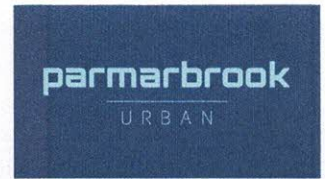


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SURFACE-WATER STRATEGY
FOR RESIDENTIAL PROPERTIES
AT
25 THE AVENUE, NORTHWOOD, HA6 2NJ

22nd December 2023

1. **Residential Development Description**

The Residential Development, comprises of a 4 New-Build 3 storey properties including parking bays at the front of each House

2. **Surface Water Resources**

Although there is a surface water sewer in the main roadway, e.g. 'The Avenue' as it is the preferred choice under Building Regulations and Thames Water Authority to employ use of Soakaways, where the ground strata permits. Sustainable urban drainage systems[SUDS]

also recommends the use of infiltration techniques, for non clay type areas.

As percolation tests have been carried out on this development site, indicating that the ground strata is suitable for infiltration systems, e.g. Soakaways and Permeable Paving, there are soakaways provided at the rear of each House / Dwelling, with Permeable paved driveway/parking bays. The rear terrace and side of property pathways have non permeable paving to avoid moisture transmission to building walls and to avoid undermining of boundary fencing support posts. Aco channels are provided to side of property pathways with discharge of surface water to Soakaways.

As no surface water is proposed to discharge to the sewer, the drainage system meets the requirements of the London Plan [2011] policy 5.13

THE SCHEDULE OF CONDITIONS

The following information provides Information and description to meet the listed

5 items of the Condition 15, related to the Surface water drainage System:

Item 1a] As Soakaways are the sole means of discharge /disposal of surface water from the Development, the design is based on BRE Digest DG365 [Rev.2016]

Storm return Period [Years]10 Years Storm Duration ...30 minutes

Refer to Appendix sheet A ... for Soakaway sizing Calculation Sheets

Item 1b] The method employed to delay and control the surface water discharge is via the storage capacity within the soakaways and by use of permeable paving for the front of house driveway/parking bays.

Each rainwater pipe would be provided with a trapped gully, to retain silt, organic matter, etc.

Item 1c] ...Maintenance: Each surface water gully to be cleaned of debris [from the trap] on a yearly basis, in the autumn. Permeable paved areas would be inspected annually and where deemed necessary a specialist permeable paving cleaning contractor would

Use vacuum equipment /pressure jet cleaning methods.

CONTINUED:

Item 1c] continued; Where residential properties are provided with crate type soakaways, which have Woven geo-textile wrapping to prevent ground strata particles and silt from entering, The assembled crate structure, maintenance is not generally required.

Schedule of Conditions:

Item 2. Timetable for Implementation.

At completion of the Development Site Construction works, all Rainwater pipe gullies to be cleared of debris/organic material/leaves and gullies flushed through with water/hose-pipe.

All Aco drainage channels to be cleared and trapped sumps to have sediment buckets emptied.

All inspection chambers to be inspected to ensure any debris/obstructions removed.

Item 3. Maintenance plan for lifetime of the development; For Items 1c and Item 2 any required maintenance to be carried out on a 12 monthly basis, as part of a Planned maintenance Contract.

Item 4] As rainwater harvesting was not deemed appropriate for this Development, there are no Rainwater collection facilities to capture excess rainwater. All rainwater would be discharged to Soakaways or permeable paved areas..

Item 5] There is no recycling of rainwater or grey water[waste water] to be reused in the Development.

APPENDIX `A`

Calculation for sizing of Soakaway [for Typical House]

Calculation For Sizing of Soakaway at 25 The Avenue, Northwood

Date : December 2023 Sheet SA1

Soakaway Location; Rear of each Property [garden area]

An Infiltration / Soakage test was carried out on 11th September 2023

Design based on BRE Digest DG365 [Rev. 2016]

Storm Return Period [Years] 10 years

Storm duration ...30 minutes [M10-30]

M10 -30minutes rainfall [mm] =20.10mm total.

Dimension of trial/test pit; 300x300x 300mm depth

2 Tests were carried out which resulted in similar period of time [e.g.14 minutes],

to drain 75% water test depth to 25% [150mm depth drop]= 14.0 minutes

Storage volume of test pit =300x 300mm x [d75%-d25%]=0.30mx0.30mx0.150m
=0.013 m³[cubic metres]

Surface area of test pit to 50%depth= $\frac{1}{2}$ = 0.30x0.150m x 4 sides = 0.18m²

Ground Strata infiltration rate [f] $f = \frac{V}{A \times t} = \frac{0.013}{0.18 \times 14 \times 60} = 0.000085 \text{ m}^3/\text{second}$

Impervious Area draining to proposed Soakaway = 156 m²

Includes rear of house/terrace/side-paths. Permeability factor... 0.95

Inflow to Soakaway:

Inflow for a 30minute duration storm = 156m² x 0.95x 20.10mm depth =
2.97m³

Allowing 30% addition to cover Climate Change [DG365]0.89m³ = 3.86m³

Outflow: Soakaway constructed using plastic crates, with geotextile wrapping
Soakaway plan size 2.00m x2.00m = 4.00m² x0.800m depth .[located in
clayey/sandy strata]

Outflow from crates at 50% depth. Sides of crates ...2.00x2.00.x0.40m depth
by 4sides=6.40m²

At infiltration rate of 0.000085through 6.40m² = 0.00054m/sec

Allowing this Outflow rate during a 30 minute storm event = 0.979cubic metres

Outflow = 0.979m³

Soakaway Storage volume required:

30 minute storm:3.86m³ inflow minus 0.979m³ outflow =2.88 m³ storage
required.

Soak-away [with 95% storage capacity within the 'crates'] provides
total storage of...2.0x2.0 x 0.80mx0.95 =3.04m³

Continued on Sheet 2

Sheet 2 ...Continuation [25 The Avenue Soakaway Calculation]

Time to empty the Soakaway:

Percolation[soakage] rate through sides of Soakaway

Time to empty to 50% of total volume capacity... $3.04\text{m}^3 \times 0.50 = 0.80\text{m}^3$

Soakaway outflow rate = 0.979m^3 in 30 minutes.

0.97m^3 divided by $0.80\text{m}^3 = 1.21$ hours

Note1; BRE Digest DG365[page 5] indicates that a soakaway should discharge from full to half-volume within 24 hours in readiness for subsequent storm flow.