



DRAINAGE STRATEGY

CARE HOME, DENE HOLM, GRAVESHAM
RDT ARCHITECTS
AUGUST 2025
6565-DENE-ICS-XX-RP-C-07.001

DRAINAGE STRATEGY

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REPORT ISSUE

Revision	Date	Notes
P01	19/08/2025	First Issue
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P03	16/09/2025	

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REVIEWED BY

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1 DRAINAGE STRATEGY

Item	Details
Method of Foul Water Discharge	Foul water flows are to drain to the existing sewers located on site via a subject to confirmation of capacity by Southern Water. The on-site system will be privately maintained by the owners of the freehold or their representatives.
Method of Surface Water Discharge	The surface water drainage design proposed for the new dwellings is to follow the drainage hierarchy to ensure the site reflects the natural flows from the site as closely as possible: 1. Rainwater reuse 2. Infiltration 3. Discharge to Surface Water or a Watercourse 4. Discharge to a Surface Water sewer or a Highway Drain 5. Discharge to a Foul Sewer Surface water falling onto the roof and hardstanding areas are to be drained via infiltration using permeable paving and modular/crate soakaways. Silt traps will be utilised to catch silt and debris from the roof run off and permeable paving and surface water treatment devices will be used to treat water from access roads and parking bays. The on-site system will be privately maintained in line with the guidance to the rear of this document by the owners of the freehold or their representatives.
Local Ground Conditions	A site investigation has yet to be undertaken for the site. However, LandIS indicated that the land is free draining and consists of slightly acid loamy soils
Infiltration Rate	A soakage rate of 3.0×10^{-5} m/s has been assumed based on local geology information found on the LandIS. Future site investigations will be needed to confirm the assumptions.
Surface Water Calculations	The surface water drainage system has been designed for a 1 in 100-year event, plus an allowance of 40% for climate change. Impermeable areas have had an additional 10% added for urban creep in line with Ciria C753. Contributing Areas Roof Areas = 1460m² Parking Area = 980m² Total Area = 2440m²
Ground Water	A site investigation has yet to be undertaken for the site. However, LandIS does not indicate a risk of high groundwater in the area Further in-situ testing is required to confirm the depth of groundwater.
Water Quality	Permeable paving and surface water treatment devices will be required to treat the run off from the car parking areas within this site.

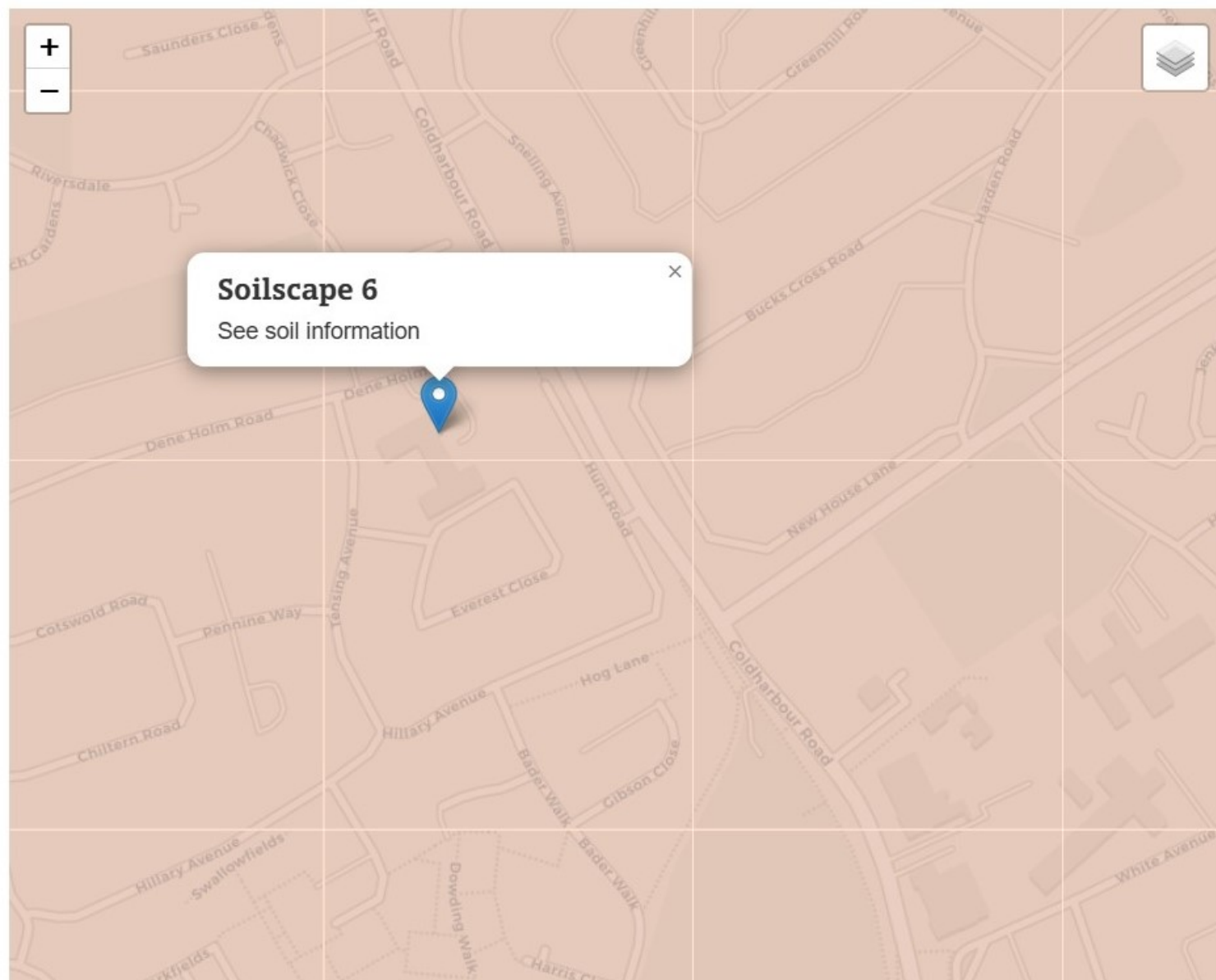
Item	Details
Fluvial Flood Risk/ Environment Agency Flood Mapping	The Environment Agency flood map for the development site suggests that the site wholly falls within Flood zone 1, which is defined as land assessed as having a less than 1 in 1000 annual probability of river flooding in any one year.
SuDS Maintenance	During construction, the SuDS systems will be maintained by the contractor. Upon sale of the last plot, the SuDS drainage system inclusive of access road, permeable paving and silt traps are to be maintained by the owner of the freehold or their appointed representative(s).
Other	

