

**WYNNSTAY GROUP PLC
LLYSONNEN MILL, TRAVELLERS REST,
CARMARTHEN**

**DISCHARGE OPTIONS APPRAISAL AND
DRAINAGE IMPROVEMENT SPECIFICATIONS**

FEBRUARY 2011

Prepared for:



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ExCAL Limited

DOCUMENT CONTROL SHEET

PROJECT:	WYNNSTAY GROUP PLC LLYSONNEN MILL, TRAVELLERS REST, CARMARTHEN
TITLE:	DISCHARGE OPTIONS APPRAISAL AND DRAINAGE IMPROVEMENT SPECIFICATIONS

PROJECT REF:	129-01-02
REPORT No.:	129-01-02.R1

PREPARED BY: C Walters


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APPROVED BY: D Thomas


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Version	Date	Amendments
Original	4/2/11	

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**WYNNSTAY GROUP PLC, LLYSONNEN MILL
TRAVELLERS REST, CARMARTHEN**

**DISCHARGE OPTIONS APPRAISAL AND DRAINAGE
IMPROVEMENT SPECIFICATIONS**

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1.0 INTRODUCTION

1.1 Scope

ExCAL Ltd have been commissioned by Wynnstay Group Plc to undertake an options appraisal and provide a drainage improvement specification for the Llysonnen Mill, located on the outskirts of Carmarthen.

This report has been developed to discharge improvement conditions set in the installation's Environmental Permit (Permit No.: EP3034GS). The conditions covered in this report are: -

Reference	Requirement
IC1	The Operator shall investigate options which avoid the discharge of surface water, other than from building roofs, to local water courses. A written report on the options and proposed actions, with timescales for implementation, shall be submitted to the Environment Agency. You must implement the plan from the date of approval in writing by the Environment Agency.
IC4	The Operator shall undertake a survey to assess the adequacy of the design, construction and condition of the site drainage system with the purpose of preventing fugitive emissions to surface water, ground water and land. A written report summarising the survey and proposals for improvements shall be submitted to the Environment Agency. A timescale for implementation of any improvements shall be approved by the Environment Agency.

1.2 Site Location

The installation is located at Travellers Rest, Carmarthen, just off the A40 (Carmarthen / St. Clears). The full site address is: -

Wynnstay Group Plc
Llysonnen Mill
Travellers Rest
Carmarthen
Carmarthenshire
SA31 3SG.

The approximate centre of the site is located at NGR: SN 38295 19579.

The site location and permit boundary is shown in drawing 129-01-01-08.D001 in Appendix A. The site covers an area of approximately 1.6 hectares.

1.3 Background

The installation operates as an animal feed compounding mill which processes vegetable based raw materials to produce a finished product. The raw materials (including fuels) stored and used on site are in solid (powder or granular) and liquid states.

The current drainage arrangements are shown in drawing 129-01-02.D03 in Appendix A. Some uncertainties have been established in the site drainage system shown in this plan, subsequently further drainage investigations were undertaken and the findings are shown in drawing EL//LM//001 in Appendix A.

There are no existing links between the site drainage network to the public sewer network. At present the site drainage involves the collection of all surface waters (including clean roof-waters) via one linked drainage network. This network subsequently discharges via consent to a series of interceptors then into controlled surface waters (ditches) located along the site's eastern and southern perimeter.

Historical monitoring of this discharge has indicated elevated levels of BOD and suspended solids, although recent monitoring exercises indicate that these levels have reduced. Initial investigations suggest that these levels are associated with the presence of fugitive emissions of solid raw materials, molasses and oils which are washed into the site drainage system.

Upon commencement of the study all foul waters from welfare facilities were thought to be stored in cess pits/septic tanks located on site.

2.0 POINT SOURCE EMISSIONS TO CONTROLLED WATERS

Surface waters collected in the site drainage system are discharged under consent at four locations to the drains located along the site boundary. The compliance point agreed with the Environment Agency for these discharges is at the confluence point of the drains located on the eastern site boundary and is shown on drawing 129-01-02.D02. Details of the compliance parameters of the discharge consent are summarised in Table 2.1 below.

Table 2.1 – Discharge consent compliance parameters

Parameter	Units	Consent Limit
pH	pH units	5.0 - 8.5
Suspended solids	mg/l	15
BOD	mg/l	10

Foul water is collected via a foul sewer and discharged to two septic tanks. Overflows from these systems discharge to the site's surface water ditch.

3.0 DISCHARGE OPTIONS APPRAISAL

3.1 Introduction

To satisfy requirement IC4 a Closed Circuit Television (CCTV) survey was undertaken on the site's surface water drainage system. The survey was undertaken to identify the integrity of the existing drainage system. The details of this survey are presented in Appendix C.

The current drainage system collects all surface waters (including clean roof waters) for discharge into controlled waters at the site's perimeter. These discharged waters have the potential to be contaminated by a range of materials used on site, including hydrocarbons and molasses, vegetable oils, and dry materials. Alternative discharge options include: -

- Discharge to public sewer;
- Discharge to ground (via soakaway);
- Discharge to surface water with reed bed treatment.

3.2 Option 1 - Public Sewer

The site is not currently served by any public sewer network (foul or surface water). The nearest public sewer is shown on drawing 129-01-02.D21 in Appendix A. The location of the public sewerage system makes connection impractical.

3.3 Option 2 – to ground (via soakaway)

3.3.1 Site Geology

The site's underlying geology has been ascertained through review of information provided by GroundSure (see Appendix D).

There are no records of the superficial deposits across a large proportion of the site, whilst the north-eastern/eastern edges of the site are shown to consist of glacial sand and gravels. Across South Wales these deposits commonly exceed 15 metres thickness. In the valley areas the permeability of these deposits are high to very high through intergranular flow, which produces recorded recharge rates of up to 63 l/s. However, outside of the valley areas recharge is limited and unreliable.

Immediately to the north west and north of the site the drift deposits are classified as Devensian Till. These glacial deposits consist of variable boulder clays and morainic drift with typical lithologies of unsorted stones, of gravel, cobble or boulder size in silty clay matrix. These deposits are typically less than 15 m thick. Hydrogeologically these deposits have limited recharge and confine water within underlying formations.

3.3.2 Intrusive investigation

Due to the uncertainties in the underlying drift geology an intrusive investigation was commissioned in order to identify the permeability and thicknesses of the underlying lithologies.

The investigation involved the excavation of four trial pits using a backhoe Hydraulic excavator to depths of up to 3 metres. The locations of these excavations are shown in drawing 129-01-02.D02 in Appendix A.

The investigative logs detailing the strata encountered at each excavation are presented in Appendix B. In summary the underlying ground consists of between 0.5 to 2 metres of made ground overlaying till deposits (described as slightly sandy, slightly gravelly very silty CLAY).

A total of 8000 litres of un-contaminated waters were poured into the excavations. The water levels in the test pits showed little or no head loss when left overnight.

Based upon the results of these falling head tests, the permeability of the underlying deposits was found to be low. Ground conditions at the site are unsuitable for large soakaway discharges.

3.4 Option 3 – to surface waters (with reed bed treatment)

Due to the lack of availability of the public sewer connection and the unsuitability of the underlying strata for soakaway, we have considered potential treatment options for the surface water that would allow discharge into the site's drainage trench.

Following review we are of the opinion that the surface water should be discharged to a settlement pond which should then discharge into a Vertical Flow reed bed.

Sub-surface vertical flow reed bed systems are commonly used for the effective removal of suspended solids BOD levels in effluents. The design allows the discharge water to filter under gravity through layered sand and gravel media. The most commonly used species of reed for this type of application is the common reed (*Phragmites Australis*).

Based on the potential storm volume for a 4 hours event for a 1 in 10 year return period the reed bed would require a hydraulic treatment area of approximately 100 sq. metres. It is considered that all surface deposits of material on the surface aprons will wash off within the initial surface flows. To accommodate additional flows from longer duration storm events the system will consist of gravel overflow treatment system outside of the main treatment.

4.0 PROPOSED REMEDIAL WORKS

4.1 Diversion of clean roof waters from existing surface water drainage

Remedial works should be undertaken on the main reception building and should allow diversion of the clean roof waters from the existing site drainage via a new carrier drain which will discharge into the site's surface water drainage ditch. Drawing 129-01-02.D05 in Appendix A provides an overview of the typical design specifications.

4.2 Diversion of clean roof waters from foul and surface water drainage

During the investigation it was found that a proportion of the roof water drainage collected from the store building is connected directly into the foul water drainage system, which is subsequently causing the rapid filling and overfilling of the Mill store building septic tank. During times of overfilling the water contained within the tank is discharged directly into the site's surface water drainage ditch.

Remedial works should be implemented to divert the clean roof waters away from the foul and surface water drainage system via a new carrier drain which will discharge the clean, uncontaminated roof waters directly into the site's surface water drainage ditch.

Drawing 129-01-02.D06 provides an initial design layout for this scheme.

4.3 Removal of Septic Tank Overflows

The septic tanks are maintained and emptied on a planned maintenance schedule and consequently, if they were emptied prior to the time at which the effluent level reaches the level of the overflow, there would be no overflow from these tanks into the surface water drainage ditch. However, it is evident from our study that this is not currently practical as large quantities of surface water also pass into the tanks from the roofs of buildings. Consequently the tanks are usually filled to their overflow level.

Remedial works are necessary in order to eliminate the septic tanks discharging to the site's surface water drainage ditch. This will eliminate the potential for waters with elevated Biochemical Oxygen Demand (BOD) and suspended solids being discharged.

The suggested remedial works is to remove the septic tank overflows and install high level alarm systems that will notify the site as to when the tanks require emptying.

4.4 Containment of Molasses at the Mill Store Building

During the investigation it was noted that the process pipework supplying the three process tanks is extended beyond the current bunded area resulting in the

possibility of process products such as molasses being washed into the site's surface water drainage.

To remove this potential, the construction of a sealed concrete bund will be required.

The proposed location of the bund is shown in drawing 129-01-02.D08 in Appendix A.

4.5 Sealing of process tank bund flooring

It was evident during the investigation that the process tank bund at one time had a rain water downpipe running through its base connecting to the site's surface water drainage. During building modification works the downpipe has been removed, leaving its connection to the surface water drainage open.

Any loss of containment has the potential to directly enter the surface water drainage system resulting in the direct discharge of process products.

To remove this potential the surface water connection requires plugging and concrete grouting.

4.6 Isolation and Treatment of Refuelling Area

It was recorded that the site's refuelling area has no dedicated drainage and any surface waters currently produced by rain at this location enter the adjacent surface water drainage where it is discharged to the site's surface water drainage trench. This provides the potential for fuel contamination to enter the surface water drainage system and subsequently the surface water drainage trench.

In order to remedy this issue a dedicated ACO surface water drainage will be required around the perimeter of the refuelling area.

In order to ensure fuel oils are not passed through to the surface water drainage, the discharge from this will need to pass through a Class 1 Full Retention Oil Separator. Details of this are shown in drawings 129-01-02.D09, 129-01-02.D18, 129-01-02.D019 and 129-01-02.D20.

4.7 Reinstatement of damaged surface water drainage adjacent to the site's electrical sub station

During our investigation of the discharges into the surface water drainage trench, ground water appeared to be seeping into the trench approximately 3m north of the store septic tank overflow. The drainage study has identified that the seepage is caused by damaged surface water drainage.

In order to remedy this issue, reinstatement of the damaged drainage will be required.

5.0 STORM WATER VOLUMES

Any new surface water network and discharge system would need to be able to cope with the volumes associated with storm events. The anticipated storm water volumes are calculated using the Flood Estimation Handbook and are as follows: -

Table 5.1 – Flood Estimation Handbook, storm volume calculations

Storm Event	Rainfall Intensity (mm)	Rainfall Intensity (m)	Roadway Servicing Northern Surface Water Discharge	Roadway Servicing Southern Surface Water Discharge	Roofed Areas			Total
					Mill Store Building	Finished product storage building	Main reception Building	
Area (m ²)			387	145	1084	3550	205	
1 in 5 year return period (m³)								
M5-30min	12.5	0.0125	4.8	1.8	13.6	44.4	2.6	67.1
M5-1hr	17	0.017	6.6	2.5	18.4	60.4	3.5	91.3
M5-2hr	23	0.023	8.9	3.3	24.9	81.7	4.7	123.5
M5-4hr	31.1	0.0311	12.0	4.5	33.7	110.4	6.4	167.0
M5-6hr	37	0.037	14.3	5.4	40.1	131.4	7.6	198.7
M5-12hr	49.8	0.0498	19.3	7.2	54.0	176.8	10.2	267.5
M5-24hr	63.4	0.0634	24.5	9.2	68.7	225.1	13.0	340.5
1 in 10 year return period (m³)								
M10-30min	15.7	0.0157	6.1	2.3	17.0	55.7	3.2	84.3
M10-1hr	21.1	0.0211	8.2	3.1	22.9	74.9	4.3	113.3
M10-2hr	28.2	0.0282	10.9	4.1	30.6	100.1	5.8	151.5
M10-4hr	37.5	0.0375	14.5	5.4	40.7	133.1	7.7	201.4
M10-6hr	44.3	0.0443	17.1	6.4	48.0	157.3	9.1	237.9
M10-12hr	58.7	0.0587	22.7	8.5	63.6	208.4	12.0	315.3
M10-24hr	73.8	0.0738	28.6	10.7	80.0	262.0	15.1	396.4

Hydraulic design of the pipe network will need to ensure that it has the capacity to receive and discharge the volumes calculated in the above table.

6.0 CONCLUSION

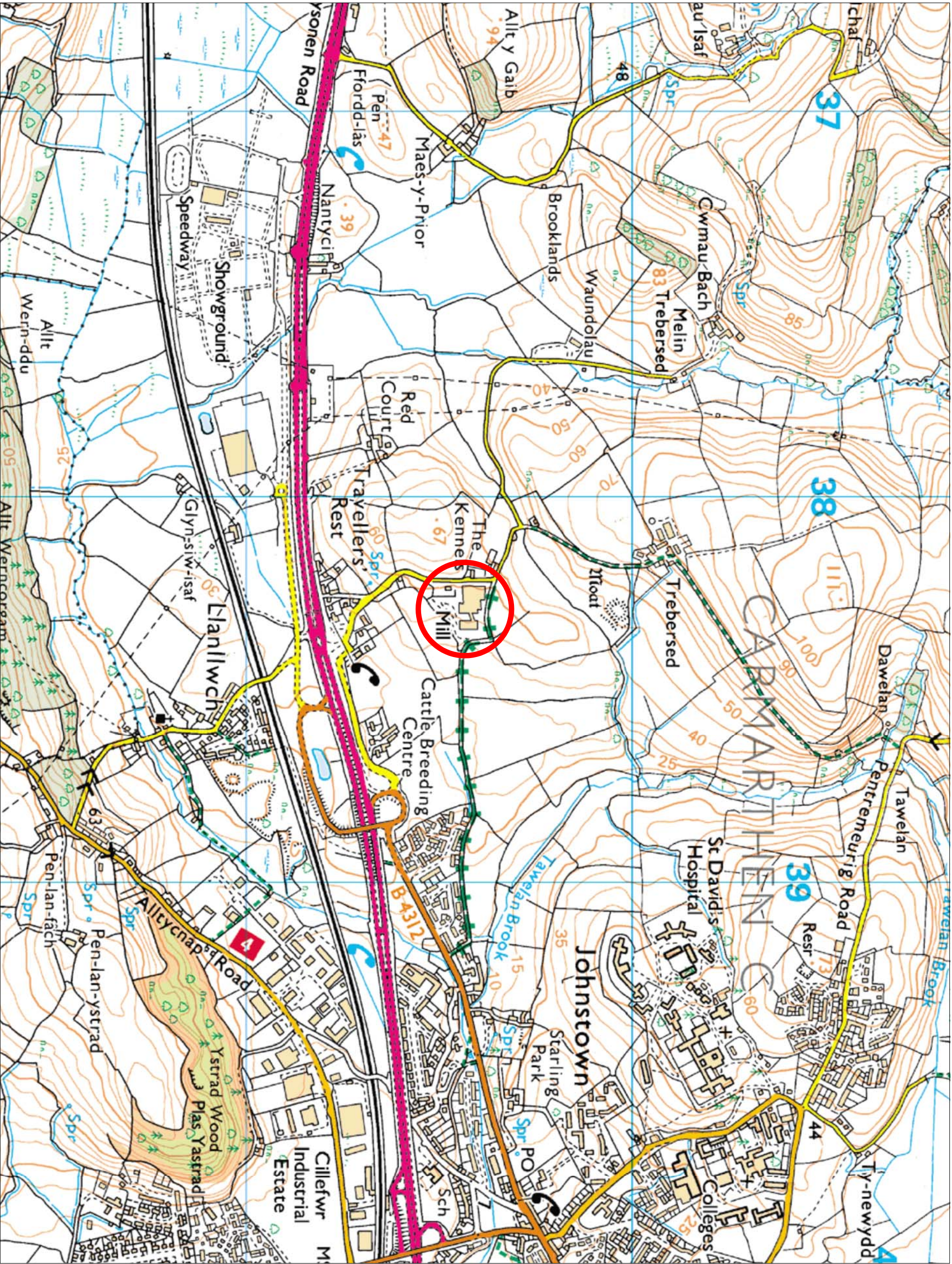
Our study indicates that the contributions of foul water and potentially contaminated surface water into the surface water drainage ditch are likely to be the primary source of BOD and Suspended Solids related to the discharge issues at the confluence point.

Our investigation has identified that there is no one main contributing source to the poor water quality issues. Several factors contribute to the elevated levels of BOD measured in the surface water ditches.

Remedial works at the identified areas would significantly reduce the BOD and Suspended Solid concentrations in surface water ditches and implementation of the recommendation above are likely to be sufficient to enable future compliance.

APPENDIX A

Drawings



Job: EPR Permit Application for Wymstay Group Plc Llysoenen Will Carmarthen

Title: Site Location

Date: June 2009

Scale: 1:10000

Drawn by: MKI

Checked by: DT

EXCAL LIMITED

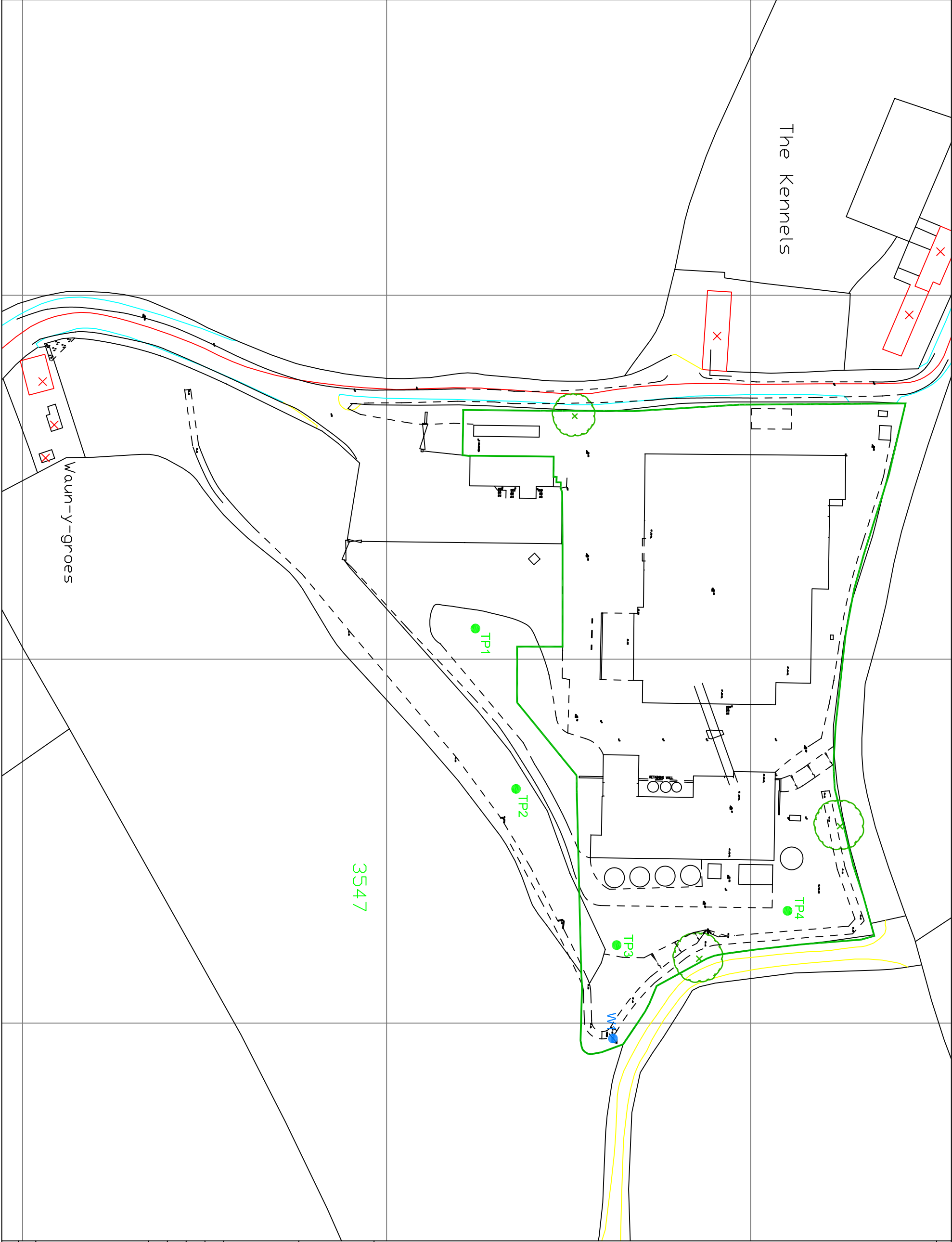
1 St Mary's Street
Carmarthen
Carmarthenshire
SA31 1TN

Tel: 01267 234231 Fax: 01267 234232
Website: www.excaluk.com E-mail: reception@excaluk.com

Drawing No: 129-01-01-08.D001

Revision No: Date:

- W1 ● Water Emissions Monitoring Point
- TP1 ● Percolation Test Pit Locations



Job:
Wynnstay Group Plc
Llysennen Mill
Carmarthen

Title:
Location of Water Monitoring Point and
Percolation Test Pits

Date: June 2009
Scale: 1:1000
Drawn by: MKI
Checked by: DT

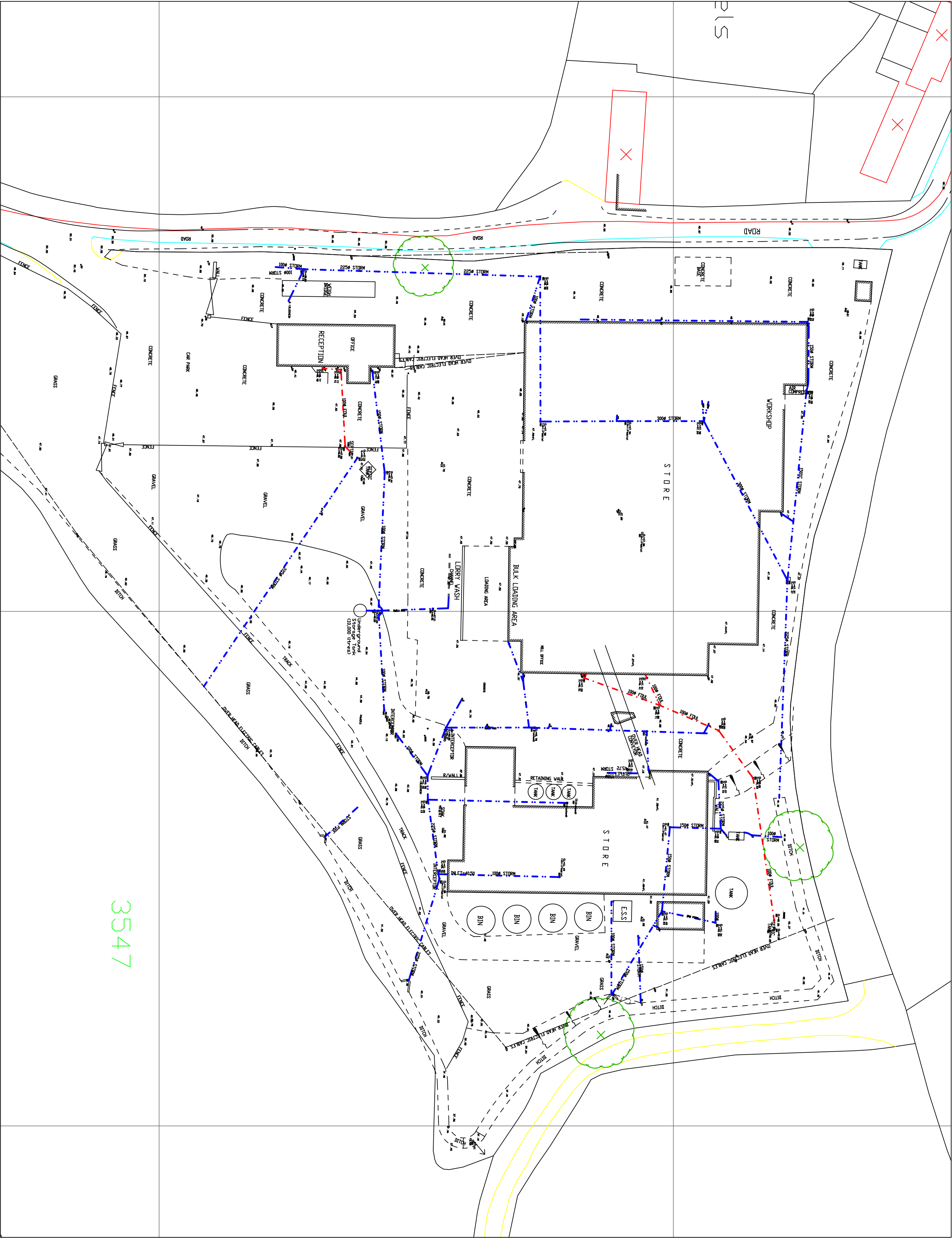
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Carmarthenshire
SA31 1TN

Tel: 01267 234231 Fax: 01267 234232
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Drawing No: 129-01-02.D02

