

Hinckley & Bosworth Borough Council

Planning and building control

Hinckley Hub

Rugby Road

Hinckley

Leicestershire

LE10 0FR

Date: 30 November 2023

Your Ref: 23/00996/DISCON

Our Ref: HA/2130/2023/1

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Discharge of Conditions 4 and 5 for the proposed development at 1 Trinity Vicarage Road, Hinckley, Leicestershire, LE10 0BU

This letter has been prepared with reference to planning application reference 23/00996/DISCON, submitted to discharge planning conditions attached to planning permission 22/00195/FUL. This letter is aimed at discharging planning conditions 4 and 5 (herein referred to as 'Conditions 4 and 5'), that relate to the safe management of surface water runoff through the use of Sustainable Drainage Systems (SuDS).

Herrington Consulting Limited

The proposed development comprises of the erection of a 3-storey building consisting of 13 self-contained flats with associated amenity space, car parking, cycle storage and refuse/recycling facilities.

The details of Conditions 4 and 5 are quoted below:

Planning Condition 4

'Development shall not begin until a scheme to provide a sustainable surface water drainage system in accordance with the Flood Risk and Sustainable Drainage Assessment dated August 2018 has been submitted to and approved by the Local Planning Authority, and the scheme shall subsequently be implemented in accordance with the approved details before the development is completed.'

Planning Condition 5

'Prior to commencement of development details in relation to the long-term maintenance of the sustainable surface water drainage system on the development shall be submitted to and approved in writing by the Local Planning Authority. Details of the SuDS Maintenance Plan should include responsibilities and schedules for routine maintenance, remedial actions and monitoring of the separate elements of the system and should also include procedures that must be implemented in the event of pollution incidents within the development site.'

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Reference has been made throughout this letter to the Flood Risk and Sustainable Drainage Assessment produced by Herrington Consulting Ltd. in August 2018, associated with the original planning application for this development (22/00195/FUL). This report is hereby referred to as the FRA and SuDS report (2018).

This report was submitted as part of application 23/00996/DISCON, and it is acknowledged that the drainage officer has requested that the drawings and calculations are updated to incorporate a 40% allowance for climate change.

National Policy for SuDS

In accordance with the National Planning Policy Framework (NPPF, 2023), SuDS should be included within the proposed development scheme where it is practicable to do so. The proposed development must also maintain, or ideally reduce, the rate at which runoff is discharged offsite. This is to ensure that the offsite risk of surface water flooding is not increased by the development.

The Non-statutory Technical Standards for SuDS (NTSS) specify criteria to ensure sustainable drainage is included within development classified as 'major development' as set out in Article 2(1) of the Town and Country Planning (Development Management Procedure) (England) Order 2010. It is, however, recognised that SuDS should be designed to ensure that the maintenance and operation requirements are economically proportionate.

The proposed development comprises 13 new residential units and as such, is classified as 'major development'. The NTSS will therefore apply and further reference to the NTSS has been made within this letter to ensure the principles of sustainable drainage are considered.

Climate Change

The NPPF and supporting Planning Practice Guidance Suite (2023) state that residential development should be considered for a minimum of 100 years. The development that is the subject of this assessment is classified as residential, and therefore a design life of 100 years has been assumed.

The Environment Agency (EA) provides guidance regarding the application of the climate change allowances relating to peak rainfall intensity and how they should be applied to the planning process. Recognising that the impact of climate change will vary across the UK, the allowances were updated in May 2022 to show the anticipated changes to peak rainfall across a series of management catchments. The proposed development site is located in the Tame Anker and Mease Management Catchment, as defined by the 'Peak Rainfall Allowance' maps, hosted by the Department for Environment, Food and Rural Affairs.

For this development, an increase of 40% has been applied to the hydraulic drainage model constructed to inform the drainage strategy. Where this allowance has been applied the abbreviation "+40%cc" has been used.

Existing Site Drainage

Details of the existing site drainage have been detailed in the FRA and SuDS report (2018). The previous report details that surface water from the existing building drains towards an adjacent surface water sewer and presents the existing discharge rates off-site for a range of rainfall events with differing return periods.

The existing discharge rates are referred to within the proposed surface water management strategy section in this letter.

The existing site is 85% impermeable and as the impermeable area of the proposed site will increase, the discharge rates will also increase. As a consequence, SuDS have been incorporated into the scheme to reduce the overall rate at which surface water runoff is discharged from the site, over the lifetime of the development.

