

SUMMARY OF STORM WATER DRAINAGE PROPOSALS SHOMREI HADDAS (Unimore) SUPERMARKET

Information provided in this Summary is referenced from the Report dated May 2016 prepared on our behalf by GeoSmart Information Limited. A copy of this Report is submitted for information along with this summary

"The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the site for a 1 in 30 year rainfall event' and 'flooding does not occur during a 1 in 100 year rainfall event in any part of: a building (including a basement); or in any utility plant susceptible to water (e.g. pumping station or electricity substation) within the development"
(DEFRA, March 2015, non-statutory guidance).

Peak discharge rates

The table below presents peak discharge rates for a range of storm events used to assess the impact of the proposed development and select the maximum permitted discharge rate. Further information on the calculation and control of peak discharge rates is provided in Section 6 'Background Information'.

Table 2: Peak discharge rates associated with the development

[†] Assumes 100% run-off from impermeable surfaces. Assumes Greenfield run-off from permeable surfaces

Rainfall event	Greenfield run-off rates	Existing run-off rates [†] (l/s)	Potential run-off rates without attenuation	Potential minus existing (l/s)
QBAR	0.0	N/A	N/A	N/A
6 hour 1 in 1 year	0.0	0.8	0.8	0.0
6 hour 1 in 10 year	0.0	2.5	2.5	0.0
6 hour 1 in 30 year	0.1	3.4	3.4	0.0
6 hour 1 in 100 year	0.1	4.6	4.6	0.0
6 hour 1 in 100 year + 20% CC	N/A	N/A	5.5	0.9
6 hour 1 in 100 year + 30% CC	N/A	N/A	5.9	1.4

calculated using the loH124 method.

Relevant local and regional plan policy should be consulted to determine restrictions on run-off from previously developed sites. In some cases green field rates may be requested. In practice it is difficult to restrict discharge rates at any one control point to less than 5 l/s.

SUMMARY OF STORM WATER DRAINAGE PROPOSALS SHOMREI HADDAS (Unimore) SUPERMARKET

Peak discharge rates

The table below presents peak discharge rates for a range of storm events used to assess the impact of the proposed development and select the maximum permitted discharge rate. Further information on the calculation and control of peak discharge rates is provided in Section 6 'Background Information'.

Table 2: Peak discharge rates associated with the development

¹ Assumes 100% run-off from impermeable surfaces. Assumes Greenfield run-off from permeable surfaces

Rainfall event	Greenfield run-off rates	Existing run-off rates ¹ (l/s)	Potential run-off rates without attenuation	Potential minus existing (l/s)
QBAR	0.0	N/A	N/A	N/A
6 hour 1 in 1 year	0.0	0.8	0.8	0.0
6 hour 1 in 10 year	0.0	2.5	2.5	0.0
6 hour 1 in 30 year	0.1	3.4	3.4	0.0
6 hour 1 in 100 year	0.1	4.6	4.6	0.0
6 hour 1 in 100 year + 20% CC	N/A	N/A	5.5	0.9
6 hour 1 in 100 year + 30% CC	N/A	N/A	5.9	1.4

calculated using the loH124 method.

Relevant local and regional plan policy should be consulted to determine restrictions on run-off from previously developed sites. In some cases green field rates may be requested. In practice it is difficult to restrict discharge rates at any one control point to less than 5 l/s.

The drainage provision for an infiltration SuDS scheme for the proposed development and compliance with DEFRA requirements will comprise:

Permeable paving within the proposed car parking spaces at ground floor levels.

Natural drainage through gravel and permeable soils, augmented by designed "French" drains around and within the perimeter of the building at "basement" level.

Attenuation/storage of the surface water run-off from the roofs of the building and the "hard-paved" impermeable areas within the site boundary at basement and ground floor levels around the perimeter of the building to allowing run-off to drain naturally over time through the permeable soils to the naturally occurring ground water table at depth.

The respective areas for assessment of both natural drainage and surface water run off are:

Permeable paving for car parking	366m ²
Natural drainage at "basement" level	150m ² (Figure included within impermeable areas)
Drainage from impermeable areas	1000m ²

SUMMARY OF STORM WATER DRAINAGE PROPOSALS SHOMREI HADDAS (Unimore) SUPERMARKET

DEFRA, March 2015, non-statutory guidance states:

The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the site for a 1 in 30 year rainfall event' and 'flooding does not occur during a 1 in 100 year rainfall event in any part of: a building (including a basement); or in any utility plant susceptible to water (e.g. pumping station or electricity substation) within the development"

The Non-Statutory Technical Guidance for SuDS (DEFRA, March 2015) states:

"Where reasonably practicable, for Greenfield development, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event should never exceed the Greenfield runoff volume for the same event. Where reasonably practicable, for developments which have been previously developed, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the Greenfield runoff volume for the same event, but should never exceed the runoff volume from the development site prior to redevelopment for that event."

