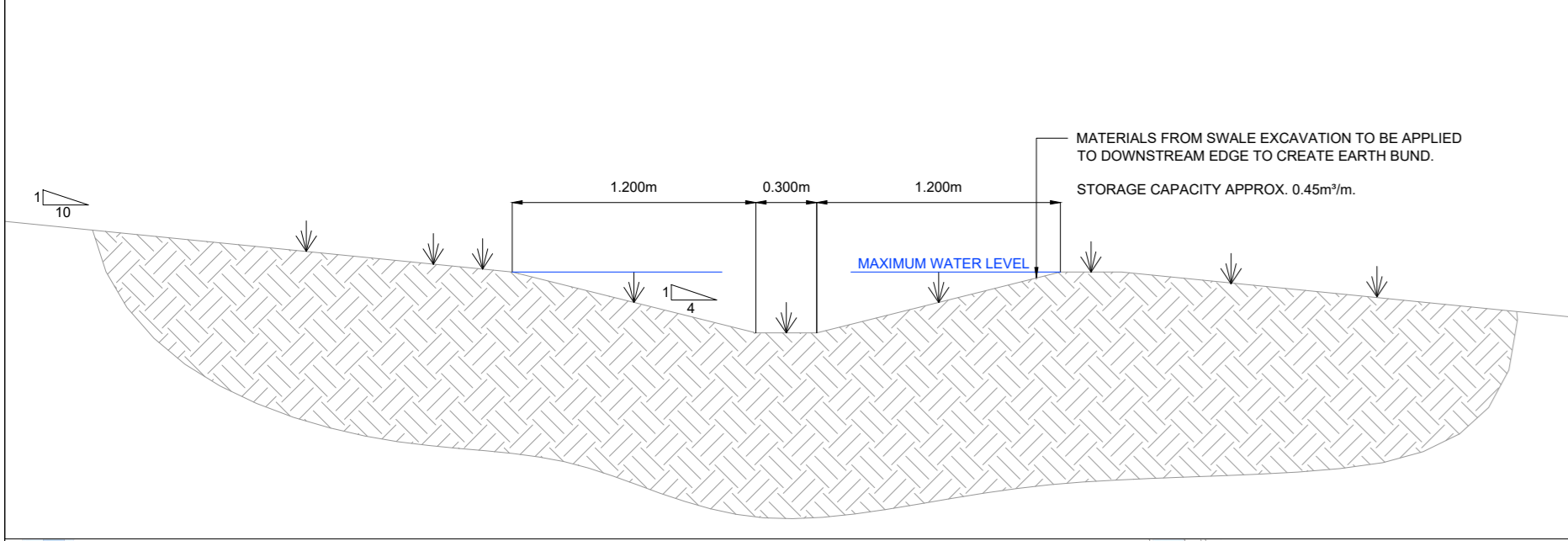
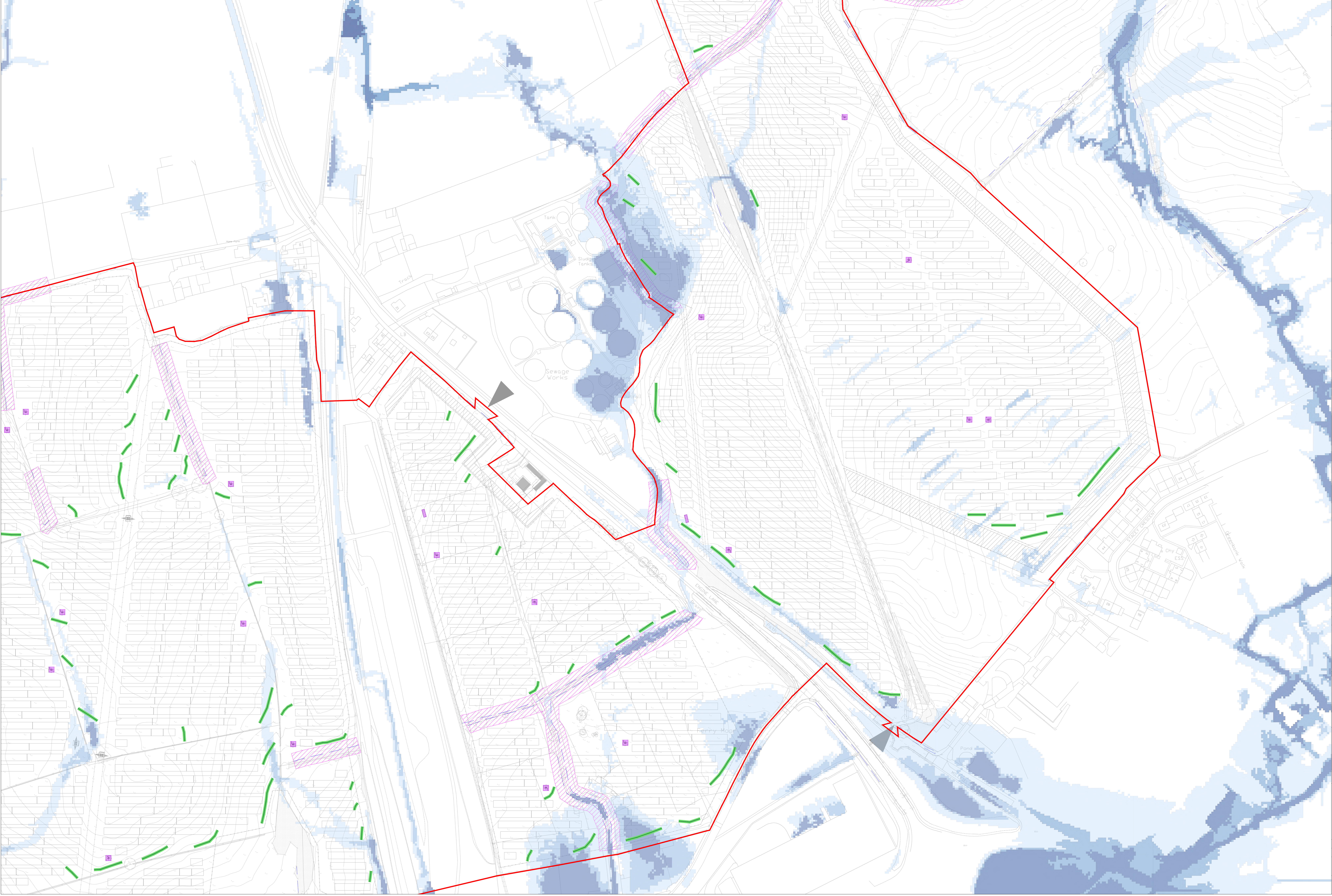


