

Hobbits, Copyhold Lane, Cuckfield

## Technical Note

Document Ref: 25187-HOD-XX-XX-RP-C-5806

Planning Ref. DM/25/1882

### Condition 7 – Foul and Surface Water Drainage Strategies (DM/26/0265)

The proposed strategy for disposal of foul and surface waters at Hobbits is based on the report submitted for planning (document ref. 25187-HOD-XX-XX-RP-C-5800-Z01), which has been appended to this report for reference. It is proposed to discharge surface water to ground via soakaways and permeable paving. A packaged treatment plant is proposed to deal with foul water generated onsite, with a drainage field to discharge the treated effluent to ground, in accordance with the EA General Binding Rules.

#### 1. Surface Water

1.1 The greenfield runoff rate for the site has been calculated to be 4.4l/s (QBar), based on the HR Wallingford design estimation tool, results are appended to this note. Onsite BRE365 infiltration testing was undertaken and gave a soil infiltration rate of  $1.43 \times 10^{-6}$  m/s. As part of the intrusive site investigation (Ref. LS8636), no groundwater was encountered in any of the trial bores, nor was it encountered during subsequent monitoring.

1.2 The updated layout can be found appended below, hydraulic calculations have been included. A 10% allowance for urban creep is included, CV values of 1.0 applied to all areas, FEH rainfall data has been used, and climate change allowances have been taken as 45% as per the Adur and Ouse Catchment peak rainfall allowances for a 1% annual rainfall event and 40% for the 3.3% annual rainfall event. The drained area going to each modelled network is, the new house roof area for the network going to SA1, and the pool plant room roof going to SA2.

1.3 The soakaway serving the pool plantroom is a standard gravel filled trench, the soakaway serving the main house is a hybrid gravel trench with a geo-cellular crate

above, this provides the larger surface area for better infiltration capacity in the lower section, with the crates providing the additional storage required to deal with the rarer, larger scale rainfall events. During the more frequently occurring rainfall events where only the lower gravel section of the main house soakaway is used, the half drain time for this gravel section, from full, is 16.5 hours. During the less frequent, larger events, the volume in the crates is used for storage and, although the half drain time for entire structure is longer than 24 hours, modelling of two subsequent 6 hour rainfall events has shown that there is capacity for a 1 in 10 year event to follow the 1 in 100.

1.4 The site is situated on a sloped site, falling to the south. Exceedance routing is shown on the proposed layout, the network is sized to contain the 1 in 100 year event, plus climate change, so the exceedance is in case of blockage, failure, or events greater than the designed.

1.5 Water quality has been assessed using the simple index approach as per the CIRIA SuDS Manual. The proposed pollutions hazard indices related to the proposed development are outlined in the tables below.

| Land Use                                         | Pollution hazard level | Total Suspended Solids (TSS) | Metals | Hydrocarbons |
|--------------------------------------------------|------------------------|------------------------------|--------|--------------|
| Residential Roofs                                | Very Low               | 0.2                          | 0.2    | 0.05         |
| Individual property driveways, low traffic roads | Low                    | 0.5                          | 0.4    | 0.4          |

**Table A - Pollution hazard indices**

| SuDS Component                                                                                                                                                                                     | Total Suspended Solids (TSS) | Metals | Hydrocarbons |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--------|--------------|
| Constructed permeable pavement (with a suitable filtration material and geotextile at formation level) underlain by a soil with good containment attenuation potential of at least 300mm in depth. | 0.7                          | 0.6    | 0.7          |

**Table B - SuDS mitigation indices for permeable paving discharge to ground**

1.6 It is deemed that adequate treatment will be provided as the mitigation indices for discharge to ground is equal to or exceeds that of the pollution hazard indices for the chosen SuDS feature.

1.7 Residential roofs are deemed very low risk and regular maintenance outlined in Section 4 of the original strategy, to remove debris from gutters and catchpits is deemed suitable mitigation.

## 2. Foul Water

2.1 Sewer records obtained from Southern Water confirmed there are no sewer in the area, it is therefore proposed that foul water generated onsite is to be treated in a packaged treatment plant onsite before discharging the treated effluent to ground via a drainage field, in accordance with EA General Binding Rules.

2.2 Onsite percolation testing within the topsoil was undertaken and gave a result of 180s/mm, too slow for a belowground drainage field, therefore an above ground drainage mound is proposed. The drainage mound is to be built into the natural slope of the site to create the required base area. The anticipated volume of foul water produced from a

## 3. Summary

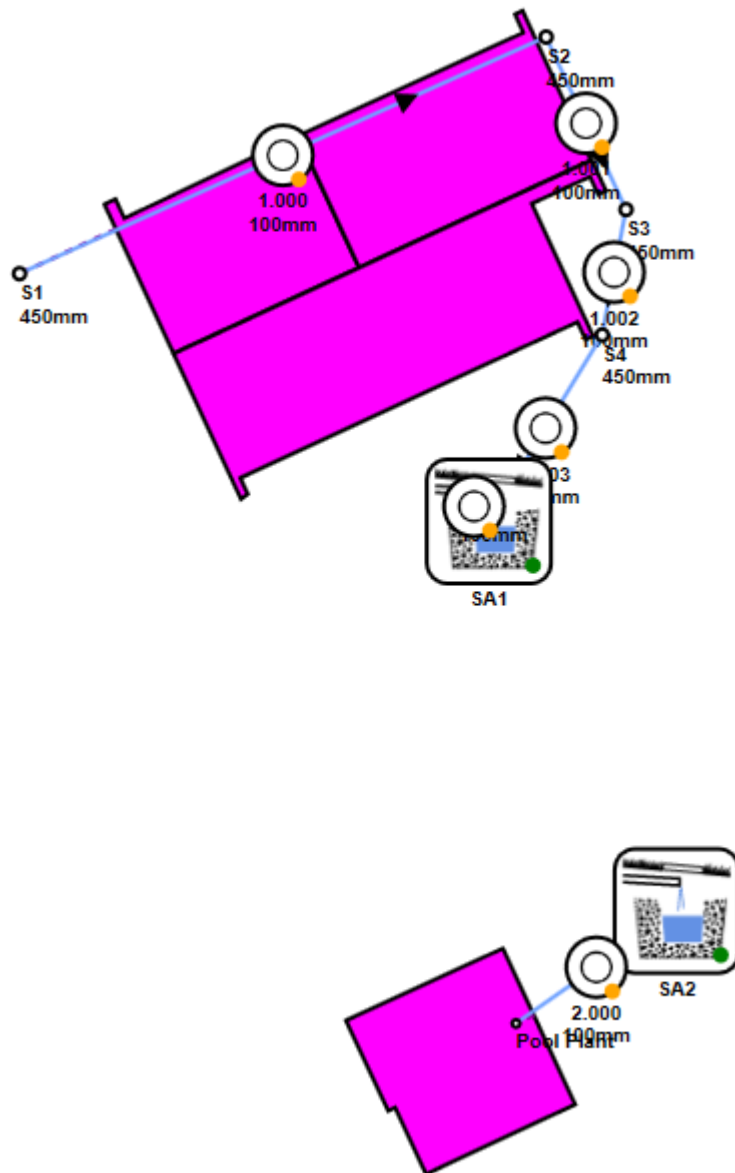
3.1 Surface water is to discharge to ground through the use of permeable paving and soakaways for the roof areas. Foul water is to be treated through an onsite packaged treatment plant and discharge the treated effluent to ground through a drainage mound, following the guidance as set out within the EA General Binding Rules.

## 4. Appendices

- Drained Areas Schematic
- Greenfield Runoff Calculator
- Proposed Drainage Layout
- Proposed Soakaway Sections
- Flow Modelling and Results – Singular Events
- Flow Modelling and Results – Consecutive Events
- Proposed Drainage Mound Construction

| Revision | Purpose       | Date     | Author | Checked | Authorised |
|----------|---------------|----------|--------|---------|------------|
| Z01      | Initial issue | 01/04/26 | MJ     | JOD     |            |
|          |               |          |        |         |            |
|          |               |          |        |         |            |

## Drained Areas Schematic



# PART 1 – SURFACE WATER DRAINAGE DESIGN CHECKLIST

| Requirement                                          | Summary of Expectation                                                                            | Summary                     | Reference (Drawing / Report Section) |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------|-----------------------------|--------------------------------------|
| <b>For all strategies</b>                            |                                                                                                   |                             |                                      |
| <b>Greenfield runoff rate (Q<sub>bar</sub>)</b>      | <i>FEH method or similar approved; based on pre-development catchment</i>                         | 4.4 l/s                     | Section 1.1                          |
| <b>On-site infiltration testing</b>                  | <i>BRE365-compliant tests at SuDS location/depth; safety factor applied</i>                       | 1.43x10 <sup>-6</sup> m/s   | Section 1.1                          |
| <b>Groundwater monitoring (if relevant)</b>          | <i>Demonstrates seasonal high water table is &gt;1m below base</i>                                | Not found                   | Section 1.1                          |
| <b>Catchment and drainage areas</b>                  | <i>Plans show areas drained and contributing catchments for each SuDS feature</i>                 |                             | Appended                             |
| <b>Climate change allowances</b>                     | <i>EA guidance applied to rainfall intensity</i>                                                  |                             | Section 1.2                          |
| <b>Urban creep allowance</b>                         | <i>10% additional impermeable area unless justified</i>                                           |                             | Section 1.2                          |
| <b>Design rainfall</b>                               | <i>Latest FEH data; FSR not accepted without justification</i>                                    |                             | Section 1.2                          |
| <b>Cv value</b>                                      | <i>1.0 applied to all impermeable surfaces</i>                                                    |                             | Section 1.2                          |
| <b>Hydraulic calculations</b>                        | <i>1 in 1, 1 in 30, 1 in 30 + CC, and 1 in 100 + CC critical storm durations; no flooding</i>     |                             | Appended                             |
| <b>Flow control structures</b>                       | <i>Head-discharge curve, outlet sizing, orifice protection from blockage</i>                      | N/A                         |                                      |
| <b>SuDS layout plan</b>                              | <i>Full drainage layout with invert levels, cover levels, flow directions, and labels</i>         |                             | 25187-HOD-XX-ZZ-DR-C-5100            |
| <b>Longitudinal and cross sections</b>               | <i>For basins, pipes, flow controls, below-ground structures</i>                                  |                             | Appended                             |
| <b>Exceedance flow routing</b>                       | <i>Plans show how exceedance flows are managed/safely routed</i>                                  |                             | 25187-HOD-XX-ZZ-DR-C-5100            |
| <b>Finished floor levels</b>                         | <i>FFLs at least 150mm above surrounding ground/exceedance routes</i>                             |                             | Landscaping layout                   |
| <b>Water quality treatment</b>                       | <i>Simple Index Approach; mitigation index ≥ hazard index</i>                                     |                             | Sections 1.5 - 1.7                   |
| <b>Proprietary systems (if used)</b>                 | <i>Certification, design basis, and O&amp;M provided</i>                                          | N/A                         |                                      |
| <b>SuDS details</b>                                  | <i>Type, size, function, inlet/outlet, invert and cover levels, safety features</i>               |                             | 25187-HOD-XX-ZZ-DR-C-5100            |
| <b>Maintenance plan</b>                              | <i>Asset register and inspection/maintenance schedule; CIRIA Table 32.1 referenced</i>            | Previously submitted report | Section 4                            |
| <b>Maintenance party and mechanism</b>               | <i>Legal body named; landowner, management company or adoption route clear</i>                    | Previously submitted report | Section 4                            |
| <b>For infiltration based strategies</b>             |                                                                                                   |                             |                                      |
| <b>Soakaway or infiltration design</b>               | <i>Sizing for 6-hour 1 in 100 +CC storm; half-drain time &lt;24h</i>                              |                             | Section 1.3                          |
| <b>For strategies which discharge to watercourse</b> |                                                                                                   |                             |                                      |
| <b>Discharge to watercourse</b>                      | <i>Restricted to Q<sub>bar</sub>; outfall location and construction details provided</i>          | N/A                         |                                      |
| <b>Attenuation sizing</b>                            | <i>Demonstrates storage for 1 in 100 +CC event without flooding</i>                               | N/A                         |                                      |
| <b>For strategies which discharge to sewer</b>       |                                                                                                   |                             |                                      |
| <b>Discharge to sewer</b>                            | <i>Q<sub>bar</sub> max unless sewerage undertaker agrees higher rate</i>                          | N/A                         |                                      |
| <b>Sewer connection approval</b>                     | <i>Undertaker correspondence confirming acceptability of rate and location; S106 not required</i> | N/A                         |                                      |

|                           |                                                                     |     |  |
|---------------------------|---------------------------------------------------------------------|-----|--|
| <b>Attenuation sizing</b> | <i>Demonstrates storage for 1 in 100 +CC event without flooding</i> | N/A |  |
|---------------------------|---------------------------------------------------------------------|-----|--|