Revision No: **Date:**

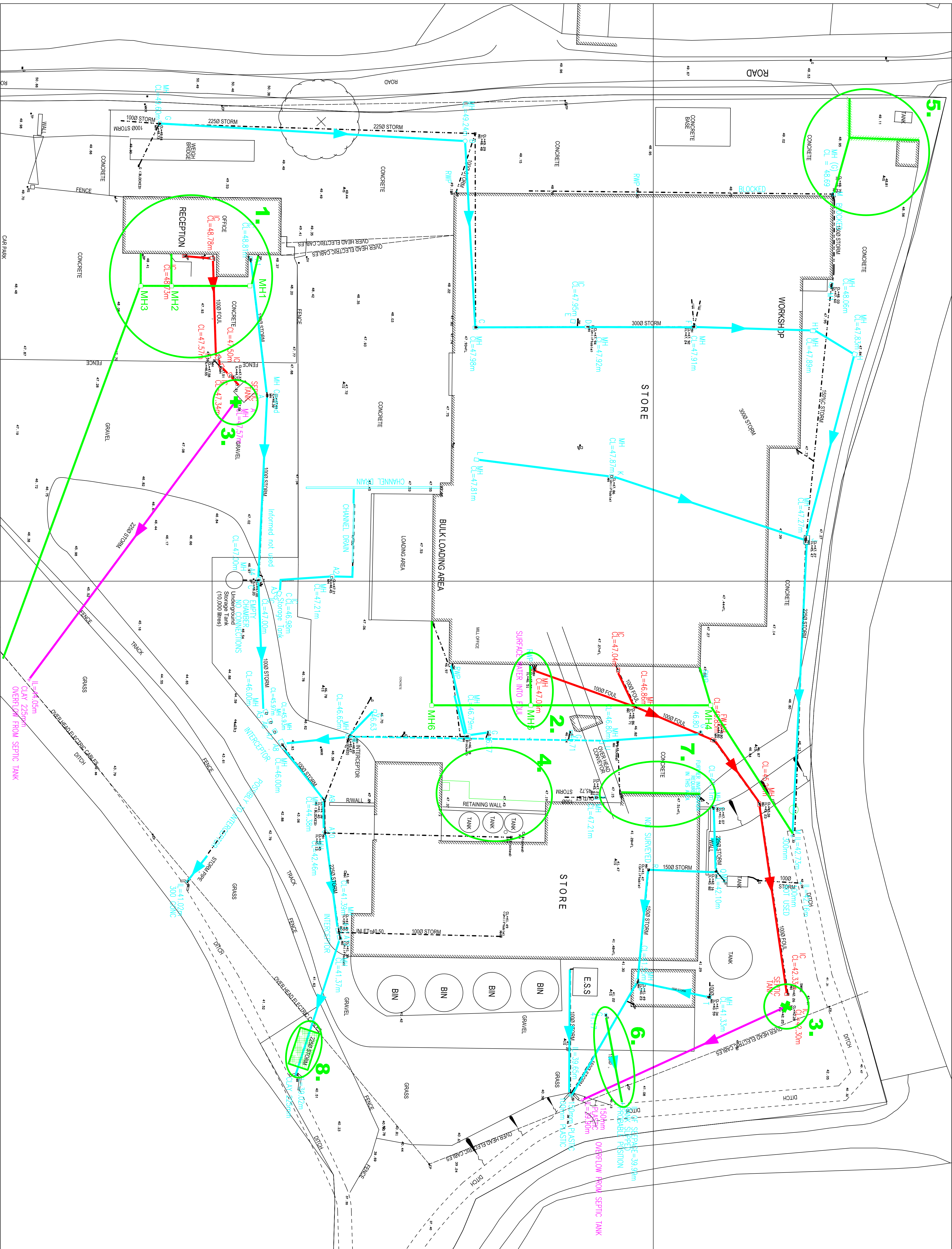
- - - - - Foul Waters
- - - - - Surface Waters



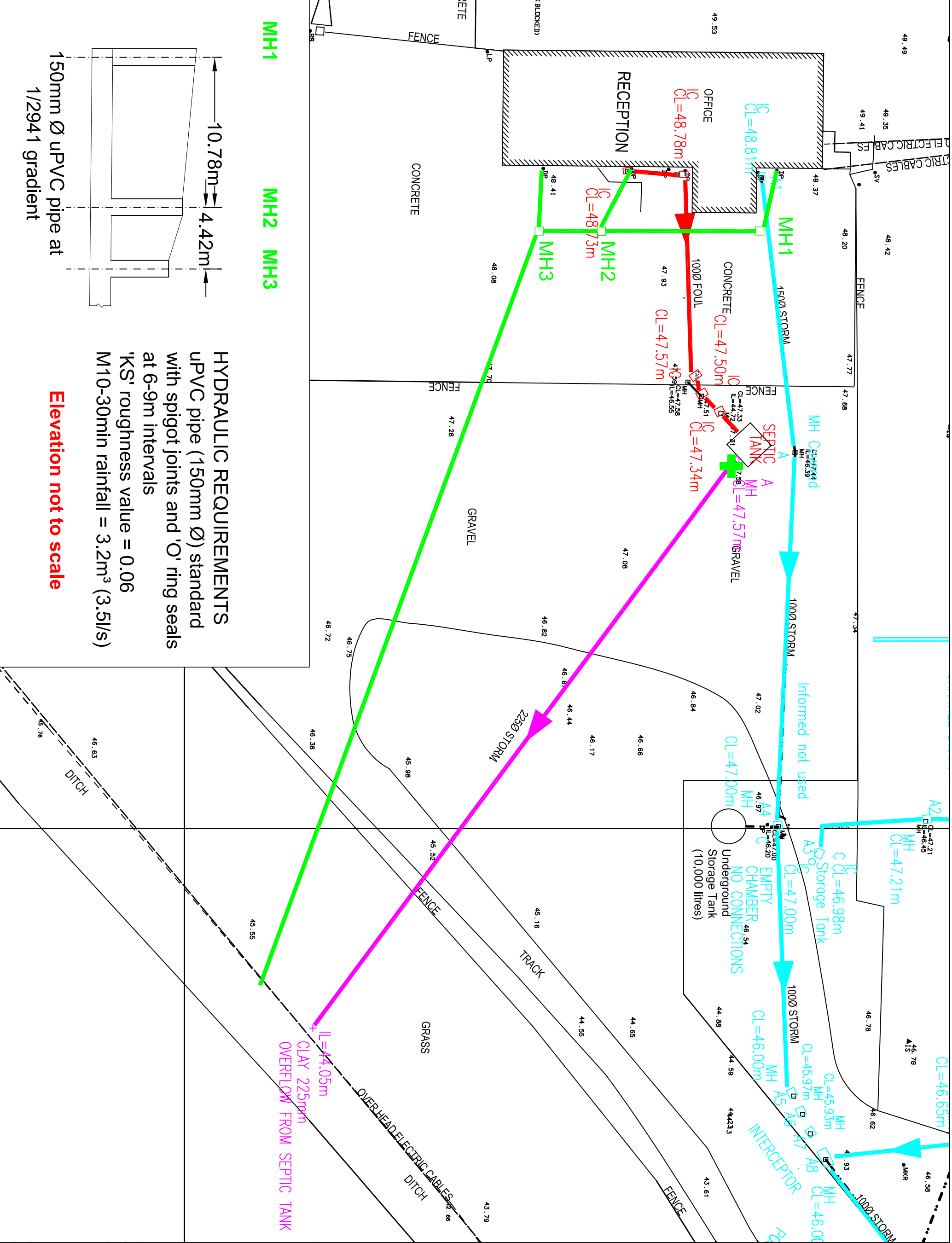
3547

Job: Wynnstay Group Plc Llysennen Mill Carmarthen	
Title: Original Site Drainage Plan	
Date:	June 2009
Scale:	1:500
Drawn by:	MKI
Checked by:	DT
E ^X CAL LIMITED 1 St Mary's Street Carmarthen Carmarthenshire SA31 1TN Tel: 01267 234231 Fax: 01267 234232 Website: www.excaluk.com E-mail: reception@excaluk.com	
Drawing No:	129-01-02.D03
Revision No:	Date:

-  New Carrier Drain
 Class 1 Interceptor
 ACO Drainage



Job: Wynnistay Group Plc Llysonnen Mill Carmarthen
Title: Proposed Remedial Works
Date: February 2011
Scale: 1:250
Drawn by: MKI
Checked by: CW
 1 St. Mary's Street Carmarthen Carmarthenshire SA31 1TN Tel: 01267 234231 Fax: 01267 234232 Website: www.ecalluk.com E-mail: info@ecalluk.com E.CAL Limited
Drawing No.: 129-01-02.D04
Revision No.: Date:



☐ **MH** New Manhole

New Carrier Drain

MH1 MH2 MH3

HYDRAULIC REQUIREMENTS

UPVC pipe (150mm Ø) standard with spigot joints and 'O' ring seals at 6-9m intervals

"K.S' roughness value = 0.06
M10-30min rainfall = 3.2m³ (3.5l/s)

Elevation not to scale

150mm Ø uPVC pipe at
1/2941 gradient

Title:
Proposed Diversion of Reception
Roof Waters via New Carrier Drain

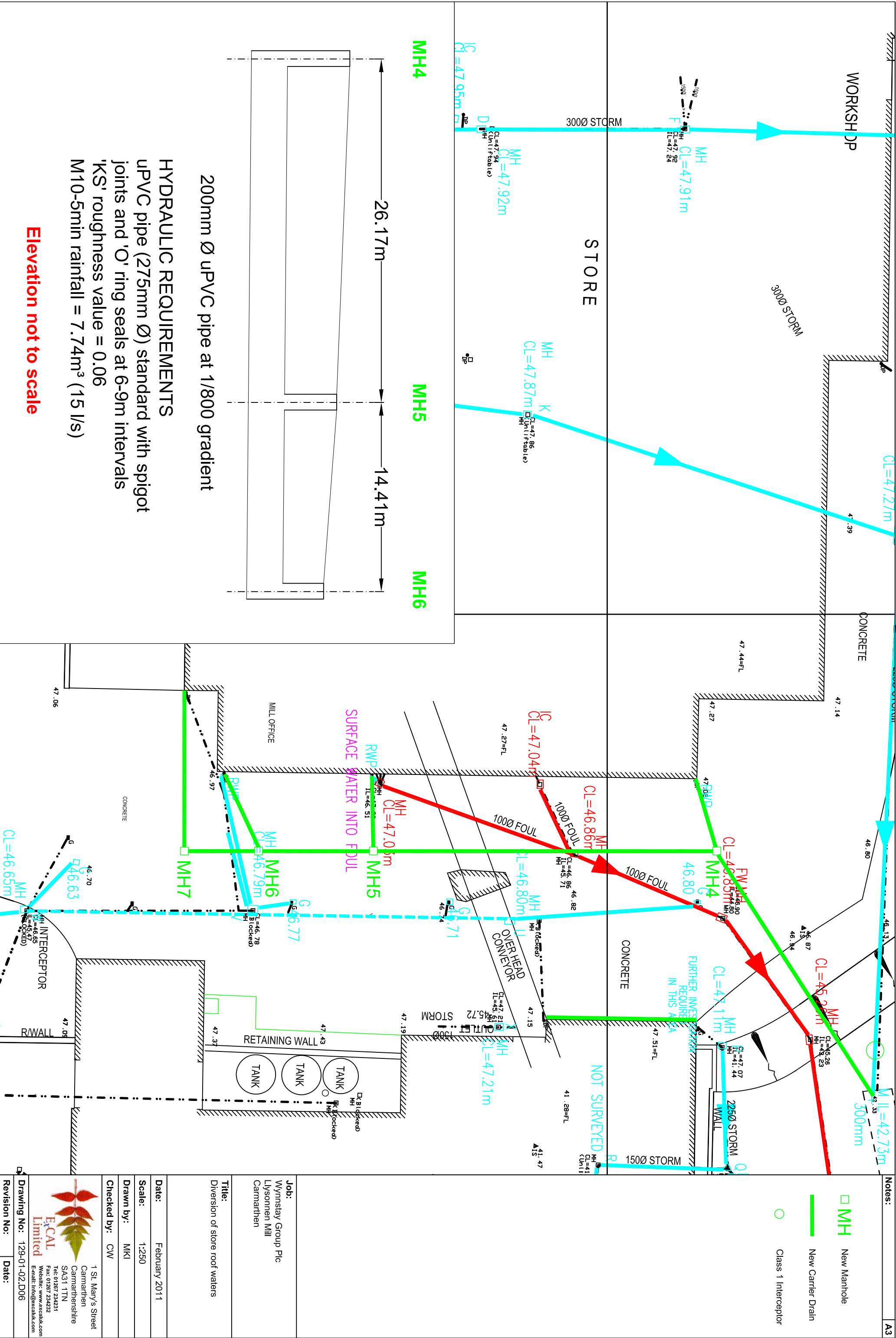
Job:
Wynnstay Group Plc
Llysennen Mill
Carmarthen

Date:	February 2011
Scale:	1:250
Drawn by:	MKI
Checked by:	CW


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Drawing No: 129-01-02.D05

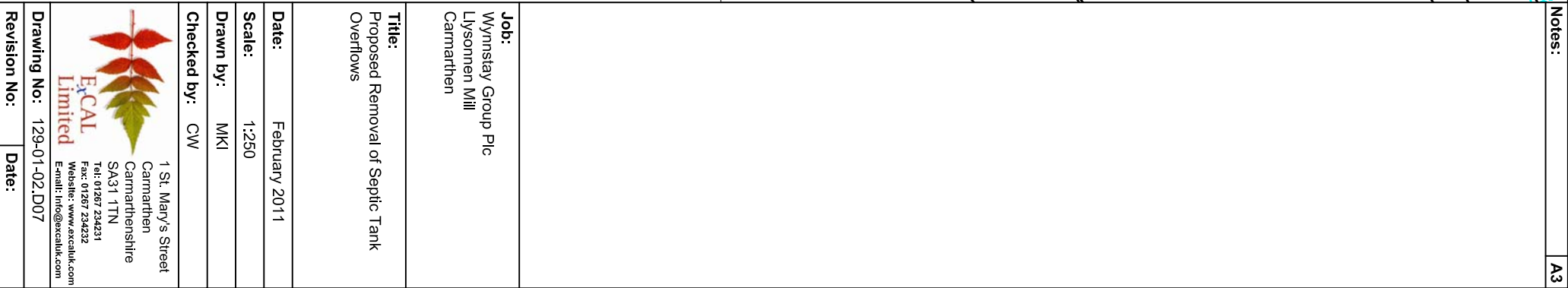
Revision No: _____ **Date:** _____



Notes: A3

- MH New Manhole
- New Carrier Drain
- Class 1 Interceptor

Job:		Wynnstay Group Plc Llysennen Mill Carmarthen
Title:		Diversion of store roof waters
Date:	February 2011	
Scale:	1:250	
Drawn by:	MKI	
Checked by:	CW	
Drawing No:		129-01-02.D06
Revision No:		Date:
 ExCAL Limited 1 St. Mary's Street Carmarthen Carmarthenshire SA31 1TN Tel: 01267 234231 Fax: 01267 234232 Website: www.excaluk.com Email: info@excaluk.com		

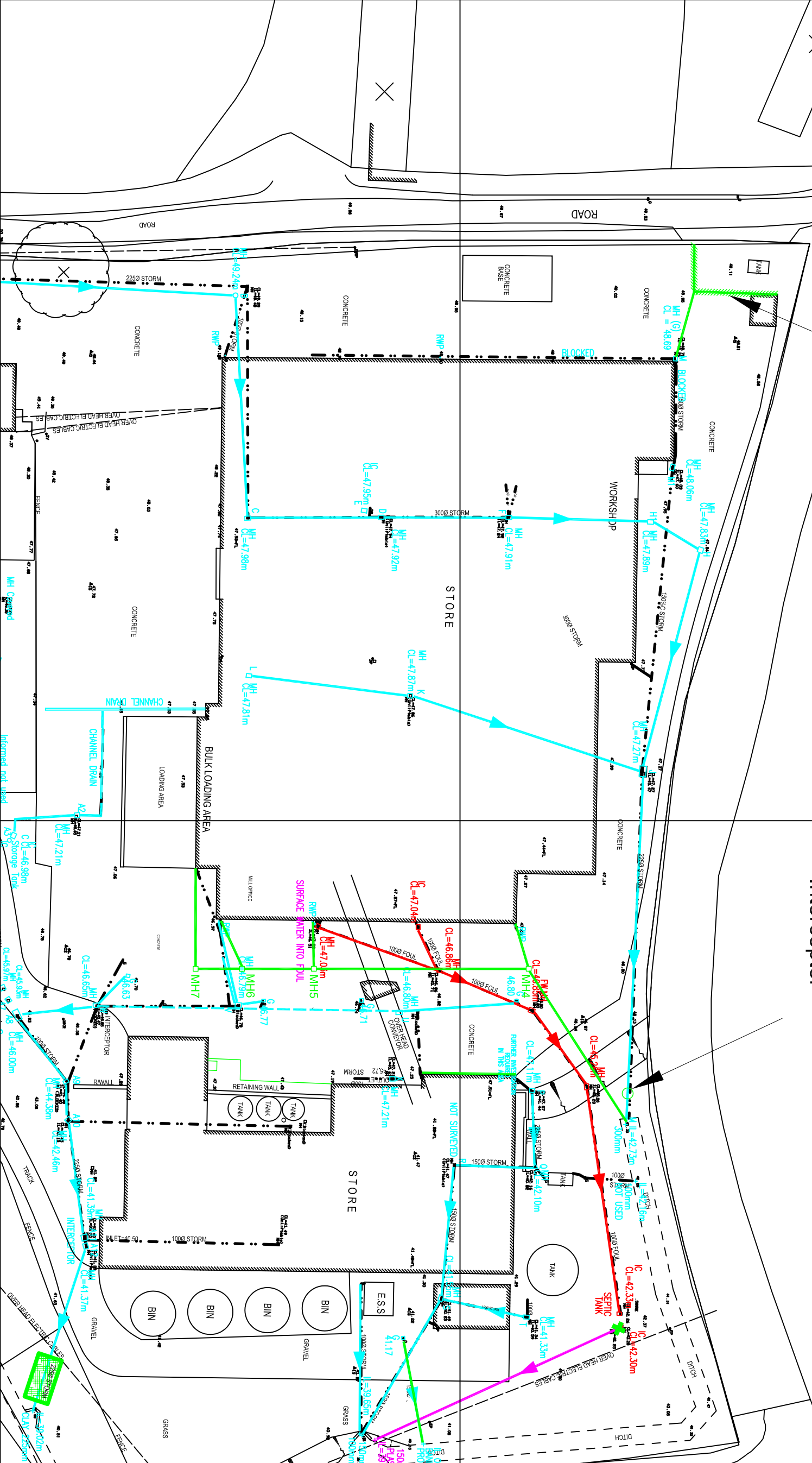


Job:	Wynnstey Group Plc Llysonnen Mill Carmarthen
Title:	Proposed Removal of Septic Tank Overflows
Date:	February 2011
Scale:	1:250
Drawn by:	MKI
Checked by:	CW
 1 St. Mary's Street Carmarthen Carmarthenshire SA31 1TN Tel: 01267 234231 Fax: 01267 234232 Website: www.excalib.com E-mail: info@excalib.com	
Drawing No:	129-01-02.D07
Revision No:	Date:

Installation of surface water ACO drainage to capture potential spills

Installation of Class 1 Full Retention Oil Interceptor

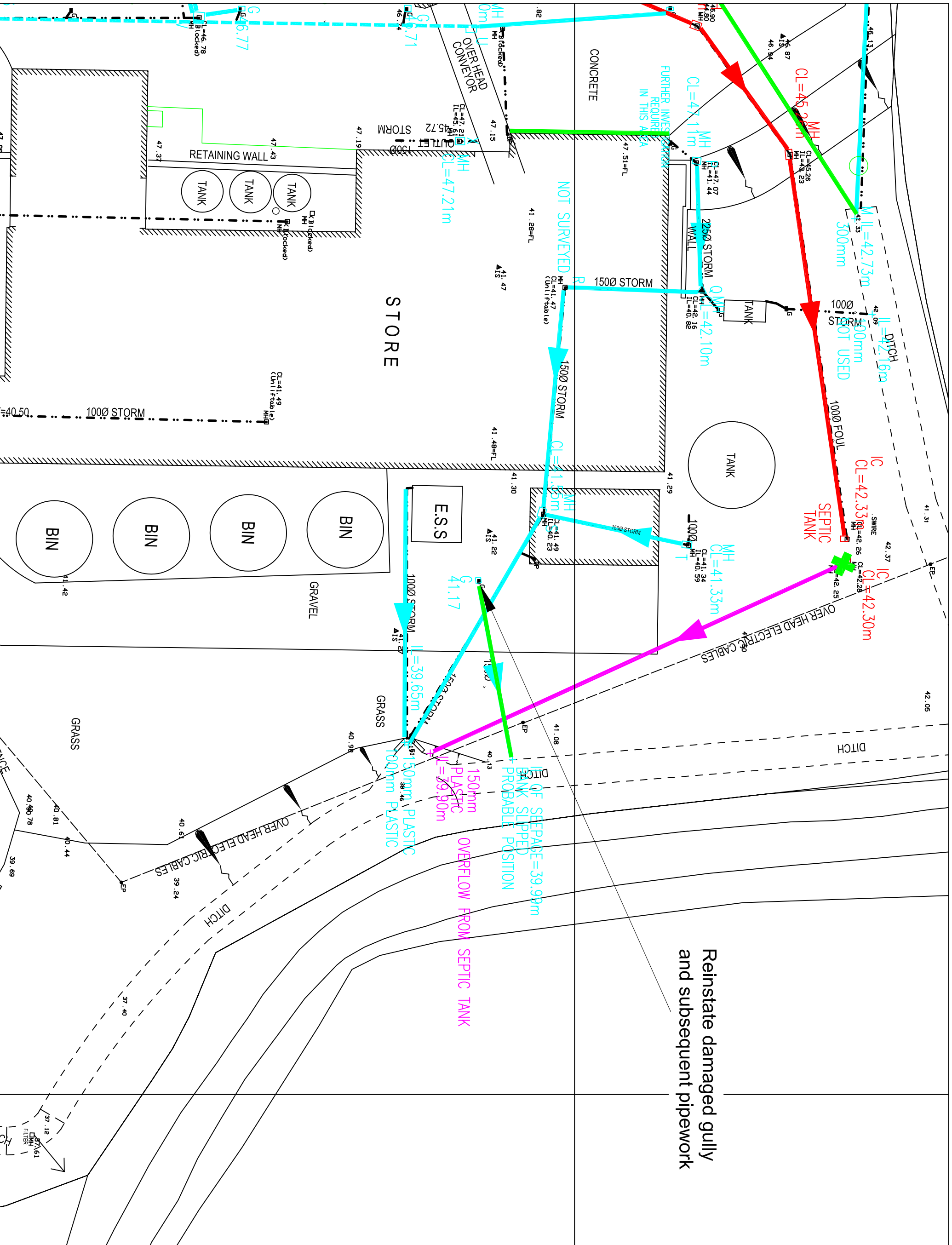
-  New Manhole
-  New Carrier Drain
-  Class 1 Interceptor
-  ACO Drainage



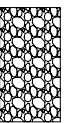
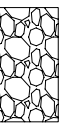
Job:	Wynnstey Group Plc Llysoenen Mill Carmarthen
Title:	Proposed Containment of Refueling Area
Date:	February 2011
Scale:	1:500
Drawn by:	MKI
Checked by:	CW
Drawing No:	129-01-02.D09
Revision No:	Date:

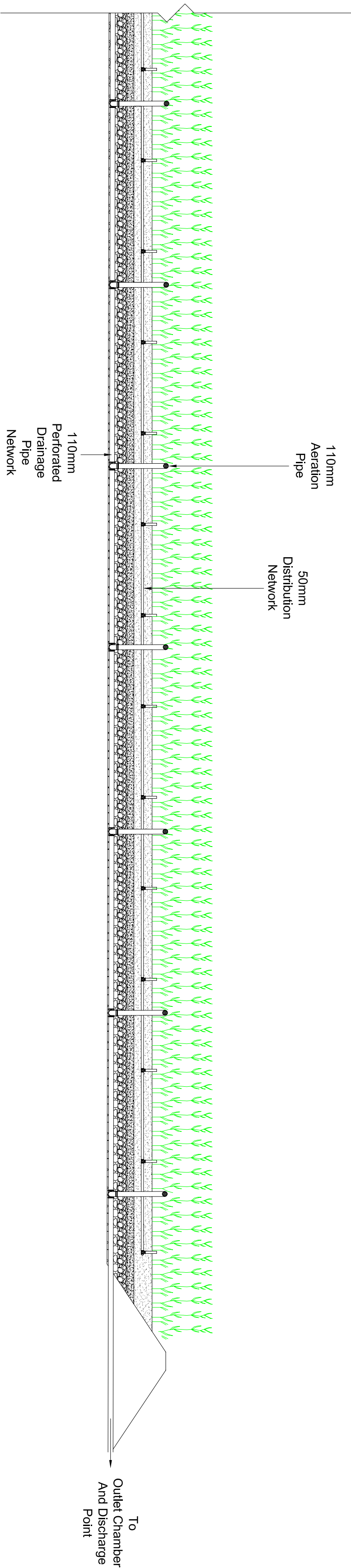
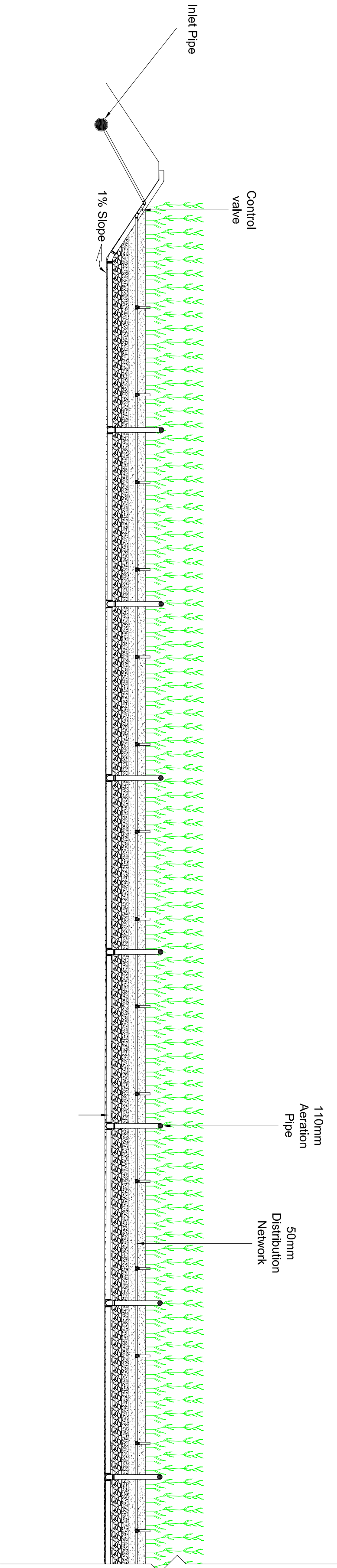
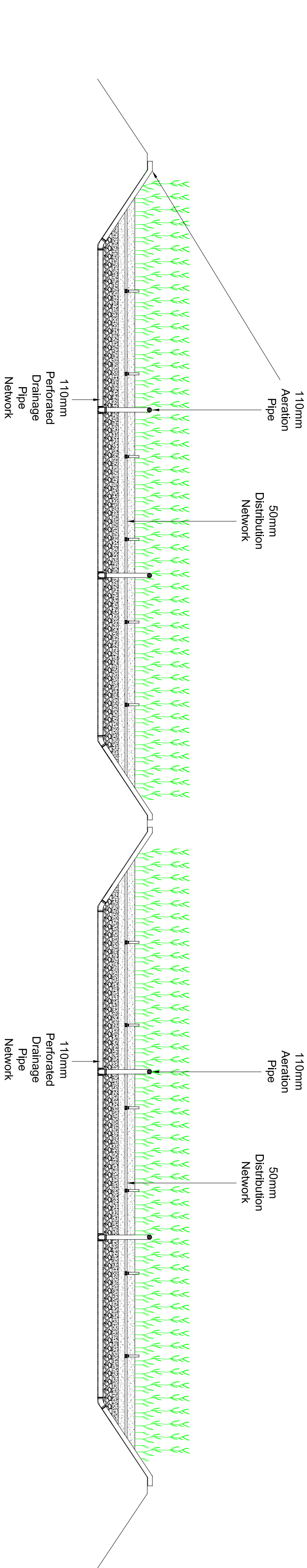


