Gas Protection Strategy Proposals

At

Grey Mare Lane,
Manchester

Client: Caddick

Reference: 34338-SUT-ZZ-00-RP-G-7302

Date: November 2025

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SUTCLIFFE INVESTIGATIONS

Gas Protection Strategy Proposals

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1 Introduction

1.1 Terms of Reference

Sutcliffe Investigations were instructed by Caddick to design an appropriate remediation strategy for the proposed development at Grey Mare Lane, Manchester, M11 3FT.

The site is centred on National Grid Reference (NGR) 386954, 398294. The site area is approximately 0.47ha.

This report provides details on the protocols to be adopted during validation works required to be undertaken on the site to ensure that any risks associated with the identified ground gas risk are mitigated.

The strategy set out in this document are produced in light of a Phase I Preliminary Risk Assessment and Phase II Ground Assessment for this site. This report and the outlined strategy should therefore be read in conjunction with:

- e3p Phase I Geoenvironmental Site Assessment Report Ref: 16-908-R1 (June 2023)
- e3p Phase II Geoenvironmental Site Assessment Report Ref: 16-908-R2-1 (June 2024).
- Sutcliffe Phase II Ground Assessment Report Ref. 31440-SUT-ZZ-00-RP-G-7202 (January 2025)
- e3p Ground Gas Addendum Report Ref: 16-908-R3-1 (June 2025).
- Sutcliffe Phase III Remediation & Validation Strategy Proposals Ref. 31440-SUT-ZZ-00-RP-G-7301 (July 2025)

1.2 Development Proposal & Legislative Context

Development Proposal

The proposed layout is shown in Bowker Sadler Drawing Ref: 22-049-A-2005. This report has been prepared in support of a planning application to develop the site for residential housing with associated soft landscaping. Based on information received from the architect, it is anticipated that site levels will be retained to facilitate the proposed development option.

Legislative Context

The presence of contaminants which may pose a risk to human health or the environment, is a material planning consideration and it remains the responsibility of the developer to ensure safe development.

For planning it should be considered whether the site is suitable for its new use, and the responsibility for securing a safe development (including cumulative effects of pollution on health, and the potential sensitivity of the proposed development to adverse effects from pollution,) rests with the developer and/or landowner. Planning is concerned with the site's proposed use not its current use, where the amount of contamination is expected to be low relative to the level of risk. This is the opposite to Part 2A which considers high levels (significant harm) and the current use of the site.

Section 57 of the Environment Act 1995 adds Part 2A (ss.78A-18YC) to the Environmental Protection Act 1990 and contains the legislative framework for identifying and dealing with contaminated land. Where development is undertaken on land which may be affected by contamination, the National Planning Policy Framework, paragraph 120 to 122 considers pollution and remediation. This links the contaminated land regime within the development process.

2 Ground Gas Risks

2.1 Ground Gas Risk Assessment

A hazardous gas flow rate (HGFR) is derived, representative of the actual flow of gas from the borehole. This, combined with a consideration of other factors such as maximum concentration, is used to characterise the site.

HGFRs for both methane and carbon dioxide based on steady state flow and concentration have been calculated as:

HGFR = maximum gas concentration on visit x measured borehole flow rate on visit.

Methane HGFR

The highest calculated HGFR per borehole for methane is presented below:

Table 8.2: Methane HGFR

Ref. No.	Flow[1] (l/h)	CH_4[2] (%)	HGFR CH_4 (l/h)	Characteristic Situation
WS101	25.9	0.1	0.0259	CS1
WS104	0.1	0.1	0.0001	CS1
WS106	0.1	0.1	0.0001	CS1

[1] Where maximum recorded flow is <0.1l/h, 0.1l/h has been used as recommended in CIRIA C665.
[2] Where maximum recorded concentration is <0.1%, 0.1% has been used as recommended in BS8485.

Carbon Dioxide HGFR

The highest calculated HGFR per borehole for carbon dioxide is presented below:

Table 8.3: Carbon Dioxide HGFR

Ref. No.	Flow[1] (l/h)	CO_2[2] (%)	HGFR CO_2 (l/h)	Characteristic Situation
WS101	25.9	3.5	0.6216	CS2
WS104	0.1	5.3	0.0053	CS1
WS106	0.1	3.2	0.0032	CS1

[1] Where maximum recorded flow is <0.1l/h, 0.1l/h has been used as recommended in CIRIA C665.
[2] Where maximum recorded concentration is <0.1%, 0.1% has been used as recommended in BS8485.

