

Surface Water Drainage Strategy Report

Motorsport Electronics Ltd – Replacement Industrial Unit

Site: 41B Main Street, BA13 4JR, Wiltshire

Report type: Planning Drainage Strategy (Surface Water)

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1. Introduction

This report sets out the proposed surface water drainage strategy for the replacement industrial unit at Motorsport Electronics Ltd, BA13 4JR. The purpose of the report is to demonstrate that runoff arising from the roof and hardstanding areas can be managed sustainably, in line with national and local planning requirements, without increasing flood risk either on the site or to third parties downstream.

The strategy has been developed from the information currently available at planning stage including the proposed site layout drawings and a Wessex Water network extract. The site currently has no flooding issues, on-site or off.

2. Site Location and Proposed Development

The site is located at 41B Main Street, BA13 4JR, as shown on the proposed location and site plan issued by Forgeworks Architects.

The proposed works include demolition of an existing light industrial unit and construction of a replacement single-storey industrial unit, with external hardstanding retained/provided for access and parking.

The proposed industrial unit is indicated as approximately 30m x 15m on the architect's drawing.

3. Drainage Catchment Areas

Surface water drainage calculations for this report are based on the following impermeable areas (provided/confirmed for drainage sizing):

- Roof area (plan area): 450 m²
- Hardstanding area: 550 m² (car parking / access / circulation areas)
- Total impermeable area: 1,000 m²
- Permeable area: 0 m²

Total impermeable area in hectares:

0.1 ha

The site is confirmed as brownfield redevelopment.

4. Flood Risk Context

4.1 Flood Zone classification

The Flood Zone classification for the site has been confirmed by the architect as Flood Zone 1 (low probability of flooding). This provides appropriate context for a standard surface water drainage strategy approach for planning.

For completeness, an Environment Agency “Flood Map for Planning” extract is included within the project information pack. This extract indicates Flood Zone 3 at the selected easting/northing shown on the printout. As this differs from the architect’s confirmation, it is assumed the EA extract relates to a selected point not matching the exact development site boundary or an incorrect map pin, and should be verified as part of the submission.

4.2 Implications for drainage

Regardless of Flood Zone, surface water drainage design still requires control of peak flows and storage of runoff during extreme events. This strategy has therefore been developed using typical planning design criteria including 1 in 30 year and 1 in 100 year + climate change events.

5. Existing Drainage Context

The site currently comprises impermeable surfacing and roof areas, with an existing gully located centrally within the site that is understood to discharge to a surface water outfall in the highway. The eastern building already drains to this gully and is therefore essentially excluded from the proposed drainage proposals. The proposed drainage strategy applies to the development area only and is anticipated to improve the existing surface water management arrangement for the parts of the site affected by the works. This reduces the total area draining through the proposed feature from approximately 1500m² to 1000m². See drawing 2526/1002/01 in Annex B.

6. Drainage Hierarchy and Proposed Strategy

The proposed surface water drainage strategy has been developed in accordance with the drainage hierarchy, with priority given to the use of infiltration to manage runoff at source. Surface water from the proposed development will be collected and conveyed to an on-site trench soakaway, which will provide both attenuation storage and discharge by infiltration into the ground.

The site is currently brownfield in nature and comprises predominantly impermeable surfacing, with surface water understood to discharge off site to an existing gully. The proposed development will improve upon this arrangement by introducing a formal surface water drainage system designed to collect, store and infiltrate runoff on site.

Primary drainage system: trench soakaway

The primary drainage feature is a trench soakaway designed in accordance with the principles of BRE 365. The soakaway has been sized to accommodate runoff from the contributing impermeable area and to provide sufficient storage during the design storm event, while allowing water to infiltrate gradually into the surrounding ground.

The proposed soakaway comprises a trench structure with the following design parameters:

- Plan dimensions: 23.0 m x 8.0 m
- Effective depth: 2.0 m
- Void ratio: 0.95
- Storage volume provided: 349.60 m³
- Soil infiltration rate: 5.00 x 10⁻⁶ m/s
- Factor of Safety: 1.5

The soakaway has been assessed for the 1 in 100 year plus 40% climate change event and the calculations demonstrate that it provides sufficient storage and infiltration capacity for the proposed development. The calculated half-drain time is within the typical BRE 365 criterion of less than 24 hours, confirming that the system will drain down within an acceptable period following the design storm.

