HOME HOUSE HOLDINGS

Sustainable Drainage System (SuDS) Proposal for 6 Wensleydale Road, Hampton, TW12 2LW

1. Introduction

This document outlines the proposed Sustainable Drainage System (SuDS) for 6 Wensleydale Road, in compliance with Local Planning Authority requirements. The system is designed to manage surface water run-off efficiently while ensuring long-term sustainability, achieving greenfield run-off rates.

2. Objectives

- Minimise surface water run-off.
- Reduce flood risks on-site and in the surrounding area.
- Improve water quality before discharge.
- Promote biodiversity and aesthetic value.

3. Key Features of the Proposed SuDS

3.1 Permeable Paving

- **Location**: Driveway and pathways.
- **Purpose**: Allows water infiltration, reducing surface run-off.
- **Design**:
  - Sub-base layer: Crushed angular aggregate for infiltration.
  - Permeable surface: Block paving with gaps filled with permeable material.
  - Maintenance: Biannual cleaning to remove debris and maintain permeability.

3.2 Rainwater Harvesting

- **Location**: Collection from roof catchment area.
- **Purpose**: Stores water for irrigation and reduces run-off volumes.
- **Design**:
  - Collection: Downpipes connected to storage tanks (capacity 1,500 liters).

- Overflow: Connected to the main SuDS system.

3.3 Attenuation Tank

- **Location**: Underground in the rear garden.
- **Purpose**: Stores excess surface water during peak rainfall and releases it slowly to mimic greenfield rates.
- **Design**:
  - Capacity: 3,000 litres (calculated based on site size and rainfall intensity).
  - Material: Modular geo-cellular units with geo-textile wrapping.
  - Discharge: Restricted to 5 l/s using a flow control device.

3.4 Infiltration Trench

- **Location**: Perimeter of the rear garden.
- **Purpose**: Directs and infiltrates water into the ground.
- **Design**:
  - Dimensions: Approximately 500mm wide and 800mm deep.
  - Fill: Washed angular gravel with a perforated pipe for water distribution.

3.5 Swale (Optional)

- **Location**: Alongside the garden boundary.
- **Purpose**: Provides surface water storage and filtration.
- **Design**:
  - Vegetated channel planted with native grasses.
  - Depth: 0.5 meters.

4. Implementation Plan

1. **Site Preparation**: Excavate areas for SuDS components.
2. **Installation**: Sequential installation of permeable paving, rainwater harvesting tanks, attenuation tank, and infiltration trench.
3. **Testing**: Perform flow tests to confirm system performance.

5. Long-Term Maintenance Plan

5.1 Permeable Paving

- Inspect biannually for debris and blockages.
- Vacuum sweep or jet wash annually.

5.2 Rainwater Harvesting

- Clean filters every 6 months.
- Inspect tanks annually for sediment buildup.

5.3 Attenuation Tank

- Inspect for sediment buildup every 12 months.
- Flush system annually.

5.4 Infiltration Trench

- Inspect for silt and debris biannually.
- Replace aggregate every 5–7 years, if necessary.

5.5 Swale

- Remove litter and replant vegetation as needed every 12 months.

6. Greenfield Run-Off Rate Compliance

The proposed SuDS system is designed to achieve a greenfield run-off rate of 5 l/s, calculated based on the impermeable surface area and anticipated rainfall. The system incorporates flow controls and infiltration to limit discharge to acceptable levels.

7. Summary

The proposed SuDS system ensures sustainable surface water management, achieving compliance with greenfield run-off rates and enhancing site sustainability. The system will be fully implemented prior to the occupation of the development and maintained in accordance with this plan.

Attachments:

1. SuDS Design Drawings
2. Drainage Calculations

HOME HOUSE HOLDINGS

Drainage Strategy Report

Project Address: 6 Wensleydale Road, Hampton
Document Number: WENS-R1-REV-A
Prepared By: Nimbus Engineering Consultants Ltd
Date: December 2024

Contents

1. Introduction

1.1 Objectives

This report addresses the planning conditions requiring a detailed surface water drainage solution, incorporating Sustainable Urban Drainage Systems (SuDS) to achieve:

- **Greenfield runoff rates** to minimise flood risks.
- Mitigation of surface water impact during extreme weather events.
- Compliance with local authority requirements and environmental guidelines.