In accordance with BS8485 the ground gas monitoring results indicate that the site has a HGFR of 0.0259l/hr for methane and 0.6216l/hr for carbon dioxide.

This results in the site being classified as Characteristic Situation 2 –Low Risk and require protective measures to be installed.

Additionally, BS8485 states in Table 2 that:

- for a typical Carbon Dioxide maximum concentration above 5%, a Characteristic Situation 2 (CS2) classification be considered.
- for a typical methane maximum concentration above 1% that an CS2 classification be considered

As there has been a reading above 5% CO_2 during the monitoring period it is further recommendation that the site is classified as CS2.

This classifies the site as having an intermediate regime identified, which requires gas protection measures, comprising a membrane and ventilated sub-floor void to create a permeability contrast to prevent the ingress of gas into buildings.

Based on the quantitative and qualitative assessment of the risk associated with ground gas, the site should be classified as a **Characterisation Situation 2** indicating gas protective measures are required.

Using BS8485:2015+A1:2019, "*Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings"* a total of 3.5 points is required for the proposed end use, *Table 2.1* details the protection measures required to achieve this point total based upon the proposed development of the site.

Table 2.1: BS8485 (2015+A1:2019) Point Score Summary

GAS PROTECTION SCORES FOR THE STRUCTURAL BARRIER	
Floor and substructure design	SCORE
Well reinforced cast in situ suspended floor slab with minimal penetrations	**1.5**

GAS PROTECTION SCORES FOR VENTILATION PROTECTION MEASURES		
Protection Element System	Comments	SCORE
Pressure relief pathway	• Whenever possible a pressure relief pathway (as a minimum) should be installed in all gas protection measures systems. • If the layer has a low permeability and/or is not terminated in a venting trench (or similar), then the score is zero	**0.5/0**

GAS PROTECTION SCORE FOR THE GAS RESISTANT MEMBRANE		
Protection Element System	Comments	SCORE
Gas resistant membrane meeting all of the following criteria: - 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 manometric method; - 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 the relevant gas; and, - Verified in accordance with CIRIA C735.	The performance of membranes is heavily dependent on the quality and design of the installation, resistance to damage after installation and integrity of joints. For example, a minimum 0.40mm thickness (equivalent to 370g/m^2 for polyethylene) reinforced membrane (virgin polymer) meets the performance criteria opposite. If a membrane is installed that does not meet all the criteria opposite, then the score is zero.	**2**

Certification that these passive protection measures have been installed correctly should be provided.

An example of a suitable gas protection membrane and a membrane validation pro forma is presented as *Appendix B.*

2.2 Mine Gas Risk

The mine shaft located 25 m northeast does not have any recorded remedial action completed, therefore potentially providing preferential pathway for the migration of mine gas from underlying worked coal seams.

In accordance with CL:AIRE Good Practice for Risk Assessment for Coal Mine Gas Emissions (2021), the following is of note:

- No mine entries have been recorded on site.
- 1No. mine shaft was identified 25m northeast of the site and no remedial measures have been recorded associated with it.
- Known workings have been recorded 114m bgl under the site.
- Observed ground conditions didn't indicate any fractures in the underlying bedrock and are likely to provide an effective barrier to migrating mine gas.
- Groundwater was not observed during the investigation.
- The risk of the proposed foundation and ground floor design forming a pathway for migrating mine gas is considered unlikely.
- The monitoring results demonstrate data is indicative of ambient air and air/CO2 mixing, therefore there is considered to be a low risk.

Taking the above into account, the site is considered classified as Characteristic Situation 2 – Low Risk and require protective measures to be installed.

3 Design of Protection

3.1 Introduction

Given the site is to be developed with apartments a Type B classification is attributed to the site. Based on the CS2 classification a Type B building requires 3.5 points worth of protection. As set out above the main way this will be achieved is though the installation of a suitable membrane and the use of a ventilated sub-floor void. Further details are given below of the choice for the structural barrier, ventilation and membrane.