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Notes:	A3
☐ MH New Manhole New Carrier Drain Class 1 Interceptor	
Title: Proposed Reinstatement of Damaged Surface Water Drainage	
Job: Wynnstey Group Plc Llysennen Mill Carmarthen	
Date: February 2011	
Scale: 1:250	
Drawn by: MKI	
Checked by: CW	
1 St. Mary's Street Carmarthen Carmarthenshire SA31 1TN Tel: 01267 234231 Fax: 01267 234232 Website: www.ecaluk.com Email: info@ecaluk.com	
Drawing No: 129-01-02.D10	
Revision No: Date:	

-  Sharp Sand
-  6mm Washed Pea Gravel
-  12mm Washed Gravel
-  20-40mm Washed Gravel



Job:
Wynnstay Group PLC
Llysonnen Mill
Carmarthen

Title:
Typical Reed Bed Design

Date: February 2011

Scale: 1:75 @ A1

Drawn by: MKI

Checked by: DT

EXCAL LIMITED

ExCAL House
Capel Hendre Industrial Estate
Ammanford
Carmarthenshire
SA18 3SJ

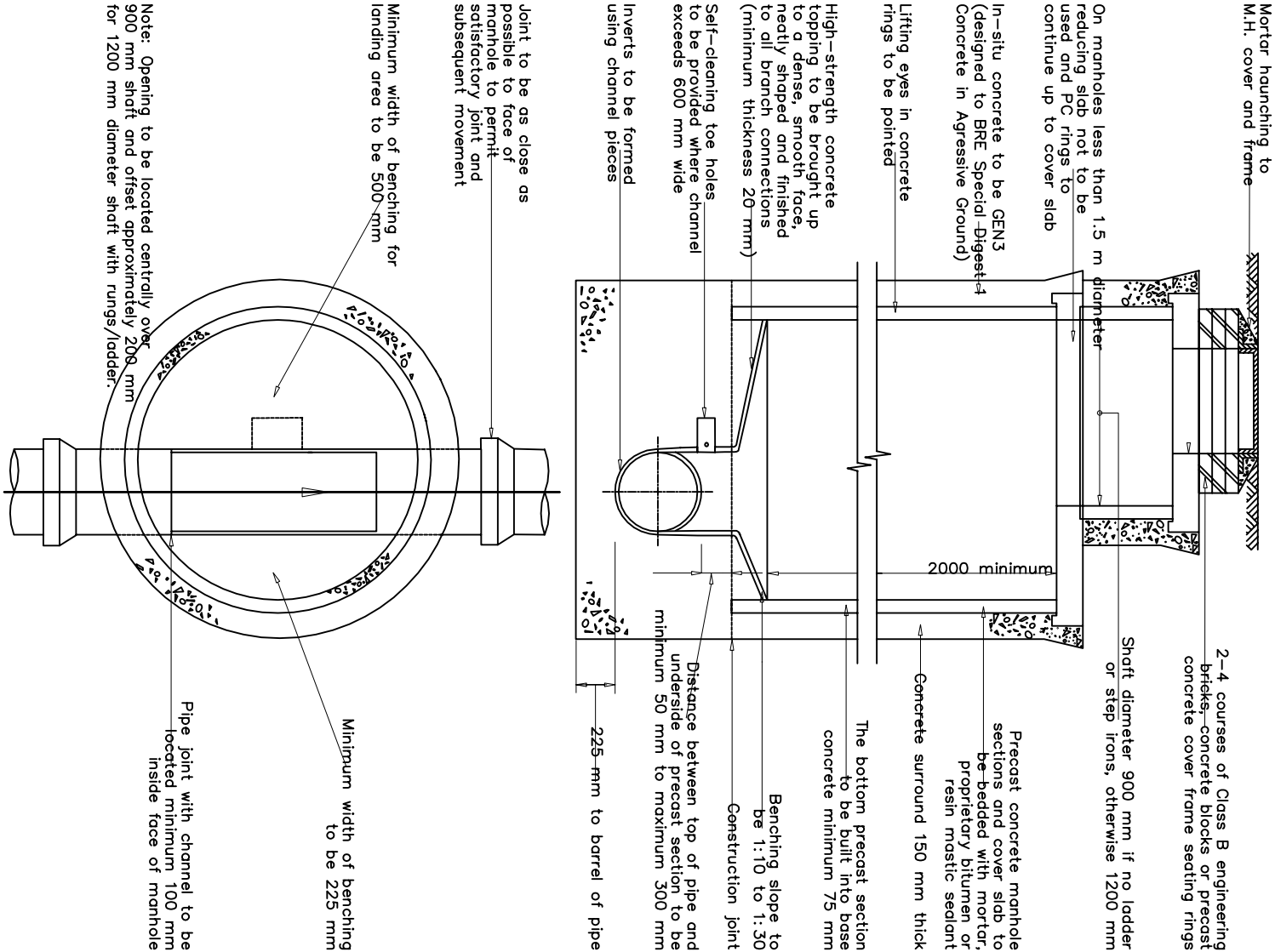
Tel: 01269 831606 Fax: 01269 841867
Website: www.excaluk.com E-mail: reception@excaluk.com

Drawing No: 129-01-02.D11

Revision No: **Date:**

TYPICAL MANHOLE DETAIL - TYPE A

Depth from cover level to soffit of pipe 3 m to 6 m



The design of manholes will need to comply with the Undertaker's safety policy.

Not to scale, dimensions in millimetres

Job:
Wynnstay Group PLC
Llysennen Mill
Carmarthen

Title:
Typical Manhole Detail - Type A

Date: February 2011

Scale: NTS

Drawn by: CW

Checked by: SW

1 St. Mary's Street
Carmarthen

Carmarthenshire
SA31 1TN

Tel: 01267 234231

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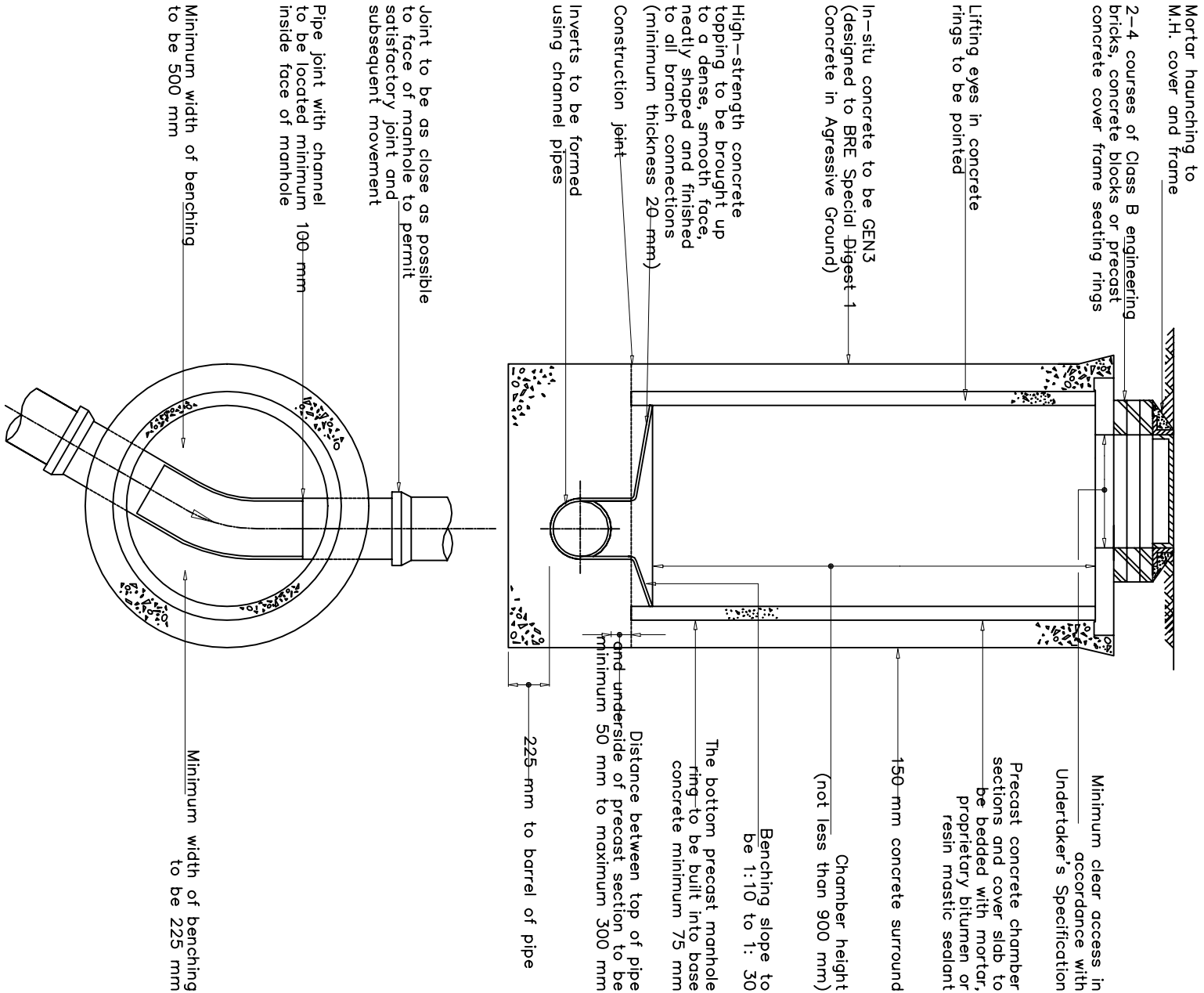
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ExCAL Limited
E-mail: info@excaliik.com

Drawing No.: 129-01-02.D12

Revision No: Date:

TYPICAL MANHOLE DETAIL - TYPE B
Maximum depth from cover level to soffit of pipe 3.0 m



Not to scale, dimensions in millimetres
The design of manholes will need to comply with the Undertaker's safety policy.

Job:
Wynnstay Group PLC
Llysennen Mill
Carmarthen

Title:
Typical Manhole Detail Type B

Date: February 2011

Scale: NTS

Drawn by: CW

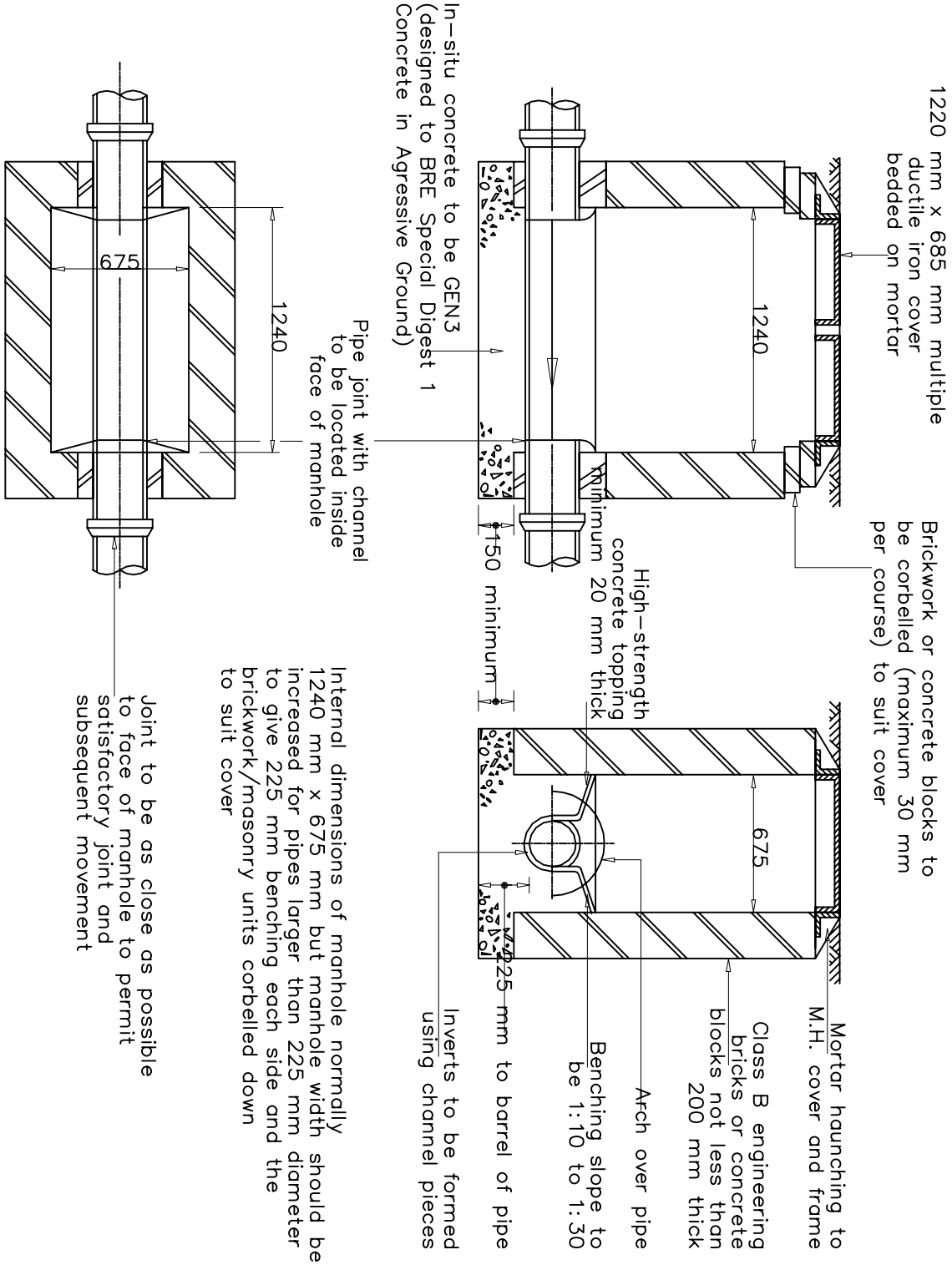
Checked by: SW

1 St. Mary's Street
Carmarthen
Carmarthenshire
SA31 1TN
Tel: 01292 224231
Fax: 01292 234232
Website: www.ecaluk.com
E-mail: info@ecaluk.com

Drawing No: 129-01-02.D13
Revision No: Date:

TYPICAL MANHOLE DETAIL - TYPE C

Depth from cover level to soffit of pipe 1.0 m to 1.5 m



Internal dimensions of manhole normally 1240 mm x 675 mm but manhole width should be increased for pipes larger than 225 mm diameter to give 225 mm benching each side and the brickwork/masonry units corbelled down to suit cover

Joint to be as close as possible to face of manhole to permit satisfactory joint and subsequent movement

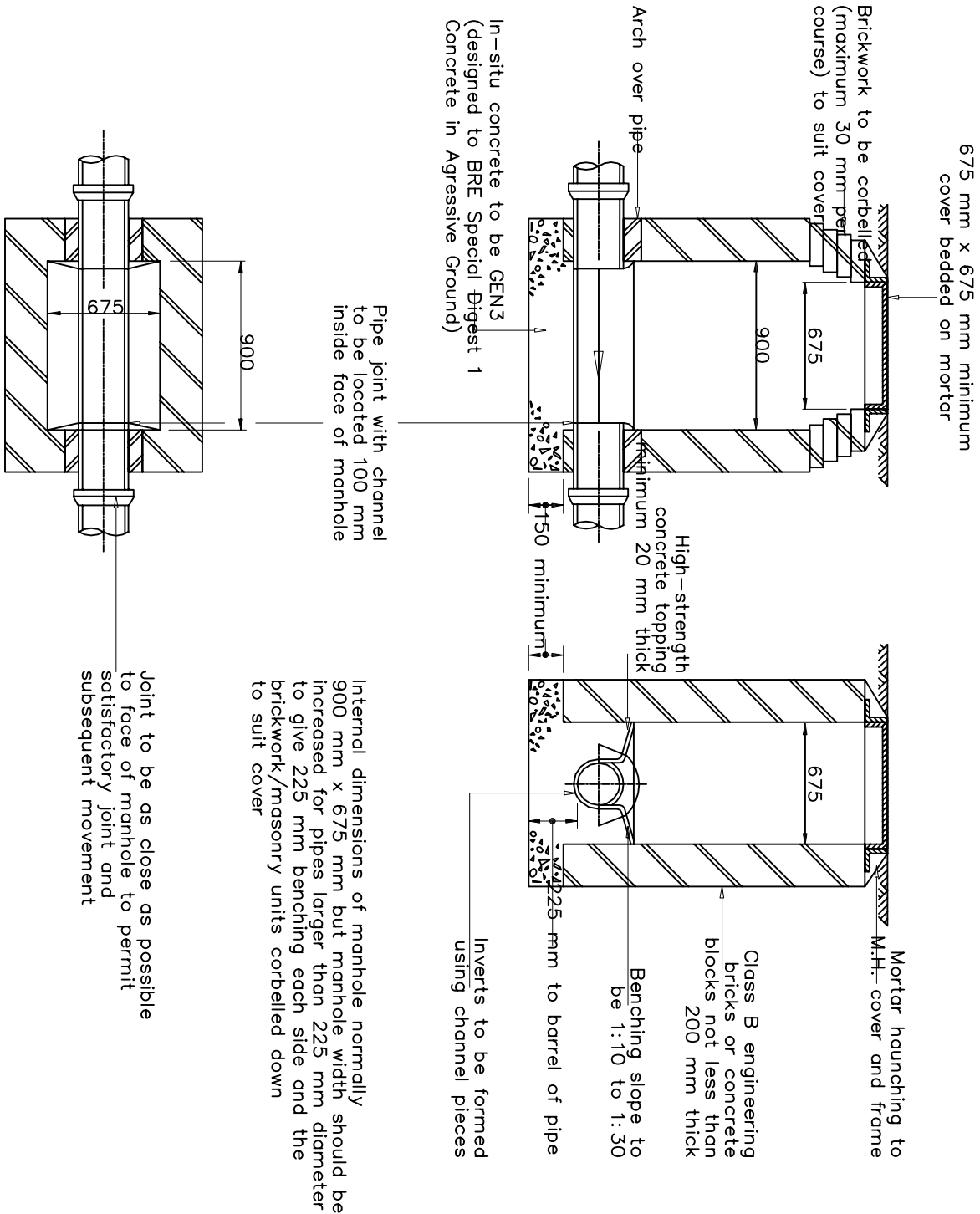
Note: The use of precast rectangular concrete manhole units with 150 mm grade GEN3 concrete surround (designed to BRE Special Digest 1 Concrete in Aggressive Ground) is permitted.

Not to scale, dimensions in millimetres
The design of manholes will need to comply with the Undertaker's safety policy.

TYPICAL MANHOLE DETAIL - TYPE D

Depth from cover level to soffit of pipe less than 1.0 m

Approval of the Undertaker must be given for installation of this type of manhole.



Note: The use of precast rectangular concrete manhole units with 150 mm grade GEN3 concrete surround (designed to BRE Special Digest 1 Concrete in Aggressive Ground) is permitted.

Not to scale, dimensions in millimetres

The design of manholes will need to comply with the Undertaker's safety policy.

Job:
Wynnstay Group PLC
Llysonnen Mill
Carmarthen

Title:
Typical Manhole Detail Type D

Date: February 2011

Scale: NTS

Drawn by: CW

Checked by: SW

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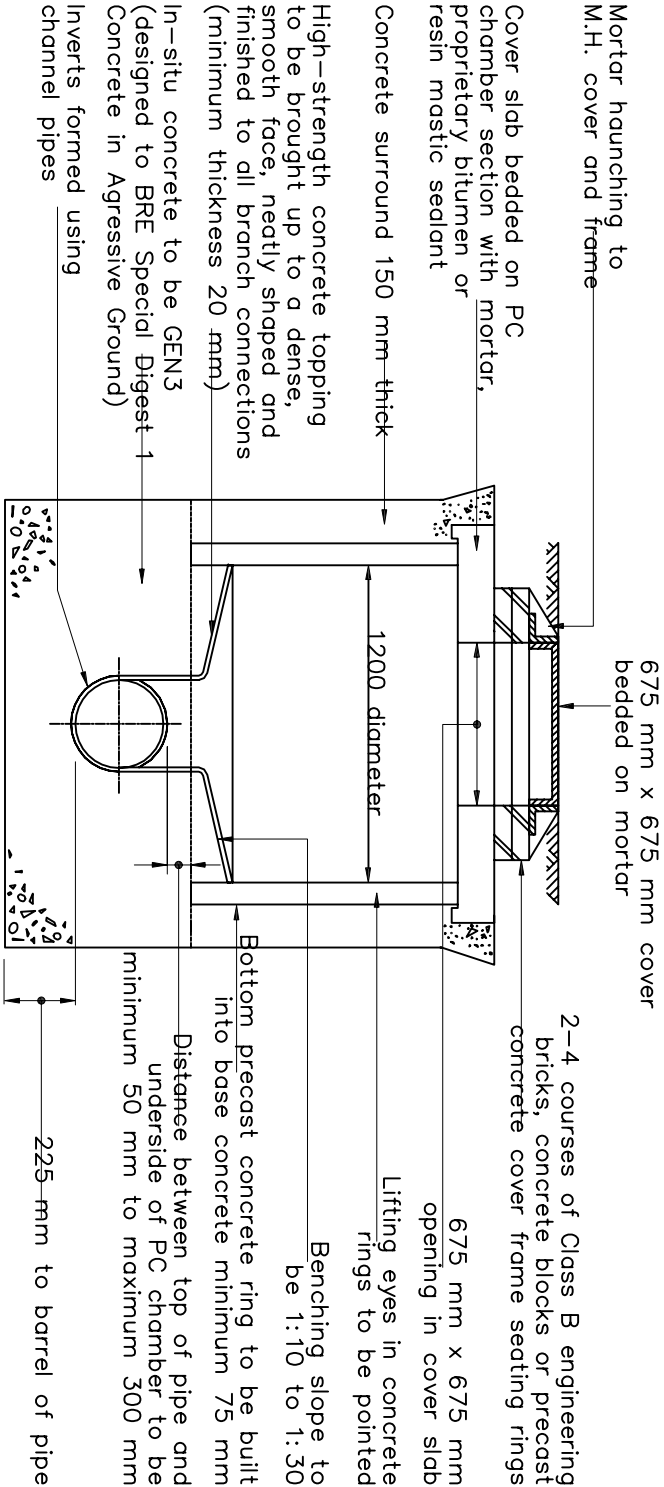
Drawing No: 129-01-02.D15

Revision No: Date:

TYPICAL MANHOLE DETAIL - TYPE E

Depth from cover level to soffit of pipe 1.0 m to 1.5 m
Maximum sewer diameter 375 mm

Approval of the Undertaker must be given for installation
of this type of manhole.



Note: All precast concrete sections / slab and in-situ concrete
to be GEN3 (designed to BRE Special Digest 1 Concrete in Aggressive Ground).

Not to scale, dimensions in millimetres

Job:
Wynnstay Group PLC
Llysennen Mill
Carmarthen

Title:
Typical Manhole Detail Type E

Date: Job:
Scale: Job:
Drawn by: Job:

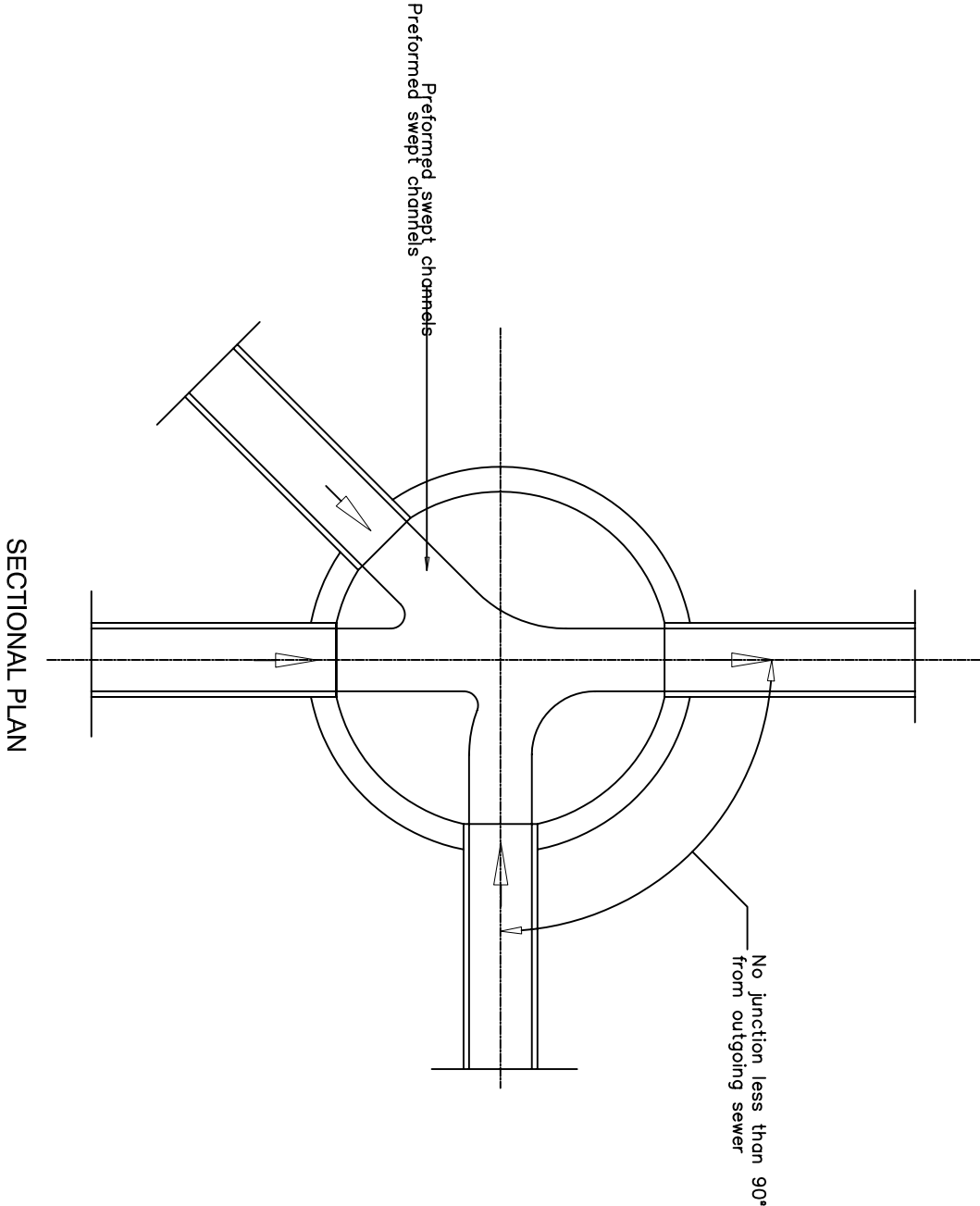
Checked by: Job:

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Website: www.ecaluk.com
E-mail: info@ecaluk.com

Drawing No: 129-01-02.D16

Revision No: Date:

TYPICAL ARRANGEMENT OF PIPE JUNCTIONS WITHIN MANHOLES



Pipes built into manhole should have a flexible joint as close as feasible to the external face of the structure and the length of the next rocker pipe should be as shown.

