



PINS Document Number:
EN010140/APP/7.5

Flood Risk Assessment

April 2025



HELIOS RENEWABLE ENERGY PROJECT

FLOOD RISK ASSESSMENT

ENSO GREEN HOLDINGS D LIMITED

DOCUMENT REFERENCE NUMBER: 7.5

PART 6 OF 6

APPENDICES 26 - 32

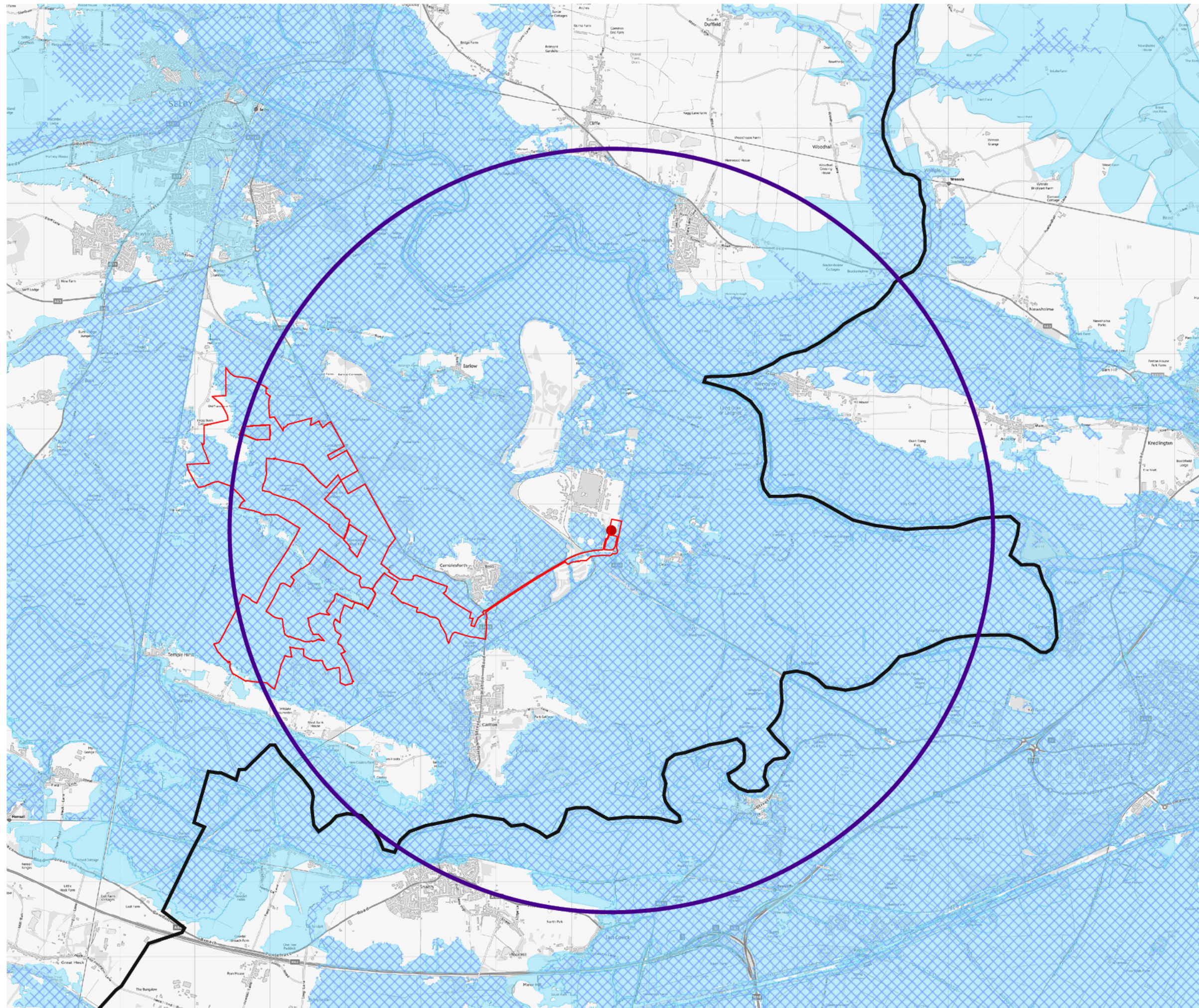
PFA Document Reference: E216-DOC01-FRA-ISSUE 3.1

APRIL 2025

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engineering the future



The scaling of this drawing cannot be assured

Revision	Date	Drm	Ckd
C Red Line Updated	17.06.24	KT	JG

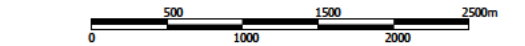
LEGEND

-  Site Location
-  Helios Red Line Boundary
-  5km Study Area
-  Selby District Boundary
-  Flood Zone 2
-  Flood Zone 3

Project
Helios Renewable Energy Project

Drawing Title
Flood Map

Date 17.06.24	Scale 1:50,000@A3	Drawn by KT	Check by TE
Project No 33627	Drawing No BL-M-04	Revision C	



PFA Consulting Ltd		Page 1
Stratton Park House Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy Post Development Runoff	
Date 26/05/2023 13:54 File	Designed by BF Checked by	
XP Solutions Source Control 2020.1.3		

IH 124 Mean Annual Flood

Input

Return Period (years)	1	Soil	0.300
Area (ha)	297.739	Urban	0.001
SAAR (mm)	625	Region Number	Region 3

Results l/s

QBAR Rural	390.5
QBAR Urban	391.4
Q1 year	336.6
Q1 year	336.6
Q2 years	369.4
Q5 years	489.3
Q10 years	567.5
Q20 years	642.7
Q25 years	667.6
Q30 years	687.9
Q50 years	741.1
Q100 years	813.8
Q200 years	923.3
Q250 years	958.5
Q1000 years	1189.1

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Website

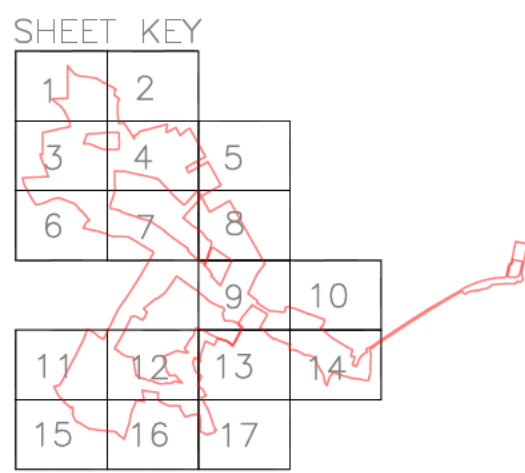
For Planning
This drawing is produced for the purposes of supporting a planning application and should not be relied upon for tender, pricing, or construction purposes.

KEY

- Site Boundary (Indicative Only)
- Ordinary Watercourse
- Ordinary Watercourse (DB Maintained)
- 7m Watercourse Buffer
- Overland Flow Route (Indicative Only)
- Archeological Mitigation Areas
- Interception Swales

NOTES

- Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024
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Rev	Date	Description	Drawn	Check
#	09.06.23	First Issue	SLC	SAM
A	23.06.23	Presentation updated	BF	
B	23/08/23	Layout Revision	S	
C	14/02/24	Updated parameters plan & site boundary	SLC	BF

Status

FOR PLANNING

Client

Enso Green Holdings D Limited

Project

Helios Renewable Energy Project

Drawing Title

Solar Farm Preliminary
Surface Water Drainage
Arrangements
Sheet 1 of 17

Drawing No.

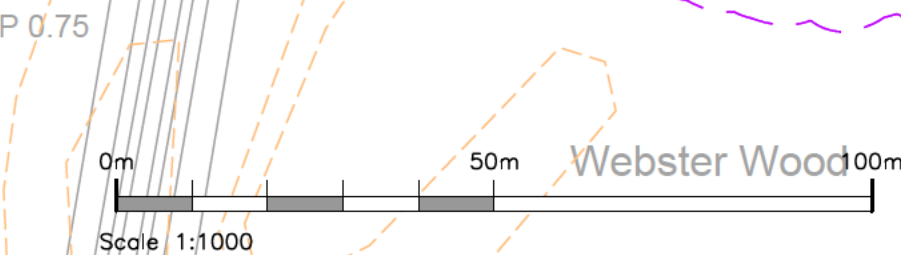
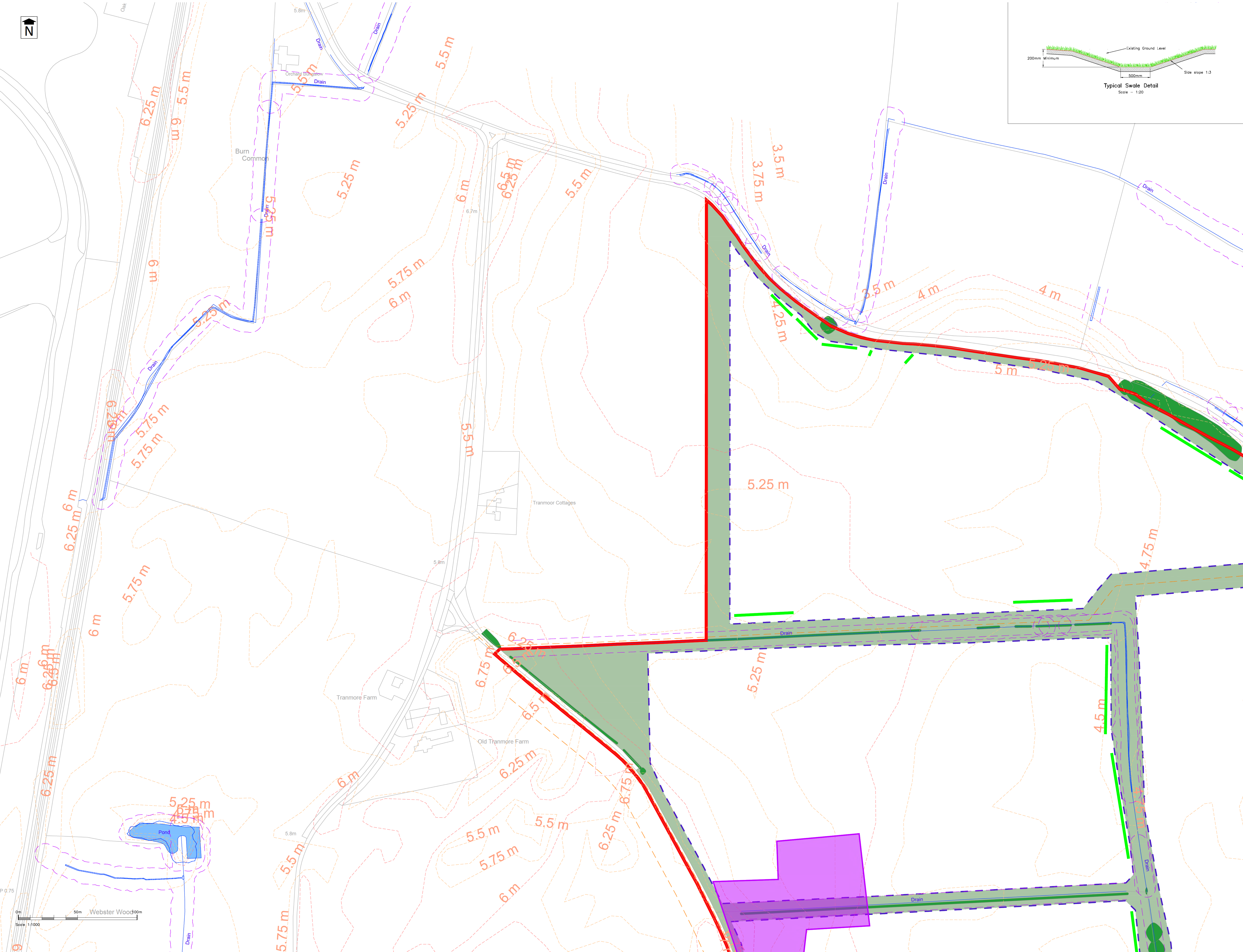
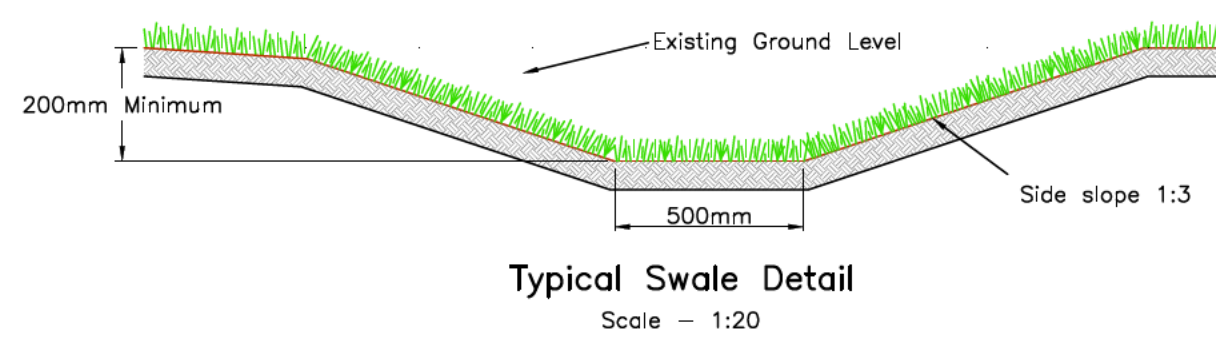
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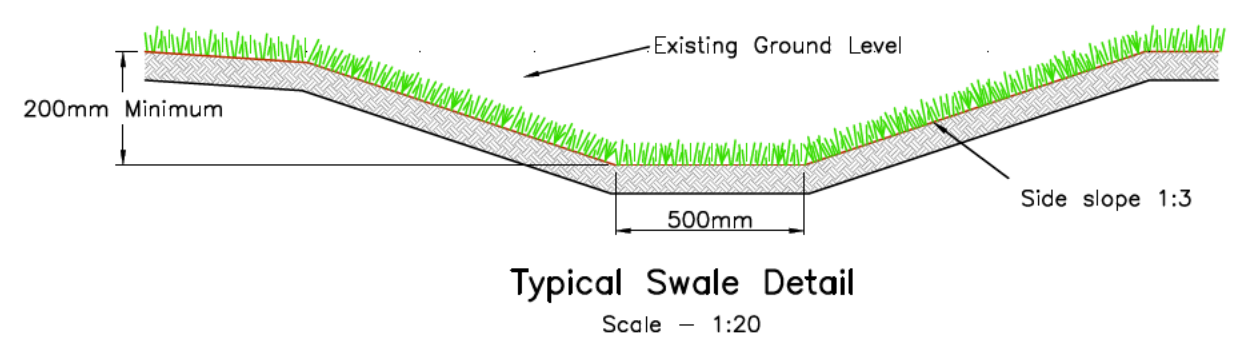
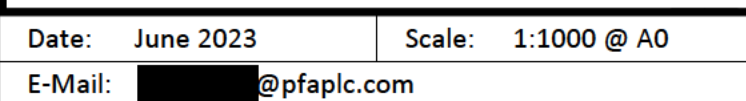
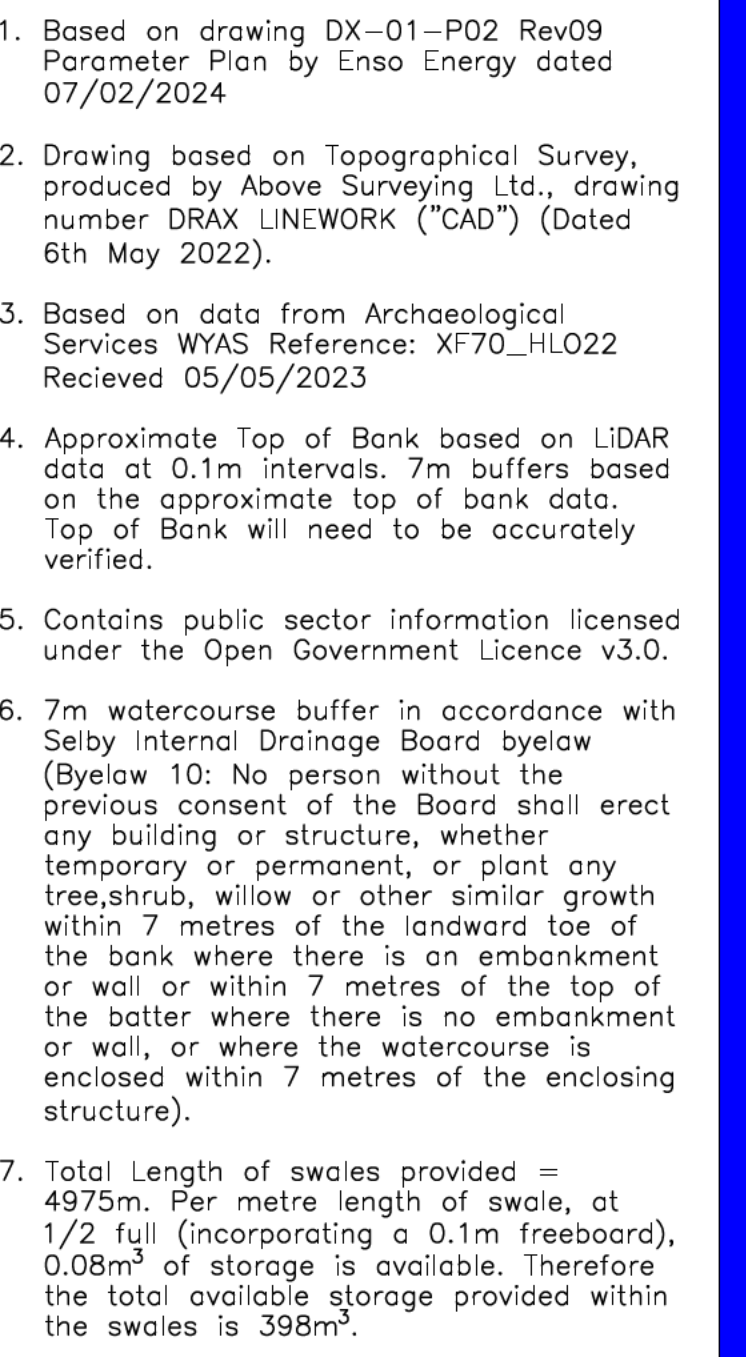
Rev C

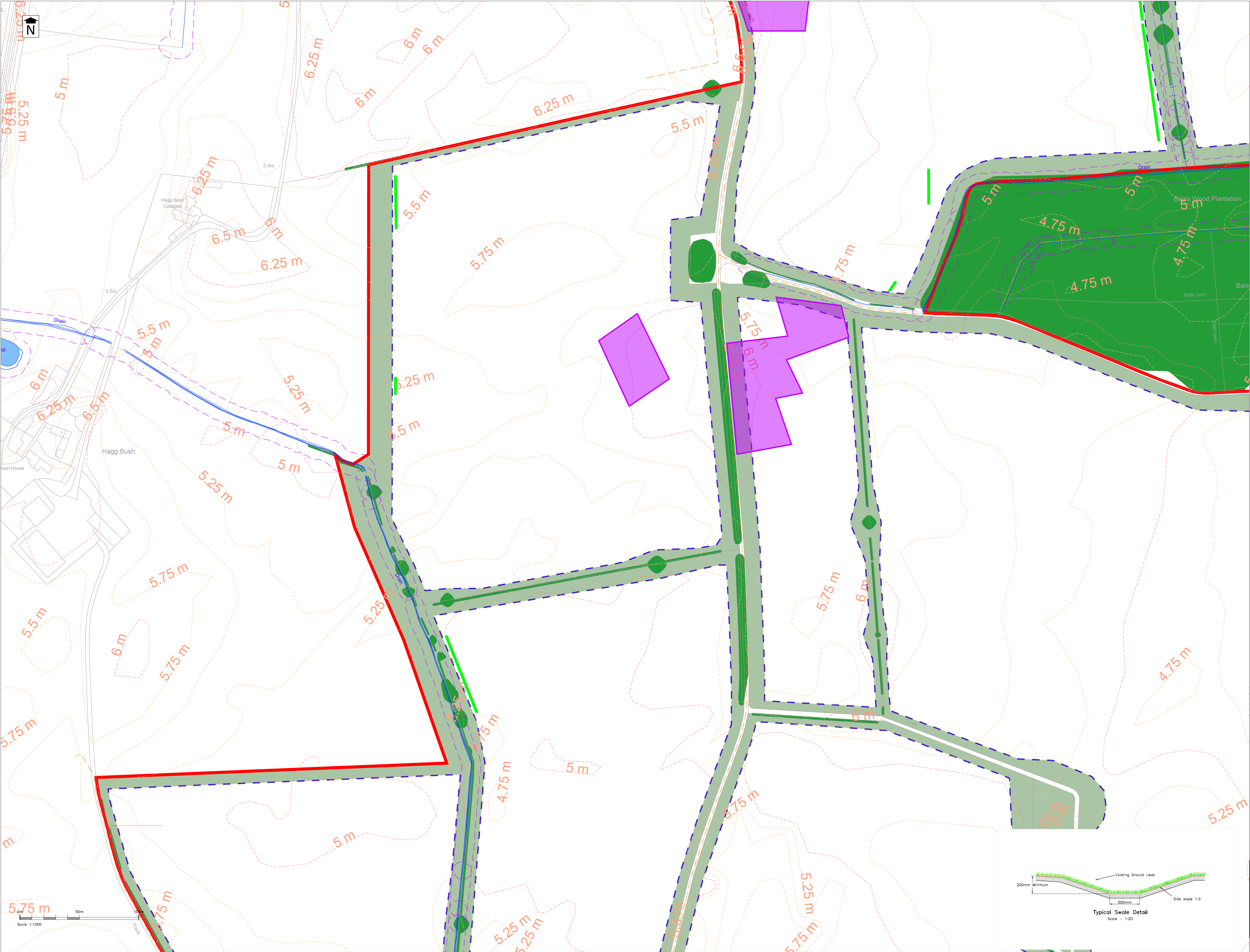
Date: June 2023

Scale: 1:1000 @ A0

E-Mail: @pfapltd.com







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SHEET KEY

1	2
3	4
5	6
7	8
9	10
11	12
13	14
15	16
17	18

Rev	Date	Description	Drawn	Check
A	09/06/23	First Issue	SIC	SAM
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C	23/08/23	Layout Revision	IS	
D	14/02/24	Updated parameters plan & site boundary	SIC	BF

