



**CONSTRUCTION PHASE
REMEDiation METHOD STATEMENT**

**35 Peterborough Road
Crowland**

Ref.1009/JH/RMS

November 2020

Sherwood Environmental, 1 Grass Hill
Reading, RG4 7TJ
T +44 (0)7799 477287
jamie@sherwood-environmental.co.uk

TABLE OF CONTENTS

1.0	INTRODUCTION	2
1.1	Background	2
1.2	Purpose of Report	2
1.3	Reference Documents.....	2
1.4	Limitations.....	3
2.0	SUMMARY OF CONTAMINATION HISTORY.....	4
2.1	Conceptual Model.....	4
2.2	Remediation works – Enabling Phase	4
3.0	CONSTRUCTION PHASE REMEDIATION METHOD STATEMENT	6
3.1	Task C1: Appointment of an appropriate Construction Phase contractor	7
3.2	Task C2: Placement of Clean Service Corridors.....	7
3.3	Task C3: Installation of Cover System in Landscaping Areas	7
3.4	Task C4: Installation of Gas Proof Membrane	8
3.5	Task C5: Verification and Reporting.....	9
3.6	Discovery Strategy for unexpected contamination	9

APPENDIX A: Figures

Figure 1: Site plan

Figure 2: Enabling Phase remediation areas

APPENDIX B: Technical data for specified barrier pipe and vapour membrane

1.0 INTRODUCTION

1.1 Background

Sherwood Environmental Ltd was appointed by Blackjack Estates Ltd to develop a Construction Phase Remediation Method Statement (RMS) for the 35 Peterborough Road site, Crowland, South Holland, PE6 0BB in preparation for redevelopment.

The site covers approximately 0.2 ha, is approximately level and was formerly occupied by a small chemical works. It is located in a residential area bounded by Peterborough Road to the east with residential properties on the other sides. A footpath runs to the south of the site. Contamination associated with the former site operations was remediated in 2018 through excavation and off-site disposal. The site is currently clear and covered with a mix of open ground and hard standing.

The site secured planning approval in April 2020 (Ref: H02-0901-18). The proposed redevelopment will comprise five detached houses with an associated access road. The plan of the proposed development is included as Figure 1.

1.2 Purpose of Report

Enabling Phase Remediation works to remove contaminated soils were completed in January 2019 and a Verification Report was issued by FLI-QDS Ltd in May 2019. The Verification report was submitted to South Holland District Council and the Environment Agency, who confirmed that the works had been achieved targets and the relevant planning condition (PC3) could be discharged.

This RMS provides additional information on the remediation works required during the construction phase and enables discharge of the pre-start Planning Condition 4 of H02-0901-18.

The scope of the RMS comprises:

- a summary of the conceptual model and previous works;
- specification for construction phase remediation works.

1.3 Reference Documents

In preparing the RMS the following documents (and all documents referenced within) were consulted and should be read in conjunction with this report:

- QDS Remediation, July 2017. Site Investigation at Peterborough Road, Crowland
- Hydrock Consultants, October 2017. Desk Study, Quantitative Risk Assessment and Remedial Strategy at Peterborough Road, Crowland

- FLI-QDS, November 2018. Remediation Implementation Plan at Peterborough Road, Crowland
- FLI-QDS, May 2019. Verification Report at Peterborough Road, Crowland

1.4 Limitations

The report has been prepared by Sherwood on the basis of available information obtained during the study period. Although every reasonable effort has been made to gather all relevant information, all potential environmental constraints or liabilities associated with the site may not have been revealed. The work has been carried out in general accordance with recognised best practice as detailed in industry and regulator guidance documents.

The report has been prepared for the exclusive benefit of Blackjack Properties and those parties designated by them for the purpose of providing information on the remediation and validation works to be undertaken during the construction phase of the development. The report contents should only be used in that context. Furthermore, new information, changed practices or new legislation may necessitate revised interpretation of the report.

Sherwood has used reasonable skill, care and diligence in the design of the remediation of the site. The inherent variation of ground conditions allows only definition of the actual conditions at the locations and depths of trial pits and boreholes at the time of the investigation. At intermediate locations, conditions can only be inferred.

Information provided by third parties has been used in good faith and is taken at face value. However, Sherwood cannot guarantee the accuracy or completeness of any information provided by others.

2.0 SUMMARY OF CONTAMINATION HISTORY

The information and conceptual model are taken from previous documents. Site investigations are known as far back as 2010 and a previous partial programme of remediation was implemented in 2011.

2.1 Conceptual Model

The site was occupied as a corn mill in the nineteenth century. By 1975 a chemical works was established on site. It was derelict by 1999 and had been demolished by 2002.

