306-006-RP04 REV A

Drainage Statement

Land at The Leys and Ivy Farm, Yaxley, Suffolk

DOCUMENT STATUS	DATE	BY	APPROVED
A	25.04.2023	Beverley Hunter	James Calvert BSc (Hons) CEng MICE

HAYDN EVANS

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Contents

Appendices

1 Introduction

Haydn Evans Consulting Ltd (HEC) has been commissioned by Conrad Energy Ltd (the Client) to carry out a drainage design for the *'Construction and operation of Synchronous Condensers with ancillary infrastructure, an associated works including access and landscaping'* located on Land at The Leys and Ivy Farm, Mellis Road, Yaxley, Suffolk IP21 4BT.

The development has been granted Planning Permission by Mid Suffolk District Council under application reference DC/22/04021 dated 20th February 2023. This document has been produced to support the discharge of Condition 6 which states:

6. ACTION REQUIRED PRIOR TO COMMENCEMENT: SURFACE WATER DRAINAGE DETAILS
No development shall commence until a strategy for surface water drainage, including implementation, maintenance and management, has been submitted to and approved, in writing, by the Local Planning Authority. The surface water drainage strategy shall be implemented and maintained as approved.
Reason - To safeguard the ground water environment and minimise the risk of flooding.

2 Location & Existing Conditions

2.1 Site Location

The greenfield site is located off Leys Lane, to the north of Yaxley in Suffolk on approximate Ordnance Survey (OS) grid reference 611914,274987 (see Figure 1).

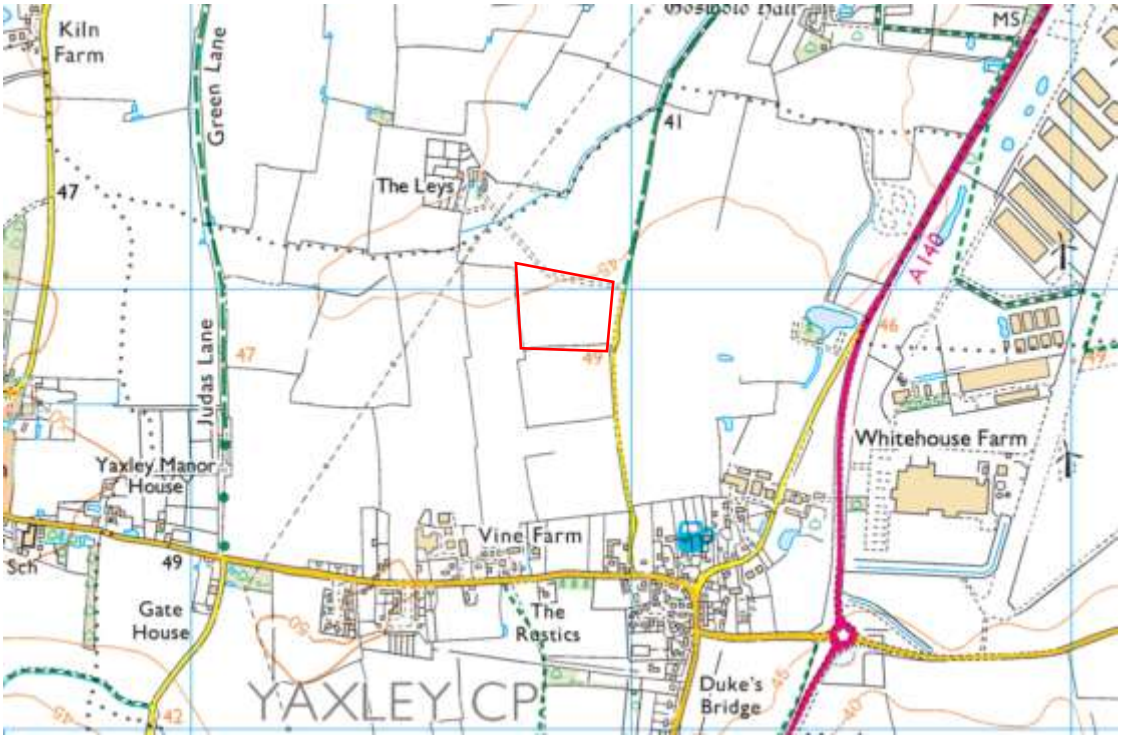


Figure 1: Site location map

The site is bound to the north and east by Leys Lane, and to the south and west by greenfield land.

2.2 Existing Topography

The topographical survey (Appendix A) shows ground levels to fall from south-east to north-west. Ground levels in the south-east are circa 48.10 metres Above Ordnance Datum (mAOD), falling to circa 44.60 mAOD in the north-west. Ground levels continue to fall to the north-west.

2.3 Existing Sewer Assets

There are no sewer assets in the vicinity of the site.

2.4 Existing Drainage Regime

The site is greenfield and therefore does not benefit from any formal drainage. Surface water run-off would flow overland towards the watercourse beyond the north-western boundary of the site.

2.5 Ground Conditions

British Geological Survey (BGS) mapping shows the site to have a bedrock geology of Crag Group (Sand) with superficial deposits of Lowestoft Formation (Diamicton).

Geo Environmental Group (GEG) trial pit and borehole logs (see Appendix B) show clay ground conditions with sandier ground conditions at depth. No groundwater was encountered in any of the trial pits. Borehole log CP01 encountered two water strikes; one at 1.30 m below ground level (bgl) and one at 13.3 mbgl. CP02 encountered water at 3.0 mbgl as seepage and CP03 at 3.45 mbgl as seepage. As none of the trial pits encountered groundwater, it is assumed that this was a localised pocket of perched groundwater and that high groundwater levels are not present across the whole site. No groundwater was encountered in TP05 nor TP12 (closest to the proposed basin) and therefore this will not affect the proposed surface water drainage strategy.

3 Surface Water Drainage Strategy

3.1 SuDS Hierarchy

Surface water drainage should be managed in a way that replicates the natural drainage processes for the site as closely as possible. The proposals should follow the NPPF hierarchy and should be disposed of to a receptor in the order of preference described below:

1. Into the ground;
2. To a surface water body e.g. watercourse;
3. To a surface water, highway drain, or another drainage system;
4. To a combined sewer.

3.2 SuDS Selection

Into the ground

Infiltration testing has been undertaken across the site. The testing proved that infiltration is not feasible at the site (see Infiltration Test results in Appendix B).

To a surface water body

The closest watercourse is located approximately 120m north of the site and flows in a north-easterly direction. The topographical survey shows the southern watercourse bank levels to be circa 43.36mAOD and channel levels to be circa 42.01mAOD; the watercourse is therefore approximately 1.35m deep.

The watercourse and land between the site and the watercourse is under the same ownership as the site and therefore no third party land is crossed or permission required.

3.3 Surface Water Drainage Strategy

Surface water run-off generated by the impermeable areas of the site will be collected via gullies and conveyed using underground pipes to an attenuation basin located towards the north of the site. Surface water will discharge to the watercourse at a restricted rate equal to the Qbar greenfield run-off rate, in accordance with the requirements of the LLFA.

The greenfield run-off discharge rates have been calculated using the HR Wallingford IH124 method and are based on the proposed impermeable area of the site (0.538 ha). The greenfield rates for the site are summarised in Table 1 below (see Greenfield Calculations in Appendix C).

Rainfall event	Greenfield discharge rate (l/s)
1:1 year	1.1
Qbar	1.3
1:30 year	3.1
1:100 year	4.5

Table 1: Greenfield run-off calculations

The attenuation basin has been sized to accommodate the temporary run-off for rainfall events up to and including the 1:100 year event inclusive of 45% climate change in line with the gov.uk 'peak rainfall intensity allowances' (see Figure 3).

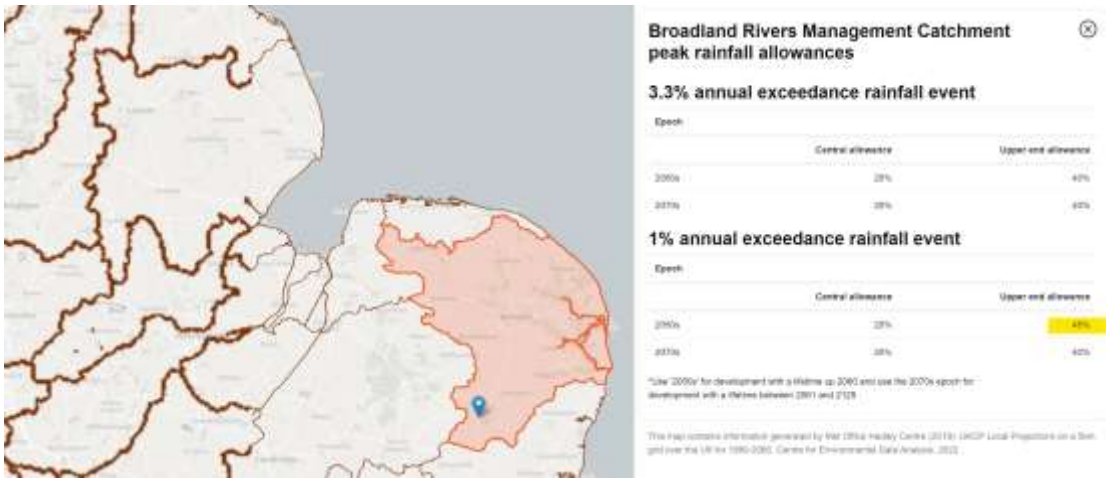


Figure 3 – Peak rainfall allowances

The volume of attenuation provided by the basin is 481 m^3 (see calculations in Appendix C).

The total contributing area is shown on the drawing in Appendix C and includes the area of the attenuation basin. The remainder of the site will comprise a permeable aggregate to allow surface water drainage to mimic the existing regime. Any exceedance flows would follow the topography and flow towards the watercourse, as is currently the case.

Surface water is limited by a flow control device to a maximum rate of 1.3 l/s up to and including the 1% AEP including 45% climate change rainfall scenario. Downstream of the flow control device, surface water will flow along a filter drain towards the watercourse; due to the depth of the basin and flow control manhole, a swale would not be a viable option due to the associated land take to achieve 1:4 side slopes.

No groundwater was encountered in TP05 nor TP12 (closest to the proposed basin) and therefore this will not affect the proposed surface water drainage strategy.

Discharge to the ditch will be via a protruding pipe outfall at an invert level of 42.50mAOD. This method of connection does not require land drainage consent as it does not obstruct the flow of water (see water level shown on Photograph 1).

At the time of the topographical survey the ditch was dry and so a water level was not recorded. The ditch is uninterrupted and has significant falls to where it connects to mapped watercourse downstream of the site.

Photo 1. Watercourse at proposed discharge location.

3.4 Pollution Mitigation

The above proposal ensures that surface water is managed 'at source'. Pollution indices from the different land types can be found on Table 26.2 of C753. The relevant land uses are tabled below, with the SuDS pollution indices tabled (as per table 26.3 of C753).

Land Use	Pollution Hazard Level	Total suspended solids pollution index	Metals	Hydrocarbons (HC)
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	0.7	0.6	0.7
SuDS Mitigation Indices				
Detention basin		0.5	0.5	0.6
Filter drain		0.2*	0.2*	0.2*
Total		**0.7**	**0.7**	**0.8**

* Secondary mitigation indices halved as per C753 guidance

Table 2: SuDS Pollution Assessment

The use of the detention basin and a filter drain provides appropriate mitigation for the pollutants likely for a commercial development.

3.5 SuDS Drainage Maintenance

The surface water drainage system should be maintained to ensure the system operates at its maximum capacity for the lifetime of development. The maintenance required by each SuDS component and the person of responsibility is outlined in the document in Appendix C.

4 Summary and Conclusion

4.1 Summary

Haydn Evans Consulting Ltd (HEC) has been commissioned by Conrad Energy Ltd (the Client) to carry out a drainage strategy for the 'Construction and operation of Synchronous Condensers with ancillary infrastructure, and associated works including access and landscaping on land at The Leys and Ivy Farm, Mellis Road, Yaxley.

Infiltration testing has been undertaken across the site which has proven that infiltration is not feasible at the site.

It is proposed to discharge surface water run-off directly to the closest watercourse located approximately 120m north of the site. The watercourse and land between the site and watercourse are in the same ownership and no third party land is crossed or permissions required.

Surface water run-off generated by the impermeable areas of the site will be collected by gullies and conveyed using underground pipes to an attenuation basin. The volume of attenuation provided by the attenuation basin is 481 m^3.

Surface water is limited by a flow control orifice to a maximum rate of 1.3 l/s up to and including the 1% AEP including 45% climate change rainfall scenario. Surface water discharge flows along a filter drain to the watercourse.

The use of the detention basin and filter drain provides appropriate mitigation for the pollutants likely for a commercial development.

The surface water drainage system should be maintained to ensure the system operates at its maximum capacity for the lifetime of development.

4.2 Conclusion

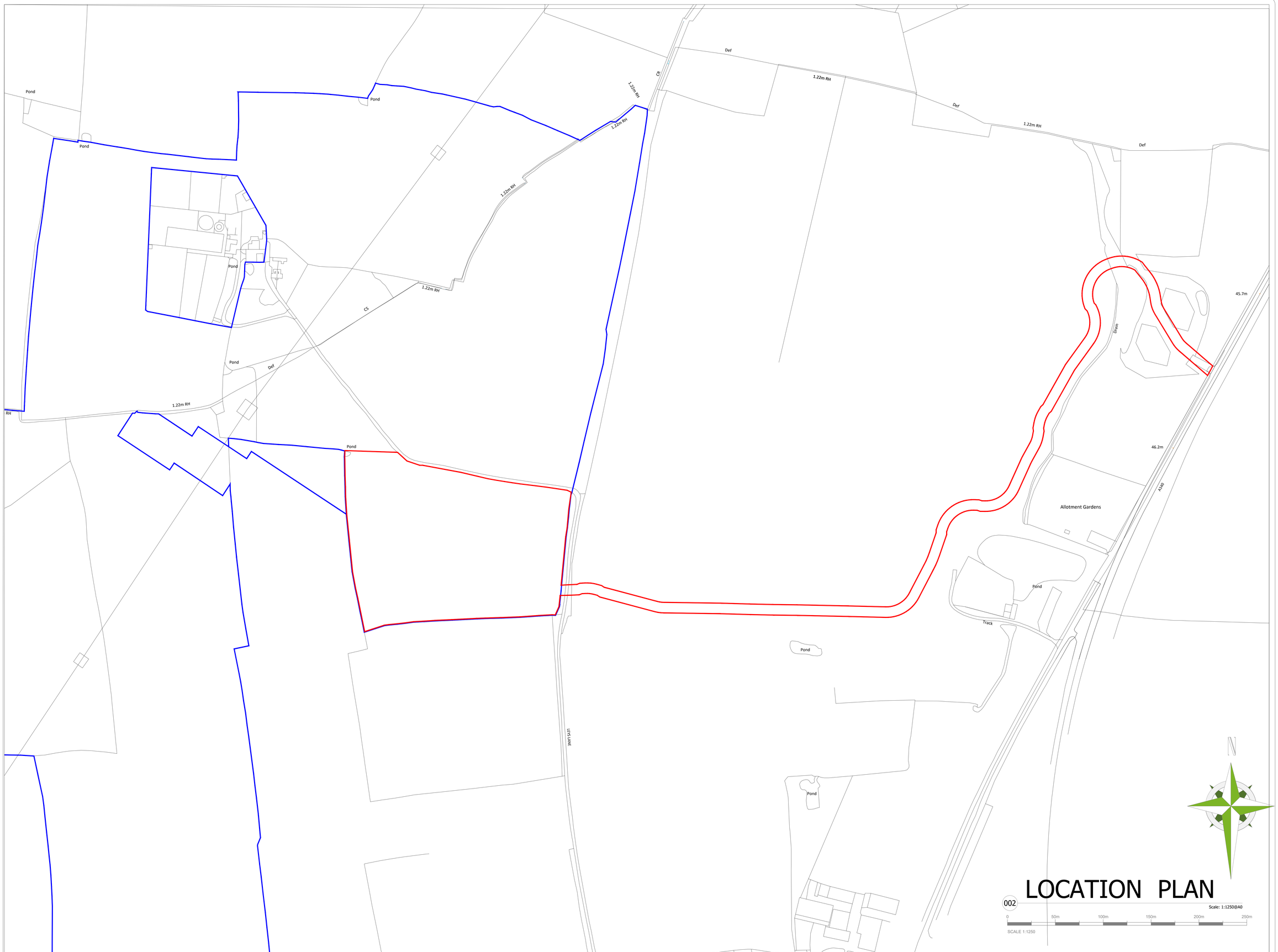
The drainage strategy complies with guidance; surface water generated by the proposed development can be attenuated on site in the extreme climate change event and discharged to a surface water body.

