

Technical Note

Project:	Thamesfield Retirement Village Development	Job No:	222351
Subject:	Drainage / SuDS Strategy	Revision:	05
Prepared by:	Richard James	Date:	03rd September 2025

This technical note has been prepared to provide supporting evidence relating to the Drainage / SuDS Strategy for the proposed development at the above site.

The application site is located within the village of Remenham, directly opposite Henley-on-Thames. The site is bordered by the River Thames to the south west, and Wargrave Road to the north east. To the north west there are retirement properties known as Remenham Row and to the south east is the Eyot Centre. The site is broadly square in shape and comprises approximately 0.88ha of land. Vehicular and pedestrian access to the site is currently directly off Wargrave Road.

Thamesfield is an established and operational Integrated Retirement Community (IRC) providing extra care retirement accommodation and associated communal facilities. The Site currently comprises 37 extra care units (use class C2).

It contains two distinct buildings - the main building which covers the northern part of the site and Thamesfield Lodge which is located in the eastern corner. The main building comprises three elements: the original Stucco Fronted building which fronts on to the Thames and late 20th century extension to the north; the 1993 extension which is adjacent to the northern boundary of the site and the 1995 extension which is broadly centrally located within the site. A mix of hard and soft landscaping cover the remainder of the site including car parking, a croquet lawn and a landscaped lawn down to the banks of the River Thames.

The surrounding area comprises a diverse mix of uses, including residential, sports and hospitality. The site is a short distance (c. 300m) from Henley Bridge and, as such, is well located in respect of the facilities and services within Henley.

The following constraints and designations are relevant to the site:

- The site is entirely within Flood Zone 3;
- The site is within the Green Belt;
- Park Palace and Temple Combe Grade II* Registered Park and Garden, which is also designated as a Local Wildlife Site, is located at approximately 320m to the east of the site;
- The site is within Remenham Henley Bridge Conservation Area and is opposite the Henley Conservation Area on the western side of the River Thames;
- The site is on a 'Green Route'; and
- There are a number of trees covered by a Tree Preservation Order (TPO-0206-1981).

The existing site is considered a brownfield site and has an approximate site area of 0.88Ha, of which 0.43Ha is considered to be impermeable.

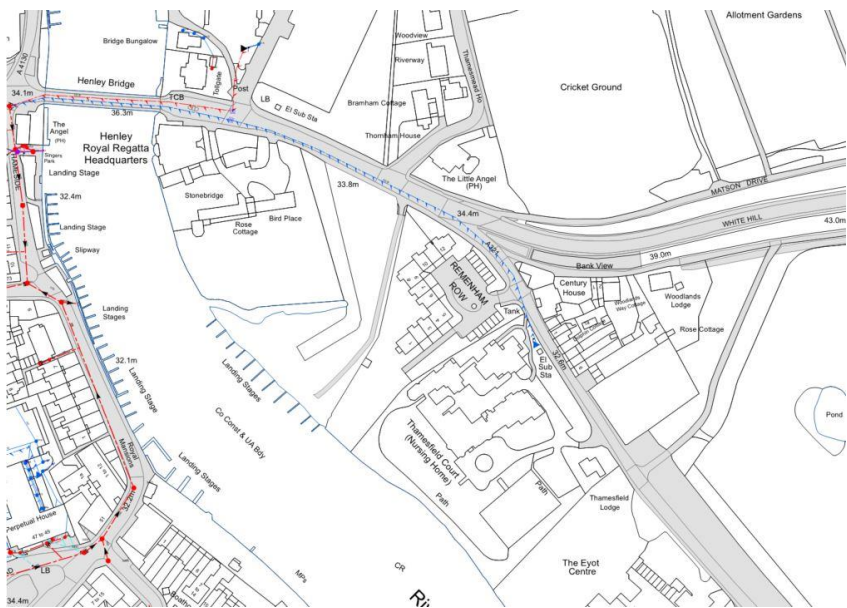
The development involves the part demolition of the existing building and replacement with a three-storey extension to provide extra-care units (Use Class C2), with associated soft and hard landscaping works; provision of additional vehicle parking, bin stores and ancillary structures; and alterations to existing basement".

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A Geotechnical site investigation undertaken at the site confirmed that the site is underlain by made ground over clay up to approximately 2.4m deep. Sand and gravel was encountered below the clay with groundwater being encountered at just over 2m below ground rising to 1.6m below ground.

Existing Site Drainage

With reference to the Thames Water sewer record plan, there are no public sewers crossing the site.



A utility tracing survey undertaken by Laser Surveys Ltd and a drainage CCTV survey carried out by Utility Surveys Ltd, confirms that the existing surface water drainage discharges towards the River Thames.