The site geology comprises made ground over superficial deposits including the Abbey Sands, peat and alluvium, with Oxford Clay at depth. Groundwater was located at 1.5 – 2.5 metres below ground level (bgl) with a likely direction of movement towards the west or south-west. The Abbey Sands are classified as a Secondary A aquifer while the Oxford Clay is classified as Unproductive Strata.

Contamination was identified in the soils and groundwater underlying the site, most likely associated with leaks and spills from the former site use. A range of Volatile Organic Compounds (VOCs) was identified, of which the most significant were BTEX and chlorinated hydrocarbons.

Two hotspots were identified, the most significant was Hotspot A covering the western end of the site, a smaller and shallower Hotspot B was identified in the centre of the site. Asbestos sheeting and fibres were also identified in isolated locations.

Boreholes to the west of the site identified elevated concentrations of chlorinated hydrocarbons indicating that groundwater contamination may have migrated up to 25m off-site.

2.2 Remediation works – Enabling Phase

A quantitative risk assessment process found that the contaminant levels presented a risk to human health, specifically to potential future site occupiers and that remediation was required to reduce the risk to acceptable levels. Remedial targets protective of human health were defined using RTM modelling.

Potential remediation designs were assessed via an options appraisal. It was concluded that on-site treatment was not viable due to the size of the site and available timescales so excavation of the contamination was selected as the optimal approach.

Evidence of contaminant degradation was observed at the site and field monitoring showed that subsurface conditions are favourable for reductive dechlorination. In-situ bio-remediation was used to provide longer term improvements in groundwater quality outside of excavation area, though it was not considered an adequate solution for the highly impacted source zone soils.

A Remedial Method Statement was prepared to define the scope and the enabling works were completed by January 2019. Contaminated soils were excavated to a maximum depth of four metres to a base a firm clay and a total of 580 m³ of soils were removed off-site. Asbestos sheeting and fragments were handpicked during the works and a small volume of asbestos impacted soils sent to a specialist treatment centre. The locations of the excavations are shown in Figure 2.

A 250 mm layer of crushed limestone was placed at the base of the excavation to provide geotechnical stability and allow the emplacement of the reductive dechlorination bioremediation substrate within a permeable medium below the water table. The excavation was backfilled with imported virgin clay in 300mm layers and compacted. The excavation was capped with 300mm of crushed limestone.

Verification sampling was undertaken to confirm the contamination had been successfully removed. The base and sides of the excavation were sampled and analysed; concentrations were confirmed to be below targets. Surface soils were tested site wide and contaminant concentrations found to be at least an order of magnitude below the targets.

A separate remediation programme was agreed for the off-site contamination plume. This will be undertaken by Caldic UK, the original site owners.

3.0 CONSTRUCTION PHASE REMEDIATION METHOD STATEMENT

The Enabling Phase works have provided a site remediated to the existing ground level. The remaining remediation works relate to the Construction Phase and include:

- Task C1: Appointment of an appropriate construction phase contractor
- Task C2: Placement of below ground services
- Task C3: Installation of cover system for landscaping areas
- Task C4: Installation of vapour resistant gas proof membrane for proposed buildings
- Task C5: Validation and verification reporting for Construction Phase

Necessary changes to the agreed implementation plan, arising during the course of the works, are to be agreed in writing with the local authority prior to being undertaken on site.

No contaminants have been reported in concentrations over the acceptable levels for future residential use. However, low levels of VOCs may remain within some soils. Maximum reported concentrations remaining in site soils are shown in Table 3.1 below.

Chemical of concern	Maximum concentration recorded	
Vinyl Chloride	mg/kg	0.0395
Dichloromethane	mg/kg	0.531
trans-1,2-Dichloroethene	mg/kg	1.32
cis-1,2-Dichloroethene	mg/kg	32.9
1,1,1-Trichloroethane	mg/kg	9.59
1,2-Dichloroethane	mg/kg	0.153
Trichloroethene	mg/kg	53.1
Toluene	mg/kg	0.145
1,1,2-Trichloroethane	mg/kg	0.153
Tetrachloroethene	mg/kg	702
Ethylbenzene	mg/kg	0.974
p/m-Xylene	mg/kg	3.41
o-Xylene	mg/kg	1.88

Table 3.1: Maximum contaminant concentrations remaining on site

The maximum concentrations were from samples collected from the saturated zone at 1.5 – 4.0 m below current site levels. The site levels will be raised by 1 m through the import of clean fill as part of the development, increasing the separation from construction phase works.

Though the site has been thoroughly investigated, there always remains a possibility of previously undiscovered contamination or unknown subsurface infrastructure (tanks, drains etc).

3.1 Task C1: Appointment of an appropriate Construction Phase contractor

The Principal Contractor must manage the risks in accordance with the requirements outlined in this document and will need to prepare appropriate health and safety documentation prior to commencement. Method Statements should include reference to the potential for contamination and all groundworks contractors should be aware of the potential for encountering contaminated soils or asbestos.

