

**Summary of Flood Mitigation Measures**

The Proposed Development extends into areas of elevated flood risk from the fluvial 'design flood'. The Proposed Development would be designed to appropriately safe in the fluvial 'design flood' without increasing flood risk elsewhere. The Proposed Development would be designed to be resilient to the fluvial 'credible maximum scenario sensitivity test' flood event with the implementation of adaptation measures where necessary at the appropriate time.

The following design flood mitigation and adaptation measures are proposed:

- A flood warning and evacuation plan for the relevant phase of the Proposed Development would be contained in the detailed CDM, CDM or DMAP and the construction contractor and operating staff would register to receive flood alerts / warnings from the EA and follow site evacuation procedures during periods of elevated flood risk.
- During times of elevated tidal and fluvial flood risk the solar arrays within the areas of elevated flood risk would be rotated to the horizontal stow position which would be a minimum of a 0.3m above the fluvial 'design flood' level or the stow position set above the fluvial 'credible maximum scenario sensitivity test' level, whichever is greater.
- Panel supports and security fencing in flood risk areas would be securely piled into the ground and designed to allow for the effect of flowing water pressures and to be resistant to inundation during a flood event.
- Security fencing mesh size in flood risk areas (fluvial 'design flood') would be increased to 0.15m square to minimise the risk of it collecting debris.
- Ancillary control equipment will be preferentially located in areas of very low surface water flood risk and very low fluvial flood risk in the fluvial 'design flood' and in areas affected by flood depths <0.6m in the fluvial 'credible maximum scenario sensitivity test' flood event.
- Substation and BESS Compound will be preferentially located in areas of very low surface water flood risk and very low fluvial flood risk in the fluvial 'design flood'.
- The level of ancillary control equipment will be raised at least 0.3m (and up to 0.6m) above existing ground level to manage residual risk.
- As an adaptation measures 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 the 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 has been shown to be feasible.
- Onsite watercourses are related and existing watercourse crossings are utilised where possible within the Proposed Development.
- Where possible all development (including security fencing) is at least 7m from the onsite ordinary watercourses in accordance with Safety Area IDB byelaws. Additional consents may be required for watercourse crossings (site access or services) and landscape planting where this is not achieved.

**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**
- Site Boundary based upon Order Limits Location Plan, Enso Energy Drawing No. DX-01-P01 Rev 11, dated 15/02/24.
  - Drawing based upon Parameter Plan, Enso Energy Drawing No. DX-01-P02 Rev 11, dated 15/04/24.
  - Flood risk data based on the results from the site-specific flood model produced by Aegoo. Details contained in Hydraulic Model Technical Note (Document Ref: AEG0851\_Y08\_EnsoEnergy\_03 Rev A dated 16/05/24).
  - Drawing should be read in conjunction with Flood Risk Assessment produced by PFA Consulting (Document Ref: E216-DDC01-FRA-Issue 1, June 2024).
  - Low risk of surface water flooding is the extent of flooding from surface water that could result from a flood with a 0.1% chance of happening in any given year. Based on the Risk of Flooding from Surface Water (RoFSW) dataset.
  - Fluvial 'Design Flood' is the 1% AEP (1 in 100 RP) Fluvial Defended + Climate Change (Higher Central) flood event (Ref:AEG0851\_ENSO\_BAS\_SCENA\_Q0100\_CC\_HIGHER\_051\_d\_Max-CLIPPED).
  - Fluvial 'Credible Maximum Scenario Sensitivity Test' 1% AEP (1 in 100 RP) Fluvial Defended + Climate Change (Upper End) flood event (Ref: AEG0851\_ENSO\_BAS\_SCENA\_Q0100\_CC\_UPPER\_051\_d\_Max-CLIPPED).
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Rev	Date	Description	Drawn	Check
#	04/06/24	First Issue:	BF	SAM