The survey also confirms that the existing foul drainage for the site drains to an existing pump chamber at the north of the site next to the Substation where it is then pumped along Wargrave Road and connects into the public foul network in Thameside.

A separate foul pump chamber is provided for the lodge house, this pumps back into the site foul drainage.

For further information on the existing drainage arrangement refer to a copy of the drainage survey and utility survey drawings includes as part of this report.

The table below shows the greenfield run off rates for the site based on a site area of 1.24Ha

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Event	Greenfield Run Off Rate
QBar	0.5l/s
1 in 1 year	0.4l/s
1 in 30 year	1.1l/s
1 in 100 year	1.6l/s

It can be assumed that the site currently freely discharges to the River Thames, the modified rational method can be adopted in line with Section 24.6.2 of the CIRIA “The SuDS Manual”, in order to determine an estimate for the existing surface water runoff rate from the site. The below table outlines the existing run off rates for a number of events. The peak intensities are based on FSR rainfall data and a winter rainfall profile for a duration of 60 minutes and an impermeable area of 0.43Ha.

Event	Peak intensity (i) 60min Winter Event	Calculation	Brownfield Discharge Rate
1 in 1 year	32.196mm/hr	$Q = 3.61 \times 1.00 \times 32.196 \times 0.43$	49.98 l/s
1 in 30 year	77.499mm/hr	$Q = 3.61 \times 1.00 \times 77.499 \times 0.43$	120.30l/s
1 in 100 year	101.894mm/hr	$Q = 3.61 \times 1.00 \times 101.894 \times 0.43$	158.17 l/s

The majority of the site and existing buildings are remaining and will continue to drain as per the existing arrangement, however 580m² of existing building is being demolished to make way for a new residential block. The existing runoff from this area can be calculated as follows:

Event	Peak intensity (i) 60min Winter Event	Calculation	Brownfield Discharge Rate
1 in 1 year	32.196mm/hr	$Q = 3.61 \times 1.00 \times 32.196 \times 0.058$	6.74 l/s
1 in 30 year	77.499mm/hr	$Q = 3.61 \times 1.00 \times 77.499 \times 0.058$	16.23l/s
1 in 100 year	101.894mm/hr	$Q = 3.61 \times 1.00 \times 101.894 \times 0.058$	21.33l/s

Local Planning Policies

Referring to Wokingham Borough Council’s planning guidance documents the following policies are applicable for flood risk & drainage.

Wokingham Borough Council Core Strategy Development Plan

Policy CP1 Sustainable Development

“Development must ensure that greenfield surface water run-off rates are achieved, where possible, through the use of Sustainable Urban Drainage Systems (SUDS).”

Wokingham Borough Council Sustainable Design and Construction Supplementary Planning Document section 12

“Sustainable Drainage Systems (SUDs) can be used to minimise the risk and impact of flooding. New development should be designed to be resilient to flooding as appropriate. There should be a nil

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detriment situation, the run-off from the site (post development) must not increase and where possible be reduced.

The Council encourages the use of SUDs, which act as an alternative way to drainage in that they attempt to reduce the total amount, flow and rate of surface water run-off. They also aim to mimic the natural drainage patterns of a site."

The document also confirms that Brown Roofs should be considered for all buildings where appropriate.

Wokingham Borough Local Plan Update: Proposed Submission Plan 2023-2040

Policy FD2: Sustainable Drainage

"1. Development proposals must ensure surface water arising, including the impact of climate change, is managed in a sustainable manner. This must be demonstrated through either a:

- a) Site-specific Flood Risk Assessment; or*
- b) Surface Water Drainage Strategy.*

a) Surface Water Drainage Strategy. Development proposals will only be supported where the proposal would reproduce greenfield runoff characteristics and return run-off rates and volumes back to the original greenfield levels for greenfield sites; and for brownfield sites both run-off rates and volumes be reduced to as near greenfield as practicably possible, or 40% betterment of existing, whichever is achievable;

2. The provision of SuDS should:

- a) Be of an appropriate design (in line with the principles and local standards set out in the council's latest SuDS strategy and technical guide and any current national technical standards) to meet the long term needs over the lifetime of the development and which achieve wider social, ecological and environmental benefits;*
- b) Include a clear strategy for adoption and maintenance to the satisfaction of the council, as the Lead Local Flood Authority (LLFA);*
- c) Do not cause adverse impacts on the public sewerage network serving the development where discharging surface water to a public sewer. Any discharges should be agreed in writing by the local sewerage undertaker;*
- d) Effectively manage flood risk, improve the water environment, enhance biodiversity and mitigate and adapt to the effects of climate change;*

Proposed Drainage Strategy

Given the underlying geology and the fact that groundwater was found at a shallow depth on the site infiltration is not a viable method of surface water discharge from the development, in addition it is not proposed that any below ground attenuation tanks will be installed at the site.