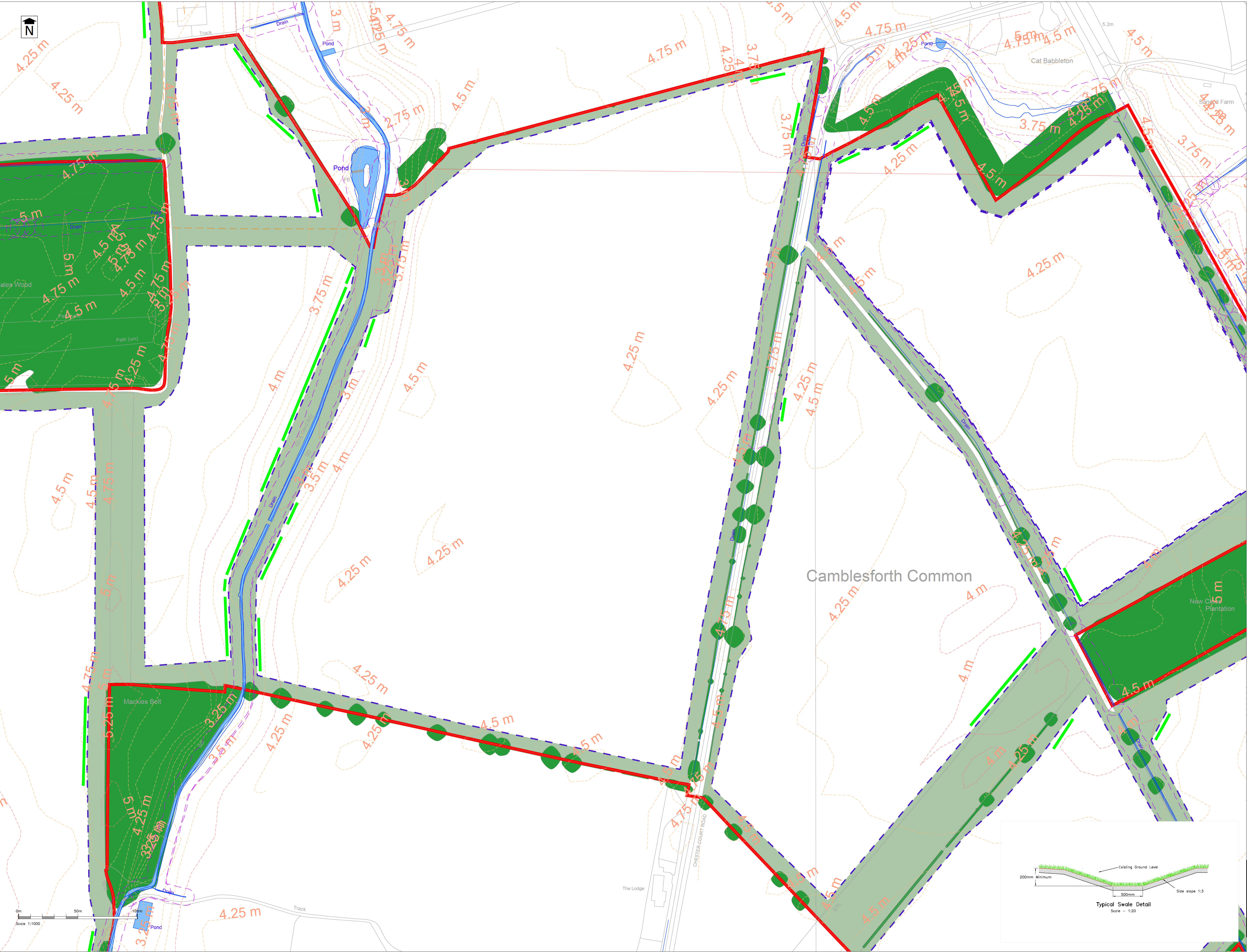
Status
FOR PLANNING

Client
Enso Green Holdings D Limited

Project
Helios Renewable Energy Project

Drawing Title
Solar Farm Preliminary Surface Water Drainage Arrangements Sheet 3 of 17

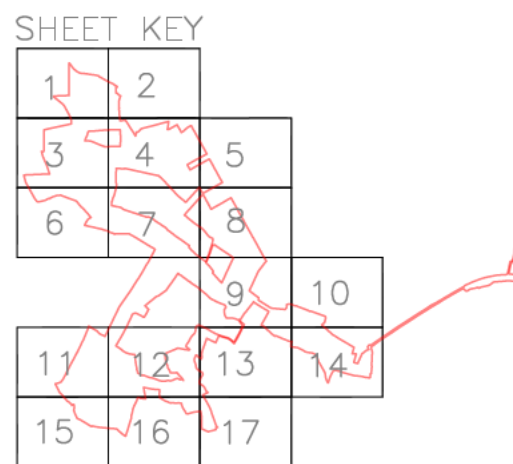
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Date: June 2023 Scale: 1:1000 @ A0
E-Mail: info@pfapl.com



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Perimeter Plan by Enso Energy dated 07/02/2024
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A	23.06.23	Presentation updated	BF	
B	23/08/23	Layout Revision	IS	
C	14/02/24	Updated parameters plan & site boundary	SLC	BF

Status
FOR PLANNING

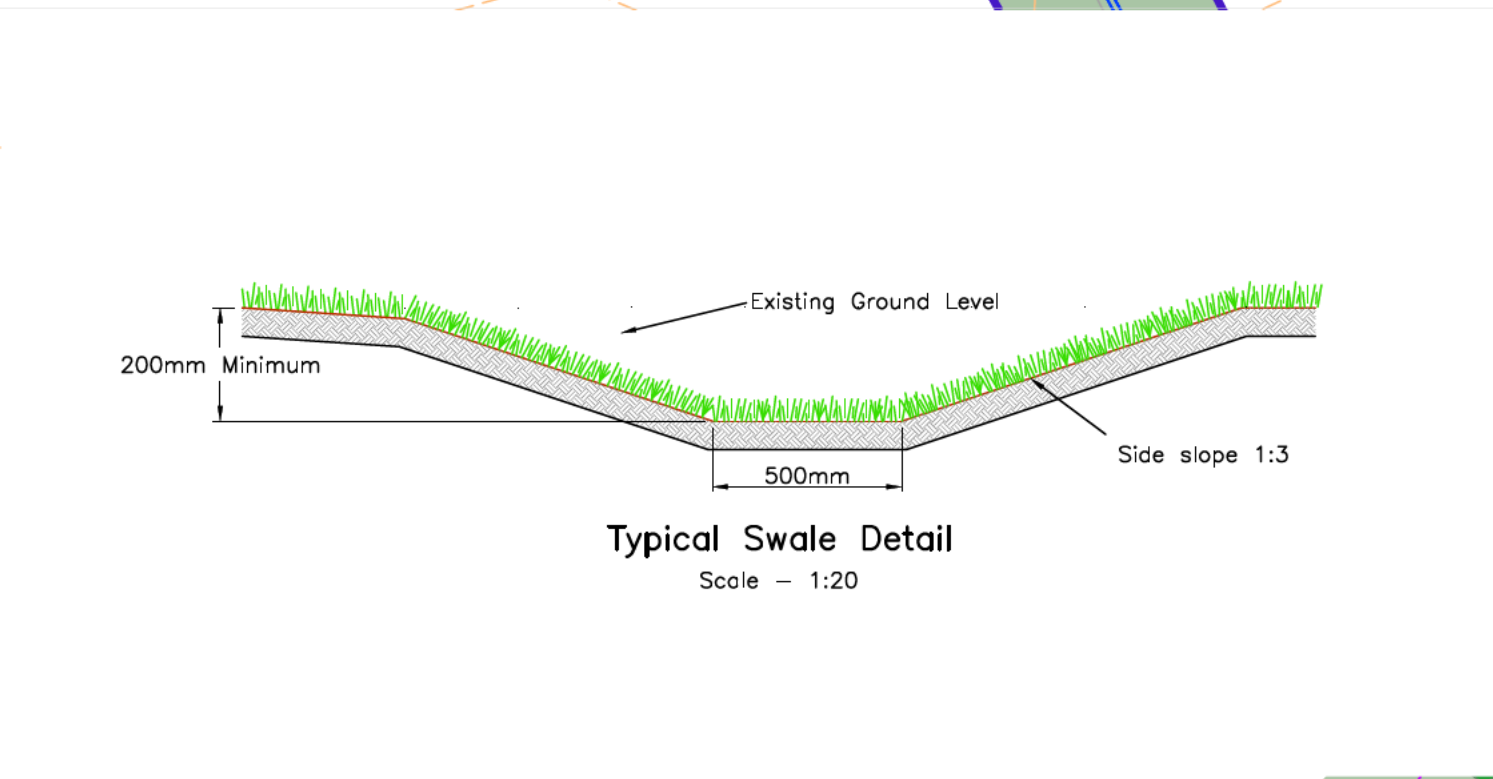
Client
Enso Green Holdings D Limited

Project
Helios Renewable Energy Project

Drawing Title
Solar Farm Preliminary Surface Water Drainage Arrangements Sheet 4 of 17

Drawing No. **E216/93** Rev C

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E-Mail: info@pfaplc.com

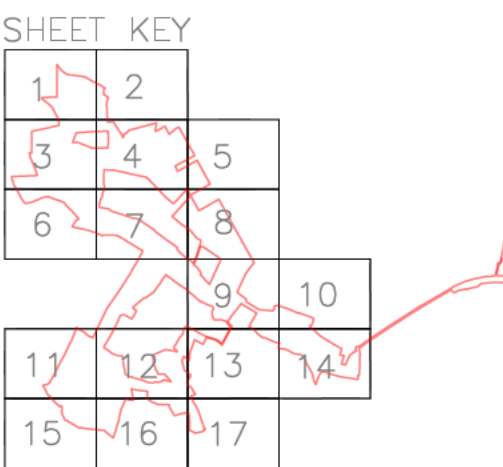




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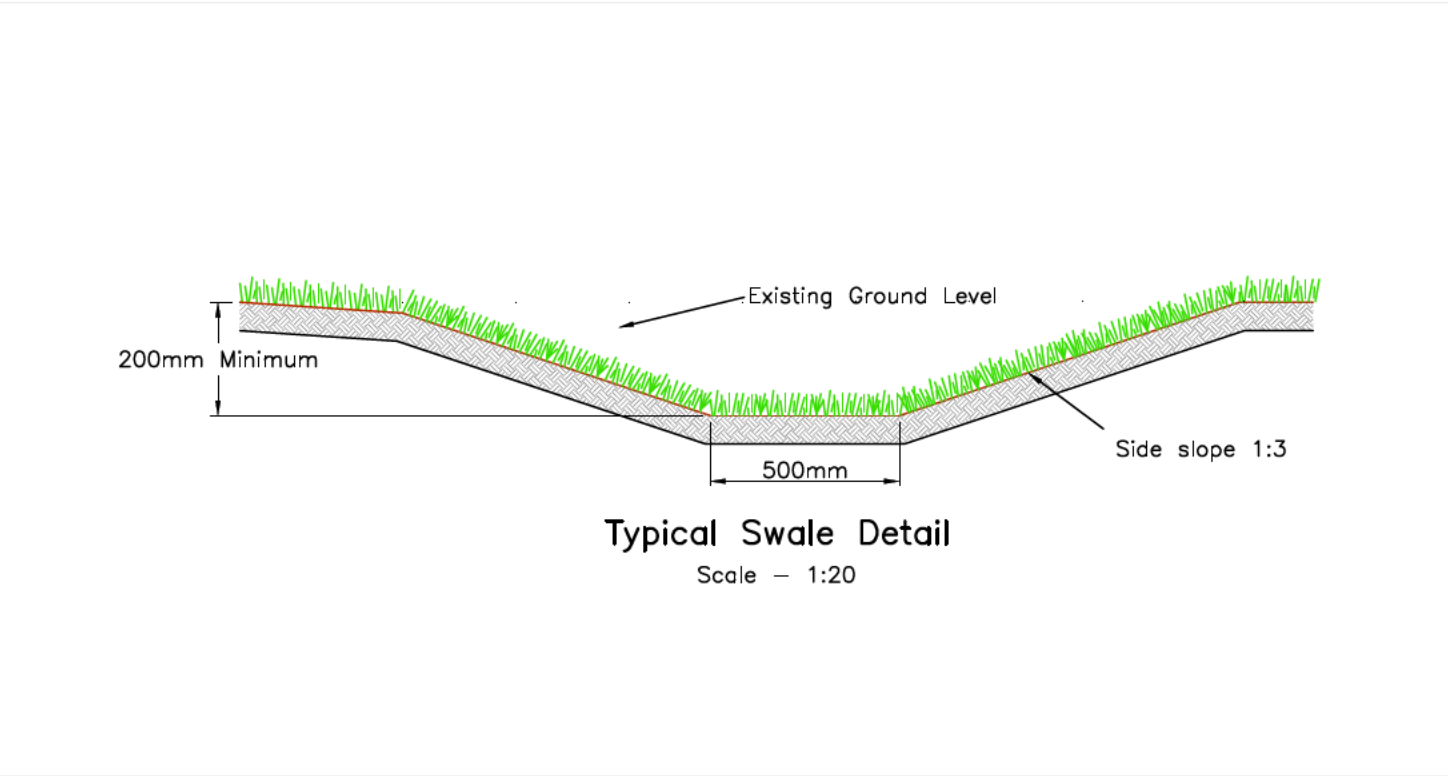
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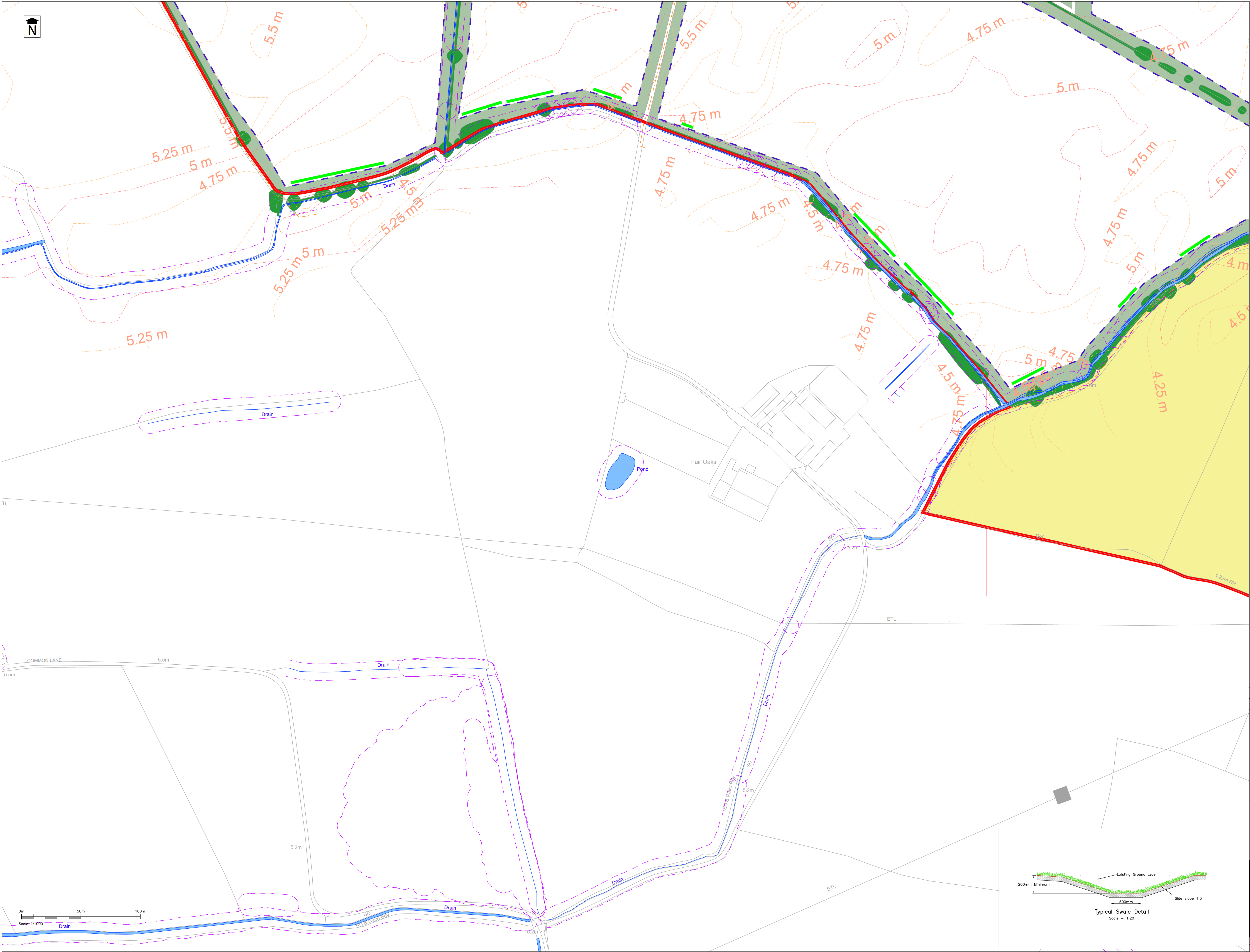
Client
Enso Green Holdings D Limited

Project
Helios Renewable Energy Project

Drawing Title
Solar Farm Preliminary Surface Water Drainage Arrangements Sheet 5 of 17

Drawing No. **E216/94** Rev C
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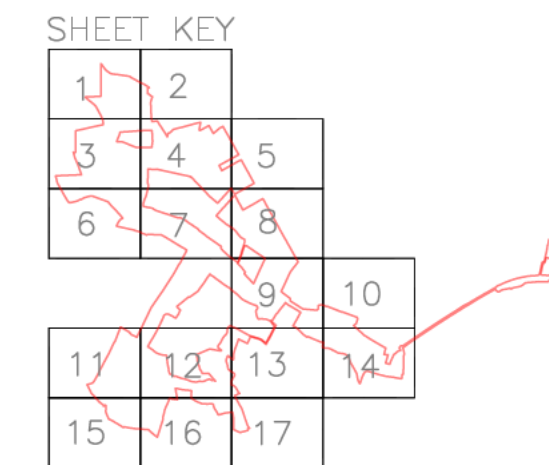




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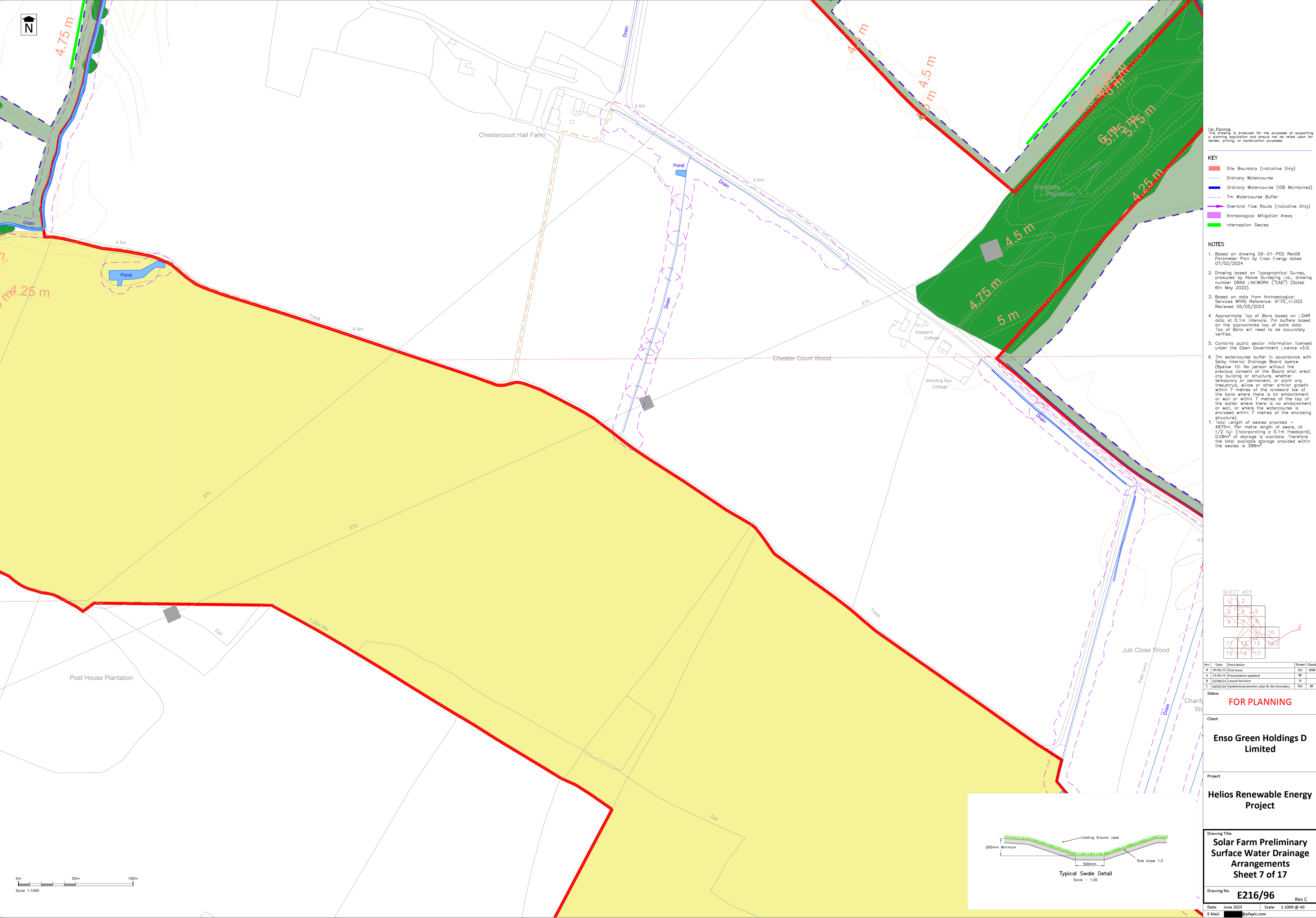
Status **FOR PLANNING**

Client
Enso Green Holdings D Limited

Project
Helios Renewable Energy Project

Drawing Title
Solar Farm Preliminary Surface Water Drainage Arrangements Sheet 6 of 17

