

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 design will be developed further at detailed stage once infiltration testing and final discharge arrangements have been confirmed.

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 30 m x 15 m 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): 465 m²
(Note: architect drawing indicates GEA 450 m²; 465 m² has been used as a conservative roof drainage area for sizing.)
- Hardstanding area: 750 m² (car parking / access / circulation areas)
- Total impermeable area: 1,215 m²
- Permeable area: 0 m²

Total impermeable area in hectares:

$$A = \frac{1215}{10000} = 0.1215 \text{ ha}$$

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 and Outfall

A Wessex Water network extract has been provided for the site surroundings.

This shows the presence of underground drainage infrastructure in the vicinity of Main Street / Storridge Road and manhole locations which may provide a viable connection point for surface water overflow subject to Wessex Water approval and capacity checks.

6. Drainage Hierarchy and Proposed Strategy

The proposed surface water outfall arrangement adopts a two-stage system to manage runoff from the proposed roof and hardstanding areas. The intention is to treat and store runoff on site first, using an infiltration-based feature, with a formal overflow route to ensure the system remains resilient during intense rainfall or periods where infiltration is reduced.

Primary system: perforated land drain (infiltration / linear SuDS)

The primary drainage feature is a perforated land drain installed along the building line, intended to operate as a linear infiltration and attenuation trench. In practice, this will typically consist of:

- a perforated pipe laid to a shallow gradient
- surrounded by free-draining granular material (e.g., clean stone) to provide void space for storage
- wrapped in a geotextile to reduce clogging from fine particles
- installed with suitable access points for inspection and maintenance

Runoff from roof downpipes and yard gullies will discharge into this feature via a carrier pipe system. Once water enters the land drain trench, it will be managed in two ways:

1. **Temporary storage (attenuation):**
Rainfall is stored in the voids within the trench, which reduces peak runoff rates.
2. **Infiltration to ground (where feasible):**
Stored water gradually infiltrates into the underlying ground, which helps mimic natural drainage and reduces demand on the downstream sewer.

Planning note: Although desk-based geology suggests infiltration could be feasible, performance is site-specific. The final infiltration rate and any need for a lined system will be confirmed through BRE365 infiltration testing and groundwater checks at detailed design stage.

Secondary system: overflow to surface water manhole (engineered fallback)

To ensure the site can drain safely during large storms or periods of low infiltration capacity (e.g., prolonged wet weather), a secondary overflow connection is proposed to a surface water manhole.

The overflow route provides a controlled “relief” path so the drainage system does not surcharge and cause surface flooding. This connection would typically be designed to operate only when:

- the trench/land drain storage reaches capacity (during extreme rainfall), or
- infiltration is slow due to saturated ground conditions

The proposed overflow connection will be provided as a restricted discharge to the surface water manhole. This will be achieved using a flow control device installed within a dedicated chamber downstream of the on-site attenuation feature. The flow control will limit the discharge to an agreed maximum rate, ensuring runoff from the site is released in a controlled manner and does not increase flood risk within the receiving network. The final restricted discharge rate and control details will be confirmed in agreement with the relevant adopting authority and sewer undertaker, alongside final hydraulic calculations and confirmation of storage volume.

Supplementary features

As part of the proposed surface water management strategy, it is recommended that areas of external hardstanding and parking are surfaced using porous tarmac where feasible. This would allow rainfall to infiltrate through the surface into a free-draining sub-base, reducing the volume and rate of runoff entering the piped drainage network. Porous surfacing also provides practical source control SuDS by promoting on-site storage and gradual drainage, helping to manage peak flows during intense rainfall events and supporting compliance with the drainage hierarchy. The permeable surface is to be installed with an appropriate graded sub-base to provide attenuation storage, managing exceedance events and maintaining system resilience. This approach offers a robust and low-maintenance solution for parking and circulation areas, while improving overall drainage performance compared with conventional impermeable surfacing.