Status

**FOR PLANNING**

Client

**Enso Green Holdings D Ltd**

Project

**Helios Renewable Energy Project**

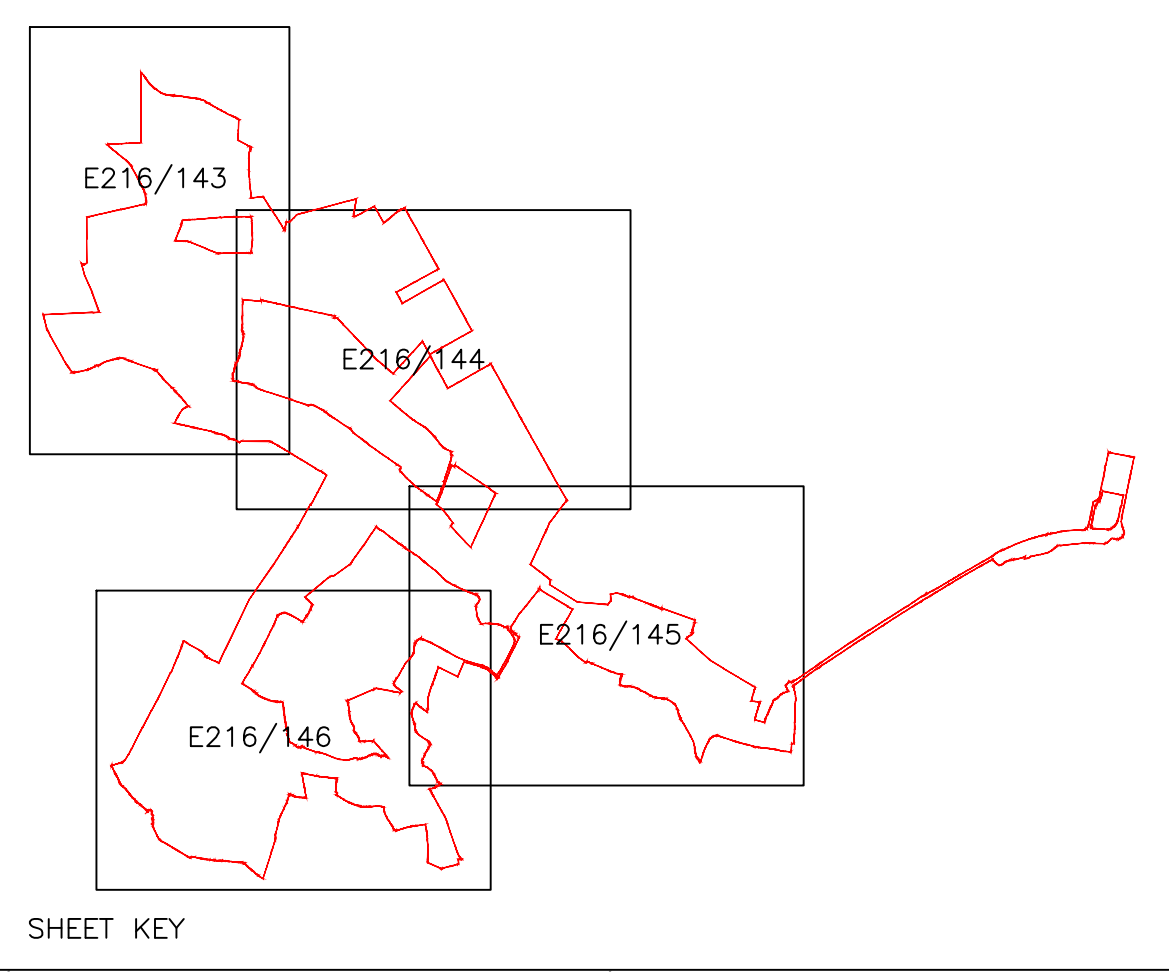
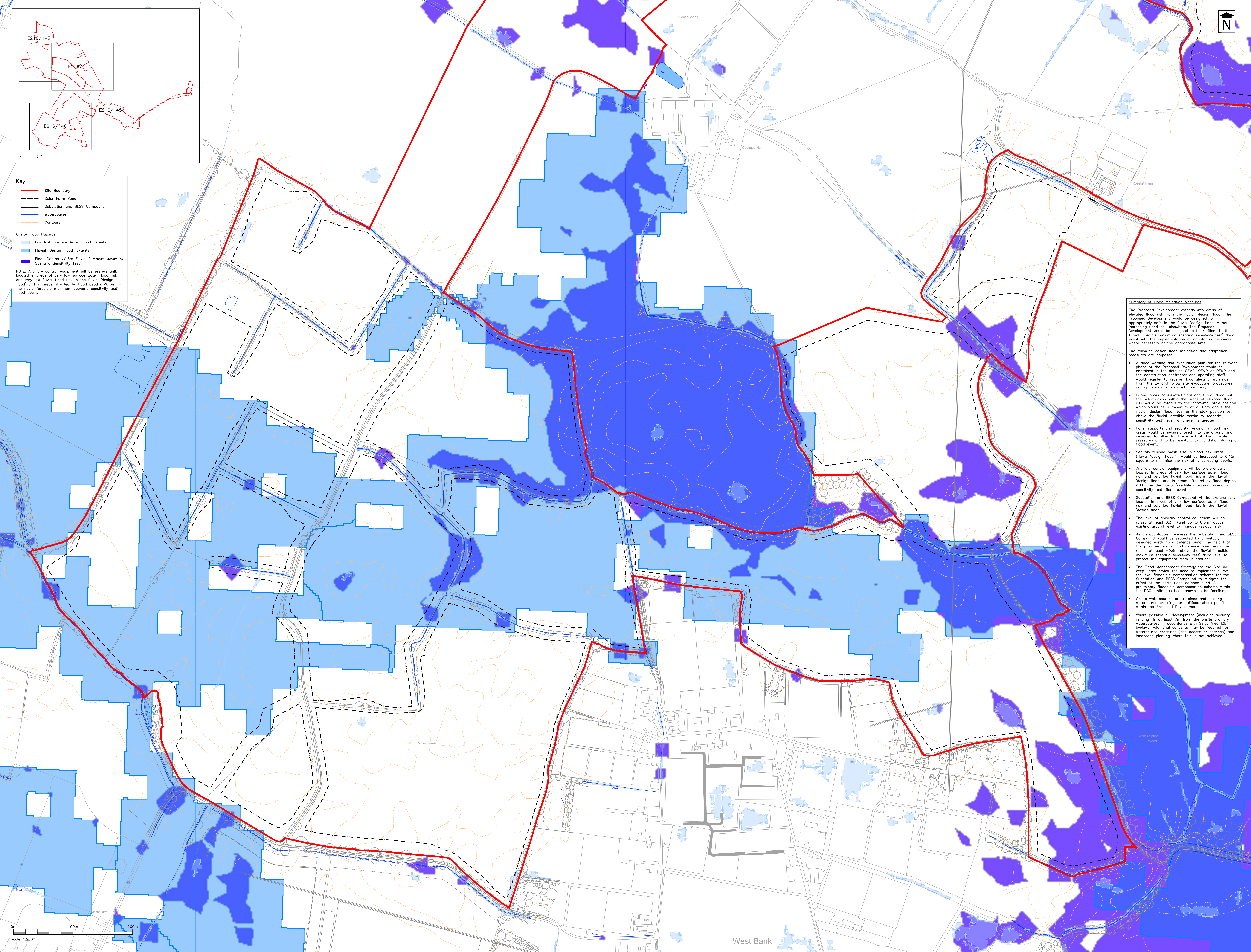
Drawing Title