3.2 Structural Barrier

Based upon the amount of Made Ground noted on site it is not recommended that a ground-bearing slab is utilised on site. Sutcliffe Investigations therefore propose a cast in situ reinforced suspended slab ground floor be adopted. Given the nature of this floor design, it will be well reinforced and will provide benefit to the protection of the new building from the identified gas regime, with a score of 1.5 points being attributed for this element of the design due to the minimal penetrations through the slab.

3.3 Ventilation Measures

Given the design of the founding structure only a pressure relief pathway can be adopted on site, with no passive ventilation being provided by the design.

As such the ventilation measures proposed can at best provide a score of 0.5 points towards the design. At this stage it is not considered that the pressure relief pathway will necessarily be terminated in a venting trench and as such is not considered to provide any protection as part of the final gas protection design.

Details of the ground floor design are included in Drawings 34338-SUT-ZZ-XX-DR-S-2301.

3.4 Membrane

The membrane that is to be used must conform to the specifications as set out in BS8485:2015+A1:2019 Table 7. While Sutcliffe would recommend the use of a Protech GM Super to achieve the required level of protection which allows for a score of 2 points. If required another suitable membrane can be used, as long as it conforms to the specification as set out in BS8485:2015+A1:2019 Table 7, any change of membrane would have to be agreed before its use with Sutcliffe to ensure that it meets the requirements to offer a suitable level of protection. Details of the proposed membrane can be found in *Appendix A.*

3.5 Conclusion

By using the above protection measures minimum level of 3.5 points of protection can be achieved, as required to protect against a CS2 gas regime in a Type B building.

4 Remediation Strategy

4.1 Overview

The recommendations provided below are considered appropriate for the site based on the site investigation and the risk assessments completed by e3p & Sutcliffe.

4.2 Additional Works Required to Assess Outstanding Contaminant Linkages

No additional works are required to assess outstanding contaminant linkage.

4.3 Regulatory Approval

Consultation with Manchester City Council Contaminated Land Officer is recommended regarding the acceptability of the validation proposal.

4.4 Remedial Works

Human Health - Ground Gas

Ground gas monitoring has indicated elevated levels of Carbon Dioxide on site and due to the highest recorded concentrations of these it is recommended that the site is classified as CS2 as outlined in CIRIA C665.

As such gas protection measures will be required as part of the development of the site.

Gas protection measures should include a ventilated sub-floor void and a suitable gas membrane in accordance with the requirements of BS8485:2015+A1:2019 as set out in Table 2.1 of this report.

An example of a suitable gas protection membrane and a membrane validation pro forma are presented in *Appendix A & B* respectively.

4.5 Documentation

On completion of the remedial works, a Phase IV Completion Report will be required and will need to include the following documentation:

- Photographic log of the gas membrane installation.
- Certification of guarantee confirming the suitability of gas membrane installation.

Appendix A – Gas Protection Membrane Specification

Protech GM Super

GAS PROTECTION

• HIGH RISK CHARACTERISTIC SITES •

REGULATIONS COMPATIBILITY TABLE

	CIRIA 665 CHARACTERISTIC SITUATION 2	CIRIA 665 CHARACTERISTIC SITUATION 3-6	BS8485 CHARACTERISTIC SITUATION 2	BS8485 CHARACTERISTIC SITUATION 3-6	BRE 211 RADON	NHBC AMBER 1	NHBC AMBER 2 & RED
METHANE	✓	✓	✓	✓	N/A	✓	✓
CARBON DIOXIDE	✓	✓	✓	✓	N/A	✓	✓
RADON	N/A	N/A	N/A	N/A	✓	N/A	N/A

DESCRIPTION

Protech GM Super is a high performance proprietary reinforced gas barrier, that incorporates a 12 micron aluminium foil layer, for maximum protection against ground-borne gases. This has been specifically designed to conform with the latest guidance documents. Due to its unique composition, the membrane is extremely robust and flexible and, therefore, easy to install on site. The membrane also provides protection from damp when placed below the slab and, therefore, there is no need to install a separate DPM.



SPECIFICATION

CIRIA C665, BS8485:2015 & Local Authority Ground Gas Handbook recommended that gas membranes are specified on the basis of the 'need to survive' construction, i.e. use one that is puncture and tear resistant.

Thickness should not be the main determinant of the suitability of a membrane for a particular site, although it can indirectly influence some key performance parameters.