## PART 2 – FOUL WATER DRAINAGE DESIGN CHECKLIST

| Requirement                                                            | Summary of Expectation                                                        | Summary | Reference (Drawing / Report Section) |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------|---------|--------------------------------------|
| <b><i>For all strategies</i></b>                                       |                                                                               |         |                                      |
| <b>Foul drainage layout</b>                                            | <i>Inverts, pipe sizes, gradients, connection points</i>                      |         | 25187-HOD-XX-ZZ-DR-C-5100            |
| <b>System type</b>                                                     | <i>Gravity or pumped; pump design and calculations if applicable</i>          | Gravity |                                      |
| <b>Peak flow rate</b>                                                  | <i>Based on occupancy and discharge volume</i>                                |         | Section 2.2                          |
| <b><i>For strategies which discharge to sewer</i></b>                  |                                                                               |         |                                      |
| <b>Public sewer connection</b>                                         | <i>Location confirmed; manhole ID and route to sewer</i>                      | N/A     |                                      |
| <b>Undertaker correspondence</b>                                       | <i>Email or letter showing awareness of proposal and preliminary approval</i> | N/A     |                                      |
| <b><i>For strategies which discharge via non-mains foul system</i></b> |                                                                               |         |                                      |
| <b>Non-mains foul system</b>                                           | <i>Justification for use; compliance with General Binding Rules</i>           |         | Section 2.1                          |
| <b>Drainage field infiltration</b>                                     | <i>BS6297-compliant infiltration test results provided</i>                    |         | Section 2.2                          |
| <b>EA Permit</b>                                                       | <i>Submitted or confirmed not required (e.g. for discharge to water)</i>      |         | Not required                         |

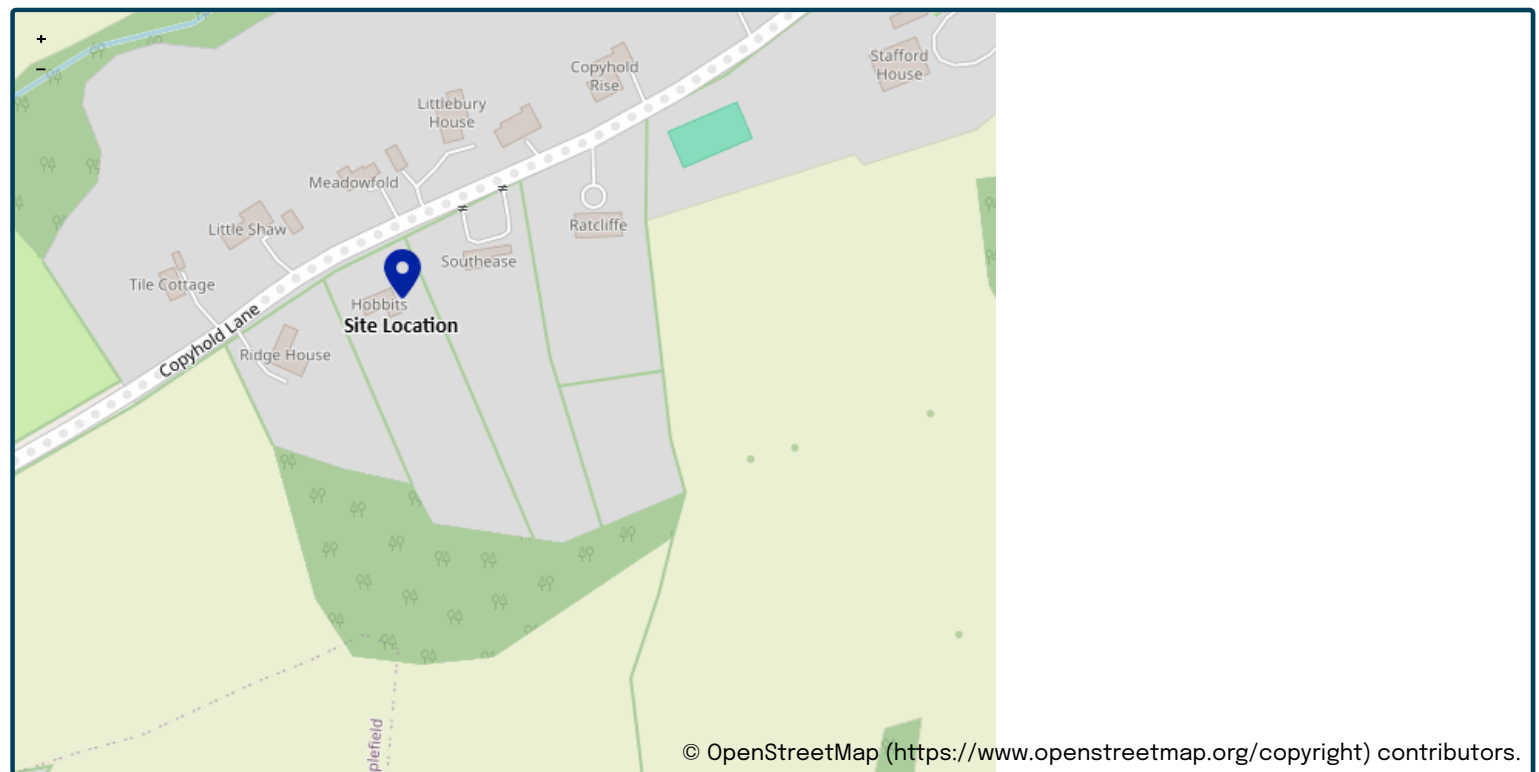
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

## Project details

|               |                                         |
|---------------|-----------------------------------------|
| Date          | <input type="text" value="24/02/2026"/> |
| Calculated by | <input type="text" value="MJ"/>         |
| Reference     | <input type="text" value="25187"/>      |
| Model version | <input type="text" value="2.2.3"/>      |

## Location

|               |                                      |
|---------------|--------------------------------------|
| Site name     | <input type="text" value="Hobbits"/> |
| Site location | <input type="text"/>                 |



|                                       |                                     |
|---------------------------------------|-------------------------------------|
| Site easting (British National Grid)  | <input type="text" value="530966"/> |
| Site northing (British National Grid) | <input type="text" value="123601"/> |

## Site details

|                      |                                   |    |
|----------------------|-----------------------------------|----|
| Total site area (ha) | <input type="text" value="0.75"/> | ha |
|----------------------|-----------------------------------|----|

# Greenfield runoff

## Method

|        |                        |
|--------|------------------------|
| Method | FEH statistical (2025) |
|--------|------------------------|

## FEH statistical (2025)

|                                   | <u>My value</u>                    | <u>Map value</u>                   |
|-----------------------------------|------------------------------------|------------------------------------|
| SAAR9120 (mm)                     | <input type="text" value="890"/>   | <input type="text" value="mm"/>    |
| BFIHOST19scaled                   | <input type="text" value="0.467"/> | <input type="text"/>               |
| QMed-QBar conversion              | <input type="text" value="1.136"/> | <input type="text" value="1.136"/> |
| QMed (l/s)                        | <input type="text" value="3.9"/>   | <input type="text" value="l/s"/>   |
| QBar (FEH statistical 2025) (l/s) | <input type="text" value="4.4"/>   | <input type="text" value="l/s"/>   |

## Growth curve factors

|                        | <u>My value</u>                   | <u>Map value</u>               |
|------------------------|-----------------------------------|--------------------------------|
| Hydrological region    | <input type="text" value="7"/>    | <input type="text" value="7"/> |
| 1 year growth factor   | <input type="text" value="0.85"/> | <input type="text"/>           |
| 2 year growth factor   | <input type="text" value="0.88"/> | <input type="text"/>           |
| 10 year growth factor  | <input type="text" value="1.62"/> | <input type="text"/>           |
| 30 year growth factor  | <input type="text" value="2.3"/>  | <input type="text"/>           |
| 100 year growth factor | <input type="text" value="3.19"/> | <input type="text"/>           |
| 200 year growth factor | <input type="text" value="3.74"/> | <input type="text"/>           |

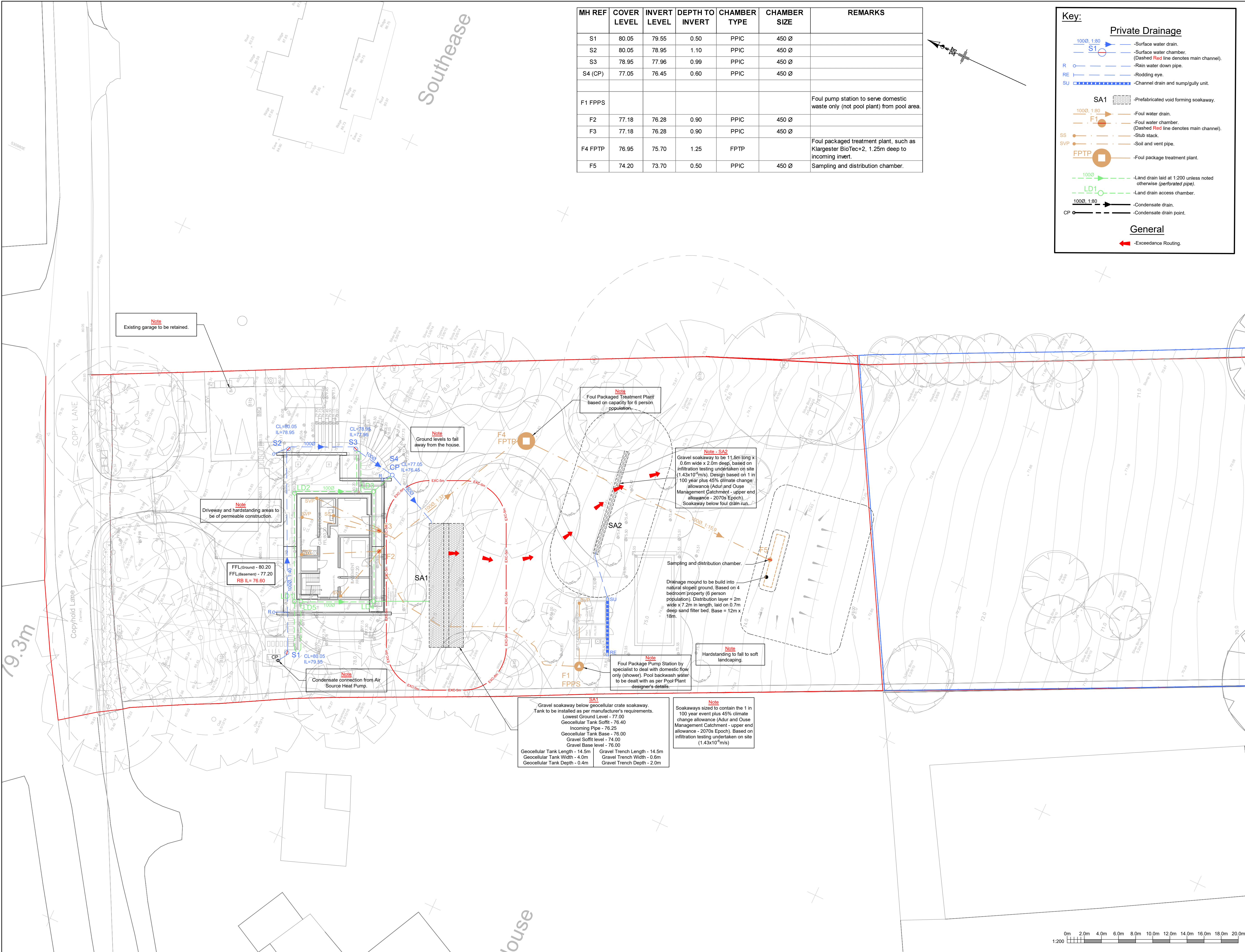
## Results

|                           |                                   |
|---------------------------|-----------------------------------|
| Method                    | FEH statistical (2025)            |
| Flow rate 1 year (l/s)    | <input type="text" value="3.7"/>  |
| Flow rate 2 year (l/s)    | <input type="text" value="3.9"/>  |
| Flow rate 10 years (l/s)  | <input type="text" value="7.1"/>  |
| Flow rate 30 years (l/s)  | <input type="text" value="10.1"/> |
| Flow rate 100 years (l/s) | <input type="text" value="14.0"/> |
| Flow rate 200 years (l/s) | <input type="text" value="16.4"/> |