Appendix A Existing & Proposed Site

Conrad Energy drawing YAX-SYNCO-LP-002 – Location Plan

GEG drawing 12265 – Topographical Survey

Conrad Energy drawing YAX-SYNCO-PP-003 – Proposed Plan



LOCATION PLAN

LEGEND:

SITE INFRASTRUCTURE:

LANDOWNERS PROPERTY

PROPOSED SITE

rev	revision notes	drw	chk	ppp	date
B	Red line (proposed site) & blue line (landlord's property) boundaries amended	ST	JC	JC	09-02-23
A	Red line area amended	HC	JC	JC	22-06-22

REVISIONS

Design

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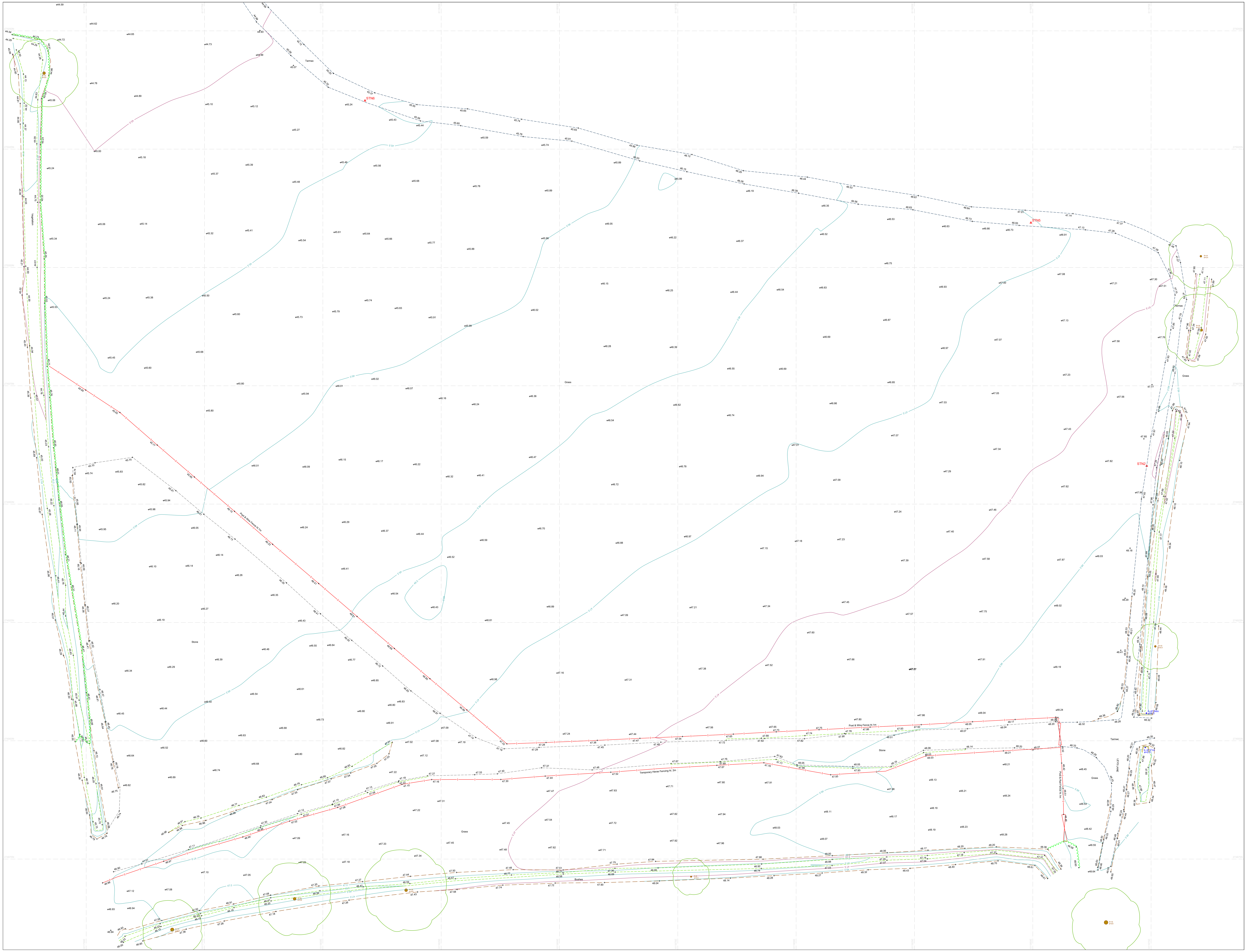
Project Title:

PROPOSED SYNCRONOUS CONDENSER
LAND OFF- LEYS LANE
YAXLEY
611791, 275017

Drawing Title:

LOCATION PLAN

Scale @A0:	1:1250	Date:	22.06.2022
Drawn:	HC	Checked:	JC
Drawing No:	YAX-SYNCO-LP-002	Rev:	B



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NOTES

Boundaries surveyed are physical features and may not necessarily represent the legally conveyed ownership.

Tree Spreads, Girths and Heights are approximate, any tree species identified should not be relied upon and checked by a specialist if critical

Underground drainage depths, pipe sizes and runs have been recorded from the surface and may have been estimated or assumed

Features surveyed off site such as buildings and trees may have been recorded remotely and may not be shown in full detail due to access / sighting restrictions

Coordinates and Datum derived using geoid model OSGM15(GB) and horizontal transformation OSTN15

SURVEY STATIONS			
Name	Easting	Northing	Height
STN2	611974.086	274958.079	47.893
STN4	611884.079	274971.999	46.707
STN5	611949.608	275009.452	46.997
STN6	611808.909	275035.255	45.395

CLIENT

Geo Environmental Group

SITE

Leys Lane
Yaxley

PROJECT

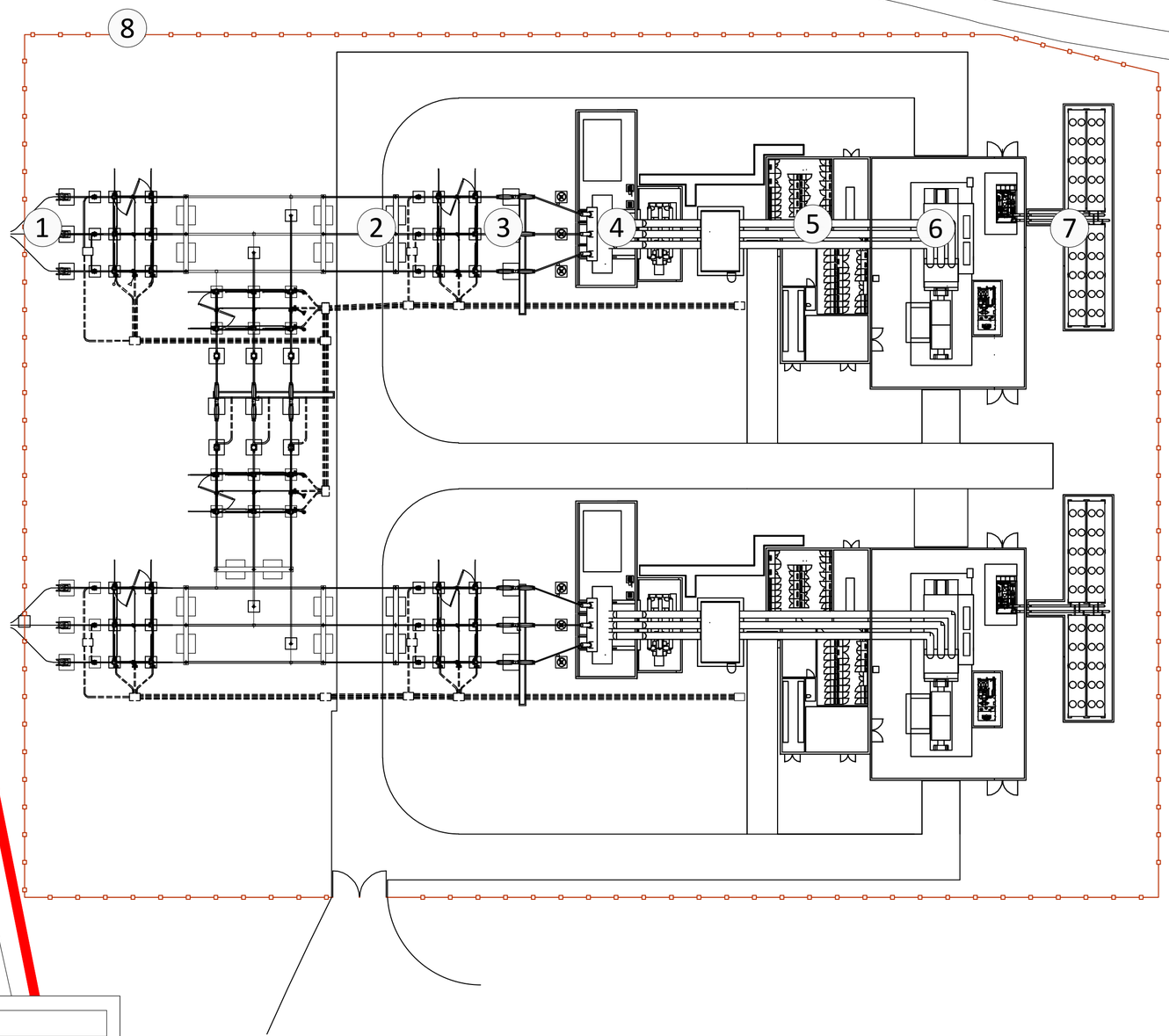
Topographical Survey

SCALE	DATE
1:250 @ A0	22/04/22

DRAWING No.

12265

Pond



INFRASTRUCTURE KEY	
1	CABLE SEALING END
2	DISCONNECTOR WITH TWO EARTH SWITCHES
3	CIRCUIT BREAKER
4	CURRENT TRANSFORMER
5	RELAY ROOM
6	SYNCHRONOUS CONDENSER
7	VENTILATION EQUIPMENT
8	SECURITY FENCE

N

003 PROPOSED PLAN

Scale: 1:500@A2

0 10m 20m 30m 40m 50m 60m 70m 80m 90m 100m

SCALE 1:500

PROPOSED PLAN

LEGEND:

rev	revision notes	date
A	Red line area amended	22.06.22

REVISIONS

Design

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Project Title:
PROPOSED SYNCRONOUS CONDENSER
LAND OFF - LEYS LANE
YAXLEY
611791, 275017

Drawing Title:
SYNCRONOUS CONDENSER
PROPOSED PLAN - INDICATIVE LAYOUT

Scale @A0:	1:500	Date:	22.06.2022
Drawn:	HC	Checked:	JC
Drawing No:		Rev:	

YAX-SYNCO-PP-003 A

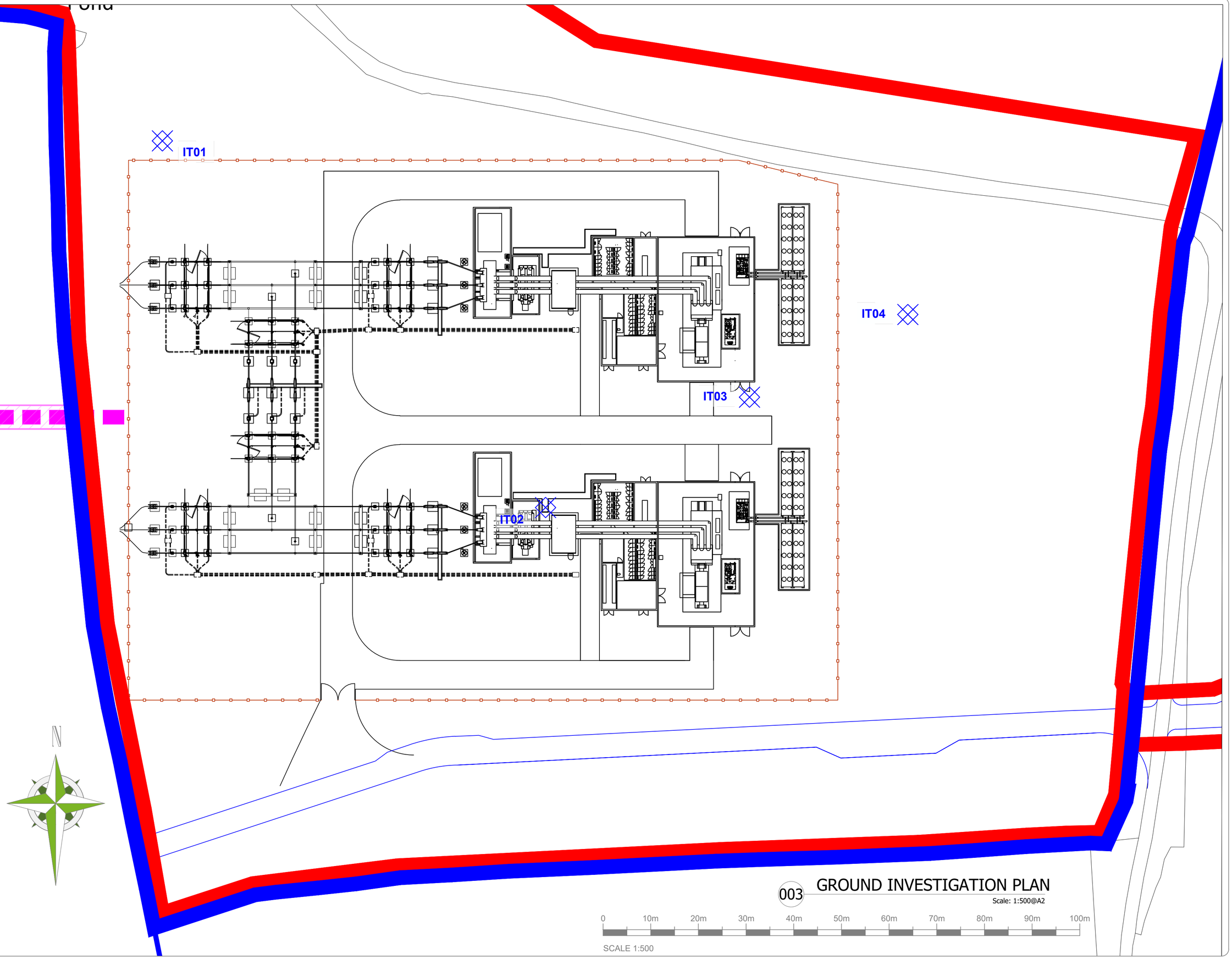
Appendix B Site Investigation

Siemens Energy drawing YAX-SYNCO-GIP-060 – Ground Investigation Plan

GEG Infiltration Test results ref: GEG-22-472

GEG Trial Pit Logs (IT01-IT04 and TP01-TP13)

GEG Borehole Logs (CP01-CP03)



GROUND INVESTIGATION PLAN

LEGEND:

INFILTRATION TEST LOCATION

rev | revision notes | date

REVISIONS

Design

ALL DIMENSIONS TO BE CHECKED ON SITE
WORK TO FIGURED DIMENSIONS ONLY
REPORT DISCREPANCIES TO CONRAD ENERGY LTD
AT ONCE BEFORE PROCEEDING
COPYRIGHT ACT APPLIES

conrad energy

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Project Title:
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YAXLEY
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Drawing Title:
SYNCRONOUS CONDENSER
GROUND INVESTIGATION PLAN

Scale @A0: 1:500 | Date: 15.11.2022
Drawn: HC | Checked: JC
Drawing No: YAX-SYNCO-GIP-060 | Rev: -

003 GROUND INVESTIGATION PLAN
Scale: 1:500@A2

Infiltration Test

Project Name:	**The Leys and Ivy Farm, Yaxley**	Depth of Pit (cm):	160.00
Project Ref.:	**GEG-22-472**	Depth of Water at Start of Depth (cm):	54.00
Trial Pit:	**IT01**	Date of Test:	10 November 2022
Test No.:	**Test 1 of 1**		

Time (min)	Depth from Surface (cm)	% Effective Depth
0	54	100.0%
5	55	99.1%
46	58	96.2%
95	61	93.4%
155	62	92.5%
235	64	90.6%
End of Test		

With Reference to: **Graph F-1**

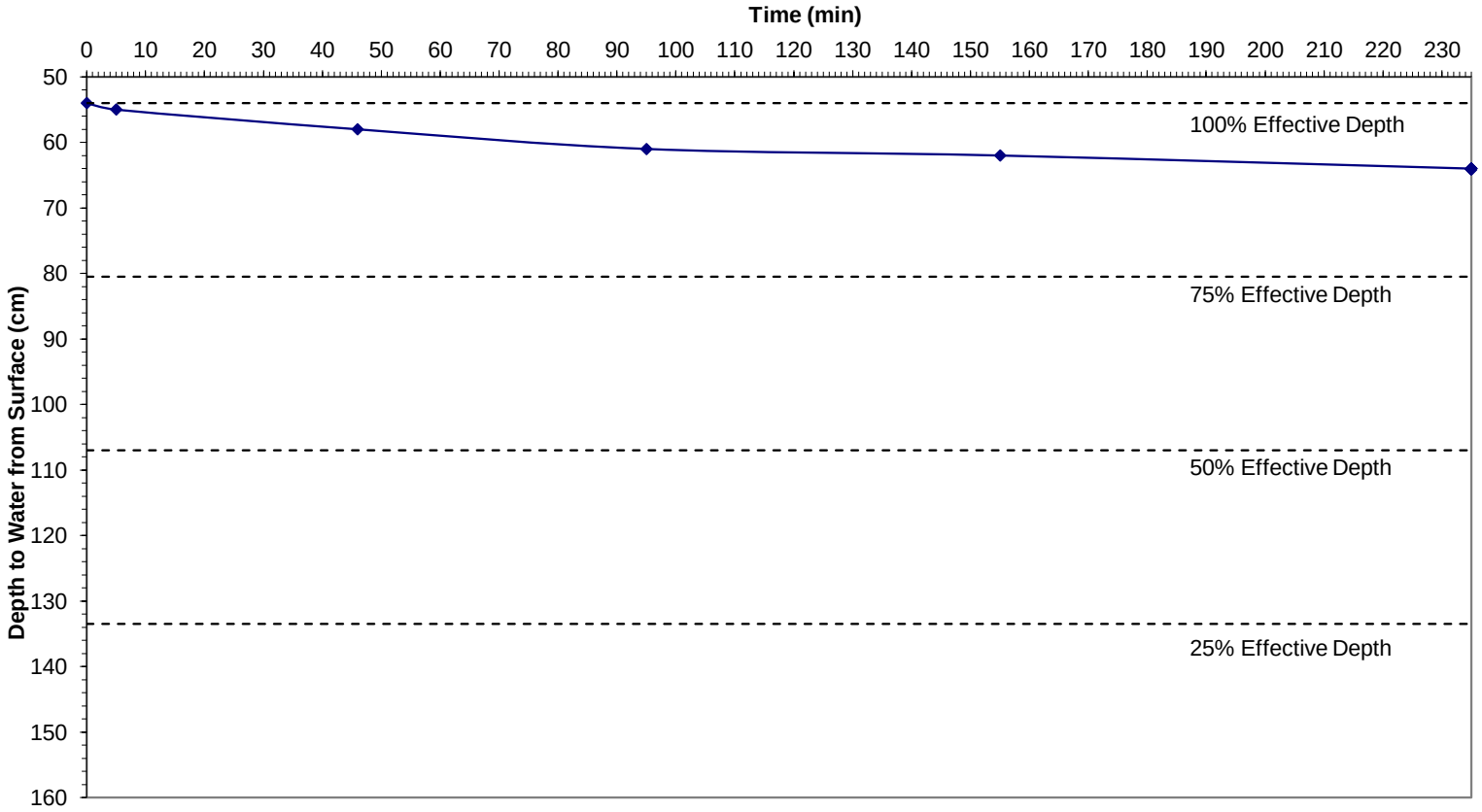
Parameter	Symbol	Calculation	Units	**IT01**
Effective Depth of Trial Pit	d_p		m	1.06
Width of Trial Pit	w		m	0.60
Length of Trial Pit	l		m	1.90
Volume of Trial Pit	V	$= d_p \times w \times l$	m^3	1.21
Volume of Trial Pit at 50% Effective Depth	$V_{50\%}$	$= V \times 0.5$	m^3	0.6042
Internal Surface Area of Trial Pit*	$a_{p50\%}$	$= l \times w + d_p \times (w + l)$	m^2	3.79
Time to reach 75% Effective Depth	$T_{p75\%}$		min	n/a
Time to reach 25% Effective Depth	$T_{p25\%}$		min	n/a
Time 25% - 75%	$T_{p75\%-25\%}$	$= T_{p25\%} - T_{p75\%}$	min	n/a
Infiltration Rate	f	$= V_{50\%} / a_{p50\%} \times (T_{p75\%-25\%})$	m/s	**n/a**