Drainage Hierarchy and Opportunities for Managing Surface Water Runoff

The opportunities for managing the surface water runoff discharged from the development site are outlined in the FRA and SuDS report (2018). The previous report lists the feasibility of surface water discharge in order of preference, with consideration of the drainage hierarchy outlined in Part H of the Building Regulations. It is found that discharging to the public sewer system is the most viable option for managing the site's surface water runoff.

Proposed Surface Water Drainage System

A drainage layout plan has been included within the enclosed documents, along with supporting calculations to demonstrate how the objectives set out in Conditions 4 and 5 can be achieved. The following SuDS have been proposed:

Permeable Surfacing – The use of permeable surfacing with underlying sub-base, laid across the proposed car park area, is considered to provide the most suitable and sustainable option to manage runoff from the proposed development.

Runoff from all roofs and hardstanding areas across the site will be directed into a layer of open graded subbase material, located beneath permeable surfacing. The rate at which runoff is permitted to exit the permeable surfacing system will be restricted through the use of a vortex flow control device (Hydro-Brake or similar).

The FRA and SuDS report (2018) provides further details surrounding mitigation measures in the event that the discharge via the flow control device becomes blocked, which includes overflow pipes and check valves.

A summary of the design parameters and Causeway Flow+ drainage analysis for the permeable surfacing is shown in Table 1 below.

Parameter	Design (1:100yr+40%cc event)
SuDS	Permeable Surfacing
Total area draining to permeable surfacing	712 m ²
Infiltration	Permitted (although assumed negligible)
Area of permeable paving	~ 310 m ²
Sub-base depth	450 mm
Required storage volume	42 m ³
Flow control device	Vortex flow control device (Hydro-Brake or similar).
Limiting discharge rate	2.0 l/s
Critical storm duration	120 minutes
Overflow device	Piped bypass <i>Connects directly to the public sewer system</i>

Table 1 – Summary of the permeable surfacing system, test for the design event 1:100+ 40%cc.

Surface Water Runoff Calculations

The results of the hydraulic drainage model are provided to demonstrate how the objectives set out in planning conditions 4 and 5 can be achieved.

The performance of the proposed drainage system has been tested by applying a series of rainfall events with varying return periods. The results have been summarised in Table 2 below.

Return Period	Existing Discharge rates	Proposed discharge rates	Betterment (%)
1 in 2yr	11.9 l/s	2.0 l/s	83%
1 in 30yr	29.3 l/s	2.0 l/s	93%
1 in 100yr	38.0 l/s	2.0 l/s	95%
1 in 100yr+40%cc	-	2.0 l/s	95%

Table 2 – Summary of proposed discharge rates, up to and including, 1:100+ 40%cc events.

From Table 2 it is evident that with the inclusion of the proposed SuDS, there is potential to accommodate all of the surface water runoff from the site, up to and including, the design rainfall event. This provides runoff characteristics that are a considerable betterment when compared to the existing situation. Consequently, it is considered that this will be acceptable to the Local Planning Authority (LPA), Lead Local Flood Authority (LLFA) and Severn Trent Water.

Design Exceedance

The proposed drainage system has been designed to accommodate surface water runoff generated under an extreme rainfall event, with a return period of 1 in 100 years, including a 40% increase in peak rainfall intensity (to account for the impacts of climate change). As such, this additional percentage increase complies with the EA's most contemporary guidance on climate change for the upper allowances.

The FRA and SuDS report (2018) provides information regarding the potential impacts of an exceedance or blockage event and appropriate mitigation measures. However, it is recognised that the drainage proposals will incorporate a significant volume of additional storage for storm water, which is not currently provided on the existing site. As a result, when compared to the existing site, it is likely that the volume of water discharged from the site during an extreme rainfall will be reduced, thus minimising the potential impact of flooding to the surrounding area.

In summary, with the inclusion of the SuDS discussed within this strategy, the proposed surface water drainage solution will not increase the risk of flooding at the site, or within the surrounding area, during an exceedance event and is, therefore, considered appropriate.

Maintenance and Management

Typical maintenance schedules have been produced for the proposed SuDS systems and have been included within the enclosed documents. For developments such as this, that rely to some extent on the ongoing inspection and maintenance of SuDS, it will be necessary to ensure that measures are in place to maintain the system for the lifetime of the development. The SuDS at this site are private and as such, it is likely that the management company responsible for maintaining the rest of the site will be tasked with the responsibility of maintaining and inspecting the proposed SuDS systems at this site.