1.2 Limitations

The report relies on the data available at the time of preparation. Any updates will be incorporated as new data becomes available.

2. Geology of the Area

The British Geological Survey identifies the site as having **Kempton Park Gravel** superficial deposits with **London Clay Formation** as the bedrock. These conditions indicate low infiltration rates, making attenuation-based solutions more suitable.

3. Sustainable Urban Drainage Systems (SuDS)

3.1 Principles

SuDS aim to manage surface water sustainably by:

- Mimicking natural drainage patterns.
- Reducing peak runoff rates.
- Enhancing water quality.

3.2 Components

For 6 Wensleydale Road, the following SuDS components are proposed:

1. **Permeable Paving**: For driveways and hardstanding areas.
2. **Attenuation Tank**: Designed to capture runoff and release it at a controlled rate of **0.5 l/s**.
3. **Rain Gardens/Green Roofs**: To improve water quality and reduce runoff.
4. **Slot Drains**: Positioned strategically to capture runoff from sloped areas.

4. Proposed Solution

4.1 Hydraulic Modelling Results

A hydraulic model simulated a **1:100-year storm event + 45% climate change allowance**, demonstrating the following:

- **Storage Requirement**: 33.2 m^3 (combined for both dwellings).
- **Attenuation Tank Design**: Cellular storage system with flow control to restrict discharge to 0.5 l/s.

4.2 SuDS Layout

1. **Permeable Paving**
    - Designed for private driveways to infiltrate minor rainfall events.
2. **Attenuation Tank**
    - Dimensions: 9m x 6m x 0.5m depth.
    - Located beneath shared garden space.
3. **Rain Gardens**
    - Positioned at the property boundaries to treat and slow runoff.
4. **Surface Water Drainage Plan**
    - Slot drains and gutters direct water to the attenuation tank.

5. Foul Drainage Design

The foul drainage system connects to Thames Water's public sewer network. Separate systems for foul and surface water are proposed, with final discharge combined at the manhole nearest the boundary.

6. Timescale and Maintenance of Works

6.1 Timescale

- Drainage systems will be installed prior to the completion of external works and occupancy of the properties.

6.2 Maintenance

The long-term maintenance strategy includes:

- **Permeable Paving**: Cleaning and inspection every six months.
- **Attenuation Tank**: Annual inspection for sediment accumulation.
- **Slot Drains**: Cleared after significant rainfall events.

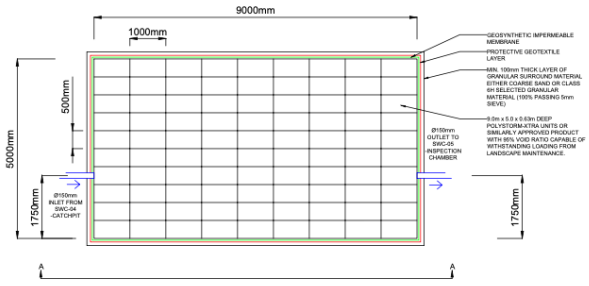
7. Conclusions

The proposed strategy incorporates SuDS components to address planning requirements, including:

- Managing surface water sustainably with runoff restricted to **0.5 l/s**.
- Reducing flood risk through attenuation and controlled discharge.
- Ensuring long-term functionality with a robust maintenance plan.

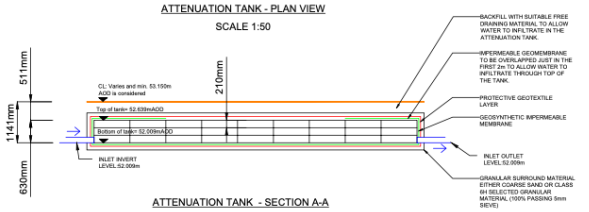
Appendices

- **Appendix A**: Hydraulic Modelling Results (available upon request).
- **Appendix B**: Drainage and SuDS Layout Drawings.
- **Appendix C**: Thames Water Asset Plans.