Given the site already discharges surface water to the adjacent River Thames, it is proposed to continue this method of surface water disposal but with the inclusion of SuDs.

The existing buildings that are unchanged as part of the redevelopment will continue to drain as per the existing arrangement with a new drainage system being provided for the proposed new block.

The greenfield runoff rate for the whole site has been calculated as 0.5l/s, however given it would be impractical to restrict the runoff from the development to this small a flow rate due to the potential

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issues with blockages, it is proposed that surface water runoff from the new block (680m²) will be restricted to 1l/s.

This provides an 85% reduction in runoff when compared to existing block / building discharge rate.

In order to achieve the surface water runoff rate of 1l/s, approximately 42m³ of surface water attenuation will be required to cater for all events up to and including the 1 in 100-year event with an additional allowance of 40% for climate change.

To manage surface water run-off generated by the post development site in a manner which is compliant with current design criteria, Sustainable Urban Drainage Systems (SUDS) will be incorporated within the onsite drainage design. Generally, there are a number of options available to achieve the proposed discharge restrictions such as above ground storage facilities, oversized sewers, below ground storage tanks, water features such as ornate ponds etc. Feasibility of available options is assessed based in the site constraints. The SUDS hierarchy is included in the table below:

	SuDS Heirachy	Constraints/Opportunities
1	Store rainwater for later use	Rainwater harvesting to be reviewed subject to further investigation.
2	Discharge into the ground (infiltration)	Due to the existing soil conditions and geology as there is no scope to use infiltration techniques.
3	Discharge to a surface water body	Existing site discharges to the River Thames River it is proposed that the existing outfalls will be utilised.
4	Discharge to a surface water sewer, highway drain or other drainage system	No public surface water drain, therefore not viable.
5	Discharge to a combined sewer.	No public combined water drain, therefore not viable.

Based on the above hierarchy, it is proposed that attenuation will be provided at roof level as a brown / blue roof, this will help to ensure that the surface water runoff is suitably treated before it enters the below ground drainage system. It is also proposed to include a below ground attenuation tank as part of the new development, followed by a flow control chamber, which will make possible a reeuction of the current runoff flow rates.

The Causeway surface water storage calculations appended to this report show that a total storage volume of 42m² is required to cater for the 1 in 100-year event with an additional allowance of 40% for climate change. It is proposed that a storage depth of 80mm over a 284m² brown / blue roof area and 20.5m³ below ground storage tank will provide sufficient storage.

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	SuDS Heirachy	Size	Volume (m ³)
2	Blue Roof	284m2 at 80mm depth @ 0.95 porosity	21.5
3	Below ground attenuation tank	5.5m x 4m x 1m	20.5
TOTAL			42

A drainage strategy has been prepared for the development and is included in this report.

Summary

Due to the underlying ground conditions and the shallow depth of the groundwater encountered at the site, the implementation of infiltration drainage will not be viable and therefore a positive drainage system connecting to the existing drainage outfall on the site is proposed.

Post development discharge from the new block will be limited to 1.0l/s for all events up to the 1:100 year + 40% climate change event. This will provide significant betterment over the existing unattenuated brownfield discharge rates from the site.

In order to attenuate flows the proposed scheme includes a brown / blue roof, as well as a below ground attenuation tank to the new block with a restricted discharge and connection to the existing outfall to the River Thames.

New parking areas will be constructed using a permeable surface water a lined sub-base material and a connection to the existing drainage system.

The proposed surface water drainage design principles set out in this document will ensure that the development does not increase the risk of flooding to surrounding area.

A drainage maintenance strategy has been detailed for the site and is included with this report.

Encl.

Existing Drainage Survey Plans
Micro Drainage Calculations - Greenfield Run Off
Micro Drainage Calculations - Rainfall intensity Values
Micro Drainage Calculations - Attenuation Volume
MNP Drainage Strategy GA Plan
Drainage and SuDS Maintenance Strategy

6) No utility mapping survey can be considered a 100% accurate depiction of the sub-surface environment, the use of these drawings does not remove the requirement for the use of safe digging techniques, in line with the requirements of HSG47 and CDM regulations.