Indicative Swale Section
Scale : 1:100



- Notes**
- Do not scale this drawing. All dimensions must be checked/verified on site. If in doubt ask.
 - This drawing is to be read in conjunction with all relevant architects, engineers and specialist drawings and specifications.
 - All dimensions in millimetres unless noted otherwise. All levels in notes unless noted otherwise.
 - Any discrepancies noted on site are to be reported to the engineer immediately.
 - This constraints plan is based on Grimethorpe Planning Layout Environment Project Management UK Limited reference: P007033-11-Planning/Layout, Rev G) dated 19th November 2024.
 - Topographical Survey completed by BWB Consulting Ltd (reference: NFW-BWB-02-ZZ-XX-D-0001) dated 19th January 2023.
 - Contains Environment Agency data © copyright and database rights (2024).
 - As stated within the Barnsley Level 1 Strategic Flood Risk Assessment, an 8m easement must be maintained from all watercourses for maintenance purposes.
 - This drawing should be read in conjunction with BWB Consulting Drainage Statement (reference: ELG-BWB-ZZ-XX-RP-CD-0001_DS).
 - Do not construct from this drawing. This drawing is intended to be a proof of concept only and all drainage infrastructure and levels are to be confirmed at detailed design with agreement with all relevant consultees.
- Key Plan**
-

