



LAND OFF BURDELL ROAD, YAPTON

PROPOSED RESIDENTIAL DEVELOPMENT

Flood Risk Assessment, Drainage Strategy
and Lidsey Drainage Impact Assessment

Prepared on Behalf of

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DRAWINGS

- PL001** Topographic Survey with Contours
- PL002** Constraints Plan
- PL003** Geotechnical Testing Plan
- PL004** Surface Water Flood Map Assessment
- PL005** Drainage Strategy
- PL006** Levels & Contours
- PL007** Catchment Areas

APPENDICES

- Appendix A** Architectural Development Proposals
- Appendix B** Topographic Survey
- Appendix C** Geotechnical Site Investigation (Ground Management)
- Appendix D** Geotechnical Site Investigation (Impact Geotechnical)
- Appendix E** Public Sewer Records
- Appendix F** Wallingford Greenfield Run-off Calculations (Pre-development)
- Appendix G** Site3D Hydraulic Calculations

1 INTRODUCTION

1.1 Background

1.1.1 BP Civils is instructed to prepare a flood risk assessment, drainage strategy and Lidsey Drainage Impact Assessment to accompany a planning application for a proposed residential development at Burndell Road, Yapton, BN18 0GB.

1.1.2 This report has been undertaken in accordance with National Planning Policy Framework (NPPF) and The Planning Practice Guidance Flood Risk and Coastal Change.

1.1.3 The surface water drainage strategy has been developed in view of the National Standards for Sustainable Drainage System (June 2025), The SuDS Manual (CIRIA C753) and local surface water drainage policy.

1.1.4 The planning application which this report supports seeks consent for the following proposed development is as follows:

"Outline planning application (all matters reserved except access) for residential development of the site with up to 40 dwellings (Use Class C3), informal and formal public open space, landscaping, drainage, and other associated works."

The development proposals are described by an illustrative masterplan (Thrive), a copy of which is contained within **Appendix A**.

1.1.5 In preparing this report, BP Civils has referred to the following documents and information:

- Environment Agency Flood Maps for Planning
- Environment Agency Flood Risk Assessment Data
- Long-term Flood Risk Service (Gov.uk)
- Arun District Council Strategic Flood Risk Assessment
- British Geological Survey (BGS) Information and Records
- Ground Management Site Investigation Reporting
- Impact Geotechnical Site Investigation Reporting
- Southern Water Public Sewer Records

1.1.6 This report has been prepared to assess flood risk at the site, and to advise of any mitigation which may be required in order to ensure that the proposed development remains safe for its design life in accordance with current design standards. Additionally, this report serves to detail the proposed foul and surface water drainage arrangements which will serve the development.

1.1.7 This report has been prepared for the benefit of the named client only.

2 SITE LOCATION AND DESCRIPTION

- 2.1.1 A site location plan is included within this report (Appendix A).
- 2.1.2 The National Grid Reference is SU 98632 02707.
- 2.1.3 The site measures 17,705m² (1.77Ha), located on the western side of Burndell Road, Yapton and comprises a shared access road serving 3rd party residential dwellings with the main site comprising 2 No residential dwellings with large grassed gardens and perimeter planting.
- 2.1.4 A topographic survey has been undertaken at the site by D&H Surveys Ltd, dated January 2025. The survey is contained within **Appendix B**.
- 2.1.5 The survey identifies levels gently transition across the site between 6.200m AOD and 7.600m AOD. The site is therefore relatively flat with a subtle westerly prevailing fall towards the ordinary watercourse.
- 2.1.6 Drawing **PL001** (Topographic Survey & Contours) have been prepared to illustrate the topography of the site.