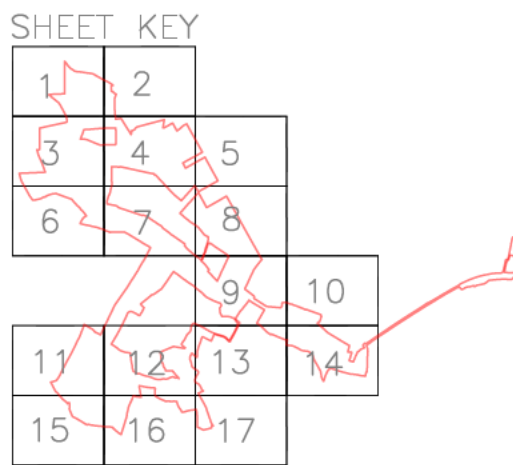
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A	23/06/23	First Issue	SJC	SAM
B	23/08/23	Presentation updated	BF	
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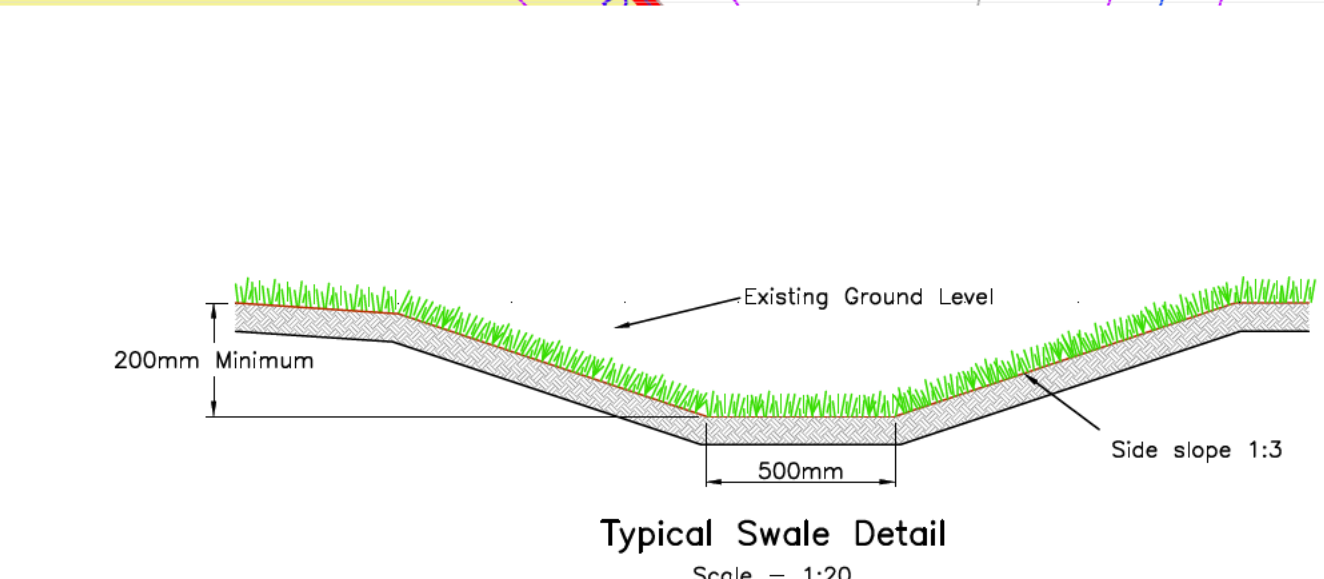
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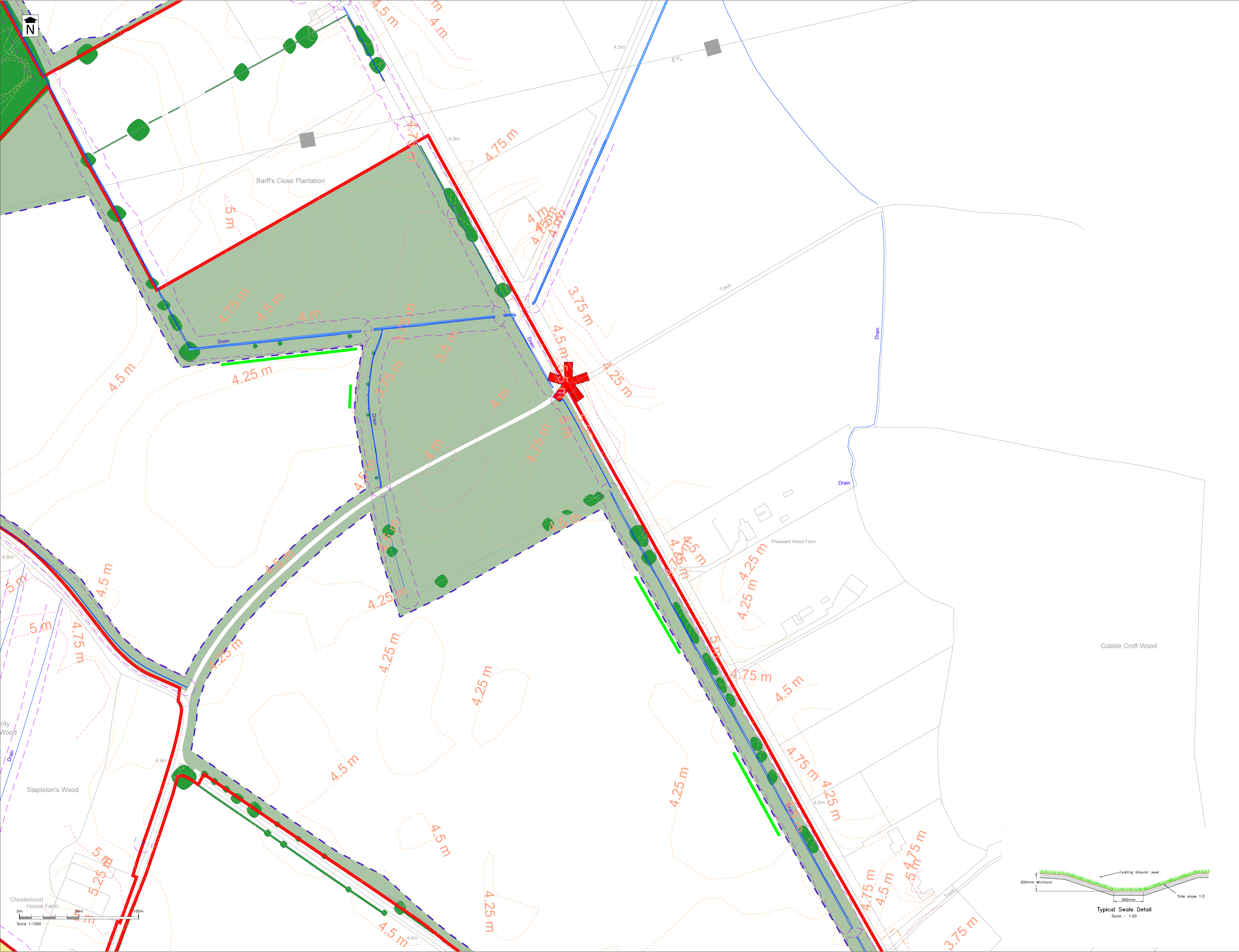
Client
Enso Green Holdings D Limited

Project
Helios Renewable Energy Project

Drawing Title
Solar Farm Preliminary Surface Water Drainage Arrangements Sheet 7 of 17

Drawing No. **E216/96** Rev C
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E-Mail: @pfaplc.com

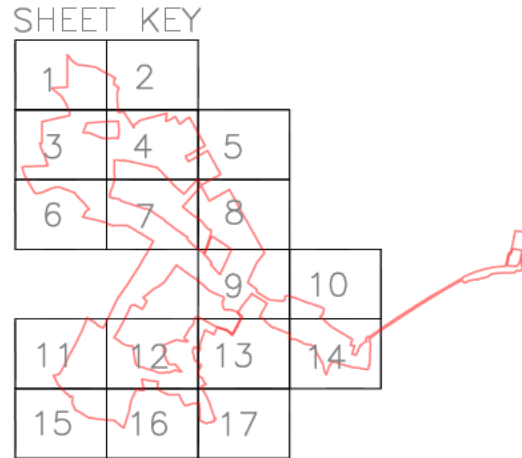




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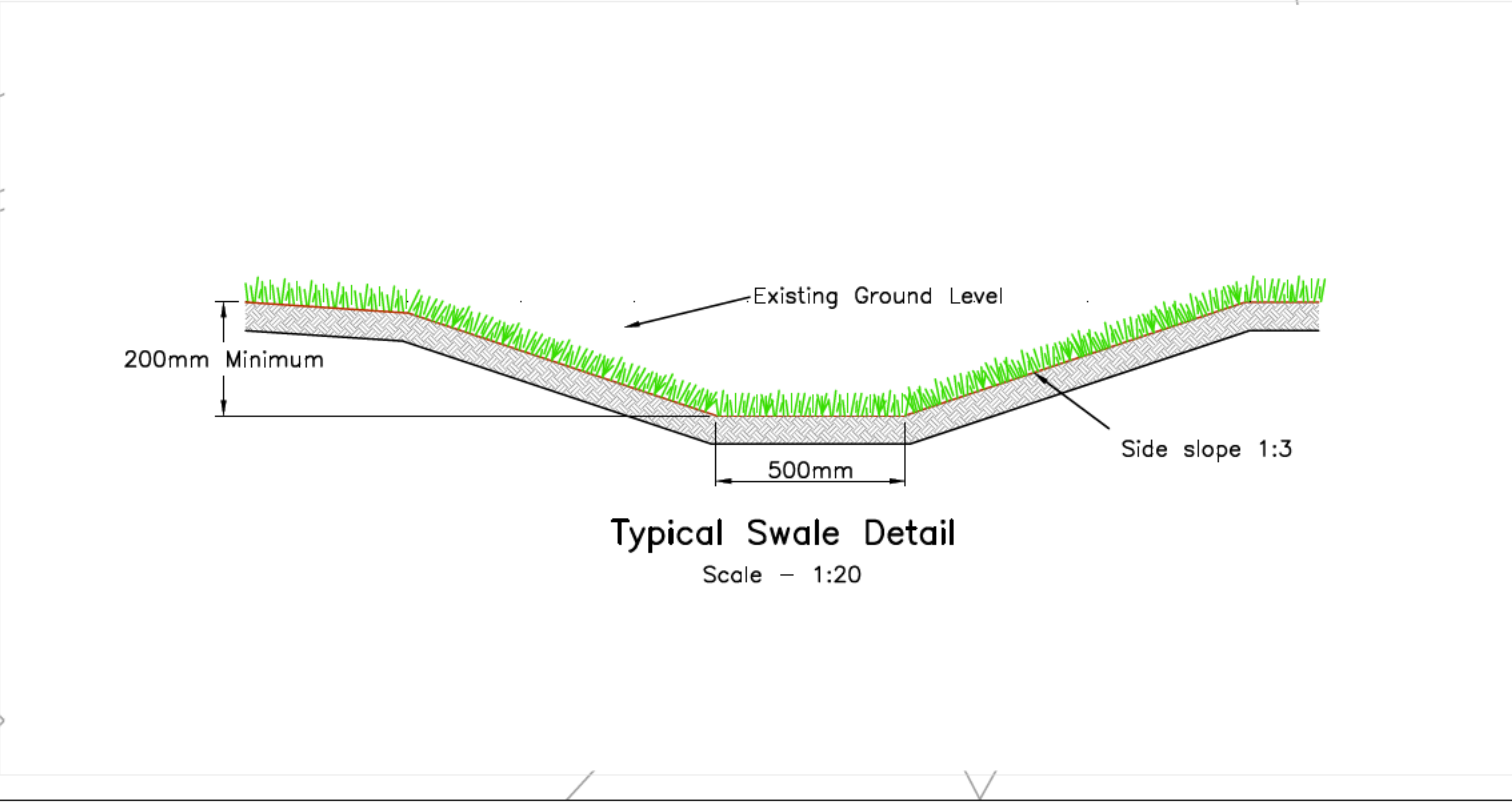
Project

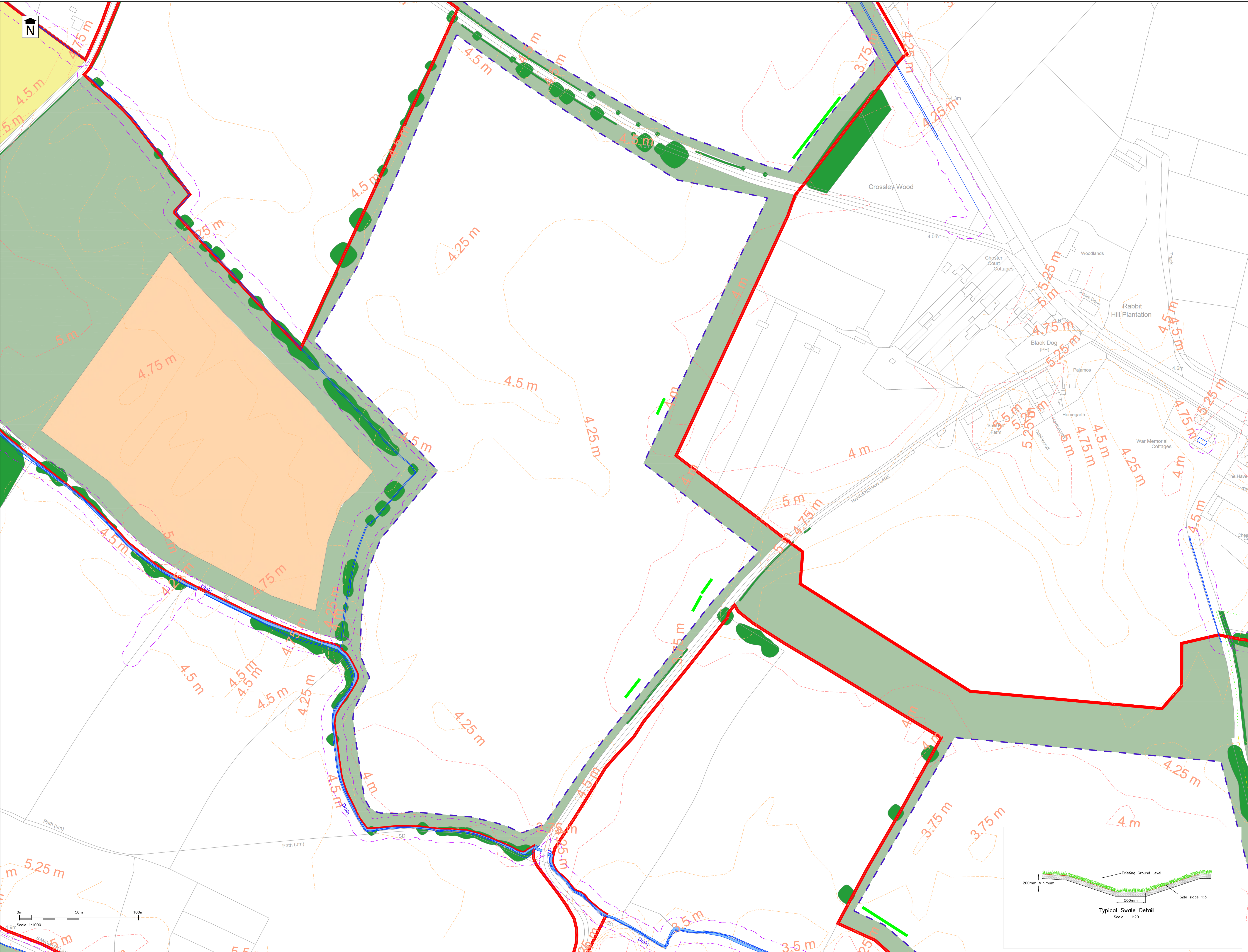
Helios Renewable Energy Project

Drawing Title
Solar Farm Preliminary Surface Water Drainage Arrangements Sheet 8 of 17

Drawing No. **E216/97** Rev C

Date: June 2023 Scale: 1:1000 @ A0
E-Mail: enso@pfapl.com





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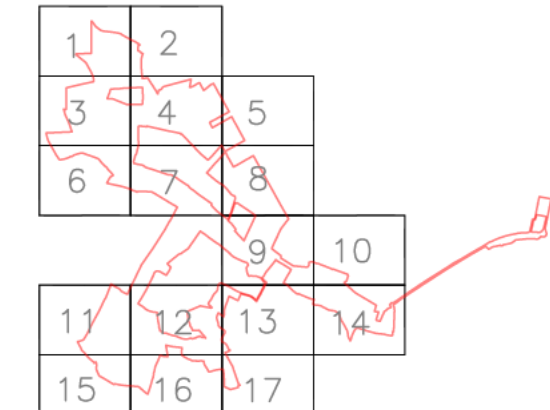
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FOR PLANNING

Client

Enso Green Holdings D Limited

Project

Helios Renewable Energy Project

Drawing Title

Solar Farm Preliminary Surface Water Drainage Arrangements Sheet 9 of 17

Drawing No.

E216/98

Rev C

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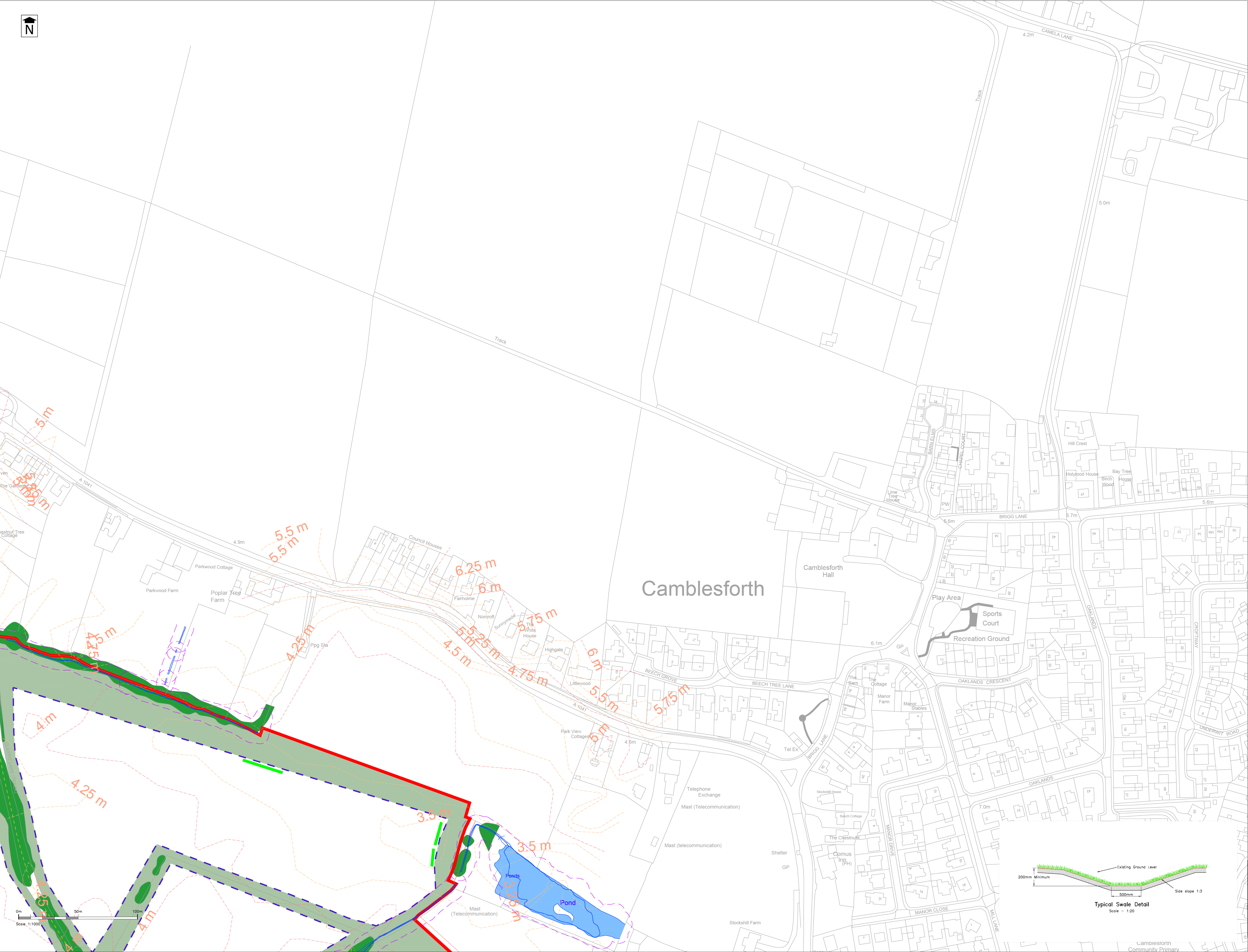
June 2023

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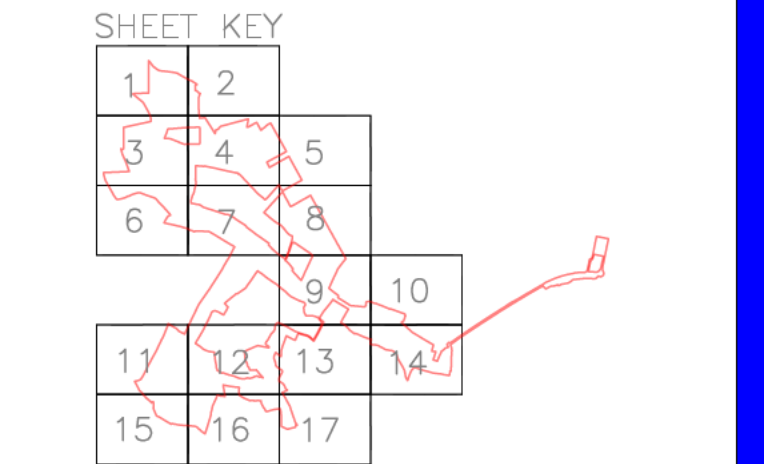
enso@pfaplc.com



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 - Approximate Top of Bank based on LiDAR data at 0.1m intervals. 7m buffers based on the approximate top of bank data. Top of Bank will need to be accurately verified.
 - Contains public sector information licensed under the Open Government Licence v3.0.
 - 7m watercourse buffer in accordance with Selby Internal Drainage Board byelaw (Byelaw 10: No person without the previous consent of the Board shall erect any building or structure, whether temporary or permanent, or plant any tree, shrub, willow or other similar growth within 7 metres of the landward toe of the bank where there is an embankment or wall or within 7 metres of the top of the batter where there is no embankment or wall, or where the watercourse is enclosed within 7 metres of the enclosing structure).
 - Total Length of swales provided = 4975m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.08m³ of storage is available, therefore the total available storage provided within the swales is 398m³.