- Legend**
- Indicative Site Boundary
 - Ditch Top of Bank
 - 8m Ditch Easement from Top of Bank
 - Measured Impermeable Area
 - Proposed Swale
- Environment Agency Surface Water Extents**
- 1 in 30-Year (High Risk)
 - 1 in 100-Year (Medium Risk)
 - 1 in 1000-Year (Low Risk)
- Site Area: 90.63ha
Measured Impermeable Area: 0.09ha
Percentage Impermeability: 0.1%



PO1	13.12.24	Preliminary Issue	AE	LDR
Rev	Date	Details of issue / revision	Draw	Rev

Issues & Revisions

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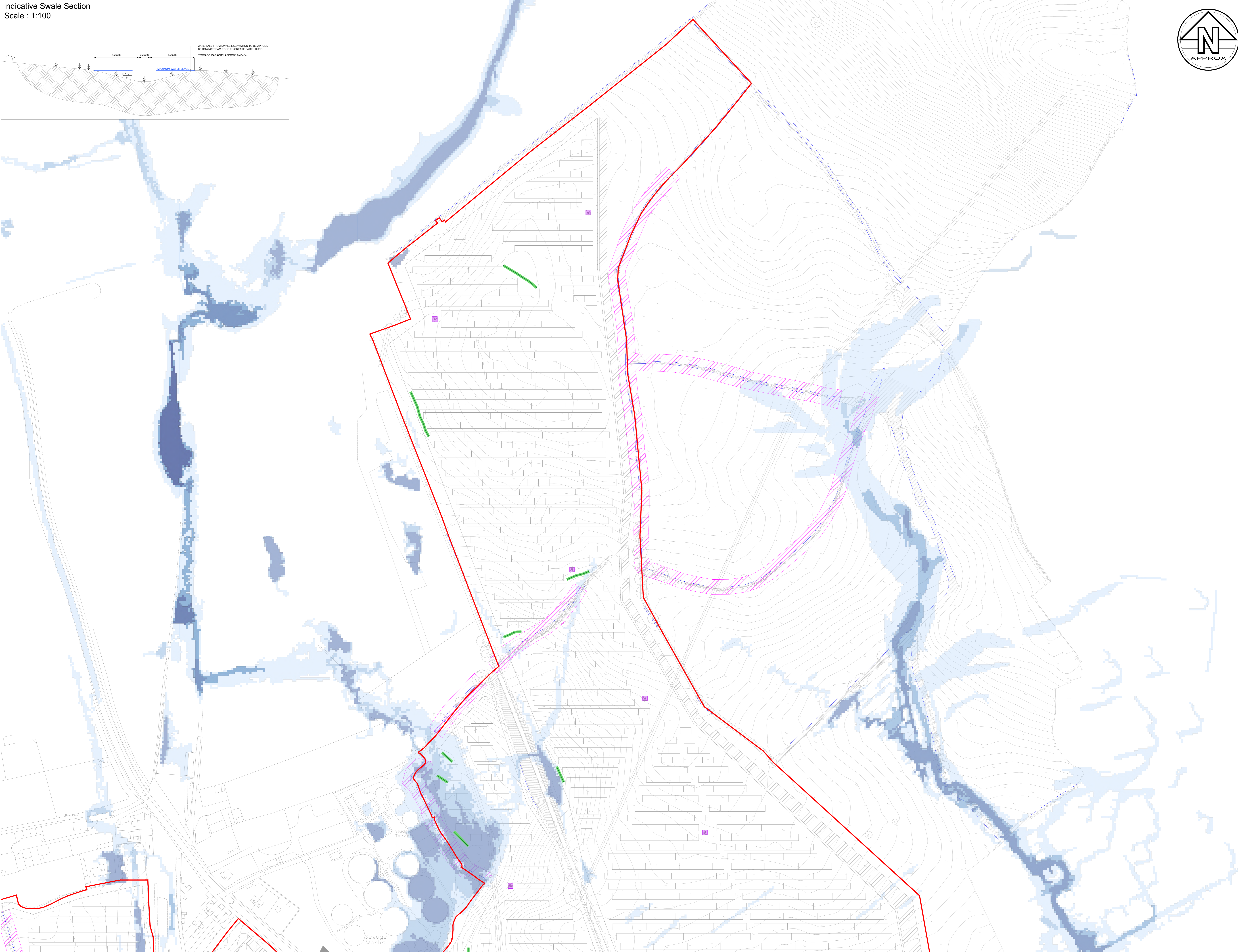
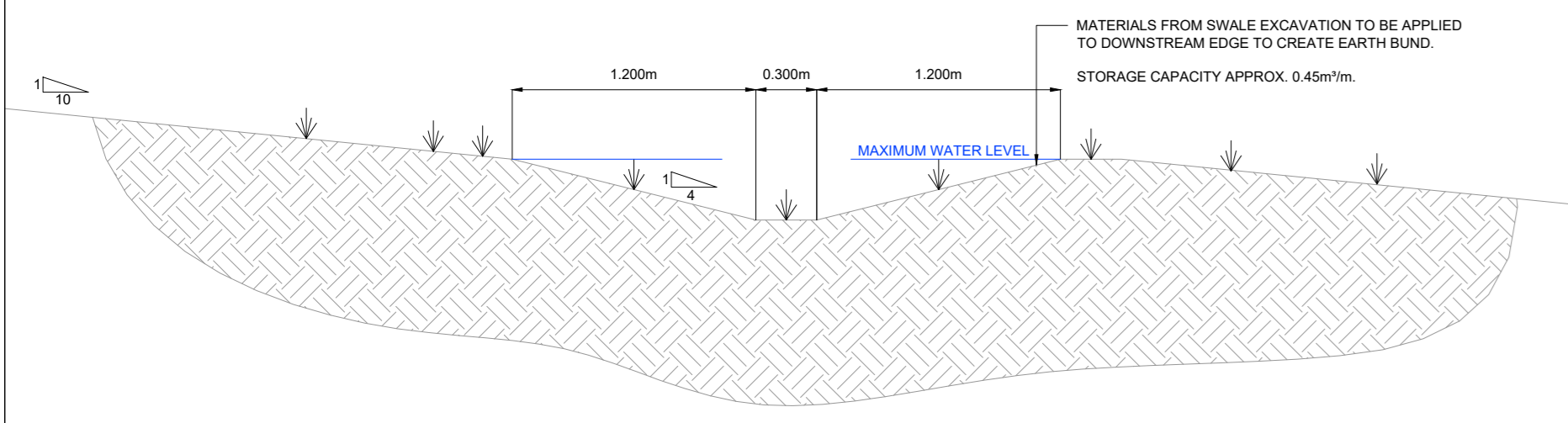
Client
ENVIRONMENTA PROJECT
MANAGEMENT UK LTD

