

Table A: Loss of Floodplain Storage Volume Summary

Level slice (m AOD)	Volume Lost (m³)
4.00-4.20	597
4.20-4.40	2823
4.40-4.60	5567
4.60-4.751	4224
<b>Total</b>	<b>13211</b>

Table B: Flood Compensation Volumes Summary

Level Slice (m AOD)	Volume Provided by Compensation (m³)						Total Volume (m³)	Additional Volume Provided (m³)	Percentage Betterment (%)
	Area A	Area B	Area C	Area D	Area E	Area F			
4.00-4.20	65	215	14	452	0	747	150	25.1	
4.20-4.40	807	451	229	924	1292	3703	880	31.2	
4.40-4.60	2424	1026	17	1617	864	5949	383	6.9	
4.60-4.751	2175	529	1	683	316	548	27	0.6	
<b>Total</b>						<b>14850</b>	<b>1439</b>	<b>10.9</b>	

Stratton Park House, Wanborough Road  
Swindon, SN3 4HG

Telephone  
01793 828000  
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www.pfacp.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
- 7m Watercourse Maintenance Buffer
- Watercourse
- SUDS Feature Earthworks
- Existing Levels (LiDAR DTM / Survey)
- Flood Defence Bund  
Top Level: 5.35m AOD  
Top Width: 1m  
Side Slopes: 1:3m  
Assumed Flood Level: 4.75m AOD
- Area protected by Flood Defence Bund / Flood storage volume lost
- Floodplain Compensation Area Earthworks

- NOTES**
- Drawing based on Substation/BESS Block Plan, produced by Enso Energy, Drawing No. E216-01-P42, Rev 01 (Dated 01/02/24).
  - Drawing based on Topographical Survey, produced by Storm Geomatics, Drawing Nos. 851/15 and 851/16 (Dated: 09/10/2023).
  - Drawing is based on 1m DTM LiDAR Data. Environment Agency copyright and/or database right 2022.
  - Surface water drainage for the BESS area subject to detailed design and technical approval.
  - Drawing to be read in conjunction with Flood Risk Assessment (including drainage strategy), Document Reference: E216-DOC01-FRA.
  - As an adaptation measure the Substation and BESS Compound would be protected by a suitably designed earth flood defence bund. The height of the proposed earth flood defence bund would be raised at least +0.6m above the fluvial 'credible maximum scenario sensitivity level' flood level to protect equipment from inundation.
  - The Flood Management Strategy for the Site will keep under review the need to implement a level for level floodplain compensation scheme for the Substation and BESS Compound to mitigate the effect of the earth flood defence bund. A preliminary floodplain compensation scheme within the DCO limits is shown to be feasible on Drawing Nos. E216/161-162.
  - Earth Flood Defence Bund is indicative only and subject to detailed design and technical approval.
  - Floodplain compensation areas are preliminary and subject to detailed design and technical approval. Design to be updated to reflect the results of the Environment Agency approved site-specific flood modelling and topographical survey.
  - No bulking factor has been applied to earthworks volumes stated.

Rev	Date	Description	Drawn	Check
1	07/06/24	First Issue	BF	SAM

Status: **FOR PLANNING**

Client: **Enso Green Holdings D Limited**

Project: **Helios Renewable Energy Project**

Drawing Title: **Preliminary Floodplain Compensation Scheme Sheet 1 of 2**

Drawing No: **E216/161**  
Date: June 2024 | Scale: 1:500 @ A0  
E-Mail: bfox@pfacp.com

Jowland Winn

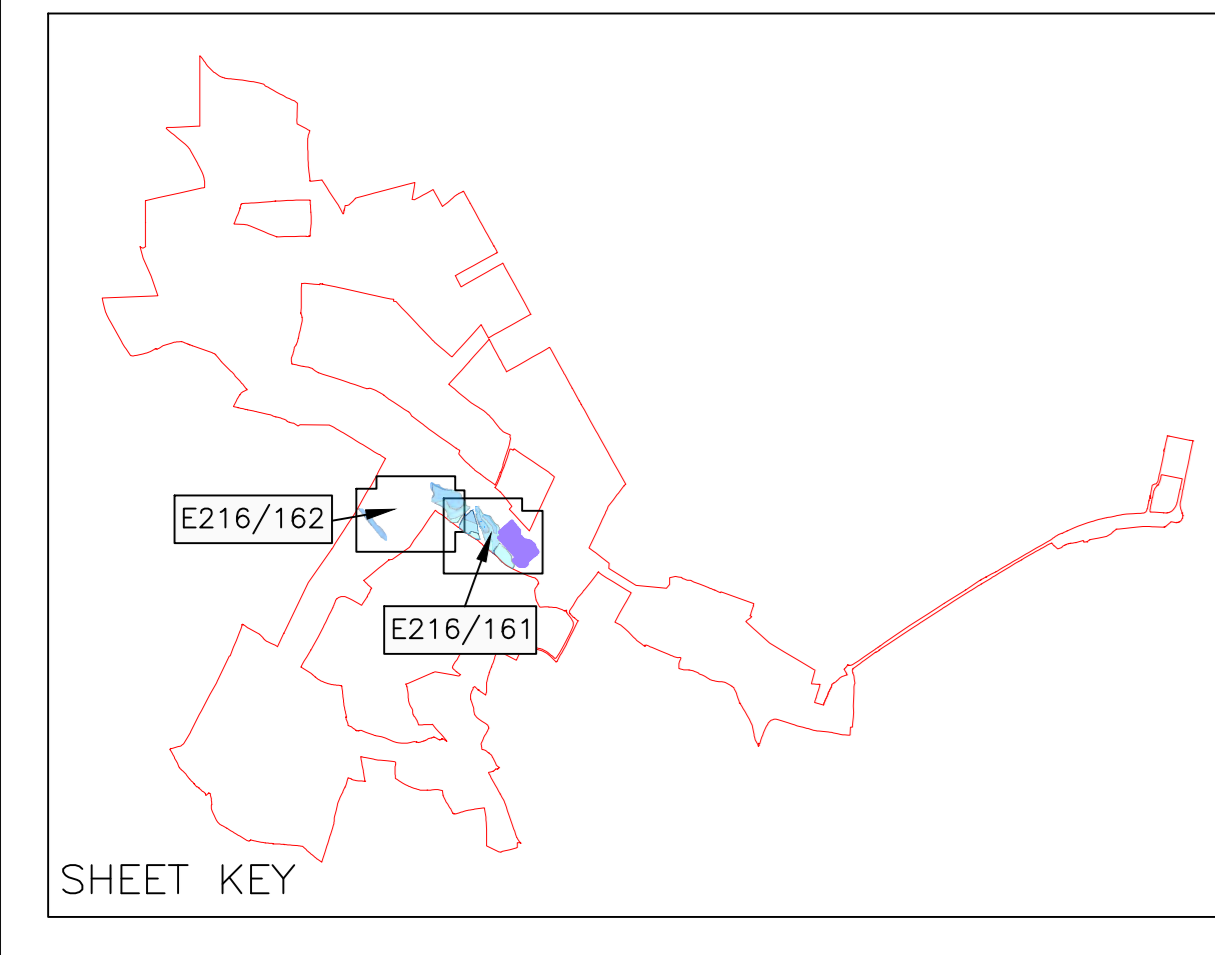


Table A: Loss of Floodplain Storage Volume Summary

Level Slice (m AOD)	Volume Lost (m³)
4.00-4.20	597
4.20-4.40	2823
4.40-4.60	5567
4.60-4.751	4224
<b>Total</b>	<b>13211</b>

Table B: Flood Compensation Volumes Summary

Level Slice (m AOD)	Volume Provided by Compensation (m³)						Total Volume (m³)	Additional Volume Provided (m³)	Percentage Betterment (%)
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4.00-4.20	85	0	215	14	452	0	747	150	25.1
4.20-4.40	807	451	229	924	1292	0	3703	880	31.2
4.40-4.60	2424	1026	17	1617	864	1	5949	383	6.9
4.60-4.751	2175	529	1	683	316	548	4251	27	0.6
<b>Total</b>							<b>14650</b>	<b>1439</b>	<b>10.9</b>



**KEY**

- Site Boundary
- 7m Watercourse Maintenance Buffer
- Watercourse
- SuDS Feature Earthworks
- Existing Levels (LiDAR DTM / Survey)
- Flood Defence Bund
  - Top Level: 0.35m AOD
  - Top Width: 1m
  - Side Slopes: 1:3m
  - Assumed Flood level: 4.75m AOD
- Area protected by Flood Defence Bund / Flood storage volume lost
- Floodplain Compensation Area Earthworks

- NOTES**
1. Drawing based on Substation/BESS Block Plan, produced by Enso Energy, Drawing No. DX-01-P42, Rev 01 (Dated 01/02/24).
  2. Drawing based on Topographical Survey, produced by Storm Geomatics, Drawing Nos. 851/15 and 851/16 (Dated: 09/10/2023).
  3. Drawing is based on 1m DTM LiDAR Data. Environment Agency copyright and/or database right 2022.
  4. Surface water drainage for the BESS area subject to detailed design and technical approval.
  5. Drawing to be read in conjunction with Flood Risk Assessment (including drainage strategy), Document Reference: E216-DOCD1-FRA.
  6. As an adaptation measure the Substation and BESS Compound would be protected by a suitably designed earth flood defence bund. The height of the proposed earth flood defence bund would be raised at least 0.6m above the fluvial credible maximum scenario sensitivity test' flood level to protect equipment from inundation.
  7. The Flood Management Strategy for the Site will keep under review the need to implement a level for level floodplain compensation scheme for the Substation and BESS Compound to mitigate the effect of the earth flood defence bund. A preliminary floodplain compensation scheme within the DOO limits is shown to be feasible on Drawing Nos. E216/151-162.
  8. Earth Flood Defence Bund is indicative only and subject to detailed design and technical approval.
  9. Floodplain compensation areas are preliminary and subject to detailed design and technical approval. Design to be updated to reflect the results of the Environment Agency approved site-specific flood modelling and topographical survey.
  10. No bulking factor has been applied to earthworks volumes stated.

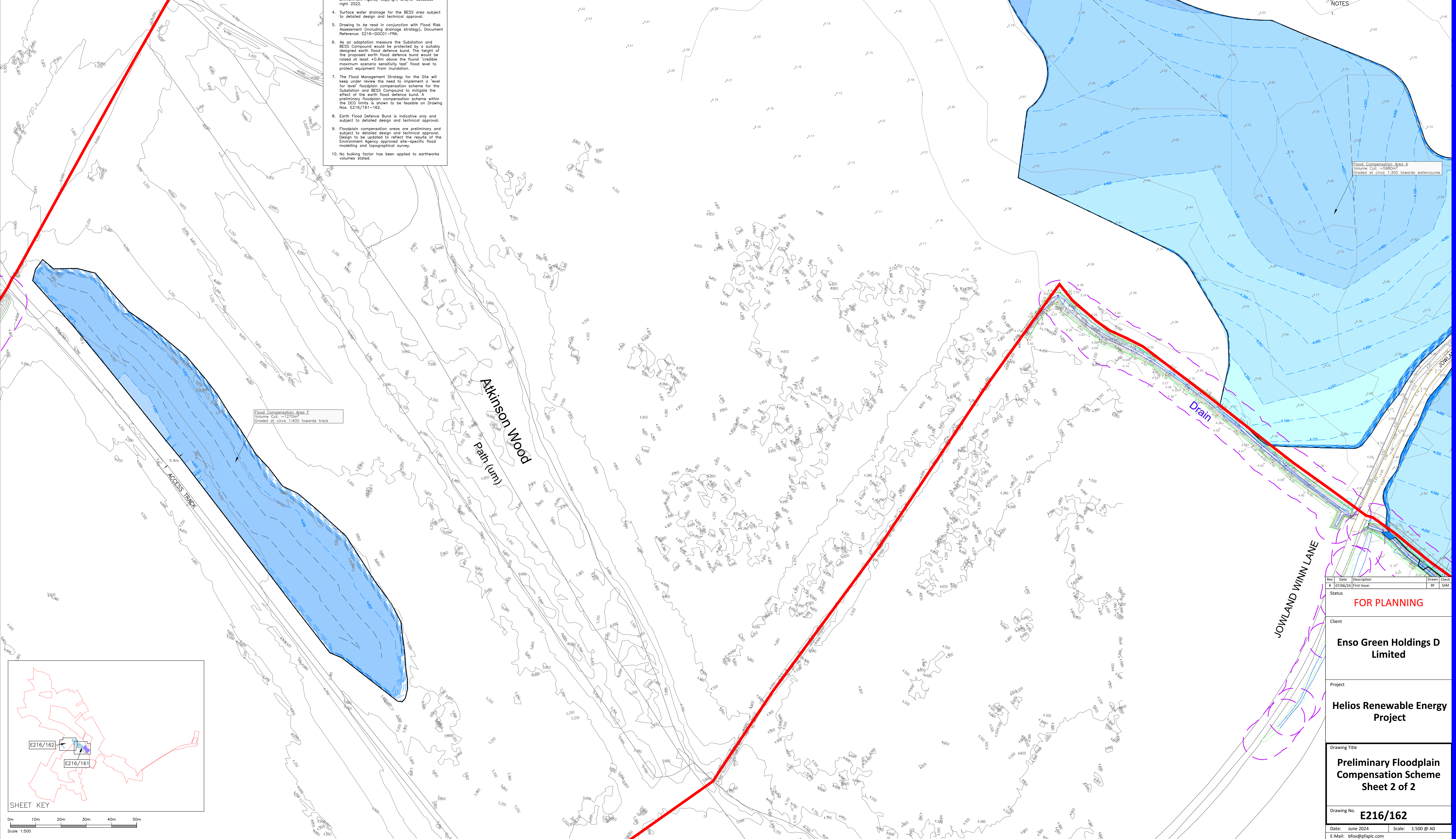
Stratton Park House, Wanborough Road  
Swindon, SN3 4HG

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01793 828000

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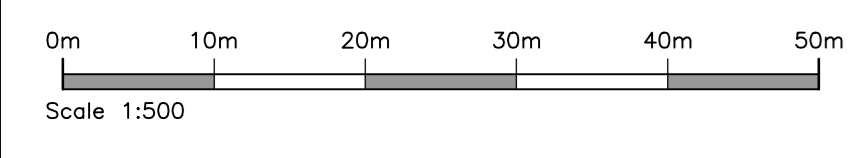
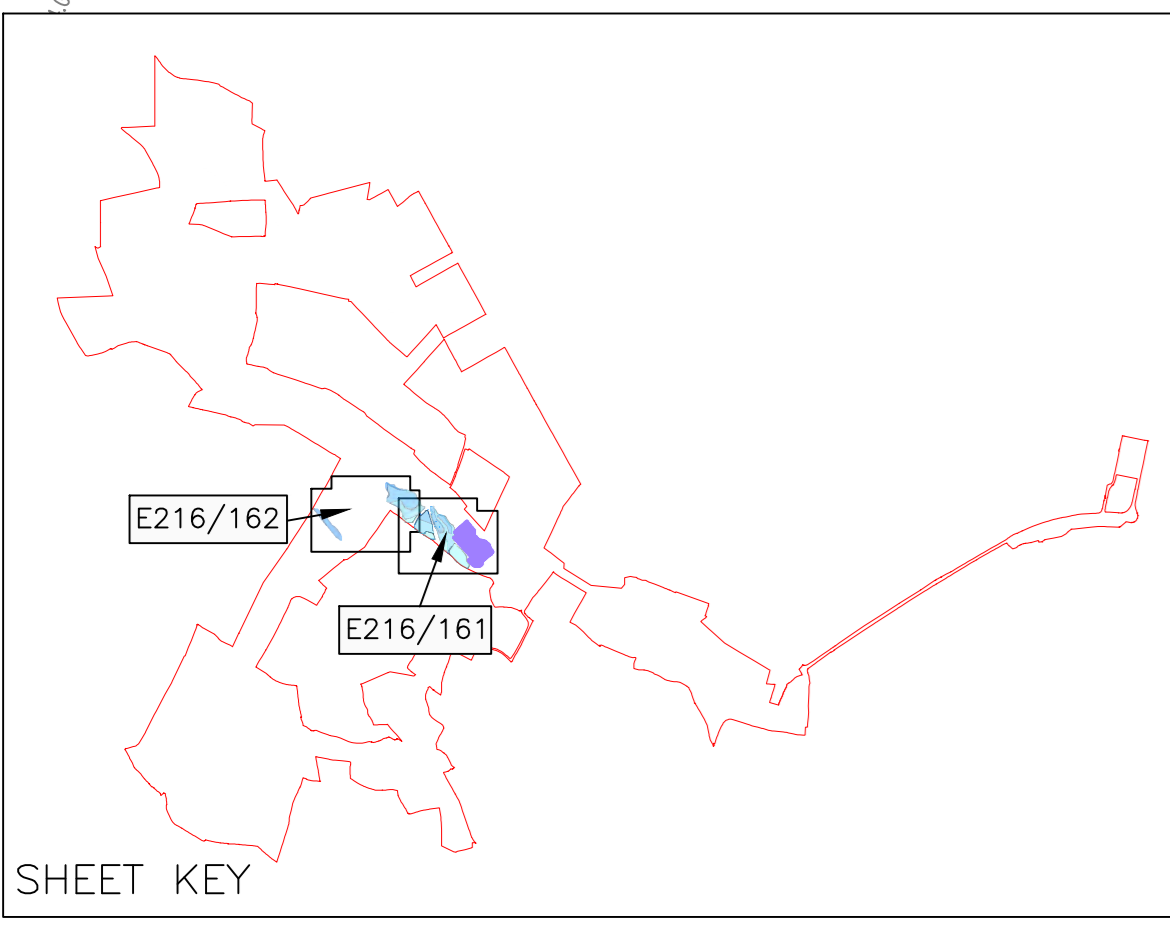
**For Planning**  
This drawing is produced for the purposes of supporting a planning application and should not be relied upon for tender, pricing, or construction purposes.

**NOTES**  
1.



Flood Compensation Area F  
Volume Cut: ~1270m³  
located at circa 1.600 towards track

Flood Compensation Area A  
Volume Cut: ~5980m³  
located at circa 1.300 towards watercourse



Rev	Date	Description	Drawn	Check
1	07/06/24	First Issue	BF	SAM

Status: **FOR PLANNING**

Client:  
**Enso Green Holdings D Limited**

Project:  
**Helios Renewable Energy Project**

Drawing Title:  
**Preliminary Floodplain Compensation Scheme Sheet 2 of 2**

Drawing No.: **E216/162**  
Date: June 2024 Scale: 1:500 @ A0  
E-Mail: bfox@pfaplc.com





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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.

KEY

- Site Boundary
- Security Fence
- Statutory Main River
- Watercourse (IDB and/or Ordinary)
- 7m Ordinary Watercourse Buffer
- 7m IDB Watercourse Buffer
- Watercourse Crossing - Proposed
- Watercourse Crossing - Existing

NOTES

1. Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number DBRX LINEWORK ("CAD") (Dated 6th May 2022).
2. Drawing based on Parameter Plan by Enso Energy, Drawing No. DX-01-P02 Rev09 Parameter Plan (Dated 07.02.24)
3. Drawing based on Site Layout, produced by Enso Energy, Drawing No. DX-01-P01 Rev10 Site Boundary (Dated 07.02.24)
4. 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.
5. Contains public sector information licensed under the Open Government Licence v3.0.
6. 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).

Rev #	Date	Description	Drawn	Check
01	09/22	First Issue.	IS	MWS
A	27/04/23	Parameters plan updated and watercourse crossing locations reappraised.		BF
B	02/08/23	IDB buffers added.	BF	BF
C	23/08/23	Update to Red Line Boundary	IS	BF
D	14/02/24	Update to Red Line Boundary	JS	BF