Nominal diameter (mm)	Effective length (m)
150 - 600	0.6
601 - 750	1.00
over 750	1.25

All pipes entering the bottom of the manhole to have soffits level.

Job:
Wynstay Group PLC
Llysennen Mill
Carmarthen

Title:
Pipe Junction Arrangements

Date: February 2011

Scale: NTS

Drawn by: CW

Checked by: SW



1 St. Mary's Street

Carmarthen

Carmarthenshire

SA31 1TN

Tel: 01267 234231

Fac: 01267 234232

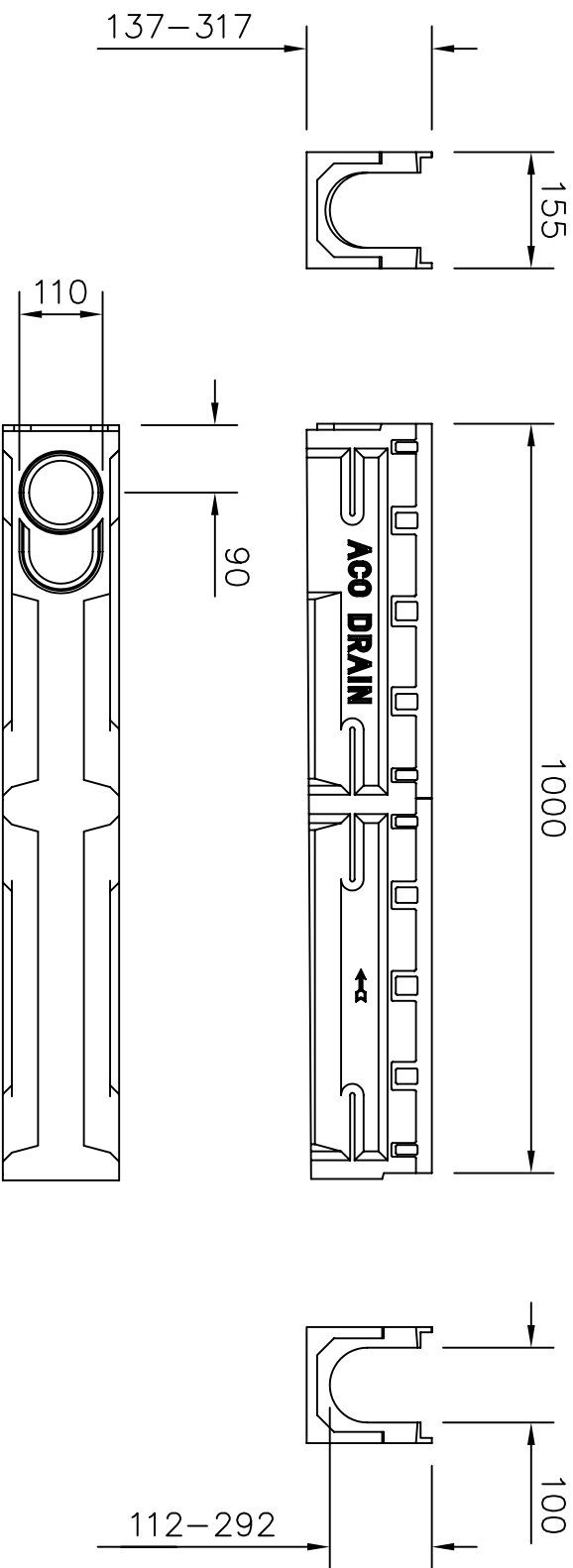
Website: www.ecalluk.com

E-mail: info@ecalluk.com

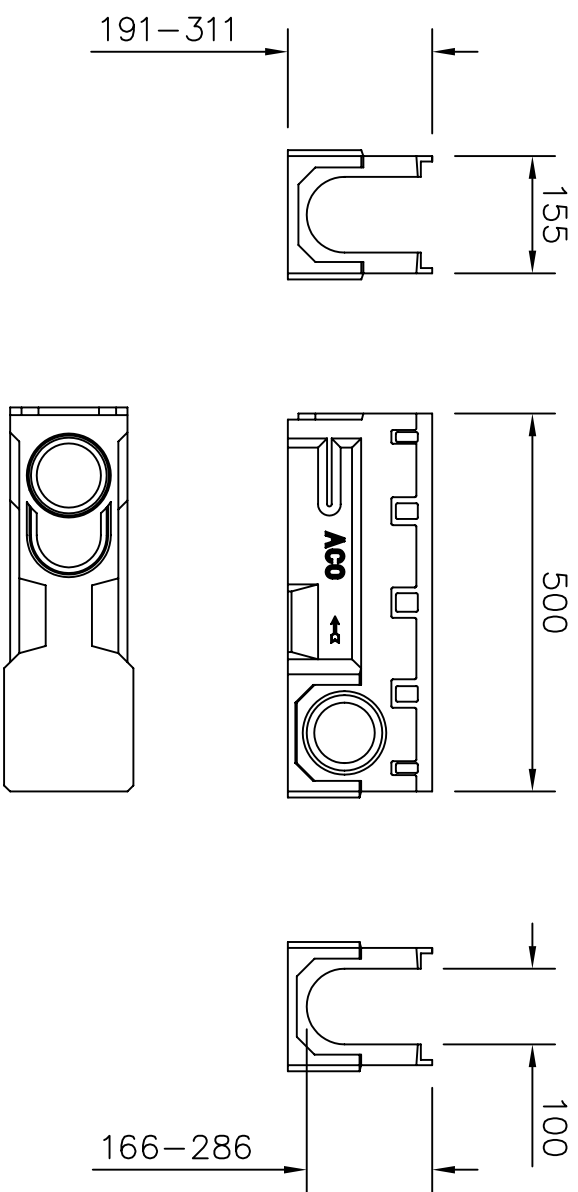
Drawing No: 129-01-02.D17

Revision No: Date:

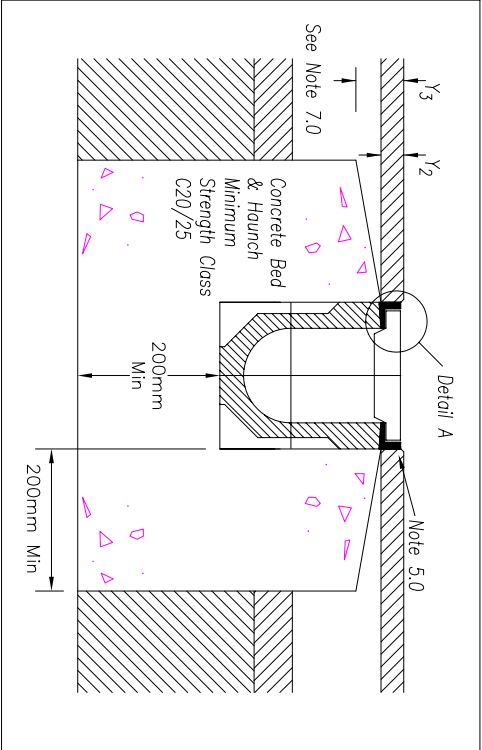
S100 1m Channel



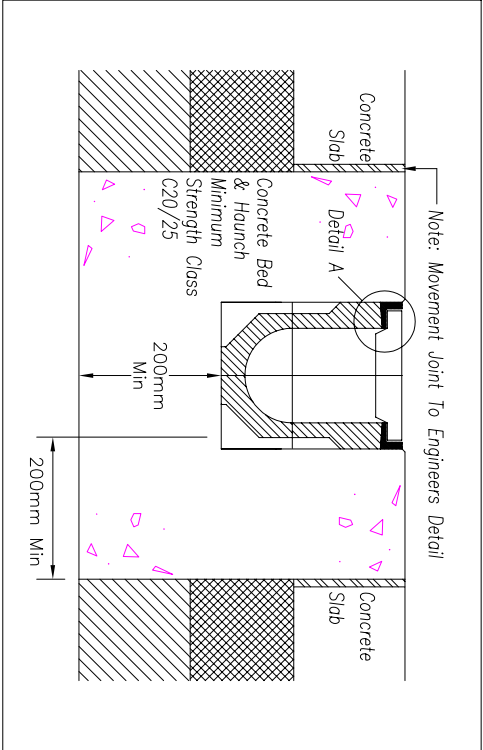
S100 500mm Junction



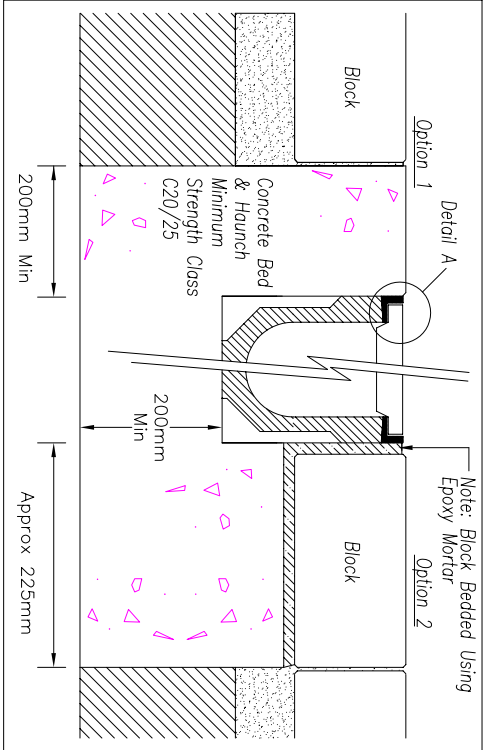
ASPHALT PAVEMENT



CONCRETE PAVEMENT



BLOCK PAVEMENT (OPTION 1 & 2)



1.0 GROUND CONDITIONS: The customer should ensure that the minimum dimensions shown are suitable for the existing ground conditions. Engineering advice may be necessary.

2.0 BLOCK PAVEMENTS: THE CHANNEL MUST BE SUPPORTED LATERALLY and therefore blocks must be restrained from movement by bedding securely. e.g. by using an Epoxy or Polymer Modified Mortar for bed and perpendicular joints.

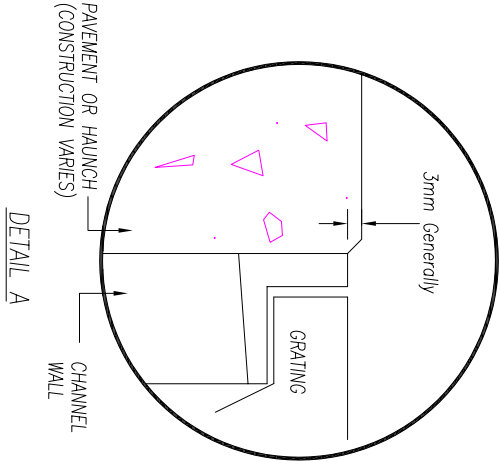
3.0 SURFACE CRACKS: Alternate crack control and movement joints transversely within bed and haunch may reduce unsightly surface cracking.

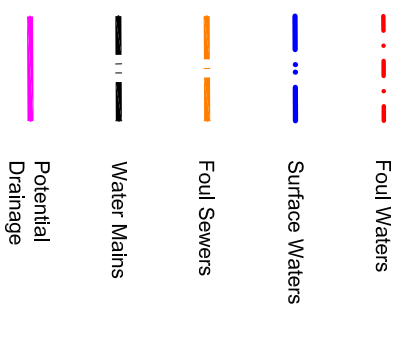
4.0 JOINT SEALANT: Where ACO Drain channel joints and fittings are to be sealed (where used in foul water applications or where impermeability is required, for example) contact a sealant specialist for guidance on the most appropriate sealing compound to use.

5.0 SURFACE PROTECTION: In asphalt pavements avoid contact between compaction equipment and channel/grating. This may be achieved by ensuring that the finished surface level lies above the grating level (by at least 3mm). Stones should be removed from grating prior to laying/rolling wearing course.

6.0 ASPHALT PAVEMENT: Top of concrete haunch
Y2 = 35mm maximum
Y3 = 70mm maximum

7.0 BOLTS: To complete the installation, tighten the grating fixing bolts to a torque of 40Nm.





Job:
Wynnstay Group Plc
Llysennen Mill
Carmarthen

Title:
Public Foul Sewer Infrastructure

Date: December 2010

Scale: 1:1250

Drawn by: MKI

Checked by: DT

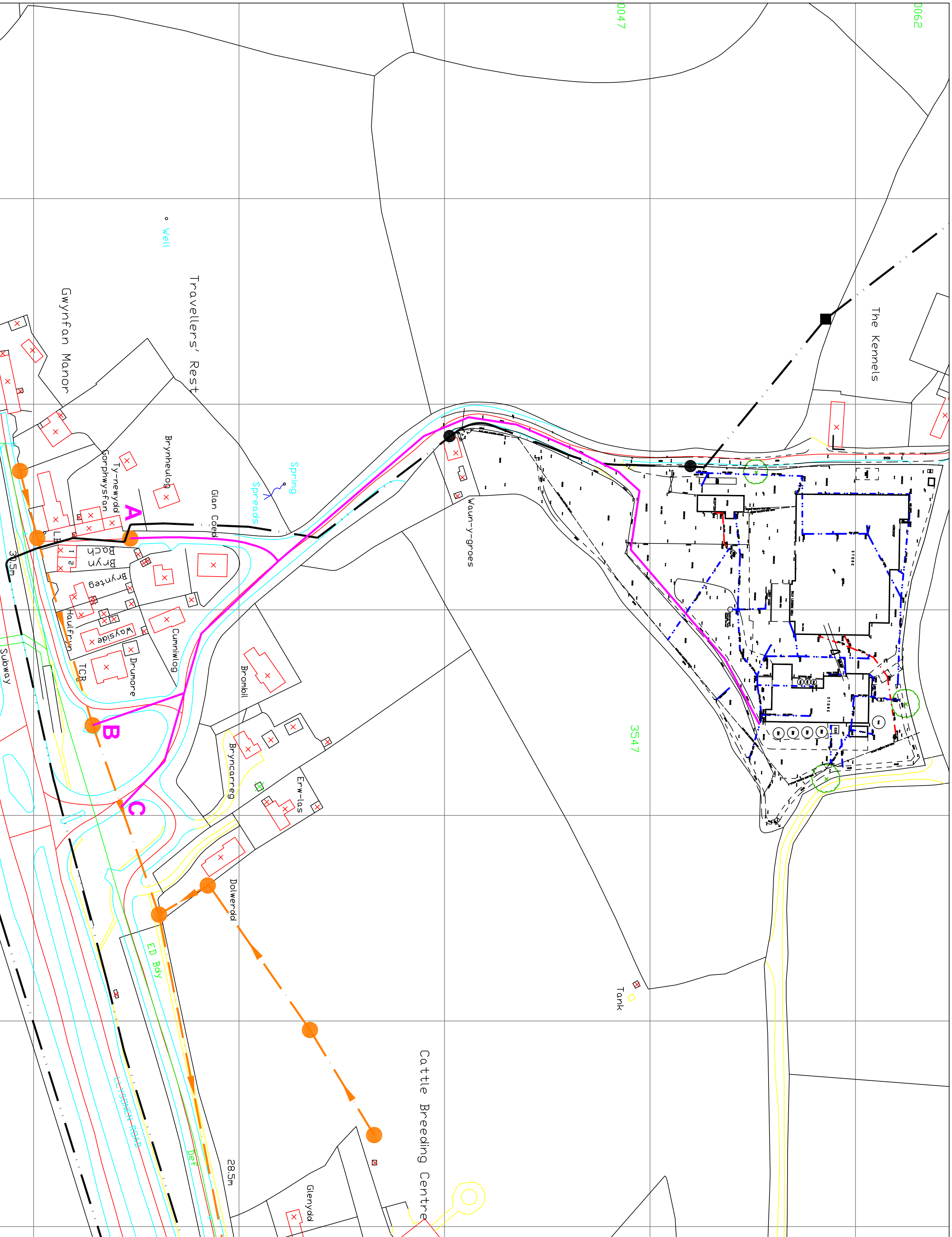
EXCAL LIMITED

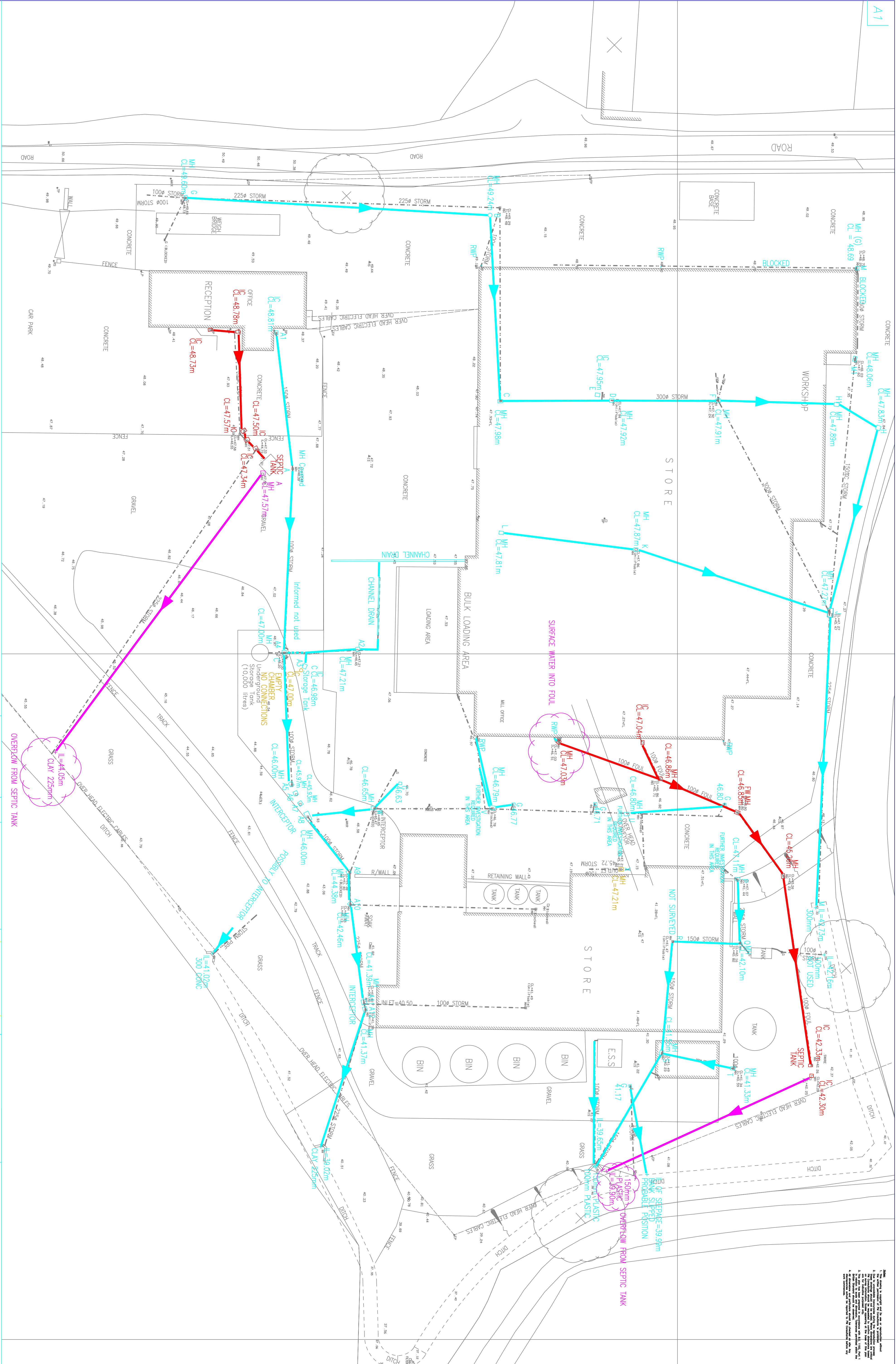
**1 St Mary's Street
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Carmarthenshire
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Website: www.excaluk.com E-mail: reception@excaluk.com

Drawing No: 129-01-02.D21

Revision No:	Date:
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APPENDIX B

Trial Pit Logs

Contract: Discharge of Improvement Conditions IC1 & IC4

Client: Wynnstay Group PLC

Trial Pit No.

TP1

Dates: 21/10/2010

Job Number: 129-01-02

Ground Level:

Location: Llysonnen Mill,
Travellers Rest, Carmarthen

Engineer: T Roberts

Coordinates:

STRATA

PHOTOGRAPHS

	Depth (Thick- ness)	Description	Legend	Depth (Thick- ness)	Water	
1	0.00 (0.50)	MADEGROUND: Brown slightly silty gravelly fine to coarse sand with sub-angular to sub-rounded pebbles. Gravel is fine to coarse.		0.00 (0.50)		
	0.50 (2.50)	Orange/brown slightly sandy slightly gravelly very silty CLAY with occasional sub-angular to sub-rounded pebbles.		0.50 (2.50)		
2						
3	3.00	Excavation ended.		3.00		
4						
5						
6						
7						
8						
9						

Excavation Progress and Water Observations			Groundwater			General Remarks
Date/Time	Depth	Water	Struck	Sealed	Flow Rate Remarks	
					No groundwater encountered.	No odour detected. Excavation stopped at 3metres owing to instability of sides of pit. 2000 litres of water added. No head loss overnight.



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Carmarthenshire
SA31 1TN
Tel: 01267 234231 Fax: 01267 234232
Website: www.excaluk.com E-mail: info@excaluk.com

Operator:
T Roberts

Logged By:
TR

Sheet No.
1 of 1

Scale:
1:58.64

All measurements in
metres unless
otherwise stated



Contract: Discharge of Improvement Conditions IC1 & IC4							Trial Pit No.	
Client: Wynnstay Group PLC							TP2	
Dates: 21/10/2010			Job Number: 129-01-02			Ground Level:		
Location: Llysonnen Mill, Travellers Rest, Carmarthen			Engineer: T Roberts			Coordinates:		

STRATA				PHOTOGRAPHS	
Depth (Thick- ness)	Description	Legend	Depth (Thick- ness)	Water	
0.00	MADEGROUND: Reddish brown slight silty very gravelly fine to coarse SAND with angular to sub-angular pebble, cobbles and boulders of limestone, siltstone, and brick		0.00		
(1.70)			(1.70)		
1.70	Excavation ended.		1.70		
2					
3					
4					
5					
6					
7					
8					
9					

Excavation Progress and Water Observations			Groundwater			General Remarks
Date/Time	Depth	Water	Struck	Sealed	Flow Rate Remarks	
					No groundwater encountered.	No odour detected. Excavation stopped at 1.7metres owing to instability of sides of pit. 2000 litres of water added. No head loss overnight.

	1 St Mary's Street Carmarthen Carmarthenshire SA31 1TN Tel: 01267 234231 Fax: 01267 234232 Website: www.excaluk.com E-mail: info@excaluk.com		Operator:	Logged By:	Sheet No.	Scale:	All measurements in metres unless otherwise stated	
			T Roberts	TR	1 of 1	1:58.64		

Contract: Discharge of Improvement Conditions IC1 & IC4							Trial Pit No.	
Client: Wynnstay Group PLC							TP3	
Dates: 21/10/2010			Job Number: 129-01-02			Ground Level:		
Location: Llysonnen Mill, Travellers Rest, Carmarthen			Engineer: T Roberts			Coordinates:		

STRATA				PHOTOGRAPHS				
Depth (Thick-ness)	Description	Legend	Depth (Thick-ness)	Water				
0.00	MADEGROUND: Reddish brown slight silty very gravelly fine to coarse SAND with angular to sub-angular pebble, cobbles and boulders of limestone, siltstone, and brick.		0.00					
(1.50)			(1.50)					
1.50	Excavation ended.		1.50					
2								
3								
4								
5								
6								
7								
8								
9								

Excavation Progress and Water Observations			Groundwater			General Remarks
Date/Time	Depth	Water	Struck	Sealed	Flow Rate Remarks	
					No groundwater encountered.	No odour detected. Excavation stopped at 1.5metres owing to instability of sides of pit. 2000 litres of water added. No head loss overnight.

	1 St Mary's Street Carmarthen Carmarthenshire SA31 1TN Tel: 01267 234231 Fax: 01267 234232 Website: www.excaluk.com E-mail: info@excaluk.com		Operator:	Logged By:	Sheet No.	Scale:	All measurements in metres unless otherwise stated	
	T Roberts	TR	1 of 1	1:58.64				

Contract: Discharge of Improvement Conditions IC1 & IC4							Trial Pit No.	
Client: Wynnstay Group PLC							TP4	
Dates: 21/10/2010			Job Number: 129-01-02			Ground Level:		
Location: Llysonnen Mill, Travellers Rest, Carmarthen			Engineer: T Roberts			Coordinates:		

STRATA				PHOTOGRAPHS	
Depth (Thickness)	Description	Legend	Depth (Thickness)	Water	
0.00	MADEGROUND: Brown slightly silty gravelly fine to coarse sand with sub-angular to sub-rounded pebbles. Gravel is fine to coarse.		0.00		
1 (2.00)			(2.00)		
2 2.00	Orange/brown slightly sandy slightly gravelly very silty CLAY with occasional sub-angular to sub-rounded pebbles.		2.00		
(1.00)			(1.00)		
3 3.00	Excavation ended.		3.00		
4					
5					
6					
7					
8					
9					

Excavation Progress and Water Observations			Groundwater			General Remarks
Date/Time	Depth	Water	Struck	Sealed	Flow Rate Remarks	
					No groundwater encountered.	No odour detected. Excavation stopped at 3metres owing to instability of sides of pit. 2000 litres of water added. No head loss overnight.