Competent advice should be sought in the event of any unexpected contamination being identified to ensure an appropriate solution is put in place.

3.2 Task C2: Placement of Clean Service Corridors

It is understood services will generally be placed within the top metre of clean imported fill. Where service corridors extend into the underlying soils, it should be ensured the corridors are free of contaminated material to protect future utilities workers. Since the shallow soils have been validated as suitable for use, this should only apply if previously unknown contamination is encountered.

On the precautionary principle, barrier water supply pipework should be compliant with *BS 8588: polyethylene pressure pipe with an aluminium barrier layer and associated fittings for potable water supply in contaminated land*. The specified pipework is GPS Protecta-Line PE Pipe Systems or an equivalent of equal or higher specification. The specification is included in Appendix B.

Potentially contaminated soil arisings should be assessed and disposed off-site as waste in line with duty of care requirements.

3.3 Task C3: Installation of Cover System in Landscaping Areas

In line with the Remedial Strategy and the Planning Conditions, all areas of soft landscaping should include a cover system of minimum 1 metre thickness to ensure future residents are protected from encountering potentially contaminated soils. The design includes a raise of 1m in site levels via the import of clean fill which will largely fulfil the requirements of the cover layer.

The cover system will consist of:

- a minimum of 850mm of clean, imported subsoil and topsoil over
- a geotextile marker layer; over
- 150mm of clean, compacted, crushed rock or concrete ("hard to dig" layer).

In the areas remediated during the enabling works, 200mm of crushed stone is already in place and provides the hard to dig layer.

Imported soils for use in the cover layer will comply with the standards in Table 3.2

Chemical of concern	Target value mg/kg	Chemical of concern	Target value mg/kg
Arsenic	37	Acenaphthene	220
Beryllium	73	Acenaphthylene	180
Boron	300	Anthracene	2400
Cadmium	14	Benz(a)anthracene	4.2
Chromium(III)	890	Benzo(a)pyrene	1.5
Chromium(VI)	6.1	Benzo(b)fluoranthene	7.6
Copper	2500	Benzo(ghi)perylene	64
Lead	200	Benzo(k)fluoranthene	12
Mercury, inorganic	170	Chrysene	7.7
Nickel	130	Dibenz(a,h)anthracene	1.1
Selenium	360	Fluoranthene	290
Vanadium	410	Fluorene	170
Zinc	3900	Indeno(1,2,3,cd)pyrene	4.3
Cyanide(free)	790	Naphthalene	2.2
Phenol(total)	290	Phenanthrene	97
Total TPH	500	Pyrene	620
Asbestos	Nil	Total PAH	50

Table 3.2: Import criteria for cover system soils

If any of these thresholds are exceeded the material shall be considered to be unsuitable for use in the cover layer without further assessment

3.4 Task C4: Installation of Gas Proof Membrane

The site was assessed as brownfield land with a moderate risk rating Amber 1. All properties and garages will require the installation of a vapour resistant gas proof membrane in accordance with CIRIA and NHBC guidance relating to gas protection.

The membrane should be installed in compliance with *CIRIA C748: Guidance on the use of plastic membranes as VOC vapour barriers* and *BS 8485: 2019 Mandatory requirements for gas membrane testing and verification*.

The membrane should be installed with joints welded/taped as appropriate to the situation and all penetrations sealed. The block and beam design should include passive venting of the subfloor void to remove any potential for the build up of gasses or vapours.

The verification is considered as important as the installation and must be undertaken independently by a competent inspector under BS 8485:2019.

The specified membrane is Protech VOC flex or an alternative of equal or higher specification. The independent verification programme will be undertaken and certified in accordance with BS 8485:2019.

3.5 Task C5: Verification and Reporting

A Verification Report confirming the works specified in this method statement will be issued following the completion of the Construction Phase remediation tasks. It will include:

- Verification report and certification for the vapour membrane
- Details of any unexpected contamination identified during construction and the management actions taken
- Records of materials management
- Verification of the suitability of imported soils
- Confirmation of the cover system in areas of landscaping
- Details of the disposal route for any contaminated soils removed from site

On completion of the verification works the appropriate verification documentation, detailing the works that have been completed in accordance with the agreed Implementation Plan, will be forwarded to the client and the local authority.