*To 50% Effective Depth (including base)

Engineer: AT

Checked by: LS

Graph F-1 **GEG-22-472** **The Leys and Ivy Farm, Yaxley** **IT01**



Infiltration Test

Project Name:	**The Leys and Ivy Farm, Yaxley**	Depth of Pit (cm):	170.00
Project Ref.:	**GEG-22-472**	Depth of Water at Start of Depth (cm):	33.00
Trial Pit:	**IT02**	Date of Test:	10 November 2022
Test No.:	**Test 1 of 1**		

Time (min)	Depth from Surface (cm)	% Effective Depth
0	33	100.0%
40	33	100.0%
89	34	99.3%
149	35	98.5%
229	36	97.8%
End of Test		

With Reference to: **Graph F-2**

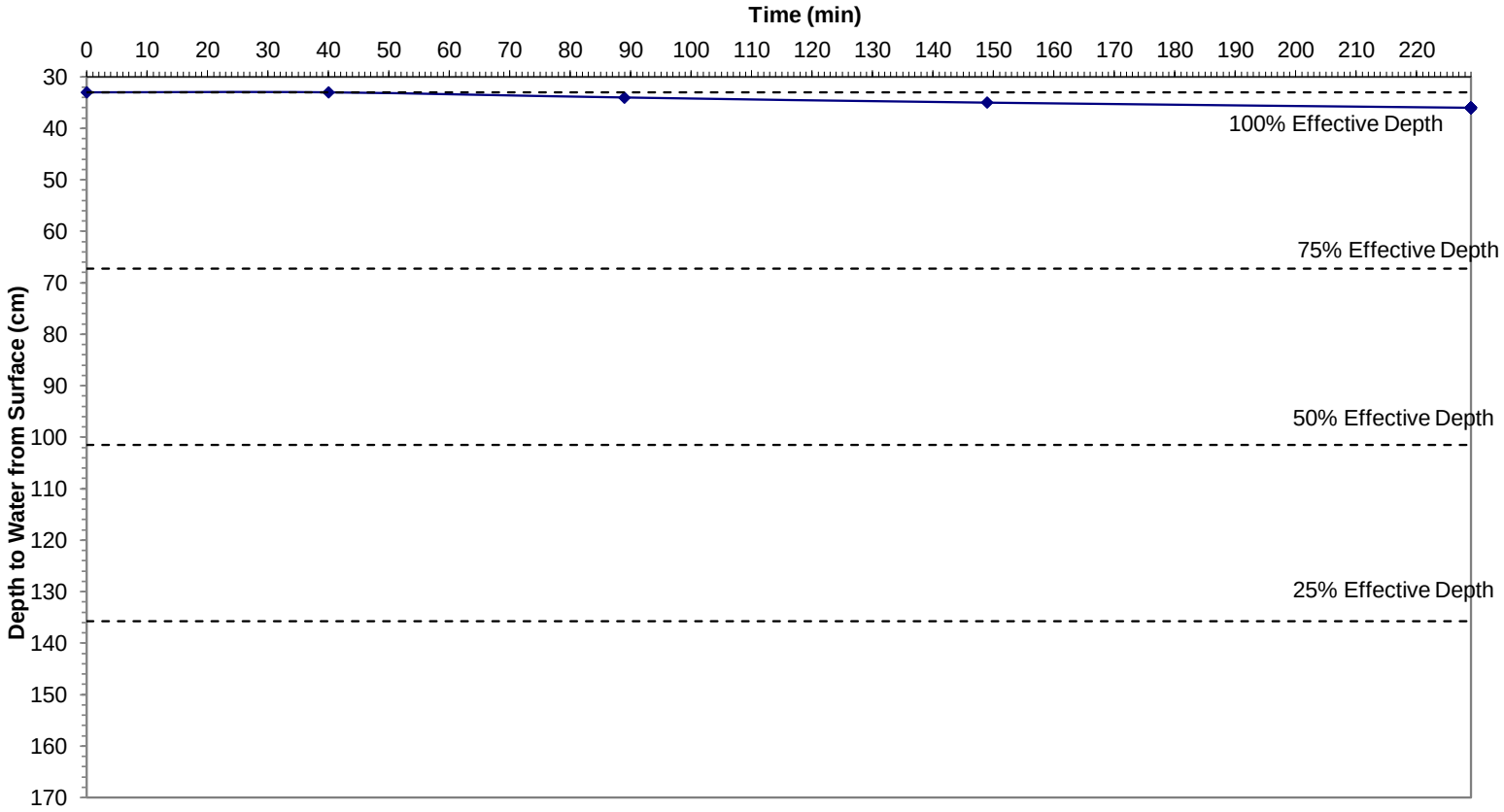
Parameter	Symbol	Calculation	Units	**IT02**
Effective Depth of Trial Pit	d_p		m	1.37
Width of Trial Pit	w		m	0.60
Length of Trial Pit	l		m	2.00
Volume of Trial Pit	V	$= d_p \times w \times l$	m^3	1.64
Volume of Trial Pit at 50% Effective Depth	$V_{50\%}$	$= V \times 0.5$	m^3	0.822
Internal Surface Area of Trial Pit*	$a_{p50\%}$	$= l \times w + d_p \times (w + l)$	m^2	4.76
Time to reach 75% Effective Depth	$T_{p75\%}$		min	n/a
Time to reach 25% Effective Depth	$T_{p25\%}$		min	n/a
Time 25% - 75%	$T_{p75\%-25\%}$	$= T_{p25\%} - T_{p75\%}$	min	n/a
Infiltration Rate	f	$= V_{50\%} / a_{p50\%} \times (T_{p75\%-25\%})$	m/s	n/a

*To 50% Effective Depth (including base)

Engineer: AT

Checked by: LS

Graph F-2 **GEG-22-472** **The Leys and Ivy Farm, Yaxley** **IT02**



Infiltration Test

Project Name:	**The Leys and Ivy Farm, Yaxley**	Depth of Pit (cm):	200.00
Project Ref.:	**GEG-22-472**	Depth of Water at Start of Depth (cm):	95.00
Trial Pit:	**IT03**	Date of Test:	10 November 2022
Test No.:	**Test 1 of 1**		

Time (min)	Depth from Surface (cm)	% Effective Depth
0	95	100.0%
31	95	100.0%
82	95	100.0%
140	94	101.0%
222	94	101.0%
End of Test		

With Reference to: **Graph F-3**

Parameter	Symbol	Calculation	Units	**IT03**
Effective Depth of Trial Pit	d_p		m	1.05
Width of Trial Pit	w		m	0.60
Length of Trial Pit	l		m	2.00
Volume of Trial Pit	V	$= d_p \times w \times l$	m^3	1.26
Volume of Trial Pit at 50% Effective Depth	$V_{50\%}$	$= V \times 0.5$	m^3	0.63
Internal Surface Area of Trial Pit*	$a_{p50\%}$	$= l \times w + d_p \times (w + l)$	m^2	3.93
Time to reach 75% Effective Depth	$T_{p75\%}$		min	n/a
Time to reach 25% Effective Depth	$T_{p25\%}$		min	n/a
Time 25% - 75%	$T_{p75\%-25\%}$	$= T_{p25\%} - T_{p75\%}$	min	n/a
Infiltration Rate	f	$= V_{50\%} / a_{p50\%} \times (T_{p75\%-25\%})$	m/s	n/a

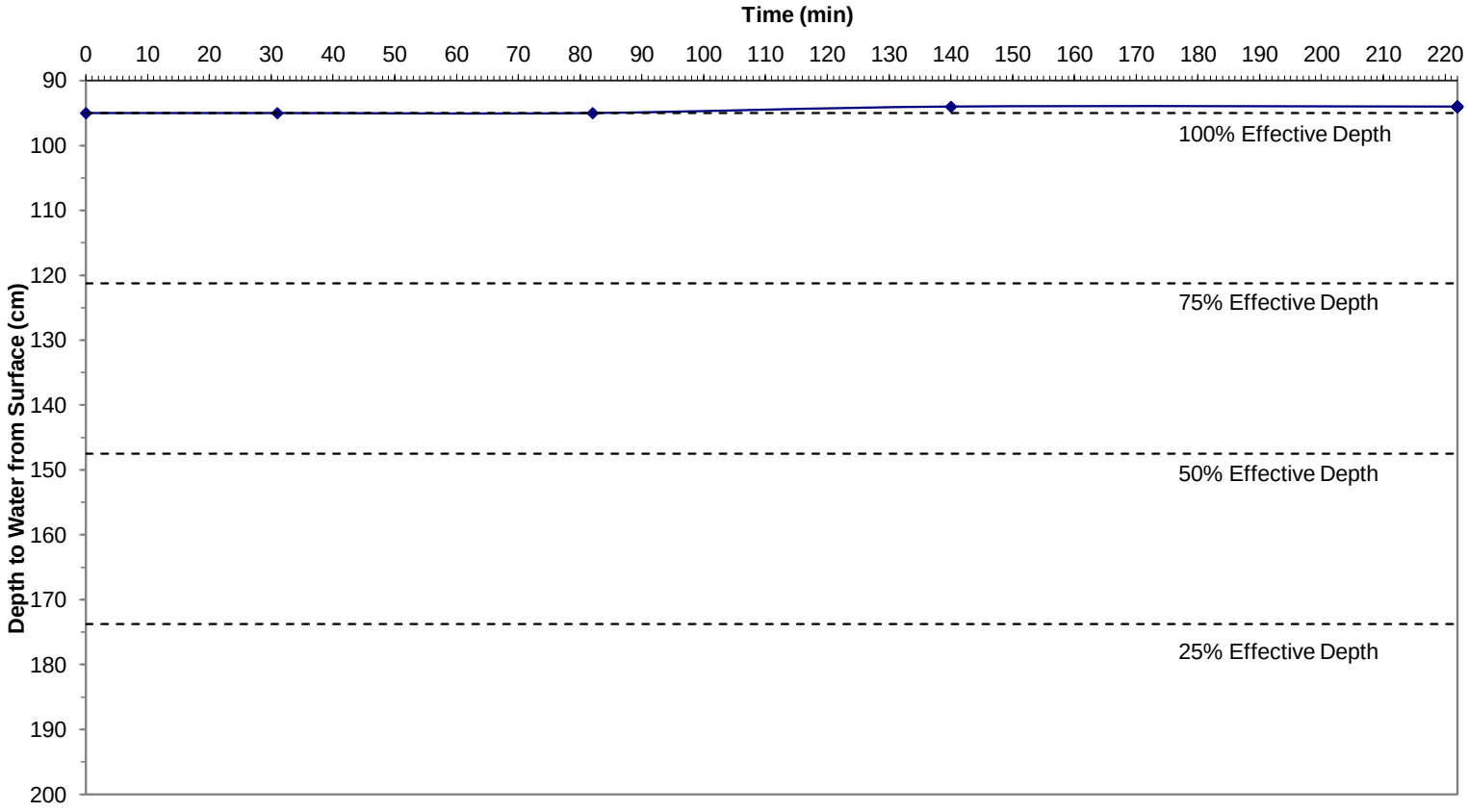
*To 50% Effective Depth (including base)

Note : Groundwater level rose during test potentially due to ingress of groundwater.

Engineer: AT

Checked by: LS

Graph F-3 **GEG-22-472** **The Leys and Ivy Farm, Yaxley** **IT03**



Infiltration Test

Project Name:	**The Leys and Ivy Farm, Yaxley**	Depth of Pit (cm):	170.00
Project Ref.:	**GEG-22-472**	Depth of Water at Start of Depth (cm):	60.00
Trial Pit:	**IT04**	Date of Test:	10 November 2022
Test No.:	**Test 1 of 1**		

Time (min)	Depth from Surface (cm)	% Effective Depth
0	60	100.0%
22	60	100.0%
73	53	106.4%
130	53	106.4%
212	53	106.4%
End of Test		

With Reference to: **Graph F-4**

Parameter	Symbol	Calculation	Units	**IT04**
Effective Depth of Trial Pit	d_p		m	1.10
Width of Trial Pit	w		m	0.60
Length of Trial Pit	l		m	1.90
Volume of Trial Pit	V	$= d_p \times w \times l$	m^3	1.25
Volume of Trial Pit at 50% Effective Depth	$V_{50\%}$	$= V \times 0.5$	m^3	0.627
Internal Surface Area of Trial Pit*	$a_{p50\%}$	$= l \times w + d_p \times (w + l)$	m^2	3.89
Time to reach 75% Effective Depth	$T_{p75\%}$		min	n/a
Time to reach 25% Effective Depth	$T_{p25\%}$		min	n/a
Time 25% - 75%	$T_{p75\%-25\%}$	$= T_{p25\%} - T_{p75\%}$	min	n/a
Infiltration Rate	f	$= V_{50\%} / a_{p50\%} \times (T_{p75\%-25\%})$	m/s	n/a

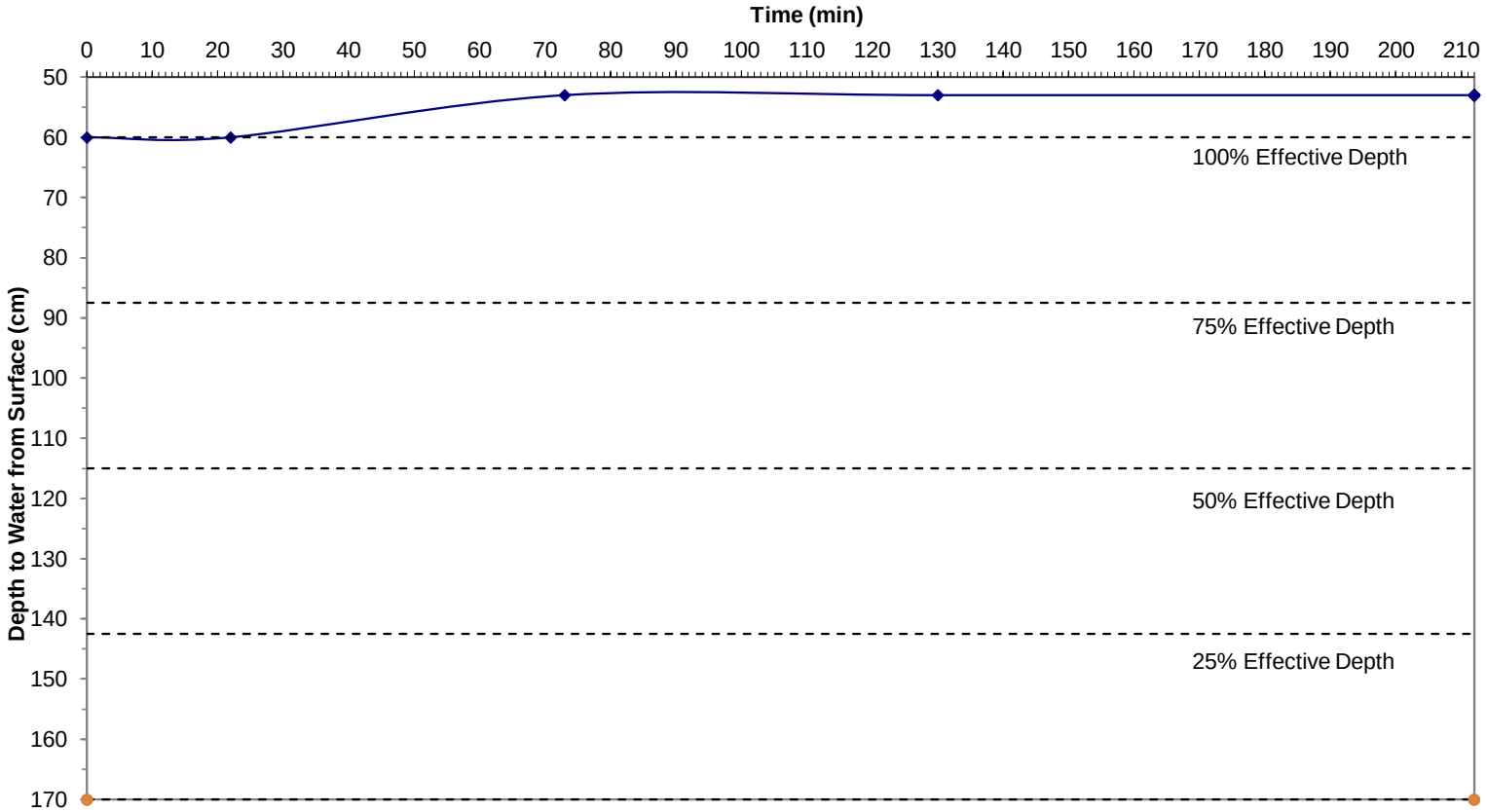
*To 50% Effective Depth (including base)

Note: Groundwater level rose during test due to partial collapse of sides.