Rev	Date	Description	Drawn	Check
#	09.06.23	First Issue	SLC	SAM
A	23.06.23	Presentation updated	BF	
B	23/06/23	Layout revision	IS	
C	14/02/24	Updated parameters plan & site boundary	SLC	BF

Status
FOR PLANNING

Client

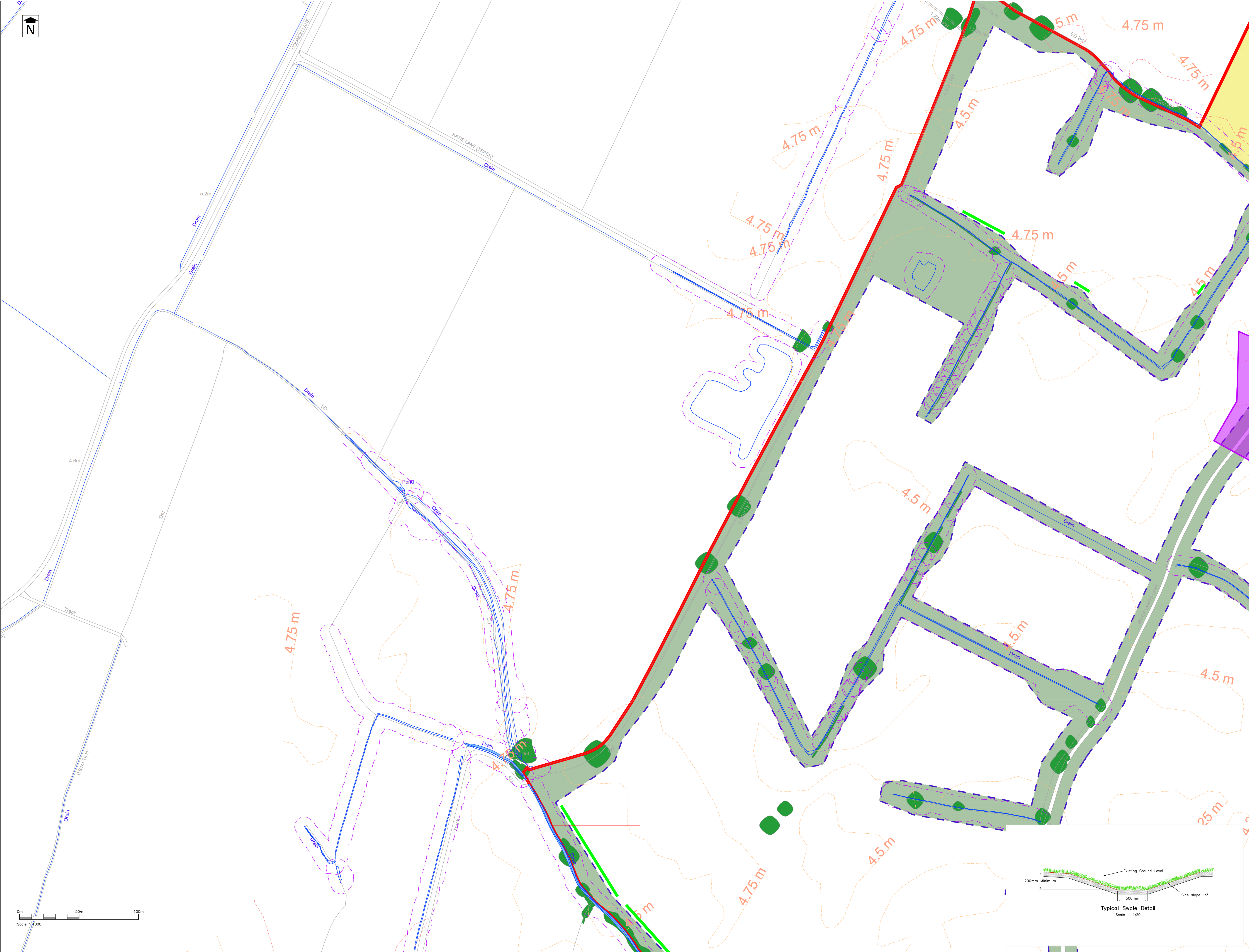
Enso Green Holdings D Limited

Project

Helios Renewable Energy Project

Drawing Title
Solar Farm Preliminary Surface Water Drainage Arrangements Sheet 10 of 17

Drawing No. **E216/99** Rev C
Date: June 2023 Scale: 1:1000 @ A0
E-Mail: @pfapic.com



For Planning
This drawing is produced for the purposes of supporting a planning application and should not be relied upon for tender, pricing, or construction purposes.

- KEY**
- Site Boundary (Indicative Only)
 - Ordinary Watercourse
 - Ordinary Watercourse (IDB Maintained)
 - 7m Watercourse Buffer
 - Overland Flow Route (Indicative Only)
 - Archaeological Mitigation Areas
 - Interception Swales

- NOTES**
- Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024
 - Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("CAD") (Dated 6th May 2022).
 - Based on data from Archaeological Services WYAS Reference: XF70_HLO22 Received 05/05/2023
 - Approximate Top of Bank based on LIDAR data at 0.1m intervals. 7m buffers based on the approximate top of bank data. Top of Bank will need to be accurately verified.
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 - Total Length of swales provided = 4975m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.08m³ of storage is available. Therefore the total available storage provided within the swales is 398m³.

SHEET KEY

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Rev	Date	Description	Drawn	Check
A	09.06.23	First Issue	SLC	SAM
A	23.06.23	Presentation updated	BF	
B	23/08/23	Layout Revision	IS	
C	13/02/24	Updated parameters plan & site boundary	SLC	BF

Status

FOR PLANNING

Client

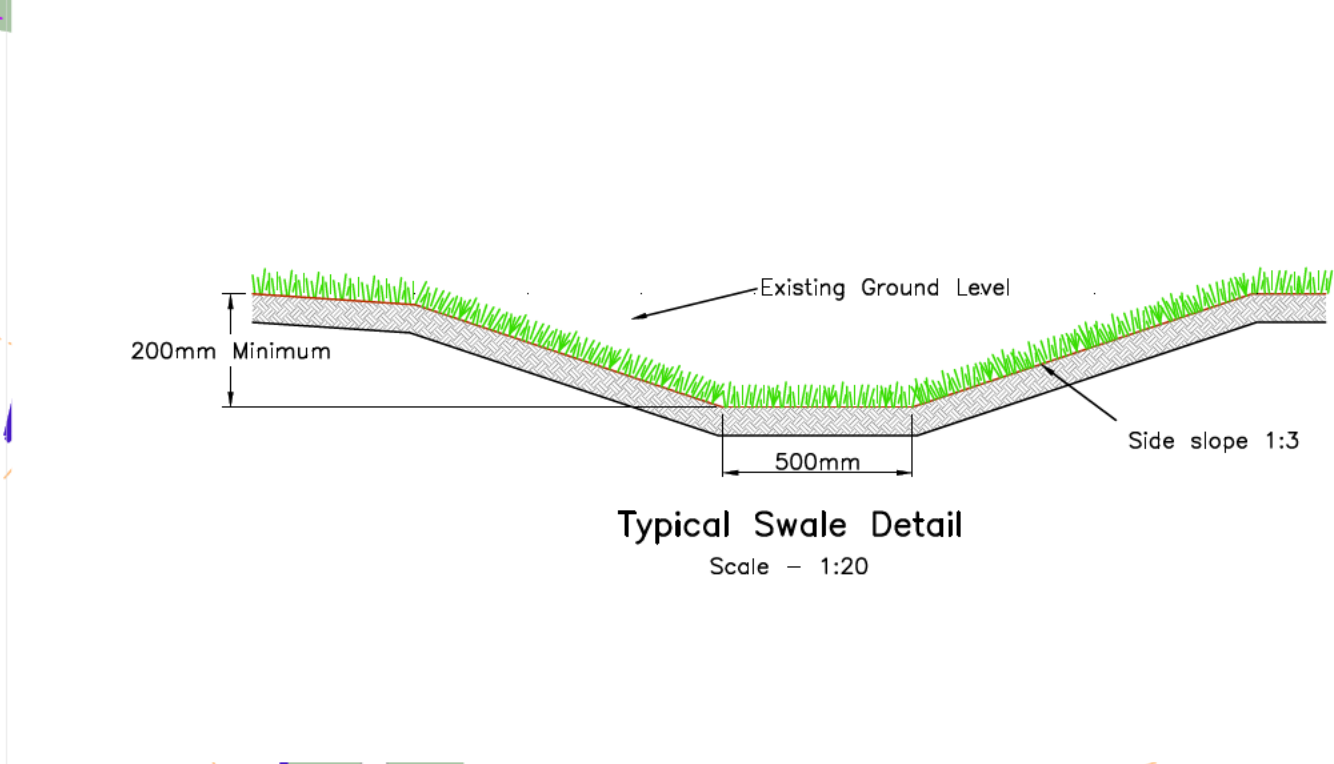
Enso Green Holdings D Limited

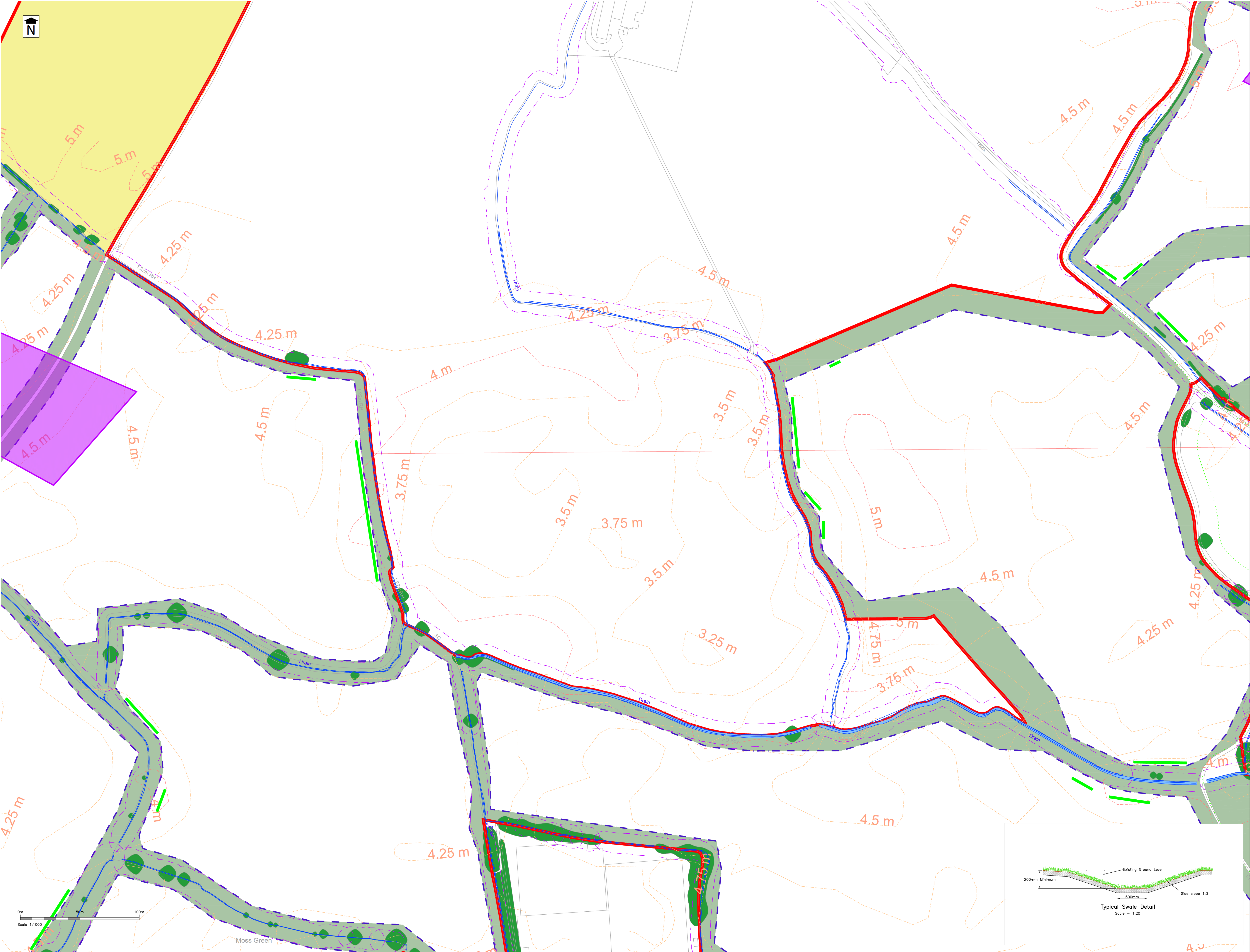
Project

Helios Renewable Energy Project

Drawing Title
Solar Farm Preliminary Surface Water Drainage Arrangements
Sheet 11 of 17

Drawing No. **E216/100** Rev C
Date: June 2023 Scale: 1:1000 @ A0
E-Mail: @pfapic.com

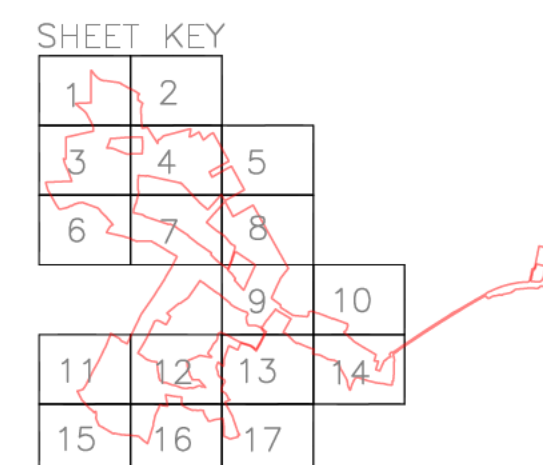




For Planning
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- KEY**
- Site Boundary (Indicative Only)
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 - Ordinary Watercourse (DB Maintained)
 - 7m Watercourse Buffer
 - Overland Flow Route (Indicative Only)
 - Archaeological Mitigation Areas
 - Interception Swales

- NOTES**
- Based on drawing DX-01-P02_Rev09 Parameter Plan by Enso Energy dated 07/02/2024
 - Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("CAD") (Dated 6th May 2022).
 - Based on data from Archaeological Services WYAS Reference: XF70_HL022 Received 05/05/2023
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 - Contains public sector information licensed under the Open Government Licence v3.0.
 - 7m watercourse buffer in accordance with Setby Internal Drainage Board bye-law (Byelaw 10: No person without the previous consent of the Board shall erect any building or structure, whether temporary or permanent, or plant any tree, shrub, willow or other similar growth within 7 metres of the landward toe of the bank where there is an embankment or wall or within 7 metres of the top of the batter where there is no embankment or wall, or where the watercourse is enclosed within 7 metres of the enclosing structure).
 - Total Length of swales provided = 4975m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.08m³ of storage is available. Therefore the total available storage provided within the swales is 398m³.



Rev	Date	Description	Drawn	Check
#	09.06.23	First issue	SC	SAB
A	23.06.23	Presentation updated	BF	
B	22/08/23	Layout Revision	IS	
C	14/02/24	Updated parameters plan & site boundary	SC	BF

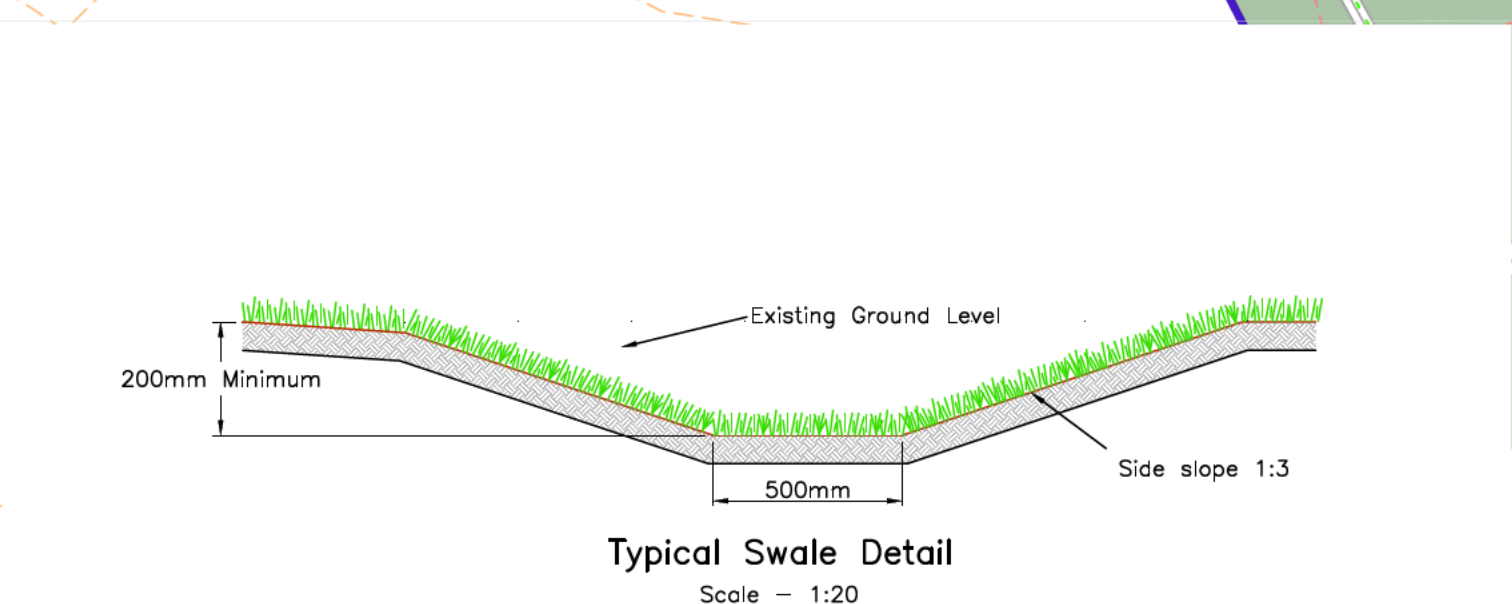
Status
FOR PLANNING

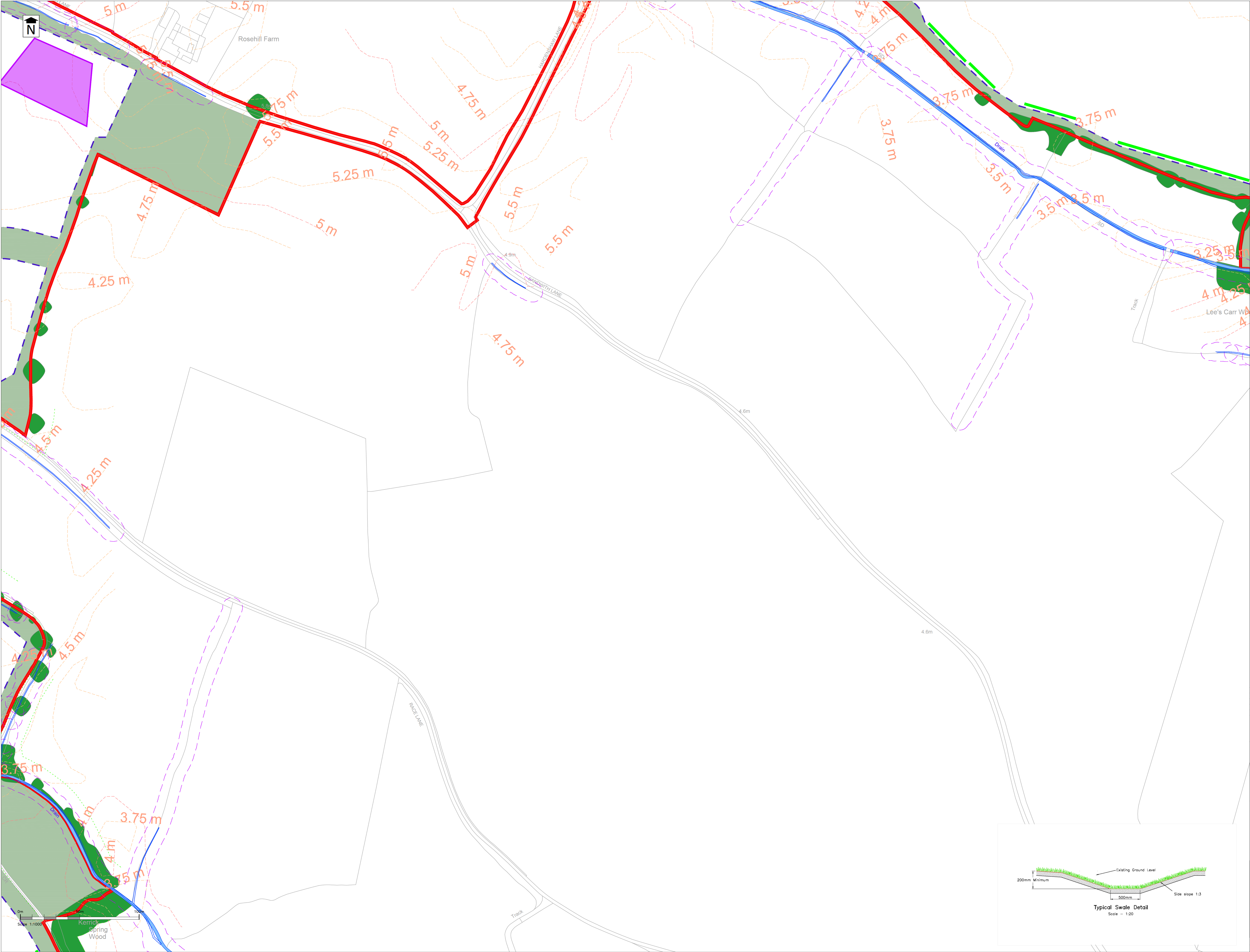
Client
Enso Green Holdings D Limited

Project
Helios Renewable Energy Project

Drawing Title
Solar Farm Preliminary Surface Water Drainage Arrangements Sheet 12 of 17

Drawing No. **E216/101** Rev C
Date: June 2023 Scale: 1:1000 @ A0
E-Mail: [REDACTED]@pfapic.com

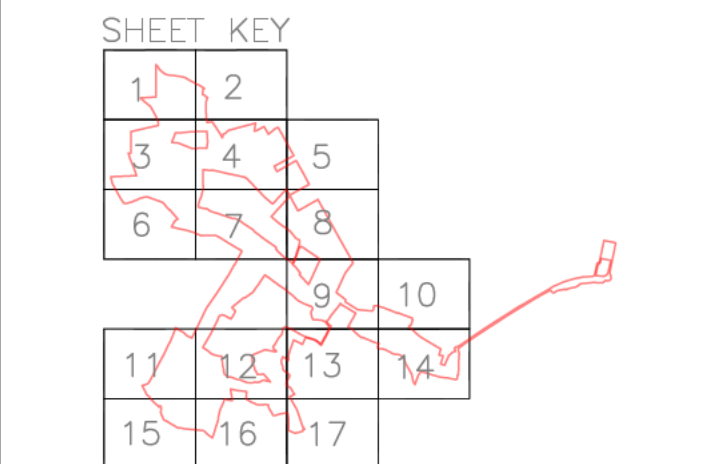




For Planning
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- KEY**
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 - Archaeological Mitigation Areas
 - Interception Swales

- NOTES**
- Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024
 - Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("CAD") (Dated 6th May 2022).
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 - Total Length of swales provided = 4975m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.08m³ of storage is available. Therefore the total available storage provided within the swales is 398m³.



