

Cinders Farm, Ruabon

Infiltration Test Report

February 2020

Project Information	
Project:	Cinders Farm, Ruabon
Report Title:	Infiltration Test Report
Client:	Wynnstay Home Farm Partnership
Instruction:	The instruction to undertake this Infiltration Test Report was received from Ms Charlene Sussums-Lewis of Carter Jonas, acting on behalf of the Client.
File Ref:	12443- Infiltration Assesment-01

Approval Record	
Author:	Jessica Roberts BSc (Hons)
Checker:	Johanne Williams LLB (Hons) PgDip MCIWEM
Approver:	Victoria Griffin BSc (Hon) MSc MEnvSc CEnv

Document History		
Revision	Date	Comment
01	06/02/2020	First issue

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Introduction

Waterco has been commissioned to undertake infiltration testing in relation to a proposed development for the erection of four agricultural buildings for rearing livestock (table fowl); ancillary buildings and plant; associated infrastructure and landscaping.

The infiltration testing will establish soil permeability and will be used to inform suitable sustainable drainage measures to be used in the development.

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Site Overview

The site covers an area of approximately 5.1 hectares (ha) and is located at National Grid Reference (NGR): 332382, 344047. A location plan and an aerial image are included in Appendix A.

Online mapping (including Google Maps / Google Streetview imagery, accessed January 2020) shows that the site is greenfield and is bordered by agricultural land in all directions. Notable features in the area include an unnamed road to the south-east and Cinders Farm to the south. There are also unnamed watercourses located immediately north and south-east of the site. Access to the site is provided from the unnamed road to the south-east.

Local Topography

A topographical survey has been undertaken by A.R.M. Surveys Ltd in July 2017 and is submitted with the planning application pack (drawing reference: 755-0717-T). The topographical survey shows that the site slopes from approximately 102 metres Above Ordnance Datum (m AOD) in the west to 95m AOD in the east.

Topographic levels to m AOD have also been derived from a 2m resolution Natural Resources Wales (NRW) composite 'Light Detecting and Ranging' (LiDAR) Digital Terrain Model (DTM). LiDAR data only covers the north-western extent of the site. A review of LiDAR data shows that the topography of the site generally slopes from south-west to north-east.

Topographical Data is included in Appendix B.

Published Ground Conditions

Reference to the British Geological Survey (BGS) online mapping (1:50,000 scale) indicates that the majority of the site is underlain by superficial deposits of Devensian Till, generally comprising Diamicton. The eastern extent of the site is underlain by Devensian Glaciofluvial Deposits generally comprising sand and gravel.

The superficial deposits are identified as being underlain by the Salop Formation consisting of mudstone, sandstone and conglomerate.

The geological mapping is available at a scale of 1:50,000 and as such may not be accurate on a site-specific basis.

The EA's Aquifer Designation data, obtained from MAGIC's online mapping [accessed January 2020], indicates that the superficial deposits and the underlying Bedrock Deposit are classified as a Secondary A Aquifer.

Secondary A Aquifers are 'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers';

The EA's 'Source Protection Zones' data, viewed from MAGIC's online mapping [accessed January 2020], indicates that the site is not located within a Groundwater Source Protection Zone.

The Cranfield University 'Soilscapes' map [accessed January 2020] indicates that the site is underlain by 'slowly permeable seasonally wet loamy and clayey soils' with 'impeded drainage'.

Development Proposals

The proposed development is for the erection of four agricultural buildings for rearing livestock (table fowl); ancillary buildings and plant; associated infrastructure; and landscaping. It is proposed to form a level development platform in the location of the four agricultural buildings. A Biomass building is also proposed in the south-eastern extent of the site. An access road will be provided off the unnamed road to the east, culverting a section of the unnamed watercourse. A proposed site layout plan and site cross sections are submitted with the planning application (drawing references GM-MZ228-181 and GM-MZ228-301 respectively).

Proposed development plans are included in Appendix C.

Infiltration Testing

Fieldworks

Four trial pits (TP1-TP4) excavated by others, were constructed on site. The infiltration testing and the associated report has been based on the assumption that the trial pits have been constructed in accordance with the specification provided by Waterco.

Three trial pits (TP1-TP3) were located in the topographically lower, northern extent of the site, with TP4 located in the south-east of the site. Trial pit locations were based on; the changing topography; the potential changing ground conditions; the proposed development layout; and, health and safety constraints. Approximate trial pit locations are annotated on the 'Trial Pit Location Plan' in Appendix D. A photographic record is also included in Appendix D.

Three trial pits were generally excavated to a depth of approximately 1metre below ground level (m.bgl). The depth was chosen as based on the potential depth of the proposed infiltration feature which would be relatively shallow in depth. A fourth trial pit was excavated to a depth of 1.6m.bgl. This was to establish if any shallow groundwater is present.

The excavated material /arising were stockpiled adjacent to the trial pits. In the northern extent of the site, the excavated material generally comprised topsoil, organic matter (roots), sandy clay, grey clay and gravel. The excavated material stockpiled adjacent to TP4 in the south-eastern extent of the site generally comprised topsoil with organic matter (roots) and clay.

Water was recorded in TP1, TP3 and TP4, with varying depths of between 0.80m.bgl and 1.05m.bgl. It is possible that the water observed is accumulated rainwater /surface water run-off however given the variable depth in the trial pits, it more likely to be groundwater and for the purposes of this report will be referred to as such. No groundwater was recorded in TP2.

Trial pit dimensions are provided in Table 1.

Table 1 – Trial Pit Dimensions

Trial Pit	Depth (m)	Width (m)	Length (m)
TP1	0.90	1.00	2.80
TP2	1.60	0.90	3.00
TP3	0.95	0.75	2.80
TP4	1.10	0.90	2.00

Waterco undertook infiltration testing in general accordance with the BRE Digest 365 specification. The infiltration testing was completed on 28th January 2020. The weather conditions were mostly dry with a few sun showers throughout the day. Anecdotal information from online weather forecasts indicated that it had

also rained intermittently for two days prior to the infiltration testing.

Water was provided from a 10,000-litre water bowser.

Results

Infiltration test results conclude that the ground conditions onsite was such that infiltration rates could not be calculated (due to the presence of groundwater or lack of infiltration), suggesting that the site is poorly drained and highly unlikely to be suitable for infiltration drainage techniques.

A summary of the infiltration test results at each trial pit is provided in Table 2. The full infiltration test results are included in Appendix E.

