

Technical Note on Surface Water Drainage for Harlands Road, Haywards Heath, West Sussex, RH16 1LS

for:

Frontier Estates Ltd, Oldbury Place, London, W1U 5PN

Date	Issued	Revision
16 September 2025	Issued	-

Reference: 82960-02

Prepared by:



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Approved by:



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Director

EXECUTIVE SUMMARY

This Technical Note has been prepared in response to comments from the Lead Local Flood Authority (LLFA) to support the planning application for the proposed residential development at Harlands Road, Haywards Heath.

It outlines the principles of surface water drainage, including the discharge hierarchy, the Four Pillars of Sustainable Drainage Systems (SuDS), and the maintenance and management plan with clearly defined responsibilities. The proposed drainage strategy incorporates permeable paving, cellular attenuation, and flow control measures to manage runoff effectively and sustainably.

This note should be read in conjunction with the outline Drainage Strategy prepared by Curtins (ref: 077578-CUR-00-XX-RP-C-72000 Revision: V01, Issue Date: 09 February 2022).

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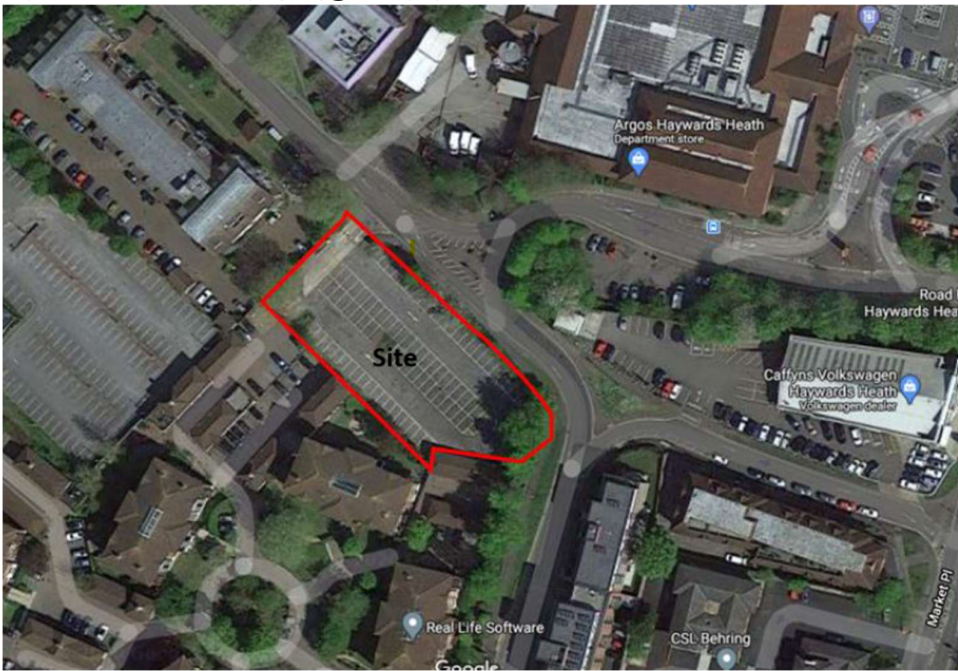
1. INTRODUCTION

- 1.1 This technical note has been prepared on behalf of Frontier Estates Ltd to address surface water drainage considerations for the proposed residential development located at Harlands Road, Haywards Heath, West Sussex.
- 1.2 The purpose of this note is to assess how the proposed drainage layout aligns with established drainage principles and the surface water discharge hierarchy. It also evaluates the suitability of various Sustainable Drainage Systems (SuDS) features, including their implementation, maintenance, and long-term management.

2. **SITE DESCRIPTION AND LOCATION**

- 2.1 The site is located to the west of Harlands Road, Haywards Heath. The British National Grid metre coordinates for the approximate centre of the site are easting: 532860, northing: 124625.
- 2.2 The site is irregular in shape and occupies an area of approximately 0.027ha. Site levels fall from south east to north west, with levels ranging from 54.54mAOD to 47.64mAOD.
- 2.3 The site is currently occupied by a car park, surfaced with bound macadam.

