

Mostyn Gospel Hall Trust
190 Station Road
Ratby
Leicestershire

BG Reference: BG26.108

26th May 2026

RE: Soakaway Calculations– Swedish Cottage**Introduction**

Brindle & Green have been commissioned to provide information to discharge planning conditions relating to the consultation of a new/ replacement building at Swedish Cottage, Earl Shilton, Leicestershire.

The planning condition relating to the site drainage reads as follows:

6. The development hereby permitted should not commence until drainage plans for the disposal of foul and surface water flows have been submitted to and approved by the Local Planning Authority. The scheme shall be implemented in accordance with the approved details before the development is first brought into use. Planning Practice Guidance and section H of the Building Regulations 2010 detail surface water disposal hierarchy. The disposal of surface water by means of soakaways should be considered as the primary method. If this is not practical and there is no watercourse available as an alternative, other sustainable methods should also be explored. If these are found unsuitable satisfactory evidence will need to be submitted before a discharge to the public sewerage system is considered. No surface water to enter the foul or combined water systems by any means.

Reason: To ensure that the development is provided with a satisfactory means of drainage as well as reduce the risk of creating or exacerbating a flooding problem and to minimise the risk of pollution and in accordance with Policy DM7 of the adopted Site Allocations and Development Management Policies Development Plan Document (2016).

The existing barn buildings are drained to a soakaway within the field area to the north of the barns. Under the approved site layout, the new building will have a smaller roof area than the existing barns and will continue to drain to the existing soakaway. The existing building roof area is approximately 250m², compared to the proposed building roof area which is approximately 174m².

The exact dimensions of the soakaway have not been determined, since this is already installed within the field. The catchment to the soakaway has been surveyed and the connectivity and the location of the outfall into the soakaway have all been confirmed.

Soakaway calculations have been undertaken based on assumed soakaway dimensions. These calculations are designed to confirm that the existing soakaway, which has the capacity to accommodate the existing roof catchment, will still have capacity to accommodate the proposed building roof catchment, based on the continued

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use of the same soakaway. Therefore, this will ensure that the flood risk to the site and offsite areas is not increased as a result of the development, and is indeed marginally reduced as a result of the reduction in impermeable rood area draining to the soakaway.

Based on the assumed soakaway dimensions, it is suggested that the soakaway may not have the capacity to accommodate all design rainfall events. However, there are no recorded incidents of flooding at the site, and the landowner/ client understands that the existing soakaway adequately accommodates flows from the building roof area. Since the proposed building is smaller than the existing building, and the existing soakaway is to be retained to serve this smaller catchment area, it follows that the soakaway will continue to be adequately sized to accommodate the catchment draining to it.

The external impermeable areas of the development, ie the proposed parking area, will be permeable, and will not require a formal connection to the existing soakaway or to any other formal drainage network.

It is not considered that an outfall to any watercourse or public sewer network will be required.

Foul drainage will be contained within the site within a collected tank, and emptied periodically for disposal off site. No connection to the public sewer network is anticipated or would be required.

The details contained within this letter are considered suitable to discharge Planning Condition 6 of the planning permission.

Yours sincerely,



Nicola Dibble
Head of Flood Risk & Drainage
For and on behalf of Brindle & Green Ltd

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Brindle & Green Limited. Registered company in England & Wales. Company number 08174516.
Registered office address: Unit 3, Silverhill Court, Radbourn, Ashbourne, Derbyshire, DE6 4LY.



Consider Area to be drained = 250 m²

EXISTING - Discharge via external soakaway

Flow

Time (min)	M2-D (mm)	Inflow M ³	Outflow M ³	Storage M ³
15	7.9	2.0	0.2	1.82
30	10.1	2.5	0.3	2.21
60	12.5	3.1	0.6	2.50
120	17.7	4.4	1.2	3.18
240	23.0	5.8	2.5	3.29
360	25.9	6.5	3.7	2.76
480	27.7	6.9	4.9	1.99
600	29.1	7.3	6.2	1.10
720	30.2	7.5	7.4	0.14
840	31.1	7.8	8.6	0
1440	34.4	8.6	14.8	0
2160	37.2	9.3	22.2	0
2880	39.7	9.9	29.6	0

Climate change allowance = 0 %

Outflow

Infiltration rate: 0.003 m/min 0.00005 m/s

External Soakaway

Soakaway details: 1.2 m diameter 0.7 m depth
Assume void ratio 1

Available storage area = 0.79 m³

Soakaway Pit details: 2.5 m length 2.5 m width 0.7 m depth
Assume void ratio 0.3

Available storage area = 0.52 m³

Total Storage area= 1.31 m³

Surface area: 3.43 m²

Eff volume: 1.31 m³ < 3.29 m³ WARNING

Additional storage volume required: 1.98 m³

Half drain down time 19172 secs 5.32547 hours
(soakaway only):

Soakaway dimensions assumed based on survey information provided by others. Infiltration rates based on testing within ground within the vicinity of the existing soakaway.