Project Title
ENGINE LANE,
GRIMETHORPE

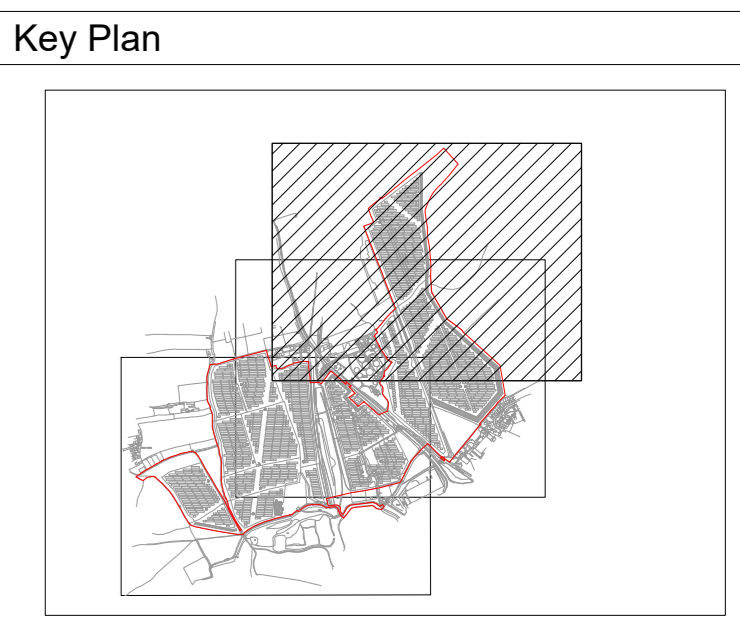
Drawing Title
SURFACE WATER
DRAINAGE STRATEGY -
SHEET 2