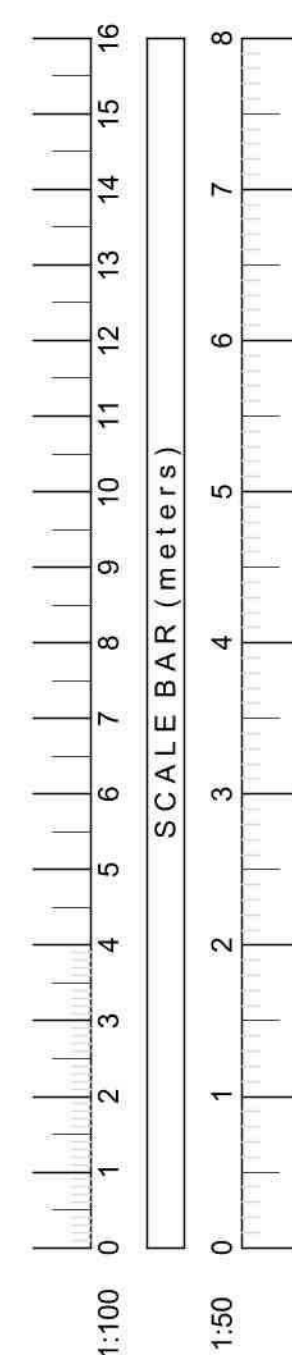
3.6 Discovery Strategy for unexpected contamination

Contamination identified by site investigations has been remediated. However, intrusive site investigations can never be certain of identifying all the contamination on a site and it is possible that additional contamination could be encountered during future work. If unexpected or suspected contamination is found the following procedures should be adhered to:

- Site works at the position of the suspected contamination should stop.
- Visual and olfactory observations made of the condition of the ground and the extent of contamination.
- An appropriate investigation undertaken from a suitably qualified geo-environmental engineer.
- Where further remediation is necessary, a remediation plan will be developed for approval by South Holland District Council.
- Following implementation of additional remediation works, a verification plan should be submitted to South Holland District Council.