In accordance with The SuDS Manual (C753) (CIRIA, 2015), the Greenfield run-off from the Site has been calculated using the loH124 method and is assumed representative of the run-off generated on the undeveloped surfaces that are affected by the proposed development. The method used for calculating the runoff complies with the NPPF (DGLC, 2014). For the impermeable surfaces, it has been assumed that 100% runoff will occur (calculations provided in Appendix A). Rainfall data is derived from the Flood Estimation Handbook (FEH) CD-ROM, developed by NERC (2009). Only areas affected by the proposed development are considered in the flow and volume calculations. Permeable areas that remain unchanged are not included in the calculations as it is assumed these will not be actively drained and attenuated.

Calculation of attenuation volume for surface water run-off from impermeable areas

In accordance with The SuDS Manual (C753) (CIRIA, 2015), the Greenfield run-off from the Site has been calculated using the loH124 method and is assumed representative of the run-off generated on the undeveloped surfaces that are affected by the proposed development. The method used for calculating the run-off complies with the NPPF (DGLC, 2014). For the impermeable surfaces, it has been assumed that 100% runoff will occur. Rainfall data is derived from the Flood Estimation Handbook (FEH) CD-ROM, developed by NERC (2009). Only areas affected by the proposed development are considered in the flow and volume calculations. Permeable areas that remain unchanged are not included in the calculations as it is assumed these will not be actively drained and attenuated.

The total discharge volume is calculated on the basis of the surface water run-off that has the potential to leave the site as a result of the assumed 6 hour duration design storm event.

SUMMARY OF STORM WATER DRAINAGE PROPOSALS SHOMREI HADDAS (Unimore) SUPERMARKET**Peak discharge rates**

The table below presents peak discharge rates for a range of storm events used to assess the impact of the proposed development and select the maximum permitted discharge rate.

Peak discharge rates associated with the development

Rainfall event	Greenfield run-off rates	Existing run-off rates ¹ (l/s)	Potential run-off rates without attenuation	Potential minus existing (l/s)
QBAR	0.0	N/A	N/A	N/A
6 hour 1 in 1 year	0.0	0.8	0.8	0.0
6 hour 1 in 10 year	0.0	2.5	2.5	0.0
6 hour 1 in 30 year	0.1	3.4	3.4	0.0
6 hour 1 in 100 year	0.1	4.6	4.6	0.0
6 hour 1 in 100 year + 20% CC	N/A	N/A	5.5	0.9
6 hour 1 in 100 year + 30% CC	N/A	N/A	5.9	1.4

¹ Assumes 100% run-off from impermeable surfaces. Assumes Greenfield run-off from permeable surfaces calculated using the loH124 method.

Total discharge volumes

The table below presents discharge volumes for a range of storm events used to assess the impact of the proposed development and calculate the required storage volumes.

Total discharge volumes associated with the development

Rainfall event	Greenfield run-off volume (m ³)	Existing run-off volume ² (m ³)	Potential run-off volume without attenuation (m ³)	Potential minus existing (m ³)
QBAR	4	N/A	N/A	N/A
6 hour 1 in 1 year	2	18	18	0.0
6 hour 1 in 10 year	5	54	54	0.0
6 hour 1 in 30 year	7	72	72	0.0
6 hour 1 in 100 year	10	99	99	0.0
6 hour 1 in 100 year + 20% CC	N/A	N/A	118	20

² Assumes 100% run-off from impermeable surfaces. Assumes Greenfield run-off from permeable surfaces calculated using the loH124 method.

SUMMARY OF STORM WATER DRAINAGE PROPOSALS SHOMREI HADDAS (Unimore) SUPERMARKET

Design of the attenuation requirements will be based on the run-off volumns for the impermeable areas for the 6 hour 1 in 100 year Rainfall event + 20% CC

Attenuation volume to be installed = 118 m³

Detail design of the surface water attenuation and storage provisions will be carried out by a Specilaist Design Company

The installation of the surface water attenuation storage provision will be a Q Bic Plus system as supplied by Wavin UK or similar approved system.

Details of the Wavin Q Bic Plus product and its installation are submitted for information along with this summary