Rev	Date	Description	Drawn	Check
#	09.06.23	First Issue	SJC	SAM
A	23.06.23	Presentation updated	BF	
B	23/08/23	Layout Revision	IS	
C	14/02/24	Updated parameters plan & site boundary	SJC	BF

Status **FOR PLANNING**

Client

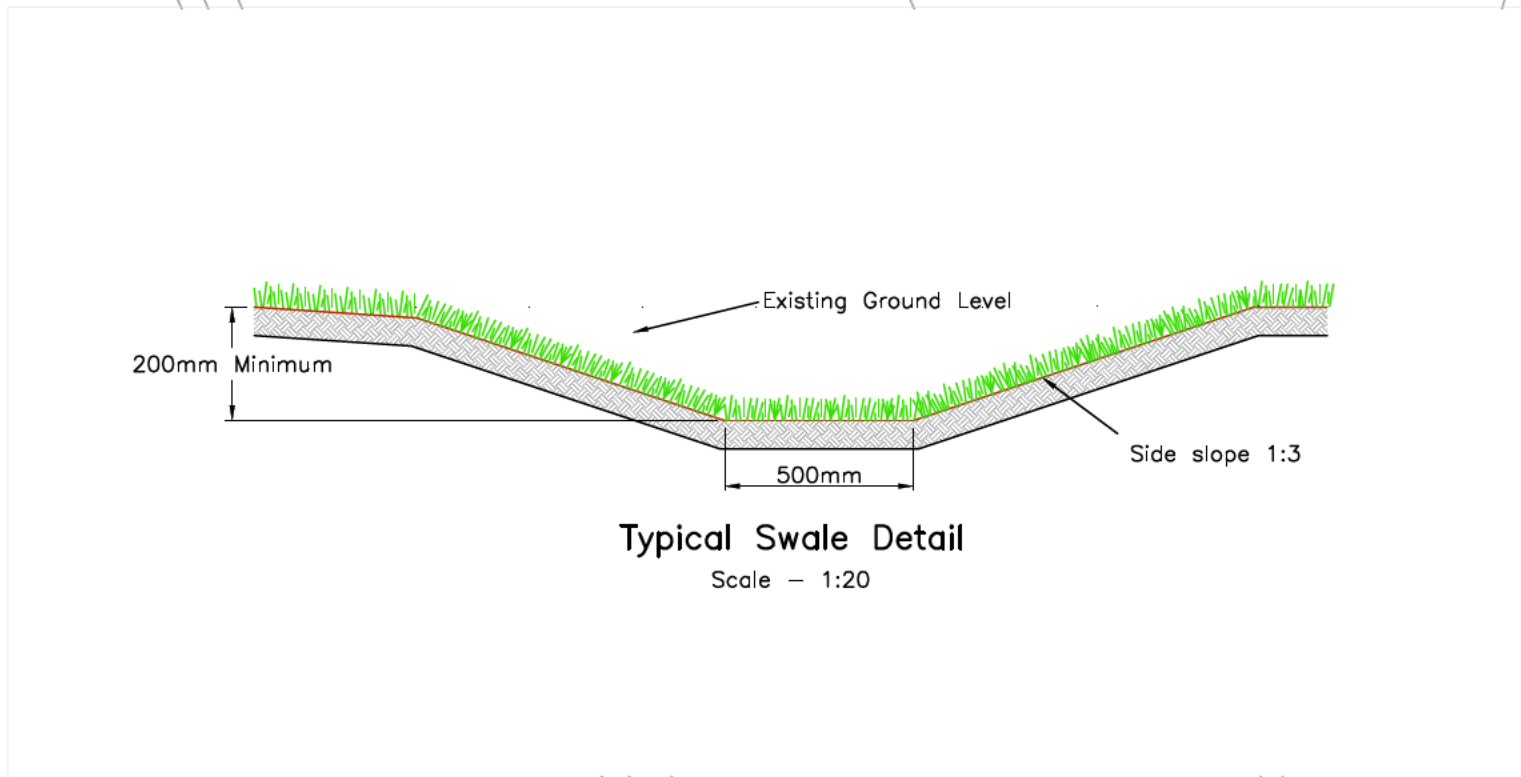
Enso Green Holdings D Limited

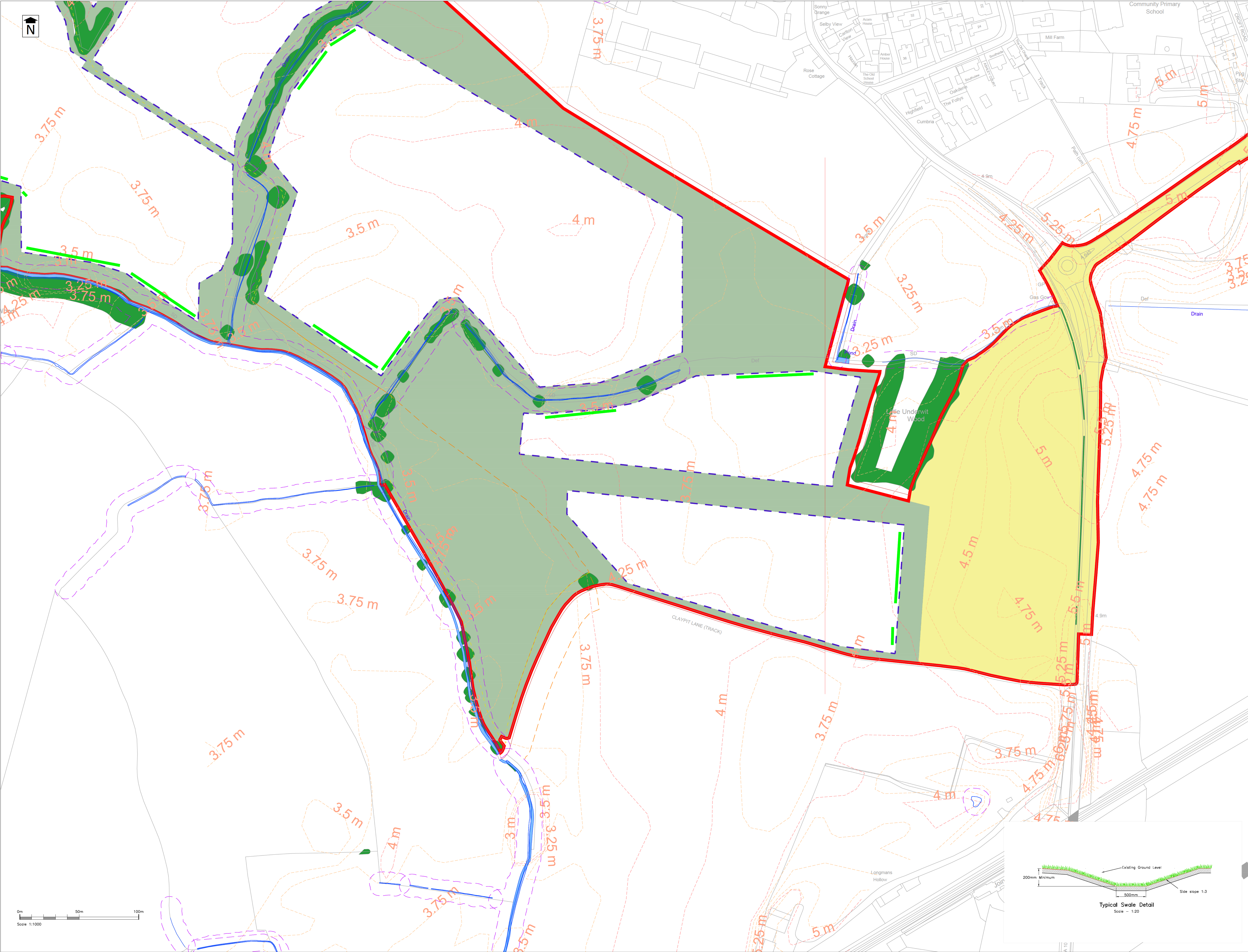
Project

Helios Renewable Energy Project

Drawing Title
Solar Farm Preliminary Surface Water Drainage Arrangements Sheet 13 of 17

Drawing No. **E216/102** Rev C
Date: June 2023 Scale: 1:1000 @ AO
E-Mail: @pfaplc.com

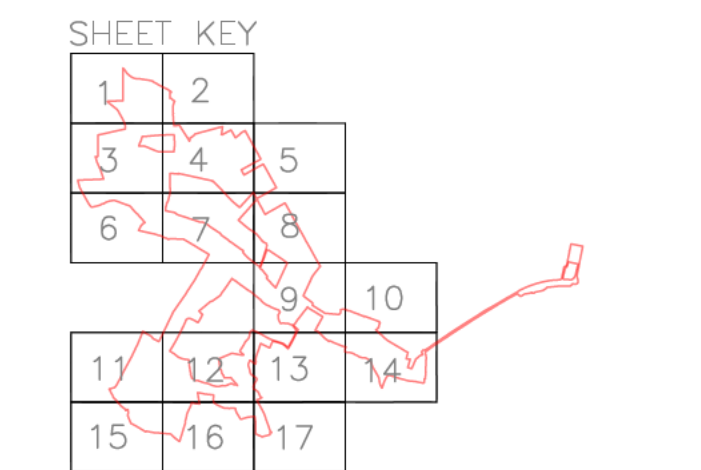




For Planning
This drawing is produced for the purposes of supporting a planning application and should not be relied upon for tender, pricing, or construction purposes.

- KEY**
- Site Boundary (Indicative Only)
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 - 7m Watercourse Buffer
 - Overland Flow Route (Indicative Only)
 - Archaeological Mitigation Areas
 - Interception Swales

- NOTES**
- Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024
 - Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("CAD") (Dated 6th May 2022).
 - Based on data from Archaeological Services WYAS Reference: XF70_HL022 Received 05/05/2023.
 - Approximate Top of Bank based on LIDAR data at 0.1m intervals. 7m buffers based on the approximate top of bank data. Top of Bank will need to be accurately verified.
 - Contains public sector information licensed under the Open Government Licence v3.0.
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 - Total Length of swales provided = 4975m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.08m³ of storage is available. Therefore the total available storage provided within the swales is 398m³.



Rev	Date	Description	Drawn	Check
#	09.06.13	First Issue.	SLC	SAM
A	23.06.23	Presentation updated	BF	
B	23/08/23	Layout Revision	RS	
C	14/02/24	Updated parameters plan & site boundary	SLC	BF

Status

FOR PLANNING

Client

Enso Green Holdings D Limited

Project

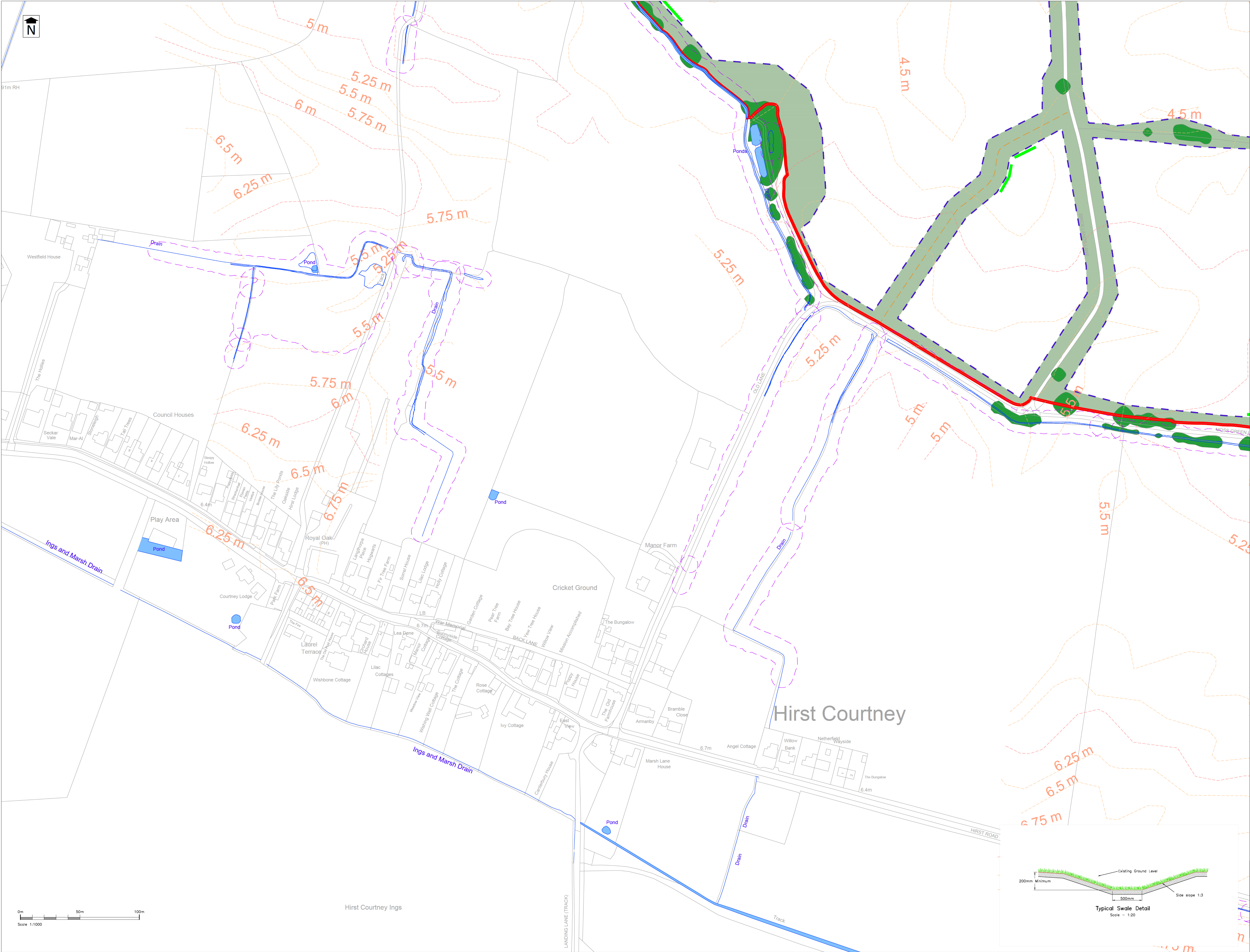
Helios Renewable Energy Project

Drawing Title
Solar Farm Preliminary Surface Water Drainage Arrangements Sheet 14 of 17

Drawing No. **E216/103** Rev C

Date: June 2023 Scale: 1:1000 @ A0

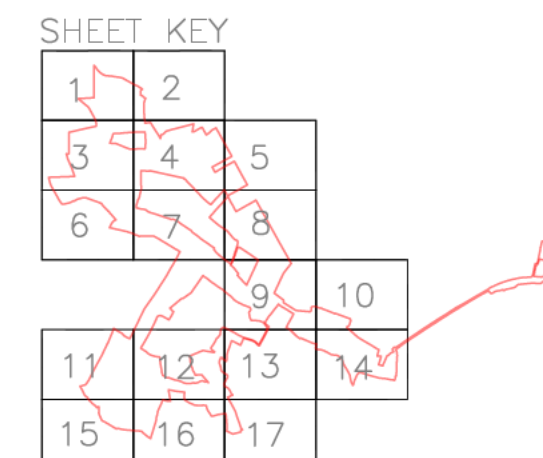
E-Mail: info@pfaplc.com



For Planning
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- KEY**
- Site Boundary (Indicative Only)
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 - Archaeological Mitigation Areas
 - Interception Swales

- NOTES**
- Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024
 - Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number BRAX_LINWORK ("CAD") (Dated 6th May 2022).
 - Based on data from Archaeological Services WYAS Reference: XF70_HL022 Recieved 05/05/2023
 - Approximate Top of Bank based on LIDAR data at 0.1m intervals. 7m buffers based on the approximate top of bank data. Top of Bank will need to be accurately verified.
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 - Total Length of swales provided = 4975m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.08m³ of storage is available. Therefore the total available storage provided within the swales is 398m³.



Rev	Date	Description	Drawn	Check
#	09.06.23	First Issue	SLC	SMM
A	23.06.23	Presentation updated	BF	
B	23/08/23	Layout Revision	RS	
C	14/02/24	Updated parameters plan & site boundary	SLC	BF

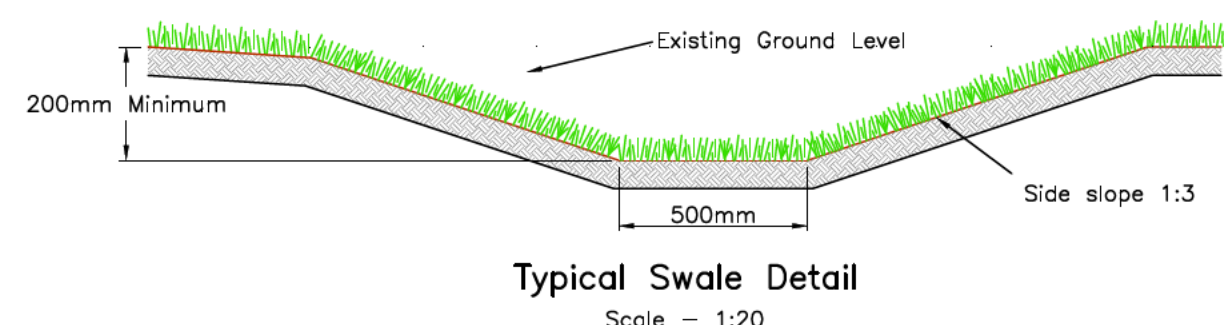
Status
FOR PLANNING

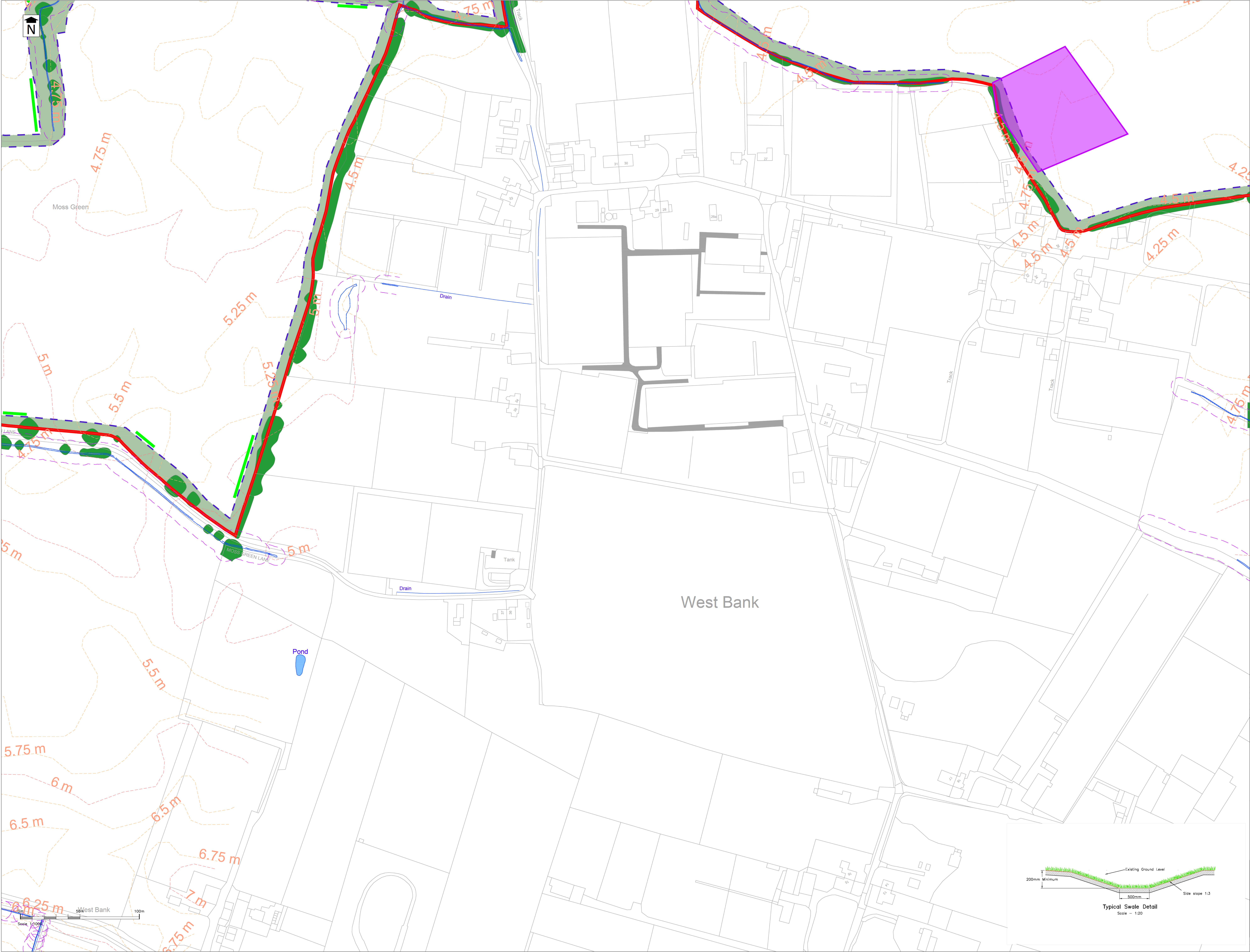
Client
Enso Green Holdings D Limited

Project
Helios Renewable Energy Project

Drawing Title
Solar Farm Preliminary Surface Water Drainage Arrangements Sheet 15 of 17

Drawing No. **E216/104** Rev C
Date: June 2023 Scale: 1:1000 @ A0
E-Mail: @pfapic.com





For Planning
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- KEY**
- Site Boundary (Indicative Only)
 - Ordinary Watercourse
 - Ordinary Watercourse (DB Maintained)
 - 7m Watercourse Buffer
 - Overland Flow Route (Indicative Only)
 - Archaeological Mitigation Areas
 - Interception Swales

- NOTES**
- Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024
 - Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("CAD") (Dated 6th May 2022).
 - Based on data from Archaeological Services WYAS Reference: XF70_HL022 Reviewed 05/05/2023
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 - Total Length of swales provided = 4975m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.08m² of storage is available. Therefore the total available storage provided within the swales is 398m³.