In practise, because of the nature of construction sites, the durability, survivability and robustness of membranes are equally important than purely permeability to gas.

Protech GM Super incorporates a reinforced grid to ensure that maximum protection is achieved when installed to manufacturers' instructions.

The need for high quality workmanship during installation should not be under-estimated. The health and safety of the occupants of the building is dependent on its satisfactory performance. If installed incorrectly or damaged during the construction process, the membrane is rendered ineffective and will fail to provide adequate protection against the ingress of ground gas or vapours.

TYPICAL PROPERTIES	
Roll Length	50m
Width	2m
Weight	370g/m^2
Thickness	0.4mm
Colour	Green / Silver
Methane Permeability (ISO 15105-1)	≤ 0.1 ml/day/m^2

REQUIRED ACCESSORIES

- Protech GM Super Starter Band (1m x 50m)
- Protech GM Tape
- Protech GM Tophats
- Protech SAGM (Self Adhesive Gas Membrane)
- Protech GM Flashing Strip
- Protech GM Super Corner Units
- Protech GM Primer
- Protech GM 3mm Protection Board
- Protech GM Protection Fleece
- Protech 125

VENTING

On sites where venting is required, our Provoid Venting System should be used. We can provide design advice for both passive and active venting systems to suit individual site requirements.

Revised August 2021

Appendix B – Membrane Validation Proforma

Visual Inspection of Gas Protection Measures

Site Name:	Gas characteristic situation:
Job Number:	Type of development and building/block checked: residential/commercial/other
Date:	Building description:
Visit by:	Foundation type: suspended floor/raft/other
Weather at time of inspection:	Gas protection type: passive/active

No.	Item	Comments (see notes)
1 Gas membrane		
1.1	Condition of sub-grade and underside of gas membrane	
1.2	Gas membrane type	
1.3	Gas membrane condition	
1.4	Joining tape product	
1.5	Lapping design	
1.6	Laps. Welds and joints seals	
1.7	Service entries seals	
2 Passive venting		
2.1	Sub-floor void	
2.2	External wall airbricks	
2.3	Internal sleeper walls	
2.4	External vent trenches/ducts	
3 Active venting		
3.1	System details	
Additional Notes:		

Notes: inspection checklist

1.1	Underside of gas 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 and meets the design criteria.
1.2	Gas membrane type	Manufacturer and product specification, gauge, colour, brand/name, material batch/roll numbers, storage arrangements (protected from dirt/damage?)
1.3	Gas membrane condition	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?
1.4	Joining tape product	Product type, brand, thickness, material, width, colour? Use of double sided tape?
1.5	Lapping design	Joints lapped and sealed in accordance with manufacturer's requirements/ specification? Minimum overlap insured? Sections taped twice?
1.6	Laps and joints sealed	Welds complete? Appropriate joining/double sided tape used?
1.7	Service entries sealed	Top hats seal arrangements fixed around service entries? Use of Jubilee clips?
2.1	Sub-floor void	Is a check possible? Void former? Gravel (type/specification)? Height of void space? Is it clear?
2.2	External wall airbricks	Numbers, size, positions as design drawing?
2.3	Internal sleeper walls	Ventilation holes (honeycomb brickwork/pipe crossings?) – size, spacing, location in accordance with design?
2.4	External vent trenches/ducts	Located and constructed in accordance with design drawings? If open-topped gravel – 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 the superstructure?
3.1	Active venting	Type of air supply: mechanical, natural, combined? Location/condition/number of fans and vents? Location and size of inlets? Provision of air-cleaning devices and air heaters? Supply and exhaust ductwork? Alarm provision/installation? Gas monitoring system in under-floor void?

Photographs

No.	Description

The gas protection measures inspected:	a Are acceptable and comply with the specification
	b Are acceptable but attention is drawn to issues related to item no.
	c Are not acceptable due to issues related to item no.