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent ‘zero’ figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

### Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at uksuds.com (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.



| MH REF  | COVER LEVEL | INVERT LEVEL | DEPTH TO INVERT | CHAMBER TYPE | CHAMBER SIZE | REMARKS                                                                                    |
|---------|-------------|--------------|-----------------|--------------|--------------|--------------------------------------------------------------------------------------------|
| S1      | 80.05       | 79.55        | 0.50            | PPIC         | 450 Ø        |                                                                                            |
| S2      | 80.05       | 78.95        | 1.10            | PPIC         | 450 Ø        |                                                                                            |
| S3      | 78.95       | 77.96        | 0.99            | PPIC         | 450 Ø        |                                                                                            |
| S4 (CP) | 77.05       | 76.45        | 0.60            | PPIC         | 450 Ø        |                                                                                            |
| F1 FPPS |             |              |                 |              |              | Foul pump station to serve domestic waste only (not pool plant) from pool area.            |
| F2      | 77.18       | 76.28        | 0.90            | PPIC         | 450 Ø        |                                                                                            |
| F3      | 77.18       | 76.28        | 0.90            | PPIC         | 450 Ø        |                                                                                            |
| F4 FPTP | 76.95       | 75.70        | 1.25            | FPTP         |              | Foul packaged treatment plant, such as Klargester BioTec+2, 1.25m deep to incoming invert. |
| F5      | 74.20       | 73.70        | 0.50            | PPIC         | 450 Ø        | Sampling and distribution chamber.                                                         |

Key:

Private Drainage

SA1

General

NOTES

Drawings References:

RISK ASSESSMENT

Job Title

Client

Engineering Layout. Sheet 1 of 2.

Scale at A1: 1:200

Status: PRELIMINARY

Drawn: DR

Checked: JOD

Approved: -

Date: Aug '25

Date: Aug '25

Date:

Document Reference:

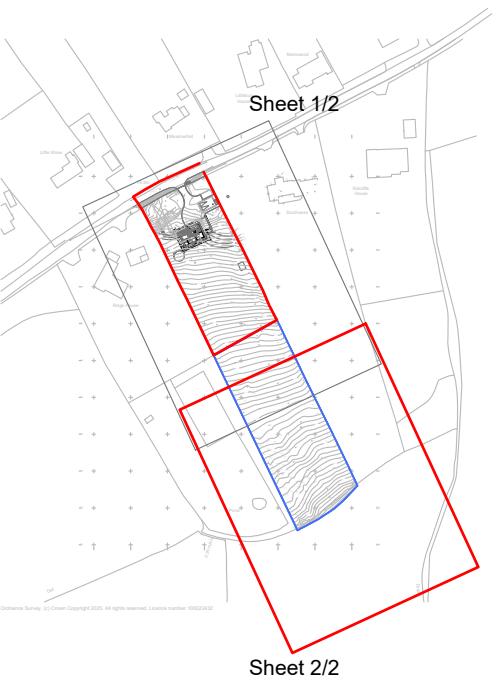
25187-HOD-XX-ZZ-DR-C-5100

Revision:

P06

## NOTES

1. Do not scale this drawing unless for Planning Permission purposes only.
2. This drawing is to be read in conjunction with all other relevant Engineer's and Architect's drawings and specifications.



Master Plan (NTS)

### Drawings References:

| Drawing:              | Drawing no:                       | Rev: | Date:    |
|-----------------------|-----------------------------------|------|----------|
| Proposed Site Plan    | b120d                             | D    | 15/07/25 |
| Tree Root Protection  | Hobbits ADT TCP<br>01_25_07_BOUND |      | July '25 |
| Proposed Basement     | Smith B                           |      | 28/07/25 |
| Proposed Ground Floor | Smith GF                          |      | 28/07/25 |

## RISK ASSESSMENT

### Residual Risks Identified

1. None currently identified (08/08/25)

### Contractor's General Risk Items

(List is not exhaustive but includes commonly raised issues)

1. Location of all buried services.
2. Existing drainage:
  - i) Gases, confined spaces, diseases.
  - ii) Maintain flow in drains during works.
3. Manual lifting of heavy objects; manhole covers, drainage pipes, concrete rings, kerbs, etc.
4. Excavation for drainage trenches and manholes.
5. Security:

Keep site secure from members of the public.  
maintain public safety when accessing site.

|     |          |    |     |                    |
|-----|----------|----|-----|--------------------|
| P01 | 08/08/25 | DR | JOD | Preliminary issue. |
|-----|----------|----|-----|--------------------|

| Rev       | Date | By | Chkd. | Revision notes |
|-----------|------|----|-------|----------------|
| Job Title |      |    |       |                |

Huf Smith, Copyhold Lane,  
Cuckfield, Haywards Heath, RH17  
5EB.

Drawing Title

Engineering Layout.  
Sheet 2 of 2.

Client

## Eclipse



01732 617555

mail@hodel.uk

Scale at A1: 1:200

Status: PRELIMINARY

Drawn: DR

Checked: JO

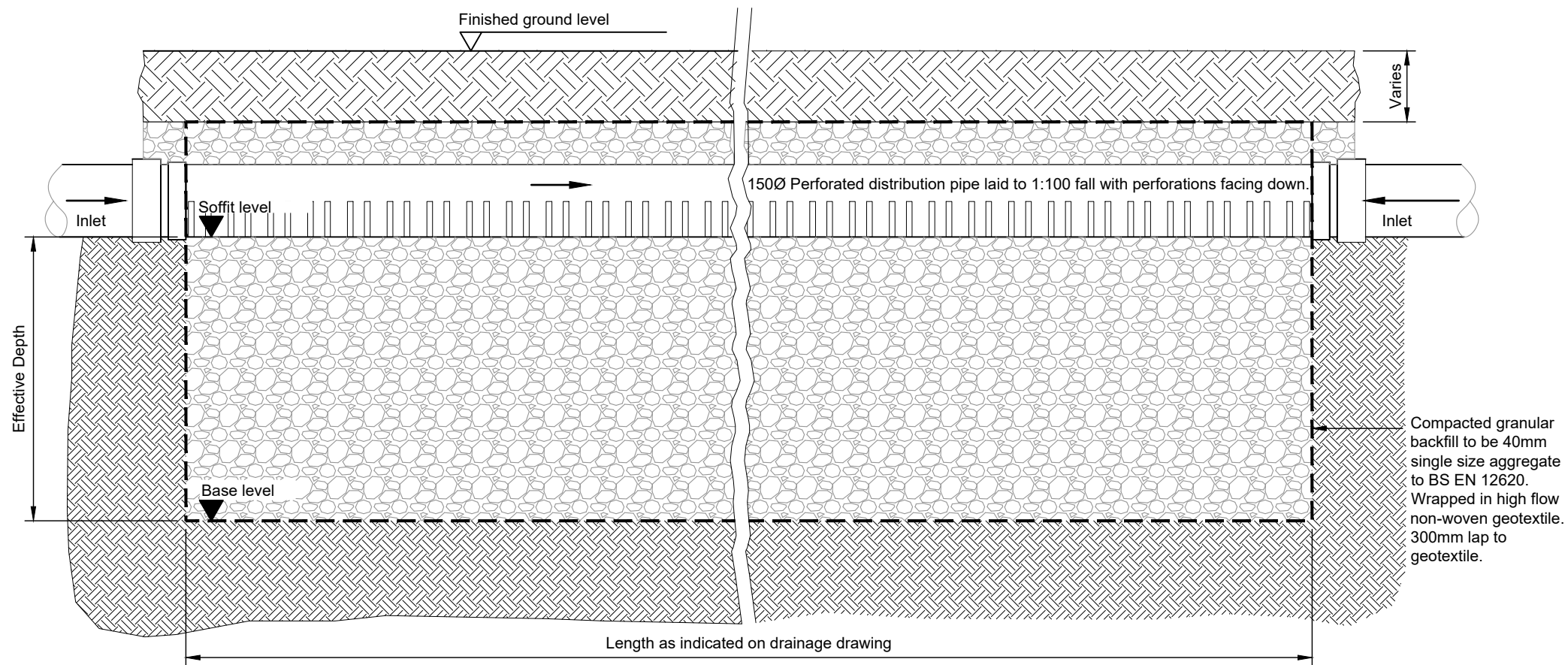
Approved: \_\_\_\_\_

Document Reference

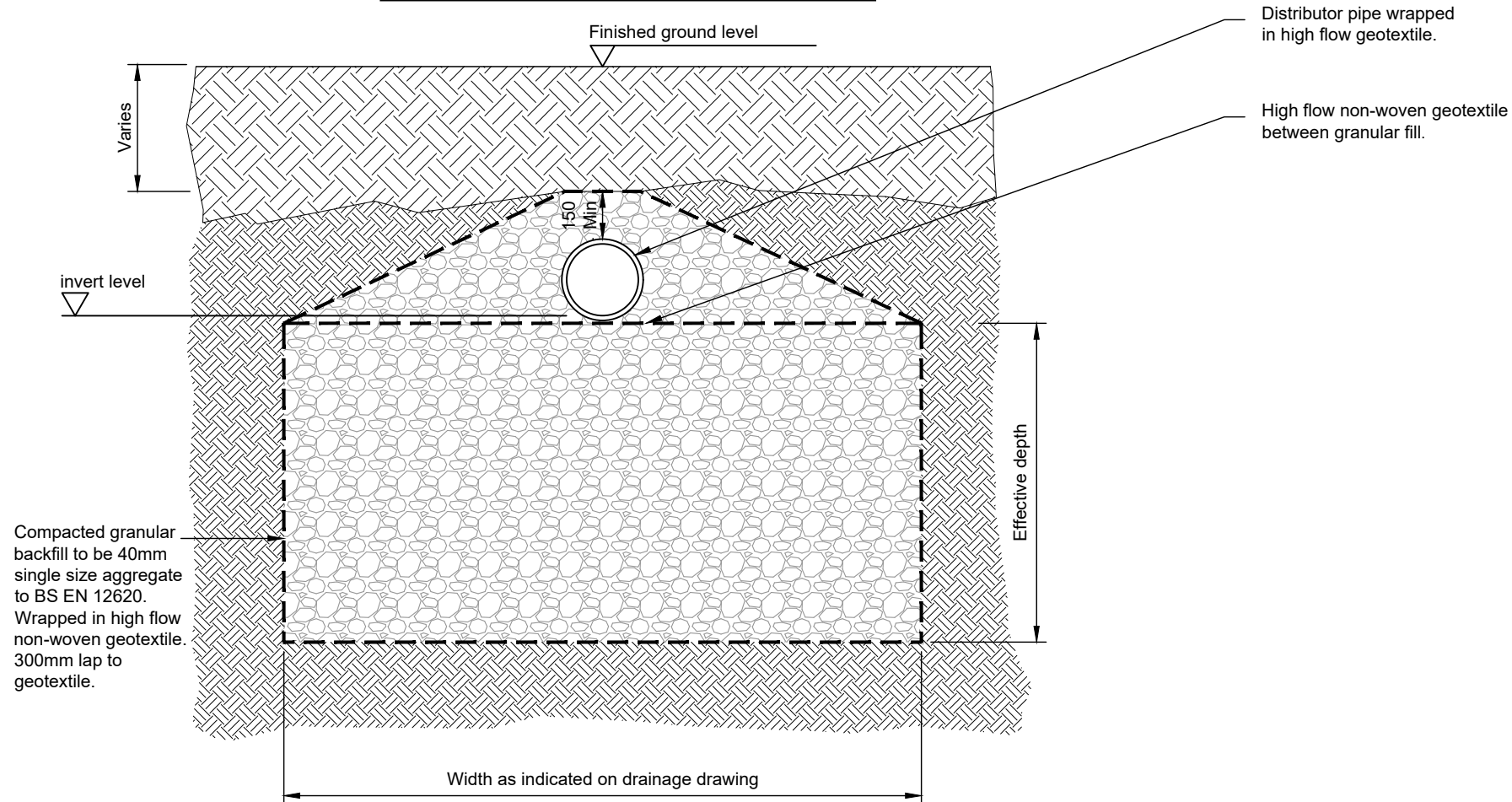
**25187-HOD-XX-ZZ-DR-C-5101**

Revision:

**P01**



**Typical gravel filled  
soakaway - longitudinal section**



**Typical gravel filled  
soakaway - cross section**

## NOTES

1. Do not scale this drawing unless for Planning Permission purposes only.
2. This drawing is to be read in conjunction with all other relevant Engineer's and Architect's drawings and specifications.

|     |          |     |     |                    |
|-----|----------|-----|-----|--------------------|
| P01 | 01/04/26 | JOD | JOD | Preliminary issue. |
|-----|----------|-----|-----|--------------------|

| Rev | Date | By | Chkd. | Revision notes |
|-----|------|----|-------|----------------|
|-----|------|----|-------|----------------|

|                                                                    |
|--------------------------------------------------------------------|
| Job Title                                                          |
| Huf Smith, Copyhold Lane<br>Cuckfield, Haywards Heath<br>RH17 5EB. |

|                                          |
|------------------------------------------|
| Drawing Title                            |
| Gravel Soakaway<br>Construction Details. |

|         |
|---------|
| Client  |
| Eclipse |

The logo for Hodel Consulting Engineers features the word "HODEL" in a large, bold, red sans-serif font. The letter "O" is stylized with a blue horizontal bar across its middle. Below "HODEL", the words "CONSULTING" and "ENGINEERS" are stacked in a smaller, blue, sans-serif font. The entire logo is enclosed within a thin black rectangular border.

01732 617555

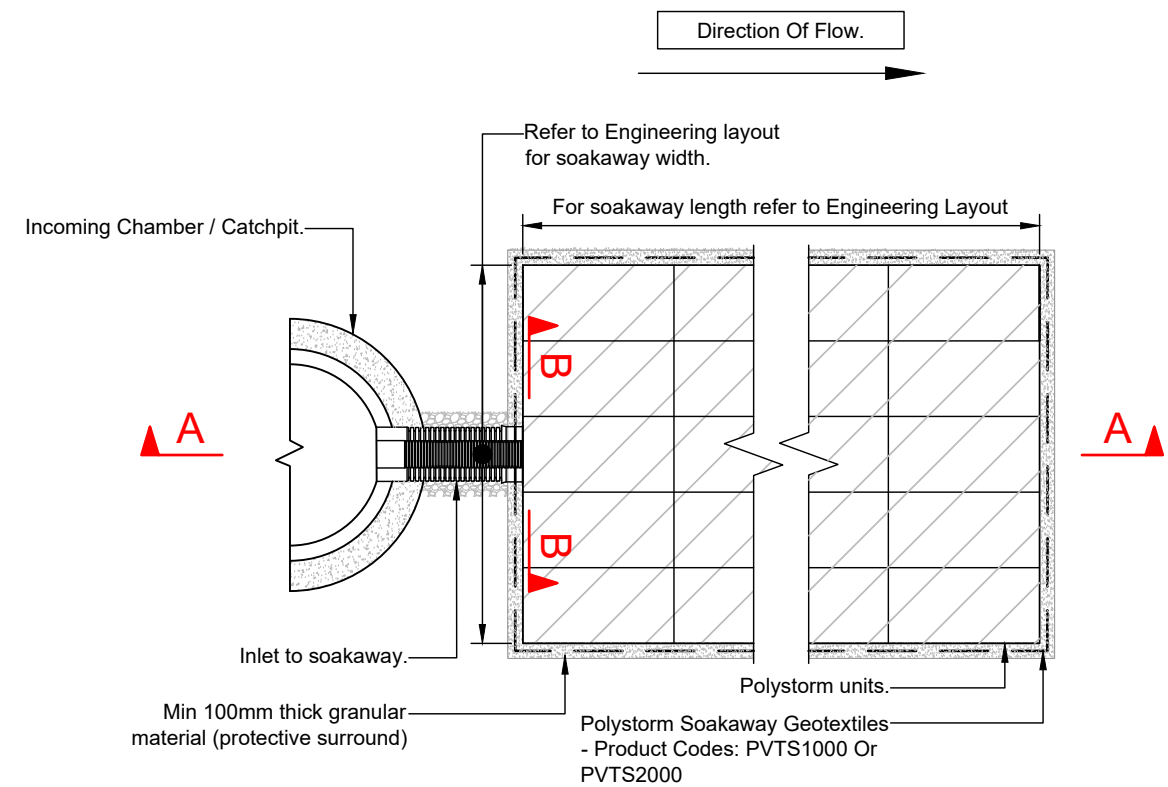
[mail@hodel.uk](mailto:mail@hodel.uk)

|                  |
|------------------|
| Scale at A3: NTS |
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| Status: PRELIMINARY |
|---------------------|

|                                                                                              |               |             |
|----------------------------------------------------------------------------------------------|---------------|-------------|
| Drawn:  | Checked: JOD  | Approved: - |
| Date: Apr '26                                                                                | Date: Apr '26 | Date: -     |

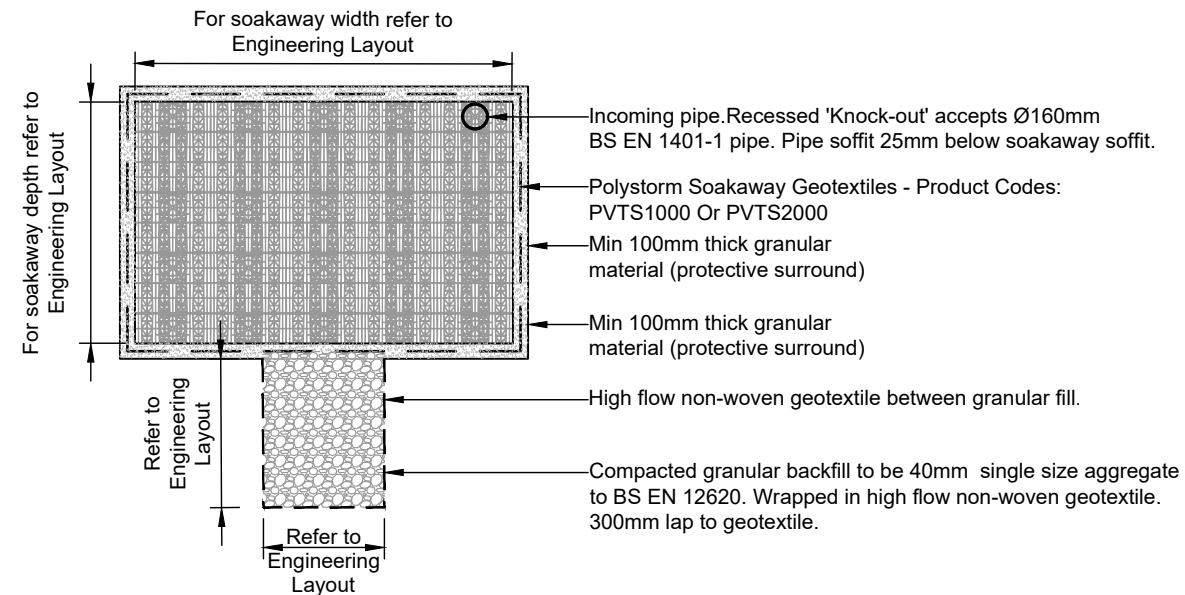
|                                  |            |
|----------------------------------|------------|
| Document Reference:              | Revision:  |
| <b>25187-HOD-XX-ZZ-DR-C-5203</b> | <b>P01</b> |



### Polystorm Construction Detail

#### Plan

Scale 1:50



#### Section B-B

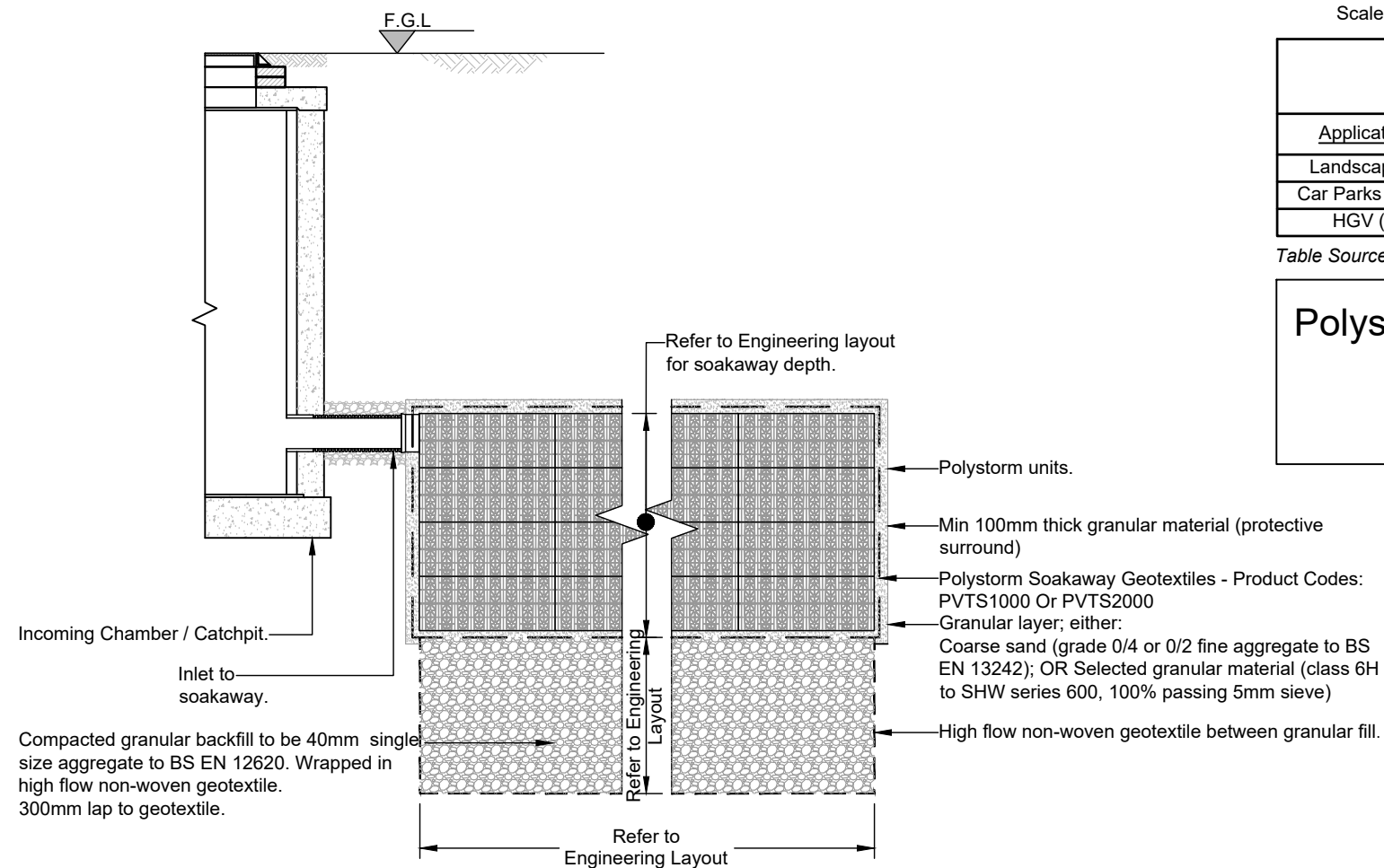
Scale 1:50

#### Polystorm Soakaway Geotextiles Product Codes: PVTS1000 & PVTS2000

| Application (Cover Above Tank)  | Product - TS1000 | Product - TS2000 |
|---------------------------------|------------------|------------------|
| Landscape (min cover 0.50m)     | ✓                | ✗                |
| Car Parks (min cover 0.6-1.0m+) | ✓                | ✗                |
| HGV ( min cover 1.0m+)          | ✗                | ✓                |

Table Source: Polystorm data sheets dated June 2018 and November 2018

Polystorm to be installed fully in accordance with manufacturer's specifications and recommendations.