	1 St Mary's Street Carmarthen Carmarthenshire SA31 1TN Tel: 01267 234231 Fax: 01267 234232 Website: www.excaluk.com E-mail: info@excaluk.com		Operator:	Logged By:	Sheet No.	Scale:	All measurements in metres unless otherwise stated	
			T Roberts	TR	1 of 1	1:58.64		

APPENDIX C

CCTV Survey

CCTV Survey

Llysonnen Mill

Carmarthen

Project-information

Project name:
Llysonnen MillContract number:
ELLM001Contact:
Neil MaineDate:
11/01/2011

Client
Contact:
Position:
Road
Town
County
Telephone:
Fax:
Mobile:
E-Mail:

Excal Uk Limited
Dylan Thomas
Senior Environmental Scientist
Mary Street
Carmarthen
Carmarthenshire
01267 234231
01267 234232
07879 627353
dylan.thomas@excaluk.com

Site
Contact:
Position:
Road
Town
County
Telephone:
Fax:
Mobile:
E-Mail:

PM Consultants (UK) LTD
Neil Maine
Director
Llysonnen Mill
Carmarthen
Carmarthenshire
01873 855591
01873 859633
surveys@pmconsultants.co.uk

Contractor
Contact:
Position:
Road
Town
County
Telephone:
Fax:
Mobile:
E-Mail:

PM Consultants (UK) LTD
Neil Maine...
Director...
48 Park Avenue
Abergavenny
Monmouthshire
01873 855591
01873 859633
surveys@pmconsultants.co.uk

Defect Grade Description

Project name:
Llysonnen MillContract number:
ELLM001Contact:
Neil MaineDate:
11/01/2011**1:**Brick: No Structural Defects
Pipe: No Structural Defects**Acceptable Structural Condition****2:**Brick: Minor cracking, Surface mortar loss, Spalling slight, wear slight
Pipe: Circumferential crack, Moderate joint defects, Spalling slight, Wear slight**Minor collapse risk in short term but potential for further deterioration****3:**Brick: Total mortarloss without other defects, single brick displaced, Deformation up to 5%, Spalling medium, Wear medium
Pipe: Fractures with deformation up to 5%, Longitudinal cracking or multiple cracking, Minor loss of level, More severe joint defects, Spalling medium, Wear medium**! Collapse unlikely in near future but future deterioration likely !****4:**Brick: Total mortarloss with deformation greater than 10%, Deformation up to 10% and fractured, Displaced/hanging brickwork, Small number of missing bricks
Pipe: Broken, Deformation up to 10% and broken, Fractured with deformation 5 - 10%, Multiple fractures, Serious loss of level, spalling large, wear large**!! Collapse likely in foreseeable future !!****5:**Brick: Already Collapsed, Missing invert, Deformation over 10% and fractured, Displaced/hanging brickwork and deformation over 10%, Extensive missing bricks
Pipe: Already collapsed, Deformation over 10% and broken, Extensive areas of fabric missing, Fractured with deformation over 10%**!!! Collapsed or collapse imminent !!!**

Inspection photos

Place: Llysonnen Mill	Road: Carmarthen	Date: 14/01/2011	section number: 1	PLR: MH A X
---------------------------------	----------------------------	----------------------------	-----------------------------	-----------------------



Photo: 2_2a, Tape No.: 01, 00:00:00
0m, Manhole Remark: MH A

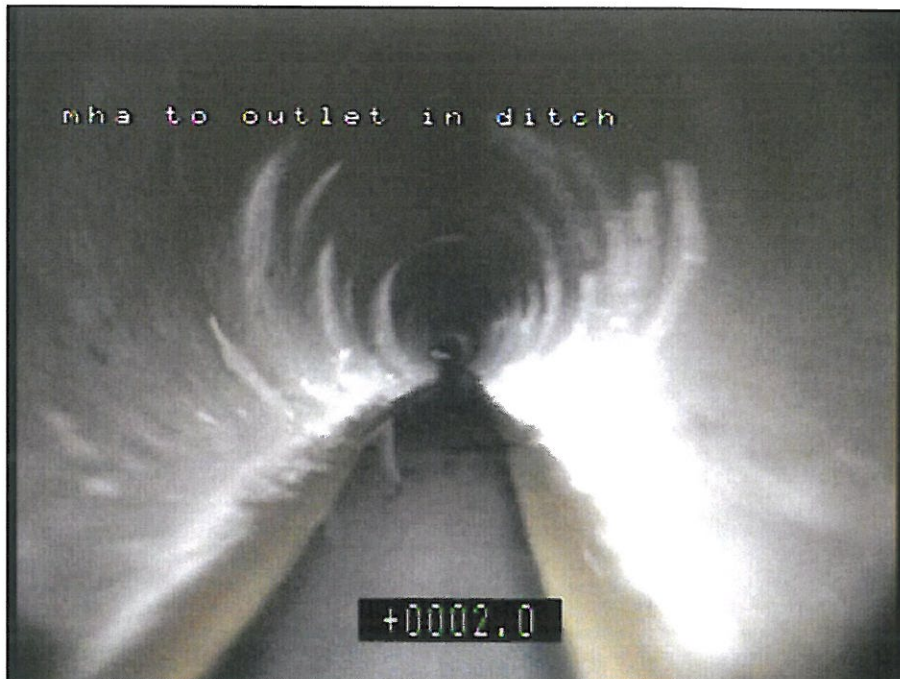


Photo: 1_5a, Tape No.: 01, 00:00:31
2m, Sewer Material changes at this point, Polyvinyl chloride

Inspection photos

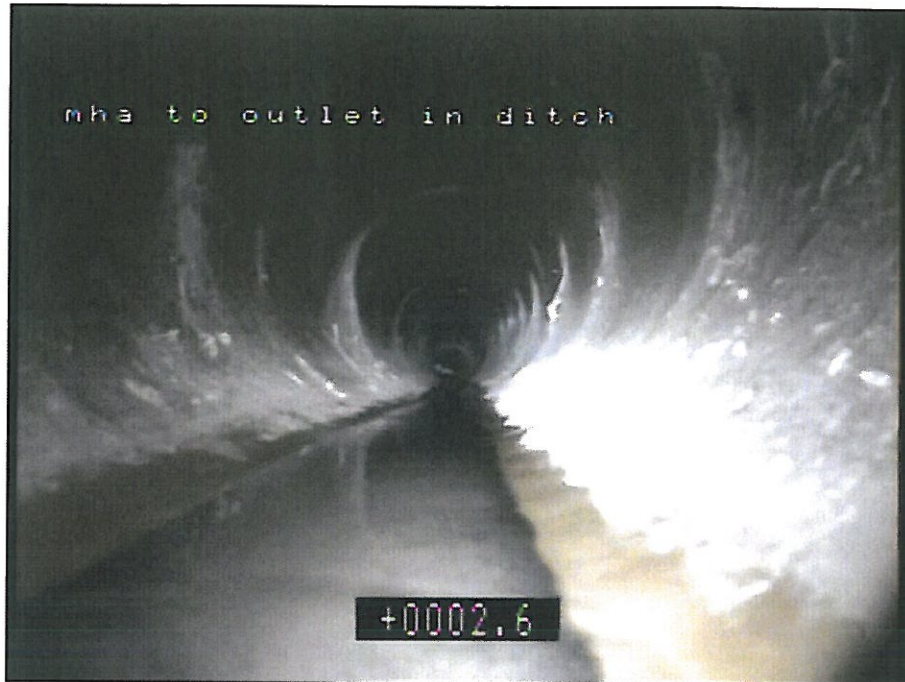
Place:
Llysonnen MillRoad:
CarmarthenDate:
14/01/2011section number:
1PLR:
MH A X

Photo: 1_5b, Tape No.: 01, 00:00:31

2m, Sewer Material changes at this point, Polyvinyl chloride

PM Consultants UK Ltd

Total expertise in surveying

PM Consultants (UK) LTD

Abergavenny

Monmouthshire

Tel: 01873 855591, Fax: 01873 859633

Inspection photos

Place:
Llysonnen MillRoad:
CarmarthenDate:
14/122010section number:
2PLR:
MH B X

Photo: 15_2a, Tape No.: 01, 00:00:00
0m, Manhole Remark: MH B

PM Consultants UK Ltd

Total expertise in sewerage

PM Consultants (UK) LTD

Abergavenny

Monmouthshire

Tel: 01873 855591, Fax: 01873 859633

Inspection report

Date: 21/122010	Job N°: ELLM001	Weather: Snow	Operator: RF	section number: 4	PLR: MH C X
Present:	Vehicle: Car 1	Camera: X TEC	Preset:	Cleaned: Not known	Grade:

Road: Carmarthen	Division:	start MH: MH C
Place: Llysonnen Mill	District:	end MH: MH F
Location: Difficult access	Tape No.: 01	Total length: 31 m

Purpose: Asset condition	Shape/Size: Circular 300
Use: Surface water	Material: Concrete Pipe length: .7m
Catchment:	Lining: Category: Z

Comment:
Location details:

1:250	position	code	observation	MPEG	photo	grade
	0.00	ST	Start of Survey	00:00:00		(Misc) 0
	0.00	MH	Manhole Remark: MH C	00:00:00		(Constr) 0
	0.00	WL	Water level, 05 % height/diameter	00:00:00		(Serv) 0
	13.90	CXI	Connection defective, at 09 o'clock, dia 100 mm, intrusion 50 mm	00:02:07	36_4a	(Constr) 4
	15.90	GO	General Observation, Remark: MH D	00:03:20	37_5a	(Misc) 0
	17.00	GO	General Observation, Remark: START OF MH D	00:03:30	38_6a	(Misc) 0
	31.00	MH	Manhole Remark: MH F	00:05:31	39_7a, b	(Constr) 0
	31.00	FH	Finish Survey	00:05:31		(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

Inspection photos

Place:
Llysonnen MillRoad:
CarmarthenDate:
21/122010section number:
4PLR:
MH C X

Photo: 36_4a, Tape No.: 01, 00:02:07
13.9m, Connection defective, at 09 o'clock, dia 100 mm, intrusion 50 mm



Photo: 37_5a, Tape No.: 01, 00:03:20
15.9m, General Observation, Remark: MH D

Inspection photos

Place:
Llysonnen MillRoad:
CarmarthenDate:
21/122010section number:
4PLR:
MH C X

Photo: 38_6a, Tape No.: 01, 00:03:30
17m, General Observation, Remark: START OF MH D



Photo: 39_7a, Tape No.: 01, 00:05:31
31m, Manhole Remark: MH F

PM Consultants UK Ltd

Total expertise in surveying

PM Consultants (UK) LTD

Abergavenny

Monmouthshire

Tel: 01873 855591, Fax: 01873 859633

Inspection photos

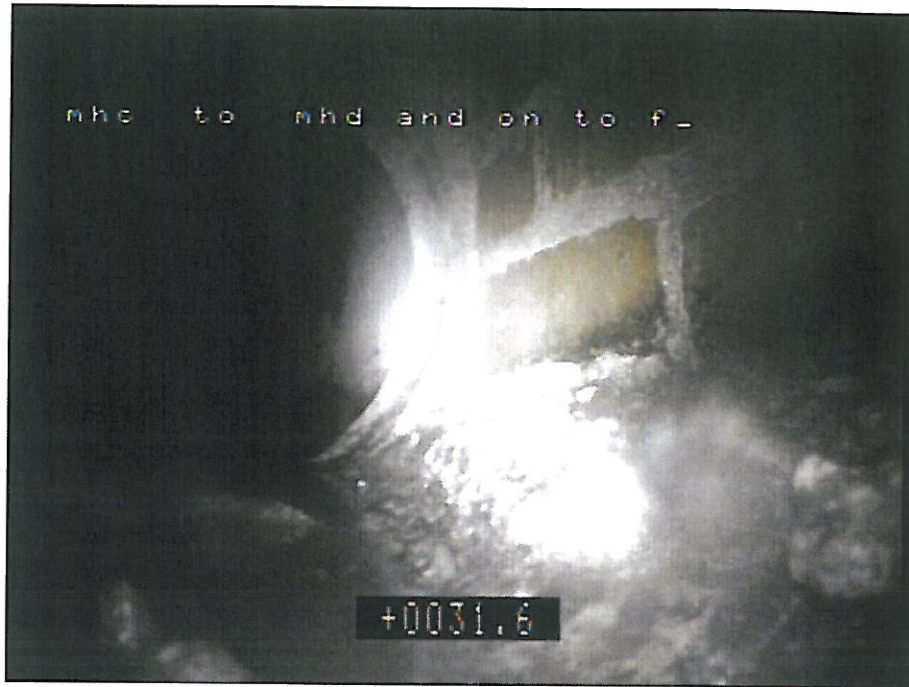
Place:
Llysonnen MillRoad:
CarmarthenDate:
21/122010section number:
4PLR:
MH C X

Photo: 39_7b, Tape No.: 01, 00:05:31
31m, Manhole Remark: MH F

PM Consultants UK Ltd

Total experience in surveying

PM Consultants (UK) LTD

Abergavenny

Monmouthshire

Tel: 01873 855591, Fax: 01873 859633

Inspection report

Date: 30/12/2010	Job N°: ELLM001	Weather: Snow	Operator: RF	section number: 5	PLR: MH F X
Present:	Vehicle: Car 1	Camera: X TEC	Preset:	Cleaned: Not known	Grade:

Road: Carmarthen	Division:	start MH: MH F
Place: Llysonnen Mill	District:	end MH: MH H1
Location: Difficult access	Tape No.: 01	Total length: 16 m

Purpose: Asset condition	Shape/Size: Circular 300
Use: Surface water	Material: Concrete Pipe length: .7m
Catchment:	Lining: Category: Z

Comment:
Location details:

1:125	position	code	observation	MPEG	photo	grade
	0.00	ST	Start of Survey	00:00:00		(Misc) 0
	0.00	MH	Manhole Remark: MH F	00:00:00		(Constr) 0
	0.00	WL	Water level, 05 % height/diameter	00:00:00	43_3a	(Serv) 0
	11.00	WL	Water level, 10 % height/diameter	00:01:37		(Serv) 0
	14.20	DE	Debris, 10 % cross-sectional area loss	00:01:57		(Serv) 1
	15.60	WL	Water level, 20 % height/diameter	00:02:07		(Serv) 0
	16.00	DE	Debris, 35 % cross-sectional area loss	00:02:15		(Serv) 1
	16.00	SA	Survey abandoned, Remark: Unable to proceed further	00:02:35		(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

Inspection photos

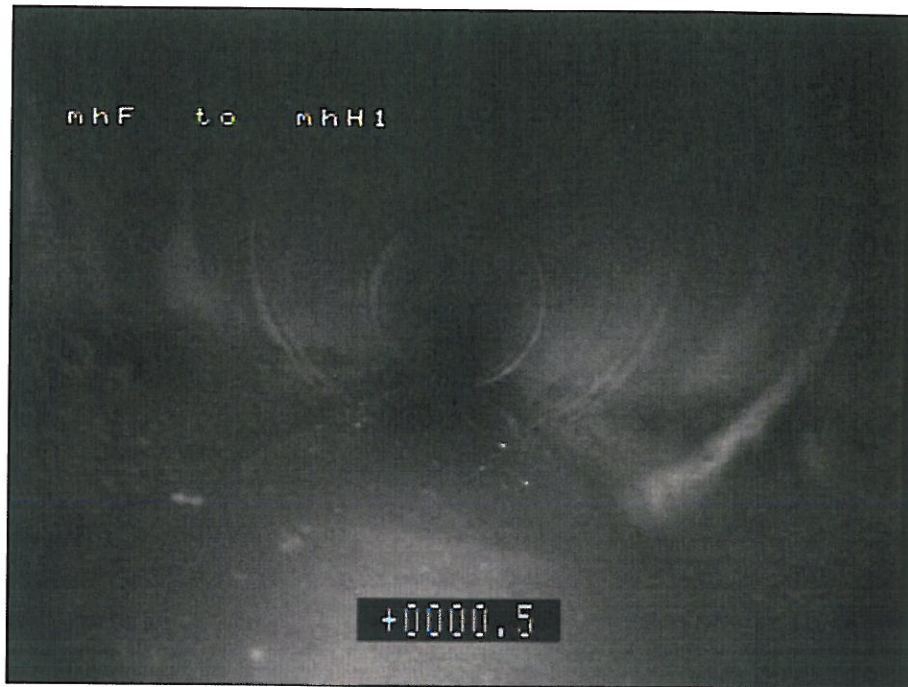
Place:
Llysonnen MillRoad:
CarmarthenDate:
30/12/2010section number:
5PLR:
MH F X

Photo: 43_3a, Tape No.: 01, 00:00:00
0m, Water level, 05 % height/diameter

Inspection photos

Place: Llysonnen Mill	Road: Carmarthen	Date: 21/12/2010	section number: 7	PLR: MH H X
---------------------------------	----------------------------	----------------------------	-----------------------------	-----------------------

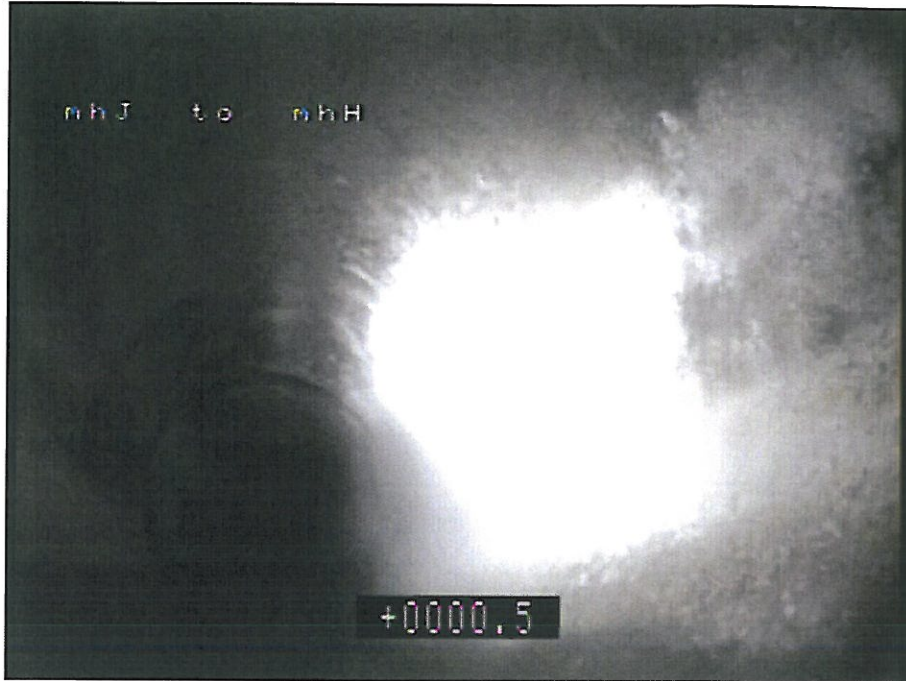


Photo: 61_2a, Tape No.: 01, 00:00:00
0m, Manhole Remark: MH J

Inspection report

Date: 30/12/2010	Job N°: ELLM001	Weather: Snow	Operator: RF	section number: 9	PLR: MH J X
Present:	Vehicle: Car 1	Camera: X TEC	Prese:	Cleaned: Not known	Grade:

Road: Carmarthen	Division:	start MH: MH J
Place: Llysonnen Mill	District:	end MH: OUTFALL
Location: Difficult access	Tape No.: 01	Total length: 42 m

Purpose: Asset condition	Shape/Size: Circular 300
Use: Surface water	Material: Concrete Pipe length: .7m
Catchment:	Lining: Z
	Category:

Comment:

Location details:

1:186	position	code	observation	MPEG	photo	grade
	0.00	ST	Start of Survey	00:00:00		(Misc) 0
	0.00	MH	Manhole Remark: MH J	00:00:00		(Constr) 0
	0.00	WL	Water level, 05 % height/diameter	00:00:00	74_3a	(Serv) 0
	3.10	CL	Longitudinal Crack, at 11 o'clock	00:00:47		(Struct) 2
	5.10	CL	Longitudinal Crack, at 11 o'clock	00:01:04		(Struct) 2
	6.50	CL	Longitudinal Crack, at 01 o'clock, Start	00:01:13		(Struct) 2
	7.60	CL	Longitudinal Crack, at 11 o'clock	00:01:22		(Struct) 2
	9.00	F1 CL	Longitudinal Crack, at 01 o'clock, Finish	00:01:32		(Struct) 2
	18.00	CL	Longitudinal Crack, at 12 o'clock	00:02:42		(Struct) 2
	18.90	CL	Longitudinal Crack, at 09 o'clock	00:02:51		(Struct) 2
	22.40	CX	Connection defective, at 02 o'clock, dia 100 mm	00:03:12	9_11a, b	(Constr) 4
	23.00	CC	Circumferential Crack, from 01 to 05 o'clock	00:03:17		(Struct) 2
	24.20	ELJ	Encrustation light at joint, from 01 to 05 o'clock	00:03:27		(Serv) 2

PM Consultants UK Ltd

Total expertise in surveying

PM Consultants (UK) LTD

Abergavenny

Monmouthshire

Tel: 01873 855591, Fax: 01873 859633

Inspection report

Date: 30/12/2010	Job nr.: ELLM001	Weather: Snow	Operator: RF	section number: 9	PLR: MH J X
Present:	Vehicle: Car 1	Camera: X TEC	Preset:	Cleaned: Not known	Grade:

1:186

position

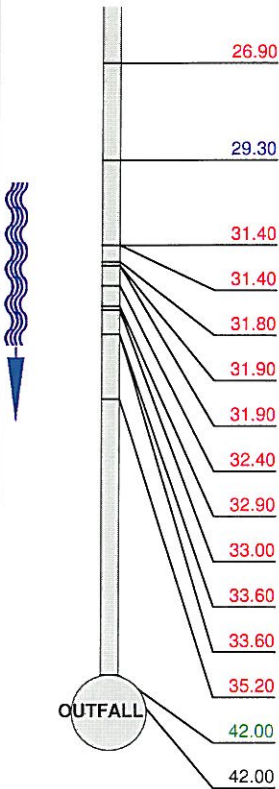
code

observation

MPEG

photo

grade



26.90	FL	Longitudinal Fracture at 12 o'clock	00:03:45		(Struct) 3
29.30	ELJ	Encrustation light at joint, from 07 to 10 o'clock	00:04:04		(Serv) 2
31.40	FL	Longitudinal Fracture at 12 o'clock	00:04:18		(Struct) 3
31.40	FL	Longitudinal Fracture at 03 o'clock	00:04:18		(Struct) 3
31.80	S2	FL Longitudinal Fracture at 12 o'clock, Start	00:04:29		(Struct) 3
31.90	B	Sewer Broken, from 09 to 12 o'clock	00:04:22		(Struct) 4
31.90	D	Sewer Deformed, 10 %	00:04:22	9_20a	(Struct) 5
32.40	FL	Longitudinal Fracture at 03 o'clock	00:04:39		(Struct) 3
32.90	S3	FL Longitudinal Fracture at 06 o'clock, Start	00:04:45		(Struct) 3
33.00	FC	Circumferential Fracture, from 12 to 05 o'clock	00:04:46	96_23a	(Struct) 3
33.60	F2	FL Longitudinal Fracture at 12 o'clock, Finish	00:05:02		(Struct) 3
33.60	F3	FL Longitudinal Fracture at 06 o'clock, Finish	00:05:02		(Struct) 3
35.20	FC	Circumferential Fracture, from 10 to 02 o'clock	00:05:13		(Struct) 3
42.00	MH	Manhole Remark: OUTFALL	00:06:55	100_27a	(Constr) 0
42.00	FH	Finish Survey	00:06:56		(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

Inspection photos

Place:
Llysonnen MillRoad:
CarmarthenDate:
30/12/2010section number:
9PLR:
MH J X

Photo: 74_3a, Tape No.: 01, 00:00:00
0m, Water level, 05 % height/diameter



Photo: 9_11a, Tape No.: 01, 00:03:12
22.4m, Connection defective, at 02 o'clock, dia 100 mm

Inspection photos

Place:
Llysonnen MillRoad:
CarmarthenDate:
30/12/2010section number:
9PLR:
MH J X

Photo: 9_11b, Tape No.: 01, 00:03:12
22.4m, Connection defective, at 02 o'clock, dia 100 mm



Photo: 9_20a, Tape No.: 01, 00:04:22
31.9m, Sewer Deformed, 10 %

Inspection photos

Place:
Llysonnen MillRoad:
CarmarthenDate:
30/12/2010section number:
9PLR:
MH J X

Photo: 96_23a, Tape No.: 01, 00:04:46
33m, Circumferential Fracture, from 12 to 05 o'clock

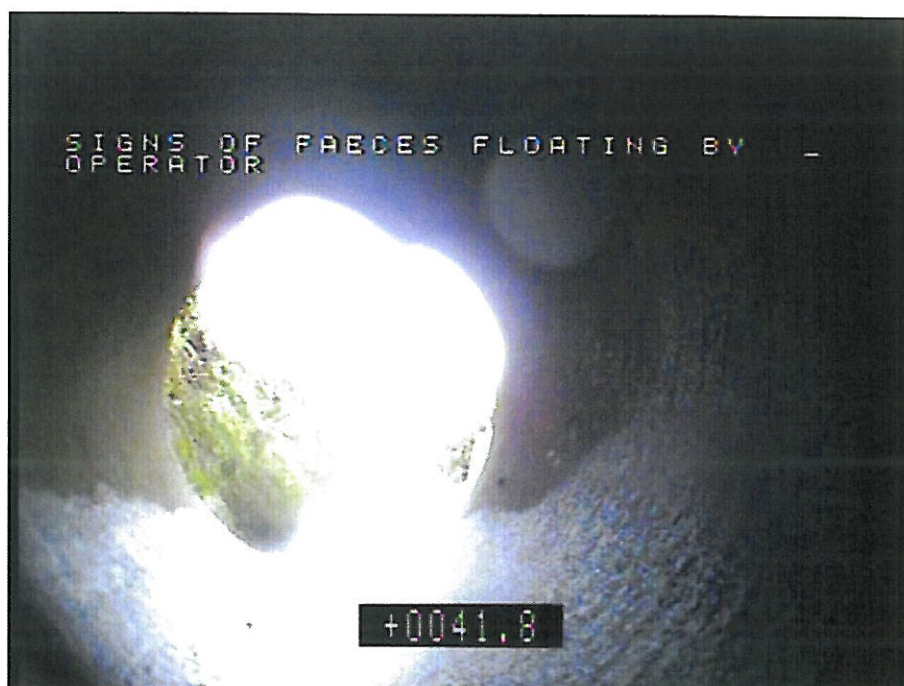


Photo: 100_27a, Tape No.: 01, 00:06:55
42m, Manhole Remark: OUTFALL

Inspection photos

Place: Llysonnen Mill	Road: Carmarthen	Date: 05/01/2011	section number: 10	PLR: MH P X
--------------------------	---------------------	---------------------	-----------------------	----------------



Photo: 104_3a, Tape No.: 01, 00:00:00
0m, Water level, 05 % height/diameter

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Abergavenny

Monmouthshire

Tel: 01873 855591, Fax: 01873 859633

Inspection report

Date: 05/01/2011	Job N°: ELLM001	Weather: Snow	Operator: RF	section number: 11	PLR: MH Q X
Present:	Vehicle: Car 1	Camera: X TEC	Preset:	Cleaned: Not known	Grade:

Road: Carmarthen	Division:	start MH: MH Q
Place: Llysonnen Mill	District:	end MH: MH R
Location: Difficult access	Tape No.: 01	Total length: 9 m

Purpose: Asset condition	Shape/Size: Circular 150
Use: Surface water	Material: Vitrified clay
Catchment:	Lining: Category: Z

Comment:

Location details:

1:75 position code observation MPEG photo grade

	0.00	ST	Start of Survey	00:00:00		(Misc) 0
	0.00	MH	Manhole Remark: MH Q	00:00:00		(Constr) 0
	0.00	WL	Water level, 05 % height/diameter	00:00:00	113_3a	(Serv) 0
	7.30	WL	Water level, 10 % height/diameter	00:01:31		(Serv) 0
	9.00	MH	Manhole Remark: MH R	00:04:27	115_5a	(Constr) 0
	9.00	FH	Finish Survey	00:04:28		(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

Inspection photos

Place:
Llysonnen MillRoad:
CarmarthenDate:
05/01/2011section number:
11PLR:
MH Q X

Photo: 113_3a, Tape No.: 01, 00:00:00
0m, Water level, 05 % height/diameter



Photo: 115_5a, Tape No.: 01, 00:04:27
9m, Manhole Remark: MH R

Service / Operational Defects (SRM 4)

 Project name:
Llysonnen Mill

 Contract number:
ELLM001

 Contact:
Neil Maine

 Date:
11/01/2011

No.	PLR	Dir.	Use	Shape / Size	Date	Mat.	Total Length	Insp. Length	Peak HWG	Cat.	Peak Score	Grade	Mean Score	Total Score
1	MH A X	D	S	C 225	14/01/2011	VC	56	46.2	2	Z	2	3	0.1	5
2	MH B X	D	S	C 300	14/122010	CO	28	27	2	Z	1	2	0.0	1
3	MH C X	U	S	C 300	14/122010	CO	28	28	2	Z	1	2	0.0	1
4	MH C X	D	S	C 300	21/122010	CO	31	31	-	Z	0	1	0	0
5	MH F X	D	S	C 300	30/12/2010	CO	16	16	1	Z	5	4	0.4	7
6	MH G X	D	S	C 300	21/12/2010	CO	44.9	44.9	-	Z	0	1	0	0
7	MH H X	U	S	C 300	21/12/2010	CO	27.3	27.3	-	Z	0	1	0	0
8	MH K X	U	S	C 300	30/12/2010	CO	30	7	1	Z	2	3	0.7	5
9	MH J X	D	S	C 300	30/12/2010	CO	42	42	2	Z	1	2	0.0	2
10	MH P X	D	S	C 300	05/01/2011	CO	9	9	1	Z	1	2	0.2	2
11	MH Q X	D	S	C 150	05/01/2011	VC	9	9	-	Z	0	1	0	0

Structural Defects (SRM 4)

 Project name:
 Llysonnen Mill

 Contract number:
 ELLM001

 Contact:
 Neil Maine

 Date:
 11/01/2011

No.	PLR	Dir.	Use	Shape / Size	Date	Mat.	Total Length	Insp. Length	Peak HWG	Cat.	Peak Score	Grade	Mean Score	Total Score
1	MH A X	D	S	C 225	14/01/2011	VC	56	46.2	-	Z	0	1	0	0
2	MH B X	D	S	C 300	14/12/2010	CO	28	27	4	Z	80	4	4.4	120
3	MH C X	U	S	C 300	14/12/2010	CO	28	28	4	Z	80	4	3.6	100
4	MH C X	D	S	C 300	21/12/2010	CO	31	31	-	Z	0	1	0	0
5	MH F X	D	S	C 300	30/12/2010	CO	16	16	-	Z	0	1	0	0
6	MH G X	D	S	C 300	21/12/2010	CO	44.9	44.9	-	Z	0	1	0	0
7	MH H X	U	S	C 300	21/12/2010	CO	27.3	27.3	-	Z	0	1	0	0
8	MH K X	U	S	C 300	30/12/2010	CO	30	7	-	Z	0	1	0	0
9	MH J X	D	S	C 300	30/12/2010	CO	42	42	5	Z	160	4	15.2	640
10	MH P X	D	S	C 300	05/01/2011	CO	9	9	-	Z	0	1	0	0
11	MH Q X	D	S	C 150	05/01/2011	VC	9	9	-	Z	0	1	0	0

Summary Sheet

PM Consultants (UK) LTD, Abergavenny, Monmouthshire, Tel: 01873 855591, Fax: 01873 859633 // Llysonnen_Mill.mdb

	Place	Road	Location	PLR	Year laid	Material	Job No.	Loc. details
1	Llysonnen Mill	Carmarthen	Difficult access	MH Q X	Z	Vitrified clay	ELLM001	
2	Llysonnen Mill	Carmarthen	Difficult access	MH P X	Z	Concrete	ELLM001	
3	Llysonnen Mill	Carmarthen	Difficult access	MH J X	Z	Concrete	ELLM001	
4	Llysonnen Mill	Carmarthen	Difficult access	MH K X	Z	Concrete	ELLM001	
5	Llysonnen Mill	Carmarthen	Difficult access	MH H X	Z	Concrete	ELLM001	
6	Llysonnen Mill	Carmarthen	Difficult access	MH G X	Z	Concrete	ELLM001	
7	Llysonnen Mill	Carmarthen	Difficult access	MH F X	Z	Concrete	ELLM001	
8	Llysonnen Mill	Carmarthen	Difficult access	MH C X	Z	Concrete	ELLM001	
9	Llysonnen Mill	Carmarthen	Difficult access	MH C X	Z	Concrete	ELLM001	
10	Llysonnen Mill	Carmarthen	Difficult access	MH B X	Z	Concrete	ELLM001	
11	Llysonnen Mill	Carmarthen	Difficult access	MH A X	Z	Vitrified clay	ELLM001	

PM Consultants UK Ltd

Total expertise in surveying

PM Consultants (UK) LTD

Abergavenny

Monmouthshire

Tel: 01873 855591, Fax: 01873 859633

 $\Sigma \emptyset$ Project name:
Llysonnen MillContract number:
ELLM001Contact:
Neil MaineDate:
11/01/2011

No.	start MH	end MH	Date	Road	Tape No.	Material	m	(m)
11	MH Q	MH R	05/01/2011	Carmarthen	01	Vitrified clay	9	9

Profile: CIRCULAR 150 = 9 m (9 m)

No.	start MH	end MH	Date	Road	Tape No.	Material	m	(m)
1	MH A	OUTFALL	14/01/2011	Carmarthen	01	Vitrified clay	56	46.2

Profile: CIRCULAR 225 = 56 m (46.2 m)

No.	start MH	end MH	Date	Road	Tape No.	Material	m	(m)
2	MH B	MH C	14/12/2010	Carmarthen	01	Concrete	28	27
3	MH B	MH C	14/12/2010	Carmarthen	01	Concrete	28	28
4	MH C	MH F	21/12/2010	Carmarthen	01	Concrete	31	31
5	MH F	MH H1	30/12/2010	Carmarthen	01	Concrete	16	16
6	MH G	mh b	21/12/2010	Carmarthen	01	Concrete	44.9	44.9
7	MH J	MH H	21/12/2010	Carmarthen	01	Concrete	27.3	27.3
8	MH J	MH K	30/12/2010	Carmarthen	01	Concrete	30	7
9	MH J	OUTFALL	30/12/2010	Carmarthen	01	Concrete	42	42
10	MH P	MH Q	05/01/2011	Carmarthen	01	Concrete	9	9

Profile: CIRCULAR 300 = 256.2 m (232.2 m)**all sections = 321.2 m (287.4 m)**

APPENDIX D

Groundsure Report

GroundSure GeoInsight

Address: Wynnstay Group Plc, Llysonen Mill, Travellers Rest, Carmarthen

Date: Mar 26, 2009

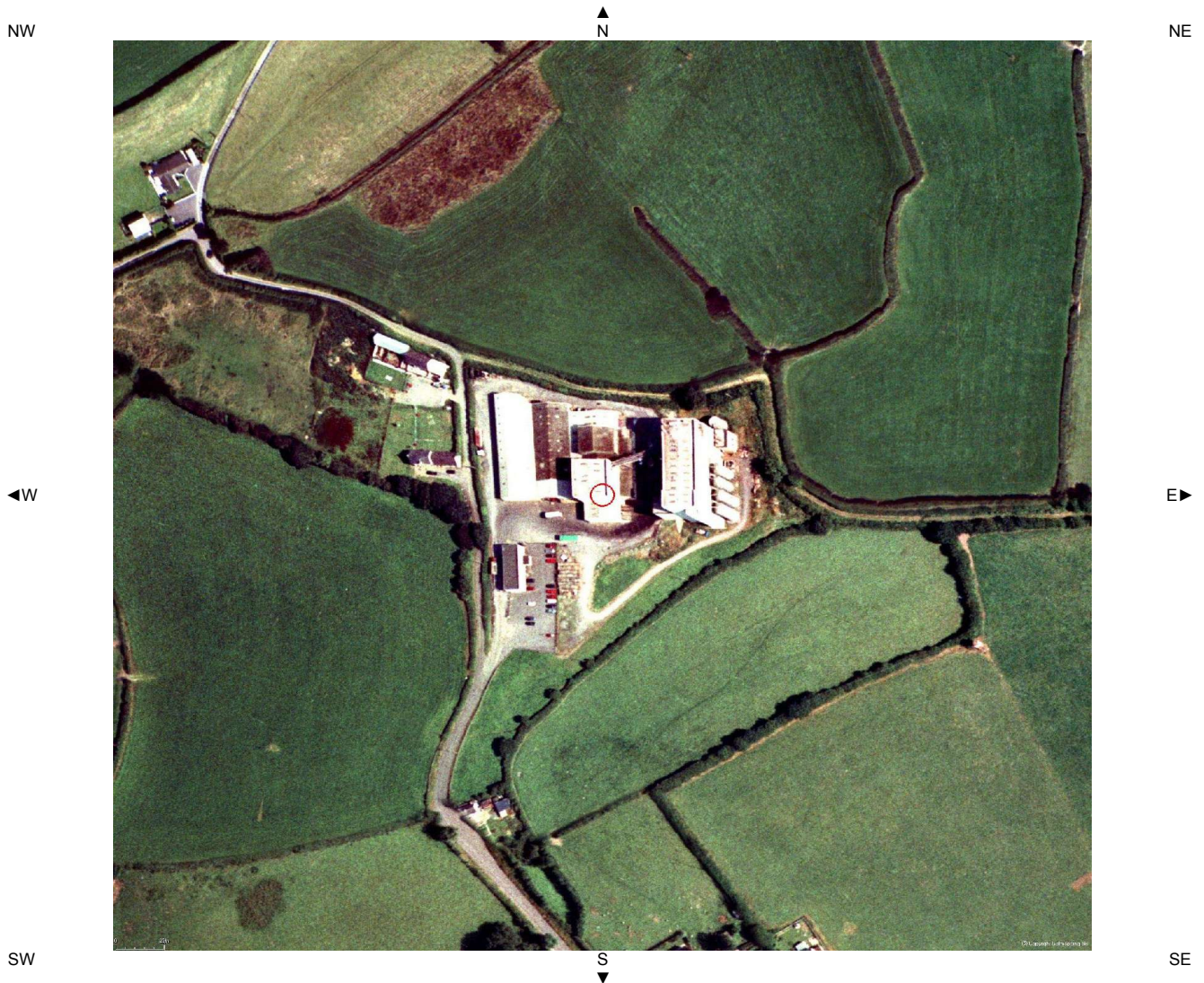
GroundSure Reference: HMD-142-385316

Your Reference: 129-01-01



Brought to you by GroundSure

Aerial Photograph of Study Site



Aerial photography supplied by Getmapping PLC.
© Copyright Getmapping PLC 2003. All Rights Reserved.

Site Name: Wynnstay Group Plc, Llysonen Mill, Travellers Rest,
Carmarthen
Grid Reference: 238295,219579

Overview of Findings

The GroundSure GeolInsight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Shallow Mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database and GroundSure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Report Section	Number of records found within (X) m of the study site boundary
1. Geology	Description
1.1 Artificial Ground,	
1.1.1 Is there any Artificial Ground /Made Ground present beneath the study site? *	No
1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	No
1.2 Superficial Geology & Landslips	
1.2.1 Is there any Superficial Ground /Drift Geology present beneath the study site? *	Yes
1.2.2 Are there any records relating to permeability of superficial geology within the study site* boundary?	Yes
1.2.3 Are there any records of landslide within 500m of the study site boundary?	No
1.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No
1.3 Bedrock, Solid Geology & Faults	
1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
1.3.2 Are there any records relating to permeability of bedrock within the study site* boundary?	Yes
1.3.3 Are there any records of faults within 500m of the study site boundary?	No
1.3.4 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is in a radon Affected Area, as between 1 and 3% of properties are above the Action Level
1.3.5 Is the property in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary

* This includes an automatically generated 50m buffer zone around the site

Source: Scale 1:50,000 BGS Sheet No:229

2. Ground Workings	on-site	0-50	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	0	0	0	-	-
2.2 Historical Underground Workings Features from Small Scale Mapping	0	0	0	0	0
2.3 Current Ground Workings	0	0	0	0	0

3. Mining, Extraction & Natural Cavities	on-site	0-50	51-250	251-500	501-1000
3.1 Historical Mining	0	0	0	0	0
3.2 Coal Mining	0	0	0	0	0
3.3 Shallow Mining*	1	-	-	-	-
3.4 Non – Coal Mining Cavities	0	0	0	0	0
3.5 Natural Cavities	0	0	0	0	0
3.6 Brine Extraction	0	0	0	0	0
3.7 Gypsum Extraction	0	0	0	0	0
3.8 Tin Mining	0	0	0	0	0
3.9 Clay Mining	0	0	0	0	0

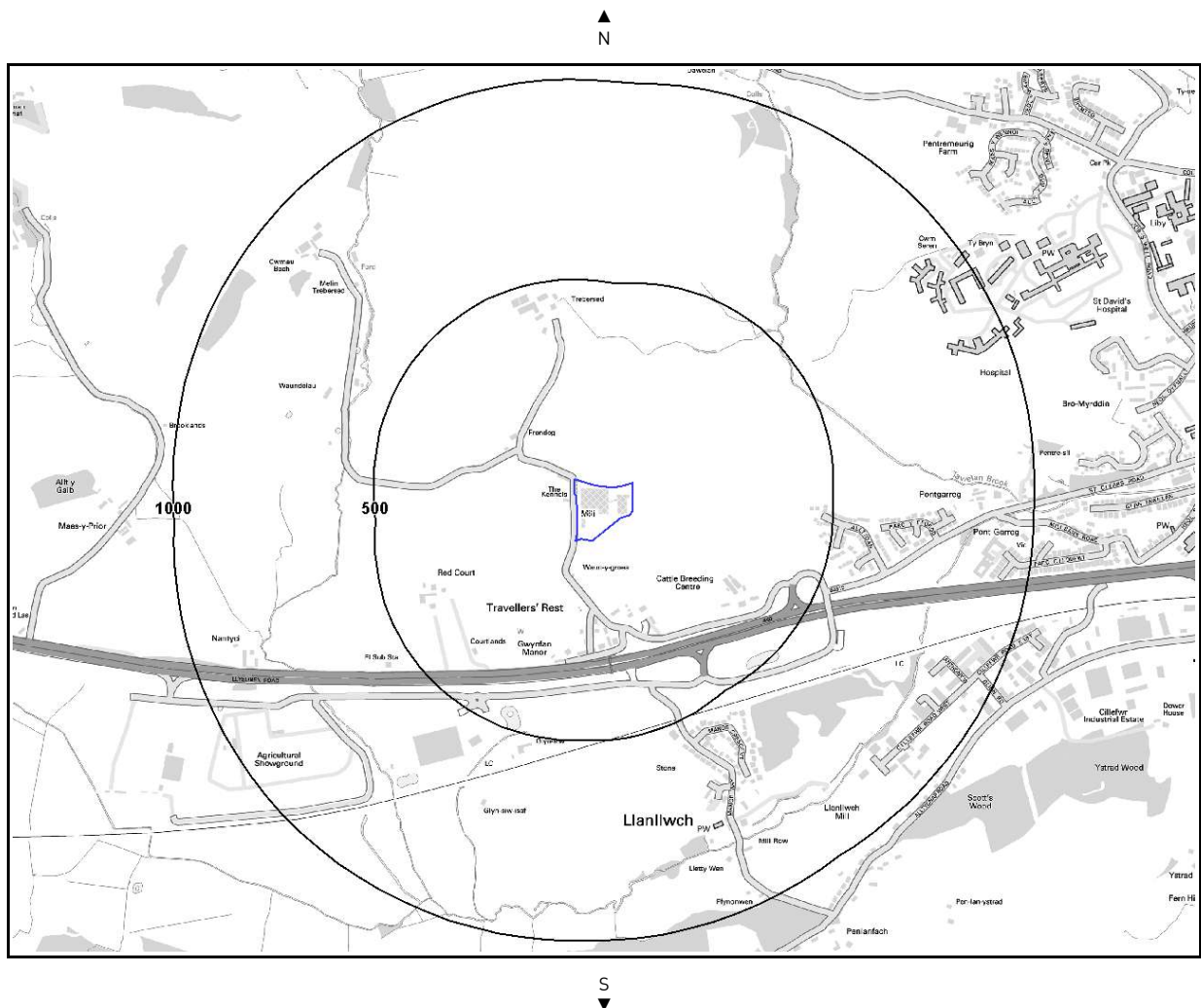
*This includes an automatically generated 150m buffer zone around the site

4. Natural Ground Subsidence	on-site*	0-50	51-250	251-500	501-1000
4.1 Shrink-Swell Clay	Very Low	-	-	-	-
4.2 Landslides	Low	-	-	-	-
4.3 Ground Dissolution of Soluble Rocks	Negligible	-	-	-	-
4.4 Compressible Deposits	Negligible	-	-	-	-
4.5 Collapsible Deposits	Negligible	-	-	-	-
4.6 Running Sand	Very Low	-	-	-	-

* This includes an automatically generated 50m buffer zone around the site

5. Borehole Records	on-site	0-50	51-250	251-500	501-1000
5.1 BGS Recorded Boreholes	0	0	0	-	-

1.1 Artificial Ground Map



Artificial Ground Legend



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	Site Outline		Made Ground (undivided)		Disturbed Ground (undivided)
	500		Worked Ground (undivided)		Landscaped Ground (undivided)
	1000		Infilled Ground		Reclaimed Ground
	Search Buffers (m)				

Geological information represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:229

1.1.1 Artificial/Made Ground

Are there any records of Artificial/Made Ground within 500m of the study site boundary: **No**

Database searched and no data found.

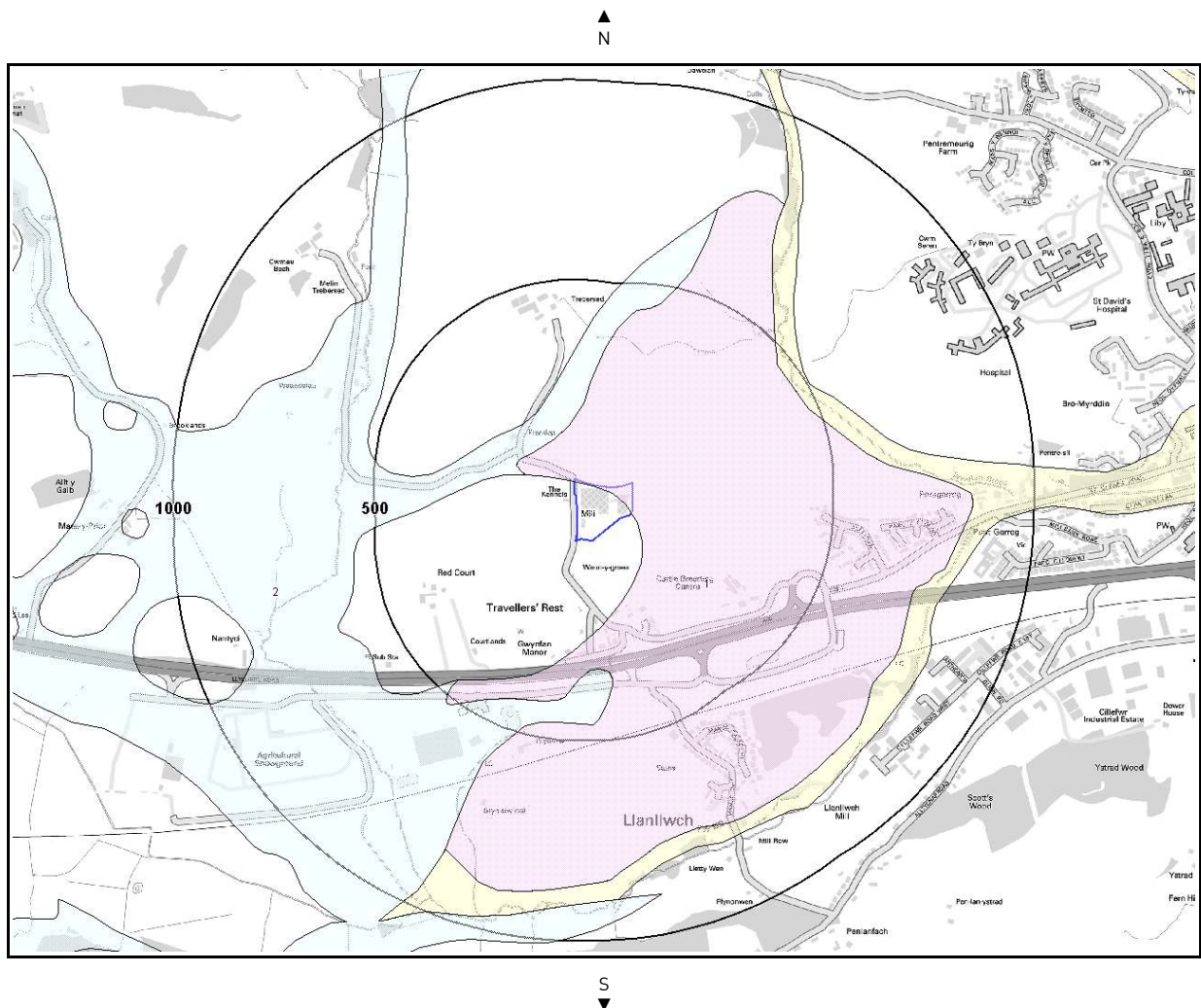
1.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site* boundary: **No**

Database searched and no data found.

* This includes an automatically generated 50m buffer zone around the site.

1.2 Superficial Deposits and Landslips Map



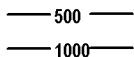
Superficial and Landslips Legend



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Site Outline



Search Buffers (m)

Geological information represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

Report Reference: HMD-142-385316

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If you would like any further assistance regarding this report then please contact GroundSure on (T) 01273 819700, (F) 01273 377902, email: info@groundsure.com

1.2 Superficial Deposits and Landslips

1.2.1 Superficial Deposits/Drift Geology

Are there any records of Superficial Deposits/Drift Geology within 500m of the study site boundary: **Yes**

ID	Distance (m)	Direction	Lex Code	Description	Rock Description
1	0.0	On Site	GFDUD-SAGR	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
2	114.0	NW	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
3	463.0	NE	ALV-CSSG	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL

1.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site* boundary: **Yes**

Distance (m)	Direction	Flow type	Maximum Permeability	Minimum Permeability
0.0	On Site	Intergranular	Very High	High

1.2.3 Landslip

Database searched and no data found.

Are there any records of Landslip within 500m of the study site boundary? **No**

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discreet layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site* boundary: **No**

Database searched and no data found.

* This includes an automatically generated 50m buffer zone around the site.



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—



Search Buffers (m)

1.3 Bedrock, Solid Geology & Faults

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:229

1.3.1 Bedrock/Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary:

ID	Distance (m)	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	TTRA-MDST	Tetragraptus Beds - Mudstone	Arenig

1.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site* boundary: Yes

Distance (m)	Direction	Flow type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	Low	Low

1.3.3 Faults

Database searched and no data found.

Are there any records of Faults within 500m of the study site boundary? No

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discreet layers, these are: Bedrock/ Solid Geology and linear features such as Faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.3.4 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?

The property is in a radon Affected Area, as between 1 and 3% of properties are above the Action Level

1.3.5 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?

No radon protective measures are necessary

* This includes an automatically generated 50m buffer zone around the site.

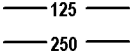
2. Ground Workings Map



Ground Workings Legend



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- | | | | |
|---|--------------------|---|----------------------------------|
|  | Site Outline |  | Historic Surface Ground Workings |
|  | Search Buffers (m) |  | Historic Underground Workings |
| | |  | Current Ground Workings |

2. Ground Workings

2.1 Historical Surface Ground Working Features derived from the Historical Mapping

This dataset is based on GroundSure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping.

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? **No**

Database searched and no data found.

2.2 Historical Underground Workings Features derived from the Historical Mapping

This data is derived from the GroundSure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? **No**

Database searched and no data found.

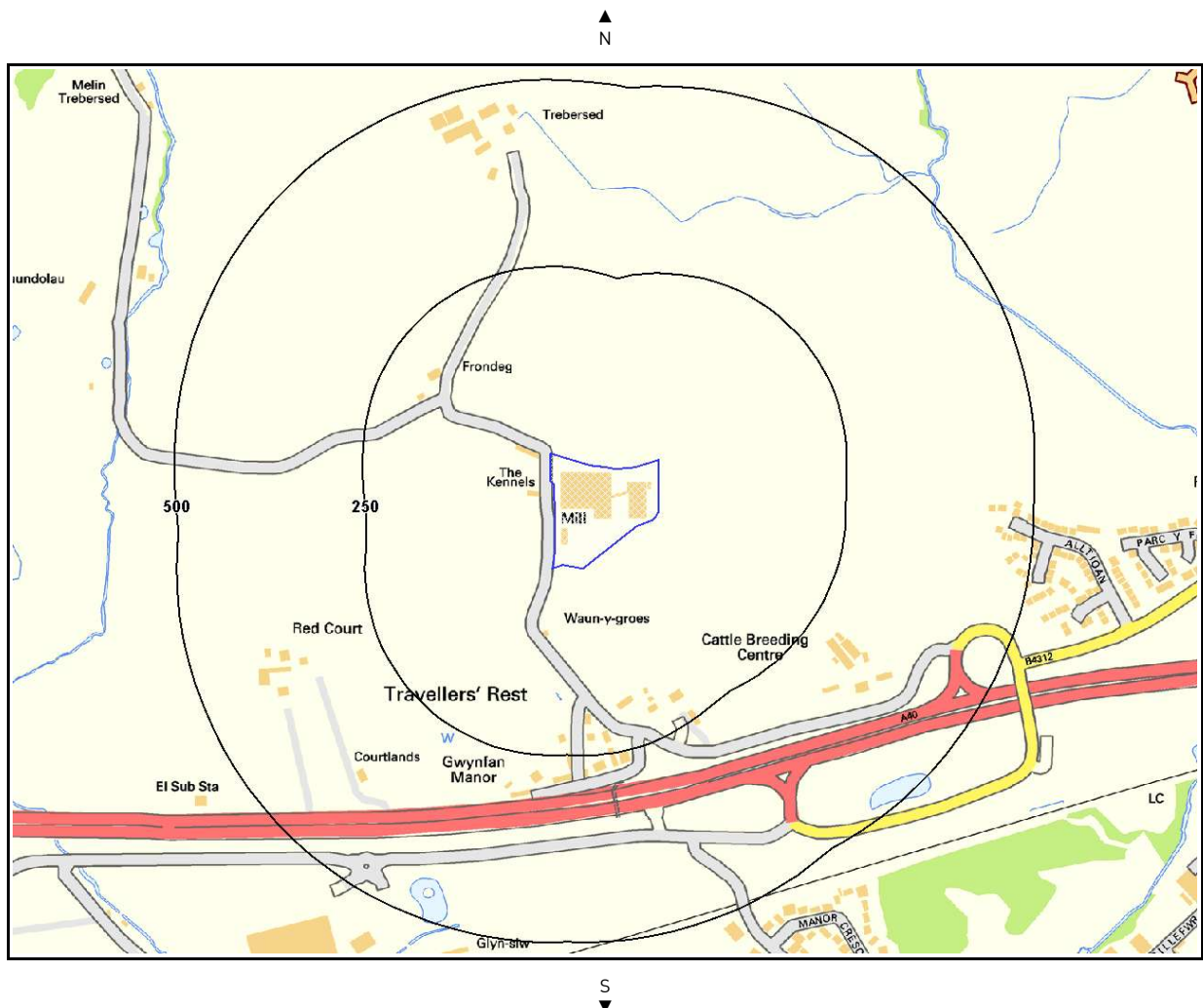
2.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Are there any BGS Current Ground Workings within 1000m of the study site boundary? **No**

Database searched and no data found.