Engineer: AT

Checked by: LS

Graph F-4 **GEG-22-472** **The Leys and Ivy Farm, Yaxley** **IT04**



Geo Environmental Group

Trial Pit Log

TrialPit No
IT01
Sheet 1 of 1

Project Name: The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611769.00 - 275021.00 Level: 45.30	Date 10/11/2022
Location: Mellis Road, Yaxley, Eye, IP23 8DB		Dimensions (m): 1.90 × 0.60 Depth 1.60	Scale 1:25
Client: Conrad Energy			Logged AT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.00			Soft brown sandy silty CLAY. (TOPSOIL)
				0.30	45.00		Firm light brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium sub-angular to sub-rounded chalk. (LOWESTOFT FORMATION - DIAMICTON)
				0.90	44.40		Firm to stiff grey and brown slightly gravelly CLAY. Gravel is fine to medium sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON) *1.00-1.20m Boulder size pocket of orangish brown fine sand.*
				1.60	43.70		End of Pit at 1.600m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks: 1. No groundwater encountered. 2. Infiltration test undertaken in trial pit. 3. Upon completion backfilled with arisings. 4. Equipment: JCB 3CX.

Stability: Stable.

Geo Environmental Group

Trial Pit Log

TrialPit No
IT02
Sheet 1 of 1

Project Name: The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611840.00 - 274930.00 Level: 46.85	Date 10/11/2022
Location: Mellis Road, Yaxley, Eye, IP23 8DB		Dimensions (m): 2.00 × 0.60, Depth 1.70	Scale 1:25
Client: Conrad Energy			Logged AT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.00			Soft brown sandy silty CLAY. (TOPSOIL)
				0.40	46.45		Firm brown very sandy CLAY. (LOWESTOFT FORMATION - DIAMICTON)
				0.80	46.05		Firm brown sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded flint and chalk. (LOWESTOFT FORMATION - DIAMICTON)
				1.10	45.75		Firm to stiff grey and brown slightly gravelly CLAY with occasional boulder size pockets of orangish brown fine sand. Gravel is fine to medium sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
				1.70	45.15		End of Pit at 1.700m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks: 1. No groundwater encountered. 2. Infiltration test undertaken in trial pit. 3. Upon completion backfilled with arisings. 4. Equipment: JCB 3CX.

Stability: Stable.

Geo Environmental Group

Trial Pit Log

TrialPit No **IT03** Sheet 1 of 1

Project Name: The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611887.00 - 274954.00 Level: 46.90	Date 10/11/2022
Location: Mellis Road, Yaxley, Eye, IP23 8DB		Dimensions (m): 2.00 x 0.60 Depth 2.00	Scale 1:25
Client: Conrad Energy			Logged AT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.00			Soft brown sandy silty CLAY. (TOPSOIL)
				0.30	46.60		Firm brown very sandy CLAY. (LOWESTOFT FORMATION - DIAMICTON)
				0.80	46.10		Firm light brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium sub-angular to sub-rounded chalk. (LOWESTOFT FORMATION - DIAMICTON)
▼				1.70	45.20		Firm to stiff grey and brown slightly gravelly CLAY. Gravel is fine to medium sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
				2.00	44.90		End of Pit at 2.000m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks: 1. Groundwater encountered at 1.90m as seepage. 2. Infiltration test undertaken in trial pit. 3. Upon completion backfilled with arisings. 4. Equipment: JCB 3CX.

Stability: Stable.

Geo Environmental Group

Trial Pit Log

TrialPit No
IT04
Sheet 1 of 1

Project Name: The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611934.00 - 274974.00 Level: 47.03	Date 10/11/2022
Location: Mellis Road, Yaxley, Eye, IP23 8DB		Dimensions (m): 1.90 × 0.60 Depth 1.70	Scale 1:25
Client: Conrad Energy			Logged AT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.00			Soft brown sandy silty CLAY. (TOPSOIL)
				0.30	46.73		Firm light brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium sub-angular to sub-rounded chalk. (LOWESTOFT FORMATION - DIAMICTON)
				0.90	46.13		Medium dense orangish brown fine SAND. (LOWESTOFT FORMATION - DIAMICTON)
				1.10	45.93		Firm to stiff grey slightly gravelly CLAY. Gravel is fine to medium sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
				1.70	45.33		End of Pit at 1.700m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks: 1. No groundwater encountered. 2. Infiltration test undertaken in trial pit. 3. Upon completion backfilled with arisings. 4. Equipment: JCB 3CX.

Stability: Stable

Geo Environmental Group

Trial Pit Log

TrialPit No **TP01** Sheet 1 of 1

Project Name: The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611794.00 - 274995.00 Level: 45.70	Date 14/11/2022
Location: Mellis Road, Yaxley, Eye, IP23 8DB		Dimensions (m): 2.20 × 0.60 Depth 3.30	Scale 1:25
Client: Conrad Energy			Logged AT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.00			Soft brown sandy silty CLAY. (TOPSOIL)
				0.30	45.40		Stiff brown very sandy CLAY. (LOWESTOFT FORMATION - DIAMICTON)
	0.50	HVP	116				
	0.50	HVP	120				
	0.50	HVP	120				
				0.80	44.90		Very stiff light brown and grey slightly sandy slightly gravelly CLAY with occasional boulder sized pockets of wet orange fine sand. Gravel is fine to course sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
	1.10	HVP	160				
	1.10	HVP	166				
	1.10	HVP	170				
				2.00	43.70		Very stiff grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
				3.30	42.40		End of Pit at 3.300m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks: 1. No groundwater encountered. 2. HVP= Hand Vane Measurements (in kPa). 3. Upon completion trial pit backfilled with arisings. 4. Equipment: JCB 3CX.

Stability: Stable

Geo Environmental Group

Trial Pit Log

TrialPit No **TP02** Sheet 1 of 1

Project Name: The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611846.00 - 274975.00 Level: 46.40	Date 10/11/2022
Location: Mellis Road, Yaxley, Eye, IP23 8DB		Dimensions (m): 2.20 × 0.60 Depth 2.90	Scale 1:25
Client: Conrad Energy			Logged AT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.00			Soft brown sandy silty CLAY. (TOPSOIL)
				0.30	46.10		Stiff brown very sandy CLAY. (LOWESTOFT FORMATION - DIAMICTON)
	0.50	HVP	136				
	0.50	HVP	144				
	0.50	HVP	150				
				0.80	45.60		Very stiff light greyish brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium sub-angular to sub-rounded chalk. (LOWESTOFT FORMATION - DIAMICTON)
	1.00	HVP	190				
	1.00	HVP	190				
	1.00	HVP	198				
				1.40	45.00		Very stiff light brown slightly sandy slightly gravelly CLAY with occasional boulder sized pockets of orange fine sand. Gravel is fine to medium sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
	2.30	PP	PP=300				*2.30-2.90m Becoming stiff to very stiff*
	2.30	PP	PP=350				
	2.30	PP	PP=350				
				2.90	43.50		End of Pit at 2.900m

Remarks: 1. No groundwater encountered. 2. HVP= Hand Vane Measurements (in kPa). 3. PP=ELE Pocket Penetrometer. 4. Upon completion backfilled with arisings. 5. Equipment: JCB 3CX.

Stability: Stable.

Geo Environmental Group

Trial Pit Log

TrialPit No **TP03** Sheet 1 of 1

Project Name: The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611896.00 - 274972.00 Level: 46.70	Date 10/11/2022
Location: Mellis Road, Yaxley, Eye, IP23 8DB		Dimensions (m): 2.20 × 0.60, Depth 3.10	Scale 1:25
Client: Conrad Energy			Logged AT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.00			Soft brown sandy silty CLAY. (TOPSOIL)
				0.30	46.40		Very stiff brown very sandy CLAY. (LOWESTOFT FORMATION - DIAMICTON)
	0.50	HVP	190				
	0.50	HVP	198				
	0.50	HVP	204				
				1.10	45.60		Stiff light brown slightly sandy slightly gravelly CLAY with occasional boulder sized pockets of orange fine sand. Gravel is fine to medium sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
	1.20	PP	PP=200				
	1.20	PP	PP=250				
	1.20	PP	PP=250				
	2.10	PP	PP=350				*2.10-3.10m Becoming very stiff*
	2.10	PP	PP=350				
	2.10	PP	PP=350				
				3.10	43.60		End of Pit at 3.100m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks: 1. No groundwater encountered. 2. HVP= Hand Vane Measurements (in kPa). 3. PP=ELE Pocket Penetrometer. 4. Upon completion backfilled with arisings. 5. Equipment: JCB 3CX.

Stability: Stable.

Geo Environmental Group

Trial Pit Log

TrialPit No **TP04** Sheet 1 of 1

Project Name: The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611822.00 - 274979.00 Level: 46.10	Date 14/11/2022
Location: Mellis Road, Yaxley, Eye, IP23 8DB		Dimensions (m): 2.20 × 0.60 Depth 3.30	Scale 1:25
Client: Conrad Energy			Logged AT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.00			Soft brown sandy silty CLAY. (TOPSOIL)
	0.20	ES		0.30	45.80		Stiff brown very sandy CLAY. (LOWESTOFT FORMATION - DIAMICTON)
	0.50	HVP	112				
	0.50	HVP	116				
	0.50	HVP	124				
	0.80	D					
	1.00	HVP	158				*1.00-1.20m Becoming very stiff*
	1.00	HVP	168				
	1.00	HVP	170	1.20	44.90		Stiff light brown and grey slightly sandy slightly gravelly CLAY with occasional boulder sized pockets of orange fine sand. Gravel is fine to course sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
	1.60	D					
							2.80-3.30m Boulder size pocket of chalk at eastern end of pit.
				3.30	42.80		End of Pit at 3.300m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks: 1. No groundwater encountered. 2. HVP= Hand Vane Measurements (in kPa). 3. Upon completion trial pit backfilled with arisings. 4. Equipment: JCB 3CX.

Stability: Stable

Geo Environmental Group

Trial Pit Log

TrialPit No **TP05** Sheet 1 of 1

Project Name: The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611816.00 - 275018.00 Level: 45.68	Date 14/11/2022
Location: Mellis Road, Yaxley, Eye, IP23 8DB		Dimensions (m): 2.20 x 0.60 Depth 3.10	Scale 1:25
Client: Conrad Energy			Logged AT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.00			Soft brown sandy silty CLAY. (TOPSOIL)
				0.30	45.38		Very stiff brown very sandy CLAY. (LOWESTOFT FORMATION - DIAMICTON)
	0.50	HVP	164				
	0.50	HVP	170				
	0.50	HVP	174				
				0.70	44.98		Very stiff light brown and grey slightly sandy slightly gravelly CLAY with occasional boulder sized pockets of wet orange fine sand. Gravel is fine to course sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
	1.00	HVP	190				
	1.00	HVP	214				
	1.00	HVP	214				
				2.20	43.48		Very stiff grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
				3.10	42.58		End of Pit at 3.100m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks: 1. No groundwater encountered. 2. HVP= Hand Vane Measurements (in kPa). 3. Upon completion trial pit backfilled with arisings. 4. Equipment: JCB 3CX.

Stability: Stable

Geo Environmental Group

Trial Pit Log

TrialPit No **TP06**

Sheet 1 of 1

Project Name:	The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611856.00 - 274995.00 Level: 46.10
Location:	Mellis Road, Yaxley, Eye, IP23 8DB	Dimensions (m): 2.20 × 0.60 Depth 3.10	Date 14/11/2022 Scale 1:25
Client:	Conrad Energy		Logged AT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.00			Soft brown sandy silty CLAY. (TOPSOIL)
				0.30	45.80		Stiff brown very sandy gravelly CLAY. Gravel is fine to coarse sub-angular flint. (LOWESTOFT FORMATION - DIAMICTON)
	0.50	HVP	138				
	0.50	HVP	146				
	0.50	HVP	150	0.60	45.50		Stiff light brown and grey slightly sandy slightly gravelly CLAY with occasional boulder sized pockets of wet orange fine sand. Gravel is fine to course sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
	0.80	B					
	0.80	D					
	1.00	HVP	238				*1.00-1.50m Becoming very stiff*
	1.00	HVP	240				
	1.00	HVP	240				
				1.50	44.60		Very stiff grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
	1.70	D					
				3.10	43.00		End of Pit at 3.100m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks: 1. No groundwater encountered. 2. HVP= Hand Vane Measurements (in kPa). 3. Upon completion trial pit backfilled with arisings. 4. Equipment: JCB 3CX.

Stability: Stable

Geo Environmental Group

Trial Pit Log

TrialPit No **TP07** Sheet 1 of 1

Project Name: The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611947.00 - 274974.00 Level: 47.05	Date 10/11/2022
Location: Mellis Road, Yaxley, Eye, IP23 8DB		Dimensions (m): 2.20 × 0.60, Depth 3.60	Scale 1:25
Client: Conrad Energy			Logged AT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.00			Soft brown sandy silty CLAY. (TOPSOIL)
	0.20	ES					
				0.40	46.65		Stiff to very stiff brown sandy CLAY. (LOWESTOFT FORMATION - DIAMICTON)
	0.50	HVP	128				
	0.50	HVP	130				
	0.50	HVP	152				
				0.80	46.25		Very stiff light brown slightly sandy slightly gravelly CLAY with occasional boulder sized pockets of orange fine sand. Gravel is fine to medium sub-angular to sub-rounded chalk. (LOWESTOFT FORMATION - DIAMICTON)
	1.00	HVP	214				
	1.00	HVP	220				
	1.00	HVP	220				
	2.50	PP	PP=350				*2.50-3.60m Occasional sub-angular and sub-rounded chalk and flint cobbles.*
	2.50	PP	PP=350				
	2.50	PP	PP=400				
				3.60	43.45		End of Pit at 3.600m

Remarks: 1. Groundwater encountered as isolated seepage from sand pockets. 2. HVP= Hand Vane Measurements (in kPa). 3. PP=ELE Pocket Penetrometer. 4. Upon completion trial pit backfilled with arisings. 5. Equipment: JCB 3CX.

Stability: Unstable in sand pockets.

Geo Environmental Group

Trial Pit Log

TrialPit No **TP08** Sheet 1 of 1

Project Name: The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611798.00 - 274965.00 Level: 46.00	Date 10/11/2022
Location: Mellis Road, Yaxley, Eye, IP23 8DB		Dimensions (m): 2.20 x 0.60 Depth 3.20	Scale 1:25
Client: Conrad Energy			Logged AT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.00			Soft brown sandy silty CLAY. (TOPSOIL)
	0.20	ES					
				0.30	45.70		Stiff brown sandy CLAY. (LOWESTOFT FORMATION - DIAMICTON)
	0.50	HVP	84				
	0.50	HVP	90				
	0.50	HVP	96				
				0.90	45.10		Very stiff grey and brown slightly gravelly CLAY. Gravel is fine to medium sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
	1.00	D					
	1.00	HVP	256				
	1.00	HVP	264				
	1.00	HVP	266				
							1.30-1.50m Large boulder size pocket of orangish brown fine sand.
	2.20	PP	PP=350				
	2.20	PP	PP=350				
	2.20	PP	PP=350				
							2.30-3.20m Occasional sub-angular and sub-rounded chalk cobbles.
				3.20	42.80		End of Pit at 3.200m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks: 1. Groundwater encountered as isolated seepage from sand pockets. 2. HVP= Hand Vane Measurements (in kPa). 3. PP=ELE Pocket Penetrometer. 4. Upon completion backfilled with arisings. 5. Equipment: JCB 3CX.

Stability: Stable.

Geo Environmental Group

Trial Pit Log

TrialPit No **TP09** Sheet 1 of 1

Project Name: The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611835.00 - 274946.00 Level: 46.60	Date 14/11/2022
Location: Mellis Road, Yaxley, Eye, IP23 8DB		Dimensions (m): 2.20 × 0.60 Depth 3.20	Scale 1:25
Client: Conrad Energy			Logged AT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.00			Soft brown sandy silty CLAY. (TOPSOIL)
				0.30	46.30		Stiff brown very sandy CLAY. (LOWESTOFT FORMATION - DIAMICTON)
	0.60	HVP	240				
	0.60	HVP	240				*0.60-0.80m Becoming very stiff*
	0.60	HVP	252				
				0.80	45.80		Very stiff light brown and grey slightly sandy slightly gravelly CLAY with occasional boulder sized pockets of orange fine sand. Gravel is fine to medium sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
	1.00	HVP	240				
	1.00	HVP	256				
	1.00	HVP	264				
				2.10	44.50		Very stiff grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
				3.20	43.40		End of Pit at 3.200m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks: 1. No groundwater encountered. 2. HVP= Hand Vane Measurements (in kPa). 3. Upon completion trial pit backfilled with arisings. 4. Equipment: JCB 3CX.