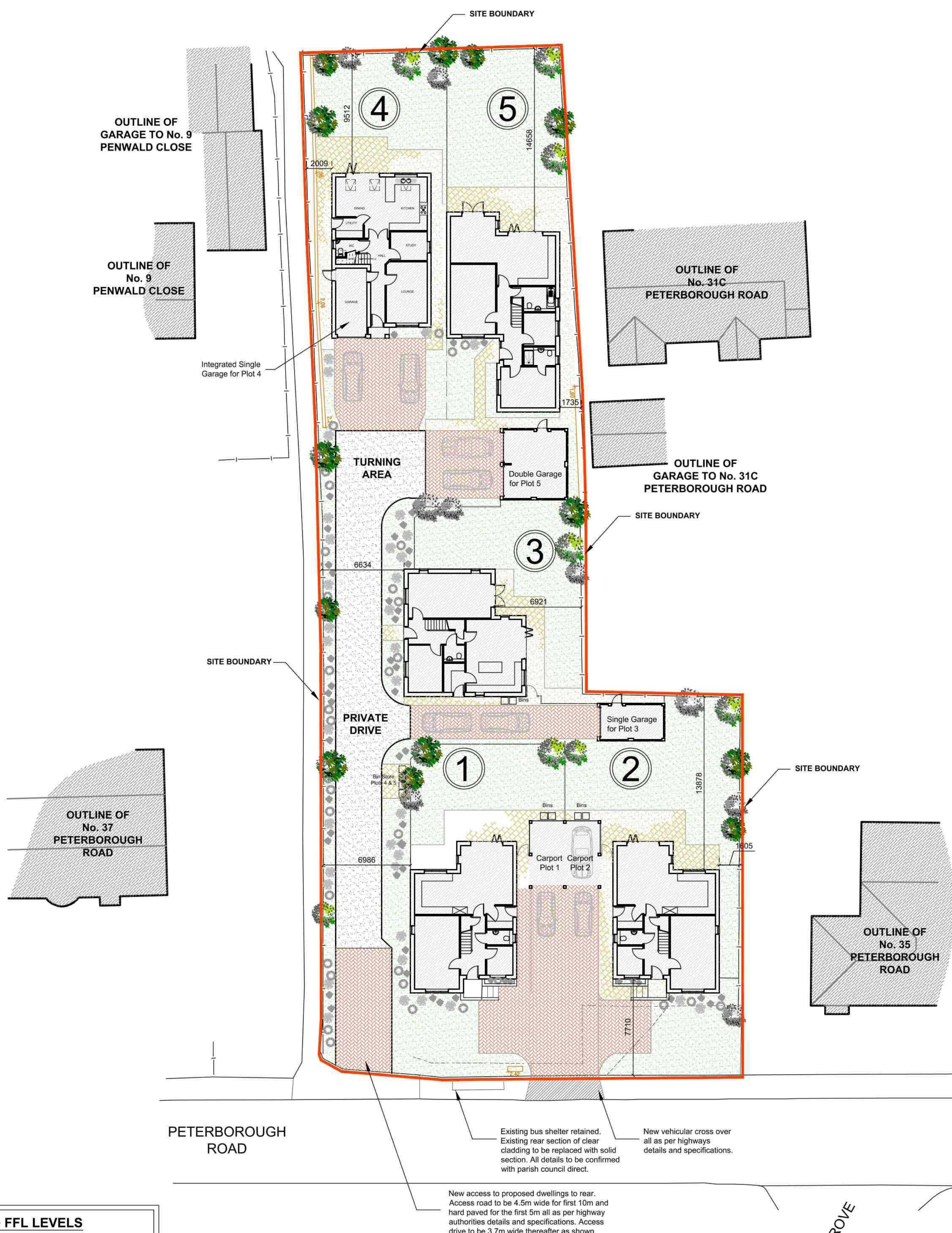
APPENDIX A: FIGURES

Figure 1: Development Plan



NATIONAL SPACE STANDARDS

All new dwellings to comply with minimum space standards set out in Policy 30 (b) of the JCS.
Detailed layouts to include built in storage to meet the standards and technical standards for single and double occupancy bedrooms.



SITE PLAN
1:200

PROPOSED FFL LEVELS

Dwelling 1 -	3.350
Dwelling 2 -	3.350
Dwelling 3 -	3.350
Dwelling 4 -	3.300
Dwelling 5 -	3.300

Refer to Topographical Survey for existing site levels.