Status

**FOR PLANNING**

Client

**Enso Green Holdings D Ltd**

Project

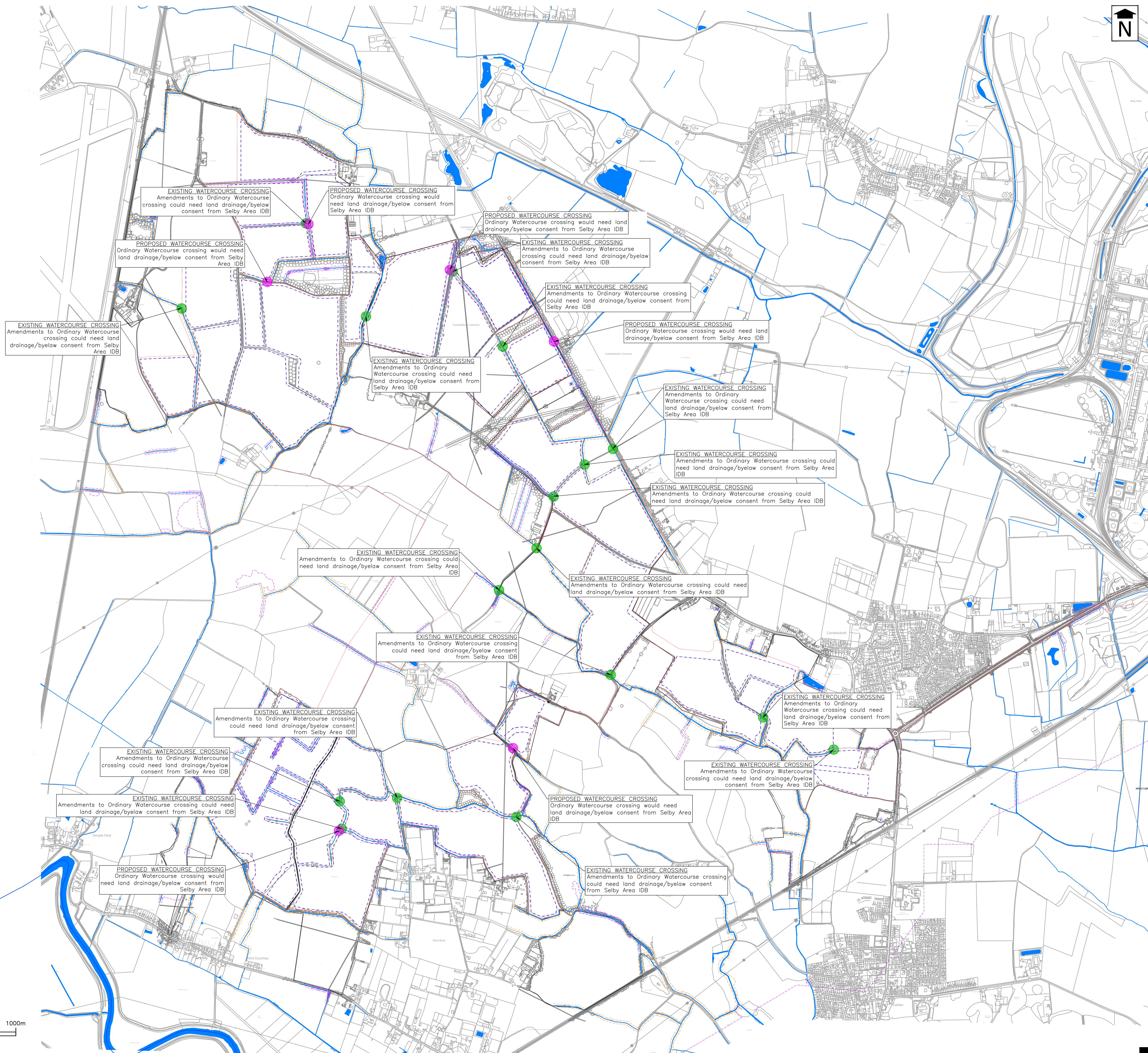
**Helios Renewable Energy Project**

Drawing Title

**Watercourse Buffers**

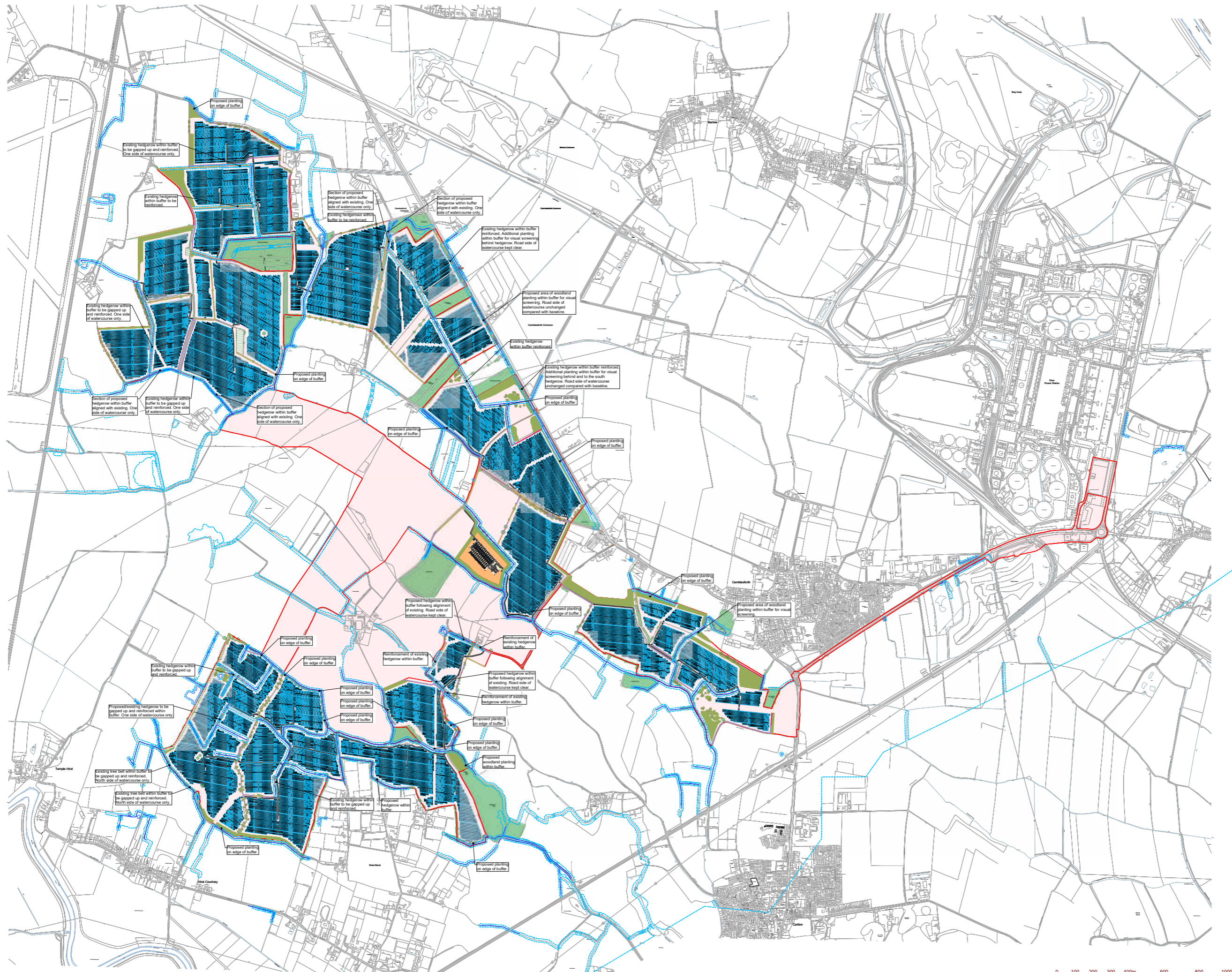
Drawing No. **E216/06** Rev D

Date: September 2022 Scale: 1:10,000 @ A1



0m 500m 1000m  
Scale 1:10000





- KEY**
- Site Boundary
  - Existing watercourses
  - 7m watercourse buffers
  - Existing surveyed trees and vegetation
  - Proposed planting - tree, scrub, hedgerows and scrapes
  - Existing woodland to be reinforced with native planting where appropriate
  - Existing field boundary hedgerow to be reinforced with new planting
  - Proposed hedgerow
  - Historic field boundary hedgerow to be reinstated



Project Title: <b>Helios Renewable Energy Project</b>		
Drawing Title: <b>Watercourse Buffers</b>		
DRWG No: 012006.00001.101	Rev: 01	Sht no: -
Drawn by: HD	Checked by: SM	
1:10,000 @ A1		Date: JUNE 2024





# HELIOS RENEWABLE ENERGY PROJECT

## FLOOD RISK ASSESSMENT

### ENSO GREEN HOLDINGS D LIMITED

DOCUMENT REFERENCE NUMBER: 7.7

**PART 10 OF 11**

**APPENDICES 22 - 23**

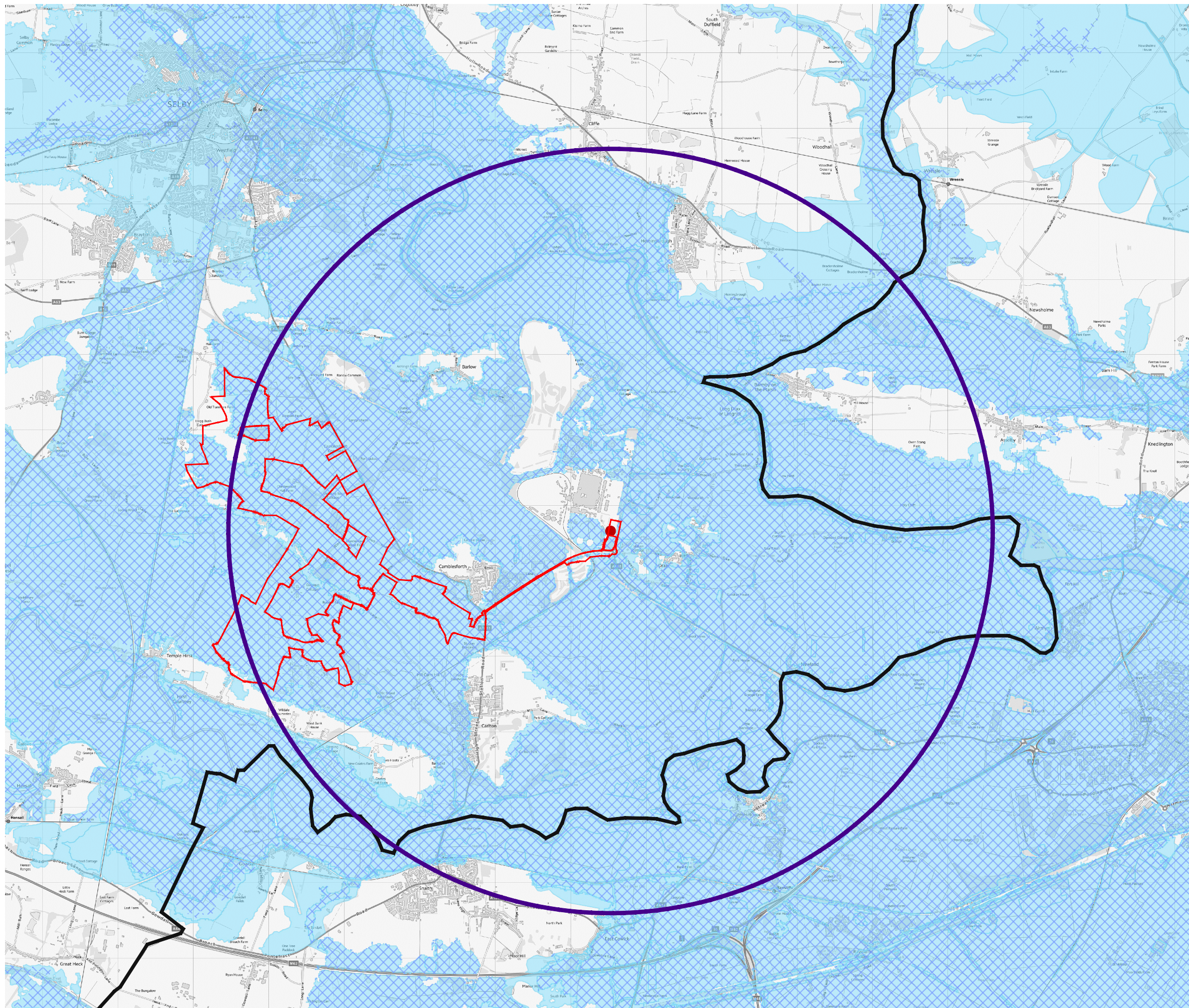
PFA Document Reference: E216-DOC01-FRA-ISSUE 1

JUNE 2024



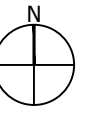












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Revision	Date	Drn	Ckd
C Red Line Updated	17.06.24	KT	JG



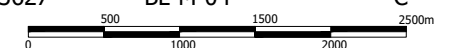
### LEGEND

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



Stantec UK Limited  
101 Victoria Street  
Bristol





PFA Consulting Ltd		Page 1
Stratton Park House Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy Greenfield 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	0.000
SAAR (mm)	625	Region Number	Region 3

**Results      l/s**

QBAR Rural	390.5
QBAR Urban	390.5

Q1 year      335.9

Q1 year	335.9
Q2 years	368.5
Q5 years	488.2
Q10 years	566.3
Q20 years	641.4
Q25 years	666.3
Q30 years	686.5
Q50 years	739.7
Q100 years	812.3
Q200 years	921.7
Q250 years	956.8
Q1000 years	1187.3

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



# HELIOS RENEWABLE ENERGY PROJECT

## FLOOD RISK ASSESSMENT

### ENSO GREEN HOLDINGS D LIMITED

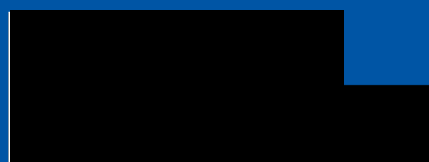
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**PART 11 OF 11**

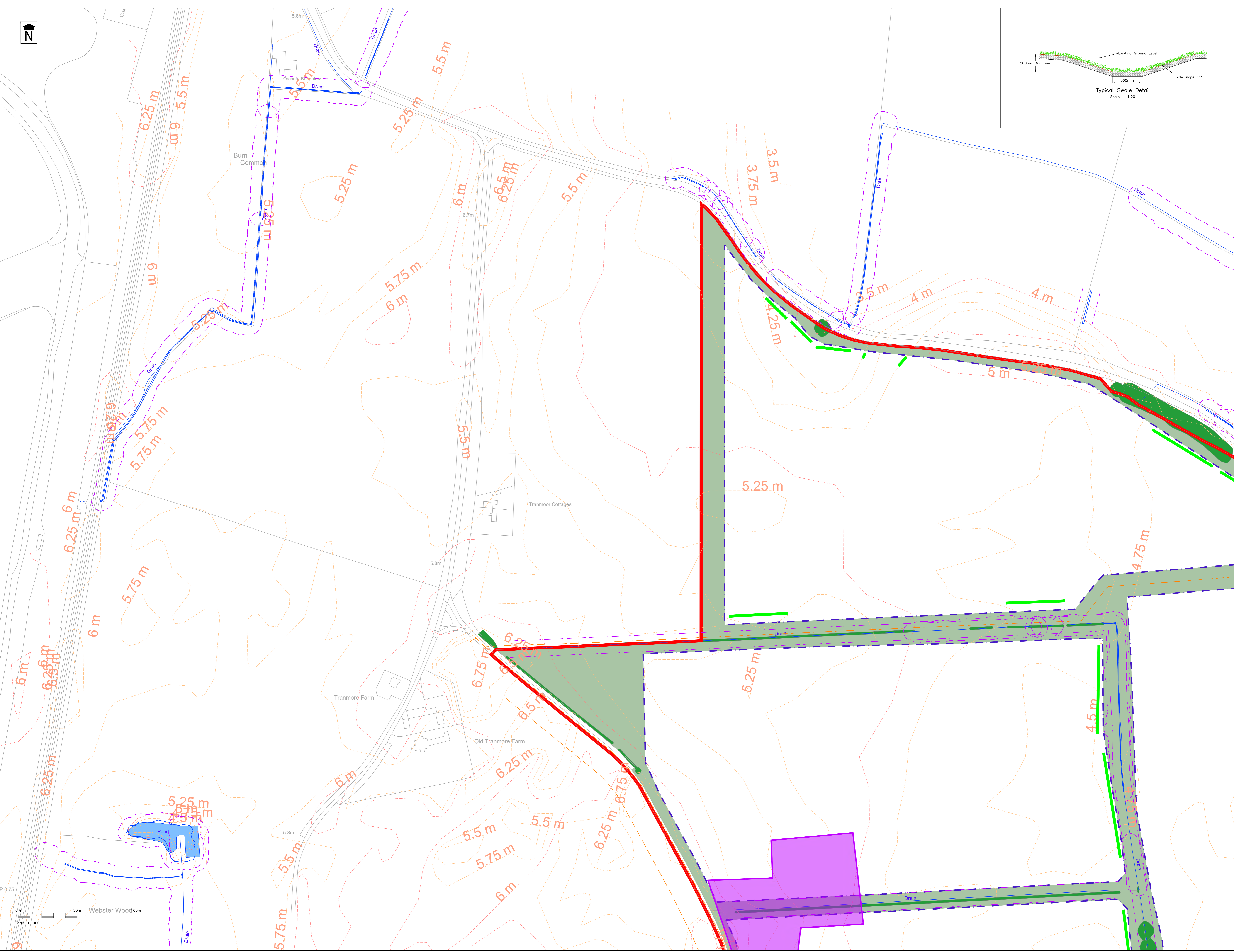
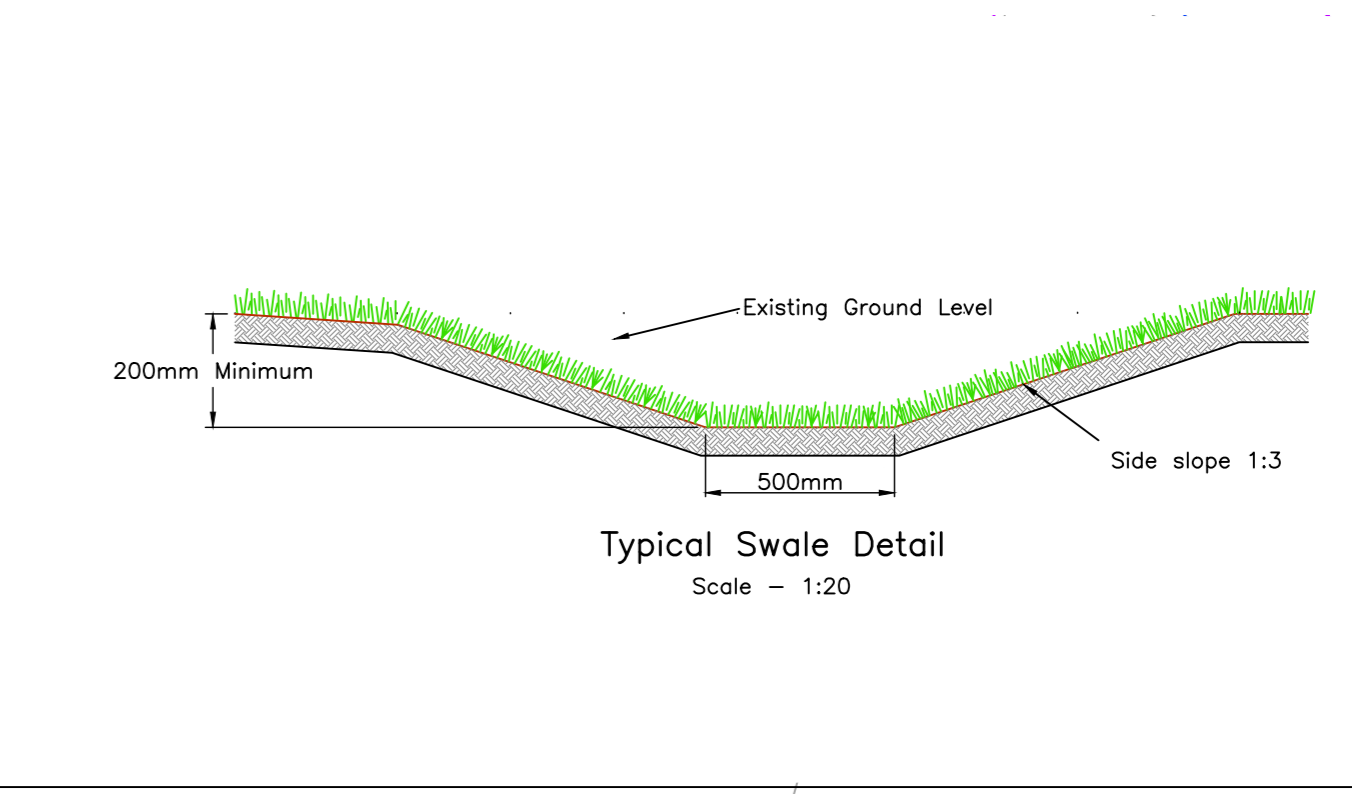
**APPENDICES 24 - 27**

PFA Document Reference: E216-DOC01-FRA-ISSUE 1

JUNE 2024



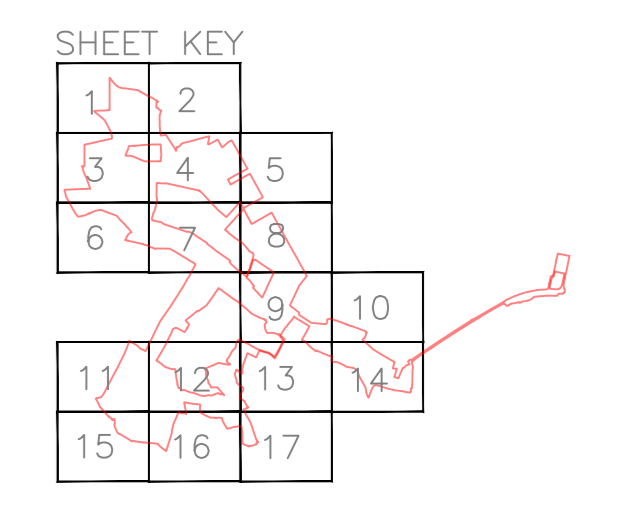




For Planning  
This drawing is produced for the purposes of supporting a planning application and should not be relied upon for tender, pricing, or construction purposes.

- 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**
1. Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024
  2. Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("CAD") (Dated 6th May 2022).
  3. Based on data from Archaeological Services WYAS, Reference: XF70\_HL022 Reviewed: 02/05/2023
  4. 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.
  5. Contains public sector information licensed under the Open Government Licence v3.0.
  6. 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).
  7. Total Length of swales provided = 497m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.08m<sup>3</sup> of storage is available. Therefore the total available storage provided within the swales is 398m<sup>3</sup>.



Rev	Date	Description	Drawn	Check
#	09.06.23	First Issue	SJC	SAM
A	23.06.23	Presentation updated	BF	S
B	23.08.23	Layout Revision	SJC	BF
C	14/02/24	Updated parameters plan & site boundary	SJC	BF

Status: **FOR PLANNING**

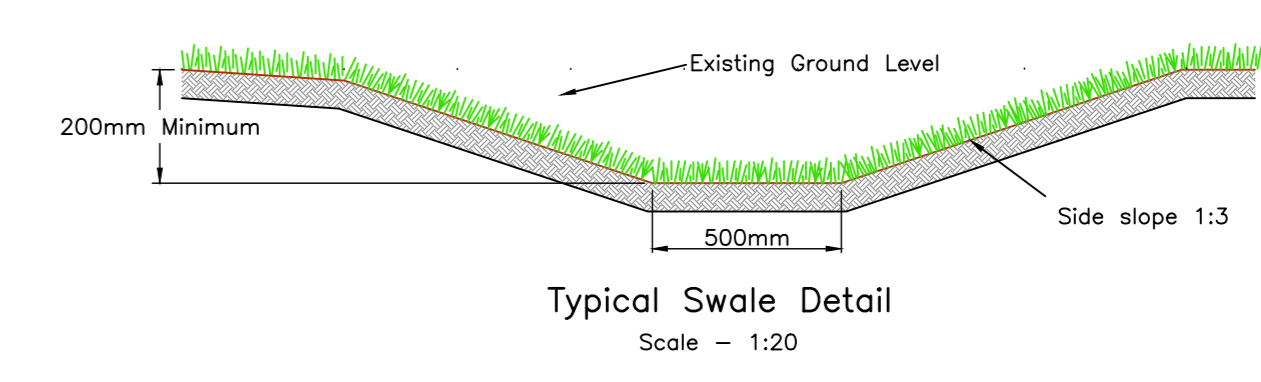
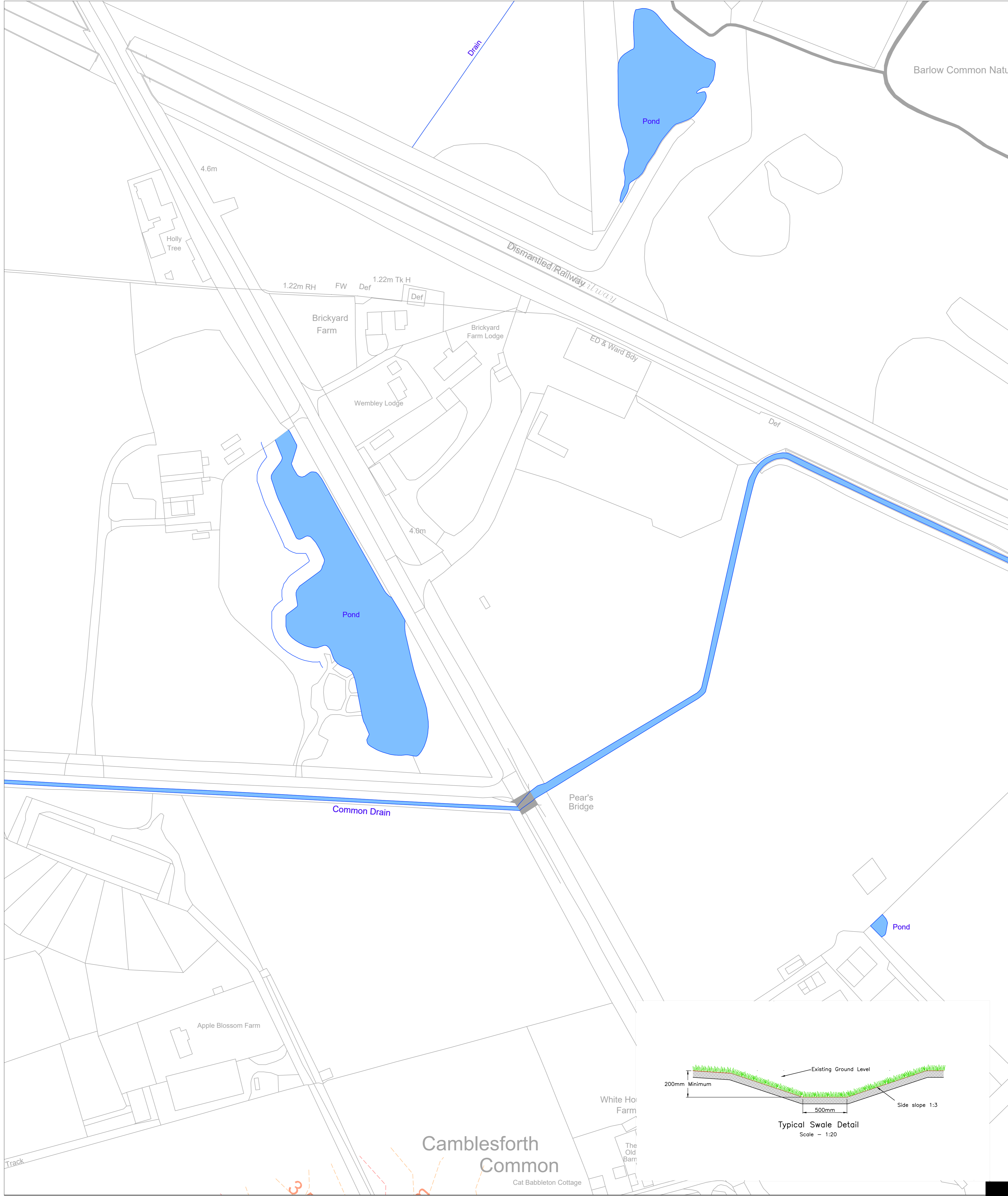
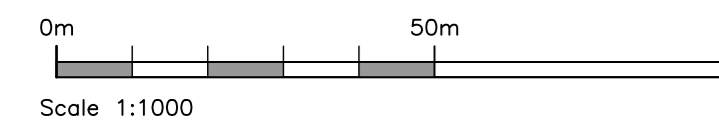
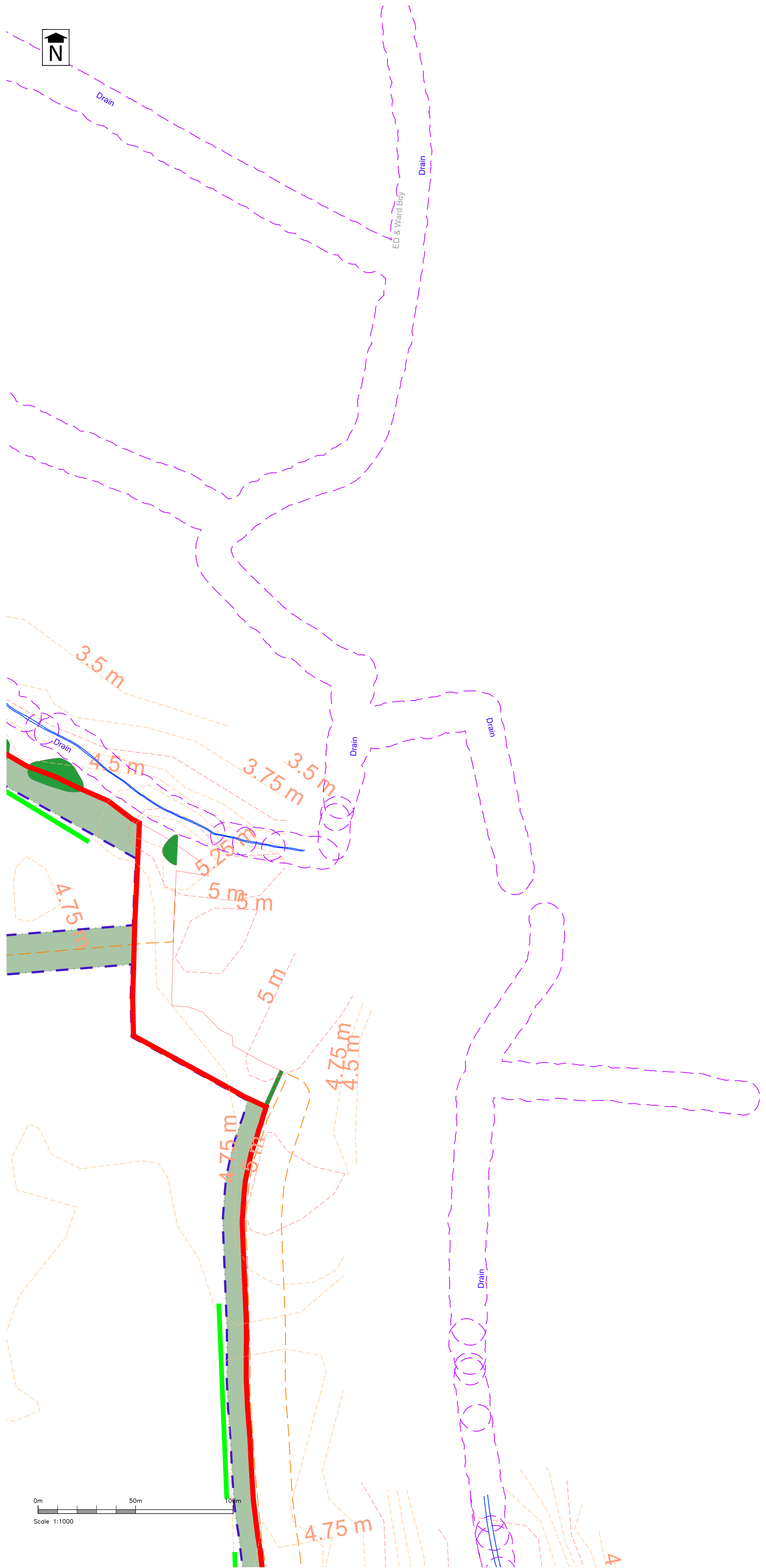
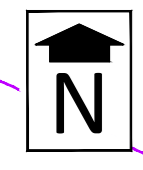
Client: **Enso Green Holdings D Limited**