Appendix A - Maintenance Schedule

Item	Required Maintenance	Frequency
Pipe and chambers	CCTV camera survey, flush, descale, repair as necessary	5 Years or upon poor performance
Pervious pavements (Block Paving)	Brushing and vacuuming.	Three times/year at end of winter, mid-summer, after autumn leaf fall, or as required based on site-specific observations of clogging or manufacturers' recommendations.
	Stabilise and mow contributing and adjacent areas.	As required.
	Removal of weed.	As required.
	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving.	As required.
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users.	As required.
	Rehabilitation of surface and upper sub-structure.	As required (if infiltration performance is reduced as a result of significant clogging).
	Initial inspection.	Monthly for 3 months after installation
	Inspect for evidence of poor operation and/or weed growth. If required, take remedial action.	3-monthly, 48 h after large storms.
	Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually.
	Monitor inspection chambers.	Annually.
Geocellular/modular systems (Crates)	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly
	Debris removal from catchment surface (where may cause risks to performance)	Monthly
	Where rainfall infiltrates into blocks from above, check surface of filter for blockage by silt, algae or other matter. Remove and replace surface infiltration medium as necessary.	Monthly (and after large storms)
	Remove sediment from pre-treatment structures	Annually, or as required
	Repair/rehabilitation of inlets, outlet, overflows and vents	As required
	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually and after large storms
Silt traps and catchpits	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly
	Debris removal from catchment surface (where may cause risks to performance)	Monthly
	Inspection of silt traps and catch pits to assess silt accumulation	Monthly (and after large storms)
	Removal of accumulated silt from silt trap and catch pit sumps	Annually, or as required

Item	Required Maintenance	Frequency
	Repair/rehabilitation of inlets, outlet, overflows and vents	As required
	Inspect/check all inlets, outlets, and overflows to ensure that they are in good condition and operating as designed	Annually and after large storms
Storm water treatment devices	Inspection of the tank for oil and sediment levels	Annually (and following poor performance)
	Cleaning of tank., inlets, outlets, gutters, withdrawal Of collected oil and silt	Annually (and following poor performance)
	Cleaning and/or replacement of any filters	Three monthly (or as required)
	Repair of overflow erosion damage or damage to tank.	As required

Appendix B - LandIS Information



Soil Information

Soilscape 6:

Freely draining slightly acid loamy soils

Texture:

Loamy

Coverage:

England: 15.5%, Wales: 24.4%, England & Wales: 16.7%

Drainage:

Freely draining



Fertility:

Low



Landcover:

Arable and grassland

Appendix C - Drainage Calculations

Project: Care Home, Dene Holm, Gravesham	Date: 16/09/2025		
	Designed by: APL	Checked by:	Approved By:
Report Details: Type: Inflows Storm Phase: Phase	The Stable, High Cogges Farm: High Cogges Witney Oxon		


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Catchment Upper South

Type : Catchment Area

Area (ha)	0.023
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Preliminary Sizing

Volumetric Runoff Coefficient	0.950
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.950
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment upper North

Type : Catchment Area

Area (ha)	0.01
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Preliminary Sizing

Volumetric Runoff Coefficient	0.950
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.950
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Upper mid

Type : Catchment Area

Area (ha)	0.012
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Preliminary Sizing

Volumetric Runoff Coefficient	0.950
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.950
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100

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Upper Car Park east

Type : Catchment Area

Area (ha)	0.032
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Preliminary Sizing

Volumetric Runoff Coefficient	0.950
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.950
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Northern Car Park

Type : Catchment Area

Area (ha)	0.028
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Preliminary Sizing

Volumetric Runoff Coefficient	0.950
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.950
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area

Type : Catchment Area

Area (ha)	0.034
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Preliminary Sizing

Volumetric Runoff Coefficient	0.950
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.950
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100

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Catchment Area (1)

Type : Catchment Area

Area (ha)	0.012
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Preliminary Sizing

Volumetric Runoff Coefficient	0.950
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.950
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (2)

Type : Catchment Area

Area (ha)	0.007
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Preliminary Sizing

Volumetric Runoff Coefficient	0.950
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.950
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (5)

Type : Catchment Area

Area (ha)	0.019
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Preliminary Sizing

Volumetric Runoff Coefficient	0.950
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.950
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100

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Catchment Area (6)

Type : Catchment Area

Area (ha)	0.021
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Preliminary Sizing

Volumetric Runoff Coefficient	0.950
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.950
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (7)

Type : Catchment Area

Area (ha)	0.015
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Preliminary Sizing

Volumetric Runoff Coefficient	0.950
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.950
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Lower Car Park

Type : Catchment Area

Area (ha)	0.014
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Preliminary Sizing

Volumetric Runoff Coefficient	0.950
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.950
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100

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Delivery area

Type : Catchment Area

Area (ha)	0.013
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Preliminary Sizing

Volumetric Runoff Coefficient	0.950
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.950
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (10)

Type : Catchment Area

Area (ha)	0.005
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Preliminary Sizing

Volumetric Runoff Coefficient	0.950
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.950
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project: Care Home, Dene Holm, Gravesham	Date: 16/09/2025		
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PP Upper South

Type : Porous Paving

Dimensions

Exceedance Level (m)	36.120
Depth (m)	0.450
Base Level (m)	35.670
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	3.0
Porosity (%)	30
Length (m)	31.454
Long. Slope (1:X)	1000.00
Width (m)	5.613
Total Volume (m³)	16.951

Advanced

Base Infiltration Rate (m/hr)	0.108
Side Infiltration Rate (m/hr)	0.108
Safety Factor	2.0
Conductivity (m/hr)	1000.0



PP Upper North

Type : Porous Paving

Dimensions

Exceedance Level (m)	35.740
Depth (m)	0.500
Base Level (m)	35.240
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	3.0
Porosity (%)	30
Length (m)	8.903
Long. Slope (1:X)	40.00
Width (m)	4.113
Total Volume (m³)	4.065

Advanced

Base Infiltration Rate (m/hr)	0.108
Side Infiltration Rate (m/hr)	0.108
Safety Factor	2.0
Conductivity (m/hr)	1000.0

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Lower Car park

Type : Porous Paving

Dimensions

Exceedance Level (m)	33.175
Depth (m)	0.520
Base Level (m)	32.655
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	3.0
Porosity (%)	30
Length (m)	10.000
Long. Slope (1:X)	1000.00
Width (m)	7.500
Total Volume (m³)	8.775

Advanced

Base Infiltration Rate (m/hr)	0.108
Side Infiltration Rate (m/hr)	0.108
Safety Factor	2.0
Conductivity (m/hr)	1000.0

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Soakaway Upper North

Type : Cellular Storage

Dimensions

Exceedance Level (m)	35.130
Depth (m)	0.800
Base Level (m)	34.320
Number of Crates Long	7
Number of Crates Wide	10
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	26.610

Advanced

Base Infiltration Rate (m/hr)	0.108
Side Infiltration Rate (m/hr)	0.108
Safety Factor	2.0