- | ABBREVIATIONS (Latin abbreviated) | | | |
|-----------------------------------|---------|----|----------|
| AL | At Time | WK | Week |
| AN | Along | WV | Widened |
| BE | Behind | WZ | Wider |
| BL | Below | XY | Widening |
| BO | Boat | YZ | Widest |
| BT | But | ZZ | Widest |
| CA | Cause | | |
| CC | Clear | | |
| CE | Clear | | |
| CF | Clear | | |
| CG | Clear | | |
| CH | Clear | | |
| CI | Clear | | |
| CJ | Clear | | |
| CK | Clear | | |
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- Drainage pipe sizes (where shown) have been gauged from the surface for safety reasons and should be regarded as approximate only.
- Tree species (where shown) should be treated with respect and expert consultation is advised.
- Although this is a digital survey the accuracy and amount of detail shown is only commensurate with the groundplot scale of mapping as specified. Care should be exercised when working to larger scales.
- Visible features in the vicinity of the boundaries as shown above may not represent the actual or legal condition of the land.
- Where any feature has been made to derive accuracy on this plan, CH2000, evidence statements, notes and insert sheets should be checked prior to design and construction.
- Earth levels have been taken in the bottom of the channel.
- All pipe sizes are 100mm unless otherwise stated.

1	2
3	4

SURVEYED FOR	Retirement Villages Developments LTD 3rd Floor, 123 Victoria Street London SW1E 6BA	SURVEYOR	Joe Stymisk
		DATE	06/0000

KD	DATE	REVISION			

Underground	Foul Drainage
Underground	Storm Drainage
Underground	Combined Drainage
Underground	Electric
Underground	Cables
Underground	Gas
Underground	Unidentified Service
Underground	Telecoms BT
Underground	Water
GPR Survey	Linear Feature

Underground	Foul Drainage
Underground	Storm Drainage
Underground	Combined Drainage
Underground	Electric
Underground	Cables
Underground	Gas
Underground	Unidentified Service
Underground	Telecoms BT
Underground	Water
GPR Survey	Linear Feature

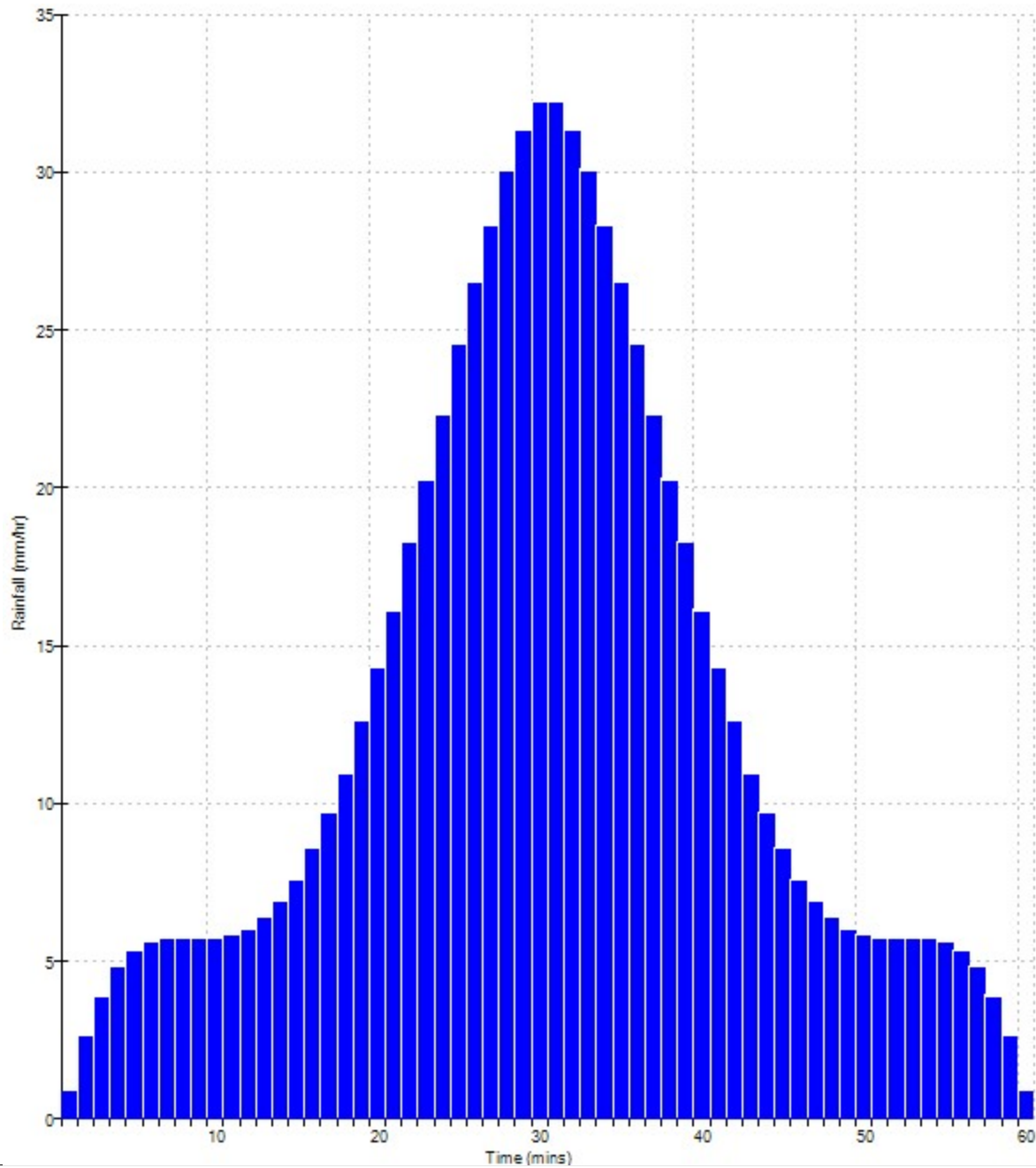
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<u>ICP SUDS Mean Annual Flood</u> Input <table><tr><td>Return Period (years)</td><td>100</td><td>SAAR (mm)</td><td>700</td><td>Urban</td><td>0.000</td></tr><tr><td>Area (ha)</td><td>1.240</td><td>Soil</td><td>0.150</td><td>Region Number</td><td>Region 6</td></tr></table> Results 1/s <table><tr><td>QBAR Rural</td><td>0.5</td></tr><tr><td>QBAR Urban</td><td>0.5</td></tr><tr><td>Q100 years</td><td>1.6</td></tr><tr><td>Q1 year</td><td>0.4</td></tr><tr><td>Q30 years</td><td>1.1</td></tr><tr><td>Q100 years</td><td>1.6</td></tr></table>			Return Period (years)	100	SAAR (mm)	700	Urban	0.000	Area (ha)	1.240	Soil	0.150	Region Number	Region 6	QBAR Rural	0.5	QBAR Urban	0.5	Q100 years	1.6	Q1 year	0.4	Q30 years	1.1	Q100 years	1.6
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Rainfall profile