Project: **Helios Renewable Energy Project**

Drawing Title: **Solar Farm Preliminary Surface Water Drainage Arrangements Sheet 1 of 17**

Drawing No.: **E216/90** Rev C  
Date: June 2023 Scale: 1:1000 @ AO  
E-Mail: [redacted]



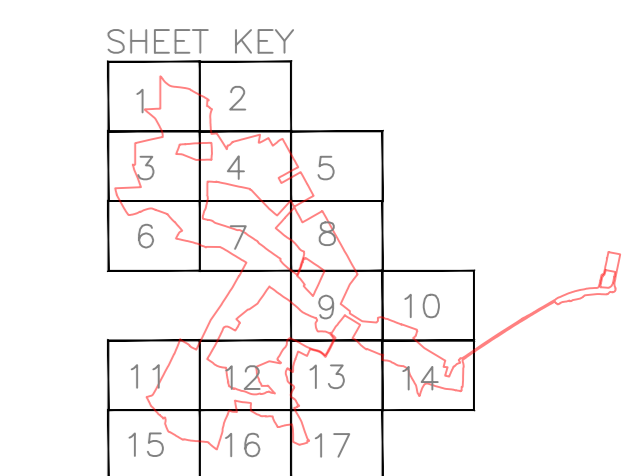


**For Planning**  
 This drawing is produced for the purposes of supporting a planning application and should not be relied upon for tender, pricing, or construction purposes.

**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**
1. Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024.
  2. Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("CAD") (Dated 6th May 2022).
  3. Based on data from Archaeological Services WYAS Reference: XF70\_HLO22 Received 05/05/2023.
  4. 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.
  5. Contains public sector information licensed under the Open Government Licence v3.0.
  6. 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).
  7. Total Length of swales provided = 497m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.08m<sup>3</sup> of storage is available. Therefore the total available storage provided within the swales is 398m<sup>3</sup>.



Rev	Date	Description	Drawn	Check
A	09.06.23	First Issue	SIC	SAM
A	23.06.23	Presentation updated	BF	SI
B	13.08.23	Layout Revision	SI	SI
C	14/02/24	Updated parameters plan & site boundary	SIC	BF

**FOR PLANNING**

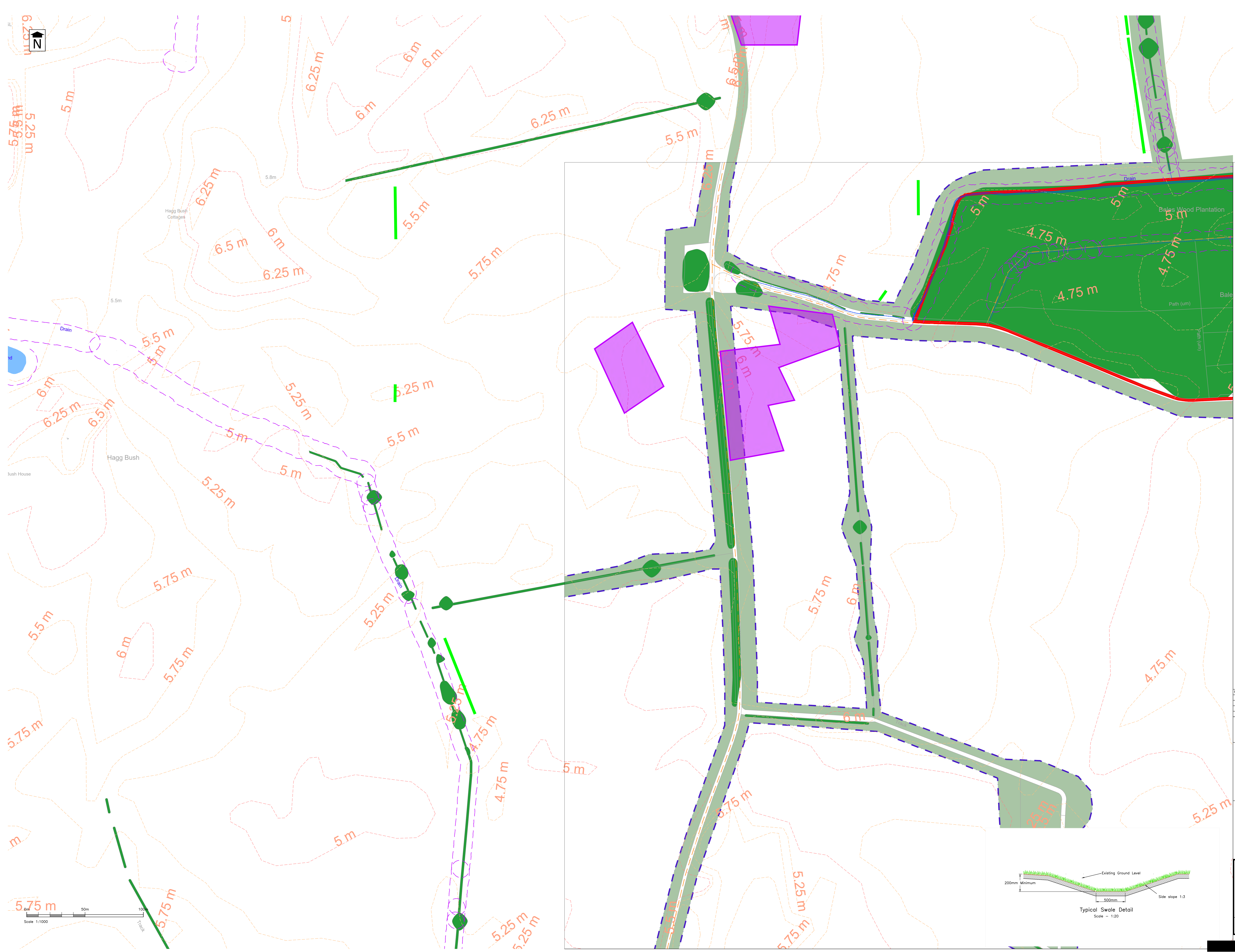
Client  
**Enso Green Holdings D Limited**

Project  
**Helios Renewable Energy Project**

Drawing Title  
**Solar Farm Preliminary Surface Water Drainage Arrangements**  
**Sheet 2 of 17**

Drawing No. **E216/91** Rev C

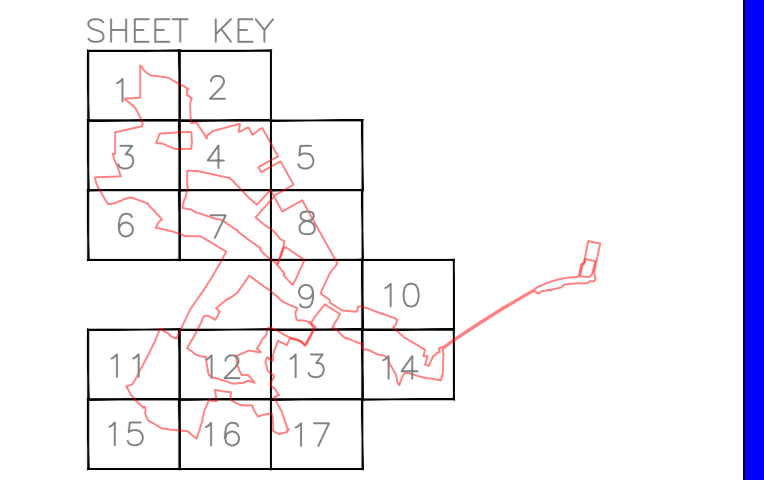
Date: June 2023 Scale: 1:1000 @ A0



**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)
  - Archeological Mitigation Areas
  - Interception Swales

- NOTES**
1. Based on drawing DY-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024
  2. Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("CAD") (Dated 6th May 2022).
  3. Based on data from Archaeological Services WYAS Reference: XF70\_HLD22 Received 05/05/2023
  4. 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.
  5. Contains public sector information licensed under the Open Government Licence v3.0.
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  7. Total Length of swales provided = 4975m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.08m<sup>3</sup> of storage is available. Therefore the total available storage provided within the swales is 398m<sup>3</sup>.



Rev	Date	Description	Drawn	Check
A	19/06/23	First Issue	SJC	SAW
A	23/08/23	Presentation updated	BF	
B	23/08/23	Layout Revision	IS	
C	14/02/24	Updated parameters plan & site boundary	SJC	BF

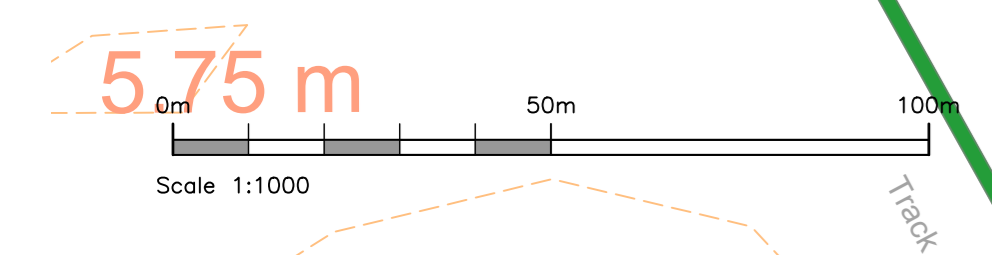
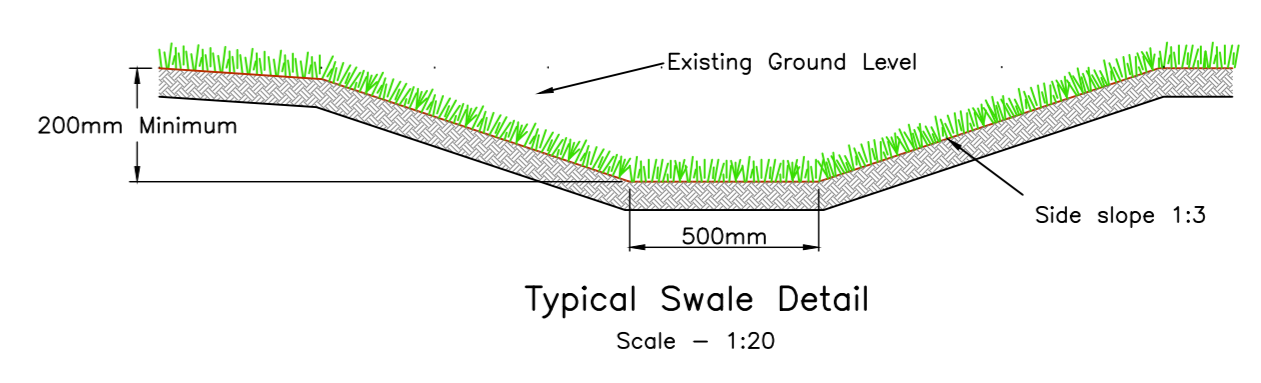
Status **FOR PLANNING**

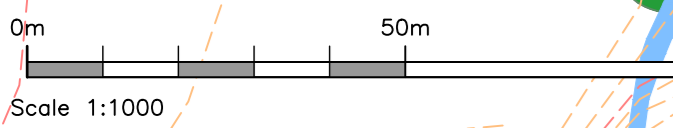
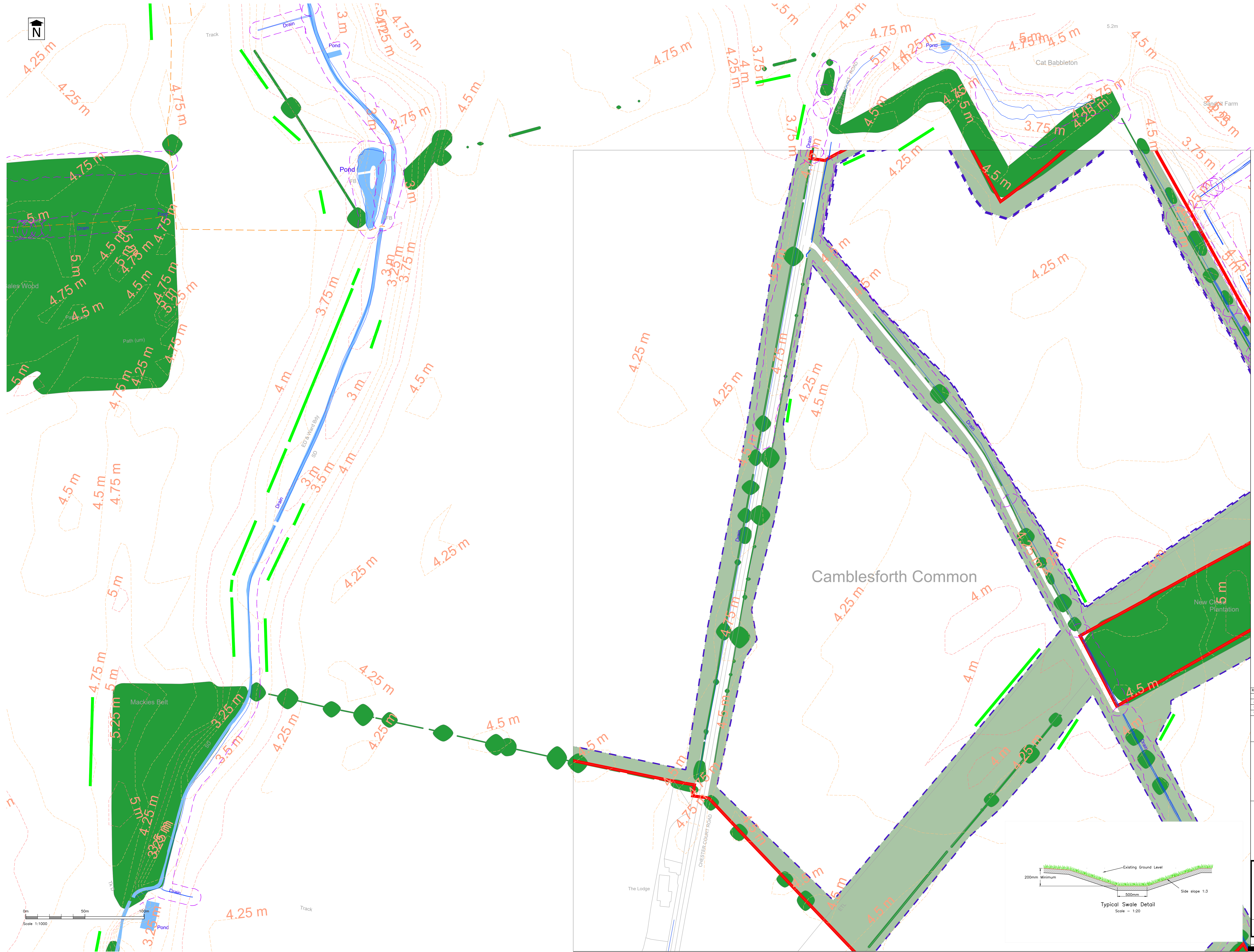
Client  
**Enso Green Holdings D Limited**

Project  
**Helios Renewable Energy Project**

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

Drawing No. **E216/92** Rev C  
 Date: June 2023 Scale: 1:1000 @ AD



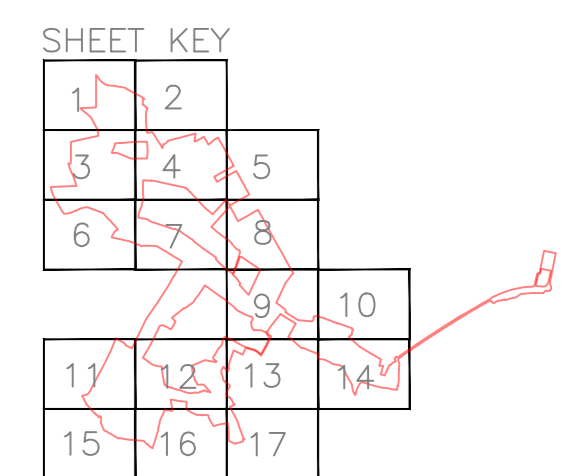


Scale 1:1000

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)
  - Archeological Mitigation Areas
  - Interception Swales

- NOTES**
1. Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024.
  2. Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("CAD") (Dated 6th May 2022).
  3. Based on data from Archaeological Services WAS Reference: XF70\_HL022 Received 05/05/2023
  4. 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.
  5. Contains public sector information licensed under the Open Government Licence v3.0.
  6. 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).
  7. Total Length of swales provided = 4375m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.08m<sup>3</sup> of storage is available. Therefore the total available storage provided within the swales is 398m<sup>3</sup>.