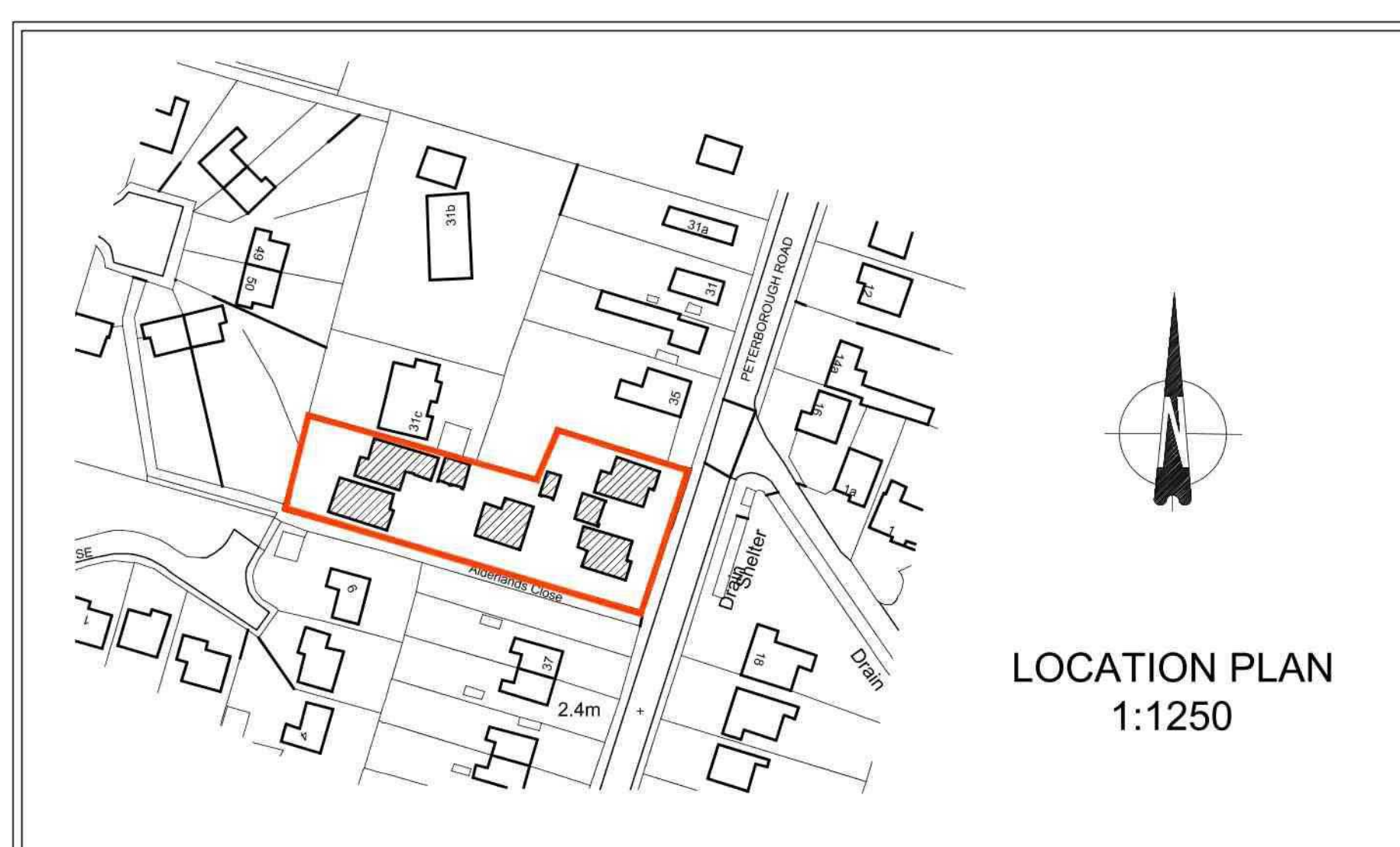
INTERNAL FLOOR AREAS

Dwelling 1 -	145 sqm	4 Bed
Dwelling 2 -	145 sqm	4 Bed
Dwelling 3 -	141 sqm	4 Bed
Dwelling 4 -	146 sqm	4 Bed
Dwelling 5 -	130 sqm	3 Bed

All areas exclude garages

SCHEDULE OF FINISHES

Walls
Facing brickwork to match existing neighboring dwellings / environment.
Windows & Doors
New double glazed windows and doors all to match existing neighboring dwellings / environment.
Roof
New roofing all similar to existing neighboring dwellings / environment. Roof pitch all similar to existing neighboring dwellings / environment.
Boundary Treatments
Existing perimeter boundary treatments replaced with new 1800mm high close boarded fence. New 1800mm high close boarded fence between dwellings as shown.



LOCATION PLAN
1:1250

Revision B - Amended following EA / Highways officers comments. 12/11/2018.
Revision A - Parking arrangements altered following highways comments. 19/10/2018.

SITE PLAN

Archi-tec
Architectural Design

0772 565 8850 Telephone

www.Archi-tec.co.uk Website

Simon@Archi-tec.co.uk Email

8 Brabham Close, Silverstone, Northants, NN12 8UL. Address

**PROPOSED 5No. NEW DWELLINGS ON
LAND ADJACENT 35 PETERBOROUGH
ROAD, CROWLAND,
PETERBOROUGH, PE6 0BB.**

Client
Date June 2018
Scale As Noted @ A1
Drawing No C36 - 200B

ALL DIMENSIONS TO BE CHECKED ON SITE. ANY DISCREPANCIES TO BE DISCUSSED AND AGREED PRIOR TO PROCEEDING. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT BUILDING REGULATIONS AND RELEVANT CODES OF PRACTICE. THIS DRAWING IS THE PROPERTY OF ARCHI-TEC ARCHITECTURAL DESIGN AND MUST NOT BE COPIED OR REPRODUCED WITHOUT PRIOR WRITTEN CONSENT.
STRUCTURAL INFORMATION SHOWN INDICATIVE ONLY. REFER TO STRUCTURAL ENGINEERS DRAWINGS AND CALCULATIONS AS NECESSARY.

Figure 2: Enabling phase remediation areas

- Legend

Fence

Contours (0.2m)

Top of Bank

Bottom of Bank

+2.09

Levels (mAOD)

Borehole
- The figure is a topographical map of a site. It features two areas highlighted in red and labeled 'Excavation Area' with arrows. The first excavation area is in the upper left, and the second is in the center-right. A hatched area in the upper right is labeled 'Concrete'. The map is covered with numerous contour lines and level points, many of which are marked with red crosses and numerical values (e.g., +1.50, +2.09). A north arrow is located in the upper left quadrant. A scale bar at the bottom left indicates distances of 0m, 10m, and 20m. Two boreholes are marked with green circles and labeled 'LP'.
- | | | |
|------|-------------|------------|
| | | |
| Rev. | Description | Revised By |
| | FIRST ISSUE | 24-01-19 |
- FLI

qds

Soil & Groundwater
Remediation Solutions

email: info@fli-qds.co.uk
www: fli-qds.co.uk
- Guildford Office:

Tel: 01483 303070

□

Rotherham Office:

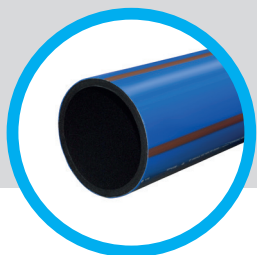
Tel: 01709 300800
- Site Address:
Peterborough Road
Crowland

Rev:
- Title: Topographical Survey 24-01-19
- Client: Caldic UK Ltd
- | | | |
|----------------|-------------------|----------------|
| Drawn: MRG | Checked: RT | Approved: RT |
| Dwg: Q-05483-? | Contract: Q-05483 | Scale: See Dwg |

APPENDIX B: Technical data for specified barrier pipe and vapour membrane

PROTECTA-LINE PIPE

PRODUCT DATA SHEET



Protecta-Line pipe is a multi-layered PE pipe with an embedded aluminium barrier layer. It is designed to safely transport drinking water in land which is contaminated or has the potential to be contaminated in the future.