Name: **Signature:** **Date:**

Drawing Ref. – 22-049-A-2005



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- Report Errors and Omissions to the Architect.
- Check all dimensions on site
- Drawing to be read in conjunction with the Health and Safety Plan and all relevant Risk Assessments

1:5
1:50 1m 2 3

1:1
1:100 1m 2 3 4 5 6

Schedule of Accommodation

House Type	Area	Count	
1b2p	49 m²	1	
1b2p	50 m²	4	
1b2p	51 m²	30	
1b2p	52 m²	22	70%
		57	
2b3p	61 m²	13	
2b3p	62 m²	1	
2b3p	63 m²	7	
2b3p	66 m²	4	30%
		25	
		82	

6 No. Accessible = 7% Total Car Parking

N

Proposed Site Plan
1 : 200

1:1
1:200 2m 4 6 8 10 12 14 16 18 20 22 24 26 28 30

P:\2022\22-049\Drawings\working\arefix - site.rvt

Rev. Date Drn. Chkd.

BowkerSadler

Project
Grey Mare Lane

Client
Great Places Housing Group

Drawing
Proposed Site Plan

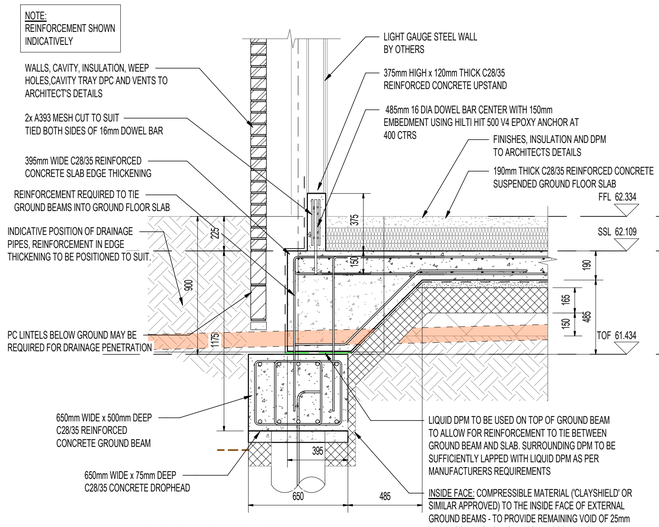
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Project No.	Originator	Zone	Level	Form	Discipline	Number	Revision
22-049 -	BSA -				A -	**2005**	

Status
Tender

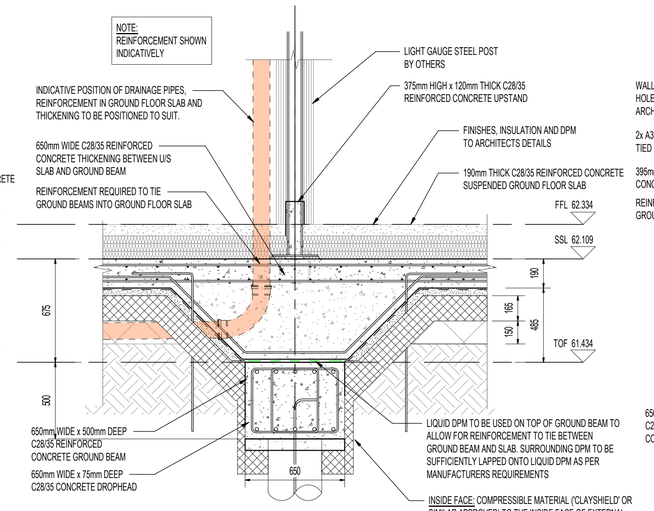
Hatherlow House, Hatherlow, Romiley, Stockport, SK6 3DY
0161 406 7333 office@bowker-sadler.co.uk www.bowker-sadler.co.uk

Drawing Ref. – 34338-SUT-ZZ-XX-DR-S-2301– Ground Floor and Foundation Sections



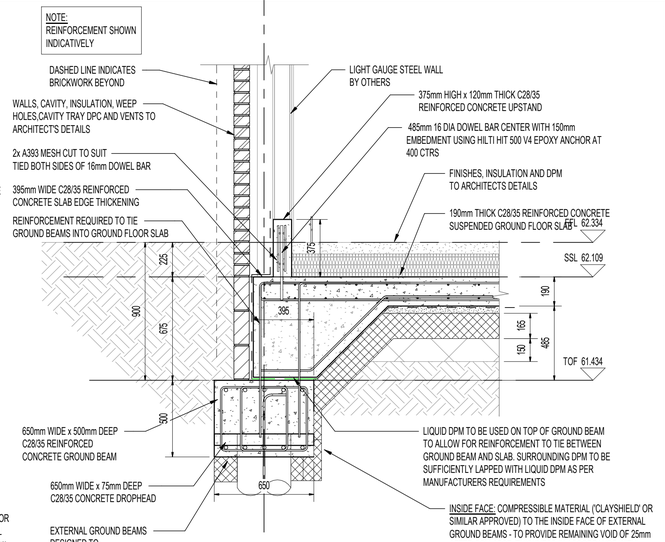
TYPICAL EDGE DETAIL

(SCALE 1 : 20)