SHEET KEY

1	2
3	4 5
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Rev	Date	Description	Drawn	Check
#	09.06.23	First Issue	SIC	SAM
A	23.06.23	Presentation updated	W	
B	23/08/23	LAYOUT Revision	S	
C	14/02/24	Updated parameters plan & site boundary	SIC	BF

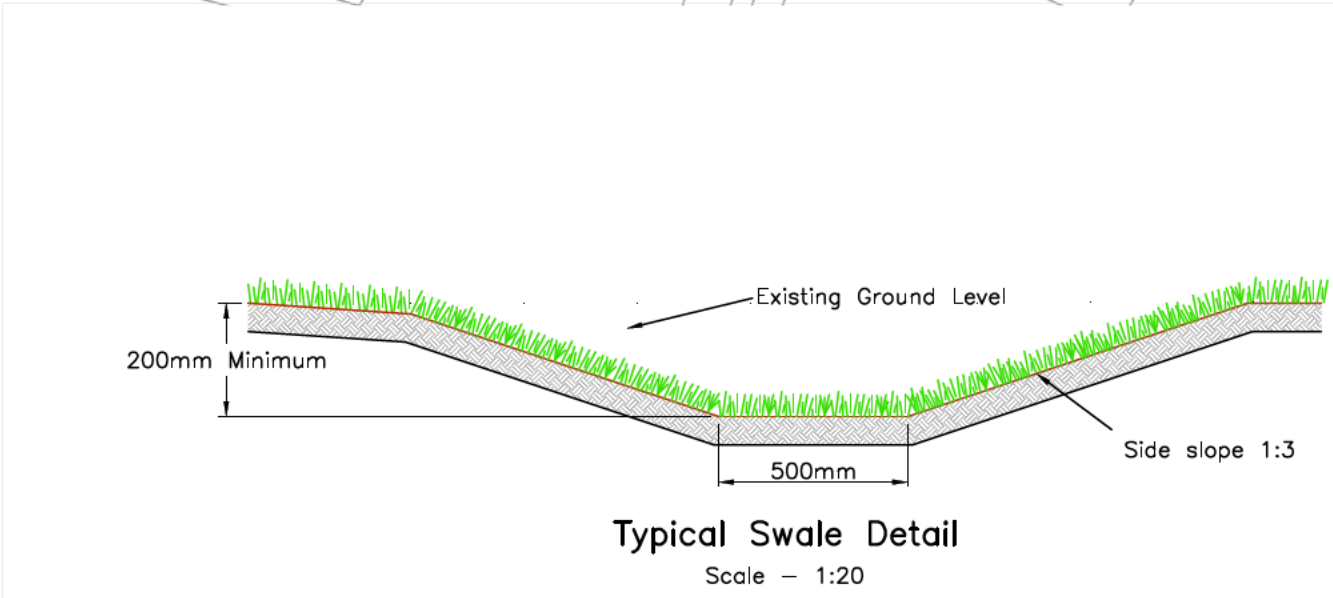
Status
FOR PLANNING

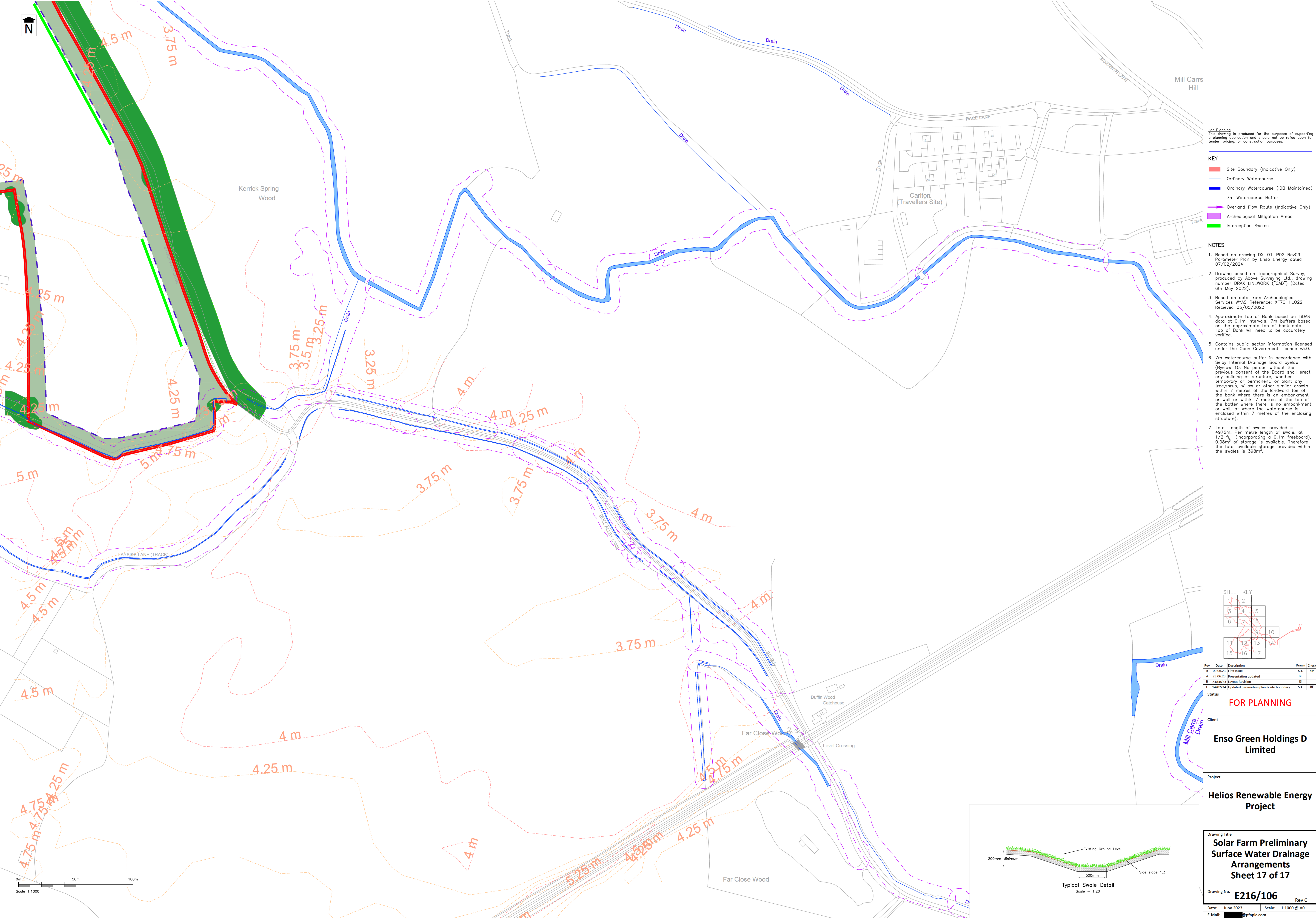
Client
Enso Green Holdings D Limited

Project
Helios Renewable Energy Project

Drawing Title
Solar Farm Preliminary Surface Water Drainage Arrangements Sheet 16 of 17

Drawing No. **E216/105** Rev C
Date: June 2023 Scale: 1:1000 @ A0
E-Mail: @pfaplc.com

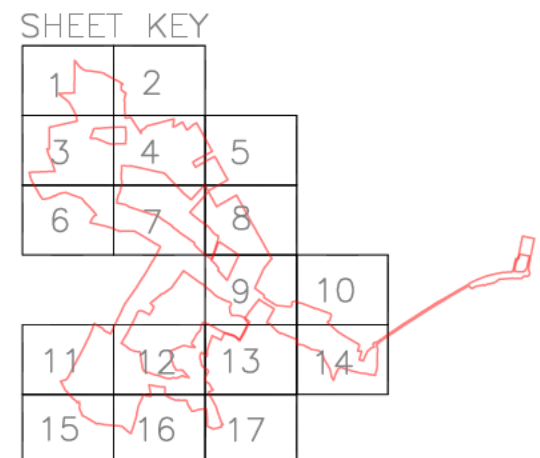




For Planning
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- KEY**
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 - 7m Watercourse Buffer
 - Overland Flow Route (indicative Only)
 - Archeological Mitigation Areas
 - Interception Swales

- NOTES**
- Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024
 - Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("L&O") (Dated 6th May 2022).
 - Based on data from Archaeological Services WYAS Reference: XF70_HL022 Received 05/05/2023
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Rev #	Date	Description	Drawn	Check
A	09.06.23	First Issue	SLC	DM
B	23.06.23	Presentation updated	BF	
B	23/08/23	Layout Revision	IS	
C	14/02/24	Updated parameters plan & site boundary	SLC	BF

Status **FOR PLANNING**

Client
Enso Green Holdings D Limited

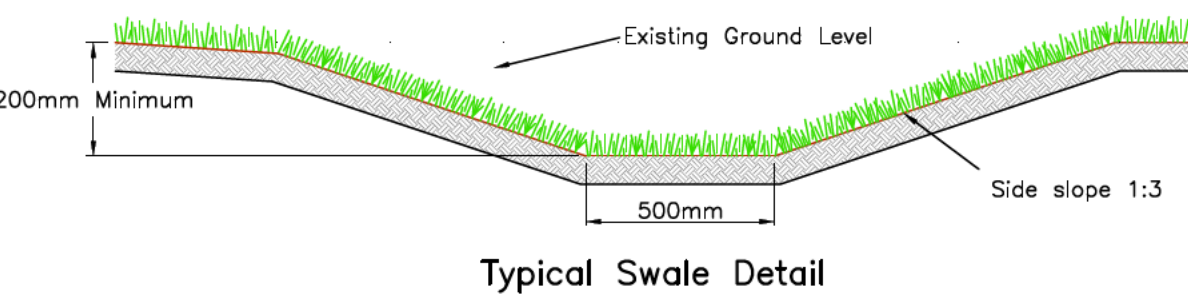
Project
Helios Renewable Energy Project

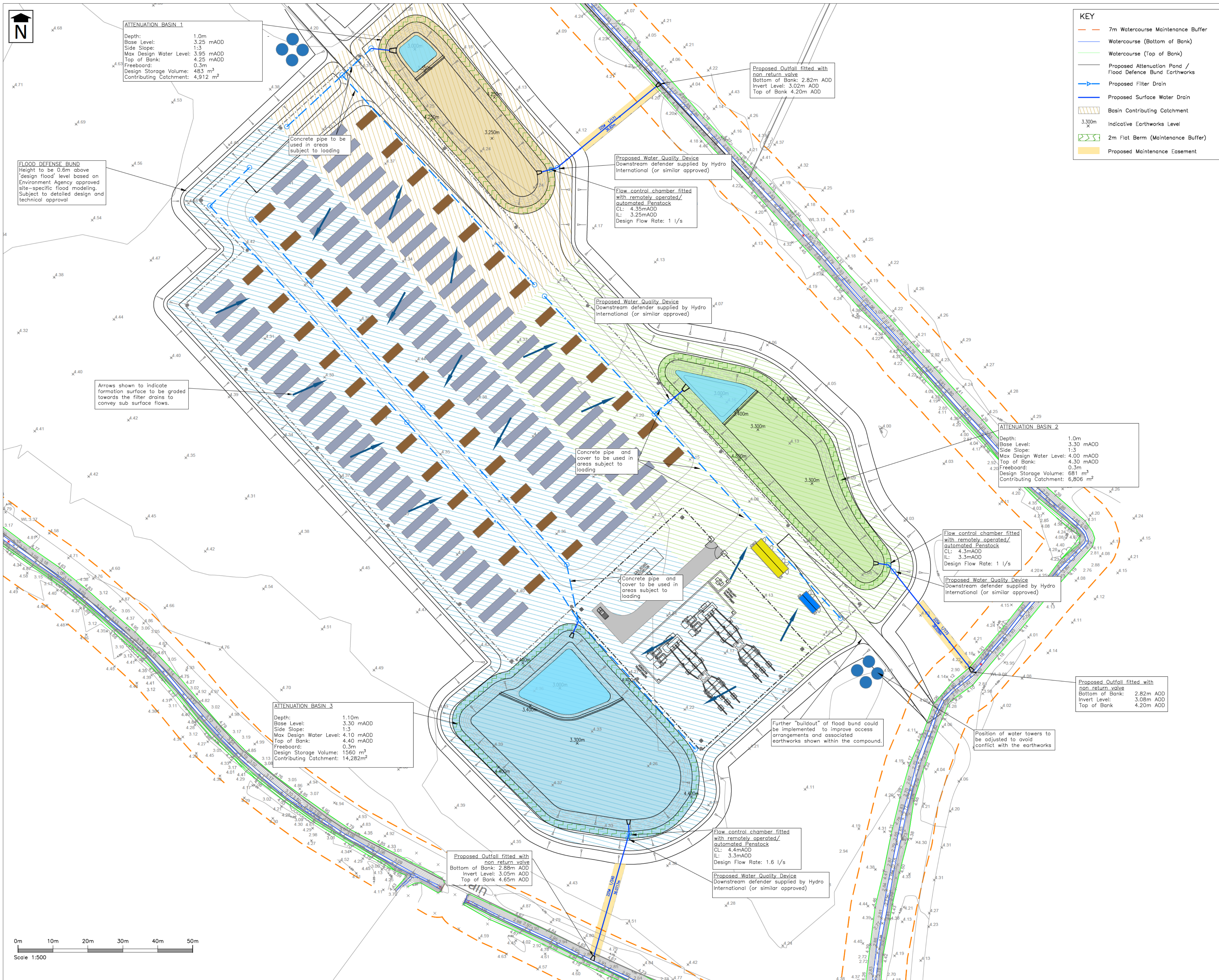
Drawing Title
Solar Farm Preliminary Surface Water Drainage Arrangements Sheet 17 of 17

Drawing No. **E216/106** Rev C

Date: June 2023 Scale: 1:1000 @ A0

E-Mail: @pfaplc.com





Stratton Park House, Wanborough Road
Swindon, SN3 4HG

Telephone
01793 828000

Website
www.pfaplc.com

For Planning
This drawing is produced for the purposes of supporting a planning application and should not be relied upon for tender, pricing, or construction purposes.

NOTES

- Drawing based on Substation/BESS Block Plan, produced by Enso Energy, Drawing No. DX-01-P42, (Dated 01/02/24).
- Drawing based on Topographical Survey, produced by Storm Geomatics, Drawing Nos. 851/15 and 851/16 (Dated: 09/10/2023)
- Surface water drainage for the BESS area subject to detailed design and technical approval.
- Basins shown with indicative 300mm deep sediment forebays with a 100mm bund above the base of the feature.
- Drawing to be read in conjunction with Flood Risk Assessment (including drainage strategy), Document Reference: E216-DOC01-FRA.
- Greenfield Runoff Rate for the entire compound contributing catchments (~2,600ha);
Q₁₀₀: 4.1 l/s
Q₅: 3.6 l/s
Q₁₀₀: 8.6 l/s
- SEPA Area IDB runoff rate restriction 1.4 l/s/ha or 3.6 l/s.
- BESS compound, including areas under Attenuation Basins, to be lined with an impermeable liner to prevent the formation of a pathway between the surface and underlying aquifer.

Rev	Date	Description	Drawn	Check
#	09/06/23	First Issue.	IS	SM
A	13/02/23	Updated in accordance with latest layout and updated drainage strategy	DAB	BF
B	03/04/24	Penstock valve details amended. Note 10 revised to confirm impermeable liner extending under Attenuation Basins.	SAM	SAM
C	06/06/24	Flood defence bund updated to reflect site-specific flood modelling.	BF	SAM
D	02/01/25	Water quality devices incorporated into design as a precautionary fail safe measure.	IS	BF

Status

FOR PLANNING

Client

Enso Green Holdings D Ltd

Project

Helios Renewable Energy Project

Drawing Title

BESS and Substation Preliminary Drainage Strategy

Drawing No. E216/88 Rev D

Date: May 2023 Scale: 1:500 @ A1
E-Mail: @pfaplc.com

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy BESS-Basin 1 1yr	
Date 13/02/2024 14:45 File Pond 1 1yr.SRCX	Designed by [REDACTED] Checked by [REDACTED]	
XP Solutions		Source Control 2020.1.3

Model Details

Storage is Online Cover Level (m) 4.250

Tank or Pond Structure

Invert Level (m) 3.250

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	553.0	0.300	668.8	0.600	790.3	0.900	916.9
0.100	590.5	0.400	708.7	0.700	831.9	1.000	960.2
0.200	629.4	0.500	749.2	0.800	874.1		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0051-1000-0700-1000
Design Head (m)	0.700
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	51
Invert Level (m)	3.250
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.700	1.0
Flush-Flo™	0.222	1.0
Kick-Flo®	0.449	0.8
Mean Flow over Head Range	-	0.9

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.9	1.200	1.3	3.000	1.9	7.000	2.9
0.200	1.0	1.400	1.4	3.500	2.1	7.500	2.9
0.300	1.0	1.600	1.4	4.000	2.2	8.000	3.0
0.400	0.9	1.800	1.5	4.500	2.3	8.500	3.1
0.500	0.9	2.000	1.6	5.000	2.4	9.000	3.2
0.600	0.9	2.200	1.7	5.500	2.6	9.500	3.3
0.800	1.1	2.400	1.7	6.000	2.7		
1.000	1.2	2.600	1.8	6.500	2.8		

PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy BESS-Basin 1 1yr	
Date 13/02/2024 14:45 File Pond 1 1yr.SRCX	Designed by [REDACTED] Checked by	
XP Solutions		Source Control 2020.1.3

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	19.000	Shortest Storm (mins)	15
Ratio R	0.403	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.491

Time (mins) Area			Time (mins) Area			Time (mins) Area		
From:	To:	(ha)	From:	To:	(ha)	From:	To:	(ha)
0	4	0.080	8	12	0.080	16	20	0.080
4	8	0.080	12	16	0.080	20	24	0.091

PFA Consulting Ltd				Page 1																																																																																																																																																																																																																																																			
Stratton Park House Wanborough Road Swindon SN3 4HG		E216: Helios Renewable Energy BESS-Basin 1 1yr																																																																																																																																																																																																																																																					
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<u>Summary of Results for 1 year Return Period</u> <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Control (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>3.313</td><td>0.063</td><td>0.7</td><td>35.4</td><td>O K</td></tr><tr><td>30 min Summer</td><td>3.330</td><td>0.080</td><td>0.9</td><td>45.6</td><td>O K</td></tr><tr><td>60 min Summer</td><td>3.350</td><td>0.100</td><td>0.9</td><td>57.0</td><td>O K</td></tr><tr><td>120 min Summer</td><td>3.370</td><td>0.120</td><td>0.9</td><td>69.1</td><td>O K</td></tr><tr><td>180 min Summer</td><td>3.382</td><td>0.132</td><td>1.0</td><td>76.3</td><td>O K</td></tr><tr><td>240 min Summer</td><td>3.391</td><td>0.141</td><td>1.0</td><td>81.4</td><td>O K</td></tr><tr><td>360 min Summer</td><td>3.402</td><td>0.152</td><td>1.0</td><td>88.1</td><td>O K</td></tr><tr><td>480 min Summer</td><td>3.407</td><td>0.157</td><td>1.0</td><td>91.7</td><td>O K</td></tr><tr><td>600 min Summer</td><td>3.411</td><td>0.161</td><td>1.0</td><td>93.9</td><td>O K</td></tr><tr><td>720 min Summer</td><td>3.413</td><td>0.163</td><td>1.0</td><td>95.2</td><td>O K</td></tr><tr><td>960 min Summer</td><td>3.416</td><td>0.166</td><td>1.0</td><td>96.8</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>3.418</td><td>0.168</td><td>1.0</td><td>98.3</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>3.417</td><td>0.167</td><td>1.0</td><td>97.7</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>3.413</td><td>0.163</td><td>1.0</td><td>95.4</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>3.402</td><td>0.152</td><td>1.0</td><td>88.7</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>3.391</td><td>0.141</td><td>1.0</td><td>81.5</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>3.379</td><td>0.129</td><td>1.0</td><td>74.6</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>3.369</td><td>0.119</td><td>0.9</td><td>68.4</td><td>O 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Summer</td><td>3.435</td><td>0.0</td><td>92.9</td><td>370</td></tr><tr><td>480 min Summer</td><td>2.782</td><td>0.0</td><td>100.0</td><td>486</td></tr><tr><td>600 min Summer</td><td>2.362</td><td>0.0</td><td>105.7</td><td>602</td></tr><tr><td>720 min Summer</td><td>2.066</td><td>0.0</td><td>110.3</td><td>692</td></tr><tr><td>960 min Summer</td><td>1.673</td><td>0.0</td><td>117.4</td><td>804</td></tr><tr><td>1440 min Summer</td><td>1.243</td><td>0.0</td><td>124.7</td><td>1058</td></tr><tr><td>2160 min Summer</td><td>0.925</td><td>0.0</td><td>158.7</td><td>1472</td></tr><tr><td>2880 min Summer</td><td>0.750</td><td>0.0</td><td>170.9</td><td>1880</td></tr><tr><td>4320 min Summer</td><td>0.557</td><td>0.0</td><td>187.7</td><td>2692</td></tr><tr><td>5760 min Summer</td><td>0.451</td><td>0.0</td><td>210.4</td><td>3472</td></tr><tr><td>7200 min Summer</td><td>0.383</td><td>0.0</td><td>223.1</td><td>4256</td></tr><tr><td>8640 min Summer</td><td>0.335</td><td>0.0</td><td>233.6</td><td>5016</td></tr><tr><td>10080 min Summer</td><td>0.300</td><td>0.0</td><td>242.0</td><td>5752</td></tr><tr><td>15 min Winter</td><td>29.454</td><td>0.0</td><td>27.2</td><td>38</td></tr><tr><td>30 min Winter</td><td>19.131</td><td>0.0</td><td>36.5</td><td>51</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status	15 min Summer	3.313	0.063	0.7	35.4	O K	30 min Summer	3.330	0.080	0.9	45.6	O K	60 min Summer	3.350	0.100	0.9	57.0	O K	120 min Summer	3.370	0.120	0.9	69.1	O K	180 min Summer	3.382	0.132	1.0	76.3	O K	240 min Summer	3.391	0.141	1.0	81.4	O K	360 min Summer	3.402	0.152	1.0	88.1	O K	480 min Summer	3.407	0.157	1.0	91.7	O K	600 min Summer	3.411	0.161	1.0	93.9	O K	720 min Summer	3.413	0.163	1.0	95.2	O K	960 min Summer	3.416	0.166	1.0	96.8	O K	1440 min Summer	3.418	0.168	1.0	98.3	O K	2160 min Summer	3.417	0.167	1.0	97.7	O K	2880 min Summer	3.413	0.163	1.0	95.4	O K	4320 min 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Stratton Park House Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy BESS-Basin 1 1yr	
Date 13/02/2024 14:45 File Pond 1 1yr.SRCX	Designed by [REDACTED] Checked by [REDACTED]	
XP Solutions		Source Control 2020.1.3