3 GROUND CONDITIONS

- 3.1.1 Intrusive site investigation has been undertaken by Impact Geotechnical. Site works were undertaken between November 2019 to March 2020 to collect a full winter duration. Subsequent infiltration testing was undertaken March 2020.
- 3.1.2 6 No windows samples were undertaken as summarised below:
- WS1 – Soft to firm CLAY up to 2.00m below ground level, becoming very silty/fine sandy with gravel of flint and chalk (below 2.30m bgl). Band of very fine sandy SILT (4.40m to 4.60m bgl). RIVER TERRACE DEPOSITS.
 - WS2 – CLAY up to 2.00m bgl (RTD), SAND to 2.80m bgl (RTD), SILT of CHALK from 2.80m bgl to 5.00m bgl (LEWES NODULAR CHALK FORMATION).
 - WS3 – Soft to firm CLAY up to 2.00m (RTD), SAND to 3.80m bgl (RTD) and sandy, gravelly CLAY to 4.00m bgl (RTD).
 - WS4 – Silty, sandy CLAY to 2.00m bgl (RTD), very silty very clayey SAND to 2.50m bgl (RTD), GRAVEL to 3.10m bgl (RTD), SILT of CHALK to 4.00m bgl (LEWES NODULAR CHALK FORMATION).
 - WS5 – Silty, sandy CLAY to 2.00m bgl (RTD), Very loose very silty very clayey SAND to 3.50m bgl (RTD), SAND to 4.00m bgl (RTD).
 - WS6 – Silty, sandy CLAY to 2.00m bgl (RTD), Very loose very silty very clayey SAND to 3.80m bgl (RTD), SILT of CHALK to 4.00m bgl (LEWES NODULAR CHALK FORMATION).
- 3.1.3 Intrusive site investigation has been undertaken by Ground Management Ltd. Site works were undertaken between October 2024 to April 2025 to collect a full winter duration. Subsequent infiltration testing was undertaken February 2026 in 4 No trial pits.
- 3.1.4 2 No. boreholes were established on site, to depths of up to 3.00m below ground level or refusal, for the purpose of undertaking groundwater monitoring. The encountered geology was recorded as topsoil, underlain by made ground, clay, silty sand soils. The existing windows samples locations were also reused for further data.
- 3.1.5 Ground Management's records are provided within **Appendix C**.
- 3.1.6 Impact Geotechnical's records are provided within **Appendix D**.
- 3.1.7 Reference has also been made to the BGS Geology of Britain Viewer. This identifies a bedrock geology consisting of 'London Clay Formation – Clay, silt and sand'.

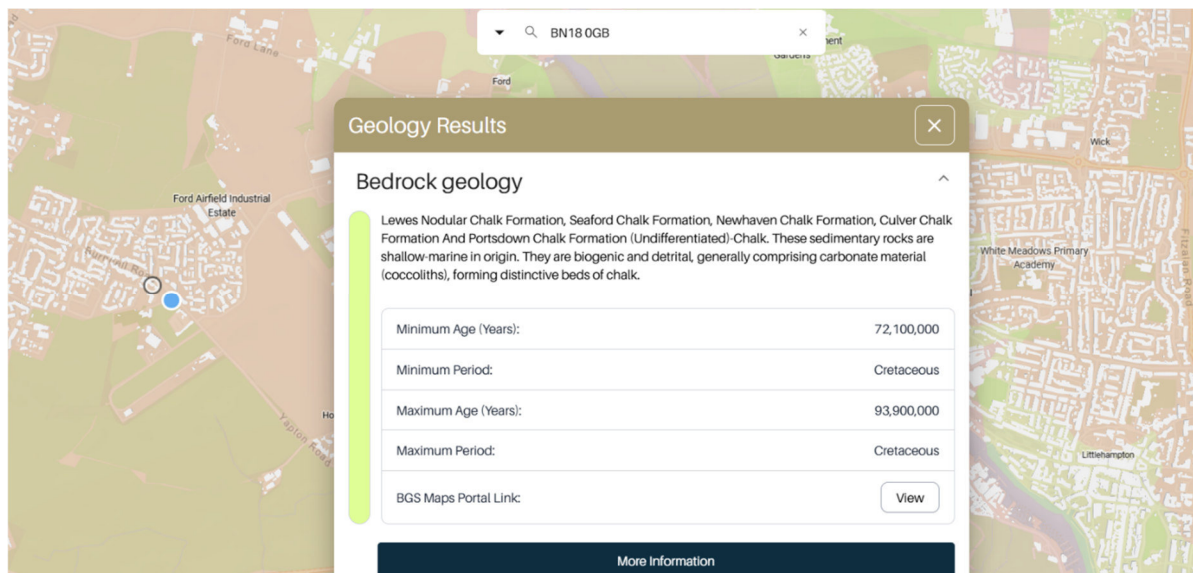


Figure 1. Geology of Britain Viewer – Bedrock Geology (BGS)