TYPICAL INTERNAL GROUND BEAM DETAIL

(SCALE 1 : 20)



TYPICAL EDGE DETAIL AT RECESSED BRICKWORK

(SCALE 1 : 20)

GENERAL NOTES

DO NOT SCALE OFF THIS DRAWING

THIS DRAWING TO READ IN CONJUNCTION WITH ALL RELEVANT STRUCTURAL AND ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR / FABRICATOR PRIOR TO COMMENCEMENT OF WORKS.

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.

ALL WORKS TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE ENGINEER'S SPECIFICATIONS, RELEVANT BRITISH STANDARDS, STATUTORY HEALTH AND SAFETY(C.D.M. REGULATIONS, RELEVANT CODES OF PRACTICE AND THE CURRENT EDITION OF THE BUILDING REGULATIONS.

FOR FINAL SETTING OUT INFORMATION RELATING TO GRID LINES AND WALL POSITIONS REFER TO THE ARCHITECT'S DRAWINGS.

MASONRY WALL CONSTRUCTION

OUTER LEAF BRICKWORK TO HAVE A WATER ABSORPTION BETWEEN 7% AND 12% UNLESS NOTED OTHERWISE (U.N.O)

MINIMUM STRENGTH OF BLOCKWORK (U.N.O.):-
BELOW GROUND 10.3 N/mm²

MORTAR ABOVE GRD TO BE 1:1:6 (ii) / M4
MORTAR BELOW GRD TO BE 1:3 (i) / M12

FOR DETAILS OF ALL BRICKWORK, BLOCKWORK AND WALL CONSTRUCTION REFER TO ARCHITECTS DRAWINGS AND DETAILS.

MOVEMENT JOINTS TO BE:-
BRICKWORK- POSITIONED AT MAX. 12000mm CENTRES
BLOCKWORK- POSITIONED AT MAX. 6000mm CENTRES

WITHIN RENDERED BLOCKWORK, BED JOINT REINFORCEMENT (BRICKFORCE SBF40W60) TO BE INSTALLED IN FIRST 2 COURSES OF THE EXTERNAL LEAF ABOVE AND BELOW OPENINGS. REINFORCEMENT TO PROJECT 600MM BEYOND OPENINGS WHERE POSSIBLE.

ARCHITECT TO POSITION MOVEMENT JOINTS TO THE APPROVAL OF THE ENGINEER.

LIGHT GAUGE STEEL FRAME WALL TIES (BUILDING HEIGHT > 15m)

WALL TIES TO BE STAINLESS STEEL AND TO COMPLY WITH WITH BS EN 845-1 AND PD-6697.

MASONRY OUTER LEAF / SFS INNER LEAF CONSTRUCTION

ANCON 25/14 CHANNEL RESTRAINT SYSTEM (OR SIMILAR APPROVED) TO BE FIXED BACK TO SFS STUDS TO MANUFACTURER'S DETAILS. EXTERNAL CAVITY WALL TIES TO BE TYPE 1. MINIMUM EMBEDMENT DEPTH IN MORTAR TO BE 55mm. MAX SPACING 600mm HORIZONTALLY AND 300mm VERTICALLY I.E. 5.5 TIES PER SQ. METRE OF WALL MINIMUM.

MASONRY EXTERNAL LEAF / BLOCKWORK INNER LEAF CONSTRUCTION

EXTERNAL CAVITY WALL TIES TO BE TYPE 1. MINIMUM EMBEDMENT DEPTH IN OUTER LEAF MASONRY MORTAR TO BE 50mm. SPACING 600mm HORIZONTALLY AND 300mm VERTICALLY IE. 5.5 TIES PER SQ. METRE OF WALL MINIMUM. ADDITIONAL TIES ARE TO BE USED AT JAMBS OF OPENINGS SO AS TO PROVIDE A VERTICAL SPACING NOT GREATER THAN 300mm. WITHIN 150mm OF VERGES AND JAMBS, A TIE IS REQUIRED AT LEAST EVERY 300mm VERTICALLY.