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	3.350	0.100	0.9	57.0	O K
120 min Winter	3.370	0.120	0.9	69.1	O K
180 min Winter	3.382	0.132	1.0	76.4	O K
240 min Winter	3.391	0.141	1.0	81.5	O K
360 min Winter	3.402	0.152	1.0	88.3	O K
480 min Winter	3.408	0.158	1.0	91.9	O K
600 min Winter	3.411	0.161	1.0	94.1	O K
720 min Winter	3.413	0.163	1.0	95.4	O K
960 min Winter	3.415	0.165	1.0	96.4	O K
1440 min Winter	3.416	0.166	1.0	96.8	O K
2160 min Winter	3.411	0.161	1.0	94.1	O K
2880 min Winter	3.404	0.154	1.0	89.7	O K
4320 min Winter	3.386	0.136	1.0	78.8	O K
5760 min Winter	3.369	0.119	0.9	68.4	O K
7200 min Winter	3.354	0.104	0.9	59.4	O K
8640 min Winter	3.341	0.091	0.9	51.9	O K
10080 min Winter	3.331	0.081	0.9	45.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	12.084	0.0	53.9	80
120 min Winter	7.478	0.0	67.3	136
180 min Winter	5.621	0.0	76.1	192
240 min Winter	4.585	0.0	82.8	248
360 min Winter	3.435	0.0	92.9	362
480 min Winter	2.782	0.0	100.0	476
600 min Winter	2.362	0.0	105.7	586
720 min Winter	2.066	0.0	110.4	694
960 min Winter	1.673	0.0	117.5	888
1440 min Winter	1.243	0.0	125.2	1110
2160 min Winter	0.925	0.0	158.7	1572
2880 min Winter	0.750	0.0	171.0	2016
4320 min Winter	0.557	0.0	188.0	2860
5760 min Winter	0.451	0.0	210.4	3640
7200 min Winter	0.383	0.0	223.2	4400
8640 min Winter	0.335	0.0	233.7	5112
10080 min Winter	0.300	0.0	242.2	5768

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy BESS-Basin 1 100yr + CC	
Date 13/02/2024 14:44 File POND 1 100YR +CC.SRCX	Designed by  Checked by 	
XP Solutions Source Control 2020.1.3		

Model Details

Storage is Online Cover Level (m) 4.250

Tank or Pond Structure

Invert Level (m) 3.250

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	553.0	0.300	668.8	0.600	790.3	0.900	916.9
0.100	590.5	0.400	708.7	0.700	831.9	1.000	960.2
0.200	629.4	0.500	749.2	0.800	874.1		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0051-1000-0700-1000
Design Head (m)	0.700
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	51
Invert Level (m)	3.250
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.700	1.0
Flush-Flo™	0.222	1.0
Kick-Flo®	0.449	0.8
Mean Flow over Head Range	-	0.9

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.9	1.200	1.3	3.000	1.9	7.000	2.9
0.200	1.0	1.400	1.4	3.500	2.1	7.500	2.9
0.300	1.0	1.600	1.4	4.000	2.2	8.000	3.0
0.400	0.9	1.800	1.5	4.500	2.3	8.500	3.1
0.500	0.9	2.000	1.6	5.000	2.4	9.000	3.2
0.600	0.9	2.200	1.7	5.500	2.6	9.500	3.3
0.800	1.1	2.400	1.7	6.000	2.7		
1.000	1.2	2.600	1.8	6.500	2.8		

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Stratton Park House	E216: Helios Renewable Energy	
Wanborough Road	BESS-Basin 1	
Swindon SN3 4HG	100yr + CC	
Date 13/02/2024 14:44	Designed by [REDACTED]	
File POND 1 100YR +CC.SRCX	Checked by	
XP Solutions	Source Control 2020.1.3	

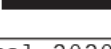
Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 463451 426329 SE 63451 26329
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.491

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)
0 4 0.080	8 12 0.080	16 20 0.080			
4 8 0.080	12 16 0.080	20 24 0.091			

PFA Consulting Ltd				Page 1	
Stratton Park House Wanborough Road Swindon SN3 4HG		E216: Helios Renewable Energy BESS-Basin 1 100yr + CC			
Date 13/02/2024 14:44 File POND 1 100YR +CC.SRCX		Designed by  Checked by 			
XP Solutions		Source Control 2020.1.3			
<u>Summary of Results for 100 year Return Period (+30%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	3.521	0.271	1.0	163.7	O K
30 min Summer	3.596	0.346	1.0	214.0	O K
60 min Summer	3.669	0.419	1.0	265.7	O K
120 min Summer	3.735	0.485	1.0	313.3	O K
180 min Summer	3.771	0.521	1.0	340.8	O K
240 min Summer	3.796	0.546	1.0	359.5	O K
360 min Summer	3.827	0.577	1.0	383.9	O K
480 min Summer	3.847	0.597	1.0	399.3	O K
600 min Summer	3.860	0.610	1.0	410.1	O K
720 min Summer	3.871	0.621	1.0	418.1	O K
960 min Summer	3.885	0.635	1.0	429.5	O K
1440 min Summer	3.899	0.649	1.0	440.9	O K
2160 min Summer	3.904	0.654	1.0	444.9	O K
2880 min Summer	3.900	0.650	1.0	442.0	O K
4320 min Summer	3.887	0.637	1.0	431.5	O K
5760 min Summer	3.877	0.627	1.0	423.5	O K
7200 min Summer	3.869	0.619	1.0	416.7	O K
8640 min Summer	3.862	0.612	1.0	411.0	O K
10080 min Summer	3.856	0.606	1.0	406.2	O K
15 min Winter	3.521	0.271	1.0	163.7	O K
30 min Winter	3.596	0.346	1.0	214.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	134.708	0.0	84.8	39	
30 min Summer	88.083	0.0	84.1	53	
60 min Summer	54.806	0.0	165.6	84	
120 min Summer	32.504	0.0	156.1	142	
180 min Summer	23.714	0.0	151.5	202	
240 min Summer	18.881	0.0	149.2	262	
360 min Summer	13.610	0.0	147.5	380	
480 min Summer	10.744	0.0	147.5	500	
600 min Summer	8.933	0.0	148.4	618	
720 min Summer	7.679	0.0	149.2	738	
960 min Summer	6.052	0.0	149.9	976	
1440 min Summer	4.330	0.0	149.0	1452	
2160 min Summer	3.107	0.0	296.4	2168	
2880 min Summer	2.465	0.0	293.3	2884	
4320 min Summer	1.797	0.0	286.0	3736	
5760 min Summer	1.446	0.0	591.8	4512	
7200 min Summer	1.227	0.0	570.4	5272	
8640 min Summer	1.076	0.0	547.8	6072	
10080 min Summer	0.966	0.0	527.1	6960	
15 min Winter	134.708	0.0	84.8	39	
30 min Winter	88.083	0.0	84.1	53	
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PFA Consulting Ltd				Page 2	
Stratton Park House Wanborough Road Swindon SN3 4HG		E216: Helios Renewable Energy BESS-Basin 1 100yr + CC			
Date 13/02/2024 14:44 File POND 1 100YR +CC.SRCX		Designed by  Checked by 			
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180 min Winter	3.771	0.521	1.0	340.8	O K
240 min Winter	3.796	0.546	1.0	359.6	O K
360 min Winter	3.828	0.578	1.0	384.2	O K
480 min Winter	3.847	0.597	1.0	399.6	O K
600 min Winter	3.861	0.611	1.0	410.6	O K
720 min Winter	3.871	0.621	1.0	418.7	O K
960 min Winter	3.886	0.636	1.0	430.4	O K
1440 min Winter	3.901	0.651	1.0	442.3	O K
2160 min Winter	3.907	0.657	1.0	447.2	O K
2880 min Winter	3.904	0.654	1.0	445.4	O K
4320 min Winter	3.891	0.641	1.0	434.8	O K
5760 min Winter	3.876	0.626	1.0	422.7	O K
7200 min Winter	3.864	0.614	1.0	412.9	O K
8640 min Winter	3.852	0.602	1.0	403.1	O K
10080 min Winter	3.840	0.590	1.0	393.5	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	54.806	0.0	165.6	82	
120 min Winter	32.504	0.0	156.1	140	
180 min Winter	23.714	0.0	151.5	200	
240 min Winter	18.881	0.0	149.2	258	
360 min Winter	13.610	0.0	147.5	374	
480 min Winter	10.744	0.0	147.5	492	
600 min Winter	8.933	0.0	148.4	608	
720 min Winter	7.679	0.0	149.1	726	
960 min Winter	6.052	0.0	149.7	958	
1440 min Winter	4.330	0.0	148.7	1424	
2160 min Winter	3.107	0.0	296.0	2112	
2880 min Winter	2.465	0.0	293.0	2780	
4320 min Winter	1.797	0.0	286.0	4060	
5760 min Winter	1.446	0.0	592.8	4616	
7200 min Winter	1.227	0.0	572.9	5544	
8640 min Winter	1.076	0.0	552.0	6488	
10080 min Winter	0.966	0.0	532.7	7384	
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PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy BESS-Basin 2 1 yr	
Date 13/02/2024 14:46 File Pond 2 1yr.SRCX	Designed by  Checked by 	
XP Solutions		
Source Control 2020.1.3		

Model Details

Storage is Online Cover Level (m) 4.300

Tank or Pond Structure

Invert Level (m) 3.300

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	791.9	0.300	944.9	0.600	1104.0	0.900	1268.1
0.100	841.7	0.400	997.4	0.700	1158.1	1.000	1324.0
0.200	893.0	0.500	1050.4	0.800	1212.8	1.001	1324.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0051-1000-0700-1000
Design Head (m)	0.700
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	51
Invert Level (m)	3.300
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.700	1.0
Flush-Flo™	0.222	1.0
Kick-Flo®	0.449	0.8
Mean Flow over Head Range	-	0.9

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.9	1.200	1.3	3.000	1.9	7.000	2.9
0.200	1.0	1.400	1.4	3.500	2.1	7.500	2.9
0.300	1.0	1.600	1.4	4.000	2.2	8.000	3.0
0.400	0.9	1.800	1.5	4.500	2.3	8.500	3.1
0.500	0.9	2.000	1.6	5.000	2.4	9.000	3.2
0.600	0.9	2.200	1.7	5.500	2.6	9.500	3.3
0.800	1.1	2.400	1.7	6.000	2.7		
1.000	1.2	2.600	1.8	6.500	2.8		

PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy BESS-Basin 2 1 yr	
Date 13/02/2024 14:46 File Pond 2 1yr.SRCX	Designed by [REDACTED] Checked by	
XP Solutions		Source Control 2020.1.3

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	19.000	Shortest Storm (mins)	15
Ratio R	0.403	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.681

Time (mins) Area			Time (mins) Area			Time (mins) Area		
From:	To:	(ha)	From:	To:	(ha)	From:	To:	(ha)
0	4	0.112	8	12	0.112	16	20	0.112
4	8	0.112	12	16	0.112	20	24	0.121

PFA Consulting Ltd				Page 1																																																																																																																																																																																																																																																			
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K</td></tr><tr><td>600 min Summer</td><td>3.466</td><td>0.166</td><td>1.0</td><td>138.6</td><td>O K</td></tr><tr><td>720 min Summer</td><td>3.470</td><td>0.170</td><td>1.0</td><td>142.0</td><td>O K</td></tr><tr><td>960 min Summer</td><td>3.475</td><td>0.175</td><td>1.0</td><td>146.1</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>3.479</td><td>0.179</td><td>1.0</td><td>149.8</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>3.482</td><td>0.182</td><td>1.0</td><td>152.0</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>3.481</td><td>0.181</td><td>1.0</td><td>151.8</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>3.476</td><td>0.176</td><td>1.0</td><td>147.1</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>3.468</td><td>0.168</td><td>1.0</td><td>140.4</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>3.460</td><td>0.160</td><td>1.0</td><td>133.0</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>3.451</td><td>0.151</td><td>1.0</td><td>125.6</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>3.443</td><td>0.143</td><td>1.0</td><td>118.5</td><td>O K</td></tr><tr><td>15 min Winter</td><td>3.361</td><td>0.061</td><td>0.7</td><td>49.4</td><td>O K</td></tr><tr><td>30 min Winter</td><td>3.379</td><td>0.079</td><td>0.8</td><td>63.8</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Discharge Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>29.454</td><td>0.0</td><td>33.1</td><td>38</td></tr><tr><td>30 min Summer</td><td>19.131</td><td>0.0</td><td>44.4</td><td>52</td></tr><tr><td>60 min Summer</td><td>12.084</td><td>0.0</td><td>70.6</td><td>82</td></tr><tr><td>120 min Summer</td><td>7.478</td><td>0.0</td><td>88.0</td><td>140</td></tr><tr><td>180 min Summer</td><td>5.621</td><td>0.0</td><td>99.2</td><td>198</td></tr><tr><td>240 min Summer</td><td>4.585</td><td>0.0</td><td>107.4</td><td>256</td></tr><tr><td>360 min Summer</td><td>3.435</td><td>0.0</td><td>119.2</td><td>374</td></tr><tr><td>480 min Summer</td><td>2.782</td><td>0.0</td><td>126.7</td><td>490</td></tr><tr><td>600 min Summer</td><td>2.362</td><td>0.0</td><td>131.9</td><td>608</td></tr><tr><td>720 min Summer</td><td>2.066</td><td>0.0</td><td>135.3</td><td>726</td></tr><tr><td>960 min Summer</td><td>1.673</td><td>0.0</td><td>138.5</td><td>962</td></tr><tr><td>1440 min Summer</td><td>1.243</td><td>0.0</td><td>136.0</td><td>1214</td></tr><tr><td>2160 min Summer</td><td>0.925</td><td>0.0</td><td>213.3</td><td>1592</td></tr><tr><td>2880 min Summer</td><td>0.750</td><td>0.0</td><td>227.3</td><td>2000</td></tr><tr><td>4320 min Summer</td><td>0.557</td><td>0.0</td><td>237.1</td><td>2824</td></tr><tr><td>5760 min Summer</td><td>0.451</td><td>0.0</td><td>289.7</td><td>3640</td></tr><tr><td>7200 min Summer</td><td>0.383</td><td>0.0</td><td>306.9</td><td>4464</td></tr><tr><td>8640 min Summer</td><td>0.335</td><td>0.0</td><td>321.1</td><td>5208</td></tr><tr><td>10080 min Summer</td><td>0.300</td><td>0.0</td><td>331.8</td><td>5976</td></tr><tr><td>15 min Winter</td><td>29.454</td><td>0.0</td><td>33.1</td><td>38</td></tr><tr><td>30 min Winter</td><td>19.131</td><td>0.0</td><td>44.4</td><td>52</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status	15 min Summer	3.361	0.061	0.7	49.4	O K	30 min Summer	3.379	0.079	0.8	63.8	O K	60 min Summer	3.398	0.098	0.9	79.9	O K	120 min Summer	3.419	0.119	0.9	97.5	O K	180 min Summer	3.431	0.131	1.0	108.3	O K	240 min Summer	3.441	0.141	1.0	116.2	O K	360 min Summer	3.453	0.153	1.0	127.2	O K	480 min Summer	3.461	0.161	1.0	133.9	O K	600 min Summer	3.466	0.166	1.0	138.6	O K	720 min Summer	3.470	0.170	1.0	142.0	O K	960 min Summer	3.475	0.175	1.0	146.1	O K	1440 min Summer	3.479	0.179	1.0	149.8	O K	2160 min Summer	3.482	0.182	1.0	152.0	O K	2880 min Summer	3.481	0.181	1.0	151.8	O K	4320 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Summer	0.335	0.0	321.1	5208	10080 min Summer	0.300	0.0	331.8	5976	15 min Winter	29.454	0.0	33.1	38	30 min Winter	19.131	0.0	44.4	52
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120 min Summer	7.478	0.0	88.0	140																																																																																																																																																																																																																																																			
180 min Summer	5.621	0.0	99.2	198																																																																																																																																																																																																																																																			
240 min Summer	4.585	0.0	107.4	256																																																																																																																																																																																																																																																			
360 min Summer	3.435	0.0	119.2	374																																																																																																																																																																																																																																																			
480 min Summer	2.782	0.0	126.7	490																																																																																																																																																																																																																																																			
600 min Summer	2.362	0.0	131.9	608																																																																																																																																																																																																																																																			
720 min Summer	2.066	0.0	135.3	726																																																																																																																																																																																																																																																			
960 min Summer	1.673	0.0	138.5	962																																																																																																																																																																																																																																																			
1440 min Summer	1.243	0.0	136.0	1214																																																																																																																																																																																																																																																			
2160 min Summer	0.925	0.0	213.3	1592																																																																																																																																																																																																																																																			
2880 min Summer	0.750	0.0	227.3	2000																																																																																																																																																																																																																																																			
4320 min Summer	0.557	0.0	237.1	2824																																																																																																																																																																																																																																																			
5760 min Summer	0.451	0.0	289.7	3640																																																																																																																																																																																																																																																			
7200 min Summer	0.383	0.0	306.9	4464																																																																																																																																																																																																																																																			
8640 min Summer	0.335	0.0	321.1	5208																																																																																																																																																																																																																																																			
10080 min Summer	0.300	0.0	331.8	5976																																																																																																																																																																																																																																																			
15 min Winter	29.454	0.0	33.1	38																																																																																																																																																																																																																																																			
30 min Winter	19.131	0.0	44.4	52																																																																																																																																																																																																																																																			
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PFA Consulting Ltd		Page 2
Stratton Park House Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy BESS-Basin 2 1 yr	
Date 13/02/2024 14:46 File Pond 2 1yr.SRCX	Designed by XXXXXXXXXX Checked by XXXXXXXXXX	
XP Solutions		Source Control 2020.1.3

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	3.398	0.098	0.9	80.0	O K
120 min Winter	3.419	0.119	0.9	97.5	O K
180 min Winter	3.431	0.131	1.0	108.4	O K
240 min Winter	3.441	0.141	1.0	116.3	O K
360 min Winter	3.453	0.153	1.0	127.4	O K
480 min Winter	3.461	0.161	1.0	134.1	O K
600 min Winter	3.467	0.167	1.0	138.8	O K
720 min Winter	3.470	0.170	1.0	142.2	O K
960 min Winter	3.475	0.175	1.0	146.5	O K
1440 min Winter	3.478	0.178	1.0	149.3	O K
2160 min Winter	3.479	0.179	1.0	149.8	O K
2880 min Winter	3.477	0.177	1.0	147.6	O K
4320 min Winter	3.466	0.166	1.0	138.5	O K
5760 min Winter	3.453	0.153	1.0	127.4	O K
7200 min Winter	3.440	0.140	1.0	116.1	O K
8640 min Winter	3.428	0.128	0.9	105.5	O K
10080 min Winter	3.417	0.117	0.9	95.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	12.084	0.0	70.6	80
120 min Winter	7.478	0.0	88.0	138
180 min Winter	5.621	0.0	99.2	194
240 min Winter	4.585	0.0	107.5	252
360 min Winter	3.435	0.0	119.3	366
480 min Winter	2.782	0.0	126.8	480
600 min Winter	2.362	0.0	132.0	596
720 min Winter	2.066	0.0	135.6	708
960 min Winter	1.673	0.0	139.0	930
1440 min Winter	1.243	0.0	137.0	1338
2160 min Winter	0.925	0.0	213.5	1664
2880 min Winter	0.750	0.0	227.7	2132
4320 min Winter	0.557	0.0	238.9	3032
5760 min Winter	0.451	0.0	289.8	3872
7200 min Winter	0.383	0.0	307.1	4696
8640 min Winter	0.335	0.0	321.3	5464
10080 min Winter	0.300	0.0	332.3	6256

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy BESS-Basin 2 100yr + CC	
Date 13/02/2024 14:46 File Pond 2 100yr +CC.SRCX	Designed by  Checked by 	
XP Solutions		
Source Control 2020.1.3		

Model Details

Storage is Online Cover Level (m) 4.300

Tank or Pond Structure

Invert Level (m) 3.300

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	791.9	0.300	944.9	0.600	1104.0	0.900	1268.1
0.100	841.7	0.400	997.4	0.700	1158.1	1.000	1324.0
0.200	893.0	0.500	1050.4	0.800	1212.8	1.001	1324.0

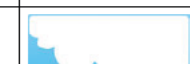
Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0051-1000-0700-1000
Design Head (m)	0.700
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	51
Invert Level (m)	3.300
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.700	1.0
Flush-Flo™	0.222	1.0
Kick-Flo®	0.449	0.8
Mean Flow over Head Range	-	0.9

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.9	1.200	1.3	3.000	1.9	7.000	2.9
0.200	1.0	1.400	1.4	3.500	2.1	7.500	2.9
0.300	1.0	1.600	1.4	4.000	2.2	8.000	3.0
0.400	0.9	1.800	1.5	4.500	2.3	8.500	3.1
0.500	0.9	2.000	1.6	5.000	2.4	9.000	3.2
0.600	0.9	2.200	1.7	5.500	2.6	9.500	3.3
0.800	1.1	2.400	1.7	6.000	2.7		
1.000	1.2	2.600	1.8	6.500	2.8		

PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy BESS-Basin 2 100yr + CC	
Date 13/02/2024 14:46 File Pond 2 100yr +CC.SRCX	Designed by  Checked by	
XP Solutions	Source Control 2020.1.3	

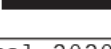
Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 463451 426329 SE 63451 26329
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.681

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)
0 4 0.112	8 12 0.112	16 20 0.112			
4 8 0.112	12 16 0.112	20 24 0.121			