Drawn:	A. Eaton	Reviewed:	L. Ream
BWB Ref:	221749	Date:	13.12.24
Scale:	A0	Scale:	1:1250
PRELIMINARY			
Project - Originator - Zone - Level - Type - Role - Number	ELG-BWB-ZZ-XX-D-W-0002	Status	Rev
		S2	P01

Indicative Swale Section
Scale : 1:100



- Notes**
- Do not scale this drawing. All dimensions must be checked/verified on site. If in doubt ask.
 - This drawing is to be read in conjunction with all relevant architects, engineers and specialist drawings and specifications.
 - All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
 - Any discrepancies noted on site are to be reported to the engineer immediately.
 - This constraints plan is based on Grimethorpe Planning Layout Environment Project Management UK Limited reference: P007033-11-Planning/Layout, Rev G) dated 19th November 2024.
 - Topographical Survey completed by BWB Consulting Ltd (reference: NFW-BWB-ZZ-XX-D-0011) dated 08th January 2023.
 - Contains Environment Agency data © copyright and database rights (2024).
 - As stated within the Barnsley Level 1 Strategic Flood Risk Assessment, an 8m easement must be maintained from all watercourses for maintenance purposes.
 - This drawing should be read in conjunction with BWB Consulting Drainage Statement (reference: ELG-BWB-ZZ-XX-DR-D-0011_DS).
 - Do not construct from this drawing. This drawing is intended to be a 'proof of concept' only and all drainage infrastructure and levels are to be confirmed at detailed design with agreement with all relevant consultees.



- Legend**
- Indicative Site Boundary
 - Ditch Top of Bank
 - 8m Ditch Easement from Top of Bank
 - Measured Impermeable Area
 - Proposed Swale
- Environment Agency Surface Water Extents**
- 1 in 30-Year (High Risk)
 - 1 in 100-Year (Medium Risk)
 - 1 in 1000-Year (Low Risk)
- Site Area: 90.63ha
Measured Impermeable Area: 0.09ha
Percentage Impermeability: 0.1%

PO1	13.12.24	Preliminary Issue	AE	LDR
Rev	Date	Details of issue / revision	Drawn	Reviewed

Issues & Revisions

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Client
ENVIRONMENTA PROJECT MANAGEMENT UK LTD

Project Title
ENGINE LANE, GRIMETHORPE

Drawing Title
SURFACE WATER DRAINAGE STRATEGY - SHEET 3

Drawn:	A. Eaton	Reviewed:	L. Ream
BWB Ref:	221749	Date:	13.12.24
Scale:	A0	Scale:	1:1250
PRELIMINARY			
Project - Originator - Zone - Level - Type - Role - Number	ELG-BWB-ZZ-XX-D-W-0003	Status	Rev
		S2	P01

Appendix 5 – MicroDrainage Greenfield Runoff Rate Calculations

BWB Consulting Ltd		Page 1
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	Grimethorpe Greenfield Runoff Rate Pre-dev no CC	
Date 04/12/2024 15:35 File Grimethorpe Updates.SRCX	Designed by A. Eaton Checked by L. Ream	
Innovyze	Source Control 2020.1	


ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	90.630	Urban	0.000
SAAR (mm)	674	Region Number	Region 3