3.1.8 Superficial deposits are recorded as 'River Terrace Deposits – Sand, silt and clay.'

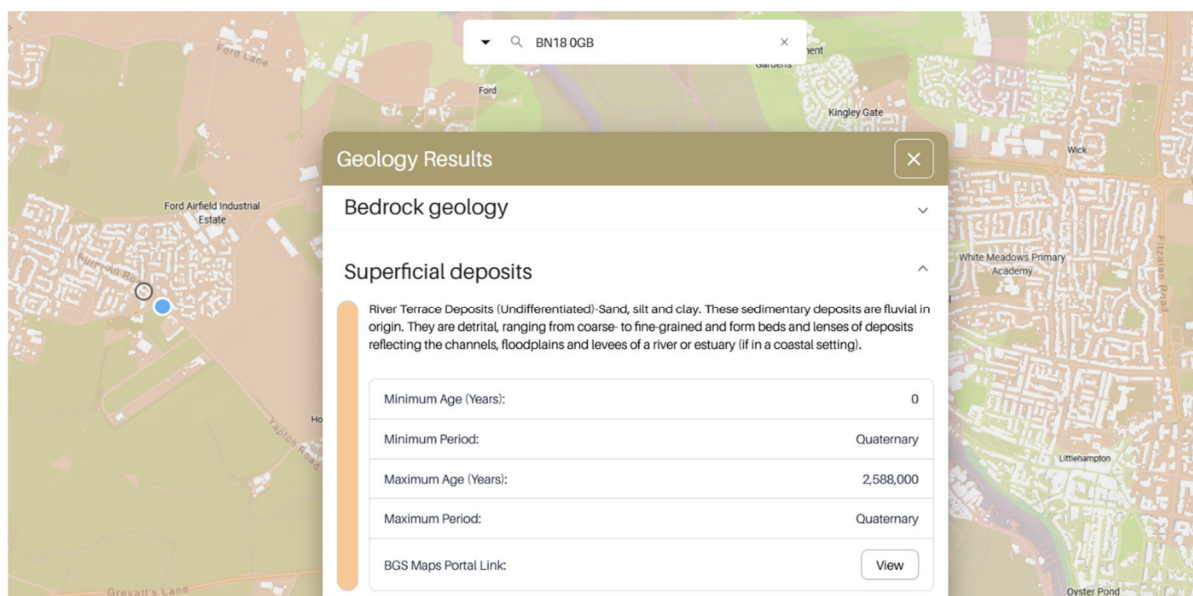


Figure 2. Geology of Britain Viewer – Superficial Deposits (BGS)

3.2 Groundwater

- 3.2.1 The SFRA mapping suggests that there is a medium-high risk (1% to over 3.3% annual probability of water tables rising above ground level) of groundwater flooding at this location. The WSCC mapping at this location advises groundwater levels are between 0.025m and 0.5m below the ground surface. Therefore, it is likely infiltration techniques will not be suitable.
- 3.2.2 As part of the SFRA deliverables, mapping of the whole District has been provided showing the Areas Susceptible to Groundwater Flooding (AStGWF). This information is provided in Appendix F of the SFRA.

The AStGWF is a strategic-scale map showing groundwater flood areas on a 1km square grid. The data was produced to annotate indicative Flood Risk Areas for Preliminary Flood Risk Assessment (PFRA) studies and allow the LLFAs to determine whether they may be at risk of flooding from groundwater.

