# SUDS MAINTENANCE AND MANAGEMENT PLAN

## 2 PARK LANE, KNEBWORTH

FOR NLD LONDON

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Mason Navarro Pledge Ltd.
CONSULTANT SCOPE OF SERVICES: CIVIL/STRUCTURAL ENGINEER

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# 1. INTRODUCTION

1.1. MNP have been commissioned by MNP to produce a SuDS Maintenance and Management Plan for a proposed development at 2 Park Lane, Knebworth.

1.2. The total area of the development site is approx. 0.36ha.

1.1. The proposed development comprises the redevelopment of the former Hamilton Billards and Games Co, to provide 11 residential apartments, whilst converting an existing building into 2 residential apartments. The development also includes the provision of new pedestrian and vehicular parking, landscaping, open space remediation and associated works.

1.2. This report gives details of the SUDS system and describes the long-term operation and maintenance requirements.

# 2. DESCRIPTION OF PROPOSED DRAINAGE

2.1. The proposed drainage is shown on drawings 217414-C-902 Drainage Strategy (Appendix A).

2.2. Surface water run-off from the site will be discharged off site via pipes and below ground attenuation tanks.

2.3. The communal parking areas on the site will incorporate permeable paving systems with sub-base storage (approx. 30% void ratio within the sub-base), that will store surface water run-off generated the paved areas.

2.4. Run-off from roofs will drain into the surface water sewer network underneath the site parking.

2.5. Surface water run-off will be discharged into the existing private sewer running through the site.

2.6. Discharge to the public sewer will be restricted to 3.2 l/s.

2.7. The surface water drainage design will cater for storm events up to a 1 in 100yr return period plus 40% to account for climate change without causing detrimental flooding to properties

# INVENTORY OF SURFACE WATER DRAINAGE COMPONENTS

## GULLIES

2.8. Deep-trapped road gullies provide a degree of pollution control in preventing silt and debris passing into the main sewer network.

2.9. The operation and maintenance requirements are given in the table below:

*TABLE 1: GULLY MAINTENANCE*

| Maintenance Schedule | Required Action | Recommended Frequency |
|---|---|---|
| Regular maintenance | Clean and empty gullies. | Quarterly. |

## CATCHPITS

2.10. Catchpit chambers and manholes provide a degree of pollution control in preventing silt and debris passing forwards into the drainage network.

2.11. 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. |

## PERMEABLE PAVING

2.12. Permeable block paving allows water to infiltrate through gaps between the blocks into a layer of gravel / granular material.

2.13. 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 washing into the paving. | As required. |
| | 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. | As required. |

| Maintenance Schedule | Required Action | Recommended Frequency |
|---|---|---|
| | Rehabilitation of surface and underlying sand and geotextile. | As required (if infiltration performance is significantly reduced as a result of significant clogging). |
| 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. |

2.14. 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.

2.15. 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.

2.16. Between inspections residents may observe ponding in certain low points throughout the site, indicating that the permeable paving is not performing adequately and therefore requires cleaning.

2.17. If the areas of ponding are within the adopted road network or shared road/parking areas then residents should contact the appropriate organization to inform them of the issue and allow suitable maintenance measures to be arranged.

## MODULAR CELLULAR STORAGE

2.18. These plastic geocellular systems wrapped in an impermeable membrane have a high void ratio, which can be used to provide stormwater attenuation storage for surface water runoff prior to discharge further downstream.

2.19. Water from the buildings and roads is routed to a cellular storage tanks as set out in 3799-1002 Drainage Strategy.

2.20. Maintenance of the system will be the responsibility of a private management company set up by the developer.

2.21. The operation and maintenance requirements are given in the table below:

*TABLE 4: MODULAR CELLULAR STORAGE 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. |
| | Remove sediment from geocellular crates. | Annually, or as required. |
| Remedial actions | Repair/rehabilitation of inlets, outlets, vents. | As required. |
| Monitoring | Inspect/check all inlets, outlets and vents to ensure that they are in good condition and operating as designed. | Annually and after large storms. |

## FLOW CONTROLS

2.22. These are proprietary systems which are custom made to control the discharge off of site to the required levels

2.23. Flow controls may be prone to blocking and should be monitored closely.

2.24. The operation and maintenance requirements are given in the table below:

*TABLE 5: FLOW CONTROL MAINTENANCE*

BELOW GROUND

| Maintenance Schedule | Required Action | Recommended Frequency |
|---|---|---|
| Regular maintenance | Remove litter and debris and grass cutting and removal of cuttings from the upstream SuDS to prevent these being washed into the control. Inspection of control chamber and removal of any sediments, debris etc. | Quarterly or as required following monitoring. |
| Remedial actions | Check drain down doors are operational, check the flow control fixings to manhole chamber and access into the control chamber is functional. | Quarterly or as required following monitoring. |
| Monitoring | Inspect flow controls and check flow are not impeded. | Monthly or after periods of heavy rainfall. |

## MANHOLES AND DRAINAGE – GENERAL

2.25. 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.

# 3. DESIGN LIFE

3.1. The design life of the development is likely to exceed the design life of each of the SuDS components listed above.

3.2. During the routine inspections of any SUDS components it may become apparent that they have reached the end of their functional lifetime. In the interest of sustainability repairs should be the first-choice solution where practicable. If this is not the case then it will be necessary for the responsible organisation to undertake complete replacement of the component in question.

3.3. The design life of modular geocellular storage systems is unproven, but BBA certification states that for the majority of geocellular units a design life in excess of 50 years should be expected when installed as per the certification. Therefore the routine assessment and maintenance should take into account an assessment of creep deflection and visual monitoring of the surface above any underground geocellular units.

# APPENDICES

## APPENDIX A

## DRAINAGE STRATEGY DRAWING

*DRAWING NO. 217414-C-902*