Calculations confirm the existing soakaway details and capacity, not design details.



Consider Area to be drained = 250 m²

EXISTING - Discharge via external soakaway

Flow

Time (min)	M30-D (mm)	Inflow M ³	Outflow M ³	Storage M ³
15	19.1	4.8	0.2	4.63
30	24.8	6.2	0.3	5.90
60	31.0	7.7	0.6	7.13
120	38.6	9.7	1.2	8.43
240	46.4	11.6	2.5	9.14
360	50.6	12.7	3.7	8.96
480	53.4	13.4	4.9	8.41
600	55.5	13.9	6.2	7.69
720	57.1	14.3	7.4	6.87
840	58.5	14.6	8.6	5.98
1440	63.5	15.9	14.8	1.06
2160	68.1	17.0	22.2	0
2880	72.2	18.0	29.6	0

Climate change allowance = 0 %

Outflow

Infiltration rate: 0.003 m/min 0.00005 m/s

External Soakaway

Soakaway details: 1.2 m diameter 0.7 m depth
Assume void ratio 1

Available storage area = 0.79 m³

Soakaway Pit details: 2.5 m length 2.5 m width 0.7 m depth
Assume void ratio 0.3

Available storage area = 0.52 m³

Total Storage area = 1.31 m³

Surface area: 3.43 m²

Eff volume: 1.31 m³ < 9.14 m³ WARNING

Additional storage volume required: 7.83 m³

Half drain down time 53297 secs 14.8048 hours
(soakaway only):

Soakaway dimensions assumed based on survey information provided by others. Infiltration rates based on testing within ground within the vicinity of the existing soakaway.

Calculations confirm the existing soakaway details and capacity, not design details.

Project.

Swedish Cottage, Earl Shilton

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Revision.

Consider Area to be drained = **250 m²**
EXISTING - Discharge via external soakaway
Flow

Time (min)	M100-D (mm)	Inflow M ³	Outflow M ³	Storage M ³
15	24.0	6.0	0.2	5.85
30	31.6	7.9	0.3	7.59
60	39.5	9.9	0.6	9.26
120	48.4	12.1	1.2	10.86
240	57.5	14.4	2.5	11.92
360	62.6	15.7	3.7	11.95
480	66.0	16.5	4.9	11.56
600	68.5	17.1	6.2	10.95
720	70.5	17.6	7.4	10.21
840	72.1	18.0	8.6	9.38
1440	77.8	19.5	14.8	4.64
2160	82.9	20.7	22.2	0
2880	87.2	21.8	29.6	0

Climate change allowance = **0 %**
Outflow

Infiltration rate: **0.003 m/min** **0.00005 m/s**
External Soakaway

Soakaway details: **1.2 m diameter** **0.7 m depth**
Assume void ratio **1**

Available storage area = **0.79 m³**

Soakaway Pit details: **2.5 m length** **2.5 m width** **0.7 m depth**
Assume void ratio **0.3**

Available storage area = **0.52 m³**

Total Storage area = **1.31 m³**

Surface area: **3.43 m²**

Eff volume: **1.31 m³** < **11.95 m³** **WARNING**

Additional storage volume required: **10.64 m³**

Half drain down time **69684 secs** **19.3565 hours**
(soakaway only):

Soakaway dimensions assumed based on survey information provided by others. Infiltration rates based on testing within ground within the vicinity of the existing soakaway.

Calculations confirm the existing soakaway details and capacity, not design details.



Consider Area to be drained = 250 m²

EXISTING - Discharge via external soakaway

Flow

Time (min)	M100-D (mm)	Inflow M ³	Outflow M ³	Storage M ³
15	24.0	8.4	0.2	8.26
30	31.6	11.1	0.3	10.75
60	39.5	13.8	0.6	13.21
120	48.4	16.9	1.2	15.69
240	57.5	20.1	2.5	17.67
360	62.6	21.9	3.7	18.21
480	66.0	23.1	4.9	18.15
600	68.5	24.0	6.2	17.79
720	70.5	24.7	7.4	17.25
840	72.1	25.2	8.6	16.58
1440	77.8	27.2	14.8	12.43
2160	82.9	29.0	22.2	6.78
2880	87.2	30.5	29.6	0.90