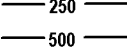
3. Mining, Extraction & Natural Cavities Map



Mining, Extraction & Natural Cavities Legend

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-  Site Outline
-  Historical Mining
-  Non-Coal Mining Cavities
-  Natural Cavities
-  Search Buffers (m)

3. Mining, Extraction & Natural Cavities

3.1 Historical Mining

This dataset is derived from GroundSure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary?

No

Database searched and no data found.

3.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary?

No

Database searched and no data found.

3.3 Shallow Mining

This dataset refers to the (largely very old) extraction of mineral deposits by means of near surface underground workings.

What is the maximum hazard rating of subsidence relating to shallow mining within the study site* boundary?

Negligible

*This includes an automatically generated 150m buffer zone around the study site boundary

The following Shallow Mining information provided by the British Geological Survey is not represented on Mapping:

Distance (m)	Direction	Hazard Rating	Details
0.0	On Site	Negligible	Where negligible potential is indicated, this means that the rocks underlying the area are not likely to have been mined at shallow depth. However, you should still find out whether or not a Coal Authority mining search is required in the area, for example, to check for deeper mining.

3.4 Non – Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled "Review of mining instability in Great Britain, 1990" PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary?

No

Database searched and no data found.

3.5 Natural Cavities

This dataset provides information based on Peter Brett Associates natural cavities database.

Are there any Natural Cavities within 1000m of the study site boundary?

No

Database searched and no data found.

3.6 Brine Extraction

This dataset provides information from the Brine compensation board which has been discontinued and is now covered by the Coal Authority.

Are there any Brine Extraction areas within 1000m of the study site boundary?

No

Database searched and no data found.

3.7 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

[Report Reference: HMD-142-385316](#)

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Are there any Gypsum Extraction areas within 1000m of the study site boundary?

No

Database searched and no data found.

3.8 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records.

Are there any Tin Mining areas within 1000m of the study site boundary?

No

Database searched and no data found.

3.9 Clay Mining

This dataset provides information on Kalin and Ball Clay mining from relevant mining records.

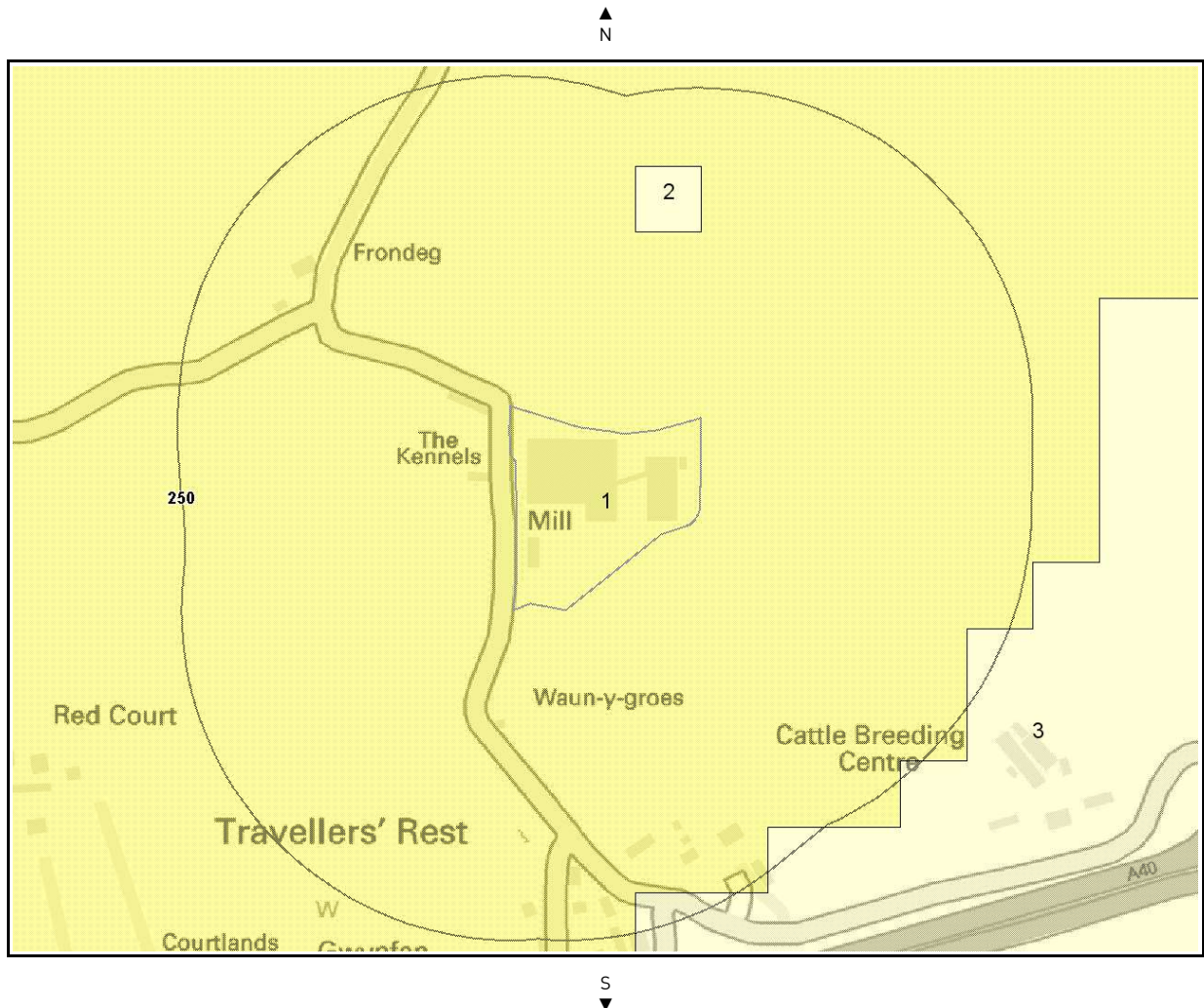
Are there any Clay Mining areas within 1000m of the study site boundary?

No

Database searched and no data found.

4. Natural Ground Subsidence

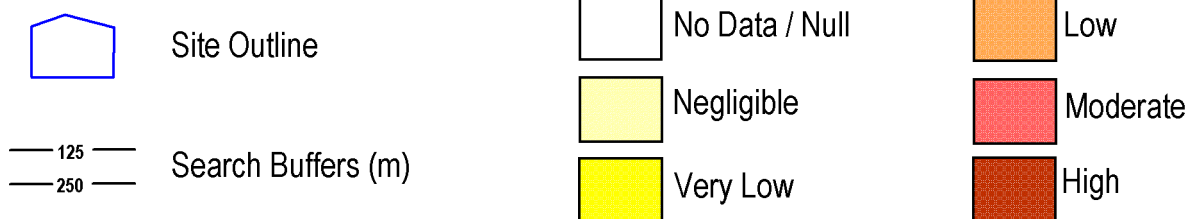
4.1 Shrink-Swell Clay Map



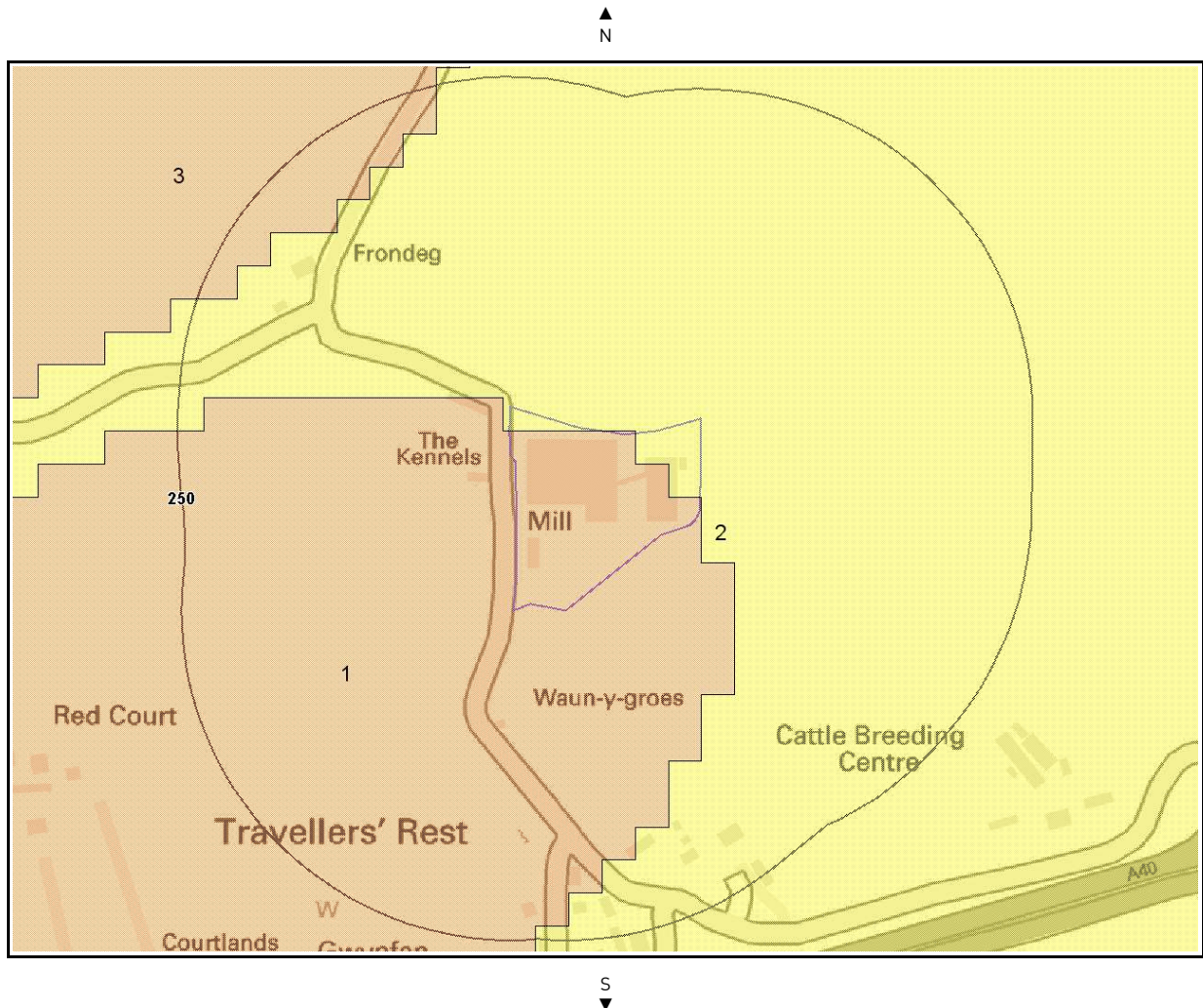
Shrink-Swell Clay Legend



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4.2 Landslides Map



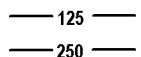
Landslides Legend



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Site Outline



Search Buffers (m)



No Data / Null



Negligible



Very Low



Low

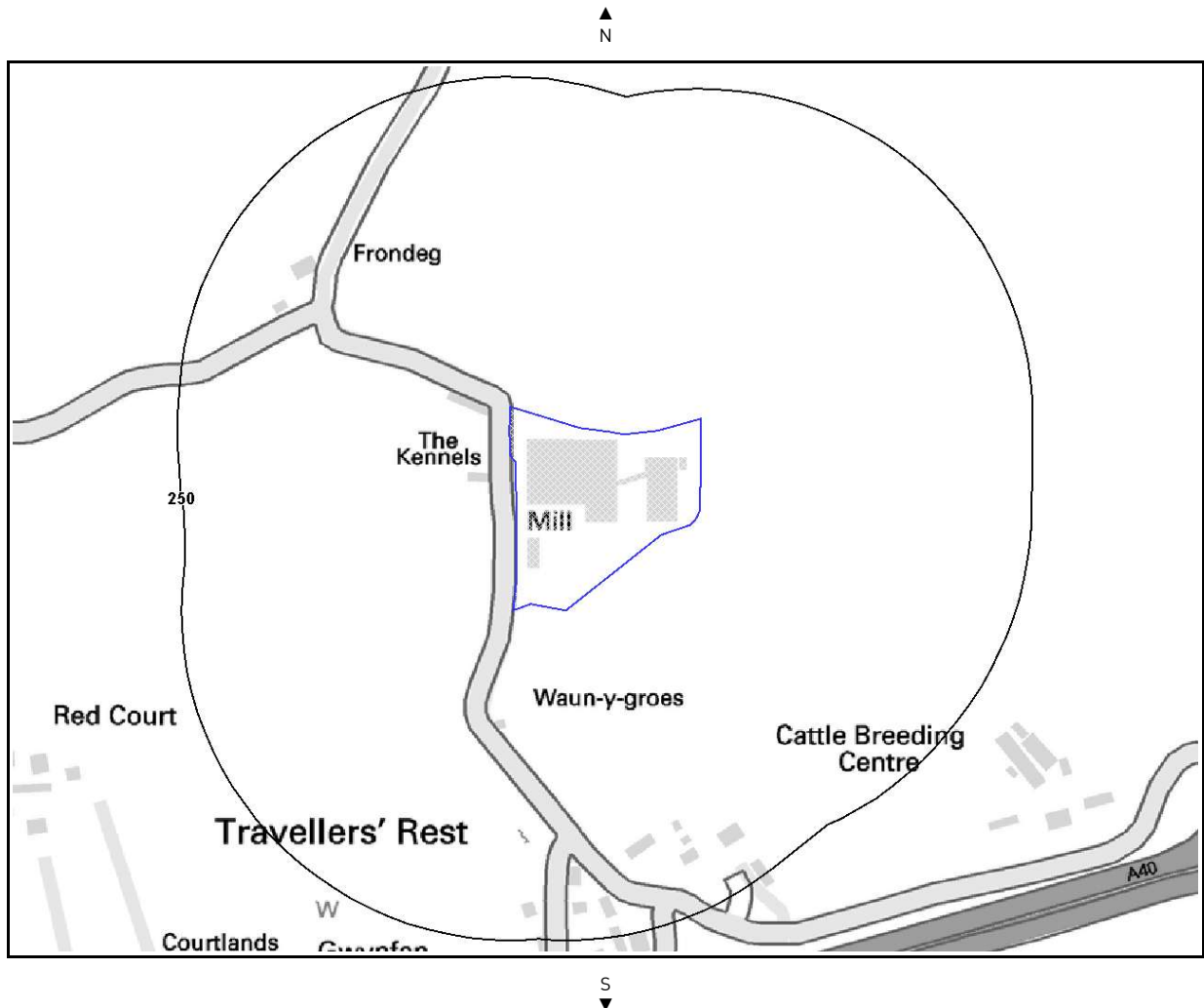


Moderate



High

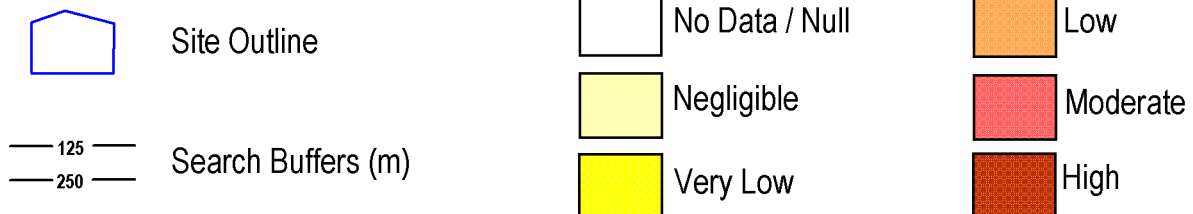
4.3 Ground Dissolution Soluble Rocks Map



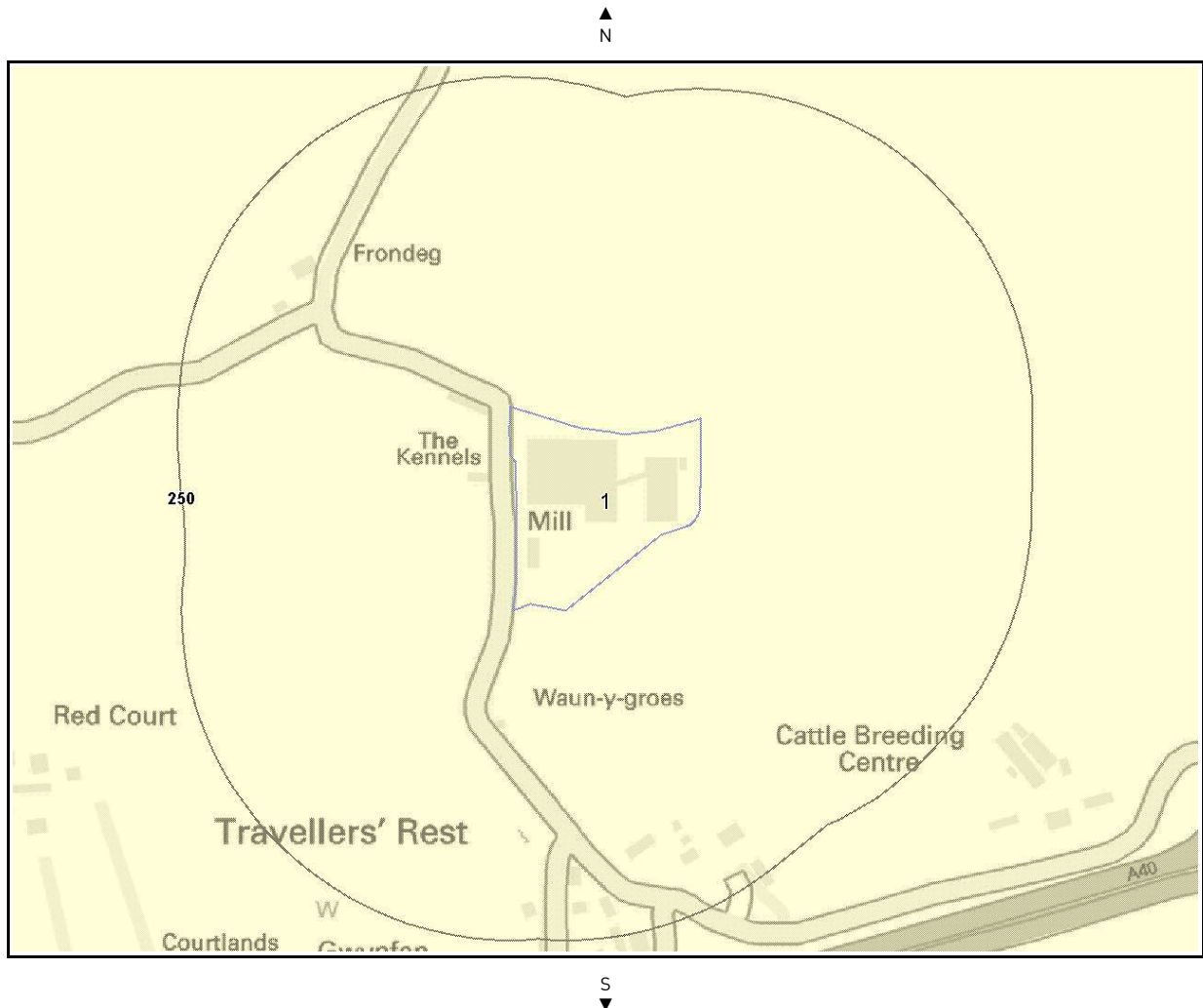
**Ground Dissolution Soluble Rocks
Legend**

Enabled by  **Ordnance
Survey**

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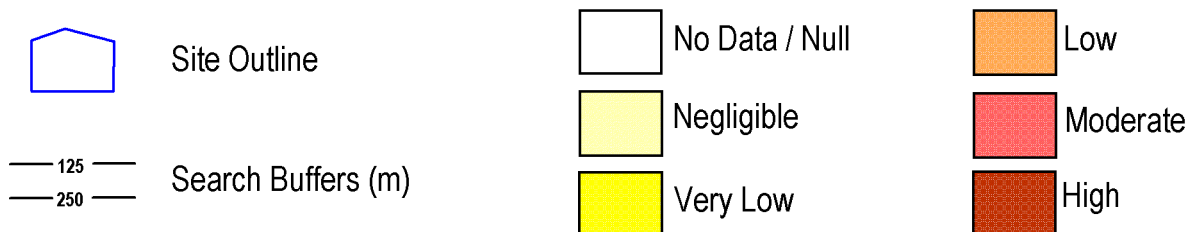
4.4 Compressible Deposits Map



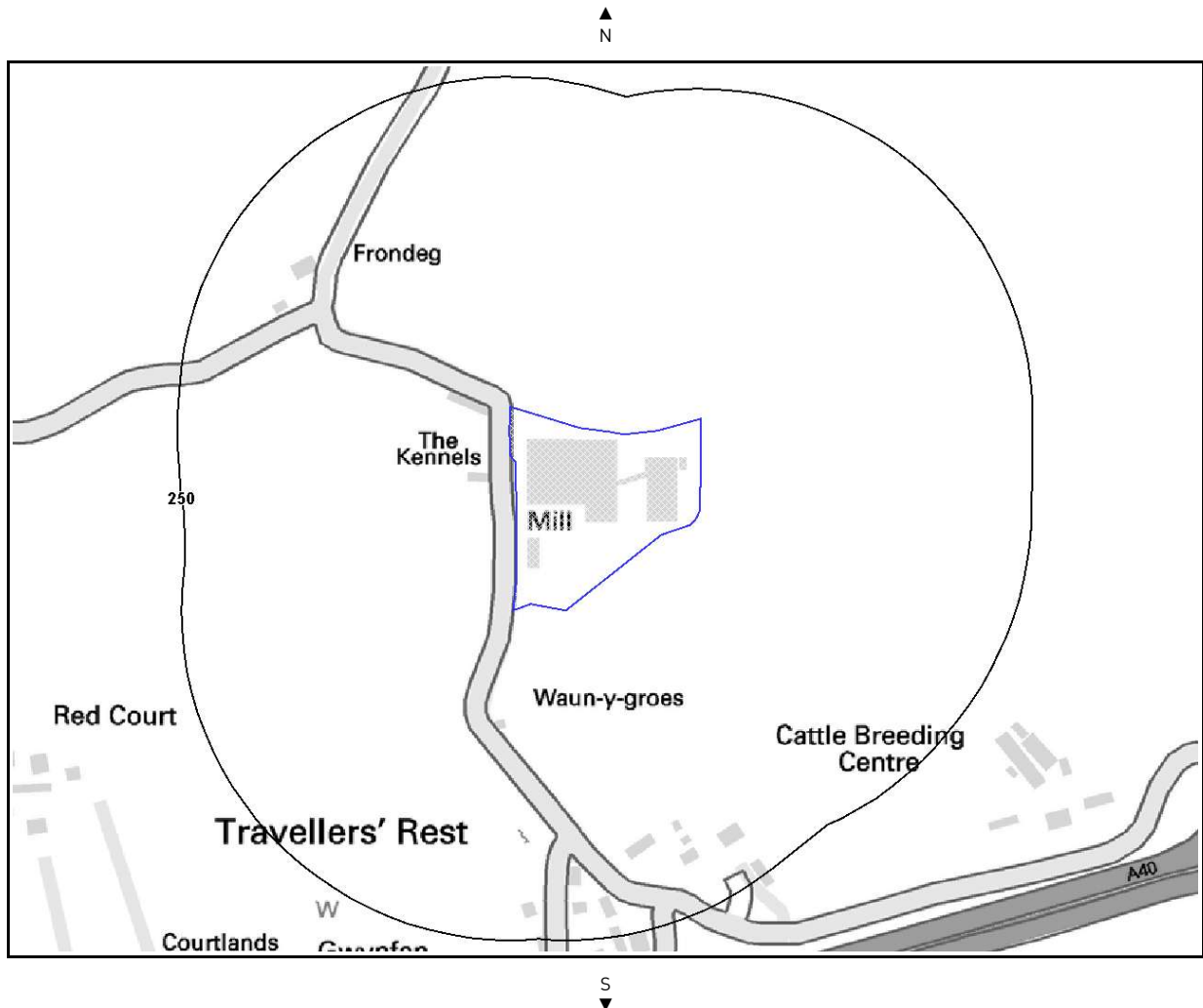
Compressible Deposits Legend



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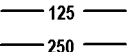
4.5 Collapsible Deposits Map



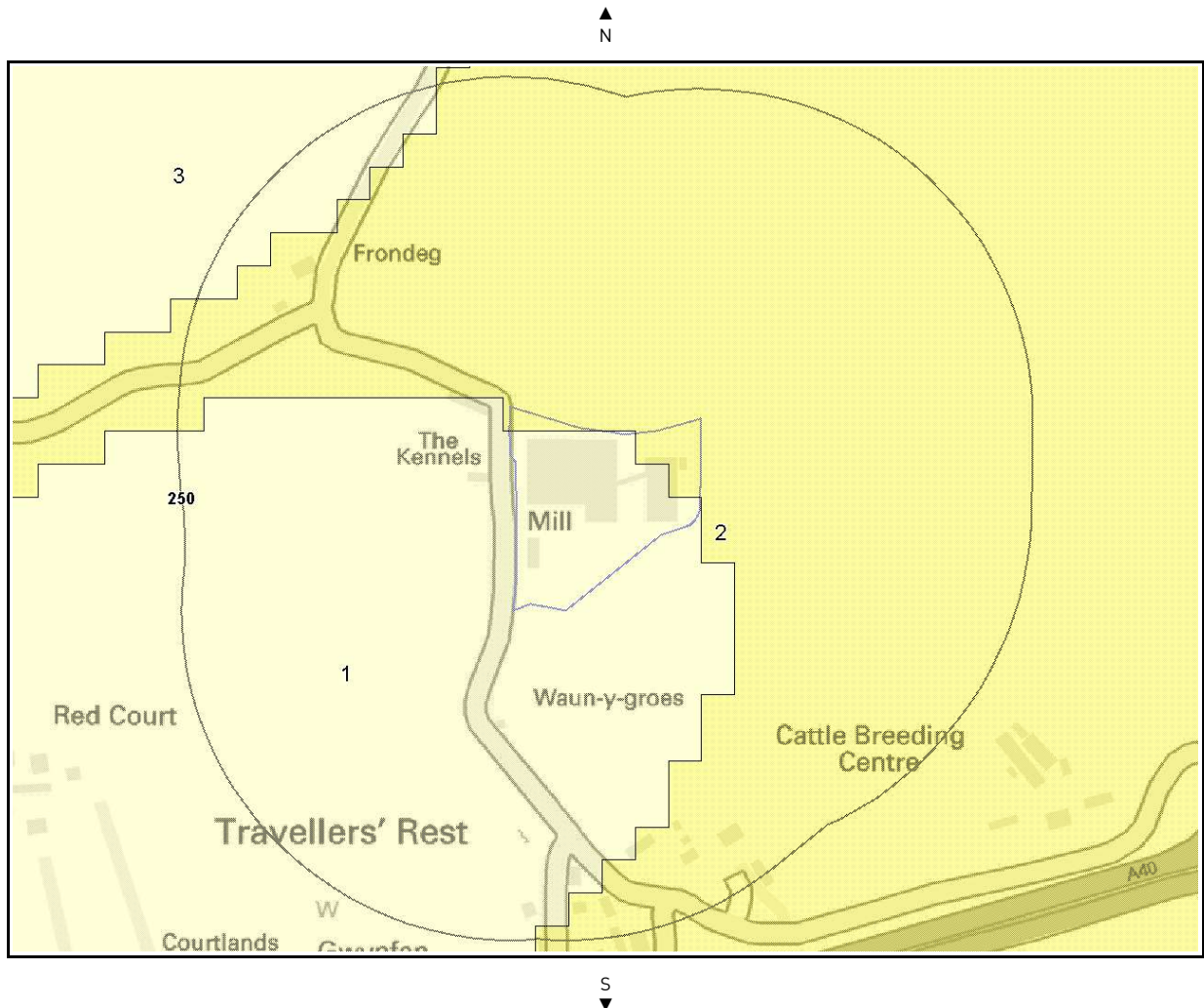
Collapsible Deposits Legend



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- | | | | |
|---|--------------------|---|----------------|
|  | Site Outline |  | No Data / Null |
|  | Search Buffers (m) |  | Significant |

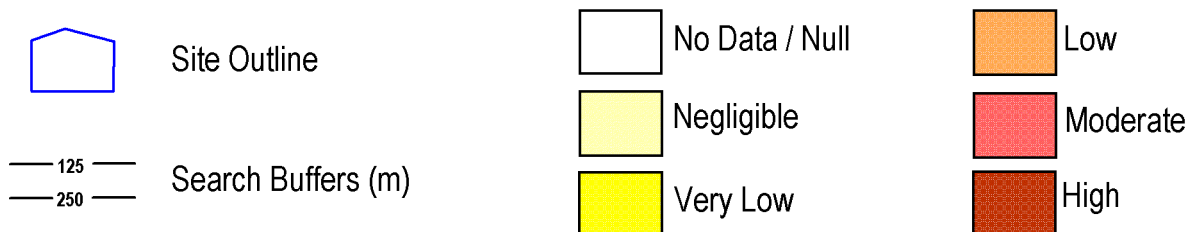
4.6 Running Sand Map



Running Sand Legend



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4. Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS)

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site* boundary?