Surface water runoff from roof areas will be collected via rainwater downpipes and conveyed to the soakaway through a below-ground 100/110 mm diameter PVC-U surface water drainage pipework system laid to suitable falls. Prior to discharge into the soakaway, runoff will pass through a catchpit / silt trap chamber to intercept debris and sediment and to reduce the risk of clogging within the downstream infiltration system.

The catchpit chamber will be installed upstream of the soakaway and will incorporate a silt trap at a minimum of 300mm below outlet level to allow for the settlement and retention of silt. This will provide a practical point for inspection and maintenance and will support the long-term operation of the drainage system.

Where proposed external hardstanding is formed in permeable tarmac, this will provide an additional element of source control by allowing rainfall to pass through the surface construction and into the underlying granular layers. This assists in reducing the rate and volume of direct runoff entering the piped drainage system and supports the overall SuDS approach adopted for the site.

The permeable surfacing build-up above the soakaway will be designed with appropriate porous asphalt layers and open-graded granular material to provide both structural support and temporary storage within the pavement construction. This will further improve the performance and resilience of the drainage system compared with a conventional impermeable surfacing arrangement.

As the proposed drainage strategy relies on on-site infiltration and does not include a routine off-site surface water discharge, the proposed runoff rate from the site is taken as 0.0 l/s under normal design operation. This represents an improvement over the existing site arrangement, where runoff currently leaves the site uncontrolled to an external gully.

Overall, the proposed surface water drainage strategy is considered to accord with the drainage hierarchy by prioritising infiltration and on-site management of runoff, while improving the site's drainage performance relative to the existing brownfield condition.

7. Design Standards and Criteria

The strategy has been developed to meet requirements:

- 1 in 30 year event: no flooding for standard design storms (no uncontrolled ponding).
- 1 in 100 year + 40% climate change: no flooding of buildings and no increase in flood risk off site.
- Exceedance routing: overland flow paths should remain within external areas and be directed away from door thresholds.

The climate change allowance adopted is +40%.

8. FEH Rainfall Data

Rainfall inputs used in the calculations are FEH depth-duration values for the site location (BA13 area). The following 1 in 100 year + 40% climate change depths are used:

Duration	Rainfall depth (mm)
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15 min	34.5
30 min	46.2
60 min	59.1
120 min	71.5
6 hr (360 min)	96.9
12 hr (720 min)	115.4

9. Proposed Drainage Layout

The proposed layout is shown on the drawings in Annex B

9.1 Roof drainage

Surface water runoff from the roof will be collected by gutters and downpipes and conveyed via a buried below-ground pipework system to the proposed soakaway. The connecting pipework will comprise 100/110 mm diameter PVC-U surface water drainage pipes laid to suitable falls.

Prior to discharge into the soakaway, roof runoff will pass through a catchpit / silt trap chamber to intercept debris and sediment and to provide access for future inspection and maintenance. This arrangement is intended to protect the long-term performance of the downstream infiltration system.

9.2 Hardstanding drainage

External hardstanding areas will be formed in permeable tarmac where proposed, allowing rainfall to pass through the surface and into the underlying open-graded granular construction. This will

provide source control by reducing the volume and rate of direct surface runoff entering the piped drainage system.

Where required, runoff from hardstanding areas will be directed by finished levels and local collection measures toward the proposed drainage system and soakaway arrangement. Ground levels and surfacing will be set out so that runoff is managed positively and does not pond adjacent to the building.

9.3 Trench soakaway

The primary drainage feature is a trench soakaway designed to provide attenuation storage and infiltration of surface water runoff into the ground. The soakaway has been sized in accordance with the principles of BRE 365 and is designed to receive runoff from the contributing impermeable areas via the proposed buried pipework system.

The soakaway provides:

- **attenuation storage volume** within the trench structure
- **infiltration to ground** at the designed infiltration rate
- **on-site management of runoff** without routine off-site surface water discharge

The proposed trench soakaway forms the main element of the site's surface water drainage strategy and replaces the existing uncontrolled runoff arrangement with a formalised on-site SuDS solution. The soakaway will be wrapped in a geotextile such as Terram 1000 to reduce the ingress of fines.

10. Water Quality and Treatment

The external areas are expected to be used as general car parking, with occasional HGV movements. This introduces typical pollution risks including sediment and small hydrocarbon loads from vehicles.