REINFORCED CONCRETE (C28/35)

DESIGN SULFATE CLASS: DS-1
ACEC CLASSIFICATION: AC-1s
DESIGN CHEMICAL CLASS: DC-1

REINFORCED CONCRETE TO BE GRADE C28/35
MINIMUM CEMENT CONTENT 280 kg/m³
WATER/CEMENT RATIO OF 0.60
MAXIMUM AGGREGATE SIZE 20mm.

GROUND BEAMS MINIMUM CONCRETE COVER TO BE 40mm TOP, 40mm BTM AND SIDES UNLESS NOTED OTHERWISE.

PILE CAPS AND LIFT PIT PILE CAP MINIMUM CONCRETE COVER FOR GROUND BEAMS TO BE 75mm BTM, 40mm TOP AND SIDES UNLESS NOTED OTHERWISE.

ALL REINFORCEMENT TO BE GRADE B500B OR B500C TO COMPLY WITH BS4449 AND TO BE CUT AND BENT TO BS8666.

CONTRACTOR TO USE APPROVED SPACER BLOCKS & REBAR SAFETY CAPS. CONTRACTOR MUST ENSURE ANY PROTRUDING BARS ARE TO HAVE SAFETY CAPS FITTED TO ENDS PRIOR TO NEXT LIFT/POUR/CONNECTION.

REINFORCEMENT MINIMUM LAPS FOR C28/35
BOTTOM LAYER (GOOD BOND CONDITIONS):
B8 : 330mm B10 : 440mm
B12 : 570mm B16 : 830mm
B20 : 1090mm B25 : 1420mm
B32 : 1810mm B40 : 2460mm

TOP LAYER (POOR BOND CONDITIONS):
B8 : 460mm B10 : 670mm
B12 : 810mm B16 : 1190mm
B20 : 1560mm B25 : 2020mm
B32 : 2580mm B40 : 3510mm

ALL LAPS AND INTERSECTIONS OF BARS SHALL BE SECURELY CONNECTED WITH MALLEABLE IRON WIRE OF A SUITABLE SIZE OR OTHER APPROVED METHOD OF FIXING.

ALL REINFORCEMENT SHALL BE ACCURATELY PLACED, SECURED AND MAINTAINED IN POSITION. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY STOOLS, CHAIRS AND SPACERS REQUIRED TO SUPPORT AND RESTRAIN REINFORCEMENT.

MESH REINFORCEMENT TO HAVE A MINIMUM LAP OF 460mm UNLESS NOTED OTHERWISE.

ALL CONCRETE TO BE ADEQUATELY VIBRO COMPACTED (ON PLACING) TO ENSURE THAT ALL VOIDS ARE REMOVED.

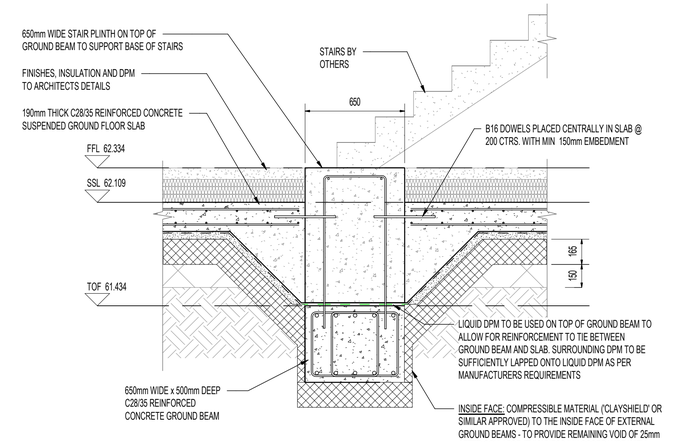
ALL WORKS ARE TO CARRIED OUT IN ACCORDANCE WITH ALL THE RELEVANT BRITISH STANDARD CODES OF PRACTICE.