- 3.2.3 The AStGWF data should be used only in combination with other information, however, for example local or historical data. It should not be used as sole evidence for any specific flood risk management, land use planning or other decisions at any scale.
- 3.2.4 This data shows the proportion of each 1km grid square, where geological and hydrogeological conditions indicate that groundwater might emerge. It does not show the likelihood of groundwater flooding occurring, nor does it take account of the chance of flooding from groundwater rebound (rising groundwater levels resulting from a reduction in abstraction rates from groundwater).
- 3.2.5 Impact Geotechnical has undertaken groundwater monitoring at the site, spanning November 2019 to March 2020:
- WS1 – 0.50m bgl WS2 – 1.20m bgl WS3 – 0.45m bgl
 - WS4 – 0.46m bgl WS5 – 0.29m bgl WS6 – 0.55m bgl
- 3.2.6 Ground Management has undertaken groundwater monitoring at the site, spanning October 2024 to April 2025:
- WS1 – 0.93m bgl WS2 – 1.83m bgl WS3 – 0.66m bgl BH1 – 0.78m bgl
 - WS4 – 0.79m bgl WS5 – 0.80m bgl WS6 – 0.70m bgl BH2 – 1.07m bgl
- 3.2.7 Complete monitoring results are contained within **Appendix D**.
- 3.2.8 Mapping managed by MAGIC (magic.defra.gov.uk) provides geographic information concerning the natural environment from across government. This mapping tool has been referred to in order to confirm aquifer designations, as well as whether the site is located within any groundwater source protection zones, groundwater vulnerability zones, drinking water protected areas or drinking water safeguard zones.
- 3.2.9 The site falls within an area designated an 'Principal' bedrock aquifer, as well as a 'Secondary A' superficial drift aquifer.

Magic

Landscape

Geology and Soils

Aquifer Designation Map (Bedrock) (England)

- Principal
- Secondary A
- Secondary B
- Secondary (undifferentiated)
- Unproductive

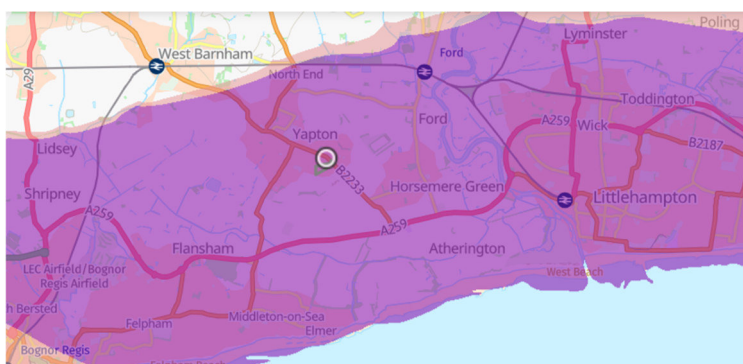


Figure 4. Bedrock Aquifer Designation Map (DEFRA)

Magic

Landscape

Geology and Soils

Aquifer Designation Map (Superficial Drift) (England)

- Principal
- Secondary A
- Secondary B
- Secondary (undifferentiated)
- Unknown (lakes+landslip)
- Unproductive

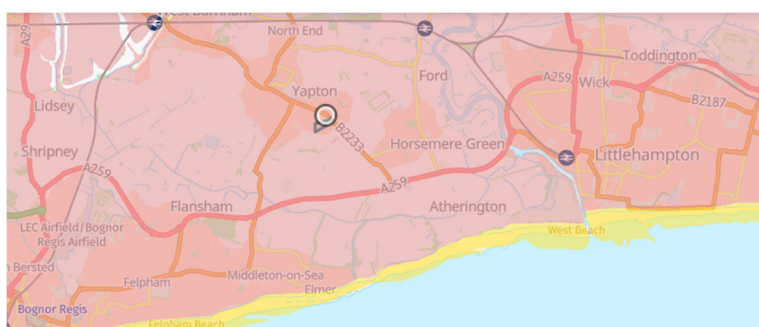


Figure 5. Superficial Drift Aquifer Designation Map (DEFRA)