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

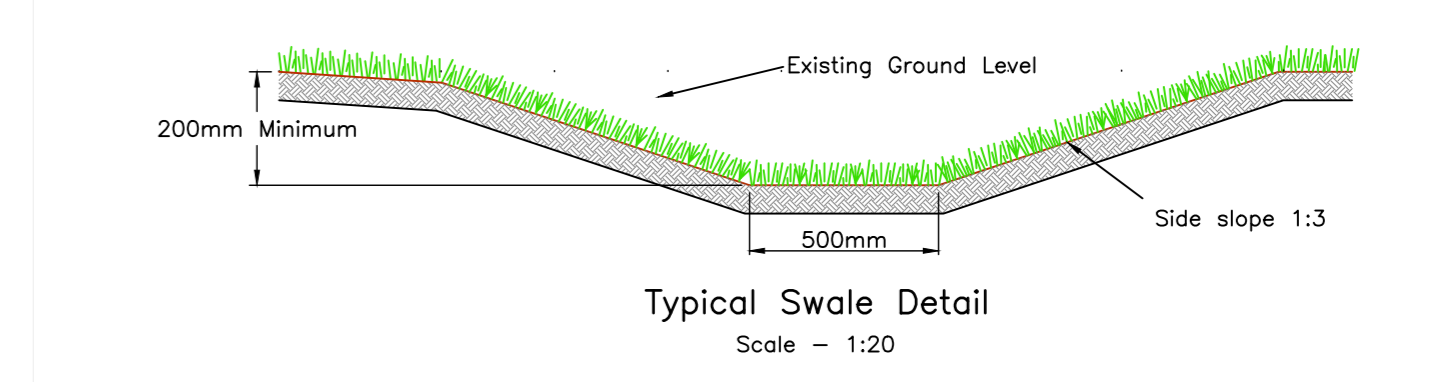
Status **FOR PLANNING**

Client  
**Enso Green Holdings D Limited**

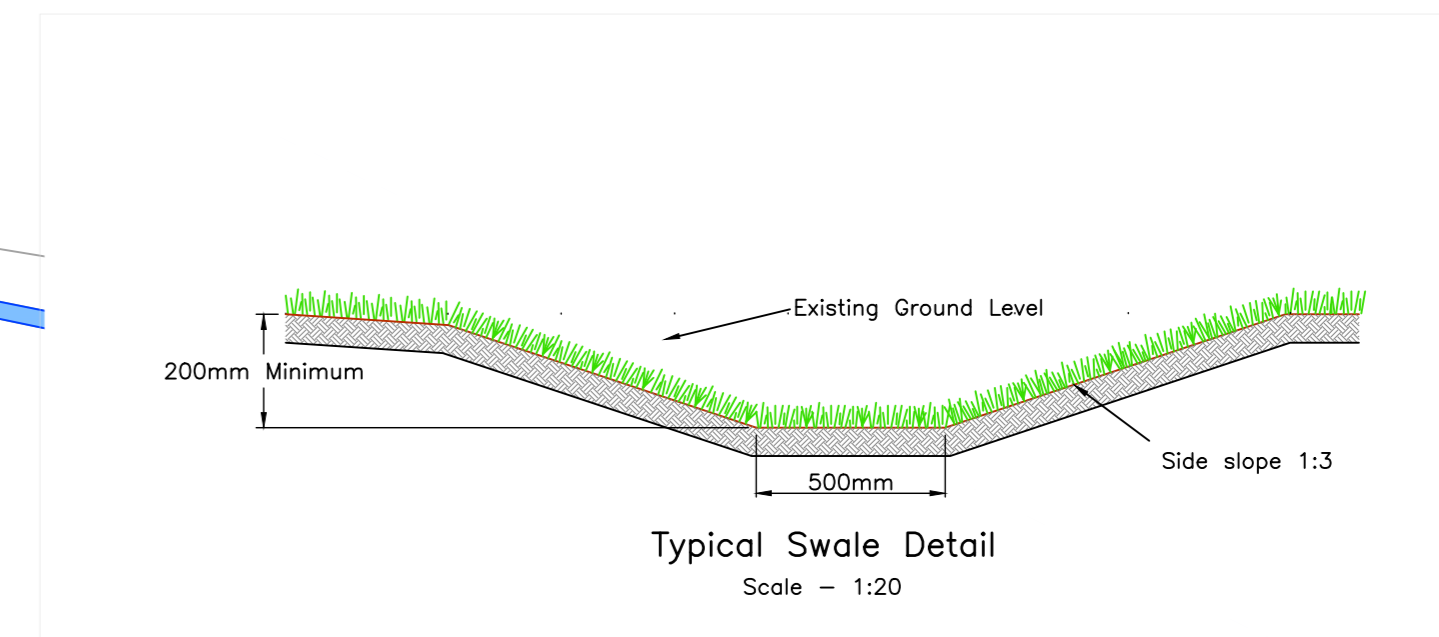
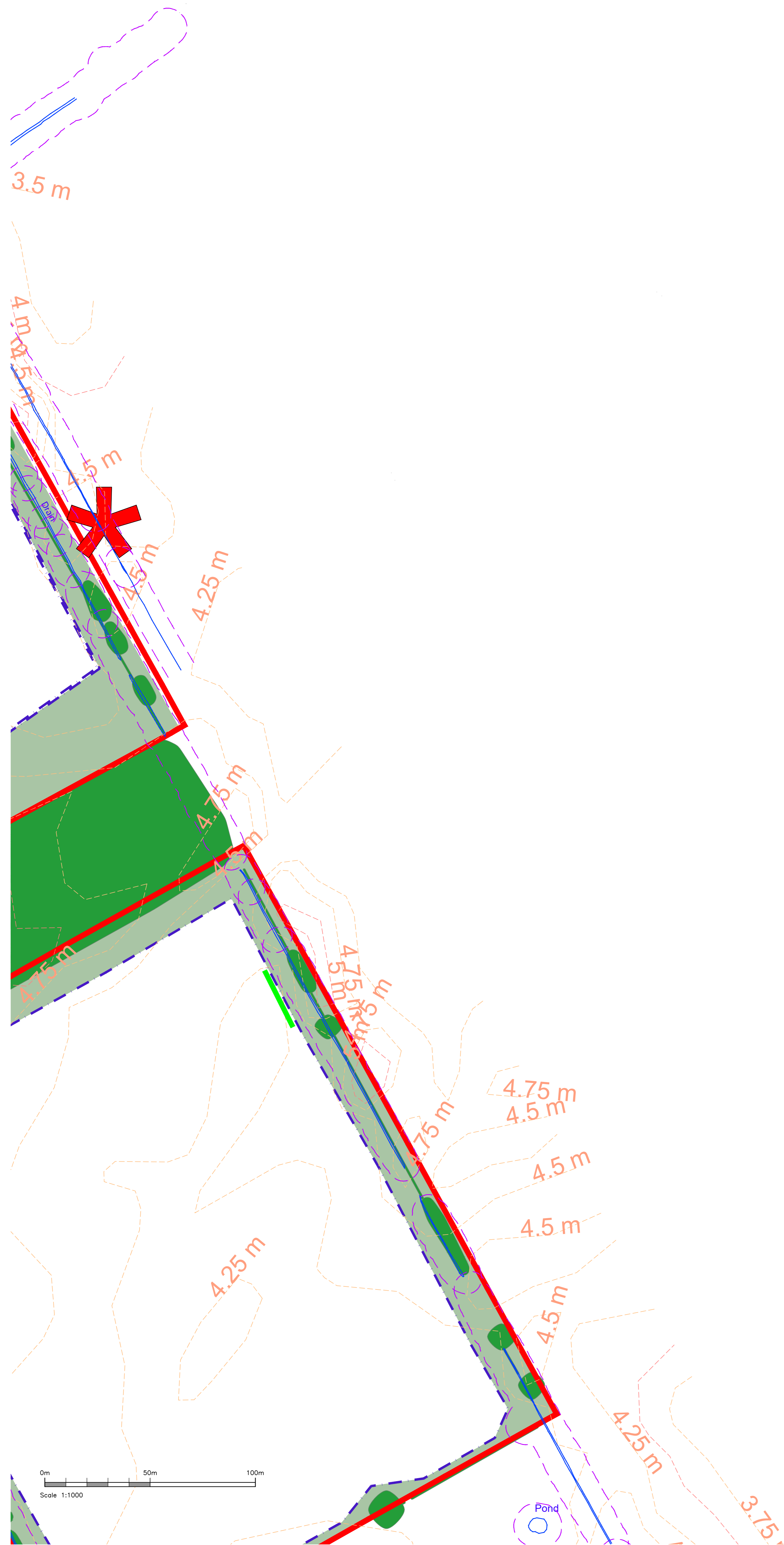
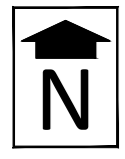
Project  
**Helios Renewable Energy Project**

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

Drawing No. **E216/93** Rev C  
Date: June 2023 Scale: 1:1000 @ A0



Typical Swale Detail Scale = 1:20

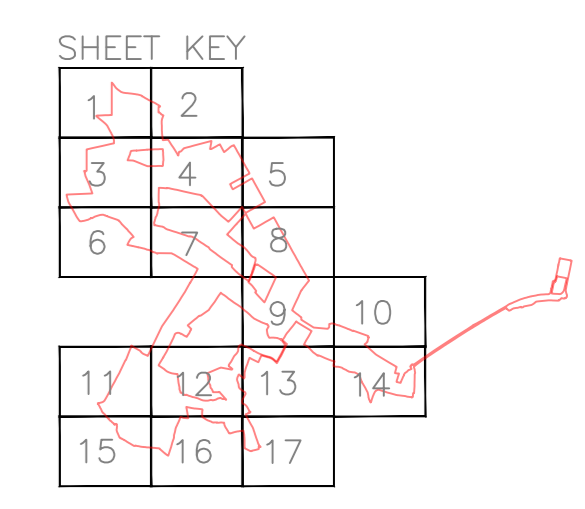


**For Planning**  
 This drawing is produced for the purposes of supporting a planning application and should not be relied upon for tender, pricing, or construction purposes.

**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**
1. Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024.
  2. Drawing based on Topographical Survey produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("CAD") (Dated 6th May 2022).
  3. Based on data from Archaeological Services WYAS Reference: XF70\_HL022 Received 05/05/2023
  4. 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.
  5. Contains public sector information licensed under the Open Government Licence v3.0.
  6. 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).
  7. Total length of swales provided = 4975m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.008m<sup>3</sup> of storage is available. Therefore the total available storage provided within the swales is 398m<sup>3</sup>.



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

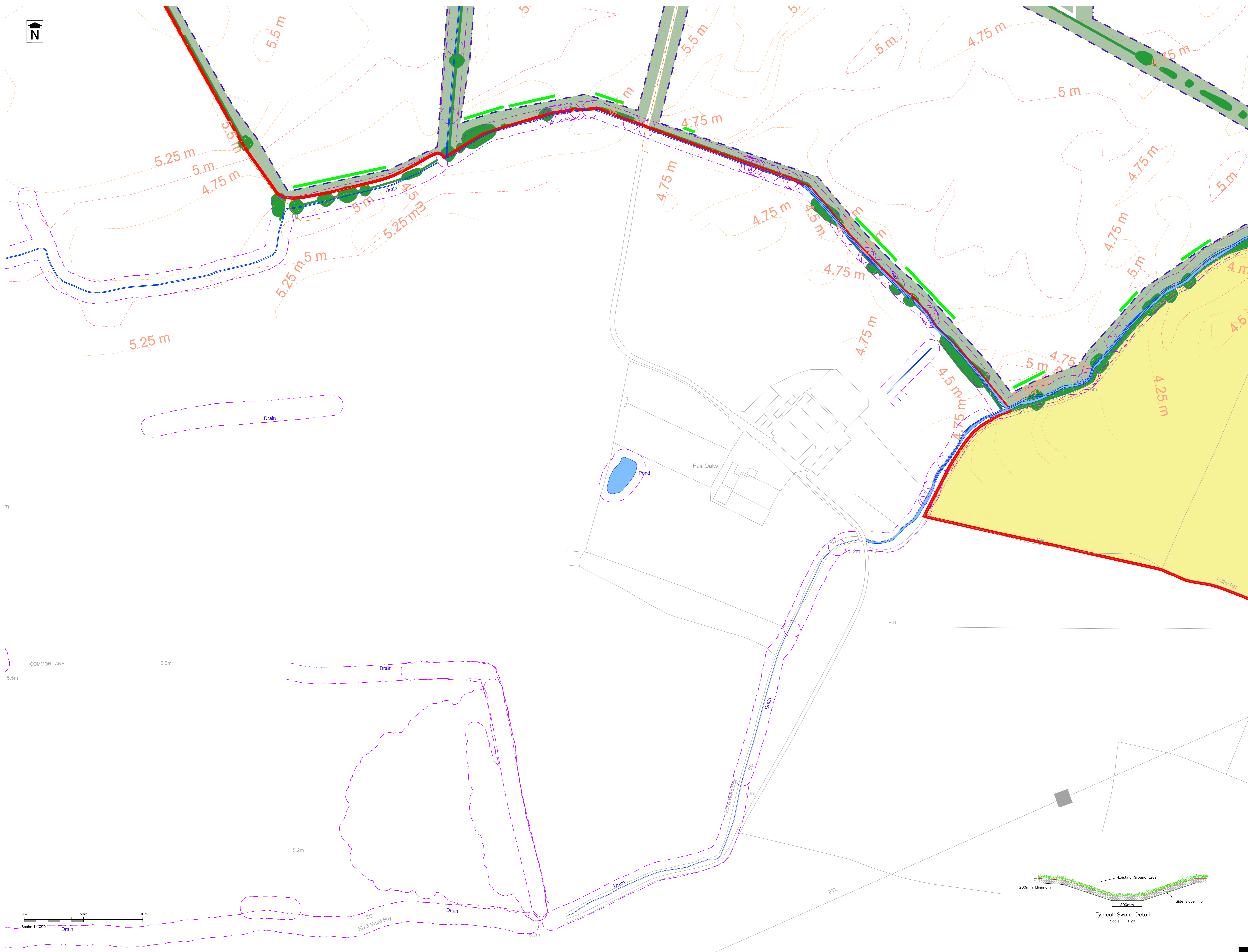
Status  
**FOR PLANNING**

Client  
**Enso Green Holdings D Limited**

Project  
**Helios Renewable Energy Project**

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

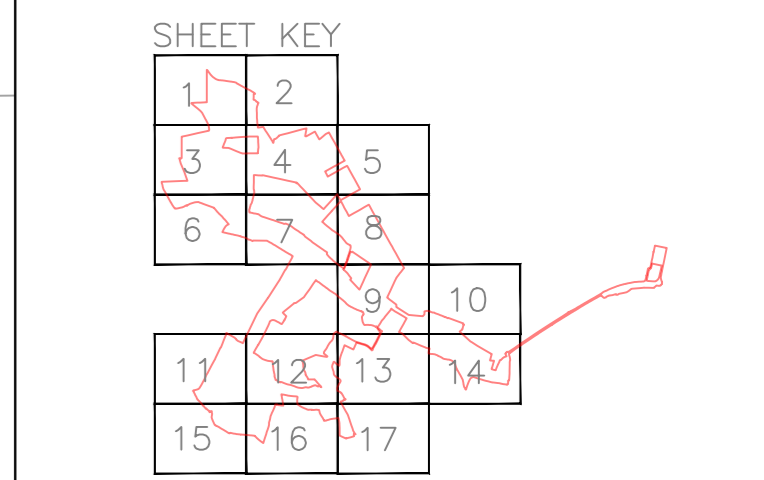
Drawing No. **E216/94** Rev C  
 Date: June 2023 Scale: 1:1000 @ A0



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)
  - Archeological Mitigation Areas
  - Interception Swales

- NOTES**
1. Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024
  2. Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number GRAX LINEWORK ("CAD") (Dated 8th May 2022).
  3. Based on data from Archaeological Services WYAS Reference: XF70\_HLO22 Received 05/05/2023
  4. 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.
  5. Contains public sector information licensed under the Open Government Licence v3.0.
  6. 7m watercourse buffer in accordance with Satey 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).
  7. Total Length of swales provided = 4975m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.08m<sup>3</sup> of storage is available. Therefore the total available storage provided within the swales is 398m<sup>3</sup>.



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

Status: **FOR PLANNING**

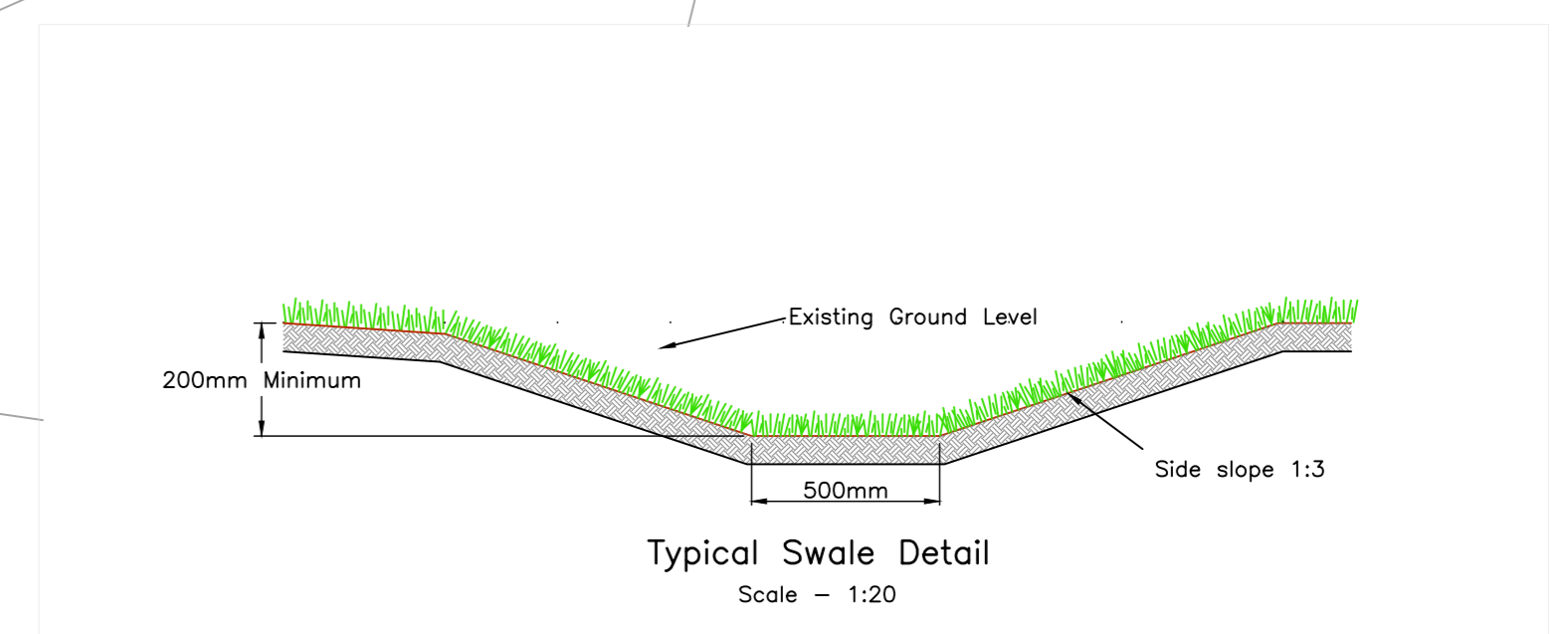
Client: **Enso Green Holdings D Limited**

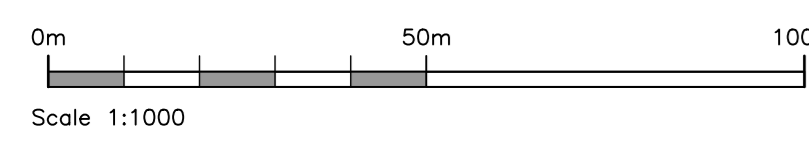
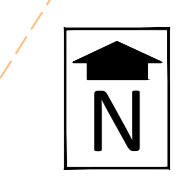
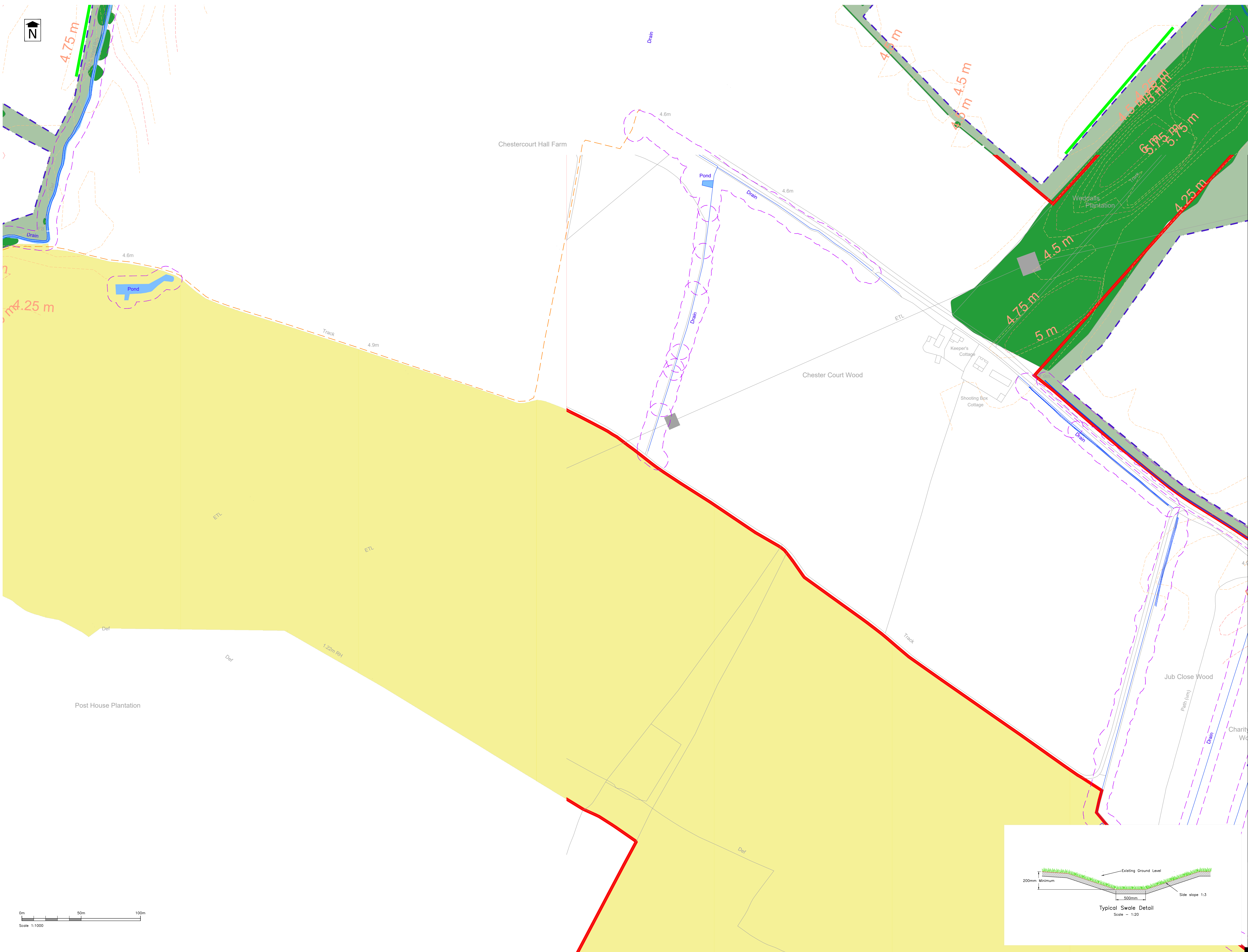
Project: **Helios Renewable Energy Project**

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

Drawing No. **E216/95** Rev C

Date: June 2023 Scale: 1:1000 @ A0

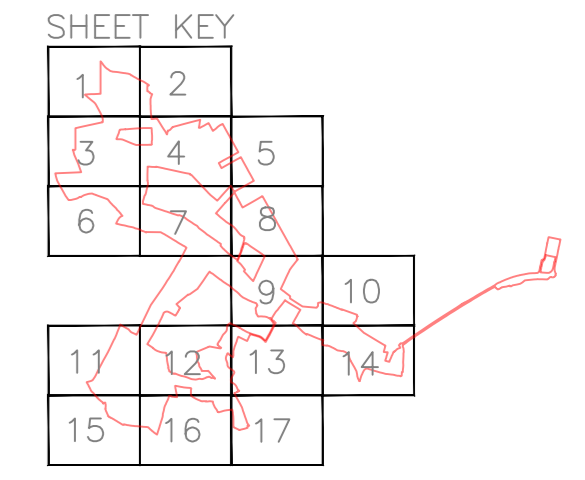




For Planning  
 This drawing is produced for the purposes of supporting a planning application and should not be relied upon for tender, pricing, or construction purposes.

- 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**
1. Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024
  2. Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("CAD") (Dated 6th May 2022).
  3. Based on data from Archaeological Services WYAS Reference: XF70\_HLO22 Received 05/05/2023
  4. 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.
  5. Contains public sector information licensed under the Open Government Licence v3.0.
  6. 7m watercourse buffer in accordance with Sully 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 trees, 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).
  7. Total Length of swales provided = 4975m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.08m<sup>3</sup> of storage is available. Therefore the total available storage provided within the swales is 398m<sup>3</sup>.