Climate change allowance = 40 %

Outflow

Infiltration rate: 0.003 m/min 0.00005 m/s

External Soakaway

Soakaway details: 1.2 m diameter 0.7 m depth
Assume void ratio 1

Available storage area = 0.79 m³

Soakaway Pit details: 2.5 m length 2.5 m width 0.7 m depth
Assume void ratio 0.3

Available storage area = 0.52 m³

Total Storage area = 1.31 m³

Surface area: 3.43 m²

Eff volume: 1.31 m³ < 18.21 m³ WARNING

Additional storage volume required: 16.90 m³

Half drain down time 106197 secs 29.4992 hours
(soakaway only):

Soakaway dimensions assumed based on survey information provided by others. Infiltration rates based on testing within ground within the vicinity of the existing soakaway.

Calculations confirm the existing soakaway details and capacity, not design details.



Consider Area to be drained = 174 m²

Discharge via external soakaway

Flow

Time (min)	M2-D (mm)	Inflow M ³	Outflow M ³	Storage M ³
15	7.9	1.4	0.2	1.22
30	10.1	1.8	0.3	1.45
60	12.5	2.2	0.6	1.55
120	17.7	3.1	1.2	1.84
240	23.0	4.0	2.5	1.54
360	25.9	4.5	3.7	0.80
480	27.7	4.8	4.9	0
600	29.1	5.1	6.2	0
720	30.2	5.3	7.4	0
840	31.1	5.4	8.6	0
1440	34.4	6.0	14.8	0
2160	37.2	6.5	22.2	0
2880	39.7	6.9	29.6	0

Climate change allowance = 0 %

Outflow

Infiltration rate: 0.003 m/min 0.00005 m/s

External Soakaway

Soakaway details: 1.2 m diameter 0.7 m depth
Assume void ratio 1

Available storage area = 0.79 m³

Soakaway Pit details: 2.5 m length 2.5 m width 0.7 m depth
Assume void ratio 0.3

Available storage area = 0.52 m³

Total Storage area= 1.31 m³

Surface area: 3.43 m²

Eff volume: 1.31 m³ < 1.84 m³ WARNING

Additional storage volume required: 0.52 m³

Half drain down time 10707 secs 2.97429 hours
(soakaway only):

Soakaway dimensions assumed based on survey information provided by others. Infiltration rates based on testing within ground within the vicinity of the existing soakaway.

Calculations confirm the existing soakaway details and capacity, with the proposed building roof contributing area.

Attenuation Estimates

BG28.108

Minimum Storage Required:

48 m³

FACTOR	VALUE	SOURCE
Return Period (yrs):	30	Environment Agency, Water Authority, etc.
Limiting Discharge (l/s):	1	Environment Agency, Water Authority, etc.
Contributing Area (ha):	0.174	Site plans
Impervious, PIMP (%):	100	Site plans
M5-60min (mm):	20	Volume 3 maps and site location
SAAR (mm/yr):	565	Volume 3 maps and site location
Ratio, r:	0.45	Volume 3 maps and site location
Soil Type:	4	Volume 3 maps and site location
SOIL:	0.45	Soil Type and Volume 1, Section 7.4
UCWI:	41	SAAR and Volume 1, Figure 9.7
Calculated PR	76.64	
Percentage Runoff =	76.64	

FACTOR	VALUE
Additional Inflow (l/s):	0
Calculate/Specify PR:	Calculate
Specify PR:	100
Climate Change Allowance	0

Duration, D (min)	M30-D (mm)	incl climate change	Area C (ha)	PR (%)	Runoff (m3)	Add. Runoff (m3)	Total Runoff (m3)	Limiting Discharge (m3/min)	Limiting Runoff (m3)	Storage Required (m3)
15	19.1	19.1	0.17	77	25.5	0.0	25.5	0.06	0.9	24.6
30	24.8	24.8	0.17	77	33.1	0.0	33.1	0.06	1.8	31.3
60	31.0	31.0	0.17	77	41.3	0.0	41.3	0.06	3.6	37.7
120	38.6	38.6	0.17	77	51.5	0.0	51.5	0.06	7.2	44.3
240	46.4	46.4	0.17	77	61.9	0.0	61.9	0.06	14.4	47.5
360	50.6	50.6	0.17	77	67.5	0.0	67.5	0.06	21.6	45.9
480	53.4	53.4	0.17	77	71.2	0.0	71.2	0.06	28.8	42.4
600	55.5	55.5	0.17	77	74.0	0.0	74.0	0.06	36.0	38.0
720	57.1	57.1	0.17	77	76.2	0.0	76.2	0.06	43.2	33.0
840	58.5	58.5	0.17	77	78.0	0.0	78.0	0.06	50.4	27.6
1440	63.5	63.5	0.17	77	84.7	0.0	84.7	0.06	86.4	-1.7
2160	68.1	68.1	0.17	77	90.8	0.0	90.8	0.06	129.6	-38.8
2880	72.2	72.2	0.17	77	96.3	0.0	96.3	0.06	172.8	-76.5