ATTENUATION TANK - PLAN VIEW

SCALE 1:50



ATTENUATION TANK - SECTION A-A

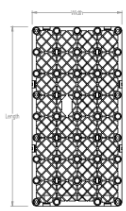
SCALE 1:50

POLYSTORM TABLE

NAME	CODE	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	A (mm)	VERTICAL STRENGTH (kN/m²)	LATERAL STRENGTH (kN/m²)	COLOUR	MATERIAL
Polystorm Xtra	PSM3	1000	500	210	36	834	93	Grey	Prime Polypropylene

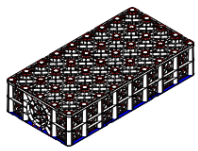
POLYSTORM CELL

Product Code: PSM3



PLAN VIEW

Scale 1:10



ISOMETRIC VIEW

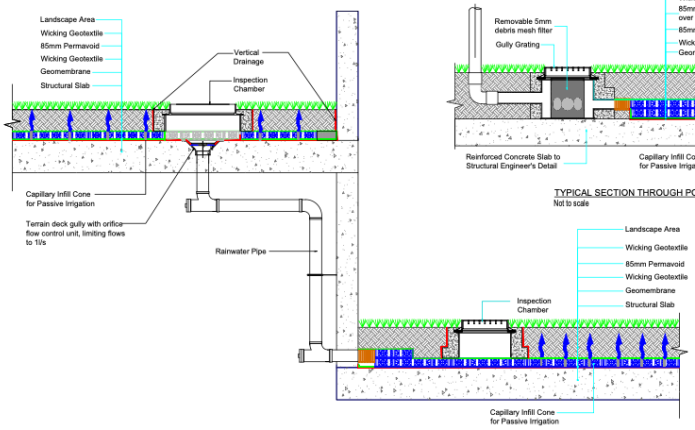
Scale 1:10

END ELEVATION

Scale 1:10

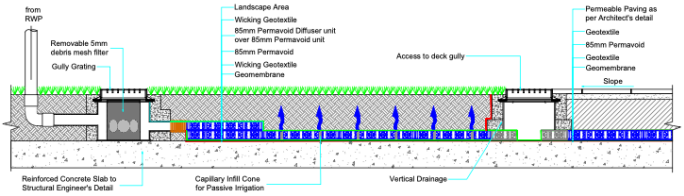
SIDE ELEVATION

Scale 1:10



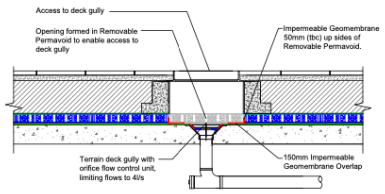
TYPICAL SECTION ON PODIUM / ROOF DECK USING PERMAVOID ON DIFFERENT LEVEL

Not to scale



TYPICAL SECTION THROUGH PODIUM BUILD UP SHOWING RWP CONNECTION INTO PERMAVOID LAYER

Not to scale



TYPICAL SECTION THROUGH OUTFLOW CHAMBER

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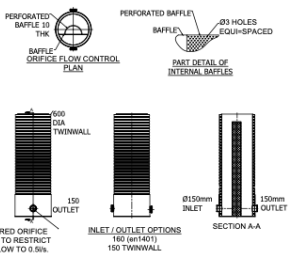
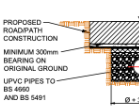


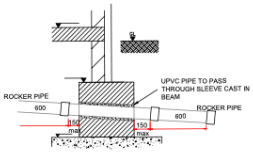
ORIFICE FLOW CONTROL ELEVATION NOT TO SCALE

ORIFICE FLOW CONTROL ELEVATION NOT TO SCALE

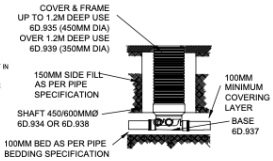
ORIFICE FLOW CONTROL SECTION A-A NOT TO SCALE