During the construction of the proposed development, it will be necessary to manage the surface water runoff from the development site using a temporary drainage system. This system is to be managed

through a Construction and Environmental Management Plan, which will need to be in place to reduce the risk of surface water flooding to the surrounding area for this short period of time.

Prior to the decommissioning of the temporary drainage system, it will be necessary to ensure that the final proposed drainage is in place prior to the completion of the construction phase. This is to ensure that there is always a suitable method available for discharging surface water in a sustainable manner.

Summary

The opportunities for draining surface water runoff from the proposed development at Trinity Vicarage Road have been assessed, with the aim of discharging Conditions 4 and 5. The analysis has shown that discharging surface water runoff at an attenuated rate from the proposed development to an adjacent combined water sewer located to the north of the site, will present the most viable and sustainable solution for draining the site.

In order to restrict the rate at which surface water is discharged offsite, a permeable surfacing SuDS solution has been proposed. The proposed drainage system is designed to intercept surface water runoff from all roofs and hardstanding areas, and storing the water onsite before it is discharged to the public combined water sewer system. A vortex flow control device has been specified to attenuate the rate at which surface water is discharged from the site, limiting the rate to 2.0 l/s, providing a significant betterment when compared to the existing situation.

The calculations provided within this report clearly demonstrate that the rate of runoff under an extreme pluvial event, with a 1 in 100-year return period, including a 40% allowance for climate change, can be restricted to meet the requirements of the LPA, LLFA and NTSS.

A maintenance schedule for various SuDS is enclosed and provides details on how the management company can maintain the drainage system, to ensure continued operation for the lifetime of the development.

The information contained within this document provides details to demonstrate how surface water runoff will be managed on site and I trust that this information will be sufficient to enable Conditions 4 and 5 to be discharged in full.

Yours faithfully,

Elena Corchon MEng. MSc MCIWEM
Senior Drainage Engineer

Enclosed documents:

- Drainage Layout Plan
- Causeway Flow+ Calculations
- SuDS Maintenance Schedule

EI Sub Sta

EXISTING 225MM VC COMBINED SEWER



Key

- Surface water manhole
- Surface water pipeline
- ⊖ Surface water manhole with vortex flow control device 330 x 80mm
- ▤ Permeable paving with minimum 450mm depth of sub-base

Notes

1. Contains Ordnance Survey data © Crown copyright and database right 2018.
2. All dimensions are in metres unless otherwise stated elsewhere.
3. Proposed drainage positions will be subject to detailed design.
4. The size and extent of the permeable paving will be subject to infiltration testing and trial holes.
5. Connection position to existing sewer indicative and is subject to further site investigations.
6. All drainage systems will need to be installed and designed for suitable loading requirements.

Location Plan



herrington

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00	First Issue			20/07/2018	
Rev	Description			Date	
- CLIENT -					
MR RICHARD TYRE					
- PROJECT -					
SWMS - 1 TRINITY VICARAGE ROAD, HINCKLEY					
SCALE 1:100					
PROJ REF 2131		ORIGINATOR SJB		CHECKED BY SMB	
DWG REF: INDICATIVE DRAINAGE LAYOUT		DWG No. 2131-01			

Design Settings

Rainfall Methodology	FEH-99	Time of Entry (mins)	4.00
Return Period (years)	100	Maximum Time of Concentration (mins)	30.00
Additional Flow (%)	20	Maximum Rainfall (mm/hr)	200.0
C (1km)	-0.022	Minimum Velocity (m/s)	1.00
D1 (1km)	0.339	Connection Type	Level Inverts
D2 (1km)	0.341	Minimum Backdrop Height (m)	0.200
D3 (1km)	0.316	Preferred Cover Depth (m)	0.300
E (1km)	0.314	Include Intermediate Ground	✓
F (1km)	2.477	Enforce best practice design rules	✓
CV	0.750		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
MH1	0.036	4.00	116.100	1200	442420.000	293863.000	0.525
MH2	0.036	4.00	116.100	1200	442420.000	293870.000	0.600
MH3			116.100	1200	442425.000	293870.000	0.621

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.001	MH1	MH2	7.000	0.600	115.575	115.500	0.075	93.3	225	4.09	200.0
1.002	MH2	MH3	5.000	0.600	115.500	115.479	0.021	238.1	300	4.17	200.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.001	1.353	53.8	23.4	0.300	0.375	0.036	0.0	104	1.310
1.002	1.014	71.7	46.8	0.300	0.321	0.072	0.0	177	1.079

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.001	7.000	93.3	225	Circular	116.100	115.575	0.300	116.100	115.500	0.375
1.002	5.000	238.1	300	Circular	116.100	115.500	0.300	116.100	115.479	0.321