Rev	Date	Description	Drawn	Check
1	06/06/23	Issue raised	SCC	SAM
A	23/06/23	Presentation updated	BF	
B	23/08/23	Layout Revision	IS	
C	16/02/24	Updated parameters plan & site boundary	SCC	BF

Status: **FOR PLANNING**

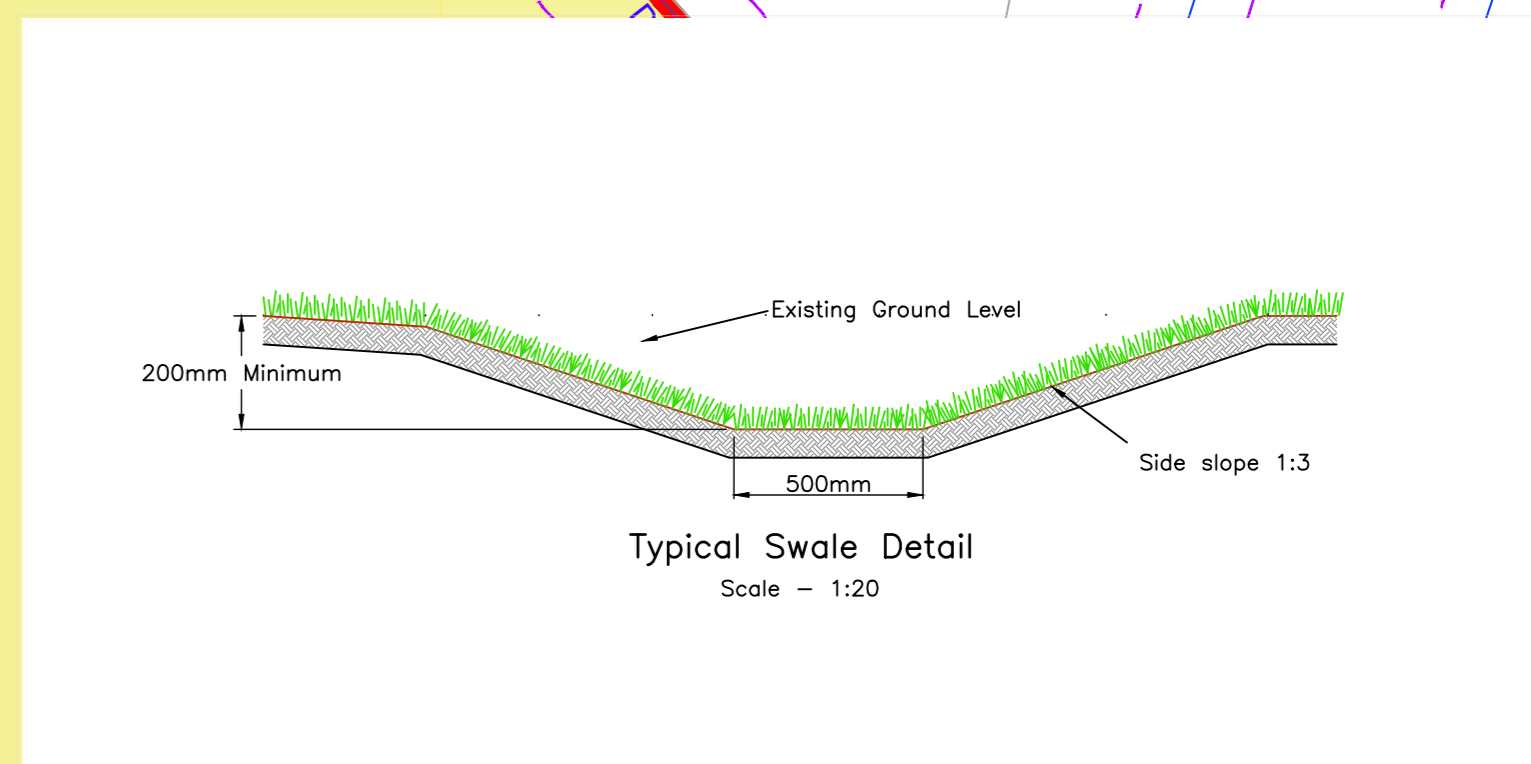
Client:  
**Enso Green Holdings D Limited**

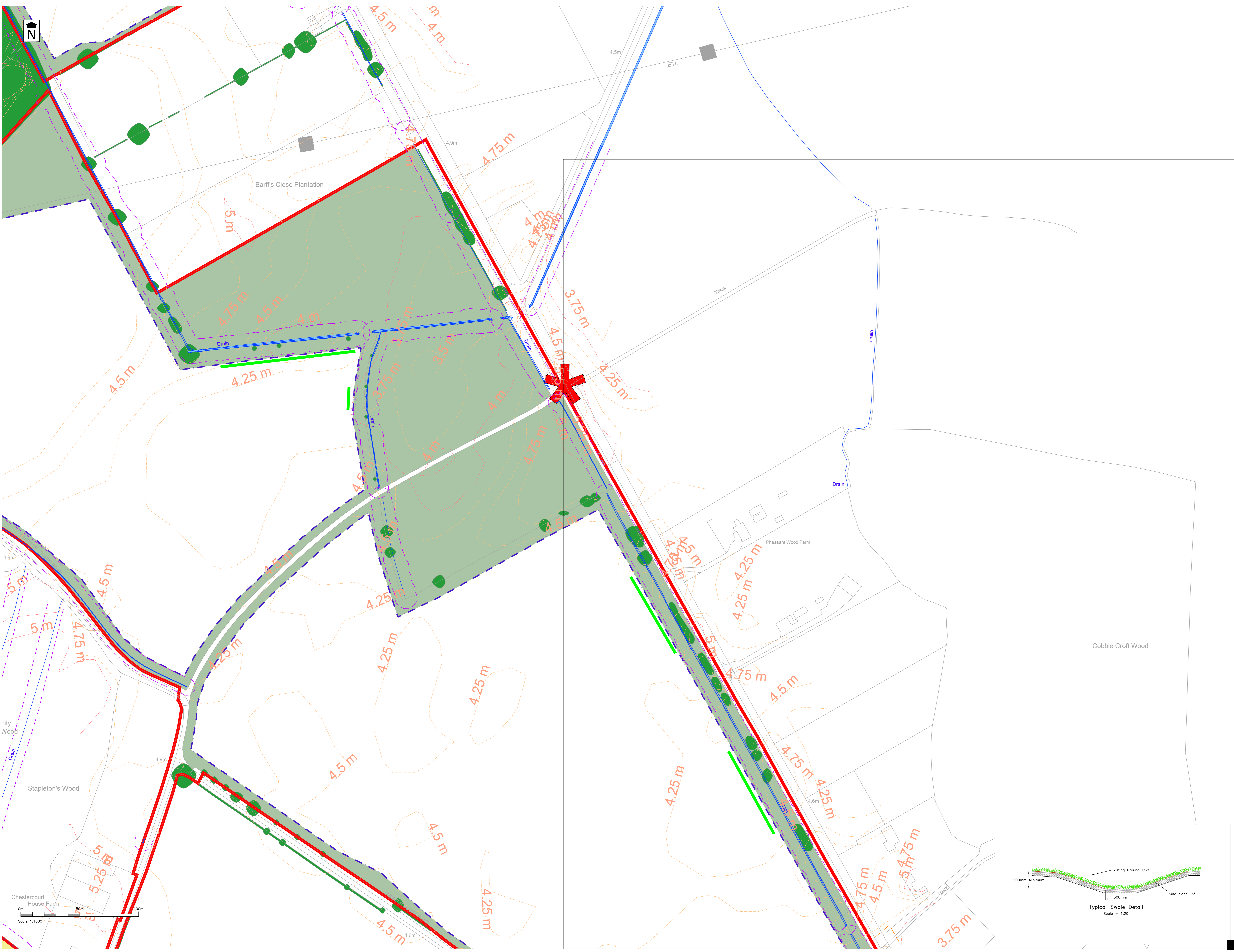
Project:  
**Helios Renewable Energy Project**

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

Drawing No.: **E216/96** Rev C

Date: June 2023 Scale: 1:1000 @ A0



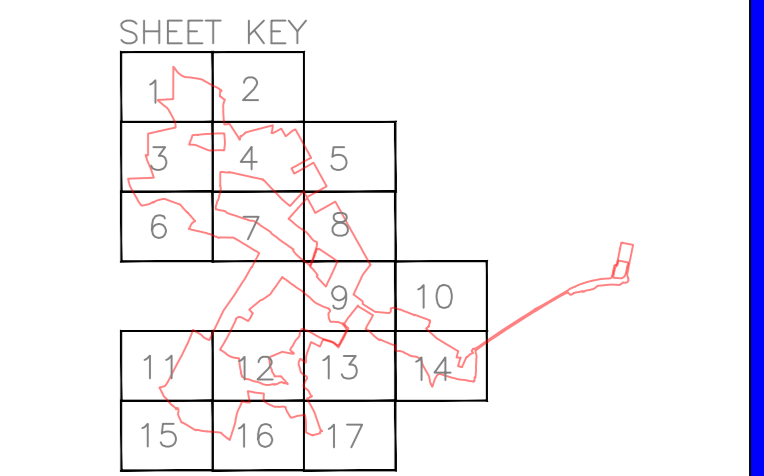


**For Planning**  
 This drawing is produced for the purposes of supporting a planning application and should not be relied upon for tender, pricing, or construction purposes.

**KEY**

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

- NOTES**
1. Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024.
  2. Drawing based on Topographical Survey produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("CAD") (Dated 6th May 2022).
  3. Based on data from Archaeological Services WYAS Reference: XF70\_HL022 Received 05/05/2023
  4. 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.
  5. Contains public sector information licensed under the Open Government Licence v3.0.
  6. 7m watercourse buffer in accordance with Selly 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).
  7. Total length of swales provided = 4975m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.038m<sup>3</sup> of storage is available. Therefore the total available storage provided within the swales is 398m<sup>3</sup>.



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

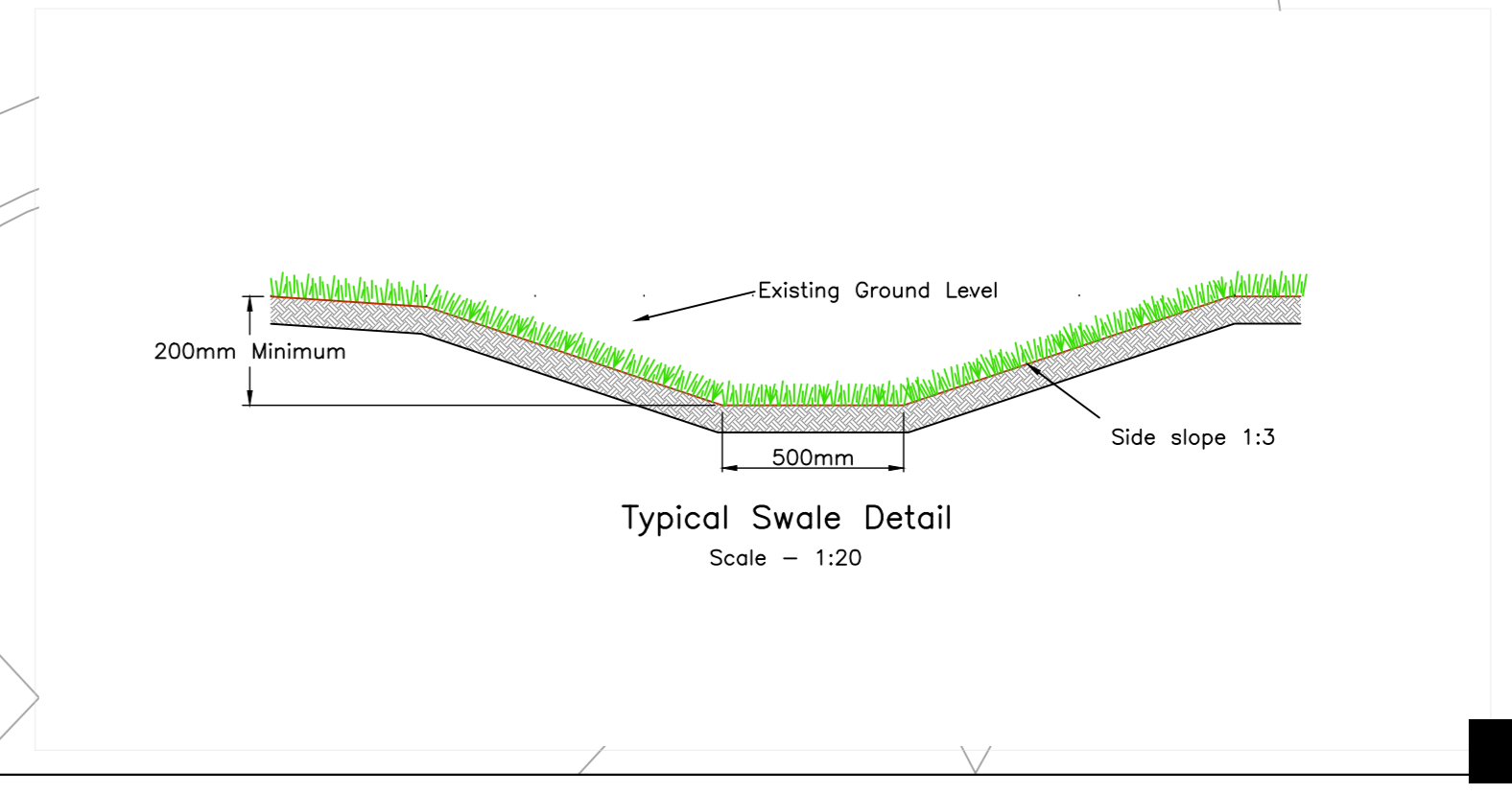
Status  
**FOR PLANNING**

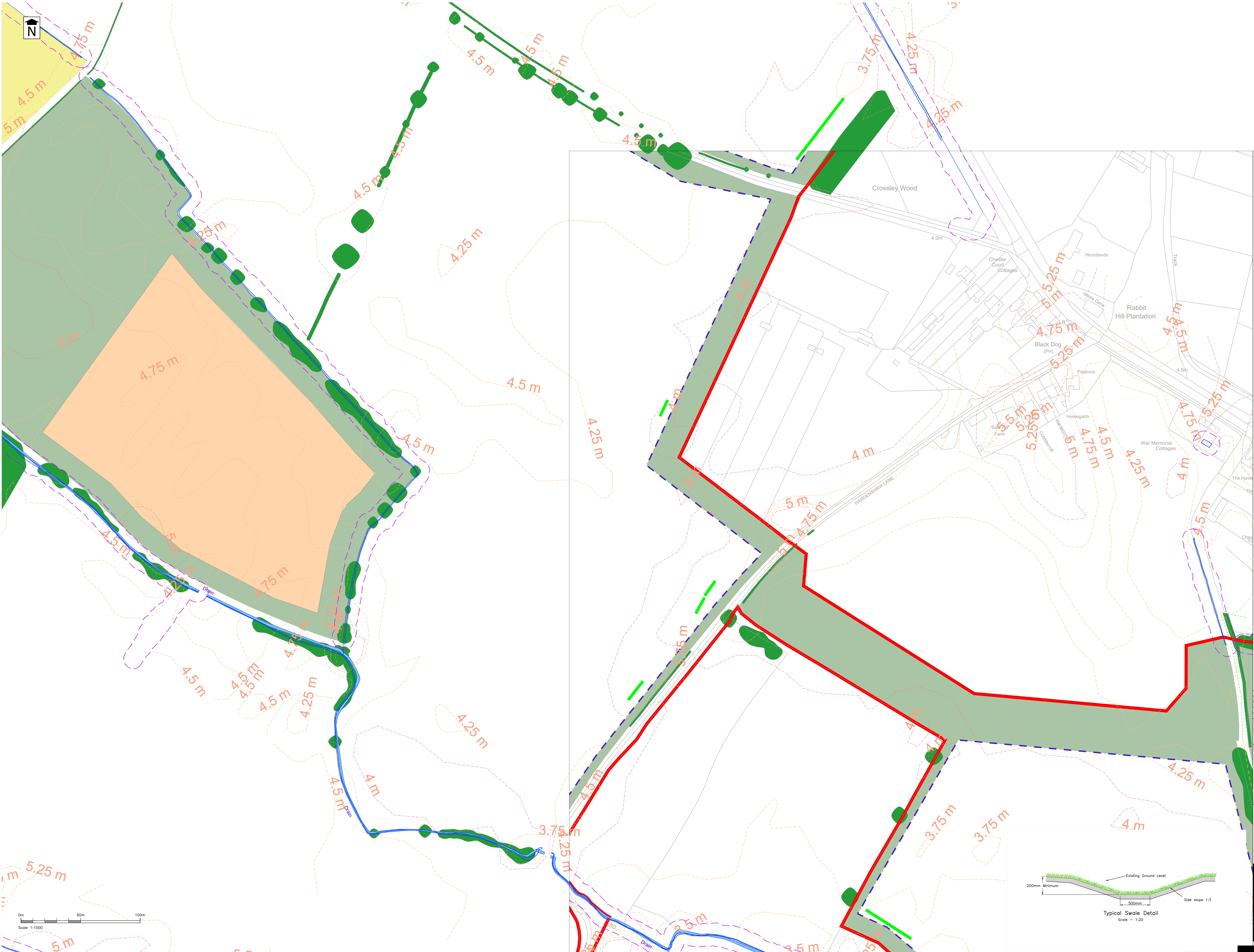
Client  
**Enso Green Holdings D Limited**

Project  
**Helios Renewable Energy Project**

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

Drawing No. **E216/97** Rev C  
 Date: June 2023 Scale: 1:1000 @ A0





**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)
- Archeological Mitigation Areas
- Interception Swales

- NOTES**
1. Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024
  2. Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("CAD") (Dated 6th May 2022).
  3. Based on data from Archaeological Services WYAS Reference: XF70\_HL022 Received 05/05/2023
  4. 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.
  5. Contains public sector information licensed under the Open Government Licence v3.0.
  6. 7m watercourse buffer in accordance with Setby 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).
  7. Total Length of swales provided = 4975m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.08m<sup>3</sup> of storage is available. Therefore the total available storage provided within the swales is 398m<sup>3</sup>.

**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
#	09/06/23	First Issue	SLC	SAM
A	23/06/23	Information updated	SR	
B	22/08/23	Layout Revision	IS	
C	14/02/24	Updated parameters plan & site boundary	SLC	BF

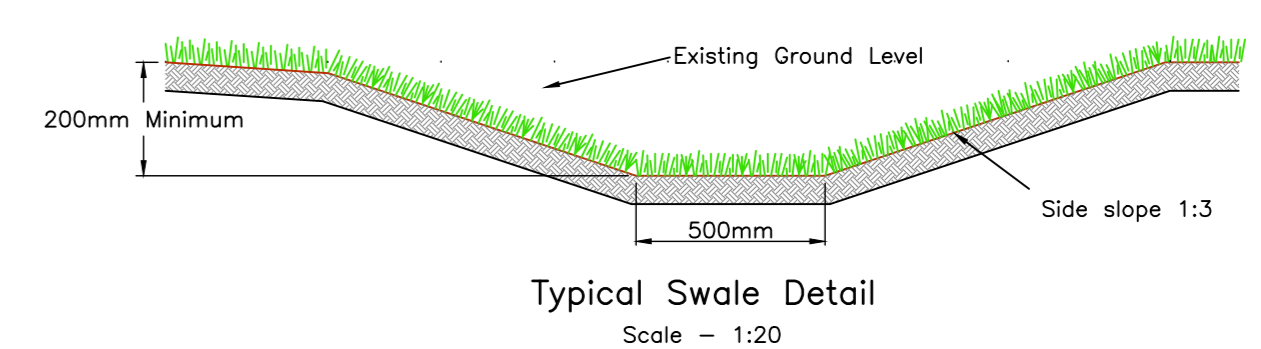
**FOR PLANNING**

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  
 Scale: 1:1000 @ A0



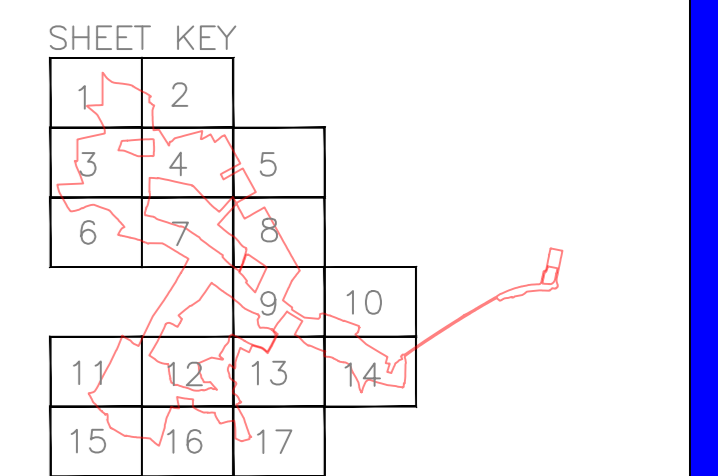
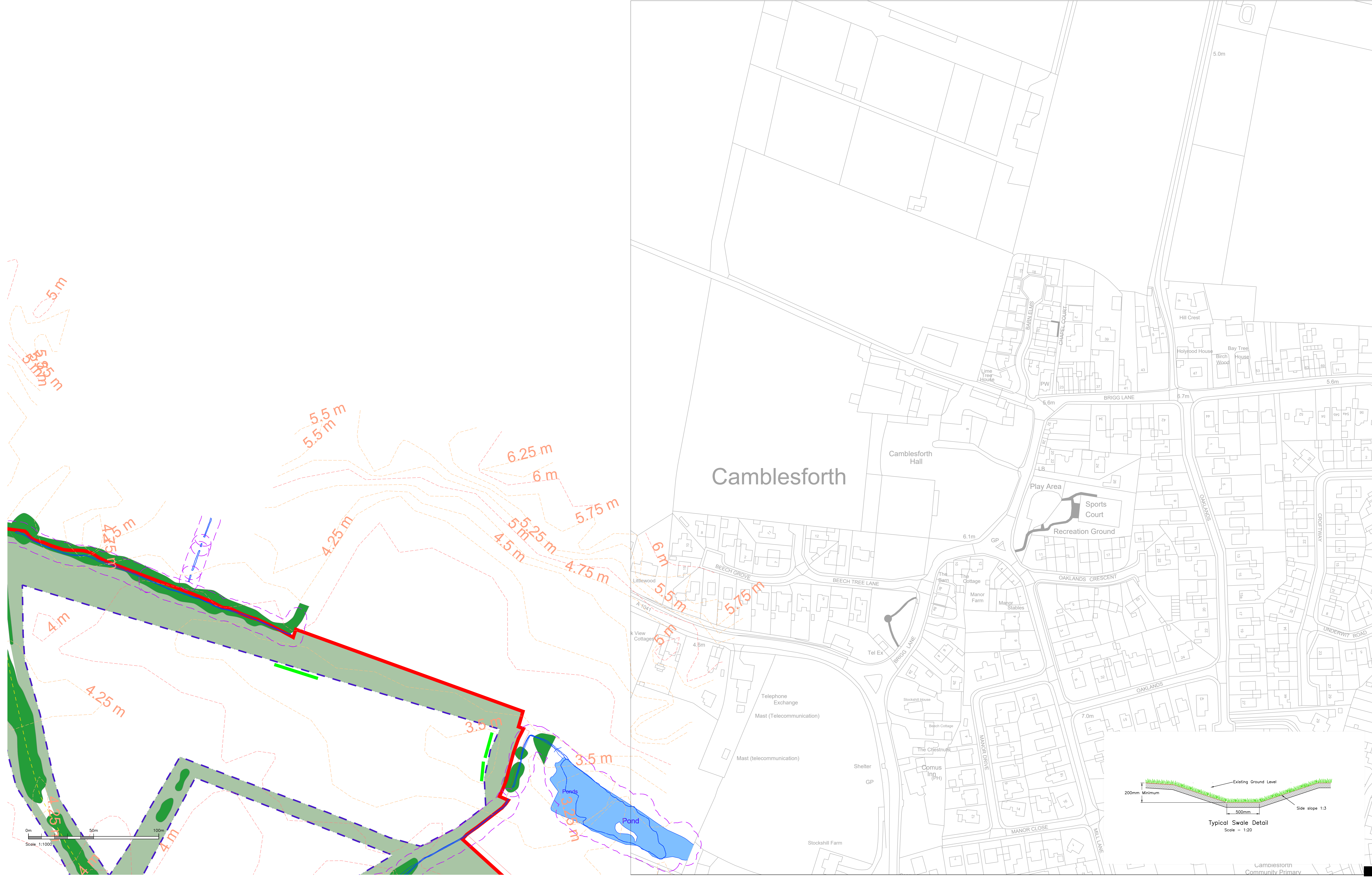




**For Planning**  
 This drawing is produced for the purposes of supporting a planning application and should not be relied upon for tender, pricing, or construction purposes.

- 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**
1. Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024.
  2. Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("CAD") (Dated 6th May 2022).
  3. Based on data from Archaeological Services WVAS Reference: XF70\_HL022 Received 05/05/2023
  4. 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.
  5. Contains public sector information licensed under the Open Government Licence v3.0.
  6. 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).
  7. Total Length of swales provided = 4975m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.08m<sup>2</sup> of storage is available, therefore the total available storage provided within the swales is 398m<sup>2</sup>.