A basic SuDS treatment train is therefore proposed, including:

- silt traps/catchpits upstream of storage
- maintainable access points for inspection and cleaning

11. Exceedance and Flood Resilience

Even with attenuation and infiltration, exceedance needs to be considered for events above design standards. The proposed surface water drainage strategy has been developed so that runoff from the site is collected and directed to the proposed infiltration system under normal design conditions. The site currently comprises a brownfield, predominantly impermeable area which drains off site to an existing gully, and there are no known records of existing surface water flooding associated with the site. The proposed development will improve upon this arrangement by formalising the drainage strategy and providing dedicated on-site attenuation and infiltration storage. On this basis, exceedance risk is considered low, and any residual overland flow risk can be appropriately managed through final ground profiling. The exceedance routing is shown on Drawing 2526/1002/01.

In the event that rainfall exceeds the design capacity of the drainage system, or if temporary blockage or partial failure were to occur, exceedance flows would remain above ground and follow the general site topography away from the building thresholds and not towards adjacent properties.

12. Conclusion

This surface water drainage strategy demonstrates that runoff from the proposed development at Motorsport Electronics Ltd, BA13 4JR can be managed safely and sustainably through the use of an on-site infiltration-based drainage system. The proposed approach is considered appropriate for the redevelopment of this brownfield industrial site and is based on:

- collection of surface water runoff via roof drainage and below-ground carrier pipes
- attenuation and infiltration via a trench soakaway
- pre-treatment through a catchpit / silt trap chamber upstream of the soakaway
- storage designed to accommodate the 1 in 100 year rainfall event plus 40% climate change
- a formalised drainage arrangement which improves upon the existing uncontrolled runoff condition

The soakaway has been designed in accordance with the principles of BRE 365 and sized to accommodate runoff from the contributing impermeable area. The submitted calculations demonstrate that the proposed soakaway provides sufficient storage and infiltration capacity for the design event, with a storage volume of approximately 349.60 m³ compared to a calculated requirement of approximately 105.01 m³.

On this basis, the proposed development will manage surface water runoff on site without the need for a routine off-site surface water discharge and is therefore considered acceptable in principle for planning purposes.

Annex A — Calculations

A1. Inputs

Impermeable area:

1000m²

Converted to hectares:

$A = 0.1 \text{ ha}$

Runoff coefficient (impermeable surfaces):

$C = 0.95$

Design event: 1 in 100 year + 40% CC

A2. Rainfall depths used (1:100 + 40% CC)

Duration (min)	Depth D (mm)
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15	34.5
----	------

30	46.2
----	------

60	59.1
----	------

120	71.5
-----	------

360	96.9
-----	------

720	115.4
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A3. Runoff volume calculation

Existing:

Surface water runoff from the existing site is assumed to discharge rapidly as overland flow to an off-site gully, with no significant on-site attenuation or infiltration currently taking place.

An estimate of the existing runoff rate has been undertaken using the Rational Method

A runoff coefficient of 0.95 has been applied to reflect the impermeable character of the site, and a 15-minute storm duration has been adopted to represent the likely rapid runoff response.

Based on FEH point rainfall data for the site, the existing peak runoff rates have been estimated as follows:

- 1 in 1 year event: 4.7 l/s
- 1 in 30 year event: 22.2 l/s
- 1 in 100 year event: 28.1 l/s

These values provide a reasonable estimate of the existing brownfield runoff.

Proposed:

Surface water runoff from the proposed development will be managed by means of an on-site trench soakaway designed in accordance with the principles of BRE 365. Runoff from the

proposed impermeable area will be directed to the soakaway for infiltration into the ground, with no routine off-site surface water discharge proposed.

The soakaway has been sized to accommodate runoff from an impermeable area of approximately 1,000 m² and has been assessed for the 1 in 100 year plus 40% climate change event. The submitted calculations demonstrate that the soakaway provides sufficient storage and infiltration capacity for the design event, with a calculated maximum storage requirement of 105.01 m³ compared to a provided storage volume of 349.60 m³. The calculated half-drain time is approximately 20.8 hours, which is within the typical BRE 365 criterion of less than 24 hours.

On this basis, there will be no routine discharge of surface water from the site, and the proposed runoff rate is therefore taken as 0.0 l/s for the 1 in 1 year, 1 in 30 year, and 1 in 100 year rainfall events.