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.001	MH1	1200	Manhole	Adoptable	MH2	1200	Manhole	Adoptable
1.002	MH2	1200	Manhole	Adoptable	MH3	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
MH1	442420.000	293863.000	116.100	0.525	1200				
						0	1.001	115.575	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
MH2	442420.000	293870.000	116.100	0.600	1200		1	1.001	115.500	225
							0	1.002	115.500	300
MH3	442425.000	293870.000	116.100	0.621	1200		1	1.002	115.479	300

Simulation Settings

Rainfall Methodology	FEH-99	E (1km)	0.307	Skip Steady State	x
C (1km)	-0.028	F (1km)	2.343	Drain Down Time (mins)	240
D1 (1km)	0.372	Summer CV	1.000	Additional Storage (m³/ha)	20.0
D2 (1km)	0.337	Winter CV	1.000	Check Discharge Rate(s)	x
D3 (1km)	0.270	Analysis Speed	Normal	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160	4320
30	120	240	480	720	1440	2880	5760

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	0	0	0
100	40	0	0

Node MH3 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	115.479	Product Number	CTL-SHE-0073-2000-0600-2000
Design Depth (m)	0.600	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node MH2 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00100	Invert Level (m)	115.650	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	
Safety Factor	2.0	Width (m)	31.000	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	MH1	25	115.720	0.145	5.6	0.3618	0.0000	OK
30 minute summer	MH2	24	115.718	0.218	8.5	2.6779	0.0000	OK
30 minute summer	MH3	24	115.718	0.239	2.8	0.2705	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	MH1	1.001	MH2	3.2	0.317	0.060	0.2323	
30 minute summer	MH2	1.002	MH3	2.8	0.377	0.038	0.2878	
30 minute summer	MH2	Infiltration		0.0				
30 minute summer	MH3	Hydro-Brake®		2.0				6.5

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	MH1	59	115.832	0.257	7.3	0.6439	0.0000	FLOOD RISK
60 minute winter	MH2	59	115.832	0.332	14.2	13.0869	0.0000	FLOOD RISK
60 minute winter	MH3	59	115.832	0.353	2.5	0.3996	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	MH1	1.001	MH2	6.9	0.346	0.129	0.2784	
60 minute winter	MH2	1.002	MH3	2.5	0.372	0.035	0.3521	
60 minute winter	MH2	Infiltration		0.0				
60 minute winter	MH3	Hydro-Brake®		2.0				20.8

Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	MH1	60	115.929	0.354	10.6	0.8861	0.0000	FLOOD RISK
60 minute winter	MH2	60	115.929	0.429	20.7	22.3284	0.0000	FLOOD RISK
60 minute winter	MH3	60	115.929	0.450	3.1	0.5092	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	MH1	1.001	MH2	10.1	0.375	0.188	0.2784	
60 minute winter	MH2	1.002	MH3	3.1	0.393	0.044	0.3521	
60 minute winter	MH2	Infiltration		0.0				
60 minute winter	MH3	Hydro-Brake®		2.0				30.2

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	MH1	118	116.065	0.490	8.9	1.2255	0.0000	FLOOD RISK
120 minute winter	MH2	118	116.065	0.565	17.4	35.2491	0.0000	FLOOD RISK
120 minute winter	MH3	118	116.065	0.586	2.3	0.6625	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	MH1	1.001	MH2	8.5	0.339	0.158	0.2784	
120 minute winter	MH2	1.002	MH3	2.3	0.377	0.032	0.3521	
120 minute winter	MH2	Infiltration		0.0				
120 minute winter	MH3	Hydro-Brake®		2.0				39.3

Operation and Maintenance Schedule – Pervious paving / surfacing		
Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Brushing and vacuuming (for driveways this can be a standard cosmetic sweep over whole surface).	At minimum once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – particular attention must be paid to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment.
Occasional maintenance	Stabilise and mow contributing and adjacent areas.	As required.
	Removal of weeds or management using a suitable weed killer which will not adversely affect water quality. Weed killer should be applied directly into the weeds by an applicator rather than spraying.	As required – once per year on less frequently used pavements.
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving / surfacing.	As required when damage or erosion is detected following inspection. For block paving systems jointing material to be replaced shortly after installation and subsequently when required.
	Remedial work to any depressions. Rutting and cracked or broken blocks and replace lost jointing material (where block paving is used).	
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

General Maintenance Requirements for Permeable Surfacing (additional requirements may apply depending on type of surfacing material used).