Table 2 – Infiltration Test Summary

Trial Pit	Description	Infiltration Rate (m ³ /s)
TP1	Prior to adding water for infiltration purposes, groundwater was recorded at a depth of 0.80m.bgl. The water level fell by 110mm (from 0.017m.bgl to 0.028m.bgl) over a period of 331 minutes (5 hours and 31 minutes). Infiltration testing was abandoned.	N/A
TP2	The water level fell by 80mm (from 0.28m.bgl to 0.36m.bgl) over a period of 310 minutes (5 hours and 10 minutes). Infiltration testing was abandoned.	N/A
TP3	Prior to adding water for infiltration purposes, groundwater was recorded at a depth of 0.86m.bgl. During the infiltration testing the water level fell by 30mm (from 0.28m.bgl to 0.31m.bgl) over a period of 300 minutes (5 hours). Infiltration testing was abandoned.	N/A
TP4	Prior to adding water for infiltration purposes, groundwater was recorded at a depth of 1.05m.bgl. The water level did not fall over a period of 270 minutes (4 hours and 30 minutes). Infiltration testing was abandoned.	N/A

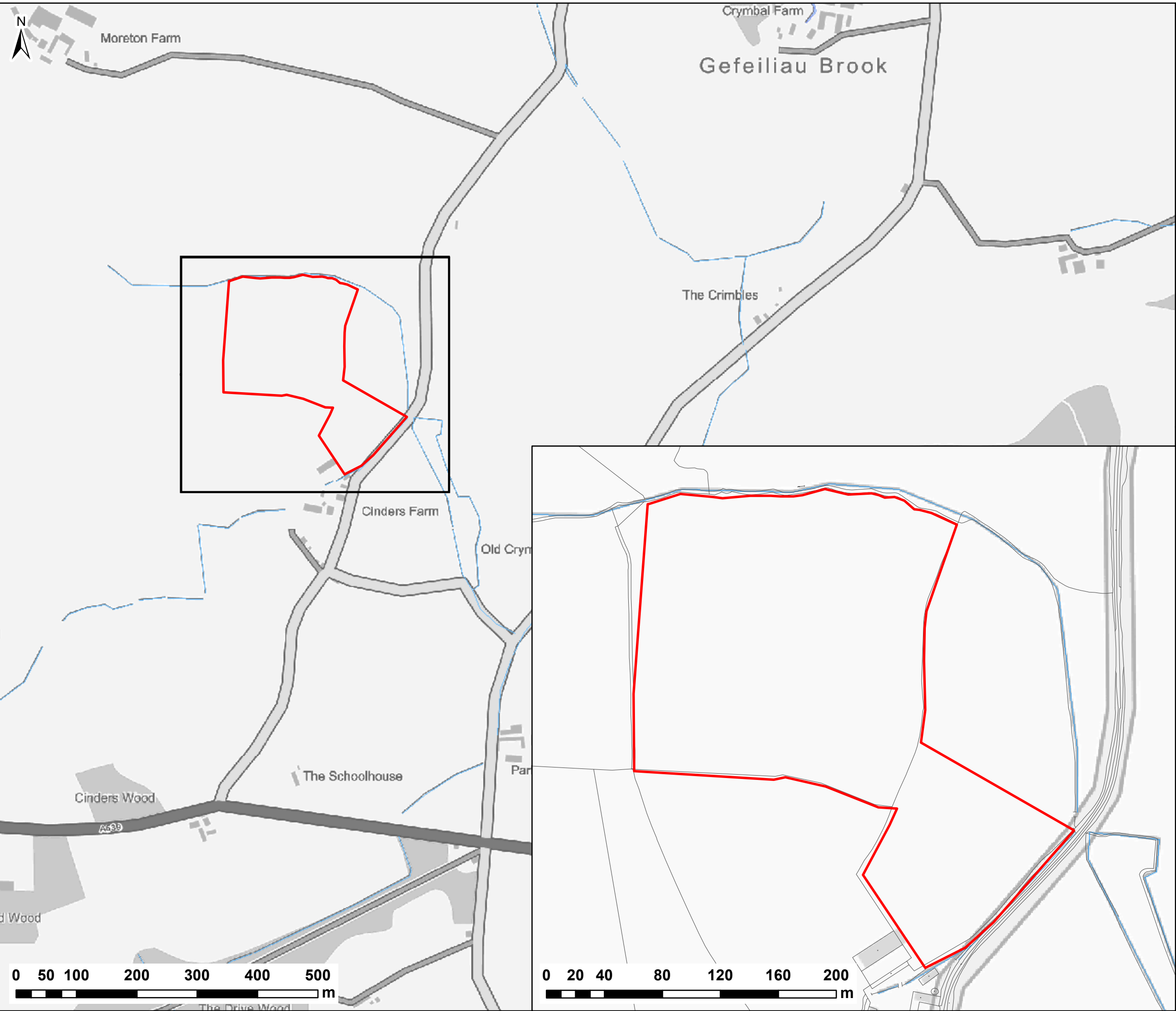
Conclusions

The proposed development is for the erection of four agricultural buildings for rearing livestock (table fowl); ancillary buildings and plant; associated infrastructure; and landscaping.

Infiltration testing has been undertaken in general accordance with the BRE Digest 365 specification. The infiltration testing found that the soil permeability is not sufficient to support infiltration drainage techniques such as soakaways.

It is recommended that an alternative discharge method is investigated, such as an above ground attenuation feature such as a pond is implemented to store the surface water runoff from the proposed site.

Appendix A Location Plan and Aerial Image



NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

Site Boundary

Watercourses / Water Bodies

CLIENT:

**WYNNSTAY HOME
FARM PARTNERSHIP**

www.waterco.co.uk

SCHEME:

**CINDERS FARM,
WREXHAM**

PLOT TITLE:

LOCATION PLAN

PLOT STATUS:			DATE:
FINAL			17/10/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
IJ	AW	VG	1:6,000
			(UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w10493-Location_Plan	-



NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

Site Boundary

CLIENT:

**WYNNSTAY HOME
FARM PARTNERSHIP**

www.waterco.co.uk

SCHEME:

**CINDERS FARM,
WREXHAM**

PLOT TITLE:

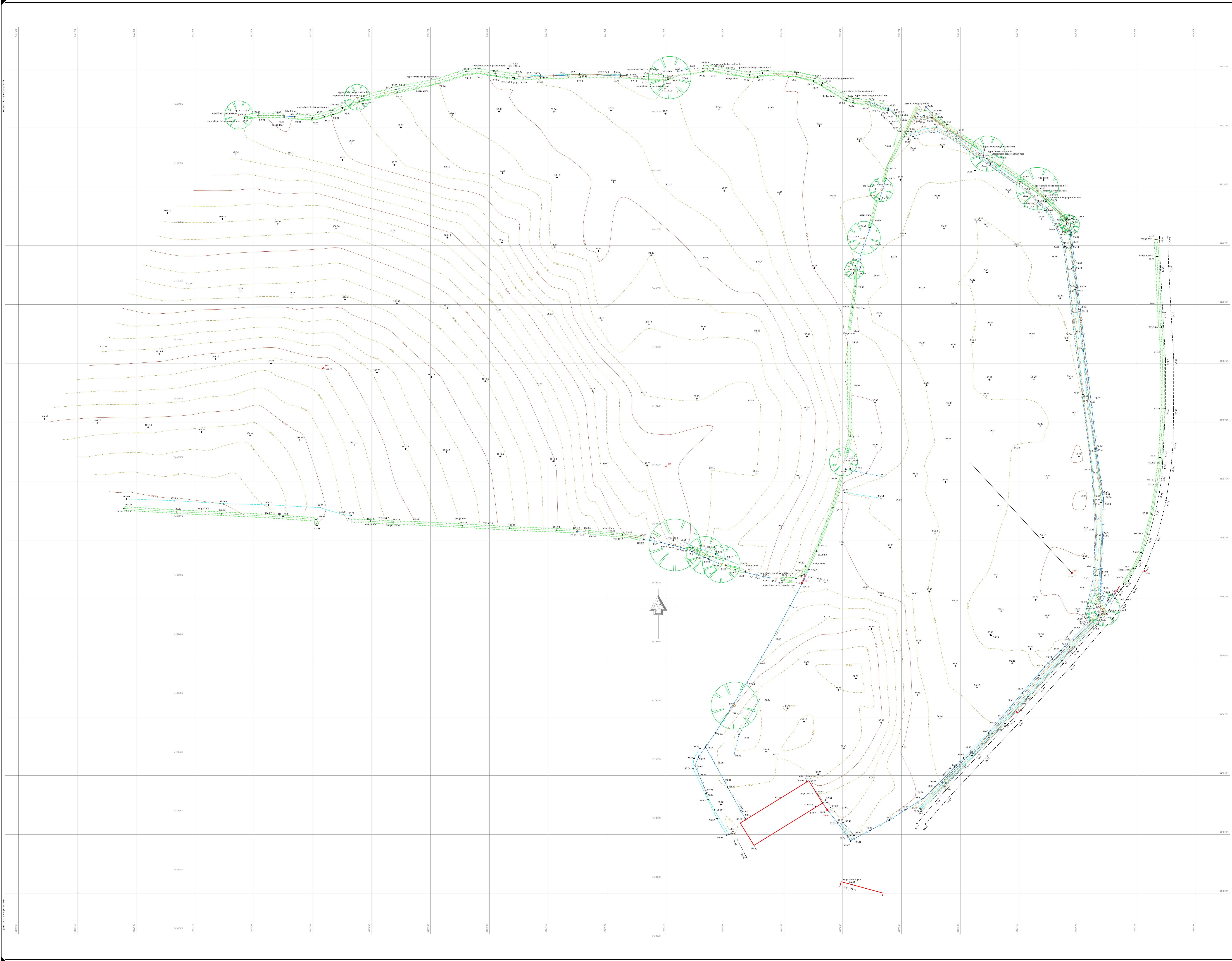
AERIAL PLAN

PLOT STATUS:			DATE:
FINAL			16/10/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
IJ	AW	VG	1:5,000
			(UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w10493-Aerial_Plan	-