Accordingly, the proposed runoff rates are as follows:

- 1 in 1 year event: 0.0 l/s
- 1 in 30 year event: 0.0 l/s
- 1 in 100 year event: 0.0 l/s

A4. Storage requirement

M5-60 = 21.20 mm

M5-2d = 59.18 mm

r= 0.36

An infiltration rate of **5 × 10⁻⁶ m/s** has been adopted for the drainage design. This value was provided by the client following testing and has been used as the basis for the soakaway sizing calculations.

A5. Soakaway Calcs

BRE 365 - Trench Soakaway Design

Soakaway Dimensions										Storm M100 +40%												Storm	M100 +40%							
Length	Width	Effective Depth	50% Internal Surface Area (as50)	Void Ratio	Storage Volume	Impermeable Area	Soil Infiltration Rate (f)	Rainfall Ratio (r)	Factor of Safety	INFLOW	OUTFLOW	STORAGE	Half-Drain Time (ts50)	Storm Duration (t)	Z1 Factor	M5-D Min. Rainfall	M10 Z2 Factor	M10 Rainfall	M100 Rainfall +40%	M30 Z2 Factor	M30 Rainfall	M30 Rainfall +40%	M100 Z2 Factor	M100 Rainfall +30% (f)	M100 Rainfall +40% (f)	Inflow (i)	Outflow (o)	Storage (s)	Depth	
														(min)	0.36	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(m3)	(m3)	(m3)	(m)
														5	0.36	7.2	1.20	8.7	12.1	1.452	10.5	14.6	1.84	17.2	18.6	18.56	6.20E-02	18.50	0.1005287	
														10	0.51	10.2	1.22	12.4	17.4	1.490	15.2	21.3	1.91	25.4	27.3	27.31	1.24E-01	27.18	0.1477242	
														15	0.62	12.4	1.23	15.2	21.3	1.505	18.7	26.1	1.95	31.4	33.8	33.81	1.86E-01	33.62	0.1827157	
														30	0.79	15.8	1.24	19.6	27.4	1.530	24.2	33.8	2.00	41.0	44.1	44.15	3.72E-01	43.78	0.2379161	
														60	1.00	20.0	1.24	24.8	34.7	1.543	30.9	43.2	2.03	52.8	56.8	56.84	7.44E-01	56.10	0.3048695	
														120	1.22	24.4	1.24	30.3	42.4	1.535	37.5	52.4	2.01	63.8	68.7	68.73	1.49E+00	67.25	0.3654695	
														240	1.48	29.6	1.22	36.1	50.6	1.513	44.8	62.7	1.97	75.8	81.7	81.66	2.98E+00	78.68	0.4276244	
														360	1.67	33.4	1.21	40.4	56.5	1.499	50.1	70.1	1.94	84.2	90.7	90.70	4.46E+00	86.23	0.4686505	
														600	1.90	38.0	1.19	45.3	63.5	1.476	56.1	78.5	1.90	93.8	101.0	101.00	7.44E+00	93.56	0.5084889	
														1440	2.42	48.4	1.17	56.7	79.3	1.434	69.4	97.2	1.81	114.1	122.9	122.86	1.79E+01	105.01	0.5706871	

Surface water runoff from the proposed development will be managed by means of a trench soakaway designed in accordance with the principles of BRE 365. The soakaway has been sized to accommodate runoff from an impermeable catchment area of approximately 1,000 m².

The design has been undertaken using the following parameters:

Soakaway type: Trench soakaway

- Plan dimensions: 23.0 m x 8.0 m
- Effective depth: 2.0 m
- Internal surface area (50% sidewall area): 62 m²
- Void ratio: 0.95
- Storage volume provided: 349.60 m³
- Impermeable area drained: 1,000 m²
- Soil infiltration rate: 5.00 x 10⁻⁶ m/s
- Rainfall ratio (r): 0.36
- Factor of Safety: 1.5

A Factor of Safety of 1.5 has been applied within the design. This is considered appropriate in the context of the site and the absence of any known existing surface water drainage issues, while still providing a suitable allowance within the infiltration assessment.

The soakaway has been assessed for the 1 in 100 year plus 40% climate change rainfall event. The design calculations indicate a maximum storage requirement of approximately 105.01 m³,

compared to a provided storage volume of 349.60 m³. The proposed soakaway therefore provides sufficient storage capacity for the design event.