**Onsite Flood Hazards  
Sheet 3 of 4**

Drawing No. **E216/145**

Date: June 2024 Scale: 1:2000 @ A0  
E-Mail: bfox@pfapl.com





**Key**

- Site Boundary
- Solar Farm Zone
- Substation and BESS Compound
- Watercourse
- Contours

**Onsite Flood Hazards**

- Low Risk Surface Water Flood Extents
- Fluvial 'Design Flood' Extents
- Flood Depths >0.6m Fluvial 'Credible Maximum Scenario Sensitivity Test'

NOTE: Ancillary control equipment will be preferentially located in areas of very low surface water flood risk and very low fluvial flood risk in the fluvial 'design flood' and in areas affected by flood depths <0.6m in the fluvial 'credible maximum scenario sensitivity test' flood event.

**Summary of Flood Mitigation Measures**

The Proposed Development extends into areas of elevated flood risk from the fluvial 'design flood'. The Proposed Development would be designed to appropriately site in the fluvial 'design flood' without increasing flood risk elsewhere. The Proposed Development would be designed to be resilient to the fluvial 'credible maximum scenario sensitivity test' flood event with the implementation of adaptation measures where necessary at the appropriate time.

The following design flood mitigation and adaptation measures are proposed:

- A flood warning and evacuation plan for the relevant phase of the Proposed Development would be contained in the detailed CLMP, O&MP or O&MP and the construction contractor and operating staff would register to receive flood alerts / warnings from the EA and follow site evacuation procedures during periods of elevated flood risk;
- During times of elevated tidal and fluvial flood risk the solar arrays within the areas of elevated flood risk would be rotated to the horizontal stow position which would be a minimum of 0.3m above the fluvial 'design flood' level or the stow position set above the fluvial 'credible maximum scenario sensitivity test' level, whichever is greater;
- Panel supports and security fencing in flood risk areas would be securely piled into the ground and designed to allow for the effect of flowing water pressures and to be resistant to inundation during a flood event;
- Security fencing mesh size in flood risk areas (fluvial 'design flood') would be increased to 0.15m square to minimise the risk of it collecting debris;
- Ancillary control equipment will be preferentially located in areas of very low surface water flood risk and very low fluvial flood risk in the fluvial 'design flood' and in areas affected by flood depths <0.6m in the fluvial 'credible maximum scenario sensitivity test' flood event;
- Substation and BESS Compound will be preferentially located in areas of very low surface water flood risk and very low fluvial flood risk in the fluvial 'design flood';
- The level of ancillary control equipment will be raised at least 0.3m (and up to 0.6m) above existing ground level to minimise residual risk;
- As an adaptation measures 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 the 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 OGD limits has been shown to be feasible;
- Onsite watercourses are retained and existing watercourse crossings are utilised where possible within the Proposed Development;
- Where possible all development (including security fencing) is at least 7m from the onsite ordinary watercourses in accordance with Selly Area OGD byelaws. Additional consents may be required for watercourse crossings (site access or services) and landscape crossings where this is not achieved.

**PFA consulting**

Stratton Park House, Wanborough Road  
Swindon, SN3 4HG

Telephone  
01793 828000

Website  
www.pfaplcl.com

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- NOTES**
1. Site Boundary based upon Order Limits Location Plan, Enso Energy Drawing No. DX-01-P01 Rev 11, dated 15/02/24.
  2. Drawing based upon Parameter Plan, Enso Energy Drawing No. DX-01-P02 Rev 11, dated 15/04/24.
  3. Flood risk data based on the results from the site-specific flood model produced by Aegre. Details contained in Hydraulic Model Technical Note (Document Ref: AEG0851\_Y08\_EnsoEnergy\_03 Rev A dated 16/05/24).
  4. Drawing should be read in conjunction with Flood Risk Assessment produced by PFA Consulting (Document Ref: E216-DDC01-FRA-Issue 1, June 2024).
  5. Low risk of surface water flooding is the extent of flooding from surface water that could result from a flood with a 0.1% chance of happening in any given year. Based on the Risk of Flooding from Surface Water (RoFSW) dataset.
  6. Fluvial 'Design Flood' is the 1% AEP (1 in 100 RP) Fluvial Defended + Climate Change (Higher Central) flood event (Ref:AEG0851\_ENSO\_BAS\_SCENA\_00100\_CO\_UPPER\_051\_d\_Max-CLIPPED).
  7. Fluvial 'Credible Maximum Scenario Sensitivity Test' 1% AEP (1 in 100 RP) Fluvial Defended + Climate Change (Upper End) flood event (Ref: AEG0851\_ENSO\_BAS\_SCENA\_00100\_CO\_UPPER\_051\_d\_Max-CLIPPED).
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Status **FOR PLANNING**