Storm duration (mins) 60

FSR Data
Region England and Wales
M5-60 (mm) 20.000
Ratio R 0.400
Peak Intensity (mm/hr) 32.196
Ave. Intensity (mm/hr) 12.800
Return Period (years) 1.0

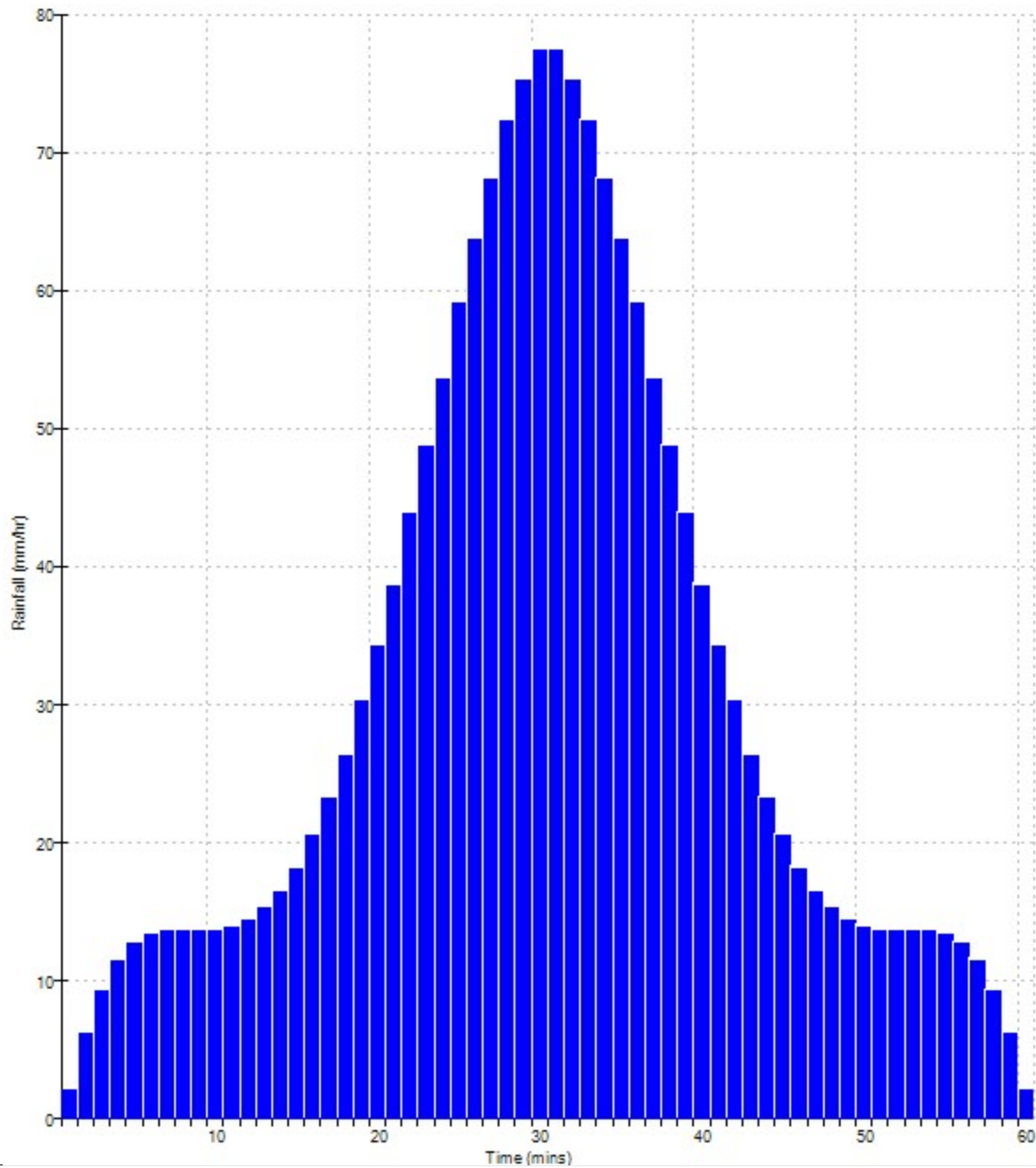


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Rainfall profile

Storm duration (mins) 60

FSR Data
Region England and Wales
M5-60 (mm) 20.000
Ratio R 0.400
Peak Intensity (mm/hr) 77.499
Ave. Intensity (mm/hr) 30.811
Return Period (years) 30.0