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)
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

- Roof runoff will be collected by gutters and downpipes and routed into a buried carrier pipe system.
- The carrier pipes will discharge into the perforated land drain / infiltration trench arrangement, allowing infiltration and/or storage prior to overflow discharge.

9.2 Hardstanding drainage

- Hardstanding runoff will be collected via gullies and/or linear drainage channels.
- Trapped gully pots are used to limit sediment transfer.
- Catchpits or silt traps should be included upstream of infiltration/storage features and any flow control to protect long-term performance.

9.3 Perforated land drain

The perforated land drain is intended to provide:

- storage volume within the trench system
- infiltration into the ground where conditions allow
- reduced peak discharge to the downstream manhole

9.4 Overflow to surface water manhole (secondary system)

Overflow to a surface water manhole provides a defined route for exceedance and ensures the system remains functional during intense storms or when infiltration is limited.

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:

- trapped gullies
- silt traps/catchpits upstream of storage and any flow control
- 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 design intent is that:

- any exceedance remains on external hardstanding areas
- overland flow routes avoid building entrances
- finished floor levels remain above adjacent paving to reduce the chance of internal flooding

The presence of an overflow route to the surface water manhole reduces the likelihood of uncontrolled ponding on the site in extreme events.

12. Conclusion

This surface water drainage strategy demonstrates that runoff from the proposed development at Motorsport Electronics Ltd, BA13 4JR can be managed sustainably and safely. The approach is suitable for a brownfield industrial redevelopment and is based on:

- infiltration and attenuation via a perforated land drain along the building
- a resilient overflow route to a surface water manhole supported by Wessex Water mapping
- storage designed to accommodate extreme rainfall events including 1 in 100 year + 40% climate change

Indicative storage calculations (Annex A) show that an attenuation requirement of approximately 50 m³ is expected for the critical storm duration, with a practical allowance of ~55 m³ recommended at this stage.

Annex A — Calculations

A1. Inputs

Impermeable area:

$$A_{imp} = 465 + 750 = 1215m^2$$

Converted to hectares:

$$A = 0.1215 \text{ ha}$$

Runoff coefficient (impermeable surfaces):

$$C = 0.95$$

Design event: 1 in 100 year + 40% CC

Discharge assumption

Because a formal discharge limit has not yet been agreed, a conservative flow restriction of: 5L/s has been assumed for storage sizing. This can be updated once the outfall agreement is confirmed.

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

Duration (min)	Depth D (mm)
15	34.5
30	46.2
60	59.1

120 71.5

360 96.9

720 115.4

A3. Runoff volume calculation

Runoff volume for each duration:

$$V_r = A_{\text{imp}} \times D/1000 \times C$$

Where:

- $A_{\text{imp}} = 1215 \text{ m}^2$
- $D = \text{rainfall depth in mm}$
- $C = 0.95$

A4. Outflow volume during event

Outflow volume discharged during the storm:

$$V_{\text{out}} = Q_{\text{out}}/1000 \times (t \times 60)$$

Where:

- Q_{out} in L/s
 - t in minutes
 - conversion: $1000 \text{ L} = 1 \text{ m}^3$
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A5. Storage requirement

Required storage volume:

$$V_s = V_r - V_{out}$$

A6. Results table

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

Critical duration

The highest storage requirement occurs at:

60 minutes with 50.2 m³

A7. Recommended planning-stage storage allowance

A practical allowance for uncertainty and sediment capacity:

$$V_{\text{design}} = 50.2 \times 1.10 \sim 55 \text{ m}^3$$

Recommended attenuation volume: $\sim 55 \text{ m}^3$

This storage can be provided within the perforated land drain trench (where feasible) and/or via modular attenuation units, with overflow controlled to the downstream surface water manhole.

Annex B — Drawings and Supporting Information

Scale 1:200 @ A3

Outflow size downsizes into perf. carrier pipes