Appendix B Topographical Data

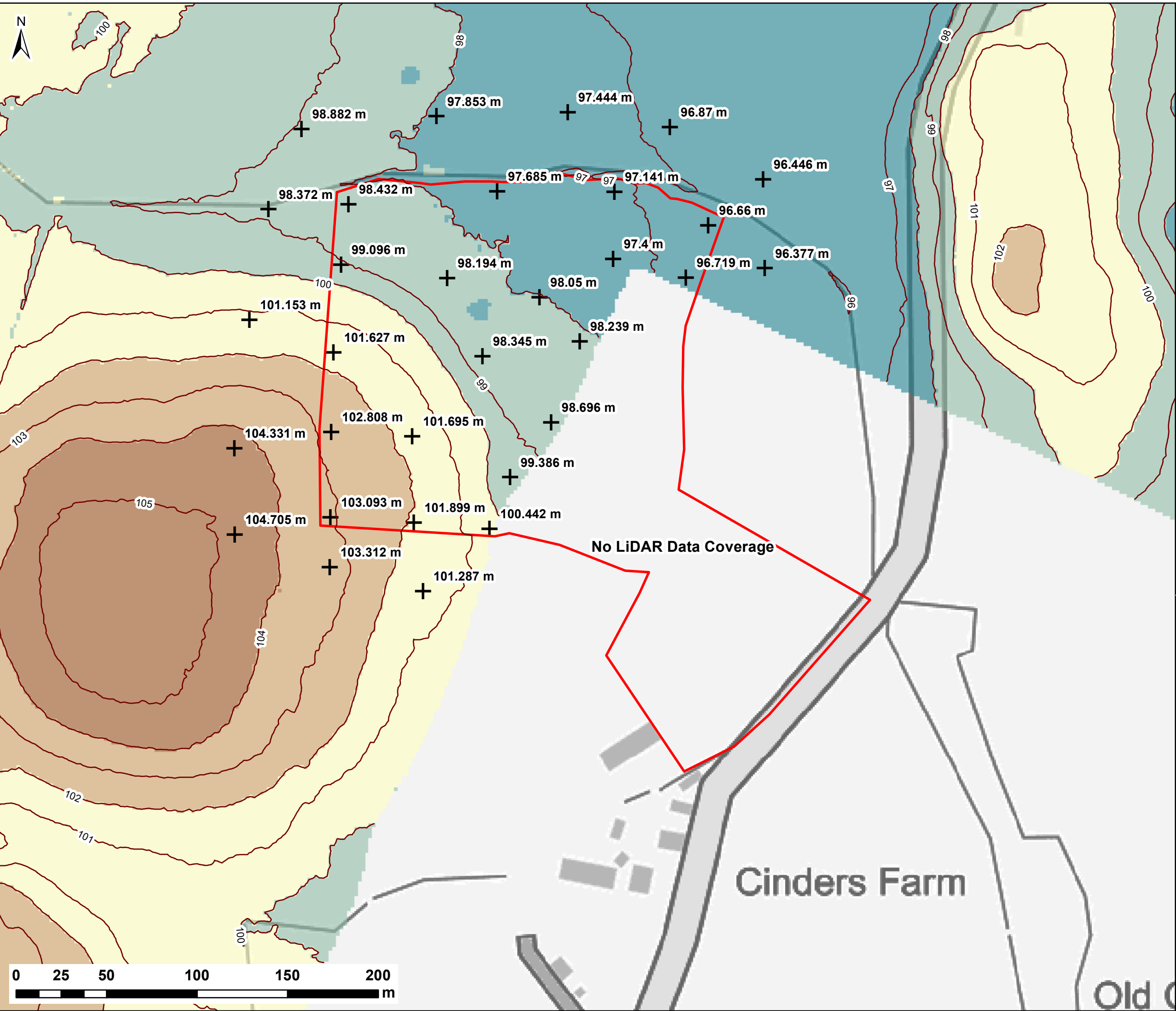


SURVEY STATIONS				
Name	Easting	Northing	Height	Description
SN01	332493.544	343835.236	98.906	Nail in fence post
SN011	332482.426	343931.647	98.574	Nail in fence post
SN1	332279.861	343876.883	98.647	Nail in peg
AP2	332628.187	343936.678	96.525	Nail in peg
AP3	332297.482	343935.581	96.136	Nail in peg
AP5	332425.982	343981.215	99.117	Nail in peg
AP6	332278.441	344022.995	103.384	Nail in peg

Legend			
BT	British Telecom Cover	OHCL	Overhead Cable Level
CL	Ceiling Level	O.S.B.M	OS Bench Mark
DK	Dropped Kerb	PLP	Ped Lamp Post
EP	Electric Pole	RS	Road Sign
FL	Flour Level	TCSL	Tree Clear Stem Level
G	Gully	TP	Telegraph Pole
GSV	Gas Stop Valve	TTL	Top Tree Level
HTL	Hedge Top Level	TWL	Top Wall Level
IC	Inspection Cover	UTL	Unable To Lift
IL	Invert Level	UTM	Unable To Measure
LP	Lamp Post	WSV	Water Stop Valve
Fence types			
A/B	Armo Barrier	P/R	Post & Rail
C/L	Chain Link	P/W	Post & Wire
E/F	Estate Fencing	S/S	Steel Security
I/R	Iron Railing	V/C	Vertical Closeboard
P/P	Timber panel		
Borehole  Survey station			
Water		Wall	
Gas		Building	
Telecom		Bottom of bank	
Electric		Top of bank	
Unknown		Contour major	
Fence		Contour minor	
Hedge		Surface edge	
Foliage		Tree canopy	

Notes.
Copyright of this plan is held by A.R.M. Surveys Limited.
No responsibility is taken for amendments by others.
Do not scale from copies or PDFs.
The origin and orientation of the survey grid is based on arbitrary values and the levels are related to an arbitrary datum.
This survey was carried out to an agreed specification. Detail and features not included in the original specification will not be shown.
The drawing scale indicates the accuracy of the digital data.
Levels on road kerb strings are taken in the channel.
Trees with a trunk diameter of 0.2m and larger included in the survey and shown with the average canopy spread.
Internal walls are surveyed at approximately 1m above FL and are assumed to be vertical.
Hedge widths are indicative, text notes show widths.
Stock boundary fences may not be shown where they occur adjacent to other boundary features.
Areas of the site obscured by overgrowth or spoil may have detail omitted from the survey.

A.R.M. Surveys Ltd Suite 9 Sabrina Court Shrewsbury SY3 7BF Tel 01743 248265				
Client Wynnstay Home Farm Partnership c/o Edward Sample Cefn Estate Office Cefn St Asaph LL17 0EY			Project Cinders Farm Ruabon LL14 6HL	
Job 755-0717-T		Scale 1:500		
Topographical Survey				
Top Level Plans		Rear Plans		Drainage Surveys
Date 07/07/17	Dwg no 02/03	Rev -	Surveyor MM/SH	Checked SH
Grid 25m	Contours 0.25m	Level Datum Ordnance datum via GNS.		



NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

Site Boundary

+ Topographic Levels

Ground Elevations (m AOD)

	< 98
	98 - 100
	100 - 102
	102 - 104
	> 104

CLIENT:

**WYNNSTAY HOME
FARM PARTNERSHIP**

waterco
consultants

www.waterco.co.uk

SCHEME:

**CINDERS FARM,
WREXHAM**

PLOT TITLE:

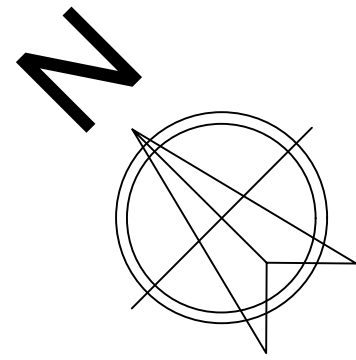
LIDAR ELEVATIONS
2m RESOLUTION

PLOT STATUS:			DATE:
FINAL			16/10/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
IJ	AW	VG	1:2,000
			(UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w10493-LIDAR_Plan	-

Appendix C Proposed Development Plans



- GENERAL NOTES:
- 1: THIS DRAWING IS PRELIMINARY.
 - 2: All dimensions are in millimeters (mm), all levels are in meters (m) unless noted otherwise.
 - 3: Discrepancies or omissions are to be reported to the Engineer prior to work commencing.
 - 4: Materials and workmanship are to comply in all respects with current British Standard Specifications, Codes of Practice and Building Regulations Approved Documents.
 - 5: The copyright of this drawing is vested in the engineer and must not be copied or reproduced without written consent.
 - 6: The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work commences.
 - 7: This drawing is to be read in conjunction with all relevant specifications and drawings issued by the Engineer, Architect and other Specialists.