TYPICAL LIFT PIT DETAIL

(SCALE 1 : 20)

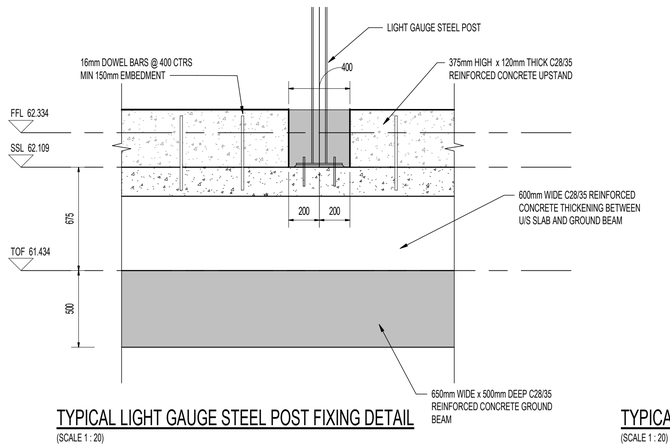
TYPICAL INTERNAL GROUND BEAM WITH PILE CAP DETAIL

(SCALE 1 : 20)



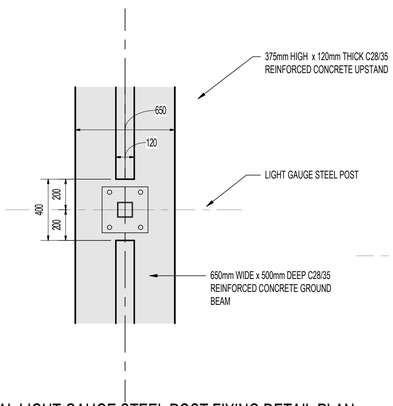
TYPICAL STAIR PLINTH DETAIL

(SCALE 1 : 20)



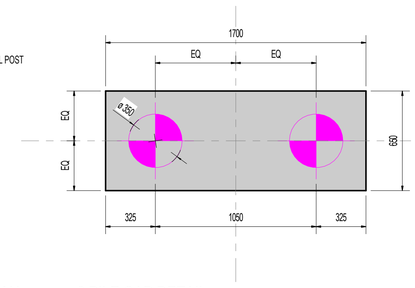
TYPICAL LIGHT GAUGE STEEL POST FIXING DETAIL

(SCALE 1 : 20)



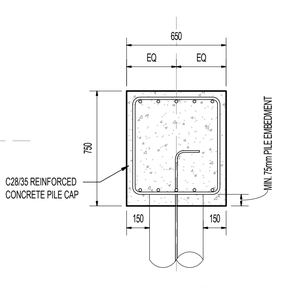
TYPICAL LIGHT GAUGE STEEL POST FIXING DETAIL PLAN

(SCALE 1 : 20)



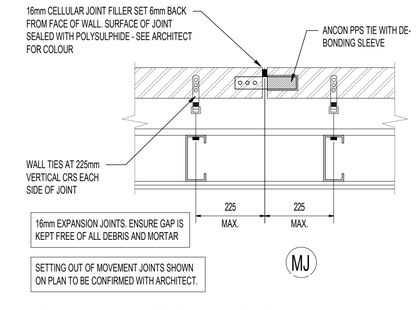
2 PILE CAP DETAIL

(SCALE 1 : 20)



2 PILE CAP SECTION

(SCALE 1 : 20)



BRICKWORK MOVEMENT JOINT SFS

(SCALE 1 : 10)

Rev	Description	Date	By	Chkd
P04	DETAIL ADDED	13-10-25	MA	SJ
P03	REVISED FOR UPLOAD TO VIEWPOINT	10-09-25	SH	SJ
P02	DETAILS UPDATED AT CONTRACTORS REQUEST AND STAIR PLINTH DETAIL ADDED	16-05-25	SH	SJ
P01	PRELIMINARY ISSUE	17-04-25	SH	SJ

Suitability

STAGE 4

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Client

GREAT PLACES

Project

GREY MARE LANE
MANCHESTER, M11 3DQ

Drawing Title

GROUND FLOOR AND FOUNDATION SECTIONS

Date	Drawn By	Checked By	
APRIL 25	SH	DO	
Scale at A1	Project Number	Status	Revision
As indicated	34338	S4	P04

Sheet Number

34338-SUT-ZZ-XX-DR-S-2301