#### Section A-A

Scale 1:50

## NOTES

- Do not scale this drawing unless for Planning Permission purposes only.
- This drawing is to be read in conjunction with all other relevant Engineer's and Architect's drawings and specifications.

|     |          |    |     |                    |
|-----|----------|----|-----|--------------------|
| P01 | 01/04/26 | MJ | JOD | Preliminary issue. |
|-----|----------|----|-----|--------------------|

|     |      |    |       |                |
|-----|------|----|-------|----------------|
| Rev | Date | By | Chkd. | Revision notes |
|-----|------|----|-------|----------------|

Job Title

Huf Smith, Copyhold Lane  
Cuckfield, Haywards Heath  
RH17 5EB.

Drawing Title

Typical Geocellular  
Soakaway by Polystorm  
with gravel base section.

Client

Eclipse

**HODEL**  
CONSULTING  
ENGINEERS

01732 617555

mail@hodel.uk

Scale at A3: 1:50

Status: PRELIMINARY

Drawn: MJ

Checked: JOD

Approved: -

Date: Apr '26

Date: Apr '26

Date: -

Document Reference:

25187-HOD-XX-ZZ-DR-C-5204

Revision:

P01

Design Settings

|                       |        |                                      |       |                          |               |                             |       |                                    |   |
|-----------------------|--------|--------------------------------------|-------|--------------------------|---------------|-----------------------------|-------|------------------------------------|---|
| Rainfall Methodology  | FEH-22 | CV                                   | 1.000 | Maximum Rainfall (mm/hr) | 50.0          | Minimum Backdrop Height (m) | 0.200 | Enforce best practice design rules | x |
| Return Period (years) | 100    | Time of Entry (mins)                 | 5.00  | Minimum Velocity (m/s)   | 1.00          | Preferred Cover Depth (m)   | 0.500 |                                    |   |
| Additional Flow (%)   | 0      | Maximum Time of Concentration (mins) | 30.00 | Connection Type          | Level Soffits | Include Intermediate Ground | ✓     |                                    |   |

Nodes

| Name       | Area (ha) | T of E (mins) | Cover Level (m) | Diameter (mm) | Easting (m) | Northing (m) | Depth (m) |
|------------|-----------|---------------|-----------------|---------------|-------------|--------------|-----------|
| S1         | 0.005     | 5.00          | 80.050          | 450           | 530939.800  | 123608.012   | 0.600     |
| S2         | 0.006     | 5.00          | 80.050          | 450           | 530961.509  | 123617.773   | 1.200     |
| S3         |           |               | 78.950          | 450           | 530964.802  | 123610.657   | 1.000     |
| S4         | 0.010     | 5.00          | 77.050          | 450           | 530963.822  | 123605.486   | 0.600     |
| SA1        |           |               | 77.000          |               | 530959.154  | 123597.796   | 0.700     |
| Pool Plant | 0.005     | 5.00          | 75.500          |               | 530960.268  | 123577.091   | 0.600     |
| SA2        |           |               | 75.500          |               | 530966.895  | 123581.725   | 0.900     |
| X          |           |               | 78.000          | 100           | 530957.919  | 123599.031   | 0.800     |

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) |
|-------|------------|---------|------------|-------------|-----------|-----------|----------|-------------|----------|---------------|--------------|
| 1.000 | S1         | S2      | 23.826     | 0.600       | 79.450    | 78.850    | 0.600    | 39.7        | 100      | 5.32          | 50.0         |
| 1.001 | S2         | S3      | 7.974      | 0.600       | 78.850    | 77.950    | 0.900    | 8.9         | 100      | 5.37          | 50.0         |
| 1.002 | S3         | S4      | 5.277      | 0.600       | 77.950    | 76.540    | 1.410    | 3.7         | 100      | 5.40          | 50.0         |
| 1.003 | S4         | SA1     | 9.009      | 0.600       | 76.450    | 76.300    | 0.150    | 60.1        | 150      | 5.51          | 50.0         |
| 2.000 | Pool Plant | SA2     | 8.089      | 0.600       | 74.900    | 74.600    | 0.300    | 27.0        | 100      | 5.09          | 50.0         |
| X     | SA1        | X       | 7.360      | 0.600       | 76.900    | 77.200    | -0.300   | -24.5       | 100      | 30.00         | 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) |
|-------|-----------|-----------|------------|--------------|--------------|-------------|--------------------|----------------|--------------------|
| 1.000 | 1.227     | 9.6       | 0.9        | 0.500        | 1.100        | 0.005       | 0.0                | 21             | 0.767              |
| 1.001 | 2.612     | 20.5      | 2.1        | 1.100        | 0.900        | 0.011       | 0.0                | 21             | 1.674              |
| 1.002 | 4.026     | 31.6      | 2.1        | 0.900        | 0.410        | 0.011       | 0.0                | 18             | 2.286              |
| 1.003 | 1.300     | 23.0      | 3.8        | 0.450        | 0.550        | 0.021       | 0.0                | 41             | 0.966              |
| 2.000 | 1.492     | 11.7      | 0.9        | 0.500        | 0.800        | 0.005       | 0.0                | 19             | 0.889              |
| X     | 0.005     | 0.0       | 3.8        | 0.000        | 0.700        | 0.021       | 0.0                | 100            | 0.000              |

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) |
|-------|------------|-------------|----------|-----------|-----------|-----------|--------------|-----------|-----------|--------------|
| 1.000 | 23.826     | 39.7        | 100      | Circular  | 80.050    | 79.450    | 0.500        | 80.050    | 78.850    | 1.100        |
| 1.001 | 7.974      | 8.9         | 100      | Circular  | 80.050    | 78.850    | 1.100        | 78.950    | 77.950    | 0.900        |
| 1.002 | 5.277      | 3.7         | 100      | Circular  | 78.950    | 77.950    | 0.900        | 77.050    | 76.540    | 0.410        |
| 1.003 | 9.009      | 60.1        | 150      | Circular  | 77.050    | 76.450    | 0.450        | 77.000    | 76.300    | 0.550        |
| 2.000 | 8.089      | 27.0        | 100      | Circular  | 75.500    | 74.900    | 0.500        | 75.500    | 74.600    | 0.800        |
| X     | 7.360      | -24.5       | 100      | Circular  | 77.000    | 76.900    | 0.000        | 78.000    | 77.200    | 0.700        |

| Link  | US Node    | Dia (mm) | Node Type | MH Type | DS Node | Dia (mm) | Node Type | MH Type |
|-------|------------|----------|-----------|---------|---------|----------|-----------|---------|
| 1.000 | S1         | 450      | Manhole   | PPIC    | S2      | 450      | Manhole   | PPIC    |
| 1.001 | S2         | 450      | Manhole   | PPIC    | S3      | 450      | Manhole   | PPIC    |
| 1.002 | S3         | 450      | Manhole   | PPIC    | S4      | 450      | Manhole   | PPIC    |
| 1.003 | S4         | 450      | Manhole   | PPIC    | SA1     |          | Junction  |         |
| 2.000 | Pool Plant |          | Junction  |         | SA2     |          | Junction  |         |
| X     | SA1        |          | Junction  |         | X       | 100      | Manhole   | PPIC    |

Manhole Schedule

| Node       | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections                                                                           | Link  | IL (m) | Dia (mm) |
|------------|-------------|--------------|--------|-----------|----------|---------------------------------------------------------------------------------------|-------|--------|----------|
| S1         | 530939.800  | 123608.012   | 80.050 | 0.600     | 450      |    |       |        |          |
|            |             |              |        |           |          | 0                                                                                     | 1.000 | 79.450 | 100      |
| S2         | 530961.509  | 123617.773   | 80.050 | 1.200     | 450      |    |       |        |          |
|            |             |              |        |           |          | 1                                                                                     | 1.000 | 78.850 | 100      |
|            |             |              |        |           |          | 0                                                                                     | 1.001 | 78.850 | 100      |
| S3         | 530964.802  | 123610.657   | 78.950 | 1.000     | 450      |    |       |        |          |
|            |             |              |        |           |          | 1                                                                                     | 1.001 | 77.950 | 100      |
|            |             |              |        |           |          | 0                                                                                     | 1.002 | 77.950 | 100      |
| S4         | 530963.822  | 123605.486   | 77.050 | 0.600     | 450      |    |       |        |          |
|            |             |              |        |           |          | 1                                                                                     | 1.002 | 76.540 | 100      |
|            |             |              |        |           |          | 0                                                                                     | 1.003 | 76.450 | 150      |
| SA1        | 530959.154  | 123597.796   | 77.000 | 0.700     |          |    |       |        |          |
|            |             |              |        |           |          | 1                                                                                     | 1.003 | 76.300 | 150      |
|            |             |              |        |           |          | 0                                                                                     | X     | 76.900 | 100      |
| Pool Plant | 530960.268  | 123577.091   | 75.500 | 0.600     |          |    |       |        |          |
|            |             |              |        |           |          | 0                                                                                     | 2.000 | 74.900 | 100      |
| SA2        | 530966.895  | 123581.725   | 75.500 | 0.900     |          |  |       |        |          |
|            |             |              |        |           |          | 1                                                                                     | 2.000 | 74.600 | 100      |
| X          | 530957.919  | 123599.031   | 78.000 | 0.800     | 100      |  |       |        |          |
|            |             |              |        |           |          | 1                                                                                     | X     | 77.200 | 100      |

Simulation Settings

| Rainfall Methodology  |                       | FEH-22                |    | Summer CV             |     | 1.000                 |                       | Analysis Speed        |     | Detailed              |     | Drain Down Time (mins)     |                       | 10080                 |      | Starting Level (m)      |      |      | Check Discharge Volume |       | x |
|-----------------------|-----------------------|-----------------------|----|-----------------------|-----|-----------------------|-----------------------|-----------------------|-----|-----------------------|-----|----------------------------|-----------------------|-----------------------|------|-------------------------|------|------|------------------------|-------|---|
| Rainfall Events       |                       | Singular              |    | Winter CV             |     | 1.000                 |                       | Skip Steady State     |     | x                     |     | Additional Storage (m³/ha) |                       | 20.0                  |      | Check Discharge Rate(s) |      |      | x                      |       |   |
| Storm Durations       |                       |                       |    |                       |     |                       |                       |                       |     |                       |     |                            |                       |                       |      |                         |      |      |                        |       |   |
|                       |                       | 15                    | 30 | 60                    | 120 | 180                   | 240                   | 360                   | 480 | 600                   | 720 | 960                        | 1440                  | 2160                  | 2880 | 4320                    | 5760 | 7200 | 8640                   | 10080 |   |
| Return Period (years) | Climate Change (CC %) | Additional Area (A %) |    | Additional Flow (Q %) |     | Return Period (years) | Climate Change (CC %) | Additional Area (A %) |     | Additional Flow (Q %) |     | Return Period (years)      | Climate Change (CC %) | Additional Area (A %) |      | Additional Flow (Q %)   |      |      |                        |       |   |
| 2                     |                       | 0                     |    | 10                    |     | 0                     |                       | 30                    |     | 0                     |     | 10                         |                       | 100                   |      | 0                       |      | 10   |                        | 0     |   |
| 10                    |                       | 0                     |    | 10                    |     | 0                     |                       | 30                    |     | 40                    |     | 10                         |                       | 100                   |      | 45                      |      | 10   |                        | 0     |   |