Client  
**Enso Green Holdings D Ltd**

Project  
**Helios Renewable Energy Project**

Drawing Title  
**Onsite Flood Hazards  
Sheet 4 of 4**

Drawing No.  
**E216/146**

Date: June 2024  
Scale: 1:2000 @ AO

E-Mail: bfox@pfaplcl.com







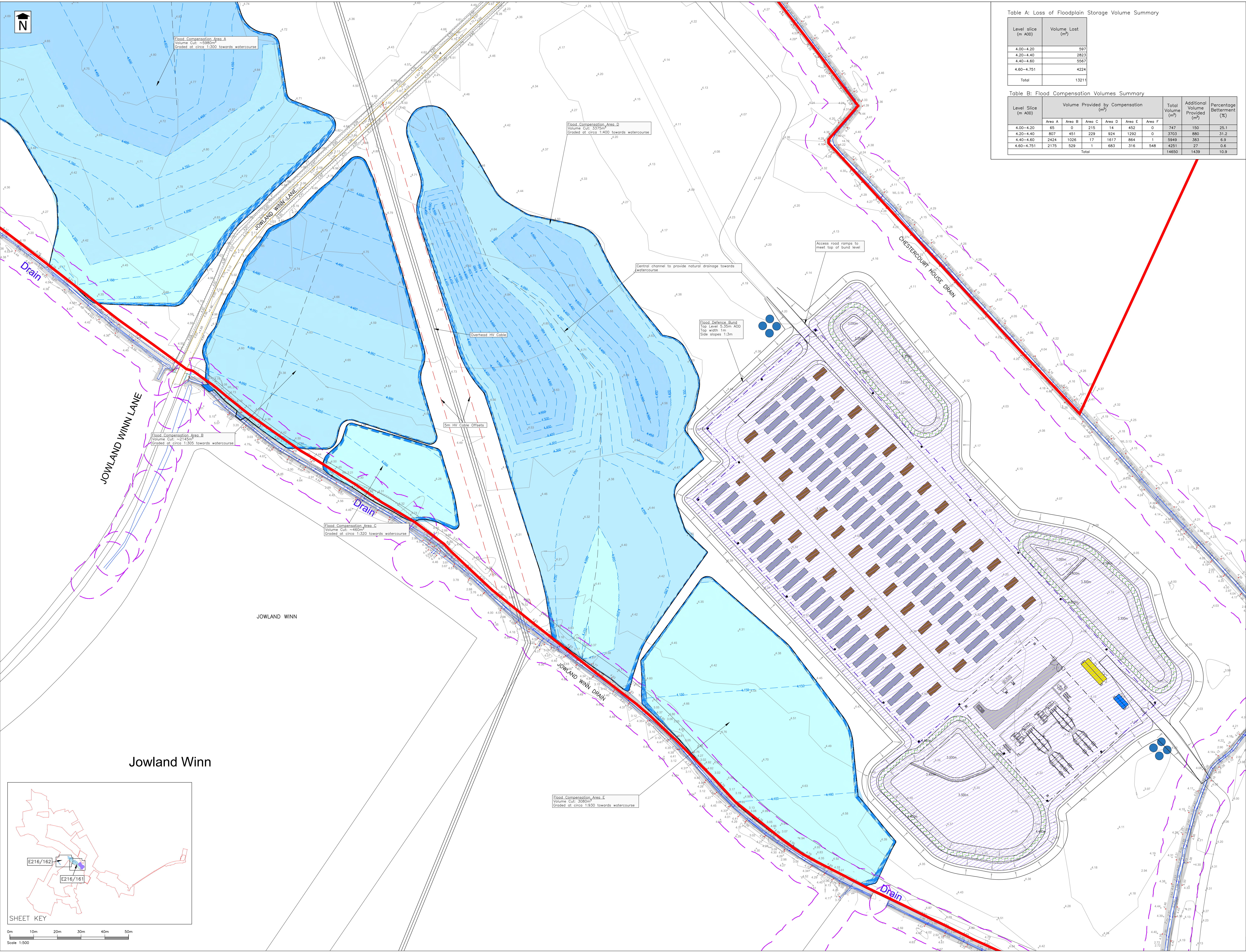


Table A: Loss of Floodplain Storage Volume Summary

Level slice (m AOD)	Volume Lost (m³)
4.00-4.20	597
4.20-4.40	2823
4.40-4.60	5587
4.60-4.751	4224
Total	13211

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	402	0	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
Total							14550	1439	10.9

Stratton Park House, Wanborough Road  
Swindon, SN3 4HG

Telephone  
01793 828000

Website  
www.pfaplpc.com

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KEY

- Site Boundary
- 7m Watercourse Maintenance Buffer
- Watercourse
- SUDS Feature Earthworks
- Existing Levels (UDAR 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. DX-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 UDAR 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 test' 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 DCI 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