Rev #	Date	Description	Drawn	Check
1	09.06.23	First Issue	SLC	SMH
A	23.06.23	Presentation updated	BF	
B	23/06/23	Layout revision	S	
C	14/02/24	Updated parameters plan & site boundary	SLC	BF

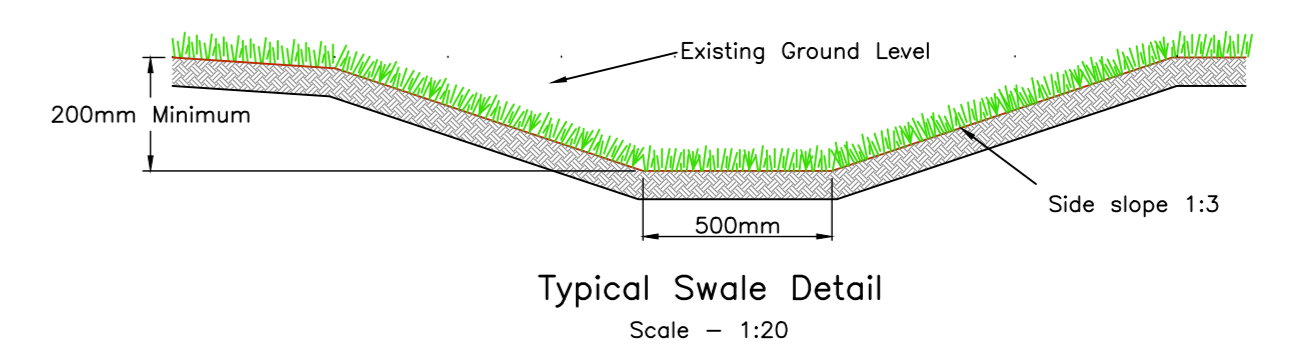
Status: **FOR PLANNING**

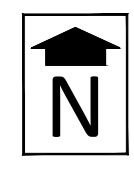
Client: **Enso Green Holdings D Limited**

Project: **Helios Renewable Energy Project**

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

Drawing No: **E216/99** Rev C  
 Date: June 2023 Scale: 1:1000 @ A0





COMMON LANE

KATIE LANE (TRACK)  
Drain

5.2m

Drain

Drain

4.6m

Drain SD

Pond

Drain

4.75 m

Drain

Drain

Track

Def

4.75 m

4.75 m

Drain

0.9m TKH

4.75 m

Drain

Drain

Drain

Drain

Drain

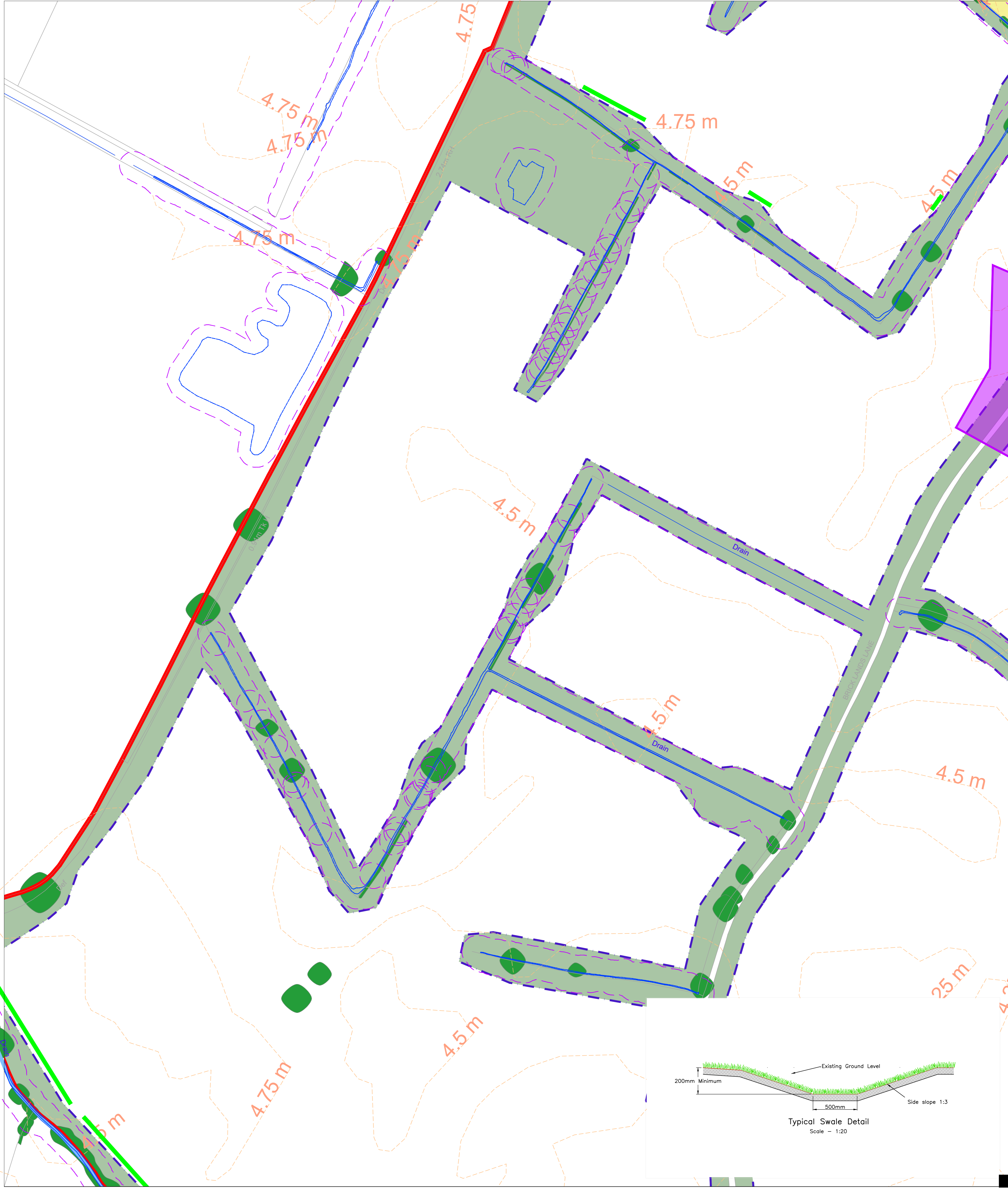
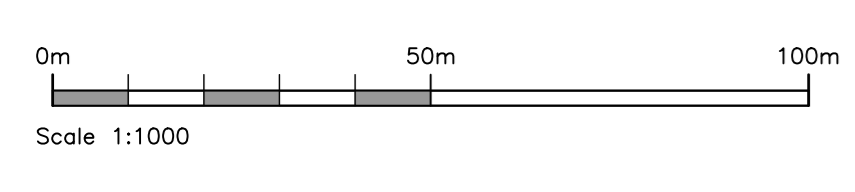
Drain

Drain

Drain

Drain

Drain

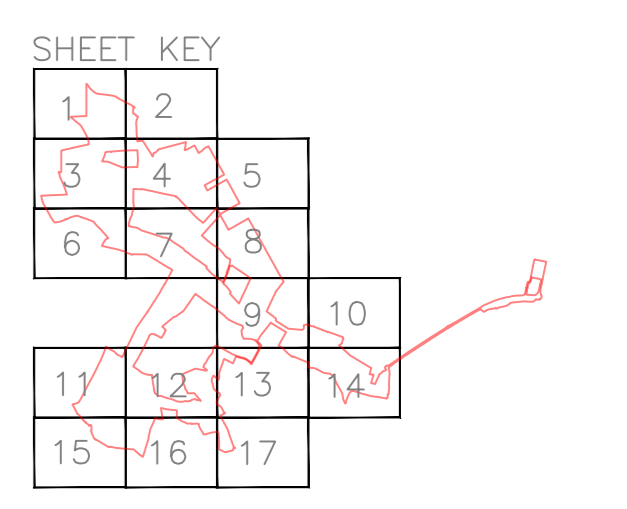


For Planning  
This drawing is produced for the purposes of supporting a planning application and should not be relied upon for tender, pricing, or construction purposes.

**KEY**

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

- NOTES**
1. Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024.
  2. Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number BRAX LINEWORK ("CAD") (Dated 6th May 2022).
  3. Based on data from Archaeological Services WYAS Reference: XF70\_HL022 Received 05/05/2023.
  4. 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.
  5. Contains public sector information licensed under the Open Government Licence v3.0.
  6. 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).
  7. Total Length of swales provided = 4975m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.08m<sup>3</sup> of storage is available. Therefore the total available storage provided within the swales is 398m<sup>3</sup>.



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	IS	
C	14/02/24	Updated parameters plan & site boundary	SLC	BF

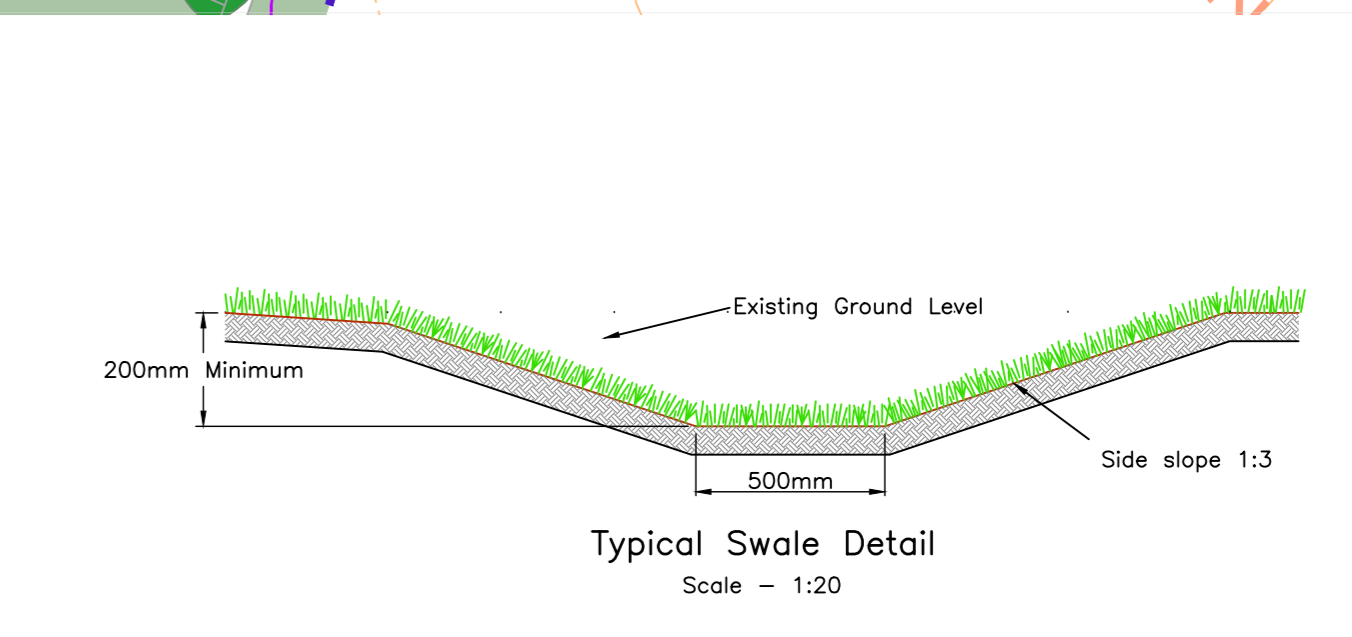
**FOR PLANNING**

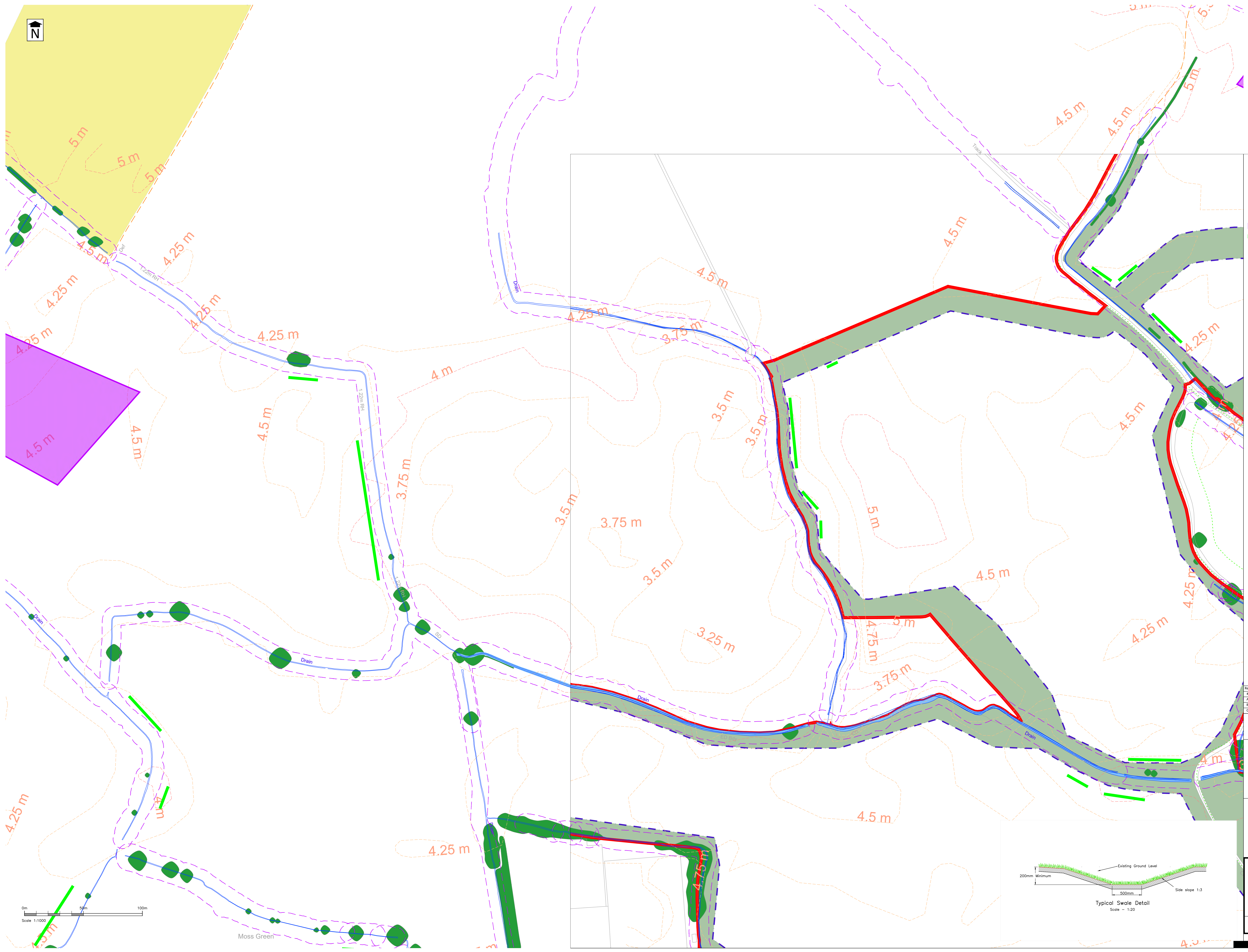
Client  
**Enso Green Holdings D Limited**

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

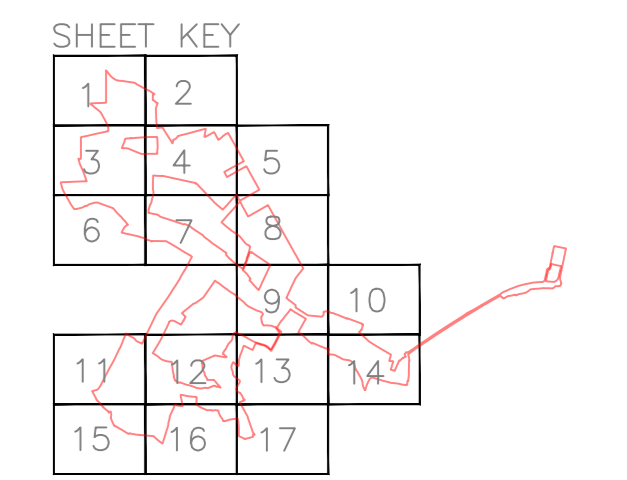




**For Planning**  
This drawing is produced for the purposes of supporting a planning application and should not be relied upon for tender, pricing, or construction purposes.

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

- NOTES**
1. Based on drawing DX-01-P02\_Rev09 Parameter Plan by Enso Energy dated 07/02/2024
  2. Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("CAD") (Dated 6th May 2022).
  3. Based on data from Archaeological Services WYAS Reference: XF70\_HL022 Received 05/05/2023
  4. Approximate Top of Bank based on LiDAR data at 0.1m intervals. 7m buffers based on the approximate top of bank date. Top of Bank will need to be accurately verified.
  5. Contains public sector information licensed under the Open Government Licence v3.0.
  6. 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 trees, shrubs, 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).
  7. Total Length of swales provided = 4975m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.08m<sup>3</sup> of storage is available. Therefore the total available storage provided within the swales is 398m<sup>3</sup>.



Rev	Date	Description	Drawn	Check
A	09/06/23	First Issue	SEC	SAMT
A	23/05/23	Presentation updated	BF	
B	22/08/23	Layout Revision	IS	
C	14/02/24	Updated parameters plan & site boundary	SEC	BF

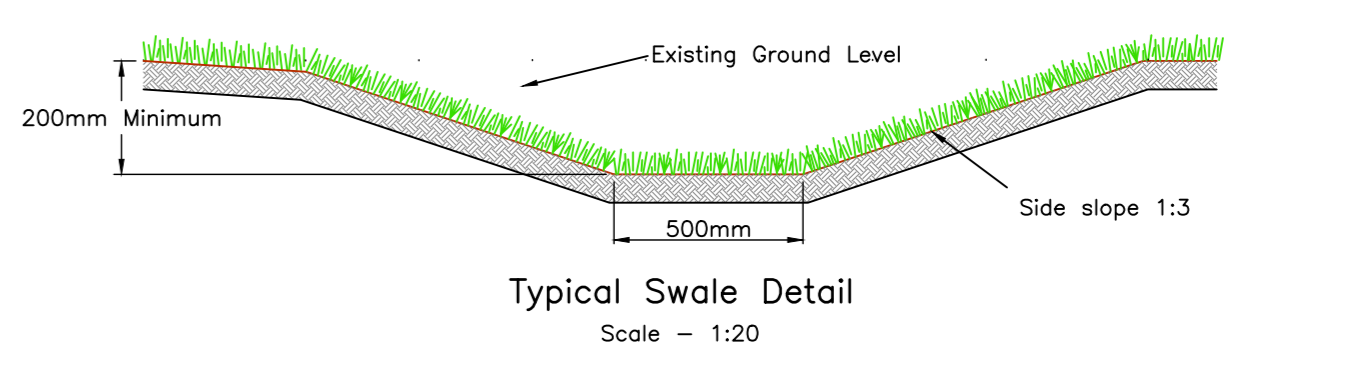
Status: **FOR PLANNING**

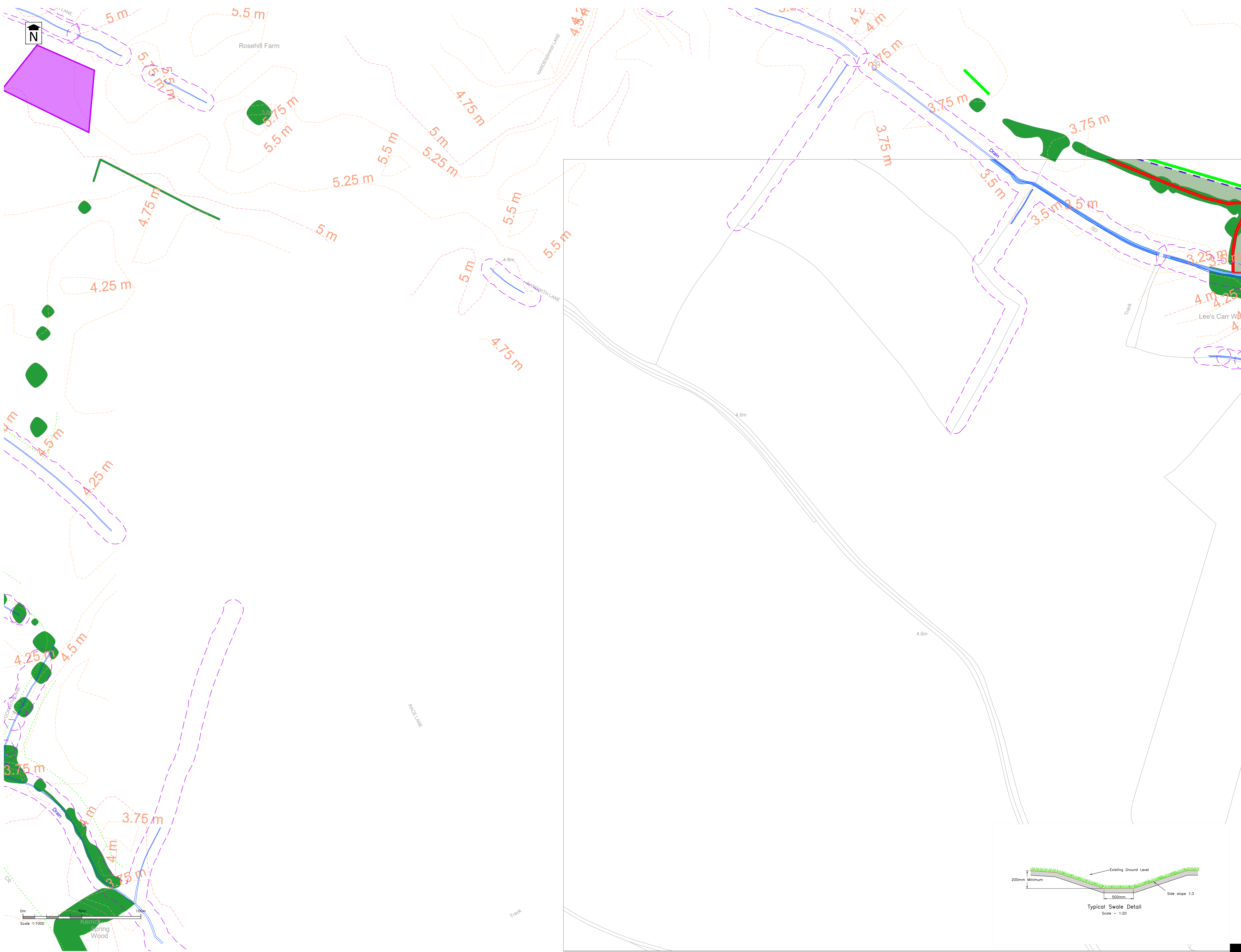
Client: **Enso Green Holdings D Limited**

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



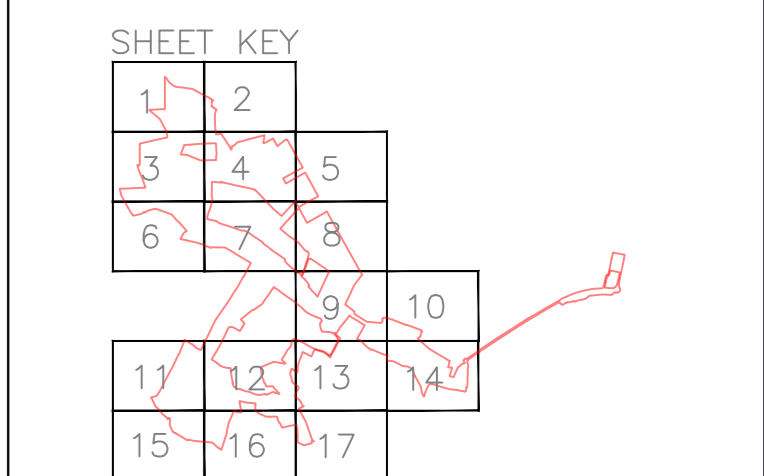


For Planning  
 This drawing is produced for the purposes of supporting a planning application and should not be relied upon for tender, pricing, or construction purposes.