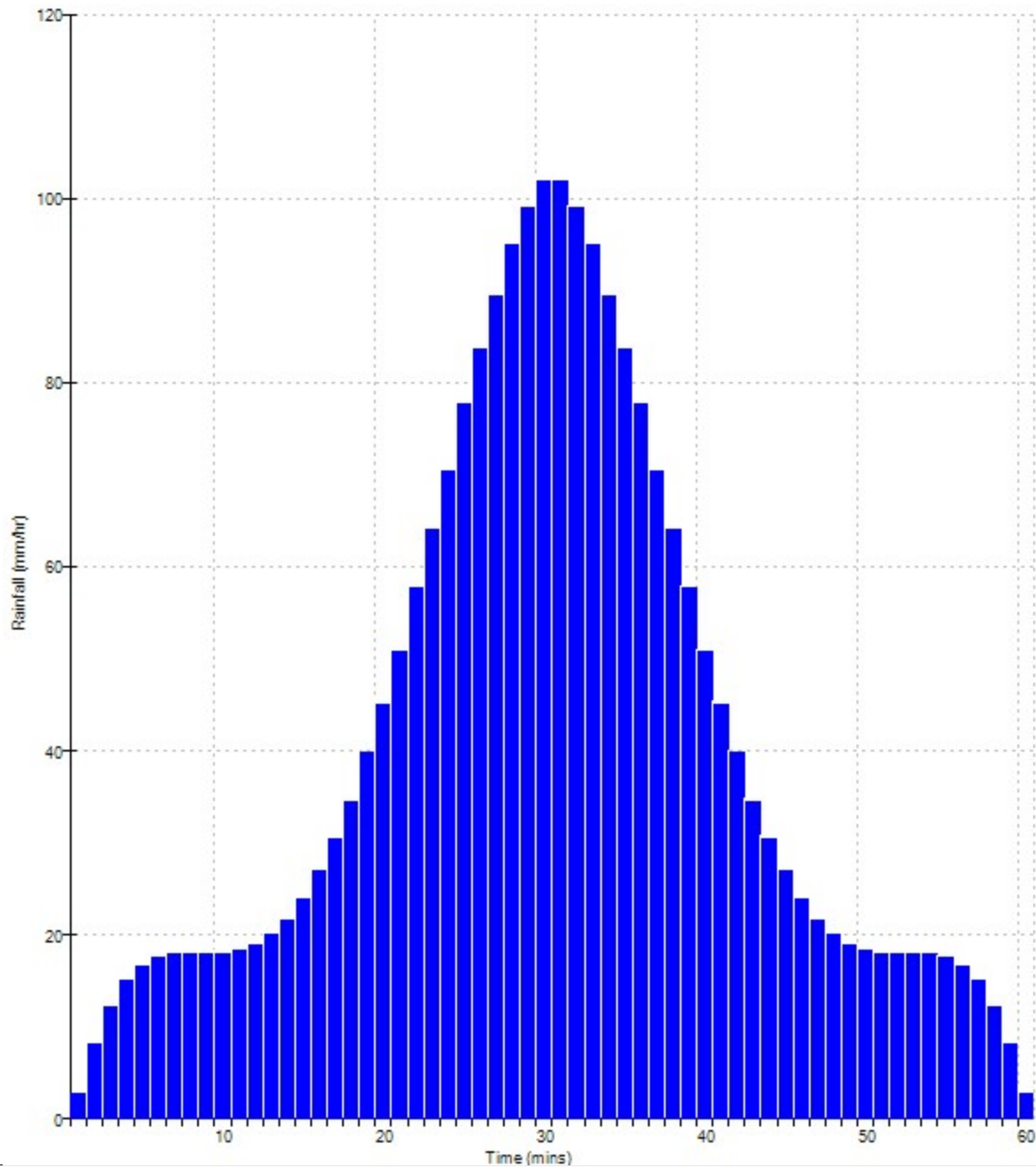


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Rainfall profile

Storm duration (mins) 60

FSR Data
Region England and Wales
M5-60 (mm) 20.000
Ratio R 0.400
Peak Intensity (mm/hr) 101.894
Ave. Intensity (mm/hr) 40.510
Return Period (years) 100.0



Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.300	Minimum Backdrop Height (m)	0.200
Ratio-R	0.444	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
ATT	0.068	5.00	32.500		-51.589	52.092	1.500
FC			32.500	1200			1.600

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	ATT	FC	10.000	0.600	31.000	30.900	0.100	100.0	150	5.17	50.0

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	1.005	17.8	9.2	1.350	1.450	0.068	0.0	76	1.013

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	10.000	100.0	150	Circular	32.500	31.000	1.350	32.500	30.900	1.450

Link	US Node	Node Type	DS Node	Dia (mm)	Node Type	MH Type
1	ATT	Junction	FC	1200	Manhole	Adoptable

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.300	Drain Down Time (mins)	1440
Ratio-R	0.444	Additional Storage (m³/ha)	0.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	40	0	0

Node FC Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	30.900	Product Number	CTL-SHE-0047-1000-1000-1000
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.0	Min Node Diameter (mm)	1200

Node ATT Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	31.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	240

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	42.0	0.0	1.000	42.0	0.0	1.001	0.0	0.0

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
180 minute winter	ATT	180	31.785	0.785	9.8	32.9617	0.0000	SURCHARGED
180 minute winter	FC	180	31.784	0.884	2.0	1.0003	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	ATT	1	FC	3.9	0.531	0.217	0.1760	
180 minute winter	FC	Hydro-Brake®		0.9				42.5

**DRAINAGE / SUDS
MAINTENANCE STRATEGY**

AT