Stability: Stable

Geo Environmental Group

Trial Pit Log

TrialPit No **TP10** Sheet 1 of 1

Project Name: The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611920.00 - 274936.00 Level: 47.50	Date 14/11/2022
Location: Mellis Road, Yaxley, Eye, IP23 8DB		Dimensions (m): 2.20 × 0.60, Depth 3.30	Scale 1:25
Client: Conrad Energy			Logged AT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.00			Soft brown sandy silty CLAY. (TOPSOIL)
				0.30	47.20		Firm brown very sandy CLAY. (LOWESTOFT FORMATION - DIAMICTON) *0.50-0.90m Becoming stiff*
	0.50	HVP	108				
	0.50	HVP	110				
	0.50	HVP	116				
				0.90	46.60		Very stiff grey and brown slightly gravelly CLAY. Gravel is fine to medium sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
	1.00	HVP	206				
	1.00	HVP	220				
	1.00	HVP	220				
				3.30	44.20		End of Pit at 3.300m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks: 1. No groundwater encountered. 2. HVP= Hand Vane Measurements (in kPa). 3. Upon completion trial pit backfilled with arisings. 4. Equipment: JCB 3CX.

Stability: Stable

Geo Environmental Group

Trial Pit Log

TrialPit No **TP11**

Sheet 1 of 1

Project Name:	The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611872.00 - 274920.00 Level: 47.30
Location:	Mellis Road, Yaxley, Eye, IP23 8DB	Dimensions (m): 2.20 × 0.60	Date 14/11/2022
Client:	Conrad Energy	Depth 3.40	Scale 1:25 Logged AT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.00			Soft brown sandy silty CLAY. (TOPSOIL)
	0.30	ES					
				0.40	46.90		Stiff brown very sandy CLAY. (LOWESTOFT FORMATION - DIAMICTON)
	0.50	HVP	124				
	0.50	HVP	134				
	0.50	HVP	136				
				0.70	46.60		Stiff light brown and grey slightly sandy slightly gravelly CLAY with occasional boulder sized pockets of orange fine sand. Gravel is fine to medium sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
	0.90	B					
	0.90	D					
	1.00	HVP	158				
	1.00	HVP	160				
	1.00	HVP	166				*1.00-1.90m Becoming very stiff*
				1.90	45.40		Very stiff grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
				3.40	43.90		End of Pit at 3.400m

Remarks: 1. No groundwater encountered. 2. HVP= Hand Vane Measurements (in kPa). 3. Upon completion trial pit backfilled with arisings. 4. Equipment: JCB 3CX.

Stability: Stable

Geo Environmental Group

Trial Pit Log

TrialPit No **TP12**

Sheet 1 of 1

Project Name: The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611770.00 - 275038.00 Level: 45.00	Date 14/11/2022
Location: Mellis Road, Yaxley, Eye, IP23 8DB		Dimensions (m): 2.20 × 0.60 Depth 3.20	Scale 1:25
Client: Conrad Energy			Logged AT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.00			Soft brown sandy silty CLAY. (TOPSOIL)
				0.30	44.70		Stiff brown very sandy gravelly CLAY. Gravel is fine to coarse sub-angular flint. (LOWESTOFT FORMATION - DIAMICTON)
	0.50	HVP	124				
	0.50	HVP	126				
	0.50	HVP	134				
				0.70	44.30		Very stiff light brown and grey slightly sandy slightly gravelly CLAY with occasional boulder sized pockets of orange fine sand. Gravel is fine to course sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
	0.80	B					
	0.80	D					
	1.10	HVP	160				
	1.10	HVP	164				
	1.10	HVP	182				
							1.70-3.20m Rare mudstone and chalk cobbles and mudstone boulders
				3.20	41.80		End of Pit at 3.200m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks: 1. Groundwater encountered as isolated seepage from sand pockets. 2. HVP= Hand Vane Measurements (in kPa). 3. Upon completion trial pit backfilled with arisings. 4. Equipment: JCB 3CX.

Stability: Stable

Geo Environmental Group

Trial Pit Log

TrialPit No **TP13** Sheet 1 of 1

Project Name: The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611763.00 - 274994.00 Level: 45.30	Date 10/11/2022
Location: Mellis Road, Yaxley, Eye, IP23 8DB		Dimensions (m): 2.20 × 0.60 Depth 3.60	Scale 1:25
Client: Conrad Energy			Logged AT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.00			Soft brown sandy silty CLAY. (TOPSOIL)
				0.30	45.00		Firm brown very sandy CLAY. (LOWESTOFT FORMATION - DIAMICTON)
				0.50	44.80		Very stiff grey and brown slightly gravelly CLAY. Gravel is fine to medium sub-angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION - DIAMICTON)
	0.60	HVP	194				
	0.60	HVP	202				
	0.60	HVP	222				
	1.00	HVP	218				
	1.00	HVP	220				
	1.00	HVP	226				
							1.10-1.30m Large boulder size pocket of orangish brown fine sand.
	1.70	HVP	230				
	1.70	HVP	230				
	1.70	HVP	252				
	2.50	PP	PP=300				
	2.50	PP	PP=350				
	2.50	PP	PP=350				
							2.50-3.60m Occasional sub-angular and sub-rounded chalk cobbles.
				3.60	41.70		End of Pit at 3.600m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks: 1. No groundwater encountered. 2. HVP= Hand Vane Measurements (in kPa). 3. PP=ELE Pocket Penetrometer. 4. Upon completion backfilled with arisings. 5. Equipment: JCB 3CX.

Stability: Stable.

Geo Environmental Group

Borehole Log

Borehole No. **CP01**

Sheet 1 of 2

Project Name:	The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords:	611790E - 274991N	Hole Type BH
Location:	Mellis Road, Yaxley, Eye, IP23 8DB		Level:	45.70 m AOD	Scale 1:50
Client:	Conrad Energy		Dates:	25/11/2022	Logged By CM

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.00 - 0.50	B		0.00			Soft brown sandy silty CLAY. (TOPSOIL)
		0.50 - 1.00	B		0.50	45.70		Medium dense yellowish brown clayey slightly silty fine to coarse SAND. (LOWESTOFT FORMATION - DIAMICTON)
		1.20 - 1.65	D					
		1.20	SPT	N=13 (1,2/3,3,3,4)	1.30	45.20		
		1.30 - 1.80	B					Firm grey mottled brown locally sandy gravelly silty CLAY. Sand is fine. Gravel is sub angular to angular fine chalk. (LOWESTOFT FORMATION - DIAMICTON)
		1.80	D					
		2.00 - 2.45	U	Ublow=46				*2.00 - 2.45m : (QUT 57 kPa).*
		2.45 - 2.50	D					
		3.00 - 3.45	D					
		3.00	SPT	N=20 (1,3/4,3,5,8)				*3.00-3.80m Becoming stiff.*
		3.50	D					
					3.80	44.40		Stiff very dark grey slightly gravelly silty CLAY. Gravel is sub angular to angular fine chalk. (LOWESTOFT FORMATION - DIAMICTON)
		4.00 - 4.45	D					
		4.00	SPT	N=25 (3,4/5,6,7,7)				
		4.50 - 5.00	B		4.50	41.90		Firm greyish brown mottled grey slightly sandy slightly gravelly silty CLAY. Sand is fine. Gravel is sub angular to angular fine to medium chalk. (LOWESTOFT FORMATION - DIAMICTON)
		5.00 - 5.45	U	Ublow=77				
		5.45 - 5.50	D					
		6.00 - 6.45	D					
		6.00	SPT	N=26 (2,3/3,5,8,10)				*6.00-6.50m Becoming stiff.*
		6.50 - 7.00	B		6.50	41.20		Medium dense orangish brown slightly gravelly SAND. Sand is fine to coarse. Gravel is sub angular to angular fine to medium chalk. (LOWESTOFT FORMATION - DIAMICTON)
		7.00 - 7.45	D					
		7.00	SPT	N=14 (2,2/3,3,4,4)				
		7.30 - 7.80	B		7.30	39.20		Firm light orangish brown very sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is sub angular to angular fine chalk. (LOWESTOFT FORMATION - DIAMICTON)
		8.00 - 8.50	B					
		8.00 - 8.50	UF	Ublow=100				
		8.50	D					
		9.00 - 9.45	D					
		9.00	SPT	N=25 (3,4/8,6,6,5)				
		9.50	D		9.20	38.40		Stiff light orangish brown very sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is sub angular to angular fine chalk. (LOWESTOFT FORMATION - DIAMICTON)
		10.00 - 10.45	D		10.00	36.50		

Remarks

1. Hand excavated service pit to 1.20 m. 2. N=SPT/CPT 'N'Value. 3. Borehole refused on very denes SAND. 4. Borehole cased (150mm) to 1.40m. 4. 50mm standpipe installed 13.80m, response zone 13.80-1.00m, bentonite seal 1.00-0.30m, flush cover concreted 0.30-0.00m. 5. Groundwater encountered at 1.30m and 13.20m as moderate inflow, rising to 0.90m and 11.00m after 20 minutes of monitoring. 6. Equipment used: Dando 3000 cable percussive rig.

Geo Environmental Group

Borehole Log

Borehole No. **CP01** Sheet 2 of 2

Project Name:	The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611790E - 274991N	Hole Type BH
Location:	Mellis Road, Yaxley, Eye, IP23 8DB		Level: 45.70 m AOD	Scale 1:50
Client:	Conrad Energy		Dates: 25/11/2022	Logged By CM

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		10.00	SPT	N=15 (3,4/3,4,4,4)				Firm to stiff dark brown locally mottled grey very sandy slightly gravelly silty CLAY. Sand is fine. Gravel is sub angular to angular fine chalk. (LOWESTOFT FORMATION - DIAMICTON)
		10.60 - 11.00	B		10.60	35.70		Very stiff orangish brown and light grey sandy CLAY. Sand is fine. Gravel is sub angular to angular fine to medium flint. (POSSIBLE CRAG GROUP)
	▼	11.00 - 11.45	D					
		11.00	SPT	N=41 (4,6/8,9,10,14)				
		12.00 - 12.45	D					
		12.00	SPT	N=25 (2,3/5,6,6,8)	12.10	35.10		Stiff greenish blue and brown laminated SILT. (POSSIBLE CRAG GROUP)
		12.10 - 12.60	B					
	▽	13.00 - 13.45	D					
		13.00	SPT	N=40 (5,6/8,9,11,12)	13.20	33.60		Dense thickly laminated orangish brown, brown and greenish grey very silty SAND with rare sub angular to angular fine to medium flint. (POSSIBLE CRAG GROUP)
		13.80	SPT	50 (6,12/50 for 197mm)				*13.80-14.15m Becoming very dense.*
					14.15	32.50		End of Borehole at 14.150m

Remarks

1. Hand excavated service pit to 1.20 m. 2. N=SPT/CPT 'N'Value. 3. Borehole refused on very denes SAND. 4. Borehole cased (150mm) to 1.40m. 4. 50mm standpipe installed 13.80m, response zone 13.80-1.00m, bentonite seal 1.00-0.30m, flush cover concreted 0.30-0.00m. 5. Groundwater encountered at 1.30m and 13.20m as moderate inflow, rising to 0.90m and 11.00m after 20 minutes of monitoring. 6. Equipment used: Dando 3000 cable percussive rig.

Geo Environmental Group

Borehole Log

Borehole No. **CP02**

Sheet 1 of 2

Project Name:	The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords:	611845E - 274976N	Hole Type BH
Location:	Mellis Road, Yaxley, Eye, IP23 8DB		Level:	46.40 m AOD	Scale 1:50
Client:	Conrad Energy		Dates:	16/11/2022	Logged By CM

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.00 - 0.50	B		0.00			Soft brown sandy silty CLAY. (TOPSOIL)
		0.60 - 1.10	B		0.60	46.40		Firm light brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is sub angular to angular fine chalk. (LOWESTOFT FORMATION - DIAMICTON)
		1.20 - 1.65	D		1.10	45.80		Firm grey mottled brown slightly sandy gravelly silty CLAY. Sand is fine. Gravel is sub angular to angular fine to medium chalk. (LOWESTOFT FORMATION - DIAMICTON)
		1.20 - 1.70	B					
		1.20	SPT	N=12 (1,2/2,3,3,4)				
		1.80	D					
		2.00 - 2.45	U	Ublow=100				*2.00 - 2.45:m: (LAB HSV 58 kPa)*
		2.45 - 2.50	D					
	▼	3.00 - 3.45	D		3.00	45.30		Firm very dark grey slightly sandy gravelly silty CLAY. Sand is fine. Gravel is sub angular to angular fine chalk. (LOWESTOFT FORMATION - DIAMICTON)
		3.00	SPT	N=12 (2,2/2,3,3,4)				
		3.50	D					
		4.00 - 4.45	D					*4.40-4.60m Becoming stiff.*
		4.00	SPT	N=28 (10,7/5,7,8,8)				
		4.50	D					
		4.60 - 5.00	B		4.60	43.40		Firm dark grey slightly sandy gravelly silty CLAY. Sand is fine. Gravel is sub angular to angular fine chalk. (LOWESTOFT FORMATION - DIAMICTON)
		5.00 - 5.45	U	Ublow=100				*5.00 - 5.45:m (QUT 64 kPa).*
		5.45 - 5.50	D					
		6.00 - 6.45	D		5.70	41.80		Stiff orangish brown slightly silty sandy slightly gravelly CLAY. Sand is fine. Gravel is sub angular to angular fine chalk and rare flint. (LOWESTOFT FORMATION - DIAMICTON)
		6.00	SPT	N=22 (3,4/5,5,6,6)				
		7.00 - 7.45	D		6.80	40.70		Very loose to loose fine yellowish brown silty gravelly SAND. Sand is fine to medium. Gravel is sub angular to angular fine to coarse chalk and flint. (POSSIBLE CRAG GROUP)
		7.00	SPT	N=4 (1,0/1,1,1,1)				
		7.50 - 7.95	B					
		8.00 - 8.45	U	Ublow=100	7.95	39.60		Firm brown slightly sandy silty gravelly CLAY. Gravel is sub angular to angular fine to medium flint and chalk. (POSSIBLE CRAG GROUP)
		8.00 - 8.50	B					
		8.50	D					
		9.00 - 9.45	D					*9.00-9.70m Becoming stiff.*
		9.00	SPT	N=20 (1,3/4,4,6,6)				
		9.50 - 9.94	D					*9.50-9.70m Becoming very stiff.*
		9.50	SPT	N=50 (4,11/50 for 291mm)	9.70	38.45		Very dense orangish brown slightly clayey gravelly SAND. Sand is medium to coarse. Gravel is sub
					9.94	36.70		

Remarks

1. Hand excavated service pit to 1.20 m. 2. N=SPT/CPT 'N'Value. 3. Borehole refused on very denes SAND. 4. Borehole cased (150mm) to 1.00m. 4. 50mm standpipe installed 9.50m, response zone 9.50-1.00m, bentonite seal 1.00-0.30m, flush cover concreted 0.30-0.00m. .5. Groundwater encountered at 3.00m as seepage. 6. Equipment used: Dando 3000 cable percussive rig.

Geo Environmental Group

Borehole Log

Borehole No.
CP02
Sheet 2 of 2

Project Name:	The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords:	611845E - 274976N	Hole Type BH
Location:	Mellis Road, Yaxley, Eye, IP23 8DB		Level:	46.40 m AOD	Scale 1:50
Client:	Conrad Energy		Dates:	16/11/2022	Logged By CM

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Very dense orangish brown slightly clayey gravelly SAND. Sand is medium to coarse. Gravel is sub angular to angular fine to coarse flint. (POSSIBLE CRAG GROUP)
								End of Borehole at 9.940m

10.5
11.0
11.5
12.0
12.5
13.0
13.5
14.0
14.5
15.0
15.5
16.0
16.5
17.0
17.5
18.0
18.5
19.0
19.5

Remarks

1. Hand excavated service pit to 1.20 m. 2. N=SPT/CPT 'N'Value. 3. Borehole refused on very denes SAND. 4. Borehole cased (150mm) to 1.00m. 4. 50mm standpipe installed 9.50m, response zone 9.50-1.00m, bentonite seal 1.00-0.30m, flush cover concreted 0.30-0.00m. .5. Groundwater encountered at 3.00m as seepage. 6. Equipment used: Dando 3000 cable percussive rig.