Key

Water services

Water pipe (Size noted)

Materials

Concrete

Clean drainage

French Drain

Solid twin wall

Inspection chamber

Downspout

Electrical services

Duct pipe (Size noted)

600mm duct chamber

Duct Ring Chamber (Diameter noted)

Dirty drainage

Marley pipe (size noted)

40000 litre dirty water tank

PPIC

Products

Bottle gully

Yard gully

Divertor chamber

Galvanised washout channel



Knights Construction Ltd.
Hafod Y Bwch Farm
Middle Sontely
Wrexham
LL13 0YP
United Kingdom
Tel: 01978 846 841

Client:

Indigo Planning -
G. Maxfield

Project Address:

Cinders Farm,
Ruabon,
Wrexham
LL14 6HL

Scale A1:

1:500

Date:

04/09/2017

Drawn By:

Michael Austin

Sheet Number:

1 of 2

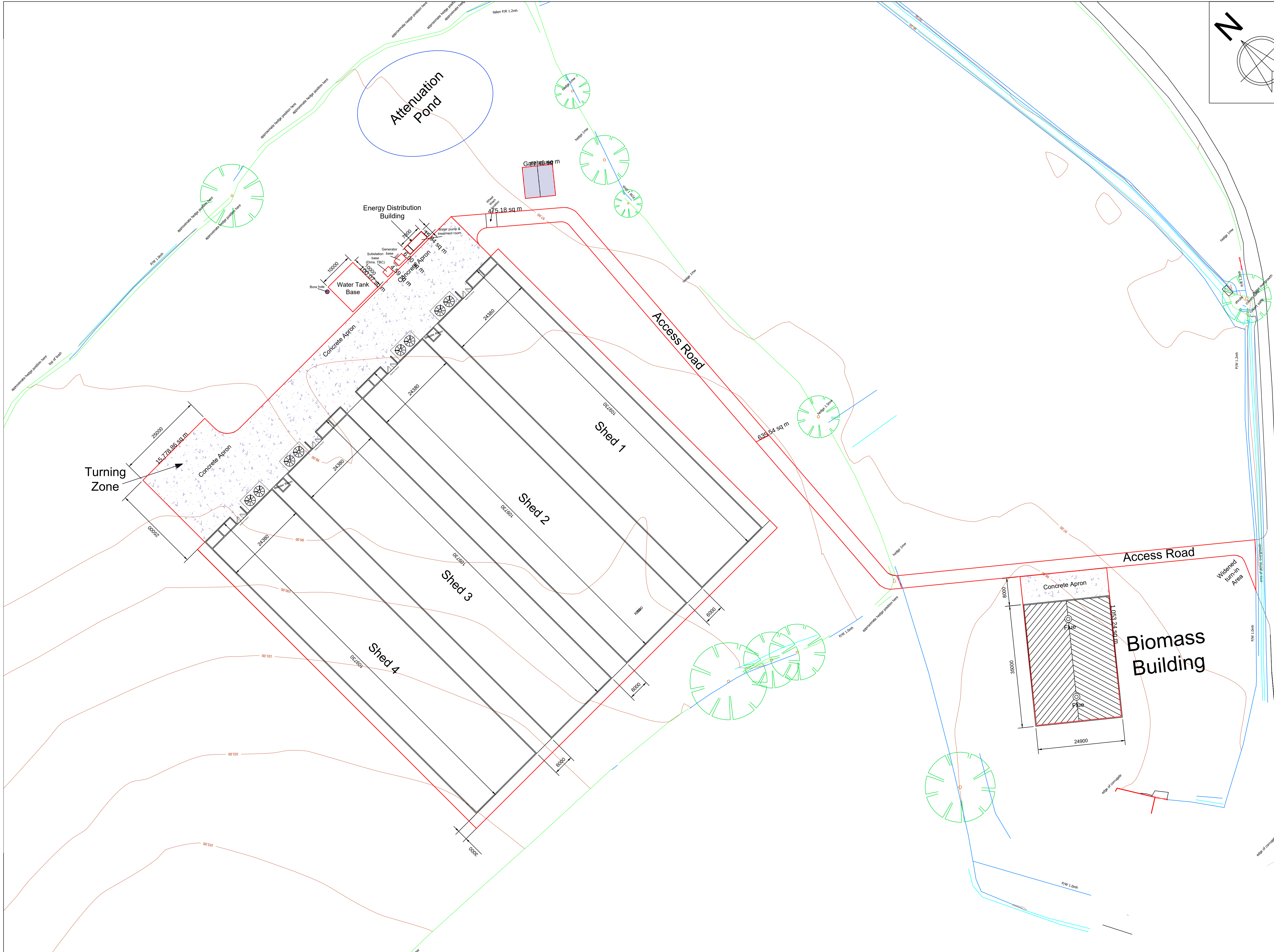
Revision:

N/A

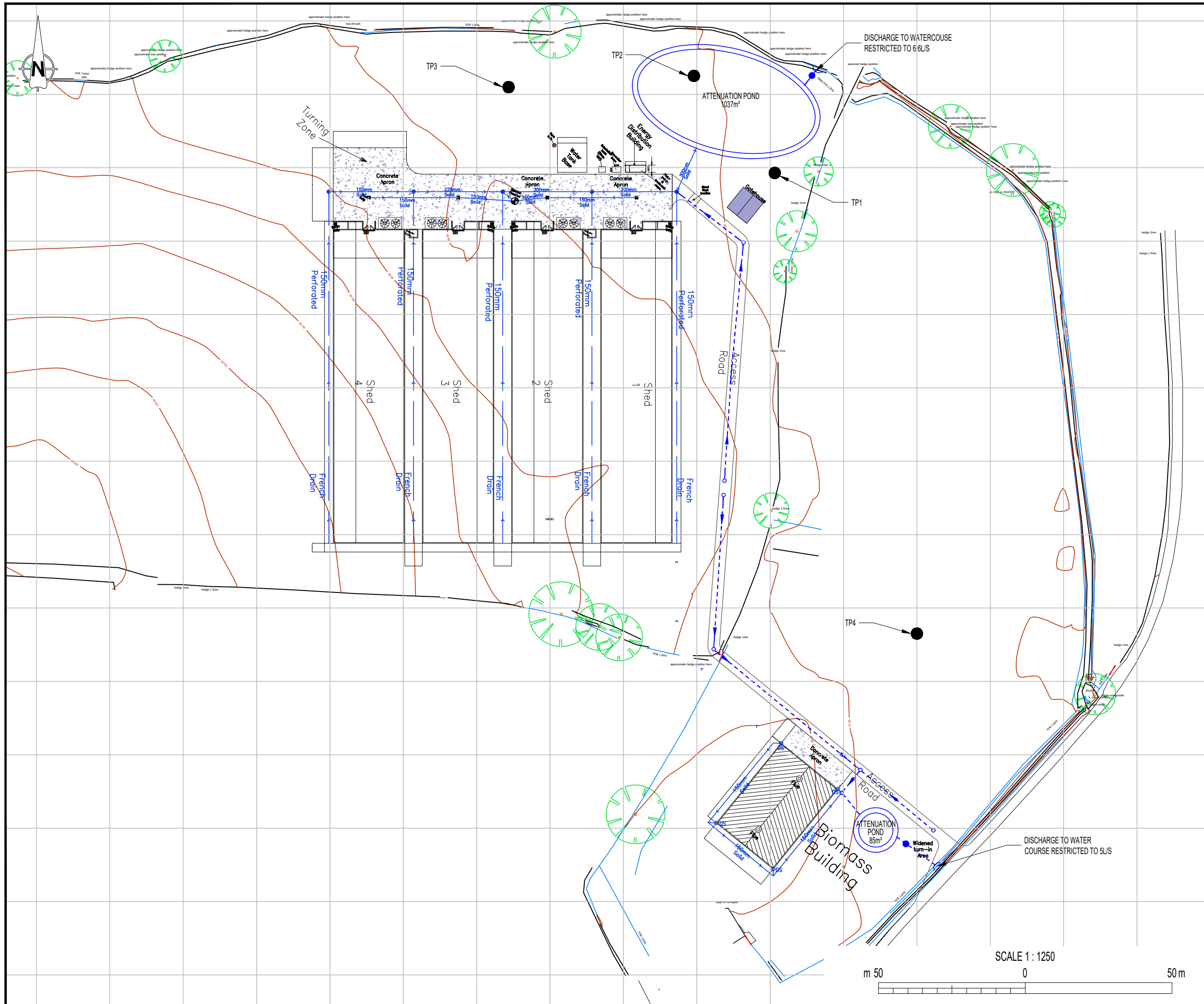
Drawing number:
Cinders 01

Drawing Title:

Site Layout



Appendix D Trial Pit Location Plan and Photographic log



NOTES

- ALL DIMENSIONS IN MILLIMETRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS SHOWN OTHERWISE.
- THIS DRAWING PROVIDES A DRAINAGE CONCEPT ONLY AND IS NOT INTENDED FOR DETAILED DESIGN.

KEY

- PROPOSED ATTENUATION STORAGE POND WITH A DEPTH OF 0.6m AND 1 IN 3 SLOPE
- PROPOSED SURFACE WATER DRAIN
- PROPOSED SURFACE WATER INSPECTION CHAMBER
- PROPOSED SURFACE WATER HYDROBRAKE CHAMBER
- TRIAL PIT

SITE LOCATION

GRID REFERENCE: 332382, 344047
SITE ADDRESS: CINDERS FARM
RUABON
WREXHAM
LL14 6HL

REV.	DATE	DESCRIPTION	DSGN'D	CHK'D	APP'D
------	------	-------------	--------	-------	-------

CLIENT

CARTER JONAS LLP

PRINCIPAL DESIGNER



Waterco Ltd., Eden Court,
Lon Parcwr Business Park, Ruthin LL15 1NJ
tel (+44) 1824 702220
www.waterco.co.uk

SCHEME

CINDER FARM,
RUABON

TITLE

TRIAL PIT LOCATION PLAN

STATUS

SKETCH

DESIGNED	CHECKED	APPROVED	SCALE / SHEET SIZE
----------	---------	----------	--------------------

1:1250 / A3

DRAWING NO.	REV
-------------	-----

12443-SK01

SK

Photo No.1 Water Bowser	Job Reference & Number: Cinders Farm, Ruabon-12443	
Date: 28/01/2020		
Description: The water bowser used for the water supply to each trial pit.		

Photo No.2 Trial Pit 1	Job Reference & Number: Cinders Farm, Ruabon-12443	
Date: 28/01/2020		
Description: Trial pit 1 before any water was added. There was groundwater present at a depth of approximately 0.80m.bgl.		

Photo No.3 Trial Pit 1	Job Reference & Number: Cinders Farm, Ruabon-12443	
Date: 28/01/2020		
Description: Trial Pit 1 after the water was added.		

Photo No. 4 Trial Pit 1	Job Reference & Number: Cinders Farm, Ruabon-12443	
Date: 28/01/2020		
Description: Trial pit 1 arisings.		

Photo No.5 Trial Pit 2	Job Reference & Number: Cinders Farm, Ruabon-12443	
Date: 28/01/2020		
Description: Trial pit 2 before any water was added. There was no groundwater present.		

Photo No. 6 Trial Pit 2	Job Reference & Number: Cinders Farm, Ruabon-12443	
Date: 28/01/2020		
Description: Photograph showing trial pit 2 after the water was added.		

Photo No.7 Trial Pit 2	Job Reference & Number: Cinders Farm, Ruabon-12443	
Date: 28/01/2020		
Description: Trial pit 2 arisings.		

Photo No. 8 Trial Pit 3	Job Reference & Number: Cinders Farm, Ruabon-12443	
Date: 28/01/2020		
Description: Photograph showing Trial pit 3 before any water was added. Groundwater was present at a depth approximately 0.86m.bgl.		

Photo No.9 Trial Pit 3	Job Reference & Number: Cinders Farm, Ruabon-12443	
Date: 28/01/2020		
Description: Trial Pit 3 after the water was added.		
Photo No. 10 Trial Pit 3	Job Reference & Number: Cinders Farm, Ruabon-12443	
Date: 28/01/2020		
Description: Trial pit 3 arisings.		

Photo No.11 Trial Pit 4	Job Reference & Number: Cinders Farm, Ruabon-12443	
Date: 28/01/2020		
Description: Photograph showing Trial pit 4 after it was excavated. There was groundwater at a depth of approximately 1.05m.bgl.		

Photo No. 12 Trial Pit 4	Job Reference & Number: Cinders Farm, Ruabon-12443		
Date: 28/01/2020			
Description: Trial pit 4 arisings.			

Photo No.13 Trial Pit 4	Job Reference & Number: Cinders Farm, Ruabon-12443
Date:28/01/2020	
Description: Photograph of trial pit 4 arisings and the location of the trial pit.	
Photo No. 14	Job Reference & Number: Cinders Farm, Ruabon-12443
Date: 28/01/2020	
Description: Photograph of the western side of the brook located to the north of the site.	