**THAMESFIELD RETIREMENT
VILLAGE DEVELOPMENT**

**REF: 222351-MNP-ZZ-ZZ-RP-C-0002
DEC 2023**

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APPENDICES

APPENDIX A - PROPOSED DRAINAGE LAYOUT

Report prepared by:



Tom Murray

Project Engineer

1. INTRODUCTION

- 1.1. Mason Navarro Pledge Ltd have been appointed to prepare a Drainage Maintenance and Management Plan for the proposed redevelopment at Thamesfield Retirement Village.
- 1.2. The proposed development comprises the part demolition of the existing building and replacement with a three-storey extension to provide 35 extra-care units, with associated soft and hard landscaping works; provision of additional vehicle parking, bin stores and ancillary structures; and alterations to existing basement.
- 1.3. This report gives details of the proposed SuDS / Drainage system and describes the long-term operation and maintenance requirements which should be carried out in accordance with the guidance in the CIRIA SuDS Manual.
- 1.4. This report has been prepared by Tom Murray HNC.

2. DESCRIPTION OF PROPOSED DRAINAGE

2.1 The proposed drainage is shown on drawings:

222351-MNP-XX-XX-DR-C-1800 - Drainage Strategy Plan

2.2 Surface water run-off from the site discharges into the river Thames and it is proposed to continue utilising the existing outfalls with the provision of a new network of pipework, manholes, porous paving, and green / blue roofs

2.3 The drainage has been designed to accommodate the 1 in 100-year storm event including a 40% allowance for climate change.

3. MAINTENANCE / MANAGEMENT RESPONSIBILITY

- 3.1 The management and maintenance responsibility for the drainage and SuDS components across the site will be the operator / owner of the development (Retirement Villages Group).

4. INVENTORY OF SURFACE WATER DRAINAGE COMPONENTS

GULLIES

- 4.1 Gullies provide a degree of pollution control in preventing silt and debris passing into the sewer network.