Geo Environmental Group

Borehole Log

Borehole No. **CP03**

Sheet 1 of 2

Project Name:	The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611887E - 274965N
Location:	Mellis Road, Yaxley, Eye, IP23 8DB		Level: 46.70 m AOD
Client:	Conrad Energy		Dates: 14/11/2022

Hole Type: BH | Scale: 1:50 | Logged By: CM

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.00 - 0.50	B		0.00			Soft brown sandy silty CLAY. (TOPSOIL)
		0.70 - 1.20	B		0.70	46.70		Firm bluish grey mottled light brown gravelly silty CLAY. Gravel is sub angular to angular fine to medium chalk. (LOWESTOFT FORMATION - DIAMICTON)
		1.20 - 1.65 1.20	D SPT	N=11 (2,2/2,3,3,3)				
		1.70 - 2.00	B		1.70	46.00		Stiff grey mottled brown very sandy slightly gravelly silty CLAY. Sand is fine. Gravel is sub angular to angular fine to medium chalk. (LOWESTOFT FORMATION - DIAMICTON)
		2.00 - 2.45	U	Ublow=65				*2.00 - 2.45m: (QUT 89 kPa).*
		2.45 - 2.50	D					
		3.00 - 3.45 3.00	D SPT	N=17 (2,5/4,5,4,4)				
	▼	3.50	D					
		4.00 - 4.45 4.00	D SPT	N=25 (3,3/6,6,7,6)	4.20	45.00		Stiff very dark grey very gravelly silty CLAY. Gravel is sub angular to angular fine to medium chalk. (LOWESTOFT FORMATION - DIAMICTON)
		4.50	D					
		5.00 - 5.45	U	Ublow=100				
		5.45 - 5.50 5.50 - 6.00	D B		5.30	42.50		Stiff orangish brown slightly sandy slightly gravelly silty CLAY. Sand is fine. Gravel is sub angular to angular fine to medium chalk. (LOWESTOFT FORMATION - DIAMICTON)
		6.00 - 6.45 6.00	D SPT	N=19 (3,3/4,6,5,4)				
		6.50	D					
		7.00 - 7.45 7.00	D SPT	N=15 (3,3/3,4,4,4)				*7.00-7.50m Becoming firm to stiff.*
		7.50 - 8.00	B		7.50	41.40		Firm light brown becoming orangish brown silty gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is sub angular to angular fine to medium chalk. (LOWESTOFT FORMATION - DIAMICTON)
		8.00 - 8.45 8.00	D SPT	N=20 (4,4/5,5,5,5)				
		8.50	D					
		9.00 - 9.45 9.00 9.10 - 9.60	D SPT B	N=11 (2,1/1,3,3,4)	9.10	39.20		Firm brown very sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is sub angular fine chalk. (LOWESTOFT FORMATION - DIAMICTON)
		10.00 - 10.50	B		10.00	37.60		

Remarks

1. Hand excavated service pit to 1.20 m. .2. N=SPT/CPT 'N'Value. 3. Borehole refused on very stiff CLAY. 4 Borehole cased (150mm) to 3.00m. 4. 50mm standpipe installed 11.00m, response zone 11.00-1.00m, bentonite seal 1.00-0.30m, flush cover concreted 0.30-0.00m. 5. Groundwater encountered at 3.45m as seepage. 6. Equipment used: Dando 3000 cable percussive rig.

Geo Environmental Group

Borehole Log

Borehole No.
CP03
Sheet 2 of 2

Project Name:	The Leys and Ivy Farm, Yaxley	Project No. GEG-22-742	Co-ords: 611887E - 274965N	Hole Type BH
Location:	Mellis Road, Yaxley, Eye, IP23 8DB		Level: 46.70 m AOD	Scale 1:50
Client:	Conrad Energy		Dates: 14/11/2022	Logged By CM

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.00 - 10.50	UF	Ublow=100				Firm orangish brown very sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is sub angular fine flint. (POSSIBLE CRAG GROUP)
		10.50	D					
		11.00 - 11.45	D					*11.00-12.08m Becoming very stiff.*
		11.00	SPT	N=36 (3,4/8,8,10,10)				
		11.70	SPT	50 (8,8/50 for 225mm)				
					12.08	36.70		End of Borehole at 12.080m

10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5 19.0 19.5

Remarks

1. Hand excavated service pit to 1.20 m. .2. N=SPT/CPT 'N'Value. 3. Borehole refused on very stiff CLAY. 4 Borehole cased (150mm) to 3.00m. 4. 50mm standpipe installed 11.00m, response zone 11.00-1.00m, bentonite seal 1.00-0.30m, flush cover concreted 0.30-0.00m. 5. Groundwater encountered at 3.45m as seepage. 6. Equipment used: Dando 3000 cable percussive rig.

Appendix C Drainage Strategy

Haydn Evans drawing 306-006-D100 – Surface Water Drainage Design

Haydn Evans drawing 306-006-D101 – Drainage Details Sheet 1 of 2

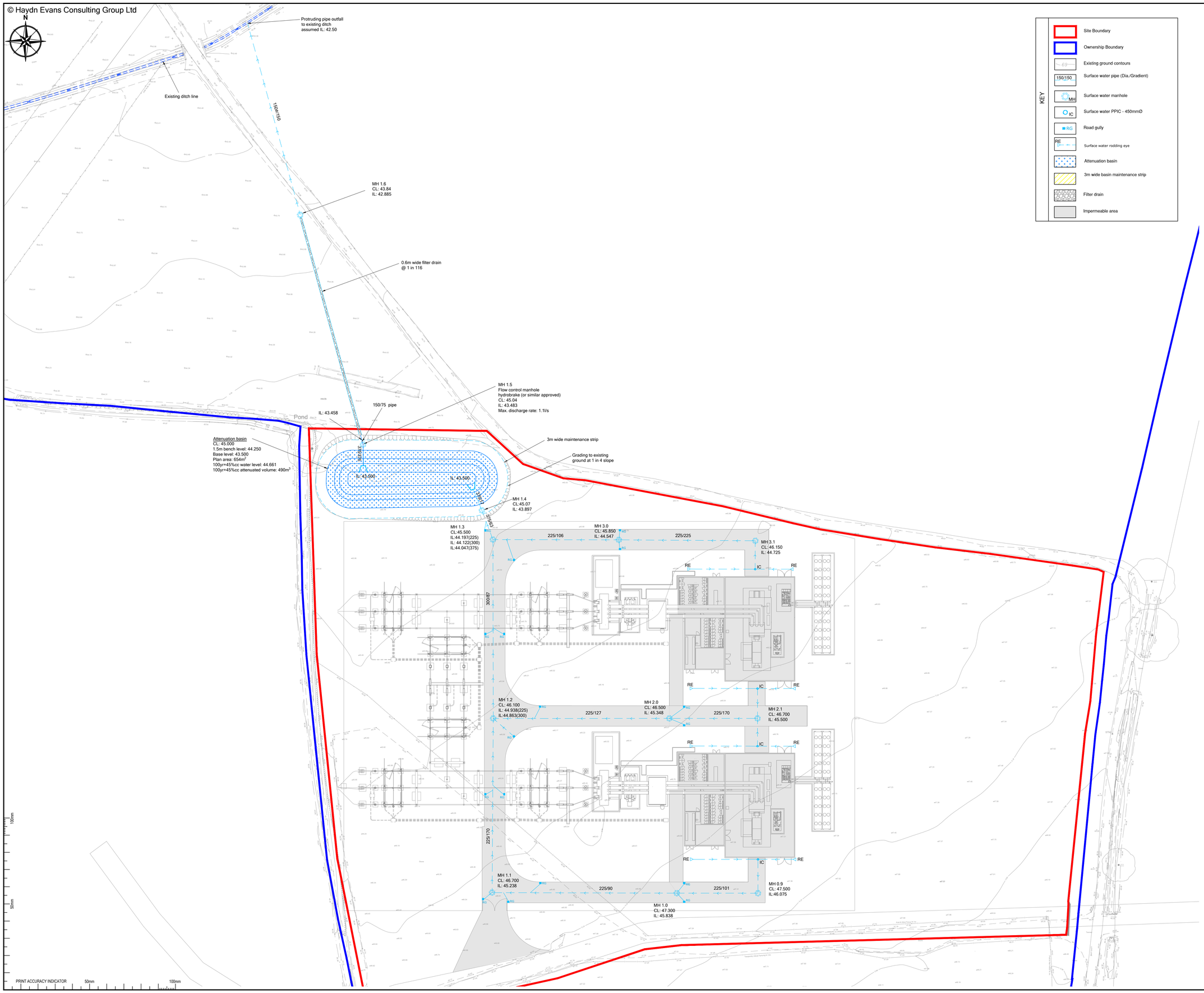
Haydn Evans drawing 306-006-D102 – Drainage Details Sheet 2 of 2

Haydn Evans drawing 306-006-D103 – Detention Pond Details

Surface water drainage calculations

SuDS Management & Maintenance Plan

SCC correspondence



PRINT ACCURACY INDICATOR 50mm 100mm

Notes

1. All private drainage works shall be in accordance with 'The Building Regulations Approved Document H' and British Standard EN 752.
2. Prior to commencement of the works the contractor shall liaise with all relevant authorities to obtain their requirements and to obtain approval for his method of working and where appropriate his intended choice of materials.
3. Refer to site survey for details of existing site conditions and bench marks.
4. Prior to commencement of the works the contractor shall liaise with all relevant authorities to locate, protect and where necessary divert all existing services affected by the works.
5. All excavations shall be kept free of standing water.
6. The contractor shall ensure the stability of all excavations is maintained at all times.
7. Prior to commencement of the works all drainage outfall points, whether existing sewer, drain or watercourse, shall be verified on site by the contractor. If the outfall point is found to be higher or significantly lower than shown on the drawings then the contract administrator shall be notified immediately (significant redesign of drainage and levels may be necessary). Prior to commencement of construction on-site the contractor shall install all off-site drainage connections, or satisfy himself that there are no obstructions or other reasons preventing the drain connections being made.
8. All cover levels shown on this drawing are approximate. Exact levels of new covers and frames to be determined on site to match level and profile of finished surface.
9. The construction of all existing chambers, gullies etc. and their covers, gratings and frames to be improved, repaired or replaced as necessary to suit their location within the finished development.
10. All covers, gratings and frames to chambers, gullies, channels etc. shall be of the correct load class to suit their location.

    - Load class A15 pedestrian areas (not accessible by vehicles)
    - Load class B125 private drives
    - Load class C250 basements / parking bays / lightly trafficked roads.
    - Load class D400 main roads

    Gratings in pedestrian areas to be designed for pedestrian use.
11. All existing chambers, gullies channels, pipes and other drainage apparatus shall be protected from damage during the works. The contractor shall take all necessary measures to ensure that no material enters the drains (other than that which they are designed to carry).
12. Refer to site investigation report for existing ground conditions and any special requirements for buried concrete (special requirements for buried concrete shall include all pre-cast and in-situ concrete and mortars). Where appropriate refer to contamination reports for details of chemicals affecting choice of materials and other additional requirements.
13. All pre-cast and in-situ concrete and mortars used in the construction of foul drains and sewers shall be made from sulphate resisting cement.
14. Unless noted otherwise all pipework shall be 100mm diameter laid to a fall of 1 in 100 or steeper for surface water and 1 in 40 or steeper for foul water.
15. Unless noted otherwise all pipework shall be constructed from 'super strength' vitrified clay to BS 65,BS EN 295 or UPVC to BS EN 1201 bedded and backfilled as per the manufacturers recommendations and the above listed publications.
16. The contractor's attention is drawn to diagrams 7 and 8 of 'The Building Regulations Approved Document H' showing details of drains laid below and near to buildings. Where ground beams are used, their level shall be set to avoid clashing with drain connections.
17. Exact location of gullies to be determined on site to suit low points. The contractor shall ensure that all finished surface are laid to falls that are sufficient for all surface water to drain without surface ponding.
18. Rainwater downpipes that do not connect directly to an access point shall be fitted with a rodding access.
19. Access fittings, inspection chambers and manholes shall be constructed to the dimensions shown in tables 11 and 12 of 'The Building Regulations Approved Document H' and from the materials listed in table 14. Access points, inspection chambers and manholes shall be constructed from products designed/rated for the location in which they are to be used. They shall be installed in accordance with the manufacturers/suppliers recommendations.

Rev'n	Date	Description	Drawn	Chk'd	App'd
P01	24.03.23	Initial Issue	RT	BH	BH

Status: FOR APPROVAL

HAYDN EVANS
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Crown Street, Ipswich, IP1 3LG
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www.haydnevans.co.uk
mail@haydnevans.co.uk

Client: CONRAD ENERGY

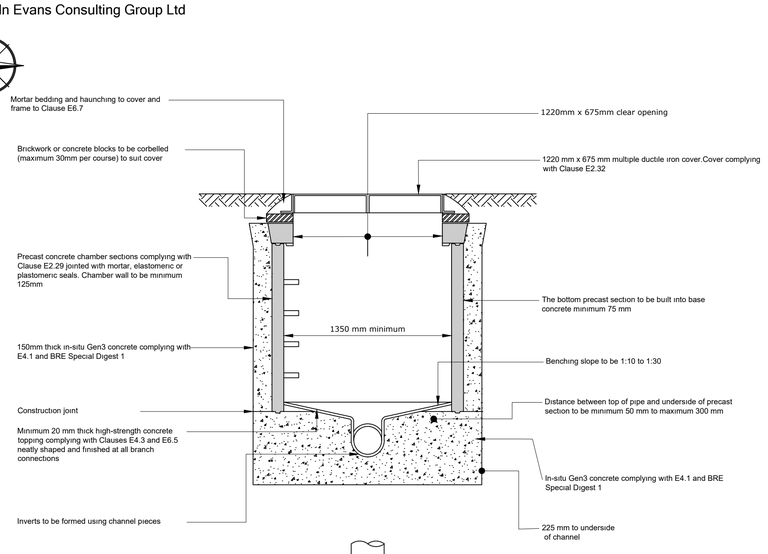
Project: YAXLEY

Drawing title: SURFACE WATER DRAINAGE DESIGN

Scale	Drawn	Checked	Approved	Date
1:500 @ A1	RT	BH		DEC 2022

Drawing no.: 306-006-D100

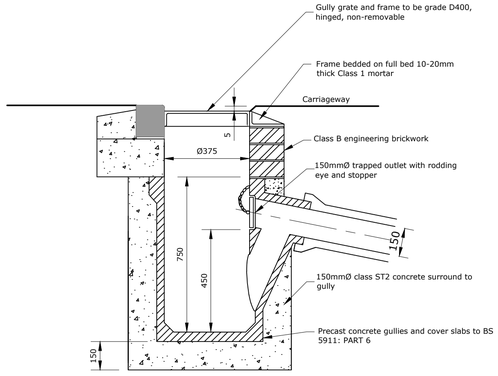
Revision: P01



TYPICAL MANHOLE DETAIL

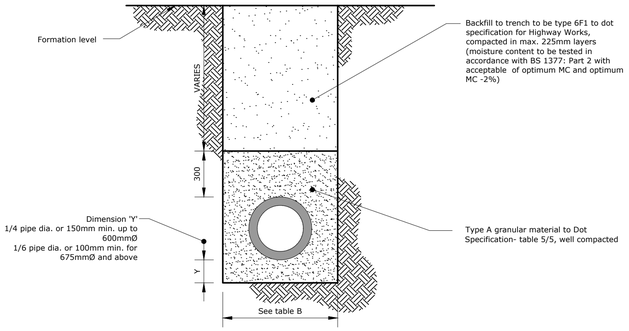
Depth from cover level to soffit of pipe less than 1.5m

1:20



ROAD GULLY DETAIL

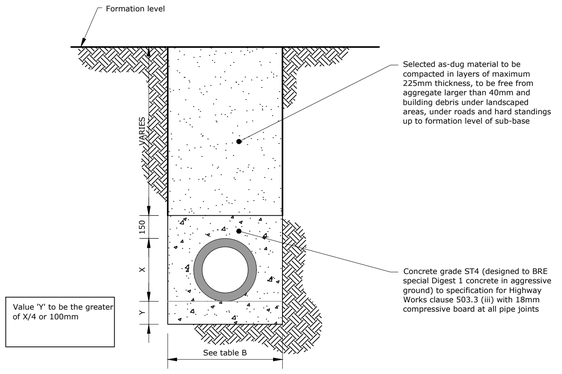
1:20



CLASS S BEDDING

1:20

For concrete/clay pipes with greater than 1200mm cover in Highways



CLASS Z BEDDING

1:20

For concrete/clay pipes with less than 1200mm cover in Highways, or less than 900mm in soft landscaping

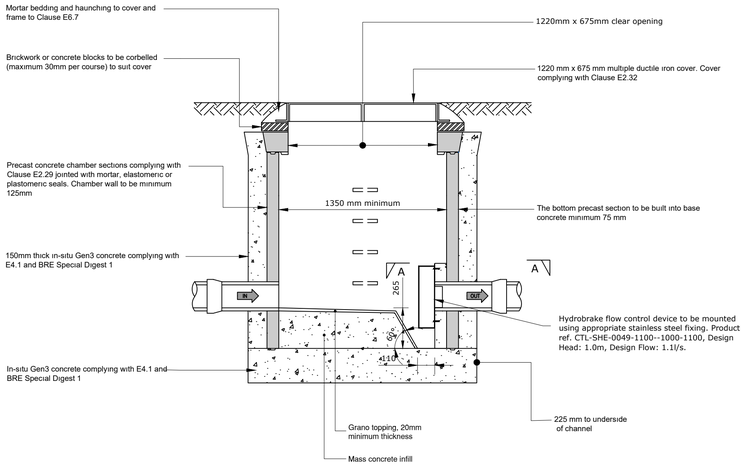
Diameter of largest pipe in manhole (mm)	Internal diameter of manhole (mm)
Less than 375	1350
375 - 700	1500
750 - 900	1800
Greater than 900	Consult undertaker

TABLE A - MANHOLE RING DIAMETERS

BEDDING FOR CONVEYANCE PIPES

Pipe dia.	150	225	300	375	450	525	600
Min. width	600	700	750	1050	1150	1200	1350

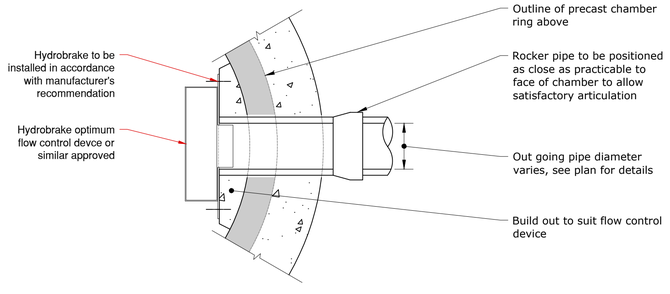
TABLE B - TRENCH WIDTHS



FLOW CONTROL MANHOLE DETAIL

(REF. SHE-0049-1100-1000-1100)