Figure 1: Aerial Photograph (@ Google)



- 2.4 Summary details of the site boundaries and adjacent land use are:

Boundary	Boundary Construction	Adjacent Land Use	Proximal Land Use
North	Fence/ Hedge	Highway	Commercial/ Car Park
East	Retaining Wall/ Fence	Footpath/ Highway	Residential/ Highways/ Railway
South	Fence/ Wall	Residential	Residential/ Commercial

West	Fence	Commercial	Residential
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3. ASSESSMENT OF PRESENT AND FUTURE SURFACE WATER FLOW

- 3.1 The site covers approximately 0.027 hectares and currently comprises a car park. The proposed development aims to replicate, as closely as possible, the surface water runoff characteristics of a natural, undeveloped greenfield site.
- 3.2 The hierarchy of surface water disposal as outlined National Standards for Sustainable Drainage Systems (SuDS) (July 2025) is as follows:
- Priority 1 – Collected for non-potable use
 - Priority 2 – Infiltrated to ground
 - Priority 3 – Discharged to an above ground surface water body
 - Priority 4 – Discharged to a surface water sewer, or other piped surface water drainage system
 - Priority 5 – Discharged to a combined sewer
- 3.3 Due to the nature of the site, the potential for non-potable water reuse is limited and insufficient to accommodate the full volume of surface water runoff.
- 3.4 A Phase II Geo-Environmental Assessment Report prepared by HSP Consulting (ref: HSP2024-D1251-G-GFP11-2427 dated June 2024) confirms that the site is made up of made ground and clayey soils which makes the site not suitable for infiltration.
- 3.5 The Remediation Method Statement prepared by PRP (Ref: R-82960-01-B) confirms that groundwater was encountered in four of the exploratory window sample boreholes.
- 1.1 There are no above ground surface water bodies within the vicinity of the site, however a culverted watercourse, owned by Mid Sussex District Council, runs through the site.

Figure 2: Culverted watercourse location



- 1.2 A Southern Water sewer is located adjacent to the site within Haywards Road and discharges into the culverted watercourse.
- 1.3 No combined sewers are present within the vicinity of the site.
- 1.4 It is therefore proposed that surface water be discharged into the culverted watercourse passing through the site, as this represents the most appropriate disposal method.
- 1.5 A SuDS approach has been adopted where feasible, and the proposed surface water drainage strategy is described in the following sections.
- 1.6 A SuDS approach, as defined in the National Standards for Sustainable Drainage Systems (SuDS) (July 2025), involves:
 - mimicking natural drainage systems and delivering surface water management that recognises the value of rainfall and runoff as a resource
 - managing surface water flooding and the rates and volumes of runoff from developments now and in the future
 - contributing to cleansing diffuse particulate and chemical substances that may be found in surface water runoff
 - using drainage features in combination as a management train, which integrates these throughout the development and its landscape to help create healthy and resilient spaces for people and habitats for wildlife
 - managing runoff close to its source, prioritising features that lie on the surface and incorporate vegetation

- meeting the requirements for delivering multiple benefit SuDS over the lifetime of the development by planning for a changing climate and ensuring long-term maintenance
 - being sustainable, considering both construction and long-term maintenance and the additional environmental and social benefits afforded by the system
- 1.7 Various SuDS techniques have been considered across the site. A summary of these features and their suitability is provided in Appendix VI, which outlines their potential to reduce flood risk and improve water quality.
- 1.8 Due to the constrained nature of the site, full above-ground attenuation is not feasible. However, a combination of above-ground SuDS features, and below-ground attenuation is proposed to enhance water quality, amenity, and biodiversity.
- 1.9 Permeable paving is proposed to the car parking areas to capture and treat the surface water runoff. This will help remove sediment, hydrocarbons, and metals, improving the quality of water leaving the site.
- 1.10 The permeable paving system, incorporating perforated drains and catchpits within a voided stone sub-base, will capture the first 5mm of rainfall. This water will be retained within the sub-base for infiltration and evapotranspiration, preventing it from leaving the site.
- 1.11 Cellular attenuation tanks will be installed beneath the paved parking areas, positioned at a safe distance from buildings. These tanks will provide sufficient storage for surface water runoff from all storm events up to and including the 1 in 100-year event plus 40% climate change allowance.
- 1.12 The flow from the site will be regulated by a flow control device (e.g., HydroBrake or similar), limiting discharge to 3.5 l/s.
- 1.13 A comprehensive SuDS strategy has been developed for the site to mitigate flood risk and manage the impacts of potential flooding events.
- 1.14 While infiltration is not feasible, permeable surfaces have been incorporated where possible to replace impermeable areas and maximise opportunities for planting and vegetated features.