Attenuation Estimates

BG28.108

Minimum Storage Required:

62 m³

FACTOR	VALUE	SOURCE
Return Period (yrs):	100	Environment Agency, Water Authority, etc.
Limiting Discharge (l/s):	1	Environment Agency, Water Authority, etc.
Contributing Area (ha):	0.174	Site plans
Impervious, PIMP (%):	100	Site plans
M5-60min (mm):	20	Volume 3 maps and site location
SAAR (mm/yr):	565	Volume 3 maps and site location
Ratio, r:	0.45	Volume 3 maps and site location
Soil Type:	4	Volume 3 maps and site location
SOIL:	0.45	Soil Type and Volume 1, Section 7.4
UCWI:	41	SAAR and Volume 1, Figure 9.7
Calculated PR	76.64	
Percentage Runoff =	76.64	

FACTOR	VALUE
Additional Inflow (l/s):	0
Calculate/Specify PR:	Calculate
Specify PR:	100
Climate Change Allowance	0

Duration, D (min)	M100-D (mm)	incl climate change	Area C (ha)	PR (%)	Runoff (m3)	Add. Runoff (m3)	Total Runoff (m3)	Limiting Discharge (m3/min)	Limiting Runoff (m3)	Storage Required (m3)
15	24.0	24.0	0.17	77	32.0	0.0	32.0	0.06	0.9	31.1
30	31.6	31.6	0.17	77	42.1	0.0	42.1	0.06	1.8	40.3
60	39.5	39.5	0.17	77	52.7	0.0	52.7	0.06	3.6	49.1
120	48.4	48.4	0.17	77	64.5	0.0	64.5	0.06	7.2	57.3
240	57.5	57.5	0.17	77	76.7	0.0	76.7	0.06	14.4	62.3
360	62.6	62.6	0.17	77	83.5	0.0	83.5	0.06	21.6	61.9
480	66.0	66.0	0.17	77	88.0	0.0	88.0	0.06	28.8	59.2
600	68.5	68.5	0.17	77	91.3	0.0	91.3	0.06	36.0	55.3
720	70.5	70.5	0.17	77	94.0	0.0	94.0	0.06	43.2	50.8
840	72.1	72.1	0.17	77	96.1	0.0	96.1	0.06	50.4	45.7
1440	77.8	77.8	0.17	77	103.8	0.0	103.8	0.06	86.4	17.4
2160	82.9	82.9	0.17	77	110.5	0.0	110.5	0.06	129.6	-19.1
2880	87.2	87.2	0.17	77	116.3	0.0	116.3	0.06	172.8	-56.5



Project.

Swedish Cottage, Earl Shilton

By.

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Checked.

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Revision.

Consider Area to be drained = 174 m²

Discharge via external soakaway

Flow

Time (min)	M100-D (mm)	Inflow M ³	Outflow M ³	Storage M ³
15	24.0	5.9	0.2	5.70
30	31.6	7.7	0.3	7.39
60	39.5	9.6	0.6	9.01
120	48.4	11.8	1.2	10.55
240	57.5	14.0	2.5	11.55
360	62.6	15.3	3.7	11.55
480	66.0	16.1	4.9	11.13
600	68.5	16.7	6.2	10.51
720	70.5	17.2	7.4	9.76
840	72.1	17.6	8.6	8.92
1440	77.8	19.0	14.8	4.14
2160	82.9	20.2	22.2	0
2880	87.2	21.3	29.6	0

Climate change allowance = 40 %

Outflow

Infiltration rate: 0.003 m/min 0.00005 m/s

External Soakaway

Soakaway details: 1.2 m diameter 0.7 m depth
Assume void ratio 1

Available storage area = 0.79 m³

Soakaway Pit details: 2.5 m length 2.5 m width 0.7 m depth
Assume void ratio 0.3

Available storage area = 0.52 m³Total Storage area = 1.31 m³Surface area: 3.43 m²Eff volume: 1.31 m³ < 11.55 m³ WARNINGAdditional storage volume required: 10.24 m³

Half drain down time 67347 secs 18.7074 hours
(soakaway only):

Soakaway dimensions assumed based on survey information provided by others. Infiltration rates based on testing within ground within the vicinity of the existing soakaway.

Calculations confirm the existing soakaway details and capacity, with the proposed building roof contributing area.