1:20



PLAN A-A ON FLOW CONTROL DETAIL

1:10

PRINT ACCURACY INDICATOR 50mm 100mm

Notes

1. All private drainage works shall be in accordance with 'The Building Regulations Approved Document H' and British Standard EN 752.
2. Prior to commencement of the works the contractor shall liaise with all relevant authorities to obtain their requirements and to obtain approval for his method of working and where appropriate his intended choice of materials.
3. Refer to site survey for details of existing site conditions and bench marks.
4. Prior to commencement of the works the contractor shall liaise with all relevant authorities to locate, protect and where necessary divert all existing services affected by the works.
5. All excavations shall be kept free of standing water.
6. The contractor shall ensure the stability of all excavations is maintained at all times.
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8. All cover levels shown on this drawing are approximate. Exact levels of new covers and frames to be determined on site to match level and profile of finished surface.
9. The construction of all existing chambers, gullies etc. and their covers, gratings and frames to be improved, repaired or replaced as necessary to suit their location within the finished development.
10. All covers, gratings and frames to chambers, gullies, channels etc. shall be of the correct load class to suit their location.
    - Load class A15 pedestrian areas (not accessible by vehicles)
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Rev'n	Date	Description	Drawn	Chk'd	App'd
P01	24.04.23	Initial issue	RT	BH	BH

Status: FOR APPROVAL

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Client: CONRAD ENERGY

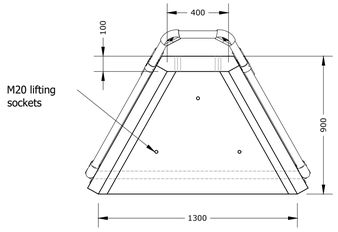
Project: YAXLEY

Drawing title: DRAINAGE DETAILS SHEET 1 OF 2

Scale	Drawn	Checked	Approved	Date
AS SHOWN @ A1	RT			DEC 2022

Drawing no.: 306-006-D101

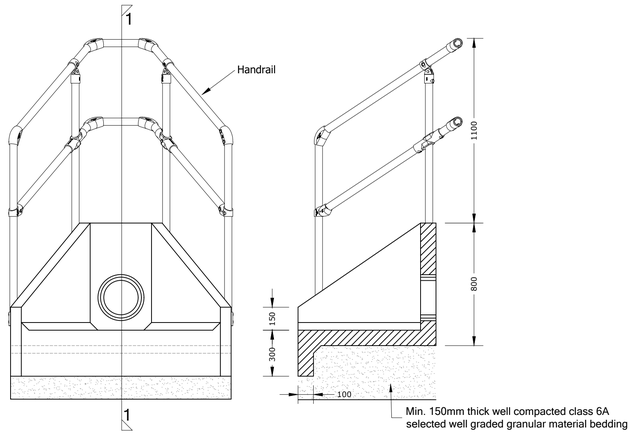
Revision: P01



PLAN

HANDRAIL SPECIFICATION

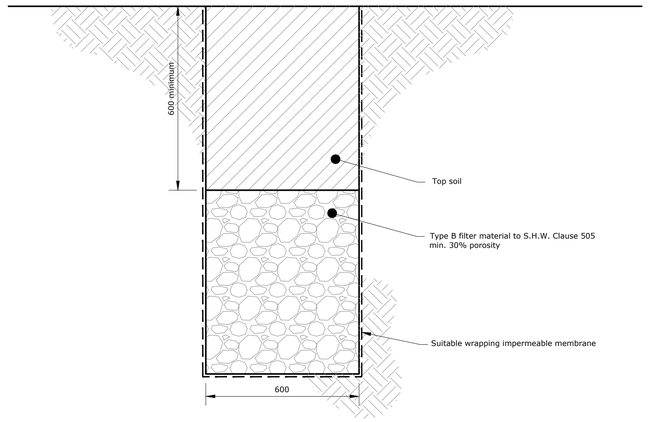
1. Kee Klamp galvanised size 8 fittings,
2. Size 8 48.3mm OD 3.2mm wall thickness galvanised medium duty tube to BS EN 10255,
3. 360n/m design load as stated in BS 8118, BS 6180, BS 6399 & BS 7818, Civil Engineering Specification for the Water Industry (CESWI),
4. Handrail fixed to handwall to manufacturer's specification.



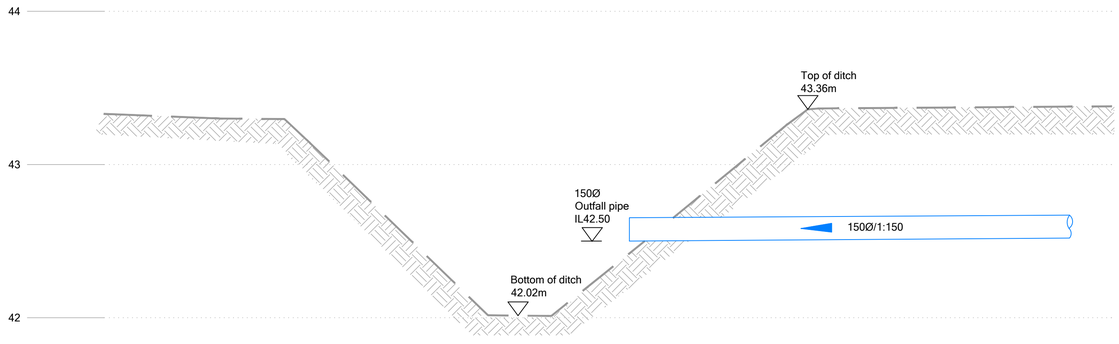
ELEVATION

SECTION 1-1

TYPICAL HEADWALL DETAIL
ALTHON H3C PRECAST CONCRETE HEADWALL
1:20
Refer to manufacturer's details for further information



TYPICAL SECTION THROUGH FILTER DRAIN
1:10



SECTION THROUGH OUTFALL DITCH
1:20

Notes

1. All private drainage works shall be in accordance with 'The Building Regulations Approved Document H' and British Standard EN 752.
2. Prior to commencement of the works the contractor shall liaise with all relevant authorities to obtain their requirements and to obtain approval for his method of working and where appropriate his intended choice of materials.
3. Refer to site survey for details of existing site conditions and bench marks.
4. Prior to commencement of the works the contractor shall liaise with all relevant authorities to locate, protect and where necessary divert all existing services affected by the works.
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Rev'n	Date	Description	Drawn	Chk'd	App'd
P01	24.04.23	Initial issue	RT	BH	BH

Status: FOR APPROVAL

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Client: CONRAD ENERGY

Project: YAXLEY

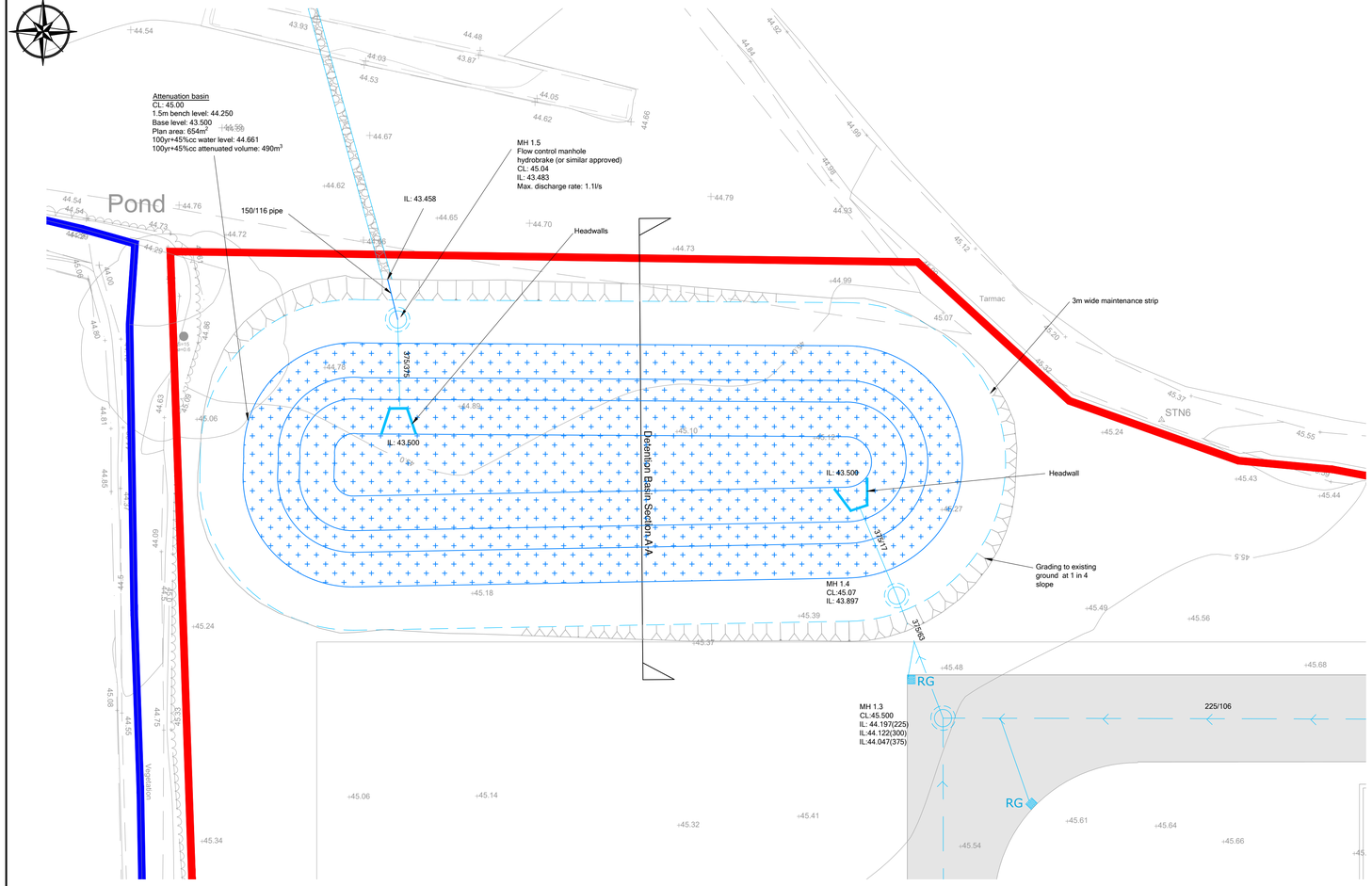
Drawing title: DRAINAGE DETAILS
SHEET 2 OF 2

Scale	Drawn	Checked	Approved	Date
AS SHOWN @ A1	RT			DEC 2022

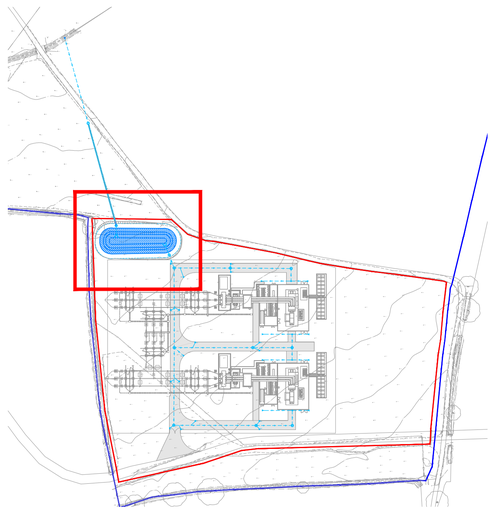
Drawing no.: 306-006-D102

Revision: P01

PRINT ACCURACY INDICATOR 50mm 100mm



DETENTION BASIN PLAN
SCALE 1:200



LOCATION PLAN
N.T.S

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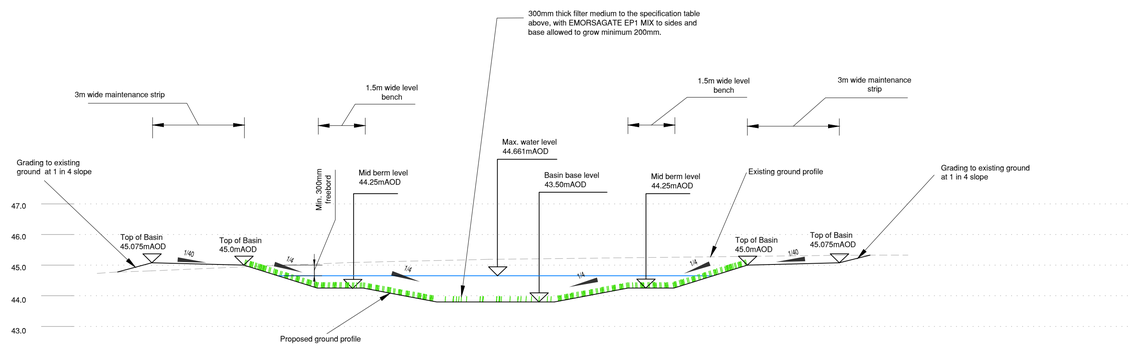
In addition to the sieve size, the filter material shall comply as below:

- The filter medium should well-grade and the composition contain limited particle size range,
- The organic matter content should be 3-5% (w/w),
- ph-should be 5.5-8.5 (1:2.5 soil water extract),
- Total nitrogen should be 0.10-0.30%,
- Extractable phosphorus should be 16-100mg/l,
- Extractible pothassium should be 120-900mg/l

(Methods of analysis in accordance.with BS 3882:2015, unless otherwise stated)

Filter Medium Topsoil		
Soil Type	Sieve Size (mm)	% Passing
Clay and Silt	0.06	less than 5
Fine Sand	0.063 - 0.2	less than 20
Medium Sand	0.2 - 0.6	35-65
Coarse Sand	0.6 - 2.0	50-60
Fine Gravel	2.0 - 6.0	less than 10



TYPICAL SECTION A-A THROUGH DETENTION POND
SCALE 1:200

PRINT ACCURACY INDICATOR 50mm 100mm

P01	24.04.23	Initial issue	RT	BH	BH
Rev'n	Date	Description	Drawn	Chk'd	App'd

Status: FOR APPROVAL

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Client: CONRAD ENERGY

Project: YAXLEY

Drawing title: DETENTION POND DETAILS

Scale	Drawn	Checked	Approved	Date
1:200 @ A1	RT			DEC 2022

Drawing no.: 306-006-D103

Revision: P01

Design Settings

Rainfall Methodology	FEH-99	Time of Entry (mins)	3.00
Return Period (years)	100	Maximum Time of Concentration (mins)	30.00
Additional Flow (%)	45	Maximum Rainfall (mm/hr)	50.0
C (1km)	-0.023	Minimum Velocity (m/s)	1.00
D1 (1km)	0.279	Connection Type	Level Soffits
D2 (1km)	0.319	Minimum Backdrop Height (m)	0.200
D3 (1km)	0.285	Preferred Cover Depth (m)	1.200
E (1km)	0.312	Include Intermediate Ground	✓
F (1km)	2.469	Enforce best practice design rules	x
CV	0.750		

Nodes

Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
0.9	0.048	3.00		47.500	1200	611870.894	274911.715	1.425
1.0	0.030	3.00		47.300	1200	611847.000	274911.000	1.462
1.1	0.057	3.00		46.700	1200	611793.000	274911.000	1.462
2.1	0.096	3.00		46.700	1200	611870.769	274962.558	1.200
2.0	0.043	3.00		46.500	1200	611845.000	274962.000	1.152
1.2	0.063	3.00		46.100	1200	611793.000	274962.000	1.237
3.1	0.048	3.00		46.150	1200	611870.137	275014.235	1.425
3.0	0.032	3.00		45.850	1200	611830.000	275014.000	1.303
1.3	0.059	3.00		45.500	1200	611793.000	275014.000	1.453
1.4	0.000	3.00	0.0	45.070	1200	611790.541	275023.078	1.173
Basin	0.062	3.00		45.000	1	611789.461	275036.095	1.500
1.5	0.000	3.00		45.040	1200	611755.957	275042.214	1.557
1.6	0.000	3.00		43.840	1200	611737.649	275109.042	0.955
Outfall	0.000	3.00		43.300	1	611722.335	275164.724	0.800

Links (Results)

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
0.900	1.302	51.7	9.4	1.200	1.237	0.048	0.0	65	0.993
1.000	1.379	54.8	15.3	1.237	1.237	0.078	0.0	81	1.187
1.001	1.000	39.7	26.5	1.237	0.937	0.135	0.0	135	1.069
2.100	1.001	39.8	18.9	0.975	0.927	0.096	0.0	109	0.989
2.000	1.159	46.1	27.3	0.927	0.937	0.139	0.0	124	1.206
1.002	1.879	132.8	66.2	0.937	1.078	0.337	0.0	150	1.877
3.100	0.867	34.5	9.4	1.200	1.078	0.048	0.0	80	0.742
3.000	1.271	50.5	15.7	1.078	1.078	0.080	0.0	86	1.123
1.004	2.291	253.1	93.5	1.078	0.798	0.476	0.0	158	2.127
1.005_1	4.477	494.5	93.5	0.798	1.125	0.476	0.0	109	3.468
1.005	0.929	102.7	105.7	1.125	1.182	0.538	0.0	321	1.050
1.006	0.932	16.5	105.7	1.407	0.805	0.538	0.0	150	0.950
1.007	0.818	14.5	105.7	0.805	0.650	0.538	0.0	150	0.833