2. REPOSNSIBILITY FOR MAINTENANCE AND MANAGMENT

- 2.1 The long-term maintenance and management of the surface water drainage system will be undertaken by the appointed Management Company responsible for the upkeep of the communal areas within the development. This includes routine inspection and maintenance of SuDS features such as permeable paving, catchpits, and landscaped areas.
- 2.2 Specialist components of the drainage system — including the cellular attenuation tanks, flow control device (e.g., HydroBrake), and associated pipework — will be maintained either directly by the Management Company or through a contracted specialist drainage maintenance provider. This ensures that all elements of the system are inspected, cleaned, and serviced in accordance with manufacturer recommendations and industry best practice.
- 2.3 A formal maintenance agreement will be established to define roles, responsibilities, and frequency of inspections, ensuring the system remains effective and compliant with the National Standards for Sustainable Drainage Systems (SuDS) over the lifetime of the development.

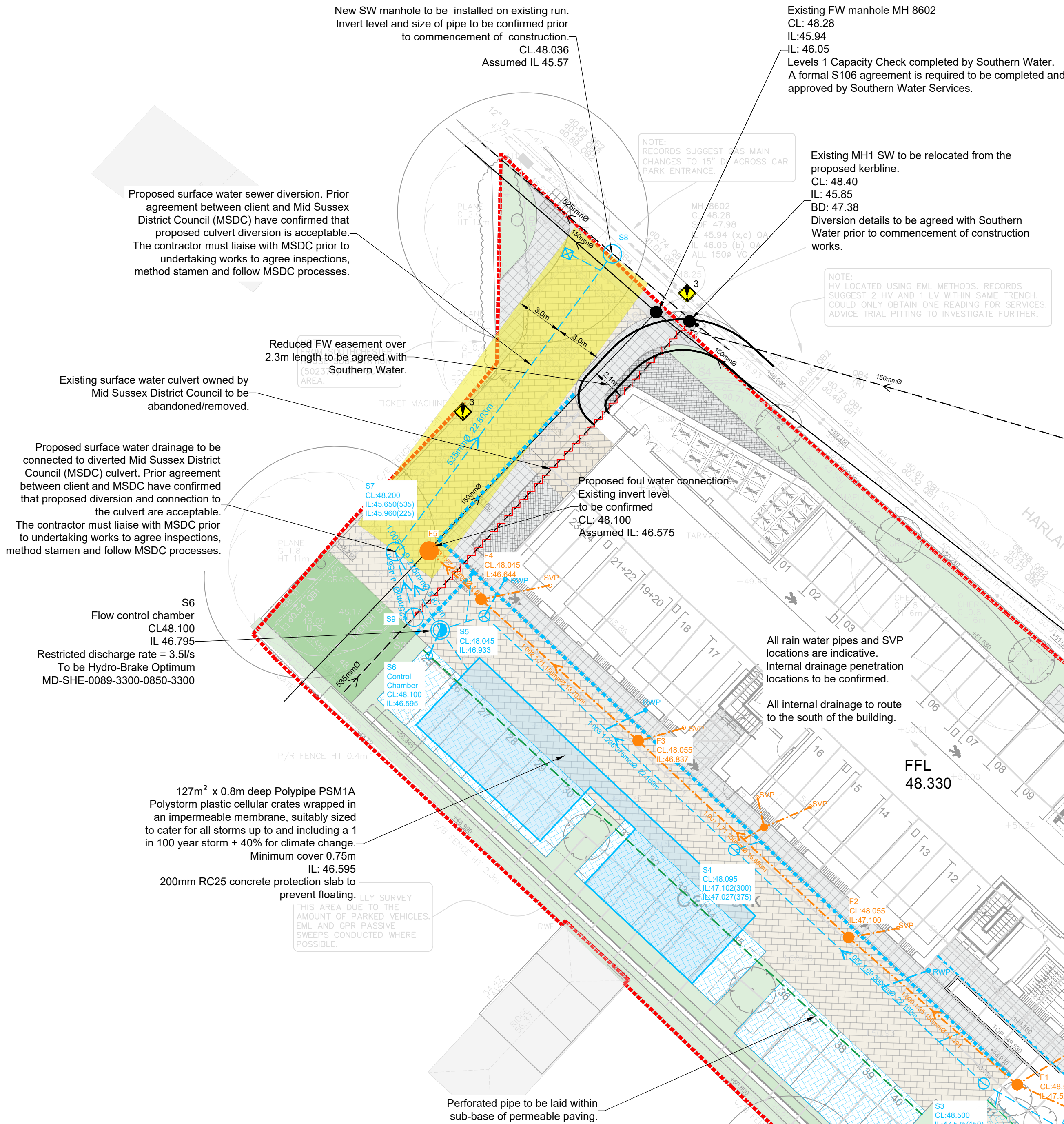
3. **CONCLUSIONS AND RECOMMENDATIONS**

3.1 The proposed drainage strategy for the Harlands Road development aligns with national standards and LLFA expectations. Key conclusions and recommendations are as follows:

- Surface water runoff will be managed using a SuDS approach, incorporating permeable paving and cellular attenuation.
- Infiltration is not feasible due to site conditions; discharge will be made to the culverted watercourse via flow control.
- The strategy adheres to the discharge hierarchy and supports the Four Pillars of SuDS: water quantity, water quality, amenity, and biodiversity.
- Maintenance and management responsibilities must be clearly defined and assigned to ensure long-term performance.
- The proposed system will accommodate up to a 1 in 100-year storm event plus 40% climate change allowance.
- It is recommended that the maintenance responsibility be formally assigned to a management company or relevant authority.

APPENDIX I

PROPOSED DRAINAGE LAYOUT



MH No.	MANHOLE DIMENSION (mm)	MANHOLE TYPE	COVER LEVEL (m)	INVERT LEVEL (m)	DEPTH TO SOFFIT (m)	EASTING (m)	NORTHING (m)
S1	600Ø	PPIC	53.200	52.200	0.900	532890.358	124614.595
S2	1200Ø	Type A	52.400	48.725	3.525	532878.141	124601.298
S3	600Ø	PPIC	48.500	47.425	0.775	532865.666	124608.527
S4	600Ø	PPIC	48.095	47.027	0.693	532849.484	124623.680
S5	600Ø	PPIC	48.045	46.933	0.737	532833.314	124638.833
S6	1200Ø	Type C	48.100	46.595	1.280	532830.412	124637.930
S7	1200Ø	Type B	48.200	45.960	2.015	532827.509	124643.011
F1	600Ø	PPIC	48.525	47.520	0.905	532867.833	124608.475
F2	600Ø	PPIC	48.055	47.100	0.855	532856.906	124617.997
F3	600Ø	PPIC	48.055	46.830	1.125	532843.261	124630.755
F4	1200Ø	Type C	48.055	46.640	1.315	532833.072	124639.917
F5	1200Ø	Type C	48.100	46.570	1.430	532829.702	124643.058
S8	1200Ø	Type B	48.036	45.570	1.941	532828.532	124643.616
S9	1200Ø	Type B	48.200	45.650	2.175	532828.532	124643.616

* Invert level to be confirmed

SAFETY, HEALTH & ENVIRONMENTAL HAZARD INFORMATION BOX.

The hazards noted below are in addition to the normal hazards and risks faced by a competent contractor when dealing with the types of works detailed on this drawing.

DEMOLITION RISKS:

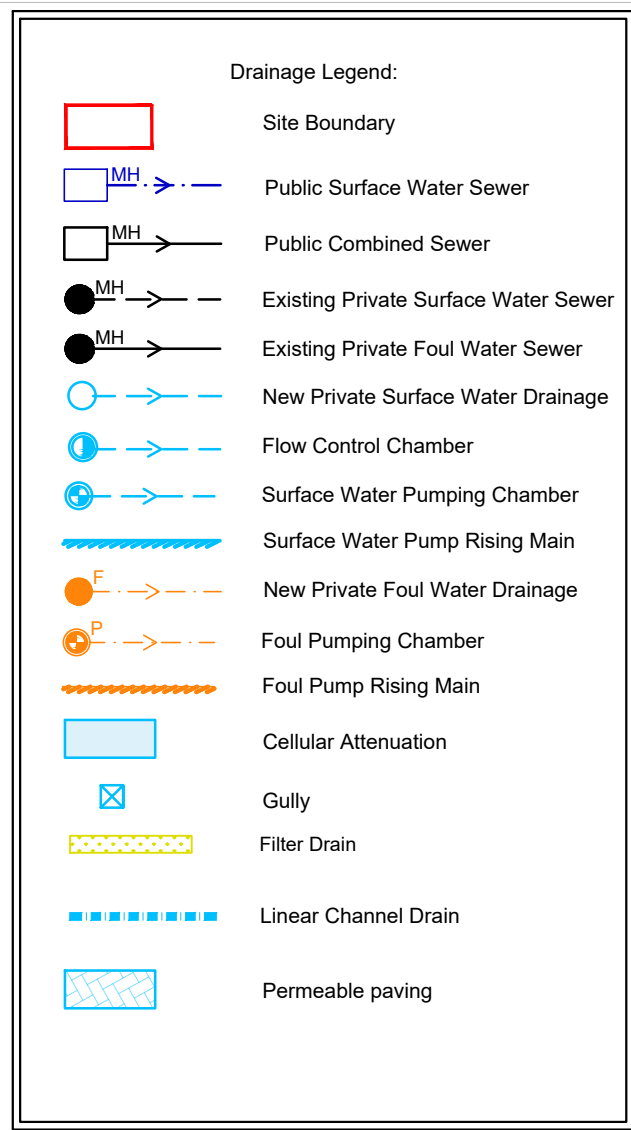
- Existing tarmac parking area to be remove.
- Potential risk of hazardous materials.