Node SA1 Soakaway Storage Structure

|                             |         |               |      |                           |        |                |        |               |       |                 |   |
|-----------------------------|---------|---------------|------|---------------------------|--------|----------------|--------|---------------|-------|-----------------|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Safety Factor | 1.5  | Invert Level (m)          | 76.000 | Pit Width (m)  | 4.000  | Depth (m)     | 0.400 | Number Required | 1 |
| Side Inf Coefficient (m/hr) | 0.00513 | Porosity      | 0.95 | Time to half empty (mins) | 2430   | Pit Length (m) | 14.500 | Inf Depth (m) | 0.400 |                 |   |

Node SA1 Soakaway Storage Structure

|                             |         |               |      |                           |        |                |        |               |       |                 |   |
|-----------------------------|---------|---------------|------|---------------------------|--------|----------------|--------|---------------|-------|-----------------|---|
| Base Inf Coefficient (m/hr) | 0.00513 | Safety Factor | 1.5  | Invert Level (m)          | 74.000 | Pit Width (m)  | 0.600  | Depth (m)     | 2.000 | Number Required | 1 |
| Side Inf Coefficient (m/hr) | 0.00513 | Porosity      | 0.33 | Time to half empty (mins) | 990    | Pit Length (m) | 14.500 | Inf Depth (m) | 2.000 |                 |   |

Node SA2 Soakaway Storage Structure

|                             |         |               |      |                           |        |                |        |               |       |                 |   |
|-----------------------------|---------|---------------|------|---------------------------|--------|----------------|--------|---------------|-------|-----------------|---|
| Base Inf Coefficient (m/hr) | 0.00513 | Safety Factor | 1.5  | Invert Level (m)          | 72.700 | Pit Width (m)  | 0.600  | Depth (m)     | 2.000 | Number Required | 1 |
| Side Inf Coefficient (m/hr) | 0.00513 | Porosity      | 0.33 | Time to half empty (mins) | 1288   | Pit Length (m) | 12.500 | Inf Depth (m) | 2.000 |                 |   |

Results for 2 year +10% A 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             |
|--------------------------------|------------|--------------|-----------|---------------|----------------|---------------|---------------|--------------------|
| 15 minute summer               | S1         | 11           | 79.472    | 0.022         | 1.0            | 0.0075        | 0.0000        | OK                 |
| 15 minute summer               | S2         | 10           | 78.874    | 0.024         | 2.3            | 0.0066        | 0.0000        | OK                 |
| 15 minute summer               | S3         | 10           | 77.969    | 0.019         | 2.3            | 0.0030        | 0.0000        | OK                 |
| 15 minute summer               | S4         | 10           | 76.494    | 0.044         | 4.2            | 0.0225        | 0.0000        | OK                 |
| 2880 minute summer             | SA1        | 1740         | 75.991    | -0.309        | 0.3            | 5.7150        | 0.0000        | OK                 |
|                                |            |              |           |               |                |               |               |                    |
| 15 minute summer               | Pool Plant | 10           | 74.920    | 0.020         | 1.0            | 0.0036        | 0.0000        | OK                 |
| 960 minute winter              | SA2        | 630          | 73.260    | -1.340        | 0.1            | 1.3864        | 0.0000        | OK                 |
| 15 minute summer               | X          | 1            | 77.200    | 0.000         | 0.0            | 0.0000        | 0.0000        | OK                 |
|                                |            |              |           |               |                |               |               |                    |
| Link Event<br>(Upstream Depth) | US Node    | Link         | DS Node   | Outflow (l/s) | Velocity (m/s) | Flow/Cap      | Link Vol (m³) | Discharge Vol (m³) |
| 15 minute summer               | S1         | 1.000        | S2        | 1.0           | 0.748          | 0.104         | 0.0322        |                    |
| 15 minute summer               | S2         | 1.001        | S3        | 2.3           | 1.854          | 0.111         | 0.0099        |                    |
| 15 minute summer               | S3         | 1.002        | S4        | 2.3           | 2.291          | 0.072         | 0.0052        |                    |
| 15 minute summer               | S4         | 1.003        | SA1       | 4.1           | 0.974          | 0.180         | 0.0383        |                    |
| 2880 minute summer             | SA1        | X            | X         | 0.0           | 0.000          | 0.000         | 0.0000        | 0.0                |
| 2880 minute summer             | SA1        | Infiltration |           | 0.0           |                |               |               |                    |
| 2880 minute summer             | SA1        | Infiltration |           | 0.1           |                |               |               |                    |
| 15 minute summer               | Pool Plant | 2.000        | SA2       | 1.0           | 0.906          | 0.084         | 0.0088        |                    |
| 960 minute winter              | SA2        | Infiltration |           | 0.0           |                |               |               |                    |

Results for 10 year +10% A 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             |
|--------------------------------|------------|--------------|-----------|---------------|----------------|---------------|---------------|--------------------|
| 15 minute summer               | S1         | 10           | 79.481    | 0.031         | 2.0            | 0.0106        | 0.0000        | OK                 |
| 15 minute summer               | S2         | 10           | 78.884    | 0.034         | 4.5            | 0.0094        | 0.0000        | OK                 |
| 15 minute summer               | S3         | 10           | 77.977    | 0.027         | 4.5            | 0.0042        | 0.0000        | OK                 |
| 15 minute summer               | S4         | 10           | 76.514    | 0.064         | 8.2            | 0.0326        | 0.0000        | OK                 |
| 1440 minute winter             | SA1        | 1080         | 76.072    | -0.228        | 0.4            | 9.7605        | 0.0000        | OK                 |
|                                |            |              |           |               |                |               |               |                    |
| 15 minute summer               | Pool Plant | 10           | 74.927    | 0.027         | 1.9            | 0.0050        | 0.0000        | OK                 |
| 2160 minute winter             | SA2        | 1380         | 73.620    | -0.980        | 0.1            | 2.2765        | 0.0000        | OK                 |
| 15 minute summer               | X          | 1            | 77.200    | 0.000         | 0.0            | 0.0000        | 0.0000        | OK                 |
|                                |            |              |           |               |                |               |               |                    |
| Link Event<br>(Upstream Depth) | US Node    | Link         | DS Node   | Outflow (l/s) | Velocity (m/s) | Flow/Cap      | Link Vol (m³) | Discharge Vol (m³) |
| 15 minute summer               | S1         | 1.000        | S2        | 2.0           | 0.897          | 0.205         | 0.0526        |                    |
| 15 minute summer               | S2         | 1.001        | S3        | 4.5           | 2.211          | 0.217         | 0.0161        |                    |
| 15 minute summer               | S3         | 1.002        | S4        | 4.4           | 2.758          | 0.140         | 0.0085        |                    |
| 15 minute summer               | S4         | 1.003        | SA1       | 8.2           | 1.169          | 0.356         | 0.0631        |                    |
| 1440 minute winter             | SA1        | X            | X         | 0.0           | 0.000          | 0.000         | 0.0000        | 0.0                |
| 1440 minute winter             | SA1        | Infiltration |           | 0.0           |                |               |               |                    |
| 1440 minute winter             | SA1        | Infiltration |           | 0.1           |                |               |               |                    |
| 15 minute summer               | Pool Plant | 2.000        | SA2       | 1.9           | 1.098          | 0.162         | 0.0140        |                    |
| 2160 minute winter             | SA2        | Infiltration |           | 0.0           |                |               |               |                    |

Results for 30 year +10% A 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             |
|--------------------------------|------------|--------------|-----------|---------------|----------------|---------------|---------------|--------------------|
| 15 minute summer               | S1         | 10           | 79.485    | 0.035         | 2.6            | 0.0122        | 0.0000        | OK                 |
| 15 minute summer               | S2         | 10           | 78.890    | 0.040         | 5.9            | 0.0109        | 0.0000        | OK                 |
| 15 minute summer               | S3         | 10           | 77.981    | 0.031         | 5.8            | 0.0049        | 0.0000        | OK                 |
| 15 minute summer               | S4         | 10           | 76.525    | 0.075         | 10.7           | 0.0381        | 0.0000        | OK                 |
| 600 minute winter              | SA1        | 585          | 76.129    | -0.171        | 1.0            | 12.8700       | 0.0000        | OK                 |
|                                |            |              |           |               |                |               |               |                    |
| 15 minute summer               | Pool Plant | 10           | 74.931    | 0.031         | 2.5            | 0.0057        | 0.0000        | OK                 |
| 360 minute summer              | SA2        | 344          | 73.869    | -0.731        | 0.5            | 2.8935        | 0.0000        | OK                 |
| 15 minute summer               | X          | 1            | 77.200    | 0.000         | 0.0            | 0.0000        | 0.0000        | OK                 |
|                                |            |              |           |               |                |               |               |                    |
| Link Event<br>(Upstream Depth) | US Node    | Link         | DS Node   | Outflow (l/s) | Velocity (m/s) | Flow/Cap      | Link Vol (m³) | Discharge Vol (m³) |
| 15 minute summer               | S1         | 1.000        | S2        | 2.6           | 0.960          | 0.268         | 0.0641        |                    |
| 15 minute summer               | S2         | 1.001        | S3        | 5.8           | 2.364          | 0.285         | 0.0198        |                    |
| 15 minute summer               | S3         | 1.002        | S4        | 5.8           | 2.966          | 0.184         | 0.0104        |                    |
| 15 minute summer               | S4         | 1.003        | SA1       | 10.7          | 1.248          | 0.464         | 0.0769        |                    |
| 600 minute winter              | SA1        | X            | X         | 0.0           | 0.000          | 0.000         | 0.0000        | 0.0                |
| 600 minute winter              | SA1        | Infiltration |           | 0.0           |                |               |               |                    |
| 600 minute winter              | SA1        | Infiltration |           | 0.1           |                |               |               |                    |
| 15 minute summer               | Pool Plant | 2.000        | SA2       | 2.5           | 1.184          | 0.212         | 0.0170        |                    |
| 360 minute summer              | SA2        | Infiltration |           | 0.0           |                |               |               |                    |

Results for 30 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 99.69%

| Node Event                     | US Node    | Peak (mins)  | Level (m) | Depth (m)     | Inflow (l/s)   | Node Vol (m³) | Flood (m³)    | Status             |
|--------------------------------|------------|--------------|-----------|---------------|----------------|---------------|---------------|--------------------|
| 15 minute summer               | S1         | 10           | 79.492    | 0.042         | 3.6            | 0.0146        | 0.0000        | OK                 |
| 15 minute summer               | S2         | 10           | 78.898    | 0.048         | 8.2            | 0.0133        | 0.0000        | OK                 |
| 15 minute summer               | S3         | 10           | 77.987    | 0.037         | 8.1            | 0.0059        | 0.0000        | OK                 |
| 15 minute summer               | S4         | 10           | 76.543    | 0.093         | 15.0           | 0.0471        | 0.0000        | OK                 |
| 720 minute winter              | SA1        | 705          | 76.252    | -0.048        | 1.3            | 19.6506       | 0.0000        | OK                 |
|                                |            |              |           |               |                |               |               |                    |
| 15 minute summer               | Pool Plant | 10           | 74.938    | 0.038         | 3.6            | 0.0069        | 0.0000        | OK                 |
| 720 minute winter              | SA2        | 675          | 74.435    | -0.165        | 0.3            | 4.2929        | 0.0000        | OK                 |
| 15 minute summer               | X          | 1            | 77.200    | 0.000         | 0.0            | 0.0000        | 0.0000        | OK                 |
|                                |            |              |           |               |                |               |               |                    |
| Link Event<br>(Upstream Depth) | US Node    | Link         | DS Node   | Outflow (l/s) | Velocity (m/s) | Flow/Cap      | Link Vol (m³) | Discharge Vol (m³) |
| 15 minute summer               | S1         | 1.000        | S2        | 3.6           | 1.044          | 0.372         | 0.0820        |                    |
| 15 minute summer               | S2         | 1.001        | S3        | 8.1           | 2.554          | 0.396         | 0.0254        |                    |
| 15 minute summer               | S3         | 1.002        | S4        | 8.1           | 3.230          | 0.257         | 0.0133        |                    |
| 15 minute summer               | S4         | 1.003        | SA1       | 14.9          | 1.348          | 0.649         | 0.0996        |                    |
| 720 minute winter              | SA1        | X            | X         | 0.0           | 0.000          | 0.000         | 0.0000        | 0.0                |
| 720 minute winter              | SA1        | Infiltration |           | 0.0           |                |               |               |                    |
| 720 minute winter              | SA1        | Infiltration |           | 0.1           |                |               |               |                    |
| 15 minute summer               | Pool Plant | 2.000        | SA2       | 3.6           | 1.310          | 0.305         | 0.0221        |                    |
| 720 minute winter              | SA2        | Infiltration |           | 0.1           |                |               |               |                    |