Results l/s

QBAR Rural	148.0
QBAR Urban	148.0
Q100 years	307.9
Q1 year	127.3
Q30 years	260.2
Q100 years	307.9

BWB Consulting Ltd		Page 1
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	Grimethorpe Greenfield Runoff Rate Pre-dev +25%CC	
Date 04/12/2024 15:37 File Grimethorpe Updates.SRCX	Designed by A. Eaton Checked by L. Ream	
Innovyze	Source Control 2020.1	


ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	90.630	Urban	0.000
SAAR (mm)	843	Region Number	Region 3

Results 1/s

QBAR Rural	192.3
QBAR Urban	192.3
Q100 years	400.0
Q1 year	165.4
Q30 years	338.0
Q100 years	400.0

BWB Consulting Ltd		Page 1
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	Grimethorpe Greenfield Runoff Rate Pre-dev no CC	
Date 04/12/2024 15:57 File Grimethorpe Updates.SRCX	Designed by A. Eaton Checked by L. Ream	
Innovyze	Source Control 2020.1	


ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	90.630	Urban	0.001
SAAR (mm)	674	Region Number	Region 3

Results 1/s

QBAR Rural	148.0
QBAR Urban	148.3
Q100 years	308.4
Q1 year	127.6
Q30 years	260.6
Q100 years	308.4

BWB Consulting Ltd		Page 1
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	Grimethorpe Greenfield Runoff Rate Post-dev +25%CC	
Date 04/12/2024 15:55 File Grimethorpe Updates.SRCX	Designed by A. Eaton Checked by L. Ream	
Innovyze	Source Control 2020.1	

ICP SUDS Mean Annual Flood


Input

Return Period (years)	100	Soil	0.300
Area (ha)	90.630	Urban	0.001
SAAR (mm)	843	Region Number	Region 3

Results 1/s

QBAR Rural	192.3
QBAR Urban	192.7
Q100 years	400.6
Q1 year	165.7
Q30 years	338.6
Q100 years	400.6

Appendix 6 – MicroDrainage Rainfall Profile and Greenfield Runoff Volume Calculations

BWB Consulting Ltd		Page 1
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	Grimethorpe Greenfield Runoff Volume Pre-Development	
Date 04/12/2024 16:36 File Grimethorpe Updates.SRCX	Designed by A. Eaton Checked by L. Ream	
Innovyze	Source Control 2020.1	


Greenfield Runoff Volume

FSR Data

Return Period (years)	100
Storm Duration (mins)	360
Region	England and Wales
M5-60 (mm)	19.000
Ratio R	0.371
Areal Reduction Factor	1.00
Area (ha)	90.630
SAAR (mm)	674
CWI	45.000
Urban	0.000
SPR	30.000

Results

Percentage Runoff (%)	13.87
Greenfield Runoff Volume (m ³)	7741.998

BWB Consulting Ltd		Page 1
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	Grimethorpe Greenfield Runoff Volume Post-Development	
Date 04/12/2024 16:43 File Grimethorpe Updates.SRCX	Designed by A. Eaton Checked by L. Ream	
Innovyze	Source Control 2020.1	


Greenfield Runoff Volume

FSR Data

Return Period (years)	100
Storm Duration (mins)	360
Region	England and Wales
M5-60 (mm)	19.000
Ratio R	0.371
Areal Reduction Factor	1.00
Area (ha)	90.530
SAAR (mm)	674
CWI	45.000
Urban	0.000
SPR	30.000

Results

Percentage Runoff (%)	13.87
Greenfield Runoff Volume (m ³)	7733.456

BWB Consulting Ltd		Page 1
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		Grimethorpe Rainfall Profile
Date 04/12/2024 16:11 File Grimethorpe Updates.SRCX		
Innovyze		

Rainfall profile

Storm duration (mins) 360

FSR Data	
Region England and Wales	
M5-60 (mm)	19.000
Ratio R	0.370
Peak Intensity (mm/hr)	40.290
Ave. Intensity (mm/hr)	10.278
Return Period (years)	100.0