CONSTRUCTION RISKS:

- Existing services within site boundary. LV cable located along western boundary. HV & LV cables located in vicinity of the site access. Risk of service strike.
- Unknown existing services within the site to be confirmed prior to construction works.
- Deep drainage, up to 3.75m depth. Deep excavations required. Risk of fall.
- High retaining walls. Risk of fall.

MAINTENANCE / CLEANING RISKS:

- High retaining walls. Risk of fall.



C1	16/09/2025	Drawing revised as per LLFA comments.	AZ / DE
P2	18/06/2025	Drawing revised as per latest hard landscaping plan	AZ / DE
P1	13/06/2025	Issued for comments	AZ / DE
Rev	Date	Description	By / Chk



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Enderby
Leicester LE19 4SA

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leicester@prp-uk.com
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Leicester
Northampton
London

engineering excellence | creating advantage

Client:
Frontier Estates Ltd

Architect:
Broadway Malyan

Project:
Harlands Road, Haywards Heath,
West Sussex

Title:
Drainage Design Layout

Status:
FOR CONSTRUCTION

Engineer:	AZ	Date:	04/06/2025
Drawn:	AZ	Scales @ A1:	
Checked:	DE	1:200	
Project No:	82960	Drg No:	100
		Rev:	C1

APPENDIX II

HYDRAULIC CALCULATIONS



Micro
Drainage

PRP

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Catherine House
Old Harborough Road
Brixworth NN6 9BX

Harlands
SW Network



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Micro Drainage

Network 2020.1.3

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
1	53.200	1.000	Open Manhole	600	1.000	52.200	100				
2	52.400	3.675	Open Manhole	1200	1.001	48.725	150	1.000	48.775	100	
3	48.500	1.075	Open Manhole	600	1.002	47.425	300	1.001	47.575	150	
4	48.095	1.068	Open Manhole	600	1.003	47.027	375	1.002	47.102	300	
5	48.045	1.112	Open Manhole	600	1.004	46.933	375	1.003	46.933	375	
6	48.100	1.505	Open Manhole	1350	1.005	46.595	225	1.004	46.595	375	
	48.200	2.240	Open Manhole	1200		OUTFALL		1.005	45.960	225	

No coordinates have been specified, layout information cannot be produced.

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Catherine House Old Harborough Road Brixworth NN6 9BX	Harlands SW Network	
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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	100	1	53.200	52.200	0.900	Open Manhole	600
1.001	o	150	2	52.400	48.725	3.525	Open Manhole	1200
1.002	o	300	3	48.500	47.425	0.775	Open Manhole	600
1.003	o	375	4	48.095	47.027	0.693	Open Manhole	600
1.004	o	375	5	48.045	46.933	0.737	Open Manhole	600
1.005	o	225	6	48.100	46.595	1.280	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	18.057	5.3	2	52.400	48.775	3.525	Open Manhole	1200
1.001	14.419	12.5	3	48.500	47.575	0.775	Open Manhole	600
1.002	22.169	68.6	4	48.095	47.102	0.693	Open Manhole	600
1.003	22.160	235.7	5	48.045	46.933	0.737	Open Manhole	600
1.004	3.019	8.9	6	48.100	46.595	1.130	Open Manhole	1350
1.005	5.989	9.4		48.200	45.960	2.015	Open Manhole	1200

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.005		48.200	45.960	0.000	1200	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