Photo No.15	Job Reference & Number: Cinders Farm, Ruabon-12443	
Date: 28/01/2020		
Description: Photograph of the eastern side of the brook located to the north of the site.		
Photo No. 16	Job Reference & Number: Cinders Farm, Ruabon-12443	
Date: 28/01/2020		
Description: Photograph of the north-eastern extent of the site. Annotations have been made showing the direction of the brook.		

Appendix E Infiltration Test Results

Approved by:	Victoria Griffin BSc (Hon) MSc MEnvSc CEnv
--------------	--

A

Date: 06/02/2020

[illegible]

Stone fill (% voids)	100
Length (m)	2.80
Width (m)	1.00
Depth (m)	0.90
Obs tube ht relative to GL (m)	0.00

Max Eff depth (m)	0.73
25% Eff depth (m)	0.18
75% Eff depth (m)	0.55
Time 25% t_{25} (min)	#VALUE!
Time 75% t_{75} (min)	#VALUE!
Time t_{p75-25} (sec)	#VALUE!
Drop H_{75-25} (m)	0.37
Volume V_{p75-25} (m ³)	1.02
Eff Area a_{p50} (m ²)	5.57
Infiltration rate (m/s)	#VALUE!

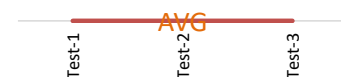
File Ref: E- Trial Pit 1
Form Ref: w042-CT-05.01-C

Client :	Wynnstay Home Farm Partnership	Page 1 of 4	
Scheme :	Cinders Farm, Ruabon		
Section :	Infiltration Testing	Initials	Revision
		TP2	A
Prepared by:	Jessica Roberts BSc (Hons)	Date:	29/01/2020
Checked by:	Johanne Williams LLB (Hons) PgDip MCIWEM	Date:	29/01/2020
Approved by:	Victoria Griffin BSc (Hon) MSc MEnvSc CEnv	Date:	06/02/2020

Based on method described in BRE Digest 365

[illegible]

Infiltration rate results



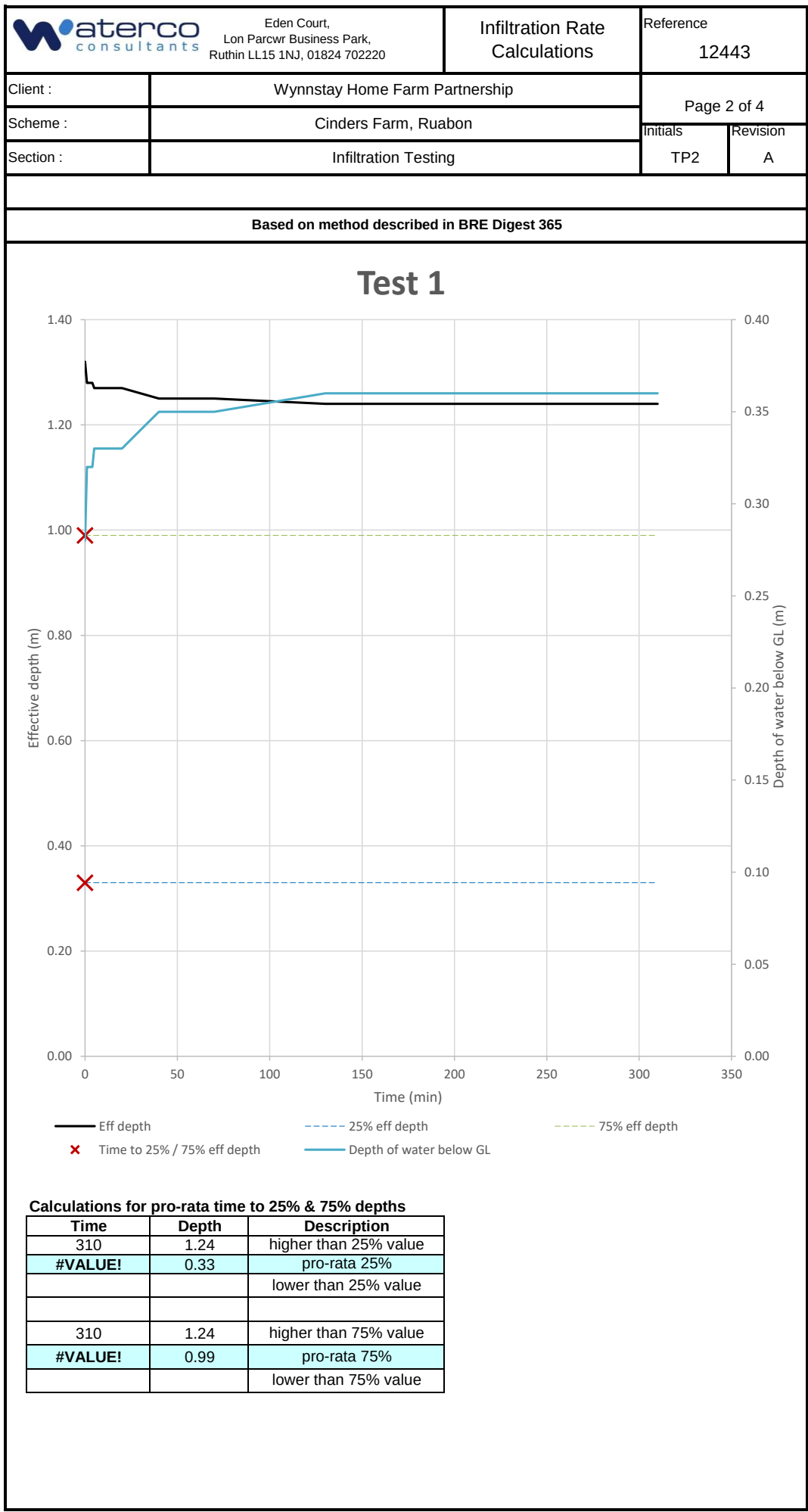
Test pit details

Test parameters				
Stone fill (% voids)	100			
Length (m)	3.00			
Width (m)	0.90			
Depth (m)	1.60			
Obs tube ht relative to GL (m)	0.00			

Infiltration rate calculations

Max Eff depth (m)	1.32		
25% Eff depth (m)	0.33	#VALUE!	#VALUE!
75% Eff depth (m)	0.99	#VALUE!	#VALUE!
Time 25% t_{25} (min)	#VALUE!	#VALUE!	#VALUE!
Time 75% t_{75} (min)	#VALUE!	#VALUE!	#VALUE!
Time t_{p75-25} (sec)	#VALUE!	#VALUE!	#VALUE!
Drop H_{75-25} (m)	0.66	#VALUE!	#VALUE!
Volume V_{p75-25} (m ³)	1.78	#VALUE!	#VALUE!
Eff Area a_{p50} (m ²)	7.85	#VALUE!	#VALUE!
Infiltration rate (m/s)	#VALUE!	#VALUE!	#VALUE!