Cellular soakaway Upper Car park

Type : Cellular Storage

Dimensions

Exceedance Level (m)	35.600
Depth (m)	0.800
Base Level (m)	34.150
Number of Crates Long	6
Number of Crates Wide	8
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	18.890

Advanced

Base Infiltration Rate (m/hr)	0.108
Side Infiltration Rate (m/hr)	0.108
Safety Factor	2.0

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Cellular Storage (1)

Type : Cellular Storage

Dimensions

Exceedance Level (m)	33.175
Depth (m)	0.800
Base Level (m)	31.375
Number of Crates Long	14
Number of Crates Wide	14
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	75.480

Advanced

Base Infiltration Rate (m/hr)	0.108
Side Infiltration Rate (m/hr)	0.108
Safety Factor	2.0

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FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Upper South	FSR: 100 years: +40 %: 15 mins: Summer	0.02	19.5	8.603
Catchment upper North	FSR: 100 years: +40 %: 15 mins: Summer	0.01	8.3	3.667
Catchment Upper mid	FSR: 100 years: +40 %: 15 mins: Summer	0.01	9.9	4.354
Upper Car Park east	FSR: 100 years: +40 %: 15 mins: Summer	0.03	26.7	11.766
Catchment Northern Car Park	FSR: 100 years: +40 %: 15 mins: Summer	0.03	23.8	10.483
Catchment Area	FSR: 100 years: +40 %: 15 mins: Summer	0.03	28.9	12.740
Catchment Area (1)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	10.0	4.387
Catchment Area (2)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	5.5	2.417
Catchment Area (5)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	16.0	7.057
Catchment Area (6)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	18.0	7.907
Catchment Area (7)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	13.0	5.707
Lower Car Park	FSR: 100 years: +40 %: 15 mins: Summer	0.01	11.8	5.195
Delivery area	FSR: 100 years: +40 %: 15 mins: Summer	0.01	10.8	4.764
Catchment Area (10)	FSR: 100 years: +40 %: 15 mins: Summer	0.00	4.2	1.829

Project: Care Home, Dene Holm, Gravesham	Date: 16/09/2025		
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Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	The Stable, High Cogges Farm: High Cogges Witney Oxon		


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FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Flooded Volume

Stormwater Control	Storm Event	Max. Avg. Level (m)	Max. Avg. Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Soakaway Upper North	FSR: 100 years: +40 %: 15 mins: Summer	34.776	0.456	33.6	15.156	0.000	0.0	0.000	43.044	OK
PP Upper South	FSR: 100 years: +40 %: 15 mins: Summer	35.834	0.164	26.7	8.733	0.000	0.0	0.000	48.481	OK
PP Upper North	FSR: 100 years: +40 %: 15 mins: Summer	35.352	0.112	4.2	1.233	0.000	0.0	0.000	69.662	OK
Cellular soakaway Upper Car park	FSR: 100 years: +40 %: 15 mins: Summer	34.590	0.440	23.8	10.025	0.000	0.0	0.000	46.928	OK
Cellular Storage (1)	FSR: 100 years: +40 %: 15 mins: Summer	31.835	0.460	56.2	42.829	0.000	0.0	0.000	43.257	OK
Lower Car park	FSR: 100 years: +40 %: 15 mins: Summer	32.787	0.132	11.8	2.967	0.000	2.3	1.883	66.194	OK

Appendix D - Sewer Records

Appendix E - Drainage Layout

The surface water from the roofs and parking areas will be collected and discharged to the ground with the use of permeable paving and cellular soakaways. A soakage rate has been assumed with the use of Landis for soil composition in the area and the Ciria 753: The Suds Manual for typical infiltration coefficients of soils. This will require confirmation at detailed design stage.

Run off from the roofs will be pass through silt traps to remove silt and debris from the run off before entering the infiltration features. Where, or, run off from access and parking areas will be discharged into permeable paving or pass through a treatment device before entering the ground to ensure pollutants are removed in line with Ciria 753 Chapter 26.

Existing foul sewer to be intercepted and new chamber constructed. Subject to S106 consent from Southern Water.

Build Close to agreement may be required due to proximity of sewer to new building.

Surface Water system designed for a 1 in 100 year event plus an allowance of 40% for climate change.

Impermeable areas have had an additional 10% added for urban creep.

An assumed soakage rate of 3x10-5m/s has been used for the calculations for the infiltration features on this scheme. This rate is based on the soils in the area as reported by LandIS and typical infiltration coefficients in table 25.1 Ciria753- The SuDs Manual

Full CCTV survey required to determine if there are upstream connections and if any drainage assets can be reused.

Full CCTV survey required to determine if there are upstream connections and if any drainage assets can be reused.

refer to Architects details

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