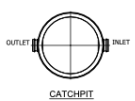
PROTECTION FOR PIPES LAID AT SHALLOW DEPTHS (UPVC PIPES) NOT TO SCALE



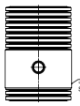
DETAIL OF DRAIN PASSING THROUGH GROUND BEAM OR OTHER STRUCTURE NOT TO SCALE



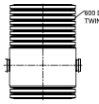
TYPICAL INSPECTION CHAMBER DETAIL (WITHIN PRIVATE LAND) NOT TO SCALE



CATCHPIT CHAMBER PLAN NOT TO SCALE



CATCHPIT CHAMBER ELEVATION NOT TO SCALE



CATCHPIT CHAMBER ELEVATION NOT TO SCALE

TRENCH BEDDING AND FILL MATERIALS

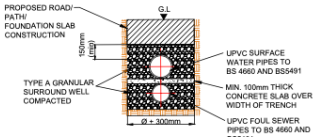
GRANULAR BEDDING TYPE A

TYPE	USE FOR NOMINAL PIPE (DIA.)	% PASSING BY MASS BS 410 SIEVE SIZES (mm)						
		63	37.5	20	14	10	5	2.36
A40	>1350	100	85-100	0-25	–	0-5	–	–
A20	600-1350	–	100	85-100	–	0-25	0-5	–
A14	300-525	–	–	100	85-100	0-50	0-10	–
A10	<300	–	–	–	100	85-100	0-25	0-5

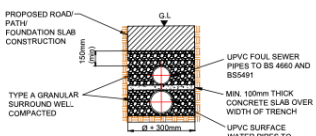
PERMEABLE PAVING INDICATIVE CROSS-SECTION (WITHOUT STORAGE)

(SUBBASE DEPTH SHOWN INDICATIVE TBC)

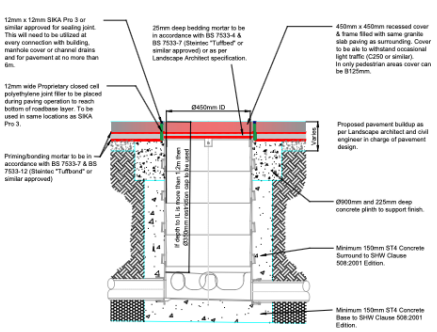
NOT TO SCALE



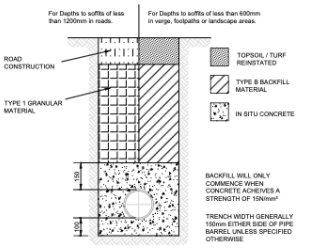
PROTECTION FOR SURFACE WATER SEWER CROSSINGS ABOVE FOUL SEWERS (UPVC PIPES) NOT TO SCALE



PROTECTION FOR FOUL SEWER CROSSINGS ABOVE SURFACE WATER SEWERS (UPVC PIPES) NOT TO SCALE



Ø450mm SURFACE WATER INSPECTION CHAMBER TYPICAL INSTALLATION DETAIL NOT TO SCALE

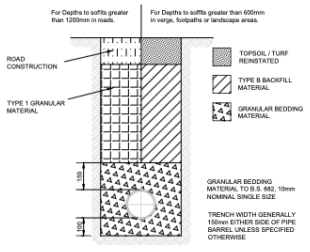


CONCRETE BED AND SURROUND TO BE GEN3 SULPHATE RESISTING WITH FLEXIBLE JOINTS 19mm THICK, AT ALTERNATE PIPE JOINTS.

SELECTED BACKFILL TYPE B AS SPECIFIED BUT GENERALLY LOCALLY EXCAVATED MATERIAL OR IMPORTED, READILY COMPACTIBLE , FREE FROM VEGETABLE MATTER, RUBBISH, FROZEN SOIL, AND MATERIAL RETAINED ON A 37.5mm SEIVE. COMPACTED IN LAYERS OF 150mm.