RANGE / PRESSURE RATING

OD (mm)	SDR	Pressure rating	Material
25	11	12.5 bar	PE80
32			
63			
90 to 180	11	16 bar	PE100
	17	10 bar	PE100
225 to 630	11	16 bar	PE100
	17	10 bar	PE100

COLOURS

Material	Description	Colour
PE80	Black core and light blue outer with brown stripes	
PE100	Black core and dark blue outer with brown stripes	

Pipe diameter $\leq$ 180mm pipe has four brown stripes; $>$ 180mm pipe has eight brown stripes.

STANDARDS / APPROVALS

The Water Supply Regulation 31/27/30	BS EN 12201-2
WRAS Approved	WIS 4-32-19

CERTIFICATION



1606501
1511343
1505514
1302025



BS EN 12201-2
KM 508224



WIS 4-32-19
KM 514626

LENGTHS

Pipes $\leq$ 180mm in diameter are available in coiled lengths of 25m, 50m or 100m

Pipes 63mm – 630mm in diameter are also available in straight lengths of 6 or 12m.

Other lengths may be produced at customer's request

MARKINGS

As a minimum requirement, the following information is marked indelibly and linearly at intervals along the pipe:

- Manufacturers identification: **GPS**
- System: **Protecta-Line**
- Pipe composition: **PE Pipe with AL Barrier**
- Standard and pipe type: **WIS 4-32-19 TYPE A**
- Material designation: **PE100 or PE80**
- Nominal size: **180mm (example)**
- SDR value: **SDR 17 (example)**
- Continuous pressure rating at 20°C: **10 bar (example)**

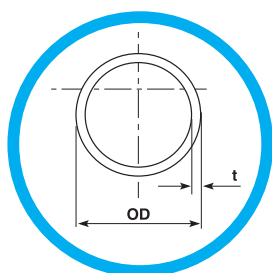
The pipes are marked with the following three times per metre:

- Application: **Water**

BATCH NUMBER FORMAT

8 Digit Code	Extruder Number 1 & 2	Shift Number 3 & 4	Week Number 5 & 6	Year 7 & 8
	01-23	01 - 14	01 - 52	01-99

PIPE DIMENSIONS



* The size is the nominal core pipe outside diameter. Other diameters, SDRs and lengths can be made subject to a minimum order value.

Size* (mm)	SDR	Min OD (mm)	Max OD (mm)	Mean Bore (mm)	Min t (mm)	Max t (mm)	Approx Weight (kg/m)
25	11	26.2	27.4	20.0	3.0	3.7	0.3
32	11	33.3	34.5	26.0	3.7	4.4	0.4
63	11	64.3	65.6	50.9	6.5	7.6	1.3
90	11	92.2	93.5	72.9	9.3	10.7	2.6
	17	92.2	93.5	78.8	6.5	7.5	1.9
110	11	112.2	113.5	89.2	11.1	12.7	3.7
	17	112.2	113.5	96.3	7.7	8.8	2.7
125	11	127.2	128.5	101.2	12.5	14.2	4.7
	17	127.2	128.5	109.6	8.5	9.8	3.4
160	11	163.2	165.1	130.4	15.8	17.9	7.6
	17	163.2	165.1	141.1	10.7	12.4	5.4
180	11	183.3	185.4	146.8	17.6	20.0	9.5
	17	183.3	185.4	158.8	11.9	13.7	6.8
225	11	227.3	229.5	182.5	21.7	24.4	14.5
	17	227.3	229.5	197.4	14.6	16.6	10.3
250	11	252.3	254.9	203.0	23.9	26.8	17.7
	17	252.3	254.9	219.6	16.0	18.3	12.4
280	11	282.3	285.1	227.4	26.6	29.8	22.0
	17	282.3	285.1	245.9	17.8	20.1	15.4
315	11	317.3	320.2	255.7	29.8	33.3	27.6
	17	317.3	320.2	276.6	19.9	22.4	19.3
355	11	357.3	360.6	288.3	33.4	37.3	34.8
	17	357.3	360.6	311.6	22.3	25.1	24.3
400	11	402.3	405.8	324.8	37.5	41.8	43.9
	17	402.3	405.8	351.3	24.9	27.9	30.4
450	11	452.3	456.1	365.4	42.1	46.8	55.3
	17	452.3	456.1	395.2	27.9	31.2	38.2
500	11	502.3	506.4	406.0	46.6	51.8	67.9
	17	502.3	506.4	439.0	30.9	34.5	46.9
560	11	562.3	566.8	454.9	52.0	57.7	84.7
	17	562.3	566.8	491.8	34.4	38.4	58.4
630	11	632.3	637.2	511.6	58.4	64.8	106.9
	17	632.3	637.2	553.2	38.6	43.0	73.6

Protech VOC Flex

GAS PROTECTION

DESCRIPTION

Protech VOC Flex complies with CIRIA C748 and BS8485:2015. It is a high performance 6 layer flexible proprietary reinforced VOC gas barrier and is suitable for use on brownfield sites that require protection from dangerous contaminants such as hydrocarbons. The Protech VOC Flex has been developed to ease installation on site due to the flexibility of the membrane. It is also suitable as a high performance damp proof membrane.



