engineer.

The Gas Protection Measures for PLOT ____:	A) Appear to be acceptable based on the evidence submitted, and do not require independent inspection or integrity testing in accordance with the testing frequencies specified in the site-specific Hazardous Gas Protection Measures Verification Plan.	X
	B) Appear to be acceptable but attention is drawn to issues relating to item(s) No.	
	C) Are not acceptable due to concerns or issues requiring remedial action as indicated above. <i>This plot should be independently re-inspected and verified upon completion of any required remedial works.</i>	
NAME	SIGNATURE	DATE
LIAM MURPHY		**/**/16

Inspection Checklist Notes:

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