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<u>Synthetic Rainfall Details</u> <table> <tr> <td>Rainfall Model</td> <td>FEH</td> </tr> <tr> <td>Return Period (years)</td> <td>100</td> </tr> <tr> <td>FEH Rainfall Version</td> <td>1999</td> </tr> <tr> <td>Site Location</td> <td>GB 532850 124750 TQ 32850 24750</td> </tr> <tr> <td>C (1km)</td> <td>-0.026</td> </tr> <tr> <td>D1 (1km)</td> <td>0.364</td> </tr> <tr> <td>D2 (1km)</td> <td>0.306</td> </tr> <tr> <td>D3 (1km)</td> <td>0.397</td> </tr> <tr> <td>E (1km)</td> <td>0.316</td> </tr> <tr> <td>F (1km)</td> <td>2.468</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> </tr> <tr> <td>Winter Storms</td> <td>No</td> </tr> <tr> <td>Cv (Summer)</td> <td>1.000</td> </tr> <tr> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>Storm Duration (mins)</td> <td>30</td> </tr> </table>			Rainfall Model	FEH	Return Period (years)	100	FEH Rainfall Version	1999	Site Location	GB 532850 124750 TQ 32850 24750	C (1km)	-0.026	D1 (1km)	0.364	D2 (1km)	0.306	D3 (1km)	0.397	E (1km)	0.316	F (1km)	2.468	Summer Storms	Yes	Winter Storms	No	Cv (Summer)	1.000	Cv (Winter)	0.840	Storm Duration (mins)	30
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Online Controls for Storm

Hydro-Brake® Optimum Manhole: 6, DS/PN: 1.005, Volume (m³): 2.4

Unit Reference	MD-SHE-0089-3300-0850-3300
Design Head (m)	0.850
Design Flow (l/s)	3.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	89
Invert Level	46.595
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.850	3.3	Kick-Flo®	0.545	2.7
Flush-Flo™	0.252	3.3	Mean Flow over Head Range	-	2.9

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	2.7	1.200	3.9	3.000	5.9	7.000	8.8
0.200	3.3	1.400	4.2	3.500	6.4	7.500	9.1
0.300	3.3	1.600	4.4	4.000	6.8	8.000	9.4
0.400	3.2	1.800	4.7	4.500	7.2	8.500	9.7
0.500	2.9	2.000	4.9	5.000	7.5	9.000	10.0
0.600	2.8	2.200	5.1	5.500	7.9	9.500	10.2
0.800	3.2	2.400	5.3	6.000	8.2		
1.000	3.6	2.600	5.5	6.500	8.5		

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Storage Structures for Storm

Porous Car Park Manhole: 5, DS/PN: 1.004

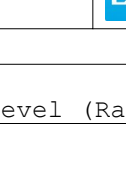
Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.8
Membrane Percolation (mm/hr)	1000	Length (m)	42.5
Max Percolation (l/s)	56.7	Slope (1:X)	40.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	46.954	Membrane Depth (mm)	0

Cellular Storage Manhole: 6, DS/PN: 1.005

Invert Level (m)	46.595	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	127.0	0.0	0.801	0.0	0.0
0.800	127.0	0.0			

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000	Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0	MADD Factor * 10m ³ /ha Storage 2.000
Hot Start Level (mm) 0	Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500	Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000	

Number of Input Hydrographs 0	Number of Offline Controls 0	Number of Time/Area Diagrams 0
Number of Online Controls 1	Number of Storage Structures 2	Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	1999
Site Location GB 532850 124750 TQ 32850 24750	
C (1km)	-0.026
D1 (1km)	0.364
D2 (1km)	0.306
D3 (1km)	0.397
E (1km)	0.316
F (1km)	2.468
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep 2.5 Second Increment (Extended)	
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080	
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 40, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1 15	Summer	1	+0%	100/15 Summer				52.227
1.001	2 15	Summer	1	+0%					48.760
1.002	3 15	Summer	1	+0%	100/15 Summer				47.495
1.003	4 15	Summer	1	+0%	30/15 Summer				47.140
1.004	5 15	Summer	1	+0%	100/60 Summer				47.010

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PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.005	6 180	Summer	1	+0%	30/15 Summer				46.717

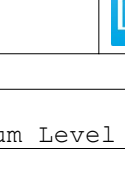
PN	US/MH Name	Surcharged	Flooded	Half Drain		Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)		
1.005	6	-0.103	0.000	0.03		87	3.0	OK