**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**
1. Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024
  2. Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("CAD") (Dated 6th May 2022).
  3. Based on data from Archaeological Services WYAS Reference: XF70\_HLO22 Received 05/05/2023
  4. 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.
  5. Contains public sector information licensed under the Open Government Licence v3.0.
  6. 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 trees, shrubs, 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).
  7. 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
A	09.06.23	First Issue	SIC	SAM
A	23.06.23	Presentation updated	BF	
B	23/08/23	Layout Revision	IS	
C	18/02/24	Updated parameters plan & site boundary	SIC	BF

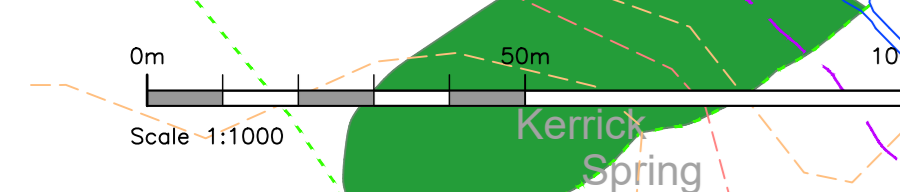
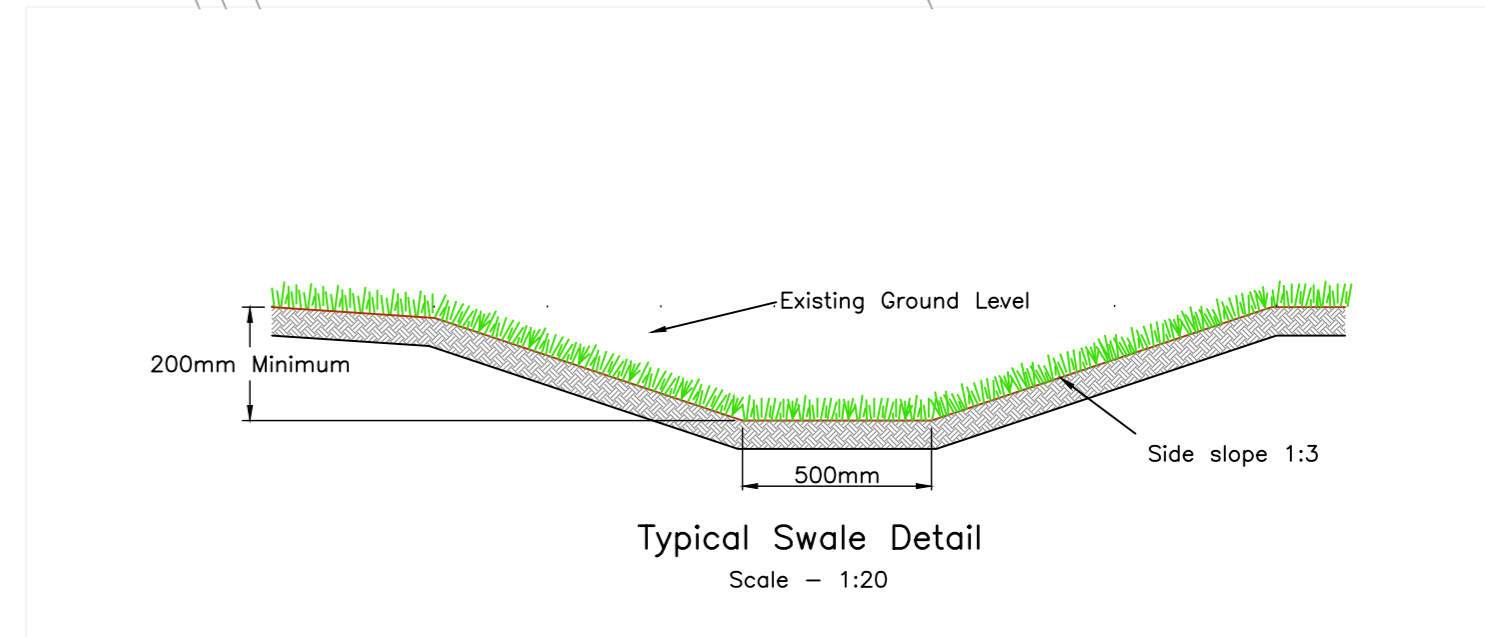
Status: **FOR PLANNING**

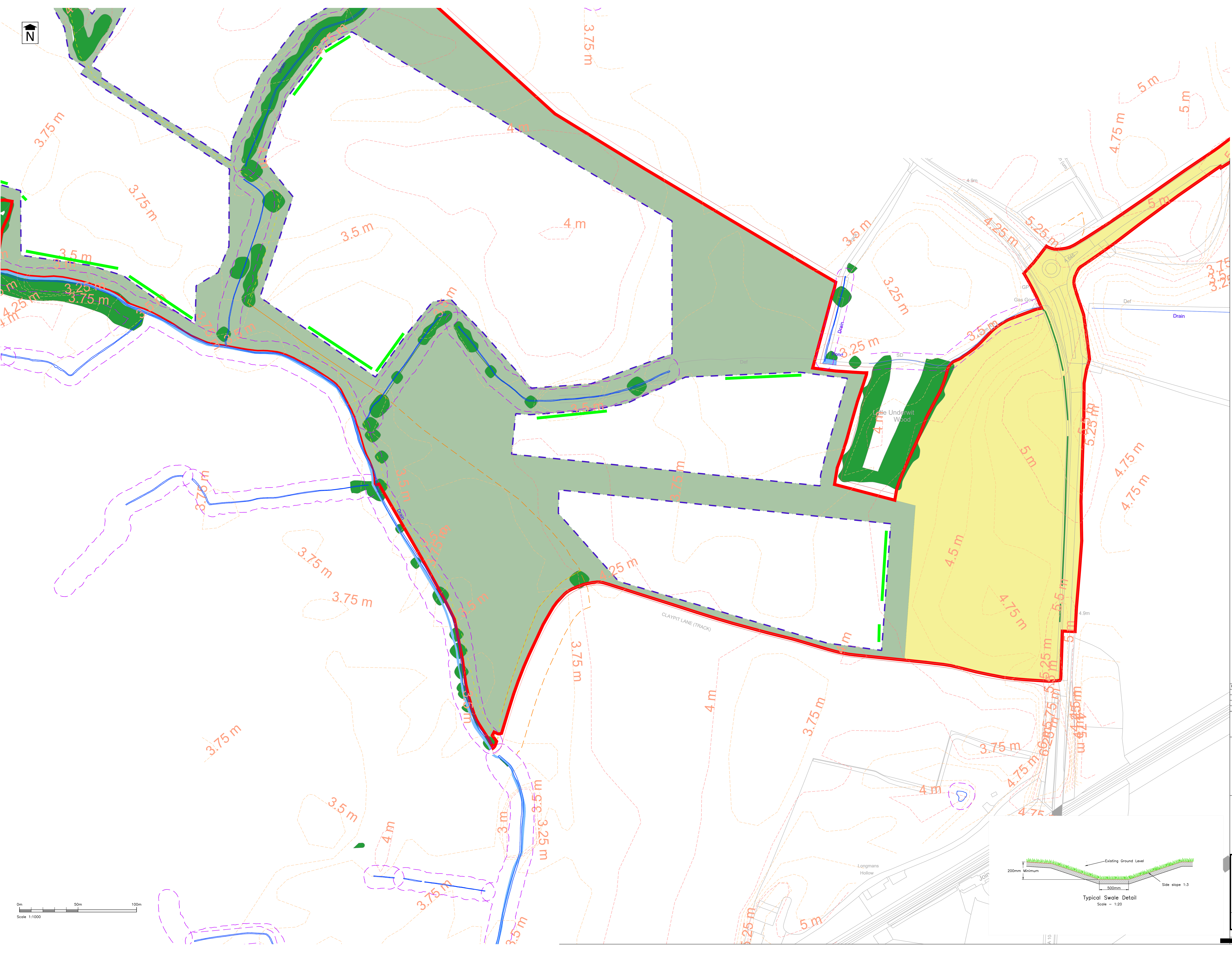
Client:  
**Enso Green Holdings D Limited**

Project:  
**Helios Renewable Energy Project**

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

Drawing No: **E216/102** Rev C  
 Date: June 2023 Scale: 1:1000 @ A0

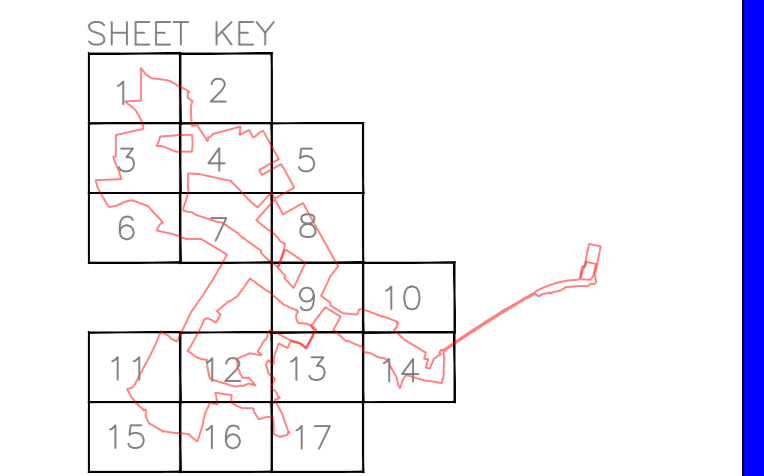




For Planning  
 This drawing is produced for the purposes of supporting a planning application and should not be relied upon for tender, pricing, or construction purposes.

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

- NOTES**
1. Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024
  2. Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("CAD") (Dated 6th May 2022).
  3. Based on data from Archaeological Services WYAS Reference: XF70\_HLO22 Received 05/05/2023
  4. 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.
  5. Contains public sector information licensed under the Open Government Licence v3.0.
  6. 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 trees, 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).
  7. Total Length of swales provided = 4975m. Per metre length of swale, at 1/2 full (incorporating a 0.1m freeboard), 0.08m<sup>3</sup> of storage is available. Therefore the total available storage provided within the swales is 398m<sup>3</sup>.



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

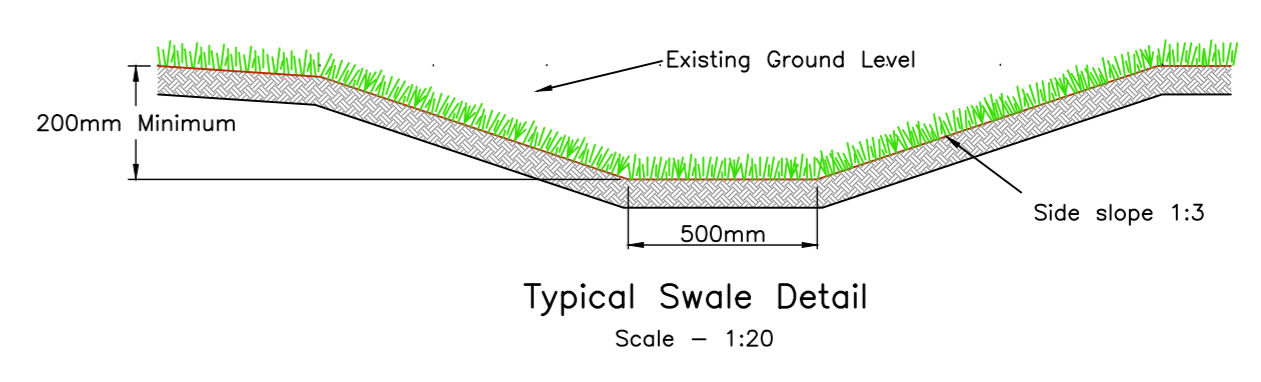
Status: **FOR PLANNING**

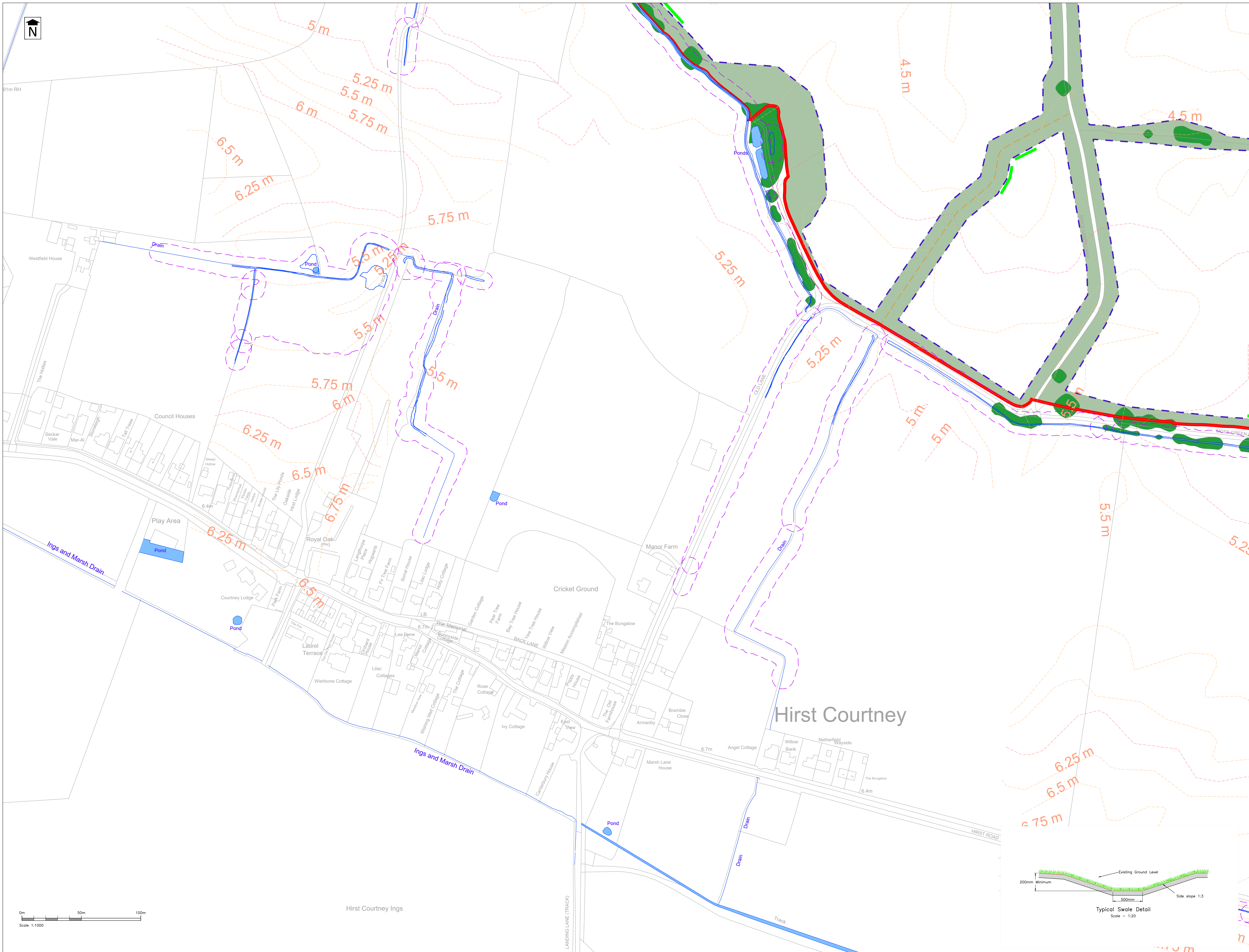
Client:  
**Enso Green Holdings D Limited**

Project:  
**Helios Renewable Energy Project**

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

Drawing No. **E216/103** Rev C  
 Date: June 2023 Scale: 1:1000 @ AO





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

- NOTES**
1. Based on drawing DX-01-P02\_Rev09 Parameter Plan by Enso Energy dated 07/02/2024
  2. Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number BRAX LINEWORK ("CAD") (Dated 6th May 2022).
  3. Based on data from Archaeological Services WYAS Reference: XF70\_HL022 Received 05/05/2023
  4. 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.
  5. Contains public sector information licensed under the Open Government Licence v3.0.
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**SHEET KEY**

1	2
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17	18

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

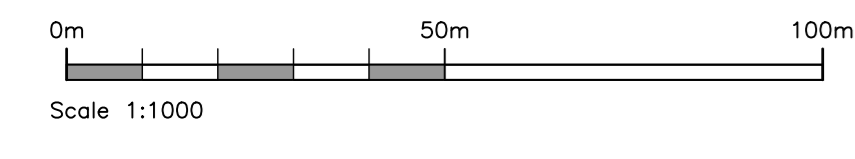
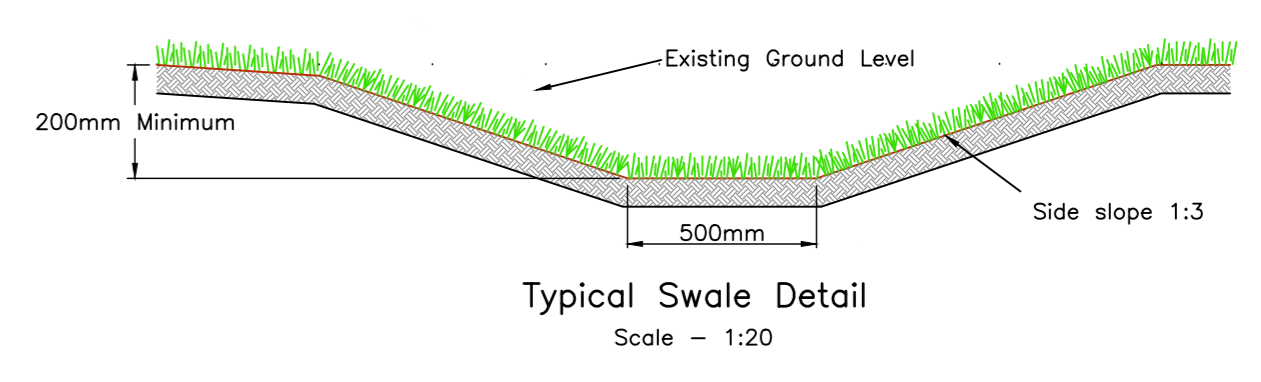
Status **FOR PLANNING**

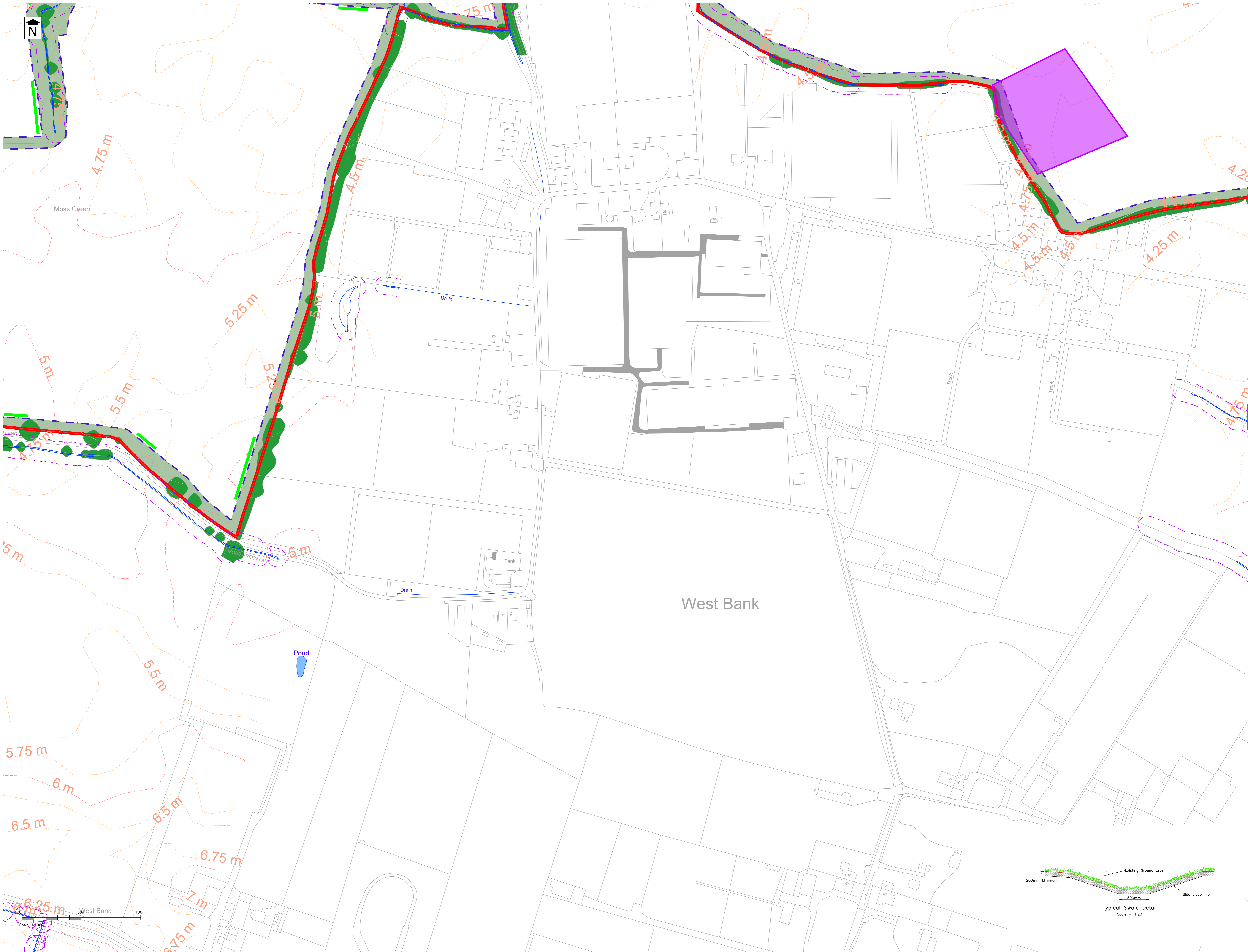
Client  
**Enso Green Holdings D Limited**

Project  
**Helios Renewable Energy Project**

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

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





**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**
1. Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024.
  2. Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("CAD") (Dated 6th May 2022).
  3. Based on data from Archaeological Services WYAS Reference: XF70\_HL022 Reviewed 05/05/2023
  4. 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.
  5. Contains public sector information licensed under the Open Government Licence v3.0.
  6. 7m watercourse buffer in accordance with Solihull 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).
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**SHEET KEY**

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3	4
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Rev	Date	Description	Drawn	Check
#	09.06.23	First Issue	SIC	SAM
A	23.06.23	Presentation updated	BF	
B	13/09/23	Layout Revision	GS	
C	14/02/24	Updated parameters plan & site boundary	SIC	BF

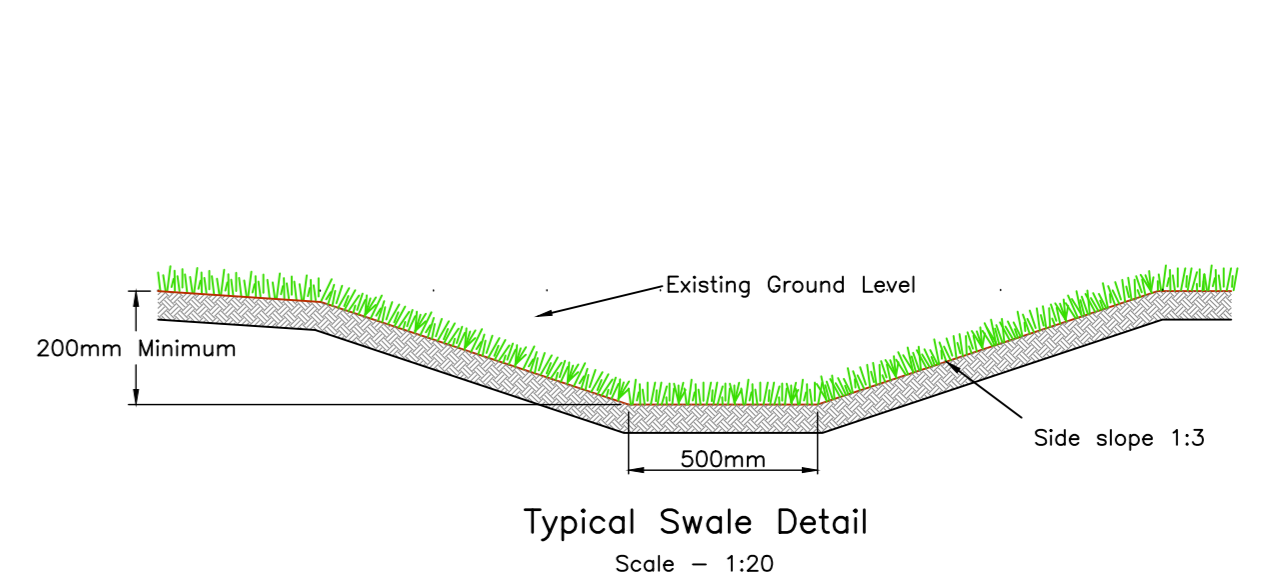
Status  
**FOR PLANNING**

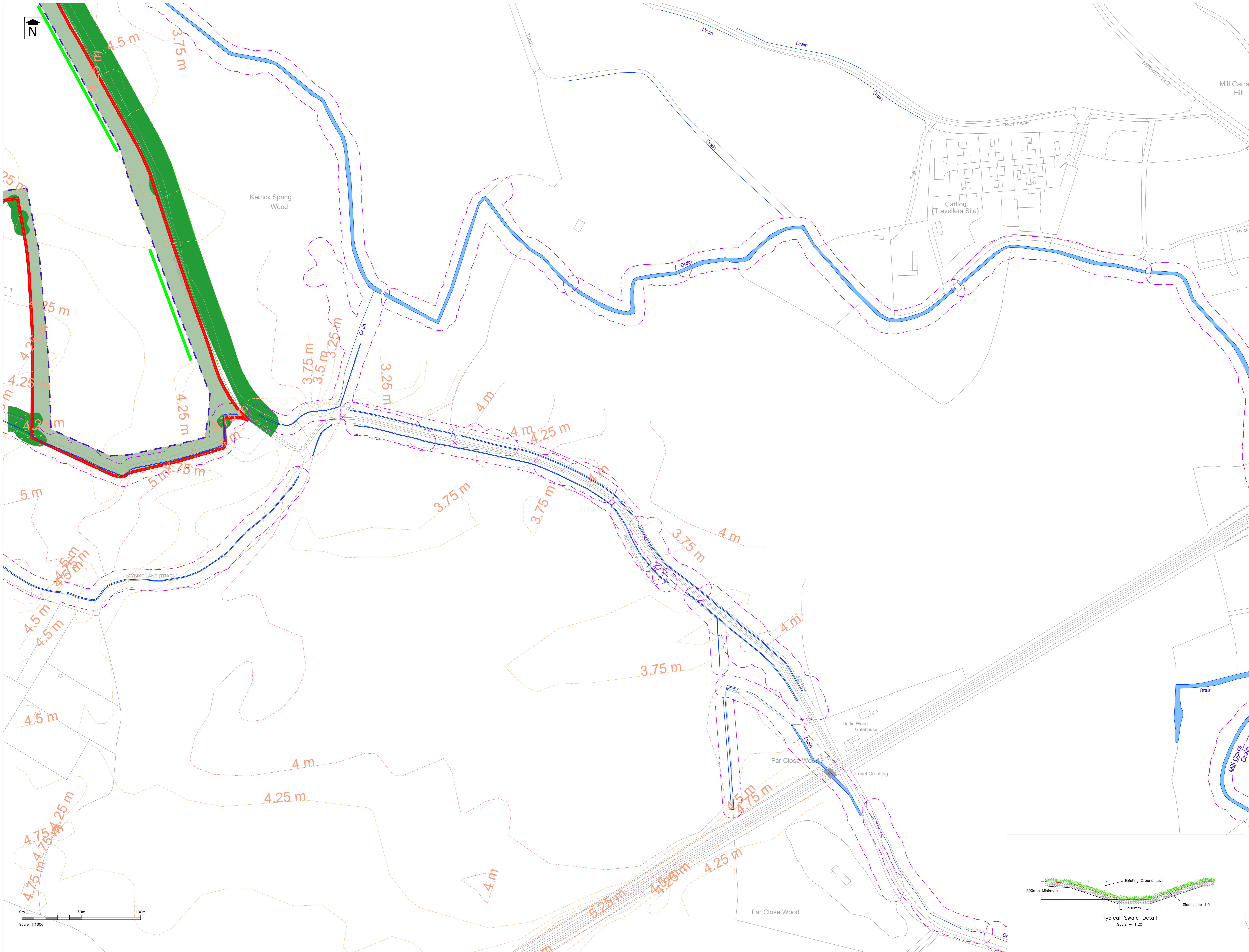
Client  
**Enso Green Holdings D Limited**