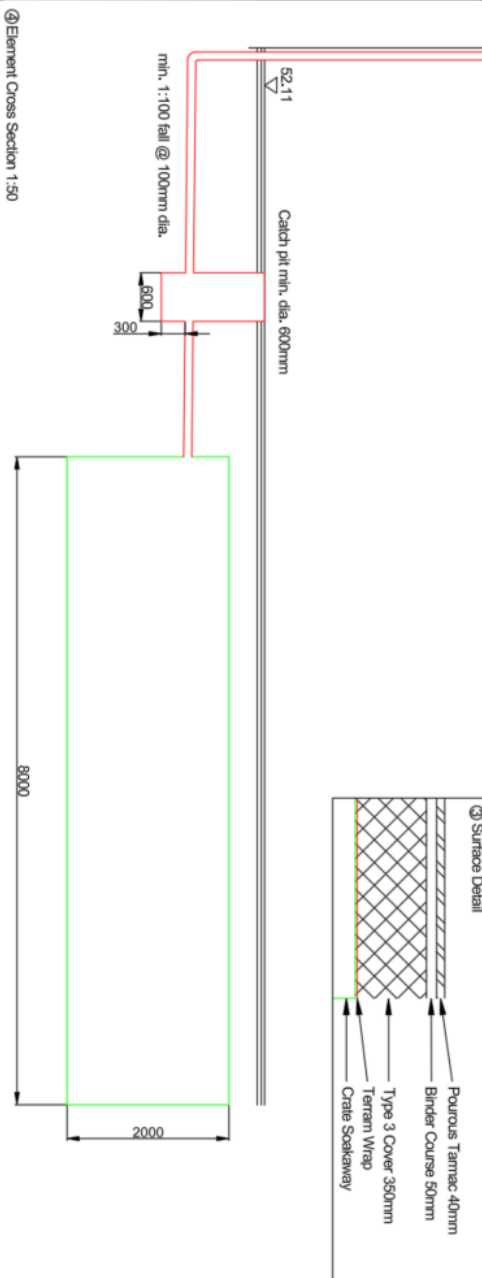
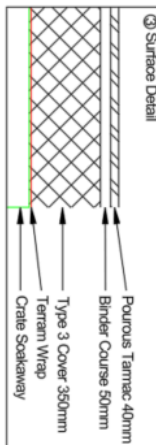
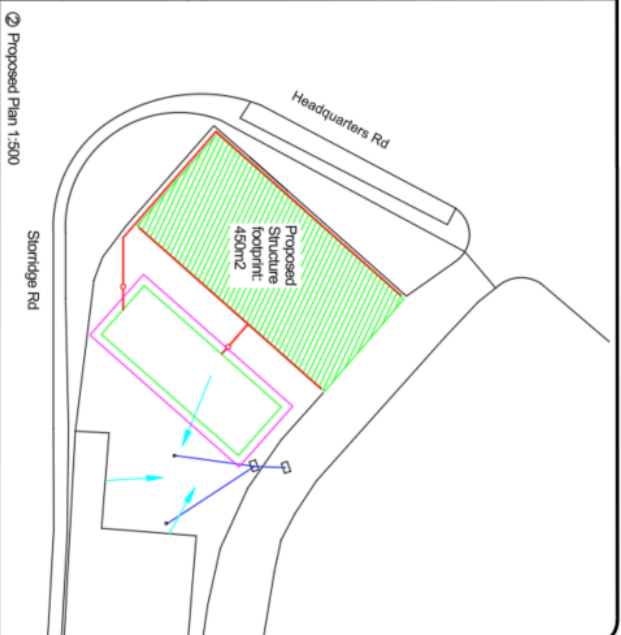
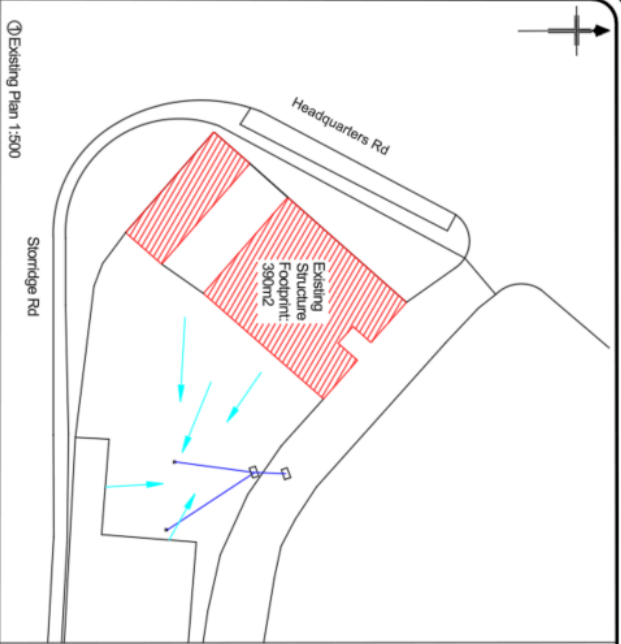
The calculated half-drain time is approximately 20.8 hours, which is within the typical BRE 365 criterion of less than 24 hours. This indicates that the soakaway will drain down within an acceptable period following the design storm event.