TABLE 1: GULLY MAINTENANCE

MAINTENANCE SCHEDULE	REQUIRED ACTION	RECOMMENDED FREQUENCY
Regular maintenance	Clean and empty gullies.	Quarterly.

CATCHPITS

- 4.1 Catchpit chambers and manholes provide a degree of pollution control in preventing silt and debris passing forwards into the drainage network.
- 4.2 The operation and maintenance requirements are given in the table below:

TABLE 2: CATCHPIT MAINTENANCE

MAINTENANCE SCHEDULE	REQUIRED ACTION	RECOMMENDED FREQUENCY
Regular maintenance	Clean and empty catchpits.	Quarterly.

BELOW GROUND MANHOLES AND DRAINAGE - GENERAL

- 4.3 Manholes and Catchpit Inspections should be frequent and regular, depending on local conditions, but at least annually. The drainage system should be cleaned / jetted as necessary.

PERMEABLE PAVING

- 4.4 Permeable block paving allows water to infiltrate through gaps between the blocks into a lined layer of granular material, from which it is collected and discharges into the below ground drainage network.
- 4.5 The operation and maintenance requirements are given the table below:

TABLE 3: PERMEABLE PAVING MAINTENANCE

MAINTENANCE SCHEDULE	REQUIRED ACTION	RECOMMENDED FREQUENCY
Regular maintenance	Sweeping. Note: Any jointing material between the blocks that is lost or displaced as a result of sweeping must be replaced. New jointing material must be the same type as that removed or a suitable replacement.	Three times a year at the end of winter, mid-summer and after autumn leaf fall. Also as required based on site-specific observations.
Occasional maintenance	Stabilise and mow contributing and adjacent areas to prevent excess sediment being washed into the paving. Removal of weed.	As required
Remedial actions	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users. Rehabilitation of surface and underlying sand and geotextile.	As required
Monitoring	Inspect for evidence of poor operation and/or weed growth. If required take remedial action.	Monthly for three months after installation, then during regular maintenance visits.

- 4.6 Over time the ability of the permeable paving to infiltrate and convey surface water run-off may degrade due to clogging of the joints by silt and other sediments.
- 4.7 All areas of permeable pavement should be regularly inspected by those responsible, preferably during and after heavy rainfall to check effective operation and to identify any areas of ponding.

GREEN ROOFS

4.8 The operation and maintenance requirements are given the table below:

TABLE 6: GREEN ROOF MAINTENANCE

MAINTENANCE SCHEDULE	REQUIRED ACTION	RECOMMENDED FREQUENCY
Regular Inspections	Inspect all components including soil substrate, vegetation, drains, irrigation systems (if applicable), membranes and roof structure for proper operation, integrity of waterproofing and structural stability	Annually and after severe storms
	Inspect soil substrate for evidence of erosion channels and identify any sediment sources	Annually and after severe storms
	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drainage system	Annually and after severe storms
	Inspect underside of roof for evidence of leakage	Annually and after severe storms
Regular maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth	Six monthly and annually or as required.
	During establishment replace dead plants as required	Monthly.
	Post establishment replace dead plants as required	Annually (in autumn)
	Remove fallen leaves and debris from deciduous plant foliage	Six monthly or as required
	Remove nuisance and invasive vegetation, including weeds	Six monthly or as required
	Mow grasses, prune shrubs and manage other planting as required - clippings should be removed and not allowed to accumulate	Six monthly or as required
Remedial actions	If erosion channels are evident, these should be stabilised with extra soil substrate similar to original material, and sources of erosion damage should be identified and controlled.	As required.
	If drain inlet has settled, cracked or moved, investigate and repair as appropriate	As required

ATTENUATION TANKS

4.9 The operation and maintenance requirements are given the table below:

TABLE 3: ATTENUATION TANKS MAINTENANCE

MAINTENANCE SCHEDULE	REQUIRED ACTION	RECOMMENDED FREQUENCY
Regular maintenance	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
	Remove sediment from pre-treatment structures	Annually, or as required
Remedial actions	Repair/rehabilitation of inlets, outlet, overflows and vents	As required
Monitoring	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

FLOW CONTROL

- 4.10 Only minimal maintenance is required for the flow control device. If a blockage occurs then it is most likely to be at the intake, therefore it is recommended that the unit be inspected monthly for the first three months and thereafter on a six monthly basis with the unit being hosed down as necessary and any build-up of detritus or silt should be removed.
- 4.11 For further details of the maintenance requirements refer to the manufacturers guidelines.

APPENDICIES

APPENDIX A
PROPOSED DRAINAGE LAYOUT