Results for 100 year +10% A 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             |
|--------------------------------|------------|--------------|-----------|---------------|----------------|---------------|---------------|--------------------|
| 15 minute summer               | S1         | 10           | 79.490    | 0.040         | 3.3            | 0.0139        | 0.0000        | OK                 |
| 15 minute summer               | S2         | 10           | 78.895    | 0.045         | 7.4            | 0.0125        | 0.0000        | OK                 |
| 15 minute summer               | S3         | 10           | 77.985    | 0.035         | 7.3            | 0.0056        | 0.0000        | OK                 |
| 15 minute summer               | S4         | 10           | 76.536    | 0.086         | 13.5           | 0.0439        | 0.0000        | OK                 |
| 1440 minute winter             | SA1        | 1320         | 76.210    | -0.090        | 0.7            | 17.3625       | 0.0000        | OK                 |
|                                |            |              |           |               |                |               |               |                    |
| 15 minute summer               | Pool Plant | 10           | 74.936    | 0.036         | 3.2            | 0.0065        | 0.0000        | OK                 |
| 600 minute winter              | SA2        | 570          | 74.245    | -0.355        | 0.3            | 3.8231        | 0.0000        | OK                 |
| 15 minute summer               | X          | 1            | 77.200    | 0.000         | 0.0            | 0.0000        | 0.0000        | OK                 |
|                                |            |              |           |               |                |               |               |                    |
| Link Event<br>(Upstream Depth) | US Node    | Link         | DS Node   | Outflow (l/s) | Velocity (m/s) | Flow/Cap      | Link Vol (m³) | Discharge Vol (m³) |
| 15 minute summer               | S1         | 1.000        | S2        | 3.3           | 1.023          | 0.339         | 0.0761        |                    |
| 15 minute summer               | S2         | 1.001        | S3        | 7.3           | 2.493          | 0.357         | 0.0234        |                    |
| 15 minute summer               | S3         | 1.002        | S4        | 7.3           | 3.143          | 0.231         | 0.0123        |                    |
| 15 minute summer               | S4         | 1.003        | SA1       | 13.4          | 1.317          | 0.583         | 0.0917        |                    |
| 1440 minute winter             | SA1        | X            | X         | 0.0           | 0.000          | 0.000         | 0.0000        | 0.0                |
| 1440 minute winter             | SA1        | Infiltration |           | 0.0           |                |               |               |                    |
| 1440 minute winter             | SA1        | Infiltration |           | 0.1           |                |               |               |                    |
| 15 minute summer               | Pool Plant | 2.000        | SA2       | 3.2           | 1.270          | 0.272         | 0.0203        |                    |
| 600 minute winter              | SA2        | Infiltration |           | 0.0           |                |               |               |                    |

Results for 100 year +45% CC +10% A Critical Storm Duration. Lowest mass balance: 99.63%

| Node Event                     | US<br>Node | Peak<br>(mins) | Level<br>(m) | Depth<br>(m)     | Inflow<br>(l/s)   | Node<br>Vol (m³) | Flood<br>(m³)    | Status                |
|--------------------------------|------------|----------------|--------------|------------------|-------------------|------------------|------------------|-----------------------|
| 15 minute summer               | S1         | 10             | 79.499       | 0.049            | 4.7               | 0.0170           | 0.0000           | OK                    |
| 15 minute summer               | S2         | 10             | 78.907       | 0.057            | 10.6              | 0.0156           | 0.0000           | OK                    |
| 15 minute summer               | S3         | 10             | 77.993       | 0.043            | 10.5              | 0.0069           | 0.0000           | OK                    |
| 15 minute summer               | S4         | 10             | 76.562       | 0.112            | 19.4              | 0.0570           | 0.0000           | OK                    |
| 1440 minute winter             | SA1        | 1380           | 76.470       | 0.170            | 0.9               | 27.8385          | 0.0000           | OK                    |
|                                |            |                |              |                  |                   |                  |                  |                       |
| 720 minute summer              | Pool Plant | 705            | 75.235       | 0.335            | 0.6               | 0.0610           | 0.0000           | FLOOD RISK            |
| 720 minute summer              | SA2        | 705            | 75.235       | 0.635            | 0.6               | 4.9512           | 0.0000           | OK                    |
| 15 minute summer               | X          | 1              | 77.200       | 0.000            | 0.0               | 0.0000           | 0.0000           | OK                    |
|                                |            |                |              |                  |                   |                  |                  |                       |
| Link Event<br>(Upstream Depth) | US<br>Node | Link           | DS<br>Node   | Outflow<br>(l/s) | Velocity<br>(m/s) | Flow/Cap         | Link<br>Vol (m³) | Discharge<br>Vol (m³) |
| 15 minute summer               | S1         | 1.000          | S2           | 4.7              | 1.111             | 0.484            | 0.1000           |                       |
| 15 minute summer               | S2         | 1.001          | S3           | 10.5             | 2.697             | 0.513            | 0.0311           |                       |
| 15 minute summer               | S3         | 1.002          | S4           | 10.5             | 3.441             | 0.332            | 0.0161           |                       |
| 15 minute summer               | S4         | 1.003          | SA1          | 19.3             | 1.415             | 0.840            | 0.1228           |                       |
| 1440 minute winter             | SA1        | X              | X            | 0.0              | 0.000             | 0.000            | 0.0000           | 0.0                   |
| 1440 minute winter             | SA1        | Infiltration   |              | 0.0              |                   |                  |                  |                       |
| 1440 minute winter             | SA1        | Infiltration   |              | 0.1              |                   |                  |                  |                       |
| 720 minute summer              | Pool Plant | 2.000          | SA2          | 0.6              | 0.784             | 0.051            | 0.0633           |                       |
| 720 minute summer              | SA2        | Infiltration   |              | 0.1              |                   |                  |                  |                       |

Design Settings

|                       |        |                                      |       |                          |               |                             |       |                                    |   |
|-----------------------|--------|--------------------------------------|-------|--------------------------|---------------|-----------------------------|-------|------------------------------------|---|
| Rainfall Methodology  | FEH-22 | CV                                   | 1.000 | Maximum Rainfall (mm/hr) | 50.0          | Minimum Backdrop Height (m) | 0.200 | Enforce best practice design rules | x |
| Return Period (years) | 100    | Time of Entry (mins)                 | 5.00  | Minimum Velocity (m/s)   | 1.00          | Preferred Cover Depth (m)   | 0.500 |                                    |   |
| Additional Flow (%)   | 0      | Maximum Time of Concentration (mins) | 30.00 | Connection Type          | Level Soffits | Include Intermediate Ground | ✓     |                                    |   |

Nodes

| Name       | Area (ha) | T of E (mins) | Cover Level (m) | Diameter (mm) | Easting (m) | Northing (m) | Depth (m) |
|------------|-----------|---------------|-----------------|---------------|-------------|--------------|-----------|
| S1         | 0.005     | 5.00          | 80.050          | 450           | 530939.800  | 123608.012   | 0.600     |
| S2         | 0.006     | 5.00          | 80.050          | 450           | 530961.509  | 123617.773   | 1.200     |
| S3         |           |               | 78.950          | 450           | 530964.802  | 123610.657   | 1.000     |
| S4         | 0.010     | 5.00          | 77.050          | 450           | 530963.822  | 123605.486   | 0.600     |
| SA1        |           |               | 77.000          |               | 530959.154  | 123597.796   | 0.700     |
| Pool Plant | 0.005     | 5.00          | 75.500          |               | 530960.268  | 123577.091   | 0.600     |
| SA2        |           |               | 75.500          |               | 530966.895  | 123581.725   | 0.900     |
| X          |           |               | 78.000          | 100           | 530957.919  | 123599.031   | 0.800     |

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) |
|-------|------------|---------|------------|-------------|-----------|-----------|----------|-------------|----------|---------------|--------------|
| 1.000 | S1         | S2      | 23.826     | 0.600       | 79.450    | 78.850    | 0.600    | 39.7        | 100      | 5.32          | 50.0         |
| 1.001 | S2         | S3      | 7.974      | 0.600       | 78.850    | 77.950    | 0.900    | 8.9         | 100      | 5.37          | 50.0         |
| 1.002 | S3         | S4      | 5.277      | 0.600       | 77.950    | 76.540    | 1.410    | 3.7         | 100      | 5.40          | 50.0         |
| 1.003 | S4         | SA1     | 9.009      | 0.600       | 76.450    | 76.300    | 0.150    | 60.1        | 150      | 5.51          | 50.0         |
| 2.000 | Pool Plant | SA2     | 8.089      | 0.600       | 74.900    | 74.600    | 0.300    | 27.0        | 100      | 5.09          | 50.0         |
| X     | SA1        | X       | 7.360      | 0.600       | 76.900    | 77.200    | -0.300   | -24.5       | 100      | 30.00         | 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) |
|-------|-----------|-----------|------------|--------------|--------------|-------------|--------------------|----------------|--------------------|
| 1.000 | 1.227     | 9.6       | 0.9        | 0.500        | 1.100        | 0.005       | 0.0                | 21             | 0.767              |
| 1.001 | 2.612     | 20.5      | 2.1        | 1.100        | 0.900        | 0.011       | 0.0                | 21             | 1.674              |
| 1.002 | 4.026     | 31.6      | 2.1        | 0.900        | 0.410        | 0.011       | 0.0                | 18             | 2.286              |
| 1.003 | 1.300     | 23.0      | 3.8        | 0.450        | 0.550        | 0.021       | 0.0                | 41             | 0.966              |
| 2.000 | 1.492     | 11.7      | 0.9        | 0.500        | 0.800        | 0.005       | 0.0                | 19             | 0.889              |
| X     | 0.005     | 0.0       | 3.8        | 0.000        | 0.700        | 0.021       | 0.0                | 100            | 0.000              |

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) |
|-------|------------|-------------|----------|-----------|-----------|-----------|--------------|-----------|-----------|--------------|
| 1.000 | 23.826     | 39.7        | 100      | Circular  | 80.050    | 79.450    | 0.500        | 80.050    | 78.850    | 1.100        |
| 1.001 | 7.974      | 8.9         | 100      | Circular  | 80.050    | 78.850    | 1.100        | 78.950    | 77.950    | 0.900        |
| 1.002 | 5.277      | 3.7         | 100      | Circular  | 78.950    | 77.950    | 0.900        | 77.050    | 76.540    | 0.410        |
| 1.003 | 9.009      | 60.1        | 150      | Circular  | 77.050    | 76.450    | 0.450        | 77.000    | 76.300    | 0.550        |
| 2.000 | 8.089      | 27.0        | 100      | Circular  | 75.500    | 74.900    | 0.500        | 75.500    | 74.600    | 0.800        |
| X     | 7.360      | -24.5       | 100      | Circular  | 77.000    | 76.900    | 0.000        | 78.000    | 77.200    | 0.700        |

| Link  | US Node    | Dia (mm) | Node Type | MH Type | DS Node | Dia (mm) | Node Type | MH Type |
|-------|------------|----------|-----------|---------|---------|----------|-----------|---------|
| 1.000 | S1         | 450      | Manhole   | PPIC    | S2      | 450      | Manhole   | PPIC    |
| 1.001 | S2         | 450      | Manhole   | PPIC    | S3      | 450      | Manhole   | PPIC    |
| 1.002 | S3         | 450      | Manhole   | PPIC    | S4      | 450      | Manhole   | PPIC    |
| 1.003 | S4         | 450      | Manhole   | PPIC    | SA1     |          | Junction  |         |
| 2.000 | Pool Plant |          | Junction  |         | SA2     |          | Junction  |         |
| X     | SA1        |          | Junction  |         | X       | 100      | Manhole   | PPIC    |