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Micro Drainage	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Surcharged Flooded		Flow / Overflow Cap.	(l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)						
1.000	1	-0.034	0.000	0.76			19.5	OK	
1.001	2	-0.066	0.000	0.60			27.8	OK	
1.002	3	-0.115	0.000	0.70			82.4	OK	
1.003	4	0.011	0.000	1.10			122.1	SURCHARGED	
1.004	5	-0.127	0.000	0.13		89	29.0	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	2	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	1999
Site Location	GB 532850 124750 TQ 32850 24750
C (1km)	-0.026
D1 (1km)	0.364
D2 (1km)	0.306
D3 (1km)	0.397
E (1km)	0.316
F (1km)	2.468
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 40, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Summer	100	+40%	100/15 Summer				52.819
1.001	2	15 Summer	100	+40%					48.832
1.002	3	15 Summer	100	+40%	100/15 Summer				47.917
1.003	4	15 Summer	100	+40%	30/15 Summer				47.565
1.004	5	240 Winter	100	+40%	100/60 Summer				47.559

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Surcharged Flooded		Flow / Overflow		Half Drain	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)	Cap.	(l/s)	Time (mins)	Flow (l/s)		
1.000	1	0.519	0.000	1.06			27.2	SURCHARGED	
1.001	2	-0.043	0.000	0.84			39.2	OK	
1.002	3	0.192	0.000	1.04			122.8	SURCHARGED	
1.003	4	0.163	0.000	1.67			185.1	SURCHARGED	
1.004	5	0.251	0.000	0.11		92	25.1	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level
									(m)
1.005	6 240	Winter	100	+40%	30/15	Summer			47.579

	US/MH	Surcharged	Flooded		Half Drain	Pipe			Level
PN	Name	Depth	Volume	Flow /	Time	Flow	Status		Exceeded
		(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)		
1.005	6	0.759	0.000	0.03		369	3.5	SURCHARGED	

APPENDIX III

DRAINAGE MAINTENANCE SCHEDULE

Maintenance Schedule - All maintenance to be carried out in accordance with CIRIA 753 by the property owner who is responsible for maintaining the drainage system

SuDS Feature	Maintenance Schedule	Required Action	Typical Frequency
Manhole & Rodding Eye	Routine maintenance	Inspect manholes and remove any silt or debris from base and ensure that they are clean.	Every six months
		Jet pipework to remove debris/silt from rodding eye	As required
Channel Drain	Routine maintenance	Channel drains. Remove any silt or debris from base and ensure that are clean.	Every three months
		Jet pipework to remove debris/silt	As required
Cellular Crates	Monitoring	Survey inside of tank for sediment build-up and remove is necessary	Every 5 years or as required
		Inspect/check all inlets, outlets , vents and overflows to ensure that they are in good condition and operating as designed.	Annually
	Occasional maintenance	Repair/rehabilitate inlets, outlets, overflows and vents.Remove sediment from road gullies and catchpit chambers	Annually or as required
	Regular maintenance	Remove debris from catchment surface.	Monthly
	Regular maintenece	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
Soft Landscaping	Regular maintenance	Replace any plants, to mainain planting density	As required
		Remove litter and surface debris and weeds	Quarterly
	Regular inspections	Assess plants for disease infection, poor growth, invasive species etc and replace as necessary	Quarterly
Permeable Paving	Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site specific observation of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this is the most likely to collect the most sediment
		Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
		Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving	As required
		Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, are replace lost jointing material	As required
	Monitoring	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
		Initial inspection	Monthly for three months
		Inspect for evidence of poor operation and/or weed growth – if required take remedial action	Three-monthly, 48h after large storms in first six months
		Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually
		Monitor inspection chambers	Annually
Tree Pit	Regular maintenance	Remove litter and debris	Monthly (or as required)
		Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
		Inspect inlets and outlets	Monthly
	Occasional maintenance	Check tree health and manage tree appropriately	Annually
		Remove silt build-up from inlets and surface and replace mulch as necessary	Annually, or as required
		Water	As required (in periods of drought)
	Monitoring	Inspect silt accumulation rates and establish appropriate removal frequencies	Half yearly
Flow Control Chamber	Monitoring	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months
	Occasional maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Six monthly
		Remove sediment build-up from pre-treatment structures	Six monthly
	Regular maintenance	Regular inspection to be carried out in accordance with manufacturer's instructions	As required