VERGE/LANDSCAPED AREAS REINSTATED TO MATCH EXISTING . PREPARE AND SEED GROUND TO BE REINSTATED AS SPECIFIED.

CLASS Z BEDDING FOR DRAINAGE PIPES NOT TO SCALE

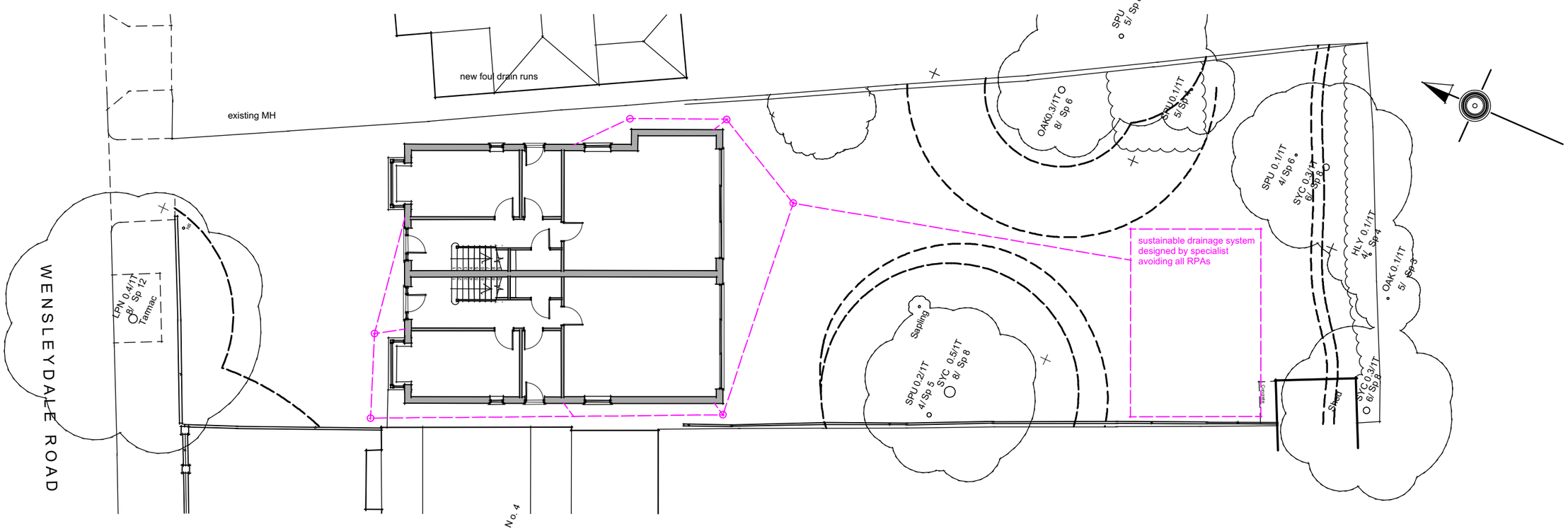


GRANULAR BACKFILL MATERIAL DTp TYPE 1. DTp CLAUSES 803 OR 804 RESPECTIVELY OR SUITABLE APPROVED EQUIVALENT COMPACTED IN LAYERS OF 150mm.

SELECTED BACKFILL TYPE B AS SPECIFIED BUT GENERALLY LOCALLY EXCAVATED MATERIAL OR IMPORTED, READILY COMPACTIBLE , FREE FROM VEGETABLE MATTER, RUBBISH, FROZEN SOIL, AND MATERIAL RETAINED ON A 37.5mm SEIVE. COMPACTED IN LAYERS OF 150mm.

VERGE/LANDSCAPED AREAS REINSTATED TO MATCH EXISTING . PREPARE AND SEED GROUND TO BE REINSTATED AS SPECIFIED.

CLASS S BEDDING FOR DRAINAGE PIPES NOT TO SCALE



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Rev:	Description:	Date:

Job Title: Proposed Development at
6 Wensleydale Road
Hampton

Drawing Title: Suface Water Drainage Plan
Drawing No: 263/15
Scale: 1:200
Date: January 2025

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