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: [REDACTED]





**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**
1. Based on drawing DX-01-P02 Rev09 Parameter Plan by Enso Energy dated 07/02/2024
  2. Drawing based on Topographical Survey, produced by Above Surveying Ltd., drawing number DRAX LINEWORK ("LXD") (Dated 6th May 2022).
  3. Based on data from Archaeological Services WYAS Reference: XF70\_HLO22 Received 05/05/2023
  4. 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.
  5. Contains public sector information licensed under the Open Government Licence v3.0.
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**SHEET KEY**

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9	10
11	12
13	14
15	16
17	18

Rev	Date	Description	Drawn	Check
A	09/06/23	First Issue	SC	SA*
A	23/06/23	Presentation updated	BF	
B	23/08/23	Layout Revision	IS	
C	15/02/24	Updated parameters plan & site boundary	SC	BF

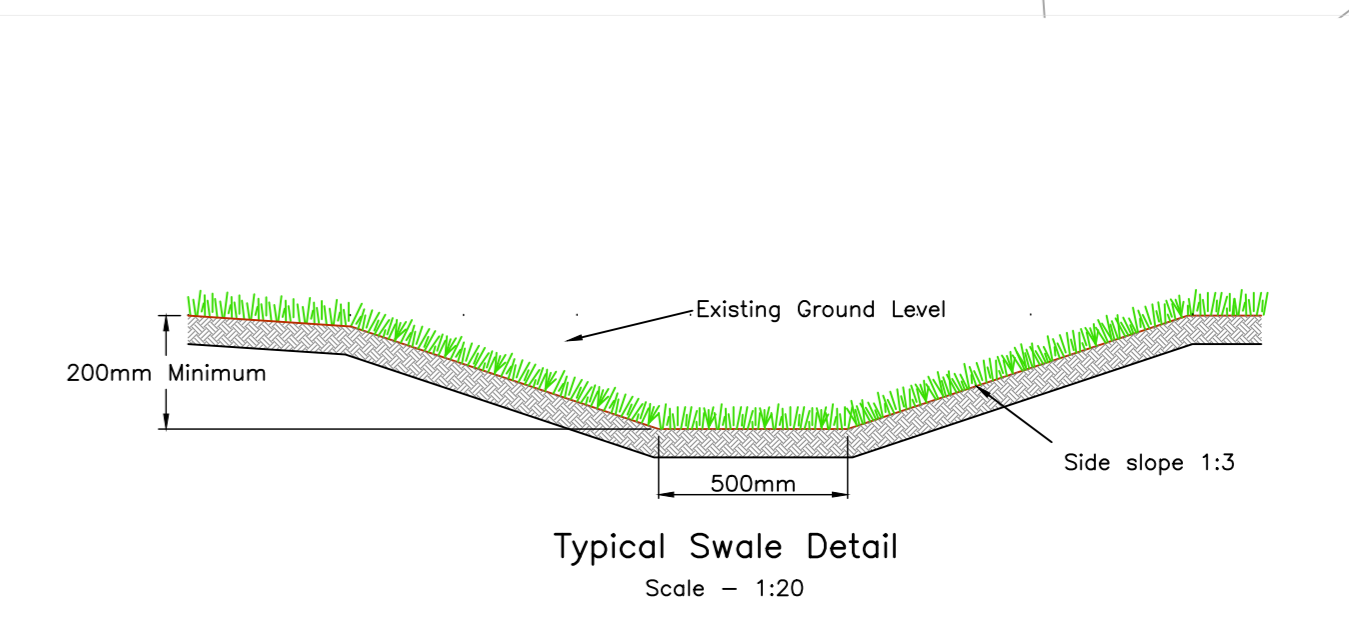
Status: **FOR PLANNING**

Client: **Enso Green Holdings D Limited**

Project: **Helios Renewable Energy Project**

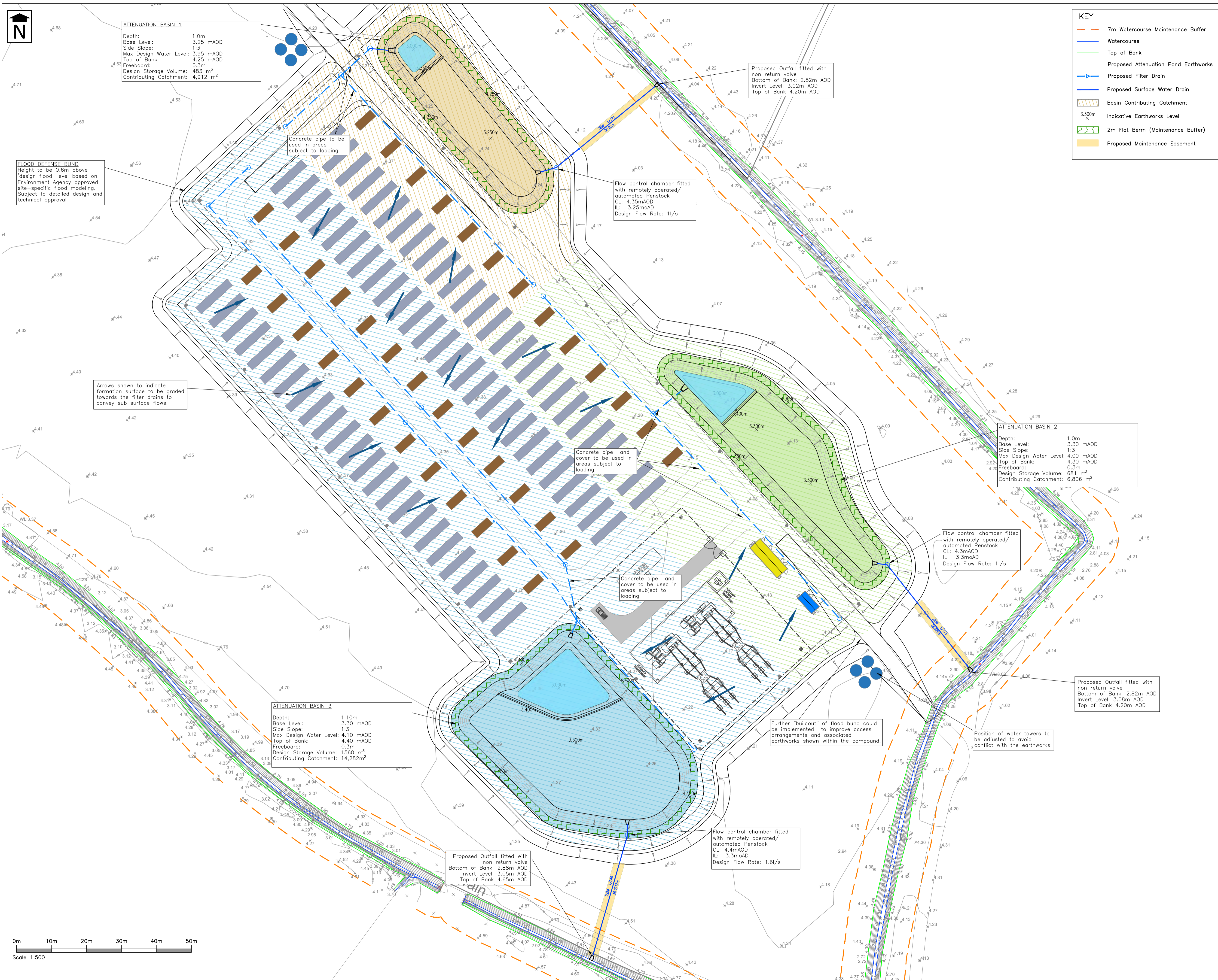
Drawing Title: **Solar Farm Preliminary Surface Water Drainage Arrangements Sheet 17 of 17**

Drawing No: **E216/106** Rev C  
 Date: June 2023 Scale: 1:1000 @ A0  
 E-Mail: [REDACTED]









Stratton Park House, Wanborough Road  
Swindon, SN3 4HG

Telephone  
01793 828000

Website  
www.pfapl.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-DOCD1-FRA.
- Greenfield Runoff Rate for the entire compound contributing catchments (~2.600ha):  
Q<sub>50%</sub>: 4.1 l/s  
Q<sub>1%</sub>: 3.6 l/s  
Q<sub>100%</sub>: 8.6 l/s
- Selby 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

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 C

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



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 Danielb 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 <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
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 Danielb 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	
Date 13/02/2024 14:45 File Pond 1 1yr.SRCX	Designed by Danielb Checked by	
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 (m <sup>3</sup> )	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 Summer	3.402	0.152	1.0	88.7	O K
5760 min Summer	3.391	0.141	1.0	81.5	O K
7200 min Summer	3.379	0.129	1.0	74.6	O K
8640 min Summer	3.369	0.119	0.9	68.4	O K
10080 min Summer	3.360	0.110	0.9	62.9	O K
15 min Winter	3.313	0.063	0.7	35.4	O K
30 min Winter	3.330	0.080	0.9	45.6	O K


Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	29.454	0.0	27.2	38
30 min Summer	19.131	0.0	36.5	52
60 min Summer	12.084	0.0	53.9	80
120 min Summer	7.478	0.0	67.3	138
180 min Summer	5.621	0.0	76.1	196
240 min Summer	4.585	0.0	82.8	254
360 min Summer	3.435	0.0	92.9	370
480 min Summer	2.782	0.0	100.0	486
600 min Summer	2.362	0.0	105.7	602
720 min Summer	2.066	0.0	110.3	692
960 min Summer	1.673	0.0	117.4	804
1440 min Summer	1.243	0.0	124.7	1058
2160 min Summer	0.925	0.0	158.7	1472
2880 min Summer	0.750	0.0	170.9	1880
4320 min Summer	0.557	0.0	187.7	2692
5760 min Summer	0.451	0.0	210.4	3472
7200 min Summer	0.383	0.0	223.1	4256
8640 min Summer	0.335	0.0	233.6	5016
10080 min Summer	0.300	0.0	242.0	5752
15 min Winter	29.454	0.0	27.2	38
30 min Winter	19.131	0.0	36.5	51

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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 Danielb Checked by	
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 (m <sup>3</sup> )	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 (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	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

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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 Danielb 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 <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
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 Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy BESS-Basin 1 100yr + CC	
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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 (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:	From:	To:
0	4 0.080	8	12 0.080	16	20 0.080
4	8 0.080	12	16 0.080	20	24 0.091

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Stratton Park House Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy BESS-Basin 1 100yr + CC	
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XP Solutions	Source Control 2020.1.3	

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	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 (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	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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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 Danielb Checked by	
XP Solutions	Source Control 2020.1.3	

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	3.669	0.419	1.0	265.7	O K
120 min Winter	3.735	0.485	1.0	313.4	O K
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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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 Danielb 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 <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
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		

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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 Danielb 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


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Stratton Park House Wanborough Road Swindon SN3 4HG		E216: Helios Renewable Energy BESS-Basin 2 1 yr
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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 (m <sup>3</sup> )	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 min Summer	3.476	0.176	1.0	147.1	O K
5760 min Summer	3.468	0.168	1.0	140.4	O K
7200 min Summer	3.460	0.160	1.0	133.0	O K
8640 min Summer	3.451	0.151	1.0	125.6	O K
10080 min Summer	3.443	0.143	1.0	118.5	O K
15 min Winter	3.361	0.061	0.7	49.4	O K
30 min Winter	3.379	0.079	0.8	63.8	O K


Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	29.454	0.0	33.1	38
30 min Summer	19.131	0.0	44.4	52
60 min Summer	12.084	0.0	70.6	82
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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Stratton Park House Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy BESS-Basin 2 1 yr	
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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 (m <sup>3</sup> )	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 (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	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

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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 <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
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		



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Stratton Park House Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy BESS-Basin 2 100yr + CC	
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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 (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:	From:	To:
0	4 0.112	8	12 0.112	16	20 0.112
4	8 0.112	12	16 0.112	20	24 0.121

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Stratton Park House Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy BESS-Basin 2 100yr + CC	
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XP Solutions	Source Control 2020.1.3	

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	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 (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	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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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 Danielb Checked by	
XP Solutions	Source Control 2020.1.3	

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	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 (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	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 Danielb Checked by	
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 <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
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		

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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 Danielb 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	

Summary of Results for 1 year Return Period


Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	3.360	0.060	1.0	104.2	O K
30 min Summer	3.377	0.077	1.2	134.8	O K
60 min Summer	3.396	0.096	1.4	169.1	O K
120 min Summer	3.417	0.117	1.5	207.0	O K
180 min Summer	3.431	0.131	1.5	230.9	O K
240 min Summer	3.440	0.140	1.5	248.7	O K
360 min Summer	3.454	0.154	1.5	274.3	O K
480 min Summer	3.464	0.164	1.6	290.8	O K
600 min Summer	3.470	0.170	1.6	303.2	O K
720 min Summer	3.476	0.176	1.6	312.8	O K
960 min Summer	3.483	0.183	1.6	326.5	O K
1440 min Summer	3.491	0.191	1.6	340.7	O K
2160 min Summer	3.496	0.196	1.6	349.9	O K
2880 min Summer	3.498	0.198	1.6	354.6	O K
4320 min Summer	3.498	0.198	1.6	354.6	O K
5760 min Summer	3.495	0.195	1.6	348.4	O K
7200 min Summer	3.490	0.190	1.6	339.3	O K
8640 min Summer	3.484	0.184	1.6	328.6	O K
10080 min Summer	3.478	0.178	1.6	317.2	O K
15 min Winter	3.360	0.060	1.0	104.2	O K
30 min Winter	3.377	0.077	1.2	134.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	29.454	0.0	52.7	38
30 min Summer	19.131	0.0	72.2	53
60 min Summer	12.084	0.0	129.1	82
120 min Summer	7.478	0.0	161.2	140
180 min Summer	5.621	0.0	180.7	200
240 min Summer	4.585	0.0	194.3	258
360 min Summer	3.435	0.0	211.7	376
480 min Summer	2.782	0.0	220.7	494
600 min Summer	2.362	0.0	225.6	612
720 min Summer	2.066	0.0	227.8	730
960 min Summer	1.673	0.0	226.7	966
1440 min Summer	1.243	0.0	217.2	1440
2160 min Summer	0.925	0.0	405.8	1788
2880 min Summer	0.750	0.0	416.3	2168
4320 min Summer	0.557	0.0	395.6	2980
5760 min Summer	0.451	0.0	592.3	3808
7200 min Summer	0.383	0.0	624.0	4624
8640 min Summer	0.335	0.0	647.3	5448
10080 min Summer	0.300	0.0	659.6	6256
15 min Winter	29.454	0.0	52.7	38
30 min Winter	19.131	0.0	72.2	52

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
60 min Winter	3.396	0.096	1.4	169.1	O K
120 min Winter	3.417	0.117	1.5	207.1	O K
180 min Winter	3.431	0.131	1.5	231.1	O K
240 min Winter	3.440	0.140	1.5	248.8	O K
360 min Winter	3.455	0.155	1.5	274.4	O K
480 min Winter	3.464	0.164	1.6	291.0	O K
600 min Winter	3.470	0.170	1.6	303.4	O K
720 min 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 (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	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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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 Danielb Checked by	
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 <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
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		



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Stratton Park House Wanborough Road Swindon SN3 4HG	E216: Helios Renewable Energy BESS-Basin 3 100yr+CC	
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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 (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:	From:	To:
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 100yr+CC	
Date 13/02/2024 09:00 File Pond 3 100yr +CC.SRCX	Designed by Danielb Checked by	
XP Solutions	Source Control 2020.1.3	

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	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 (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	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

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 Danielb Checked by	
XP Solutions	Source Control 2020.1.3	

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
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





## 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.



Stratton Park House, Wanborough Road Swindon, SN3 4HG

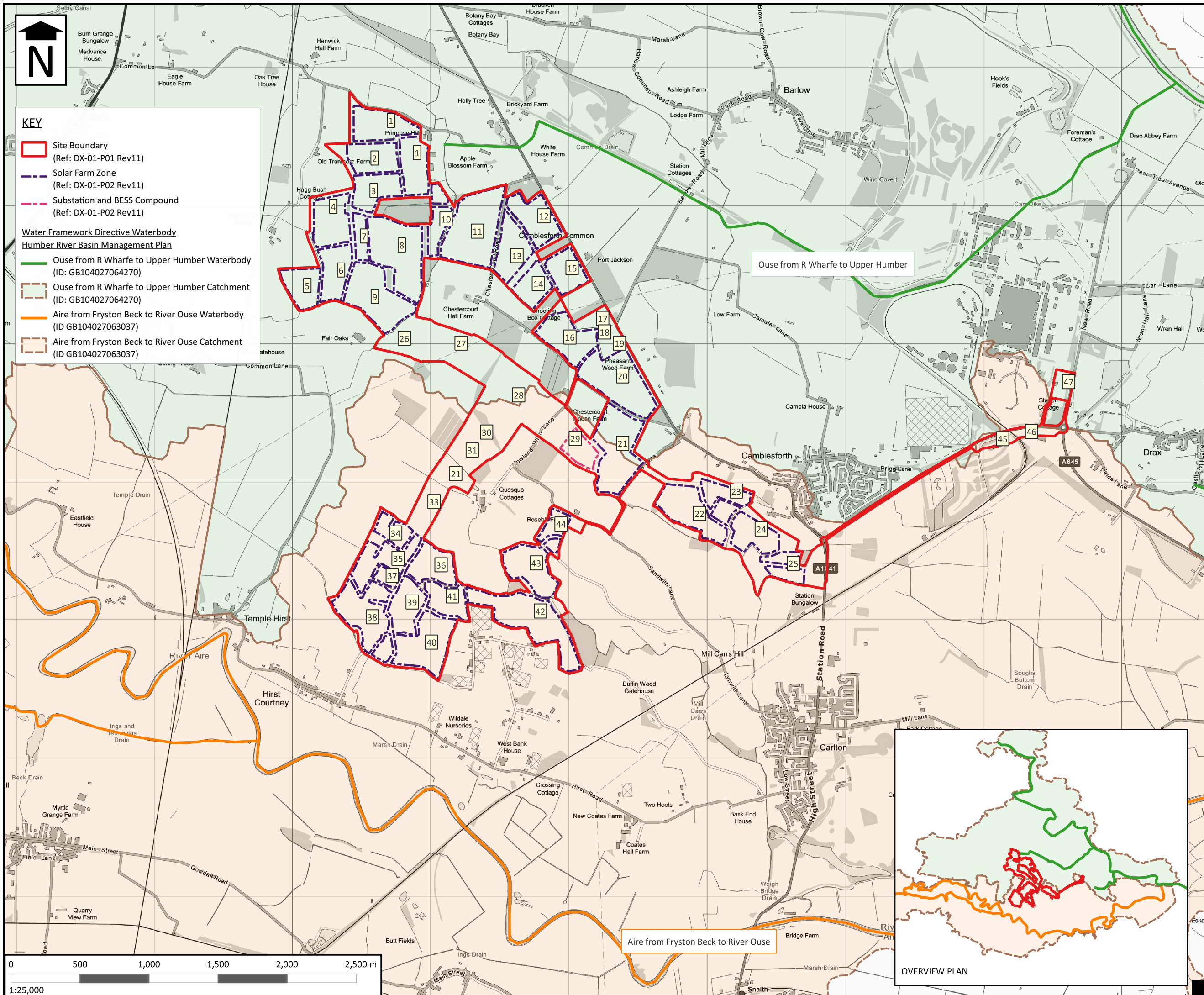
Telephone 01793 828000

Website

- 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)



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**

1. Drawing is based upon Order Limits Location Plan, Enso Energy Drawing No. DX-01-P01 Rev11 dated 15/02/2024.
2. Drawing is based upon Parameter Plan, Enso Energy Drawing No. DX-01-P02 Rev 11 dated 15/04/2024.
3. Field Numbers based upon Field Boundaries Plan, Enso Energy Drawing No. DX-01-P44 Rev 04 dated 15/04/2024.
4. Drawing is based upon Environment Agency River Basin Management Plan data accessed in August 2024.
5. 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
1	08.08.24	First issue.	BF	MWS

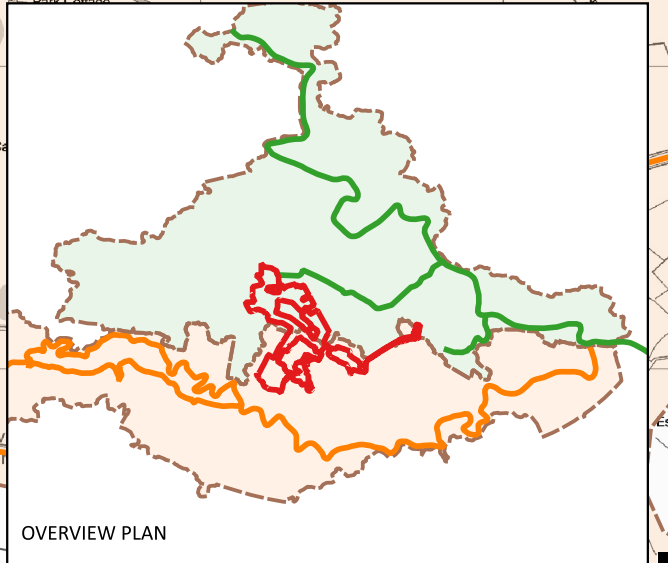
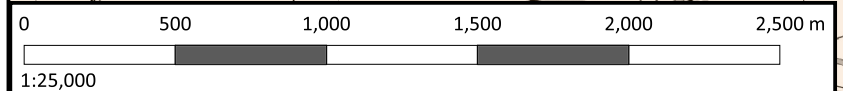
Status **FOR PLANNING**

Client **Enso Green Holdings D Limited**

Project **Helios Renewable Energy Project**

Drawing Title **Water Framework Directive Water Bodies**

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



OVERVIEW PLAN