Manhole Schedule

| Node       | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections                                                                           | Link  | IL (m) | Dia (mm) |
|------------|-------------|--------------|--------|-----------|----------|---------------------------------------------------------------------------------------|-------|--------|----------|
| S1         | 530939.800  | 123608.012   | 80.050 | 0.600     | 450      |    |       |        |          |
|            |             |              |        |           |          | 0                                                                                     | 1.000 | 79.450 | 100      |
| S2         | 530961.509  | 123617.773   | 80.050 | 1.200     | 450      |    | 1     | 1.000  | 78.850   |
|            |             |              |        |           |          | 0                                                                                     | 1.001 | 78.850 | 100      |
| S3         | 530964.802  | 123610.657   | 78.950 | 1.000     | 450      |    | 1     | 1.001  | 77.950   |
|            |             |              |        |           |          | 0                                                                                     | 1.002 | 77.950 | 100      |
| S4         | 530963.822  | 123605.486   | 77.050 | 0.600     | 450      |    | 1     | 1.002  | 76.540   |
|            |             |              |        |           |          | 0                                                                                     | 1.003 | 76.450 | 150      |
| SA1        | 530959.154  | 123597.796   | 77.000 | 0.700     |          |    | 1     | 1.003  | 76.300   |
|            |             |              |        |           |          | 0                                                                                     | X     | 76.900 | 100      |
| Pool Plant | 530960.268  | 123577.091   | 75.500 | 0.600     |          |    |       |        |          |
|            |             |              |        |           |          | 0                                                                                     | 2.000 | 74.900 | 100      |
| SA2        | 530966.895  | 123581.725   | 75.500 | 0.900     |          |  | 1     | 2.000  | 74.600   |
|            |             |              |        |           |          |                                                                                       |       |        |          |
| X          | 530957.919  | 123599.031   | 78.000 | 0.800     | 100      |  | 1     | X      | 77.200   |
|            |             |              |        |           |          |                                                                                       |       |        |          |

Simulation Settings

|                      |             |                       |       |                       |          |                        |       |                            |      |                         |     |
|----------------------|-------------|-----------------------|-------|-----------------------|----------|------------------------|-------|----------------------------|------|-------------------------|-----|
| Rainfall Methodology | FEH-22      | Winter CV             | 1.000 | Additional Flow (Q %) | 0        | Skip Steady State      | x     | Additional Storage (m³/ha) | 20.0 | Check Discharge Rate(s) | x   |
| Rainfall Events      | Consecutive | Additional Area (A %) | 10    | Analysis Speed        | Detailed | Drain Down Time (mins) | 10080 | Starting Level (m)         |      | Check Discharge Volume  | x   |
| Time Offset (mins)   | 0           | Duration (mins)       | 360   | Return Period (years) | 100      | Climate Change (CC %)  | 45    | Time Offset (mins)         | 360  | Duration (mins)         | 360 |
|                      |             |                       |       |                       |          |                        |       | Return Period (years)      | 10   | Climate Change (CC %)   | 0   |

Node SA1 Soakaway Storage Structure

|                             |         |               |      |                           |        |                |        |               |       |                 |   |
|-----------------------------|---------|---------------|------|---------------------------|--------|----------------|--------|---------------|-------|-----------------|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Safety Factor | 1.5  | Invert Level (m)          | 76.000 | Pit Width (m)  | 4.000  | Depth (m)     | 0.400 | Number Required | 1 |
| Side Inf Coefficient (m/hr) | 0.00513 | Porosity      | 0.95 | Time to half empty (mins) | 2424   | Pit Length (m) | 14.500 | Inf Depth (m) | 0.400 |                 |   |

Node SA1 Soakaway Storage Structure

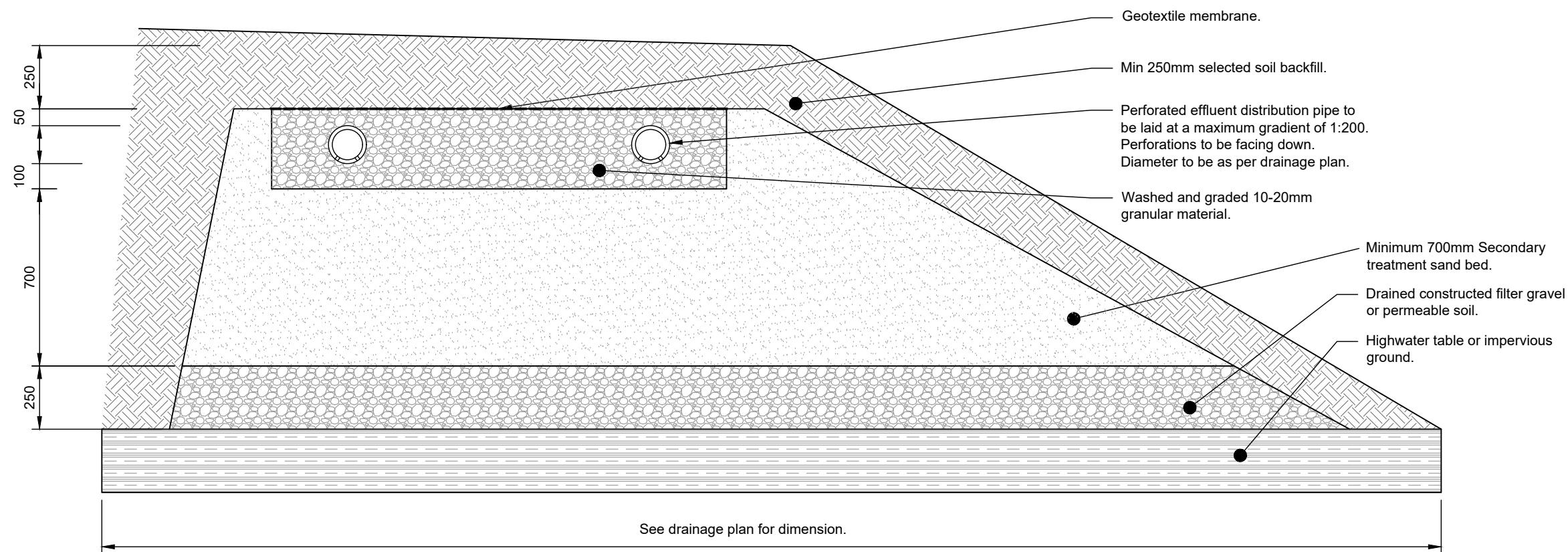
|                             |         |               |      |                           |        |                |        |               |       |                 |   |
|-----------------------------|---------|---------------|------|---------------------------|--------|----------------|--------|---------------|-------|-----------------|---|
| Base Inf Coefficient (m/hr) | 0.00513 | Safety Factor | 1.5  | Invert Level (m)          | 74.000 | Pit Width (m)  | 0.600  | Depth (m)     | 2.000 | Number Required | 1 |
| Side Inf Coefficient (m/hr) | 0.00513 | Porosity      | 0.33 | Time to half empty (mins) | 968    | Pit Length (m) | 14.500 | Inf Depth (m) | 2.000 |                 |   |

Node SA2 Soakaway Storage Structure

|                             |         |               |      |                           |        |                |        |               |       |                 |   |
|-----------------------------|---------|---------------|------|---------------------------|--------|----------------|--------|---------------|-------|-----------------|---|
| Base Inf Coefficient (m/hr) | 0.00513 | Safety Factor | 1.5  | Invert Level (m)          | 72.700 | Pit Width (m)  | 0.600  | Depth (m)     | 2.000 | Number Required | 1 |
| Side Inf Coefficient (m/hr) | 0.00513 | Porosity      | 0.33 | Time to half empty (mins) | 1288   | Pit Length (m) | 12.500 | Inf Depth (m) | 2.000 |                 |   |

Results for Consecutive Rainfall 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             |
|--------------------------------|------------|--------------|-----------|---------------|----------------|---------------|---------------|--------------------|
| 360-360                        | S1         | 184          | 79.468    | 0.018         | 0.7            | 0.0063        | 0.0000        | OK                 |
| 360-360                        | S2         | 184          | 78.869    | 0.019         | 1.5            | 0.0053        | 0.0000        | OK                 |
| 360-360                        | S3         | 184          | 77.965    | 0.015         | 1.5            | 0.0024        | 0.0000        | OK                 |
| 360-360                        | S4         | 1072         | 76.694    | 0.244         | 2.7            | 0.1239        | 0.0000        | SURCHARGED         |
| 360-360                        | SA1        | 1072         | 76.693    | 0.393         | 2.7            | 27.8385       | 0.0000        | OK                 |
|                                |            |              |           |               |                |               |               |                    |
| 360-360                        | Pool Plant | 176          | 74.915    | 0.015         | 0.6            | 0.0028        | 0.0000        | OK                 |
| 360-360                        | SA2        | 1048         | 74.871    | 0.271         | 0.6            | 4.9512        | 0.0000        | OK                 |
| 360-360                        | X          | 8            | 77.200    | 0.000         | 0.0            | 0.0000        | 0.0000        | OK                 |
|                                |            |              |           |               |                |               |               |                    |
| Link Event<br>(Upstream Depth) | US Node    | Link         | DS Node   | Outflow (l/s) | Velocity (m/s) | Flow/Cap      | Link Vol (m³) | Discharge Vol (m³) |
| 360-360                        | S1         | 1.000        | S2        | 0.7           | 0.682          | 0.072         | 0.0243        |                    |
| 360-360                        | S2         | 1.001        | S3        | 1.5           | 1.650          | 0.073         | 0.0073        |                    |
| 360-360                        | S3         | 1.002        | S4        | 1.5           | 2.033          | 0.047         | 0.0210        |                    |
| 360-360                        | S4         | 1.003        | SA1       | 2.7           | 0.864          | 0.117         | 0.1586        |                    |
| 360-360                        | SA1        | X            | X         | 0.0           | 0.000          | 0.000         | 0.0000        | 0.0                |
| 360-360                        | SA1        | Infiltration |           | 0.0           |                |               |               |                    |
| 360-360                        | SA1        | Infiltration |           | 0.1           |                |               |               |                    |
| 360-360                        | Pool Plant | 2.000        | SA2       | 0.6           | 0.784          | 0.051         | 0.0325        |                    |
| 360-360                        | SA2        | Infiltration |           | 0.1           |                |               |               |                    |



**Typical Section Through Drainage Mound  
Built into Existing Sloped Site**  
NTS

## NOTES

1. Do not scale this drawing unless for Planning Permission purposes only.
2. This drawing is to be read in conjunction with all other relevant Engineer's and Architect's drawings and specifications.
3. To provide venting of the filter, the upstream ends of the distribution pipes may be extended vertically above the mound level and capped with a cowl or grille.

|     |          |    |       |                    |
|-----|----------|----|-------|--------------------|
|     |          |    |       |                    |
| P01 | 01/04/26 | MJ | JOD   | Preliminary issue. |
| Rev | Date     | By | Chkd. | Revision notes     |

Job Title  
**Huf Smith, Copyhold  
Lane, Cuckfield,  
Haywards Heath, RH17  
5EB.**

Drawing Title  
**Drainage Mound  
Construction Detail.**

Client  
**Eclipse**

**HODEL**  
CONSULTING  
ENGINEERS  
01732 617555 mail@hodel.uk

|                                                         |               |                     |                  |
|---------------------------------------------------------|---------------|---------------------|------------------|
| Scale at A3: NTS                                        |               | Status: PRELIMINARY |                  |
| Drawn: MJ                                               | Checked: JOD  | Approved: -         |                  |
| Date: Apr '26                                           | Date: Apr '26 | Date: -             |                  |
| Document Reference:<br><b>25187-HOD-XX-ZZ-DR-C-5210</b> |               |                     | Revision:<br>P01 |