PFA Consulting Ltd				Page 1	
Stratton Park House Wanborough Road Swindon SN3 4HG		E216: Helios Renewable Energy BESS-Basin 2 100yr + CC			
Date 13/02/2024 14:46 File Pond 2 100yr +CC.SRCX		Designed by  Checked by 			
XP Solutions		Source Control 2020.1.3			
<u>Summary of Results for 100 year Return Period (+30%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	3.565	0.265	1.0	227.7	O K
30 min Summer	3.639	0.339	1.0	297.7	O K
60 min Summer	3.712	0.412	1.0	369.8	O K
120 min Summer	3.778	0.478	1.0	436.8	O K
180 min Summer	3.815	0.515	1.0	475.9	O K
240 min Summer	3.841	0.541	1.0	503.0	O K
360 min Summer	3.874	0.574	1.0	539.1	O K
480 min Summer	3.896	0.596	1.0	562.6	O K
600 min Summer	3.911	0.611	1.0	579.8	O K
720 min Summer	3.923	0.623	1.0	593.2	O K
960 min Summer	3.941	0.641	1.0	613.4	O K
1440 min Summer	3.963	0.663	1.0	638.0	O K
2160 min Summer	3.979	0.679	1.0	656.2	O K
2880 min Summer	3.986	0.686	1.0	664.4	O K
4320 min Summer	3.989	0.689	1.0	668.2	O K
5760 min Summer	3.985	0.685	1.0	663.5	O K
7200 min Summer	3.982	0.682	1.0	659.9	O K
8640 min Summer	3.980	0.680	1.0	657.1	O K
10080 min Summer	3.978	0.678	1.0	655.2	O K
15 min Winter	3.565	0.265	1.0	227.7	O K
30 min Winter	3.639	0.339	1.0	297.7	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	134.708	0.0	85.2	39	
30 min Summer	88.083	0.0	83.9	54	
60 min Summer	54.806	0.0	164.5	84	
120 min Summer	32.504	0.0	152.7	144	
180 min Summer	23.714	0.0	147.7	202	
240 min Summer	18.881	0.0	146.2	262	
360 min Summer	13.610	0.0	147.4	382	
480 min Summer	10.744	0.0	149.5	500	
600 min Summer	8.933	0.0	150.7	620	
720 min Summer	7.679	0.0	151.4	740	
960 min Summer	6.052	0.0	151.9	978	
1440 min Summer	4.330	0.0	150.9	1456	
2160 min Summer	3.107	0.0	304.3	2172	
2880 min Summer	2.465	0.0	303.3	2888	
4320 min Summer	1.797	0.0	295.9	4324	
5760 min Summer	1.446	0.0	594.8	5264	
7200 min Summer	1.227	0.0	587.7	5984	
8640 min Summer	1.076	0.0	580.3	6752	
10080 min Summer	0.966	0.0	568.4	7560	
15 min Winter	134.708	0.0	85.2	39	
30 min Winter	88.083	0.0	83.9	53	
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PFA Consulting Ltd				Page 2	
Stratton Park House Wanborough Road Swindon SN3 4HG		E216: Helios Renewable Energy BESS-Basin 2 100yr + CC			
Date 13/02/2024 14:46 File Pond 2 100yr +CC.SRCX		Designed by  Checked by 			
XP Solutions		Source Control 2020.1.3			
<u>Summary of Results for 100 year Return Period (+30%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	3.712	0.412	1.0	369.8	O K
120 min Winter	3.778	0.478	1.0	436.9	O K
180 min Winter	3.815	0.515	1.0	476.0	O K
240 min Winter	3.841	0.541	1.0	503.1	O K
360 min Winter	3.874	0.574	1.0	539.4	O K
480 min Winter	3.896	0.596	1.0	562.9	O K
600 min Winter	3.912	0.612	1.0	580.3	O K
720 min Winter	3.924	0.624	1.0	593.8	O K
960 min Winter	3.942	0.642	1.0	614.2	O K
1440 min Winter	3.964	0.664	1.0	639.3	O K
2160 min Winter	3.981	0.681	1.0	658.4	O K
2880 min Winter	3.989	0.689	1.0	667.6	O K
4320 min Winter	3.994	0.694	1.0	674.0	O K
5760 min Winter	3.992	0.692	1.0	670.8	O K
7200 min Winter	3.985	0.685	1.0	662.9	O K
8640 min Winter	3.980	0.680	1.0	657.1	O K
10080 min Winter	3.976	0.676	1.0	652.8	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	54.806	0.0	164.6	82	
120 min Winter	32.504	0.0	152.7	142	
180 min Winter	23.714	0.0	147.8	200	
240 min Winter	18.881	0.0	146.2	258	
360 min Winter	13.610	0.0	147.5	376	
480 min Winter	10.744	0.0	149.4	494	
600 min Winter	8.933	0.0	150.6	610	
720 min Winter	7.679	0.0	151.3	728	
960 min Winter	6.052	0.0	151.8	962	
1440 min Winter	4.330	0.0	150.6	1432	
2160 min Winter	3.107	0.0	303.8	2128	
2880 min Winter	2.465	0.0	302.6	2816	
4320 min Winter	1.797	0.0	294.9	4160	
5760 min Winter	1.446	0.0	593.9	5440	
7200 min Winter	1.227	0.0	587.3	6632	
8640 min Winter	1.076	0.0	580.4	6920	
10080 min Winter	0.966	0.0	569.4	7784	
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Stratton Park House Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy BESS-Basin 3 1yr	
Date 13/02/2024 10:26 File Pond 3 1yr.SRCX	Designed by [REDACTED] Checked by [REDACTED]	
XP Solutions		Source Control 2020.1.3

Model Details

Storage is Online Cover Level (m) 4.400

Tank or Pond Structure

Invert Level (m) 3.300

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1718.3	0.400	1949.3	0.800	2161.1	1.101	2326.0
0.100	1796.2	0.500	2001.4	0.900	2215.5		
0.200	1846.8	0.600	2054.1	1.000	2270.4		
0.300	1897.7	0.700	2107.3	1.100	2326.0		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0063-1600-0800-1600
Design Head (m)	0.800
Design Flow (l/s)	1.6
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	63
Invert Level (m)	3.300
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	1.6
Flush-Flo™	0.246	1.6
Kick-Flo®	0.508	1.3
Mean Flow over Head Range	-	1.4

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.4	1.200	1.9	3.000	2.9	7.000	4.3
0.200	1.6	1.400	2.1	3.500	3.1	7.500	4.5
0.300	1.6	1.600	2.2	4.000	3.3	8.000	4.6
0.400	1.5	1.800	2.3	4.500	3.5	8.500	4.8
0.500	1.3	2.000	2.4	5.000	3.7	9.000	4.9
0.600	1.4	2.200	2.5	5.500	3.9	9.500	5.0
0.800	1.6	2.400	2.6	6.000	4.0		
1.000	1.8	2.600	2.7	6.500	4.2		

PFA Consulting Limited		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy BESS-Basin 3 1yr	
Date 13/02/2024 10:26 File Pond 3 1yr.SRCX	Designed by [REDACTED] Checked by	
XP Solutions		Source Control 2020.1.3

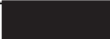
Rainfall Details

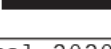
Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	19.000	Shortest Storm (mins)	15
Ratio R	0.403	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 1.428

Time (mins) Area			Time (mins) Area			Time (mins) Area		
From:	To:	(ha)	From:	To:	(ha)	From:	To:	(ha)
0	4	0.233	8	12	0.233	16	20	0.233
4	8	0.233	12	16	0.233	20	24	0.263

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Stratton Park House Wanborough Road Swindon SN3 4HG			E216: Helios Renewable Energy BESS-Basin 3 1yr																																																																																																																																																																																																																																																					
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XP Solutions			Source Control 2020.1.3																																																																																																																																																																																																																																																					
<u>Summary of Results for 1 year Return Period</u> <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Control (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>3.360</td><td>0.060</td><td>1.0</td><td>104.2</td><td>O K</td></tr><tr><td>30 min Summer</td><td>3.377</td><td>0.077</td><td>1.2</td><td>134.8</td><td>O K</td></tr><tr><td>60 min Summer</td><td>3.396</td><td>0.096</td><td>1.4</td><td>169.1</td><td>O K</td></tr><tr><td>120 min Summer</td><td>3.417</td><td>0.117</td><td>1.5</td><td>207.0</td><td>O K</td></tr><tr><td>180 min Summer</td><td>3.431</td><td>0.131</td><td>1.5</td><td>230.9</td><td>O K</td></tr><tr><td>240 min Summer</td><td>3.440</td><td>0.140</td><td>1.5</td><td>248.7</td><td>O K</td></tr><tr><td>360 min Summer</td><td>3.454</td><td>0.154</td><td>1.5</td><td>274.3</td><td>O K</td></tr><tr><td>480 min Summer</td><td>3.464</td><td>0.164</td><td>1.6</td><td>290.8</td><td>O K</td></tr><tr><td>600 min Summer</td><td>3.470</td><td>0.170</td><td>1.6</td><td>303.2</td><td>O K</td></tr><tr><td>720 min Summer</td><td>3.476</td><td>0.176</td><td>1.6</td><td>312.8</td><td>O K</td></tr><tr><td>960 min Summer</td><td>3.483</td><td>0.183</td><td>1.6</td><td>326.5</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>3.491</td><td>0.191</td><td>1.6</td><td>340.7</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>3.496</td><td>0.196</td><td>1.6</td><td>349.9</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>3.498</td><td>0.198</td><td>1.6</td><td>354.6</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>3.498</td><td>0.198</td><td>1.6</td><td>354.6</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>3.495</td><td>0.195</td><td>1.6</td><td>348.4</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>3.490</td><td>0.190</td><td>1.6</td><td>339.3</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>3.484</td><td>0.184</td><td>1.6</td><td>328.6</td><td>O 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Winter	3.476	0.176	1.6	313.0	O K	960 min Winter	3.483	0.183	1.6	326.8	O K	1440 min Winter	3.491	0.191	1.6	341.6	O K	2160 min Winter	3.495	0.195	1.6	348.0	O K	2880 min Winter	3.496	0.196	1.6	350.2	O K	4320 min Winter	3.492	0.192	1.6	344.0	O K	5760 min Winter	3.485	0.185	1.6	330.6	O K	7200 min Winter	3.476	0.176	1.6	314.3	O K	8640 min Winter	3.467	0.167	1.6	296.9	O K	10080 min Winter	3.457	0.157	1.5	279.4	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	60 min Winter	12.084	0.0	129.1	80	120 min Winter	7.478	0.0	161.2	138	180 min Winter	5.621	0.0	180.7	196	240 min Winter	4.585	0.0	194.3	254	360 min Winter	3.435	0.0	211.9	368	480 min Winter	2.782	0.0	221.0	484	600 min Winter	2.362	0.0	226.1	600	720 min Winter	2.066	0.0	228.4	714	960 min Winter	1.673	0.0	227.8	944	1440 min Winter	1.243	0.0	218.9	1388	2160 min Winter	0.925	0.0	406.8	1984	2880 min Winter	0.750	0.0	418.5	2248	4320 min Winter	0.557	0.0	400.7	3168	5760 min Winter	0.451	0.0	592.7	4056	7200 min Winter	0.383	0.0	624.9	4920	8640 min Winter	0.335	0.0	648.9	5800	10080 min Winter	0.300	0.0	662.9	6576
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PFA Consulting Limited				Page 4																																																																																																																																
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Model Details Storage is Online Cover Level (m) 4.400 Tank or Pond Structure Invert Level (m) 3.300 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>1718.3</td><td>0.400</td><td>1949.3</td><td>0.800</td><td>2161.1</td><td>1.101</td><td>2326.0</td></tr><tr><td>0.100</td><td>1796.2</td><td>0.500</td><td>2001.4</td><td>0.900</td><td>2215.5</td><td></td><td></td></tr><tr><td>0.200</td><td>1846.8</td><td>0.600</td><td>2054.1</td><td>1.000</td><td>2270.4</td><td></td><td></td></tr><tr><td>0.300</td><td>1897.7</td><td>0.700</td><td>2107.3</td><td>1.100</td><td>2326.0</td><td></td><td></td></tr></table> Hydro-Brake® Optimum Outflow Control Unit Reference MD-SHE-0063-1600-0800-1600 Design Head (m) 0.800 Design Flow (l/s) 1.6 Flush-Flo™ Calculated Objective Minimise upstream storage Application Surface Sump Available Yes Diameter (mm) 63 Invert Level (m) 3.300 Minimum Outlet Pipe Diameter (mm) 75 Suggested Manhole Diameter (mm) 1200 <table><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr><tr><td>Design Point (Calculated)</td><td>0.800</td><td>1.6</td></tr><tr><td>Flush-Flo™</td><td>0.246</td><td>1.6</td></tr><tr><td>Kick-Flo®</td><td>0.508</td><td>1.3</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>1.4</td></tr></table> The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.100</td><td>1.4</td><td>1.200</td><td>1.9</td><td>3.000</td><td>2.9</td><td>7.000</td><td>4.3</td></tr><tr><td>0.200</td><td>1.6</td><td>1.400</td><td>2.1</td><td>3.500</td><td>3.1</td><td>7.500</td><td>4.5</td></tr><tr><td>0.300</td><td>1.6</td><td>1.600</td><td>2.2</td><td>4.000</td><td>3.3</td><td>8.000</td><td>4.6</td></tr><tr><td>0.400</td><td>1.5</td><td>1.800</td><td>2.3</td><td>4.500</td><td>3.5</td><td>8.500</td><td>4.8</td></tr><tr><td>0.500</td><td>1.3</td><td>2.000</td><td>2.4</td><td>5.000</td><td>3.7</td><td>9.000</td><td>4.9</td></tr><tr><td>0.600</td><td>1.4</td><td>2.200</td><td>2.5</td><td>5.500</td><td>3.9</td><td>9.500</td><td>5.0</td></tr><tr><td>0.800</td><td>1.6</td><td>2.400</td><td>2.6</td><td>6.000</td><td>4.0</td><td></td><td></td></tr><tr><td>1.000</td><td>1.8</td><td>2.600</td><td>2.7</td><td>6.500</td><td>4.2</td><td></td><td></td></tr></table>						Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	1718.3	0.400	1949.3	0.800	2161.1	1.101	2326.0	0.100	1796.2	0.500	2001.4	0.900	2215.5			0.200	1846.8	0.600	2054.1	1.000	2270.4			0.300	1897.7	0.700	2107.3	1.100	2326.0			Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	0.800	1.6	Flush-Flo™	0.246	1.6	Kick-Flo®	0.508	1.3	Mean Flow over Head Range	-	1.4	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	1.4	1.200	1.9	3.000	2.9	7.000	4.3	0.200	1.6	1.400	2.1	3.500	3.1	7.500	4.5	0.300	1.6	1.600	2.2	4.000	3.3	8.000	4.6	0.400	1.5	1.800	2.3	4.500	3.5	8.500	4.8	0.500	1.3	2.000	2.4	5.000	3.7	9.000	4.9	0.600	1.4	2.200	2.5	5.500	3.9	9.500	5.0	0.800	1.6	2.400	2.6	6.000	4.0			1.000	1.8	2.600	2.7	6.500	4.2		
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PFA Consulting Limited		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy BESS-Basin 3 100yr+CC	
Date 13/02/2024 09:00 File Pond 3 100yr +CC.SRCX	Designed by  Checked by	
XP Solutions	Source Control 2020.1.3	

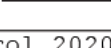
Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 463451 426329 SE 63451 26329
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+30

Time Area Diagram

Total Area (ha) 1.428

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.233	8 12	0.233	16 20	0.233
4 8	0.233	12 16	0.233	20 24	0.263

PFA Consulting Limited				Page 1	
Stratton Park House Wanborough Road Swindon SN3 4HG		E216: Helios Renewable Energy BESS-Basin 3 100yr+CC			
Date 13/02/2024 09:00 File Pond 3 100yr +CC.SRCX		Designed by  Checked by 			
XP Solutions		Source Control 2020.1.3			
<u>Summary of Results for 100 year Return Period (+30%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	3.565	0.265	1.6	478.4	O K
30 min Summer	3.642	0.342	1.6	625.4	O K
60 min Summer	3.720	0.420	1.6	777.2	O K
120 min Summer	3.792	0.492	1.6	919.0	O K
180 min Summer	3.834	0.534	1.6	1002.6	O K
240 min Summer	3.862	0.562	1.6	1061.1	O K
360 min Summer	3.901	0.601	1.6	1140.1	O K
480 min Summer	3.927	0.627	1.6	1192.6	O K
600 min Summer	3.946	0.646	1.6	1231.9	O K
720 min Summer	3.961	0.661	1.6	1263.2	O K
960 min Summer	3.984	0.684	1.6	1312.1	O K
1440 min Summer	4.015	0.715	1.6	1376.5	O K
2160 min Summer	4.042	0.742	1.6	1433.7	O K
2880 min Summer	4.058	0.758	1.6	1469.6	O K
4320 min Summer	4.079	0.779	1.6	1513.4	O K
5760 min Summer	4.088	0.788	1.6	1533.7	O K
7200 min Summer	4.091	0.791	1.6	1539.6	O K
8640 min Summer	4.092	0.792	1.6	1542.7	O K
10080 min Summer	4.095	0.795	1.6	1548.2	O K
15 min Winter	3.565	0.265	1.6	478.4	O K
30 min Winter	3.642	0.342	1.6	625.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	134.708	0.0	136.7	39	
30 min Summer	88.083	0.0	135.4	54	
60 min Summer	54.806	0.0	267.0	84	
120 min Summer	32.504	0.0	251.7	144	
180 min Summer	23.714	0.0	237.2	204	
240 min Summer	18.881	0.0	230.7	262	
360 min Summer	13.610	0.0	228.9	382	
480 min Summer	10.744	0.0	232.0	502	
600 min Summer	8.933	0.0	234.0	622	
720 min Summer	7.679	0.0	235.1	740	
960 min Summer	6.052	0.0	236.1	980	
1440 min Summer	4.330	0.0	234.6	1458	
2160 min Summer	3.107	0.0	479.7	2176	
2880 min Summer	2.465	0.0	478.1	2892	
4320 min Summer	1.797	0.0	466.8	4328	
5760 min Summer	1.446	0.0	955.7	5760	
7200 min Summer	1.227	0.0	951.7	7136	
8640 min Summer	1.076	0.0	940.6	7704	
10080 min Summer	0.966	0.0	923.5	8480	
15 min Winter	134.708	0.0	136.7	39	
30 min Winter	88.083	0.0	135.4	53	
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PFA Consulting Limited				Page 2	
Stratton Park House Wanborough Road Swindon SN3 4HG		E216: Helios Renewable Energy BESS-Basin 3 100yr+CC			
Date 13/02/2024 09:00 File Pond 3 100yr +CC.SRCX		Designed by  Checked by 			
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60 min Winter	3.720	0.420	1.6	777.2	O K
120 min Winter	3.792	0.492	1.6	919.0	O K
180 min Winter	3.834	0.534	1.6	1002.7	O K
240 min Winter	3.863	0.563	1.6	1061.1	O K
360 min Winter	3.901	0.601	1.6	1140.2	O K
480 min Winter	3.927	0.627	1.6	1192.8	O K
600 min Winter	3.946	0.646	1.6	1232.3	O K
720 min Winter	3.961	0.661	1.6	1263.7	O K
960 min Winter	3.984	0.684	1.6	1312.8	O K
1440 min Winter	4.015	0.715	1.6	1378.0	O K
2160 min Winter	4.043	0.743	1.6	1436.3	O K
2880 min Winter	4.060	0.760	1.6	1473.4	O K
4320 min Winter	4.082	0.782	1.6	1520.4	O K
5760 min Winter	4.093	0.793	1.6	1544.8	O K
7200 min Winter	4.098	0.798	1.6	1555.6	O K
8640 min Winter	4.100	0.800	1.6	1558.6	O K
10080 min Winter	4.099	0.799	1.6	1557.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	54.806	0.0	267.1	82	
120 min Winter	32.504	0.0	251.8	142	
180 min Winter	23.714	0.0	237.4	200	
240 min Winter	18.881	0.0	230.8	260	
360 min Winter	13.610	0.0	229.1	378	
480 min Winter	10.744	0.0	232.2	494	
600 min Winter	8.933	0.0	234.1	612	
720 min Winter	7.679	0.0	235.3	730	
960 min Winter	6.052	0.0	236.2	966	
1440 min Winter	4.330	0.0	234.5	1436	
2160 min Winter	3.107	0.0	479.4	2140	
2880 min Winter	2.465	0.0	477.4	2836	
4320 min Winter	1.797	0.0	465.6	4208	
5760 min Winter	1.446	0.0	954.3	5552	
7200 min Winter	1.227	0.0	950.0	6864	
8640 min Winter	1.076	0.0	938.9	8136	
10080 min Winter	0.966	0.0	922.2	9296	
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HELIOS RENEWABLE ENERGY PROJECT

SURFACE WATER DRAINAGE CHECK SHEET

1. Surface Water Drainage Arrangements

- 1.1. Swales are proposed at the low points of the development site to intercept overland flows. The locations of the Swales are shown on the attached drawing (PFA Consulting, Drawing Number E216/90-106).
- 1.2. Upon commissioning of the Solar Park the Site Manager should complete Table A.

Table A: Commissioning Checklist

Drainage Feature	Constructed as designed (Y/N)	Planted with covering vegetation (Y/N)	Notes

- 1.3. During any regular maintenance visits (at intervals no greater than 3 months) the Maintenance Engineer should complete the first column of the Drainage Checklist in the Inspection Report below. The Inspection Report will then be passed onto the Site Manager who will then arrange for the appropriate actions to be initiated.

2. Maintenance Regime

- 2.1. A guide to the general swale maintenance regime is set out in Table B.

Table B – Swale Maintenance Procedures

Maintenance Schedule	Required Action
Regular Maintenance (Quarterly)	Litter and debris removal.
	Grass cutting or animal grazing – to retain grass height to site owner's specification.
	Manage other vegetation and remove nuisance plants.
	Inspect infiltration surfaces for ponding, compaction, and silt accumulation. Record areas where water is ponding for > 48 hours.
	Inspect surface for silt accumulation.
Occasional Maintenance	Check for poor vegetation growth due to lack of sunlight or dropping of leaf litter, and cut back adjacent vegetation where possible.
(Annually)	Re-seed areas of poor vegetation growth. Alter plant types to better suit conditions, if required.

Inspection Report

To be completed at approximately 3 month intervals

Date of Inspection:

Inspector:

DRAINAGE CHECKLIST

	Y/N	Actions
1. Do any parts of the swales contain standing water?		
2. Is any water overflowing from the swales?		
3. Are some of the swales overgrown or silted up?		
4. Has there been recent excessive rainfall or local flooding issues near the site?		
5. Are any rivulets (small channels) forming or is there soil erosion due to rainwater?		

Notes:

- a) If YES to Question 3 additional maintenance may be required.
- b) If YES to Questions 4 and 5 then further investigation may be required and consultation with a drainage engineer would be prudent.



KEY

- Site Boundary (Ref: DX-01-P01 Rev11)
- Solar Farm Zone (Ref: DX-01-P02 Rev11)
- Substation and BESS Compound (Ref: DX-01-P02 Rev11)

Water Framework Directive Waterbody Humber River Basin Management Plan

- Ouse from R Wharfe to Upper Humber Waterbody (ID: GB104027064270)
- Ouse from R Wharfe to Upper Humber Catchment (ID: GB104027064270)
- Aire from Fryston Beck to River Ouse Waterbody (ID GB104027063037)
- Aire from Fryston Beck to River Ouse Catchment (ID GB104027063037)



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For Planning
This drawing is produced for the purposes of supporting a planning application and should not be relied upon for tender, pricing, or construction purposes.

NOTES

- Drawing is based upon Order Limits Location Plan, Enso Energy Drawing No. DX-01-P01 Rev11 dated 15/02/2024.
- Drawing is based upon Parameter Plan, Enso Energy Drawing No. DX-01-P02 Rev 11 dated 15/04/2024.
- Field Numbers based upon Field Boundaries Plan, Enso Energy Drawing No. DX-01-P44 Rev 04 dated 15/04/2024.
- Drawing is based upon Environment Agency River Basin Management Plan data accessed in August 2024.
- Drawing should be read in conjunction with Environmental Statement Chapter 9 Water Environment which supports the application.
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Rev	Date	Description	Drawn	Check
#	08.08.24	First issue.	BF	MWS

Status
FOR PLANNING

Client
Enso Green Holdings D Limited

Project
Helios Renewable Energy Project

Drawing Title
Water Framework Directive Water Bodies

Drawing No. **E216/171** REV #

Date: August 2024 Scale: As Shown
Email: bfox@pfapl.com