#VALUE!

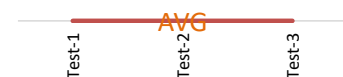


Client :	Wynnstay Home Farm Partnership	Page 1 of 4	
Scheme :	Cinders Farm, Ruabon		
Section :	Infiltration Testing	Initials	Revision
		TP3	A
Prepared by:	Jessica Roberts BSc (Hons)	Date:	29/01/2020
Checked by:	Johanne Williams LLB (Hons) PgDip MCIWEM	Date:	29/01/2020
Approved by:	Victoria Griffin BSc (Hon) MSc MEnvSc CEnv	Date:	06/02/2020

Based on method described in BRE Digest 365

[illegible]

Infiltration rate results



Test pit details

Test parameters				
Stone fill (% voids)	100			
Length (m)	2.80			
Width (m)	0.75			
Depth (m)	0.95			
Obs tube ht relative to GL (m)	0.00			

Infiltration rate calculations

Max Eff depth (m)	0.67	#VALUE!	#VALUE!
25% Eff depth (m)	0.17	#VALUE!	#VALUE!
75% Eff depth (m)	0.50	#VALUE!	#VALUE!
Time 25% t_{25} (min)	#VALUE!	#VALUE!	#VALUE!
Time 75% t_{75} (min)	#VALUE!	#VALUE!	#VALUE!
Time t_{p75-25} (sec)	#VALUE!	#VALUE!	#VALUE!
Drop H_{75-25} (m)	0.34	#VALUE!	#VALUE!
Volume V_{p75-25} (m ³)	0.70	#VALUE!	#VALUE!
Eff Area a_{p50} (m ²)	4.48	#VALUE!	#VALUE!
Infiltration rate (m/s)	#VALUE!	#VALUE!	#VALUE!

#VALUE!

Client :

Wynnstey Home Farm Partnership

Scheme :

Cinders Farm, Ruabon

Section :

Infiltration Testing

Page 2 of 4

Initials

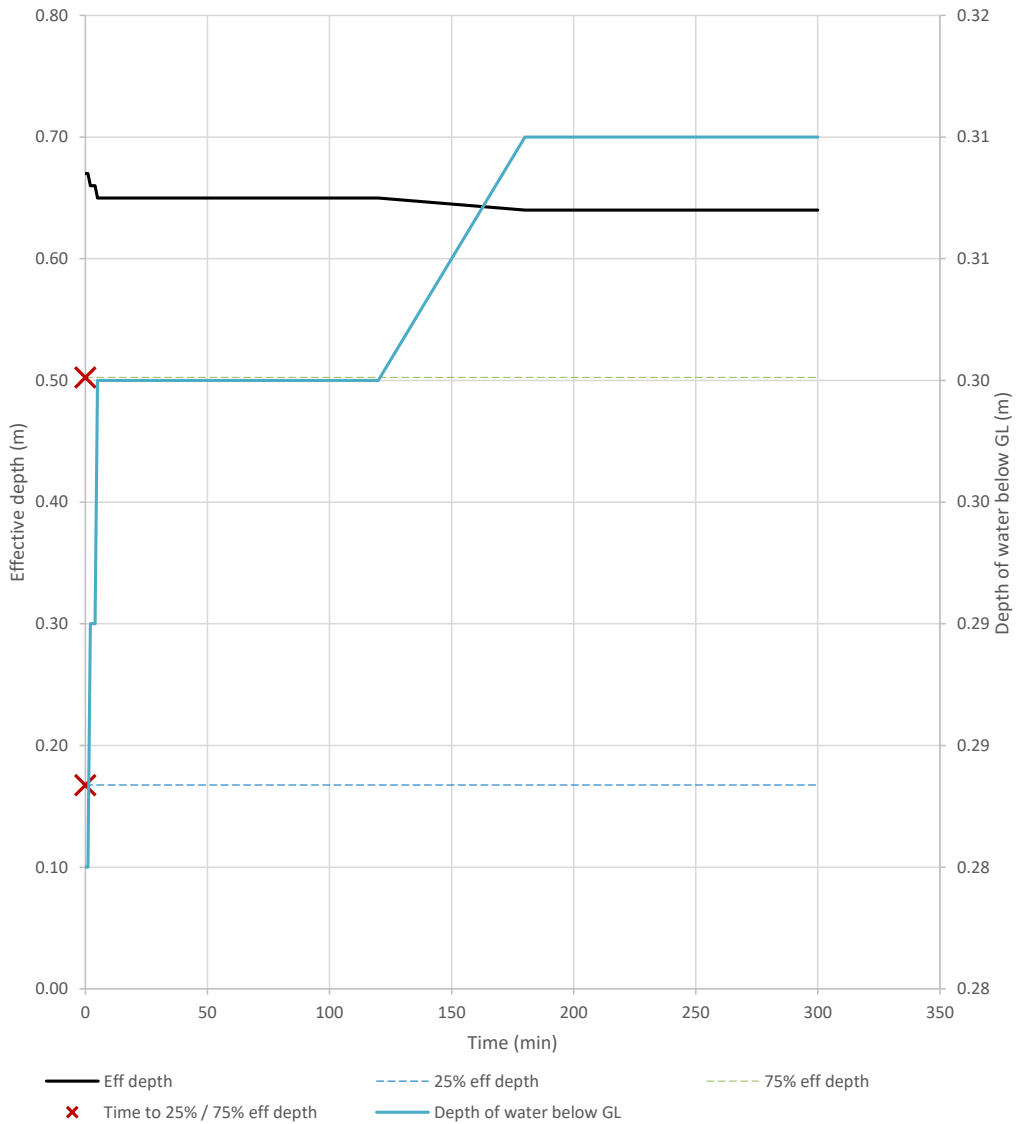
Revision

TP3

A

Based on method described in BRE Digest 365

Test 1



Calculations for pro-rata time to 25% & 75% depths

Time	Depth	Description
300	0.64	higher than 25% value
#VALUE!	0.17	pro-rata 25%
		lower than 25% value
300	0.64	higher than 75% value
#VALUE!	0.50	pro-rata 75%
		lower than 75% value