INSTALLATION

Protech VOC Flex can be sealed either by welding or using Protech GM Tape. It is considered prudent that tape joints should not be used where there will be no long term compression of the membrane or where there is a likelihood where the membrane will come into direct contact with the VOCs in a liquid state.

In areas where the membrane crosses cavity walls or internal single skin walls, Protech VOC Flex Starter Band should be used in conjunction with Protech VOC Flex Internal and External preformed corner units. Pipe penetrations should be sealed with Protech VOC Top Hats or Protech GM Flashing Strips. Stanchions and columns should be sealing with Protech GM Primer and Protech GM Flashing strips (Photos, isometric and standard details are available on our website).

KEY FEATURES

- Exceptional chemical resistance
- Gas resistant
- Additional damp proofing protection
- Flexible membrane to ease installation on site
- Robust & durable multi-layer membrane
- High resistance to puncturing

ACCESSORIES

- Protech VOC Flex Starter Band
- Protech VOC Tophats
- Protech GM Flashing
- Protech VOC Corner Units
- Protech GM Primer
- Protech GM 3mm Protection Board
- Protech GM Protection Fleece
- Protech GM Tape
- Protech Liquid Applied Gas Membrane (LAGM)



PROPERTIES

PROPERTY	UNIT	MEAN	METHOD
Roll size	m	2 x 50	
Thickness	mm	0.55	
Weight	g/m ²	564	DIN EN ISO 536
Tensile strength MD CD	N/50mm	700 640	EN 12311-1 +Mods EN 13859-1
Elongation MD CD	%	30 25	EN 12311-1 +Mods EN 13859-1
Nail tear resistance MD CD	N	500 540	EN 12311-1

Protech VOC Flex

CHARACTERISTICS	TEST METHOD		
Methane Permeability	ISO 15105-1	✓	
Diesel Permeability	ISO 6179:2010	✓	
Petrol Permeability	ISO 6179:2010	✓	
Xylene Permeability	ISO 6179:2010	✓	
Toulene Permeability	ISO 6179:2010	✓	
Vinyl Chloride	ISO 15105-2	✓	
Ethyl Benzene	ISO 15105-2 EN 14414 Method C	✓	
Trichlorethene	ISO 15105-2	✓	
Xylene (O, M, P)	ISO 15105-2 EN 14414 Method C	✓	
Naphthalene	ISO 15105-2 EN 14414 Method C	✓	
Benzene	ISO 15105-2 EN 14414 Method C	✓	
Toluene	ISO 15105-2 EN 14414 Method C	✓	
Hexane	ISO 15105-2 EN 14414 Method C	✓	
Tetrachlorethene	ISO 15105-2	✓	
Bromoform	ISO 15105-2	✓	
Carbon Tetrachloride	ISO 15105-2	✓	
Chloroform	ISO 15105-2	✓	
Ethylene Dichloride	ISO 15105-2	✓	
Methyl Teriary Butyl Ether	ISO 15105-2	✓	
Trichloroethylene (TCE)	EN 14414 Method C	✓	
Perchloroethylene (PCE)	EN 14414 Method C	✓	
Determination of Chemical Resistance	Test Method	Properties	
Hydrolysis under Acid Conditions	BS EN 14414 Method A	Tensile Strength Mpa MD	Pass
		Tensile Strength Mpa CD	Pass
		Tensile Elongation % MD	Pass
		Tensile Elongation % CD	Pass
	NO VISUAL DEGRADATION		
Hydrolysis under Basic Conditions	BS EN 14414 Method B	Tensile Strength Mpa MD	Pass
		Tensile Strength Mpa CD	Pass
		Tensile Elongation % MD	Pass
		Tensile Elongation % CD	Pass
	NO VISUAL DEGRADATION		
Solvation & Swelling (Diesel/Parafin/Lubrication Oil)	BS EN 14414 Method C	Tensile Strength Mpa MD	Pass
		Tensile Strength Mpa CD	Pass
		Tensile Elongation % MD	Pass
		Tensile Elongation % CD	Pass
	NO VISUAL DEGRADATION		
Synthetic Leachate	BS EN 14414 Method D	Tensile Strength Mpa MD	Pass
		Tensile Strength Mpa CD	Pass
		Tensile Elongation % MD	Pass
		Tensile Elongation % CD	Pass
	NO VISUAL DEGRADATION		