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Client  
**Enso Green Holdings D Limited**

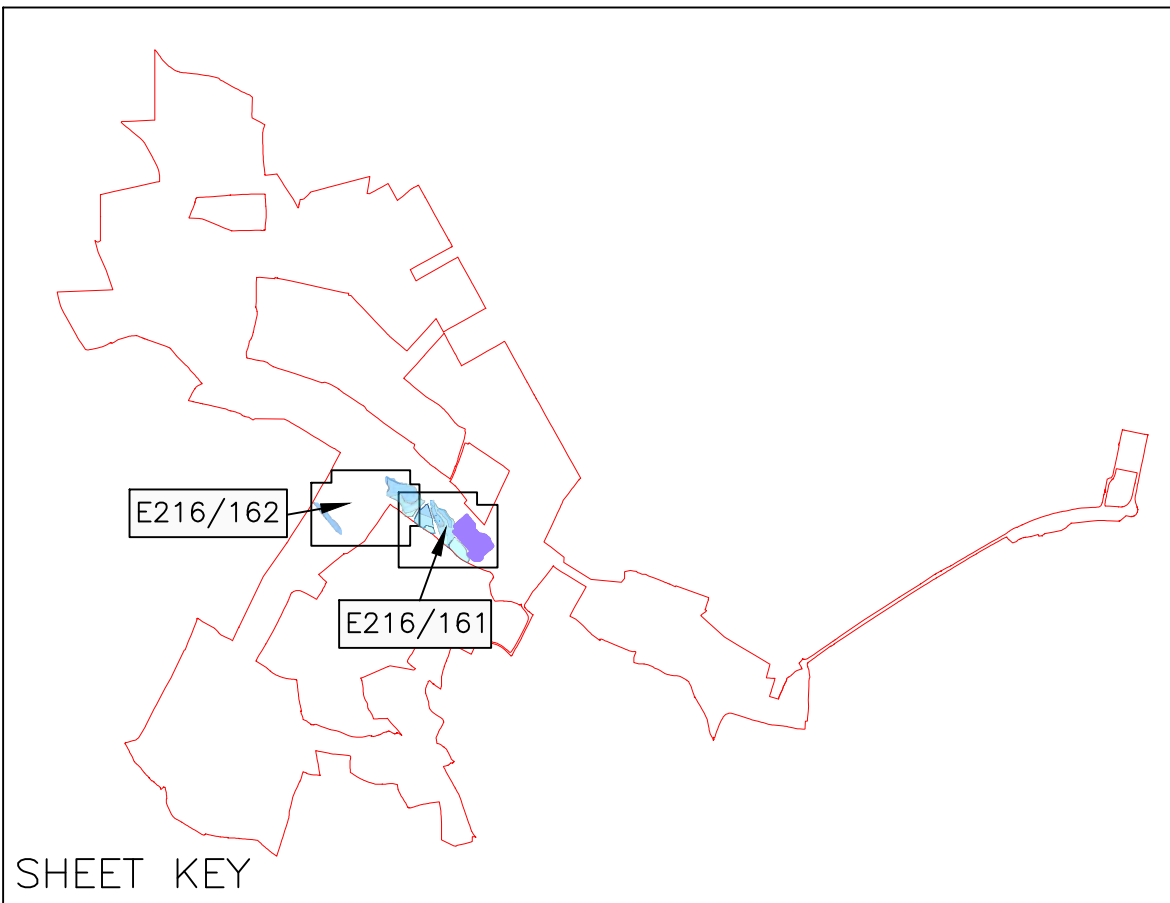
Project  
**Helios Renewable Energy Project**

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

Drawing No.  
**E216/161**

Date: June 2024  
Scale: 1:500 @ A0  
E-Mail: bfox@pfaplpc.com

Jowland Winn



0m 10m 20m 30m 40m 50m  
Scale 1:500



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
Total	13211

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			
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4.60-4.751	2175	529	1	683	316	548	4251	27	0.6
Total							14650	1439	10.9



- 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. DX-01-P42, Rev 01 (Dated 01/02/24).
- Drawing based on Topographical Survey, produced by Storm Geomatics, Drawing Nos. 651/15 and 651/16 (Dated: 29/10/2023).
- 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-DOCD1-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 test' 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 DOCD 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.
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**NOTES**

1.