On this basis, the proposed trench soakaway is considered suitable for the management of surface water runoff from the development and demonstrates compliance in principle with the requirements of the drainage strategy for planning purposes.

A6. Results table (prior to BRE testing)

Duration	Depth	Runoff volume (V_r)	Outflow volume (V_{out})	Storage required (V_s)
15 min	34.5 mm	39.82 m ³	4.50 m ³	35.32 m ³
30 min	46.2 mm	53.33 m ³	9.00 m ³	44.33 m ³
60 min	59.1 mm	68.22 m ³	18.00 m ³	50.22 m ³
120 min	71.5 mm	82.53 m ³	36.00 m ³	46.53 m ³
360 min	96.9 mm	111.85 m ³	108.00 m ³	3.85 m ³
720 min	115.4 mm	133.20 m ³	216.00 m ³	0.00 m ³

Annex B — Drawings and Supporting Information



Notes:
1. Do not scale from this drawing
2. All measurements are in millimetres unless otherwise stated

- Key:
- Current Drainage Lines
 - Routing
 - 100mm dia. PVC-U pipe (BS EN 1401-1)
 - Silt trap
 - Permeable Surface approx 250m²
 - Soakaway BS EN 17152-1:2019

AMENDMENTS		
Description	By	Date

Motorsport Electronics Ltd,
BA13 4JR
Drainage Design for Planning

Do not scale from this drawing. All dimensions, levels, drainage details, existing services and site conditions to be verified on site by contractor. No liability accepted for unverified third-party or second information. Any errors are the responsibility of the client and not the contractor. Not for construction unless expressly stated.

Scale: Varies	Date: 15/03/26
Drawn by: BP	
Drawing No: 2526/1002/01	

[illegible][illegible][illegible][illegible]

A100 Proposed site plan
01 Scale: 1:200 @ A3

Discharge into sewerage into part center pipe

Neighbouring industrial unit

Main Street

Surrey Road

Replacement industrial unit
GCL-67000

Unit 1
Unit 2
Unit 3
Unit 4
Unit 5

Attenuation Tank Location
(indicative only)

MH1 with silt trap

MH2 with silt trap

Control MH (restricted access)

Trapped Gully at base of RWP

150mm or similar agreed pipe to MH1

Setback and landscaping boundary requirement (BMD C&L DTS)

Setback of existing buildings to be maintained

Building per & above indicated for new building control fence

Existing industrial unit

Publican's lounge

Civil A

Clearance

0m 10m 20m 30m 40m 50m 60m 70m 80m 90m 100m

[illegible][illegible][illegible]

A100 Proposed site plan
01 Scale: 1:200 @ A3

Construction work located under existing road surface drainage by SWM MH
 Key: 1) All structures are constructed to 10m above ground level unless stated otherwise by BRE/BSI standards.
 Existing road boundaries into part center space.

Clearance height

Replacement industrial unit
 GEL-07262

Unit 1

Unit 2

Unit 3

Unit 4

Unit 5

Main Street

Neighbouring industrial unit

Attenuation Tank Location
 (Storage tank)

Control MH (restricted access)

MH2 with silt trap

MH1 with silt trap

Trapped Gully at base of RHP

150mm or similar agreed pipe to MH1

Notes and landscaping boundary treatment (BRE/BSI standards)

Clearance height

Pavement lengths

Cross-section

Existing road & future proposed for new building raised floor

Surrey Road

[illegible]