Simulation Settings

Rainfall Methodology	FEH-99	F (1km)	2.469	Additional Storage (m³/ha)	20.0
C (1km)	-0.023	Summer CV	0.750	Check Discharge Rate(s)	x
D1 (1km)	0.279	Winter CV	0.840	Check Discharge Volume	✓
D2 (1km)	0.319	Analysis Speed	Normal	100 year 360 minute (m³)	73
D3 (1km)	0.285	Skip Steady State	x		
E (1km)	0.312	Drain Down Time (mins)	240		

Storm Durations

60	180	360	600	960	2160	4320	7200	10080
120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	0	0	0
100	45	0	0

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)	0.286	Storm Duration (mins)	360
Soil Index	4	Betterment (%)	0
SPR	0.47	PR	0.408
CWI	84.360	Runoff Volume (m³)	73

Node 1.5 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	43.483	Product Number	CTL-SHE-0051-1300-1200-1300
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.3	Min Node Diameter (mm)	1200

Node Basin Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.0	Invert Level (m)	43.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	143.3	0.0	0.600	325.7	0.0	0.601	502.0	0.0	1.500	770.2	0.0

Node 1.5 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Link	1.005
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	43.483	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	100

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.70%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	0.9	32	46.121	0.046	4.8	0.0831	0.0000	OK
60 minute summer	1.0	32	45.895	0.057	7.8	0.0872	0.0000	OK
60 minute summer	1.1	33	45.327	0.089	13.4	0.1699	0.0000	OK
60 minute summer	2.1	32	45.577	0.077	9.6	0.2093	0.0000	OK
60 minute summer	2.0	33	45.432	0.084	13.9	0.1581	0.0000	OK
60 minute summer	1.2	33	44.965	0.102	32.0	0.2196	0.0000	OK
60 minute summer	3.1	32	44.782	0.057	4.8	0.1020	0.0000	OK
60 minute summer	3.0	33	44.607	0.060	8.0	0.0977	0.0000	OK
60 minute summer	1.3	33	44.169	0.122	45.3	0.2363	0.0000	OK
60 minute summer	1.4	33	43.977	0.080	45.3	0.0901	0.0000	OK
960 minute winter	Basin	915	43.899	0.399	5.5	81.5889	0.0000	SURCHARGED
960 minute winter	1.5	915	43.899	0.416	1.1	0.4707	0.0000	SURCHARGED
60 minute summer	1.6	262	42.912	0.027	1.0	0.0308	0.0000	OK
60 minute summer	Outfall	262	42.527	0.027	1.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	0.9	0.900	1.0	4.8	0.710	0.093	0.1629	
60 minute summer	1.0	1.000	1.1	7.7	0.702	0.140	0.6006	
60 minute summer	1.1	1.001	1.2	12.8	0.892	0.323	0.7331	
60 minute summer	2.1	2.100	2.0	9.6	0.757	0.242	0.3279	
60 minute summer	2.0	2.000	1.2	13.5	1.009	0.293	0.6961	
60 minute summer	1.2	1.002	1.3	32.1	1.546	0.242	1.0802	
60 minute summer	3.1	3.100	3.0	4.8	0.589	0.139	0.3269	
60 minute summer	3.0	3.000	1.3	7.8	0.921	0.153	0.3115	
60 minute summer	1.3	1.004	1.4	45.3	1.908	0.179	0.2255	
60 minute summer	1.4	1.005_1	Basin	45.4	1.973	0.092	0.2803	
960 minute winter	Basin	1.005	1.5	1.1	0.117	0.011	0.6986	
960 minute winter	1.5	Hydro-Brake®	1.6	1.0				
60 minute summer	1.6	1.007	Outfall	1.0	0.477	0.071	0.1252	17.2

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.70%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	0.9	32	46.150	0.075	12.3	0.1356	0.0000	OK
60 minute summer	1.0	32	45.931	0.093	20.0	0.1434	0.0000	OK
60 minute summer	1.1	33	45.400	0.162	34.5	0.3097	0.0000	OK
60 minute summer	2.1	32	45.634	0.134	24.6	0.3650	0.0000	OK
60 minute summer	2.0	32	45.498	0.150	35.6	0.2823	0.0000	OK
60 minute summer	1.2	33	45.042	0.179	83.1	0.3840	0.0000	OK
60 minute summer	3.1	32	44.818	0.093	12.3	0.1686	0.0000	OK
60 minute summer	3.0	32	44.648	0.101	20.5	0.1643	0.0000	OK
60 minute summer	1.3	33	44.258	0.211	117.1	0.4098	0.0000	OK
1440 minute winter	1.4	1410	44.244	0.347	12.6	0.3921	0.0000	OK
1440 minute winter	Basin	1410	44.244	0.744	14.1	216.3818	0.0000	SURCHARGED
1440 minute winter	1.5	1410	44.244	0.761	1.1	0.8610	0.0000	SURCHARGED
1440 minute winter	1.6	1410	42.913	0.028	1.1	0.0312	0.0000	OK
1440 minute winter	Outfall	1410	42.527	0.027	1.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	0.9	0.900	1.0	12.3	0.912	0.238	0.3236	
60 minute summer	1.0	1.000	1.1	19.9	0.876	0.363	1.2330	
60 minute summer	1.1	1.001	1.2	33.2	1.120	0.836	1.5123	
60 minute summer	2.1	2.100	2.0	24.7	0.939	0.619	0.6798	
60 minute summer	2.0	2.000	1.2	34.7	1.268	0.753	1.4305	
60 minute summer	1.2	1.002	1.3	83.3	1.962	0.628	2.2093	
60 minute summer	3.1	3.100	3.0	12.3	0.750	0.358	0.6600	
60 minute summer	3.0	3.000	1.3	20.1	1.189	0.397	0.6262	
60 minute summer	1.3	1.004	1.4	117.3	2.375	0.464	0.5065	
1440 minute winter	1.4	1.005_1	Basin	13.5	1.260	0.027	0.7105	
1440 minute winter	Basin	1.005	1.5	1.1	0.117	0.010	0.6986	
1440 minute winter	1.5	Hydro-Brake®	1.6	1.1				
1440 minute winter	1.6	1.007	Outfall	1.1	0.481	0.074	0.1277	93.6

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.70%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	0.9	32	46.168	0.093	17.9	0.1681	0.0000	OK
60 minute summer	1.0	32	45.953	0.115	29.1	0.1778	0.0000	OK
60 minute summer	1.1	33	45.529	0.290	50.3	0.5551	0.0000	SURCHARGED
60 minute summer	2.1	32	45.682	0.182	35.9	0.4982	0.0000	OK
60 minute summer	2.0	33	45.582	0.234	51.7	0.4388	0.0000	SURCHARGED
60 minute summer	1.2	33	45.093	0.230	116.4	0.4938	0.0000	OK
60 minute summer	3.1	32	44.841	0.116	17.9	0.2099	0.0000	OK
60 minute summer	3.0	32	44.675	0.128	30.0	0.2072	0.0000	OK
1440 minute winter	1.3	1440	44.402	0.355	10.3	0.6905	0.0000	OK
1440 minute winter	1.4	1380	44.405	0.508	14.9	0.5742	0.0000	SURCHARGED
1440 minute winter	Basin	1410	44.403	0.903	20.0	307.2162	0.0000	SURCHARGED
1440 minute winter	1.5	1410	44.403	0.920	1.2	1.0415	0.0000	SURCHARGED
1440 minute winter	1.6	1410	42.914	0.029	1.2	0.0325	0.0000	OK
1440 minute winter	Outfall	1410	42.529	0.029	1.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	0.9	0.900	1.0	17.9	0.998	0.346	0.4302	
60 minute summer	1.0	1.000	1.1	29.0	0.918	0.529	1.6269	
60 minute summer	1.1	1.001	1.2	46.3	1.187	1.165	1.8814	
60 minute summer	2.1	2.100	2.0	35.6	0.989	0.894	0.9518	
60 minute summer	2.0	2.000	1.2	48.4	1.322	1.049	1.9340	
60 minute summer	1.2	1.002	1.3	116.3	2.081	0.875	2.9044	
60 minute summer	3.1	3.100	3.0	18.0	0.817	0.521	0.8819	
60 minute summer	3.0	3.000	1.3	29.4	1.303	0.582	0.8372	
1440 minute winter	1.3	1.004	1.4	14.9	1.208	0.059	1.0269	
1440 minute winter	1.4	1.005_1	Basin	18.7	1.284	0.038	0.7230	
1440 minute winter	Basin	1.005	1.5	1.2	0.113	0.011	0.6986	
1440 minute winter	1.5	Hydro-Brake®	1.6	1.2				
1440 minute winter	1.6	1.007	Outfall	1.2	0.493	0.080	0.1356	99.8

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.70%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	0.9	34	46.398	0.323	26.0	0.5831	0.0000	SURCHARGED
60 minute summer	1.0	34	46.356	0.518	42.4	0.7989	0.0000	SURCHARGED
60 minute summer	1.1	34	46.129	0.891	66.7	1.7031	0.0000	SURCHARGED
60 minute summer	2.1	34	46.484	0.984	52.0	2.6861	0.0000	FLOOD RISK
60 minute summer	2.0	34	46.279	0.931	64.6	1.7487	0.0000	FLOOD RISK
60 minute summer	1.2	34	45.474	0.611	146.7	1.3131	0.0000	SURCHARGED
60 minute summer	3.1	32	44.874	0.149	26.0	0.2682	0.0000	OK
60 minute summer	3.0	32	44.713	0.166	43.3	0.2699	0.0000	OK
2160 minute winter	1.3	2100	44.678	0.631	10.8	1.2254	0.0000	SURCHARGED
2160 minute winter	1.4	2160	44.678	0.781	18.4	0.8838	0.0000	SURCHARGED
2160 minute winter	Basin	2100	44.677	1.177	25.4	480.7501	0.0000	SURCHARGED
2160 minute winter	1.5	2100	44.677	1.194	1.3	1.4015	0.0000	SURCHARGED
2160 minute winter	1.6	2100	42.915	0.030	1.3	0.0345	0.0000	OK
2160 minute winter	Outfall	2100	42.530	0.030	1.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	0.9	0.900	1.0	26.1	1.061	0.504	0.9507	
60 minute summer	1.0	1.000	1.1	36.0	1.006	0.657	2.1476	
60 minute summer	1.1	1.001	1.2	56.1	1.416	1.412	2.0283	
60 minute summer	2.1	2.100	2.0	42.7	1.073	1.072	1.0251	
60 minute summer	2.0	2.000	1.2	60.8	1.530	1.320	2.0681	
60 minute summer	1.2	1.002	1.3	143.6	2.077	1.081	3.6618	
60 minute summer	3.1	3.100	3.0	26.0	0.880	0.754	1.1902	
60 minute summer	3.0	3.000	1.3	43.4	1.298	0.858	1.2817	
2160 minute winter	1.3	1.004	1.4	18.4	1.102	0.073	1.0373	
2160 minute winter	1.4	1.005_1	Basin	24.2	0.729	0.049	0.7230	
2160 minute winter	Basin	1.005	1.5	1.3	0.109	0.013	0.6986	
2160 minute winter	1.5	Hydro-Brake®	1.6	1.3				
2160 minute winter	1.6	1.007	Outfall	1.3	0.510	0.090	0.1472	155.2

Land at The Leys and Ivy Farm, Yaxley, Suffolk
SuDS Management & Maintenance Plan

1 Introduction

Sustainable Drainage Systems (SuDS) features are utilised to manage rainfall and use landscape features to deal with surface water. SuDS control the flow rate and volume of water leaving the development area and reduce pollution by intercepting silt and cleaning run-off from hard surfaces.

Like all aspects of drainage systems, SuDS components should be regularly inspected and maintained. This ensures efficient operation and reduces the likelihood of failure. The level of inspection and maintenance will vary depending on the type of SuDS component. Further information on maintenance can be found in The SuDS Manual (CIRIA publication C753).

The SuDS and drainage features for the development are to be maintained by the site owner/occupant.

2 Managing SuDS

The SuDS features have been designed for easy maintenance to comprise:

- Regular day to day care – litter collection and checking the inlets and outlets where water enters or leaves the SuDS feature.
- Occasional tasks – removing any silt that builds up, cutting back and clearing excessive vegetation growth, inspection of outlets, manholes and flow controls.
- Remedial work – repairing damage where necessary.

3 Contact

In the event of concern over any matter to do with the SuDS, please contact the site owner/occupant.

4 SuDS Maintenance

The surface water drainage system includes gullies, pipes and manholes, an attenuation basin, a flow control and a filter drain.

Surface water generated by the hardstanding area is collected by gullies and directed to the attenuation basin via a piped network. Surface water is then directed to the outfall via a flow control and a filter drain.

Table 1 below provides a breakdown of general maintenance requirements to be undertaken, appropriate to the types of SuDS and surface water drainage systems proposed at this site.

Regular Maintenance		Frequency
1	**Litter Management** Check for and pick up litter around the entire site.	Monthly or as required
2	**Inlets and Outlets** Remove silt and debris from inlets and outlets.	Quarterly or as required
3	**Respond to reported blockages, etc.**	As required
Occasional Maintenance		**Frequency**
4	**Inspection of Control Chamber** Inspection of chambers for silt build up and visually check pipes appear clear and free flowing. Remove silt as required. Jetting as required.	Annually
5	**Inspection of Attenuation** Check for blockages within the connecting pipes.	Quarterly and following heavy storms
Remedial Work		**Frequency**
6	**Inspect SuDS systems to check for damage or failure** Undertake remedial work as required.	Annually
7	**Silt control and removal** Wash or replace filter medium when required.	As required

Table 1: SuDS General Maintenance Requirements

Tables 2 to 5 below provides a breakdown of typical maintenance requirements appropriate to the types of SuDS proposed at this site.

Operation and Maintenance Requirements for Detention Basins		
Responsible for Maintenance	**Site Owner/Occupier**	
Maintenance Schedule	**Required Action**	**Typical Frequency**
Regular maintenance	Remove litter and debris.	Monthly
	Cut grass - for spillways and access routes.	Monthly (during growing season), or as required.
	Cut grass - meadow grass in and around basin.	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants.	Monthly (at start), then as required
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage.	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required
	Check any penstocks and other mechanical devices.	Annually
	Tidy all dead growth before start of growing season.	Annually
	Remove sediment from inlets, outlets and forebay.	Annually, or as required
	Manage wetland plants in outlet pool, where provided.	Annually
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair erosion or other damage by reseeding or re-turfing.	As required
	Realignment of rip-rap.	As required
	Repair/rehabilitation of inlets, outlets and overflows.	As required
	Relevel uneven surfaces and reinstate design levels.	As required

Table 2: Site specific maintenance requirements – Detention Basin

Operation and Maintenance Requirements for Pipes, Manholes and Gullies		
Responsible for Maintenance	**Site Owner/Occupier**	
Maintenance Schedule	**Required Action**	**Typical Frequency**
Regular inspections	Remove cover and inspect, ensuring that water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt.	Annually and after leaf fall in autumn
	Jetting pipes or poor performance to assess requirements for CCTV survey and potential replacement pipes.	Annually or as required
Remedial action	Repair physical damage if necessary.	As required

Table 3: Site specific maintenance requirements - Pipes, manholes and gullies

Operation and Maintenance Requirements for a Flow Control		
Responsible for Maintenance	**Site Owner/Occupier**	
Maintenance Schedule	**Required Action**	**Typical Frequency**
Routine maintenance	Remove litter and debris and inspect for sediment, oil and grease accumulation	Six monthly
	Remove sediment, oil, grease and floatables	As necessary - indicated by system inspections or immediately following significant spill
Remedial actions	Replace malfunctioning parts or structures	As required
Monitoring	Inspect for evidence of poor operation	Six monthly
	Inspect sediment accumulation rates and establish appropriate removal frequencies	Monthly during first half year of operation, then every six months

Table 4: Site specific maintenance requirements - Flow control

Operation and Maintenance Requirements for Filter Drains		
Responsible for Maintenance	**Developer/Household**	
Maintenance Schedule	**Required Action**	**Typical Frequency**
Regular maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices	Monthly, or as required
	Inspect filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six monthly
	Remove sediment from pre-treatment	Six monthly, or as required
Occasional maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods (eg NJUG, 2007 or BS 3998:2010)	As required
	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium	Five yearly, or as required
	Clear perforated pipework of blockages	As required

Table 5: Site specific maintenance requirements – Filter drain

Bee

From: Bev Hunter
Sent: 25 April 2023 13:11
To: Bee
Subject: Fwd: 306-006 Yaxley

From: GHI Floods <floods@suffolk.gov.uk>
Sent: Monday, April 24, 2023 3:12:15 PM
To: Bev Hunter <bev.hunter@haydnevans.co.uk>
Subject: RE: 306-006 Yaxley

Dear Beverly,

Thank you for your email.

In most cases a head wall does not require consent as long as no part of it obstructs the flow of water.

Kind Regards

Jason Skilton
Flood and Water Engineer
Suffolk County Council

The Suffolk SuDS Guide has been updated (March 2023)
Suffolk Developers Event is back! This years event will take place on Thursday 15th June in Ipswich. For further info and to book a place, click here.

From: Bev Hunter <bev.hunter@haydnevans.co.uk>
Sent: Monday, April 24, 2023 3:10 PM
To: GHI Floods <floods@suffolk.gov.uk>
Subject: 306-006 Yaxley

Dear Floods

We are proposing to discharge to a minor watercourse in Suffolk, via a protruding pipe connection, at the Qbar greenfield run-off rate (1.27 l/s). There will be no other works to the watercourse. Please can you advise if land drainage consent is required? Looking at the consentable activities sheet on your website, this would suggest that consent is not required for such a connection? Please confirm.

Kind regards

Beverley Hunter
Assistant Engineer

T: 01473 236550
M: 07423 096006

Second Floor, Hyde Park House, Crown Street, Ipswich, IP1 3LG
www.haydnevans.co.uk

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