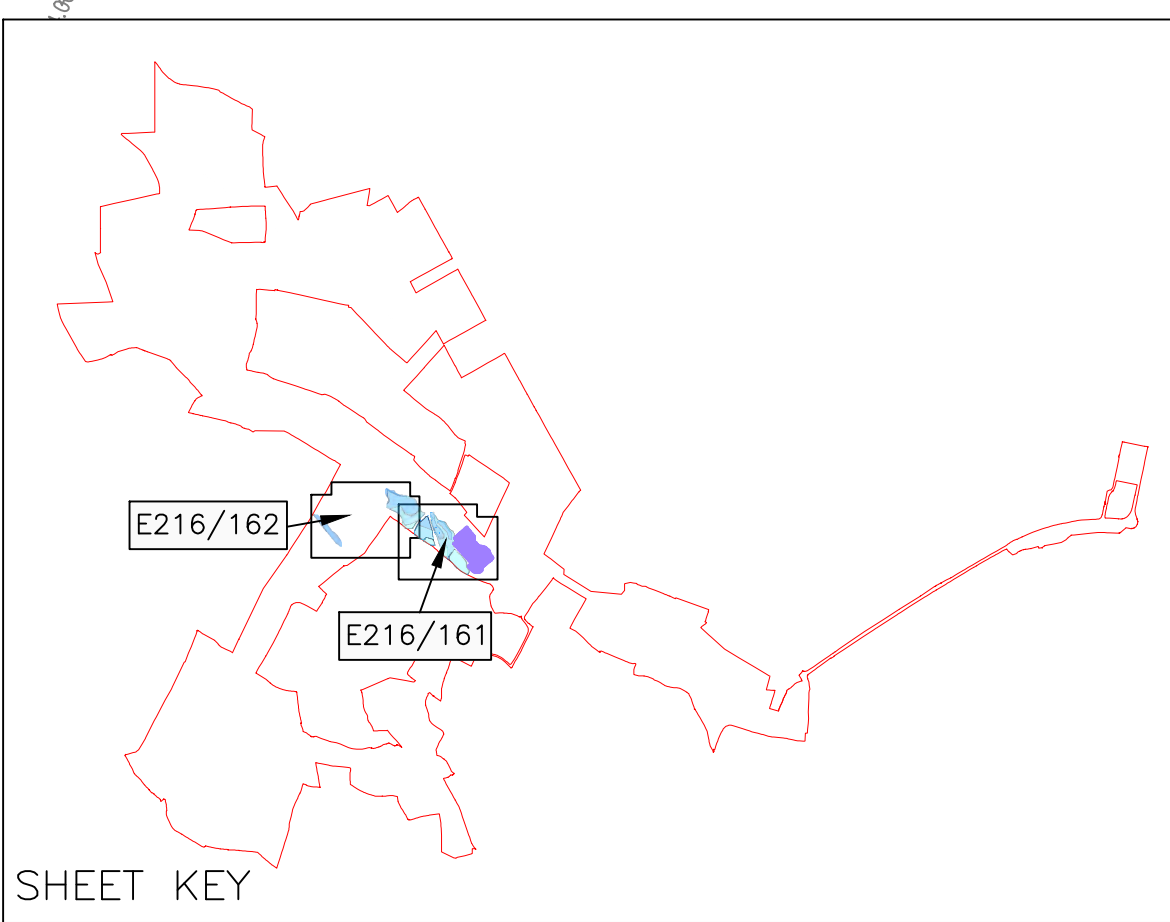
Flood Compensation Area A  
Volume Cut: ~5980m³  
Graded at circa 1:300 towards watercourse

Flood Compensation Area F  
Volume Cut: ~1270m³  
Graded at circa 1:400 towards track

Atkinson Wood  
Path (un)

Drain

JOWLAND WINN LANE



**SHEET KEY**

0m 10m 20m 30m 40m 50m

Scale 1:500

Rev	Date	Description	Drawn	Check
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**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@pfaplac.com