Low

*This includes an automatically generated 50m buffer zone around the study site boundary.

4.1 Shrink – Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.

4.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Low	Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property – no significant increase in insurance risk due to natural slope instability problems.
2	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

4.3 Ground Dissolution of Soluble Rocks

The following Soluble Rocks information provided by the British Geological Survey:

Distance (m)*	Direction	Hazard Rating	Details
0	On site	Null-Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

4.4 Compressible Deposits

The following Compressible Ground information provided by the British Geological Survey:

ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

4.5 Collapsible Deposits

Report Reference: HMD-142-385316

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The following Collapsible Rocks information is provided by the British Geological Survey:

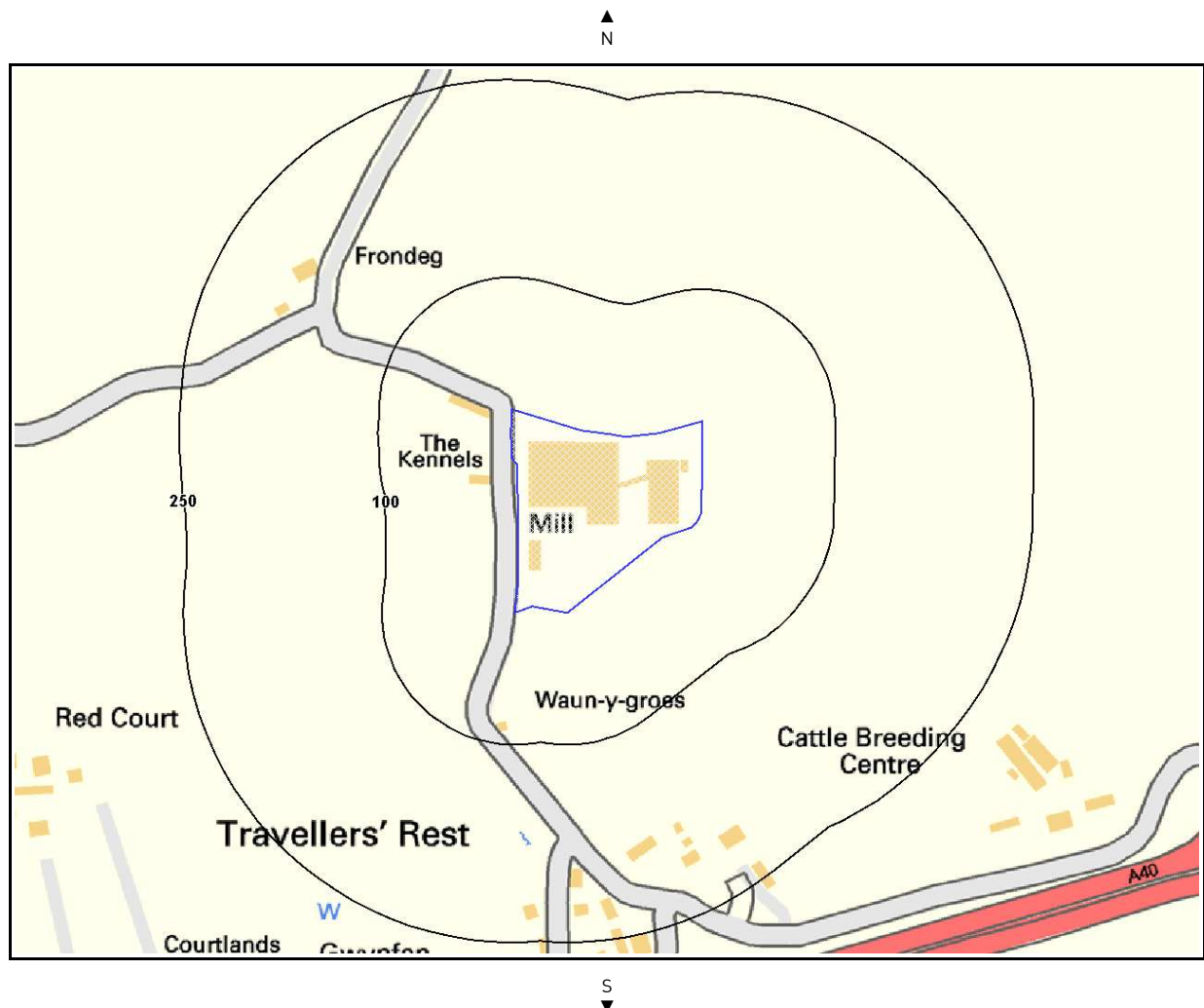
Distance (m)*	Direction	Hazard Rating	Details
0	On site	Null-Negligible	No Indicators for collapsible deposits identified. No Special actions required to avoid problems due to collapsible deposit.

4.6 Running Sands

The following Running Sands information is provided by the British Geological Survey:

ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
2	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

5. Borehole Records Map



Borehole Records Legend



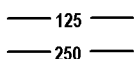
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Site Outline



Borehole Locations



Search Buffers (m)

5. Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary:

0

Database searched and no data found.

Contacts

GroundSure Helpline

Telephone: 01273 819700
info@groundsure.com



British Geological Survey Enquiries

Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143. Fax: 0115 936 3276.
Email: enquiries@bgs.ac.uk
Web: www.bgs.ac.uk
BGS Geological Hazards Reports and general geological enquiries



British Gypsum

British Gypsum Ltd, East Leake, Loughborough,
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Tel: www.british-gypsum.bpb.com



The Coal Authority

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Tel: 0845 762 6848
DX 716176 Mansfield 5 www.coal-authority.co.uk



Ordnance Survey

Romsey Road, Southampton SO16 4GU
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Acknowledgements

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This report has been prepared in accordance with the GroundSure Ltd standard Terms and Conditions of business for work of this nature.

1 Definitions

In these conditions unless the context otherwise requires:

"Beneficiary" means the Customer or the client of the Customer for whom the Customer has procured the Services.

"Consultancy Services" mean consultancy services provided by GroundSure including, without limitation, carrying out interpretation of third party and in-house environmental data, provision of environmental consultancy advice, undertaking environmental audits and assessments, site investigation, site monitoring and related items.

"Content" means any data, database or other information contained in a Report or Mapping which is provided to GroundSure by a Data Provider.

"Contract" means the contract between GroundSure and the Customer for the performance of the Services which shall incorporate these conditions, the relevant GroundSure user guide, proposal by GroundSure and the content of any subsequent report, and any agreed amendments in accordance with condition 12.

"Customer" means the party that submits an Order or commissions GroundSure further to a written proposal for environmental consultancy services.

"Data Provider" means any third party providing Content to GroundSure.

"Data Report" means reports comprising factual data with no professional interpretation in respect of the level of likely risk and/or liability available from GroundSure.

"GroundSure" means GroundSure Limited, a company registered in England and Wales under number 03421028 and whose registered office is at Greater London House, Hampstead Road, London NW1 7EJ.

"Intellectual Property" means any patent, copyright, registered design rights, service marks, moral rights, data protection rights, know-how, trade mark or other intellectual property rights.

"Mapping" an historical map or a combination of historical maps of various ages, time periods and scales available from GroundSure;

"Order" means an order form submitted by or for the Beneficiary requiring Services from GroundSure in respect of a specified site.

"Report" means a Risk Screening or Data Report for commercial or residential property available from GroundSure relating to a site identified in the Order prepared in accordance with the specifications set out in the relevant user guide.

"Risk Screening" means one of GroundSure's risk screening reports such as GroundSure Homebuyers; GroundSure Home Environmental GroundSure SiteGuard, GroundSure Screening, GroundSure Review, GroundSure Developer Review, or any other risk screening report available from GroundSure.

"Services" means the provision of any Report, Mapping and Consultancy Services which GroundSure has agreed to carry out for the Customer/Beneficiary on these terms and conditions in respect of a site detailed in the Order.

2 Scope of Services

2.1 GroundSure agrees to carry out the Services in accordance with the Contract and to the extent set out therein.

2.2 GroundSure shall exercise all reasonable skill, care and diligence in the performance of the Services.

2.3 The Customer acknowledges that it has not relied on any statement or representation made by or on behalf of GroundSure which is not set out and expressly agreed in the Contract.

2.4 Terms and conditions appearing on a Customer's order form, printed stationery or other communication, including invoices, to GroundSure, its employees, servants, agents or other representatives shall be of no effect and these terms and conditions shall prevail over all others.

2.5 In the event that a Customer/Beneficiary opts to take out insurance in conjunction with or as a result of the Services, such insurance shall be subject solely to the terms of any policy issued to it in that respect and GroundSure will have no liability therefore.

3 The Customer's obligations

3.1 The Customer shall be solely responsible for ensuring that the Report/Mapping ordered is appropriate and suitable for the Beneficiary's needs.

3.2 The Customer shall (or shall procure that the Beneficiary shall) supply to GroundSure as soon as practicable and without charge all information necessary and accurate relevant data including any specific and/or unusual environmental information relating to the site known to the Customer/Beneficiary which may pertain to the Services and shall give such assistance as GroundSure shall reasonably require in the performance of the Services (including, without limitation, access to a site, facilities and equipment as agreed in the Contract).

3.3 Where Customer/Beneficiary approval or decision is required, such approval or decision shall be given or procured in reasonable time as not to delay or disrupt the performance of any other part of the Services.

3.4 The Customer shall not and shall procure that the Beneficiary shall not, save as expressly permitted by these terms and conditions, re-sell, alter, add to, amend or use out of context the content of any Report, Mapping, or in respect of any service or information given by GroundSure. For the avoidance of doubt, the Customer and Beneficiary may make the Report, Mapping or GroundSure's findings available to a third party, but such third party cannot rely on the same unless expressly permitted under condition 4.

3.5 The Customer is responsible for maintaining the confidentiality of its user name and password if using GroundSure's internet ordering service and accepts responsibility for all activity that occurs under such account and password.

4 Reliance

4.1 Upon full payment of all relevant fees and subject to the provisions of these terms and conditions, the Customer and Beneficiary are granted an irrevocable royalty-free licence to use the information contained in the Report, Mapping or in a report prepared by GroundSure in respect of or arising out of the Consultancy Services. The Services may only be used for the benefit of the Customer and those persons listed in conditions 4.2 and 4.3.

4.2 In relation to Data Reports, Mapping and Risk Screening, reliance shall be limited to the Customer, Beneficiary and subsequent first purchaser or first tenant of the site including the professional advisers and lenders of each. For the avoidance of doubt, such persons shall include any entity necessary under the Housing Act 2004 or as legally required because of the Home Information Pack.

4.3 In relation to Consultancy Services, reliance shall be limited to the Customer, Beneficiary and named parties on the GroundSure proposal and subsequent report.

4.4 No party referred to in conditions 4.2 and 4.3 shall assign any rights or obligations under these terms and conditions without the prior written consent of GroundSure. GroundSure reserves the right to charge an assignment fee which will be no higher than 15% of the original fee or £250 whichever is the highest. GroundSure may assign its rights and obligations under these terms.

4.5 Save as set out in conditions 4.2 and 4.3, unless otherwise agreed in writing with GroundSure, any other party considering the information within a Report, Mapping or proposal and subsequent report in respect of Consultancy Services, including insurance underwriters, does so at their own risk and GroundSure has no legal obligations to such party unless otherwise agreed in writing.

4.6 The Customer shall not and shall procure that any person (including the Beneficiary) who is provided with a copy of any Report shall not: (a) remove, suppress or modify any trade mark, copyright or other proprietary marking from the Report or Mapping; (b) create any product which is derived directly or indirectly from the data contained in the Report or Mapping; (c) combine the Report or Mapping with, or incorporate the Report or Mapping into any other information data or service; or (d) re-format or otherwise change (whether by modification, addition or enhancement) data or images contained in the Report or Mapping save to the extent that the Customer is adding its assessment to the Report or Mapping solely for the purposes of providing its services to the Beneficiary.

4.7 Without prejudice to any other right or remedy available to GroundSure including without limitation any claim for infringement of copyright, breach of confidence or contract or otherwise howsoever arising if the Customer or a person to whom a Report or Mapping is provided, breaches any of the provisions of this condition 4, the Customer shall fully and effectually indemnify GroundSure and hold it harmless against any claim by any third party who may claim to have sustained injury loss or damage by reason of their reliance upon any report or document which GroundSure may have prepared for the Customer or upon the contents thereof.

5 Fees and Disbursements

5.1 GroundSure shall charge the Customer fees at the rate and frequency specified in the Contract together with all proper disbursements made in performing the Services. The Customer shall in addition pay all value added tax or other tax payable on such fees and disbursements in the country concerned in relation to the provision of the Services.

5.2 Unless GroundSure requires prepayment, the Customer shall promptly pay all fees disbursements and other monies due to GroundSure in full without deduction, counterclaim or set off together with such Value Added Tax or equivalent local tax as may be required within 30 days from the date of GroundSure's invoice. GroundSure reserves the right to charge interest which shall accrue on a daily basis from the date of invoice until the date of payment (whether before or after judgment) at the rate of two per cent per month.

5.3 In the event that the Customer disputes the amount payable in respect of GroundSure's invoice it shall notify GroundSure no later than 28 days after the date thereof that it is in dispute. In default of such notification the Customer shall be deemed to have agreed the amount thereof which shall thereupon be due and payable. As soon as reasonably practicable following receipt of any disputed invoice, a member of the management team at GroundSure shall contact the Customer and the parties shall use all reasonable endeavours to resolve the dispute.

6 Intellectual Property

6.1 Unless expressly agreed in writing to the contrary GroundSure and its Data Providers (where relevant) retain all Intellectual Property rights and proprietary rights in all information, Content and data reproduced in a Report or as part of the Consultancy Services.

6.2 Data Providers may enforce any breach of condition 6.1 against the Customer or Beneficiary.

7 Liability

7.1 GroundSure shall not be liable to pay compensation to the Customer or any person to whom the Customer provides a copy of the Report, Mapping or results of the Consultancy Services in any circumstances whatsoever unless arising out of a breach on its part of the obligations set out in the Contract.

7.2 GroundSure shall not be liable if the Services are used otherwise than as provided or referred to in these conditions

7.3 Where any person is engaged whether by the Customer or by GroundSure on the Customer or Beneficiary's behalf in the performance of the Services or any part thereof GroundSure shall not be liable for acts of negligence, default or omission by such person.

7.4 GroundSure makes no representation, warranties, express or implied, as to the accuracy, reliability, completeness, validity or fitness for purpose of the Content shall not be liable for any omission, error or inaccuracy in relation thereto.

7.5 GroundSure shall not be liable for any inaccurate statement or risk rating in a Report which resulted from a reasonable interpretation of the Content.

7.6 GroundSure shall not be liable for any indirect losses, loss of profit nor consequential loss caused by the suspension or reduction of activity on the site.

7.7 Notwithstanding anything to the contrary contained elsewhere in the Contract, and irrespective of whether multiple parties make use of the same Services, the total liability of GroundSure under or in connection with the Contract, whether in contract in tort for breach of statutory duty or otherwise shall not exceed the amount of GroundSure's insurance as provided for below.

7.8 GroundSure shall maintain professional indemnity insurance in respect of its liabilities in respect of the Services (provided it is available at reasonable commercial rates) giving cover of not less than £5 million in the aggregate which amount shall first include the whole of any sum payable for death or personal injury. GroundSure shall produce evidence of such insurance if requested by the Customer. A greater level of cover may be available upon request and agreement with the Customer.

7.9 The Customer shall be liable to indemnify GroundSure where any loss arises as a result of any breach on the part of the Customer of its obligations under these terms and conditions.

7.10 GroundSure's liability under the Contract shall cease upon the expiry of six years from the date when the Customer/Beneficiary became aware that it may have a claim against GroundSure in respect of the Services provided always that there shall be no liability at the expiration of twelve years from the completion of the Contract.

7.11 Whilst GroundSure will use all reasonable endeavours to maintain operability of its internet ordering service it will not be liable for any loss or damages caused by a delay or loss of use of such service. The Customer shall use GroundSure's internet ordering service at its own risk. GroundSure shall not be responsible for any damage to a Customer or permitted assignee's computer, software, modem, telephone or other property resulting from the use of GroundSure's internet ordering service.

7.12 The Customer accepts, and shall procure that anyone who is provided with a copy of the Report accepts, that it has no claim or recourse to any Data Provider or to GroundSure in respect of the acts or omissions of such Data Providers including Content supplied by them.

7.13 Nothing in these terms and conditions shall limit GroundSure's liability for causing death or personal injury through negligence or wilful default.

Report Reference: HMD-142-385316

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7.14 GroundSure accepts no liability for use of any residential Reports or any data or information contained therein for development or other commercial property purposes in respect of which a commercial Report should have been obtained.

8 Remediation

8.1 For the purpose of this condition 8, 'Claimant' shall mean one of: (a) the Beneficiary, (b) the purchaser of the site from the Beneficiary or (c) the funder of (a) or (b) as applicable.

8.2 This condition 8 shall apply solely to GroundSure Homebuyers and GroundSure Home Environmental with passed rather than failed status.

8.3 GroundSure may, at its sole discretion without any admission of liability, make a contribution to the Claimant towards the costs of any clean up works required to be carried out under a notice served on a Claimant in respect of a site under Part II (A) Environmental protection Act 1990 ('Remediation Notice') on the terms of this condition 8 ('Clean up Award').

8.4 The Clean up Award:

(a) is only available once in respect of a site and to one Claimant only; (b) shall only apply where the site is a single residential dwelling house or a single residential flat within a block of flats. For the avoidance of doubt, a Clean up Award will not be considered in respect of commercial property or to any site being developed or redeveloped whether for residential purposes or otherwise; and (c) shall only apply to contamination or a pollution occurring as at or prior to the date of GroundSure Homebuyers.

8.5 The Clean up Award will not be paid in respect of any of the following, including without limitation:

(a) asbestos; (b) radioactive contamination arising directly or indirectly from or in connection with ionising radiations or contamination by radioactivity from any nuclear waste or fuel; from the combustion of nuclear fuel or the radioactive toxic explosive or other hazardous properties of any explosive nuclear assembly or nuclear component thereof; (c) naturally occurring materials or their removal except where such materials are present in excess of their natural concentration; (d) any condition caused by acts of war or an act of terrorism; (e) any condition which is known or ought reasonably to have been known to the Claimant prior to the purchase of GroundSure Homebuyers; (f) non-compliance by the Claimant or any other person with respect to the site with any statute, regulation, byelaws complaint, or notice from any regulatory authority; (g) any property belonging to or in the custody or control of the Claimant which does not form a fixed part of the site or the structure; (h) any losses incurred following a material change in use of, alteration or development of the site; or (i) financial loss in respect of loss of rental, profit, revenue, savings, business or any consequential, indirect or economic loss, damages or expenses, including the cost of temporary accommodation or business interruption.

8.6 In the event the Claimant wishes to apply for a Clean up Award, it shall notify GroundSure in writing within 3 months of the date of the Remediation Notice. The Claimant shall comply with all reasonable requirements of GroundSure with regard to the commission and conduct of the clean up works to be carried out under the Remediation Notice. In the event that the Claimant breaches this provision including, without limitation, failing to obtain GroundSure's prior written consent in respect of estimates for such works GroundSure shall not be required to pay a Clean up Award.

8.7 GroundSure shall only pay a Clean up Award where a Remediation Notice is served within 36 months of the date of GroundSure Homebuyers.

8.8 The maximum sum of any Clean up Award shall be £60,000 and shall be paid subject to the Claimant having paid to GroundSure an excess in respect of its claim of £5,000.

8.9 GroundSure reserves the right at any time to withdraw the offer of payment of a Clean up Award.

8.10 The Claimant shall take all reasonable steps to appeal such Remediation Notice and mitigate any costs incurred in connection with the remediation works required under the terms of any Remediation Notice. GroundSure reserves the right to withhold or reduce the amount of its Clean up Award in the event of a breach of this condition or an appeal is still active.

9 GroundSure right to suspend or terminate

9.1 In the event that GroundSure reasonably believes that the Customer or Beneficiary as applicable has not provided the information or assistance required to enable the proper performance of the Services, GroundSure shall be entitled on fourteen days written notice to suspend all further performance of the Services until such time as any such deficiency has been made good.

9.2 GroundSure may additionally terminate the Contract immediately on written notice in the event that:

(i) the Customer shall fail to pay any sum due to GroundSure within 28 days of the due date for payment; or (ii) the Customer (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an Administration Order made against it or if a Receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Customer is struck off the Register of Companies or dissolved; or (iii) the Customer being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Customer shall enter into a composition or arrangement with the Customer's creditors or shall suffer distress or execution to be levied on his goods; or (iv) the Customer breaches any material term of the Contract (including, but not limited to, the obligations in condition 4) incapable of remedy then and in any such case GroundSure shall be entitled to a fair and reasonable amount on account of the fees due commensurate with the services performed to the date of such termination and any outstanding expenses or other disbursements that it may have incurred in respect of the Contract including without limitation equipment hire costs for the remainder of any lease, storage costs, transportation costs, labour costs or sub-contractor fees.

10 Customer's Right to Terminate and Suspend

10.1 Subject to condition 11.2, the Customer may at any time after commencement of the Services by notice in writing to GroundSure require GroundSure to terminate or suspend immediately performance of all or any of the Services.

10.2 The Customer waives all and any right of cancellation it may have under the Consumer Protection (Distance Selling) Regulations 2000 (as amended) in respect of the Order of a Report/Mapping.

11 Consequences of Withdrawal, Termination or Suspension

11.1 Upon termination or any suspension of the Services, GroundSure shall take steps to bring to an end the Services in an orderly manner, vacate any site with all reasonable speed and shall deliver to the Customer/Beneficiary any property of the Customer/Beneficiary in GroundSure's possession or control.

11.2 The Customer shall pay to GroundSure all and any fees as are due in respect of the Services performed up to or in respect of such termination or suspension.

12 General

12.1 GroundSure and the Customer agree not to rescind or vary these terms and conditions to Ordnance Survey's or its successor's detriment without obtaining Ordnance Survey's or its successor's prior written consent.

12.2 Subject to condition 12.1, GroundSure reserves the right to amend these terms and conditions. No variation to these terms shall be valid unless signed by GroundSure or made in accordance with condition 12.1.

12.3 No failure on the part of GroundSure to exercise and no delay in exercising, any right, power or provision under these terms and conditions shall operate as a waiver thereof.

12.4 Save as expressly provided in conditions 6.2 and 12.5, no person other than the Customer, Beneficiary and GroundSure shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of these terms and conditions.

12.5 The Secretary of State for Communities and Local Government acting through Ordnance Survey, may enforce breach of conditions 6.1 or 12.1 of these terms and conditions against the Customer in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.

12.6 GroundSure shall not be liable to the Customer if the provision of the Services is delayed or prevented by any circumstance which is beyond GroundSure's reasonable control including without limitation one or more of the following circumstances:

(i) the Customer or Beneficiary's failure to provide facilities, access or information; (ii) fire, storm, flood, tempest or epidemic; (iii) process shutdown; (iv) Acts of God or the public enemy; (v) riot, civil commotion or war; (vi) strikes, labour disputes or industrial action; (vii) acts or regulations of any governmental or other agency; (viii) suspension or delay of services at public registries by Data Providers; or (ix) changes in law.

12.7 Any notice provided for shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.

12.8 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email and on the second working day after the day of posting if sent by first class post.

12.9 The Contract constitutes the entire contract between the parties and shall supersede all previous arrangements between the parties.

12.10 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.

12.11 These terms and conditions shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with these terms and conditions shall be subject to the exclusive jurisdiction of the English courts.

12.12 These terms and conditions were produced on 28 May 2008.