3.2.10 The site falls within a 'Medium - High' Groundwater Vulnerability Zone.

Magic

Landscape

Geology and Soils

Groundwater Vulnerability Map (England)

-  Local Information
-  Soluble Rock Risk
-  High
-  Medium - High
-  Medium
-  Medium - Low
-  Low
-  Unproductive

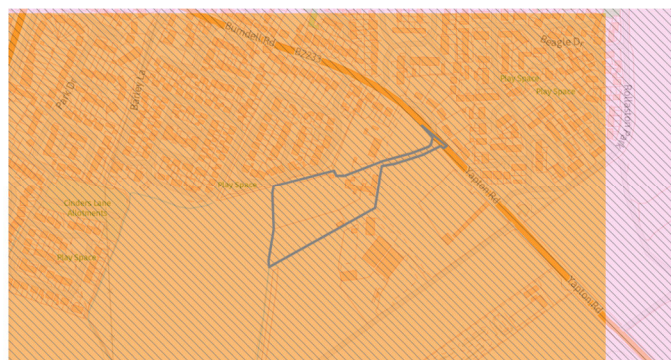


Figure 6. Groundwater Vulnerability Map (DEFRA)

3.2.11 The site is not located within any Drinking Water Protected Areas, Drinking Water Safeguard Zones or Source Protection Zones.

Magic

Designations

Land-Based Designations

Non-statutory

Drinking Water Protected Areas (Surface Water) (England)



Drinking Water Safeguard Zones (Surface Water) (England)



Drinking Water Safeguard Zones (Groundwater) (England)



Source Protection Zones merged (England)

-  Zone I - Inner Protection Zone
-  Zone I - Subsurface Activity
-  Zone II - Outer Protection Zone
-  Zone II - Subsurface Activity
-  Zone III - Total Catchment
-  Zone III - Subsurface Activity
-  Zone of Special Interest

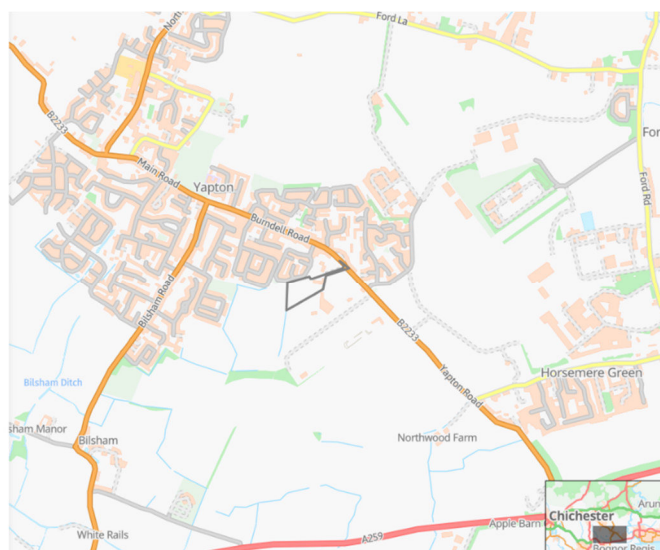


Figure 7. Drinking Water Protected Areas, Drinking Water Safeguard Zones and Source Protection Zones Map (DEFRA)

4 EXISTING DRAINAGE

4.1 Surface Water

- 4.1.1 The site is not currently served by formal surface water drainage infrastructure and drains naturally.
- 4.1.2 An ordinary watercourse is located on the north-western/western boundary, as well as to the south-east of site access.
- 4.1.3 There are no public surface water sewers on site, or within the wider vicinity of the site.
- 4.1.4 Greenfield run-off rates have been established in relation to the site area (1.77ha) using HR Wallingford's 'Greenfield run-off rate estimation' tool. The calculated rates are as follows:

QBAR: 5.3 l/s

1 in 1-Year: 4.5 l/s

1 in 2-Year: 4.6 l/s

1 in 10-Year: 8.5 l/s

1 in 30-Year: 12.1 l/s

1 in 100-Year: 16.8 l/s

1 in 200-Year: 19.7 l/s

4.2 Foul Water

- 4.2.1 The local sewerage authority is Southern Water. Public sewer records have been obtained from Southern Water, as contained within this report in **Appendix E**.
- 4.2.2 Southern Water's public sewer records do not identify any public foul water sewers within the bounds of the site.
- 4.2.3 The nearest public foul sewers to the site is FWMH7701 located in Burndell Road with an invert of 6.22mAOD.
- 4.2.4 This sewer is a 175mm dia. public foul water sewer shown to be flowing in a north westerly direction.
- 4.2.5 The public sewers within the vicinity of the site are understood to drain to Southern Water's Lidsey Waste Water Treatment Works (WWTW).

4.3 Highway Drainage

- 4.3.1 Yapton Road is served by traditional road gullies which are understood to drain to a highway drainage system that discharges to the ordinary watercourse along Burndell Road.

5 PROBABILITY

5.1 Sources of Information

- 5.1.1 The NPPF requires that all sources of flooding are considered being tidal, fluvial, pluvial, groundwater, sewers and man-made reservoirs/canals.
- 5.1.2 The likelihood of the site flooding has been established by reviewing the following information:
- Environment Agency Flood Map for Planning
 - Long-Term Flood Risk Service (Gov.uk)
 - Environment Agency Flood Risk Assessment Data
 - Arun District Council Strategic Flood Risk Assessment, November 2016

5.2 Flood Maps and Modelling

- 5.2.1 The site is located in Flood Zone 1 ("EA Flood Map for Planning"). For the avoidance of doubt none of the residential development is proposed in this modest area as shown by the illustrative masterplan (Appendix A). For the purposes of this assessment the site is therefore treated as being in Flood Zone 1.

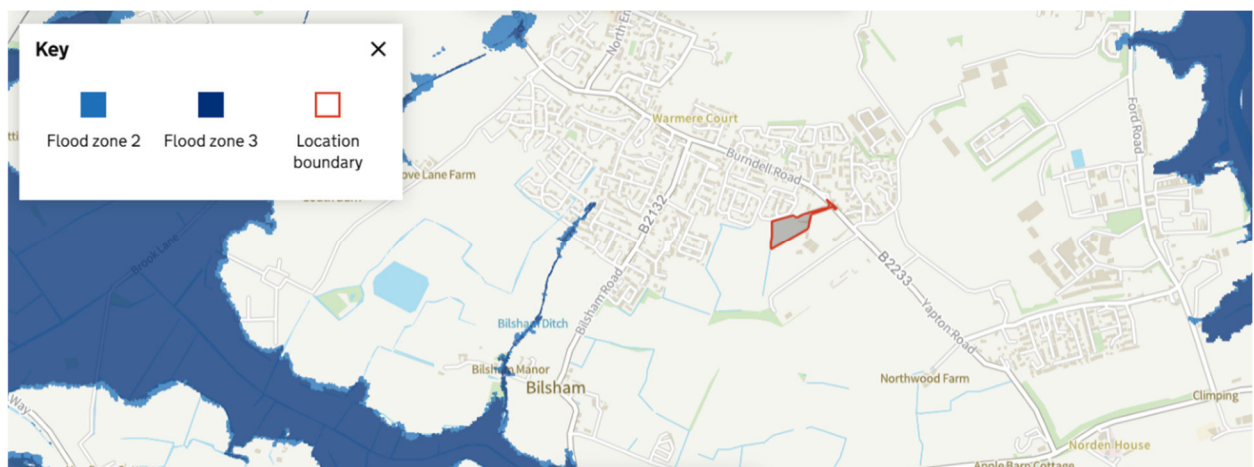


Figure 8. Flood Maps for Planning – Present Day (Gov.uk)

- 5.2.2 No change is identified to the mapping in respect of climate change (2070 to 2125).



Figure 9. Flood Maps for Planning – Climate Change (Gov.uk)

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 0.1% annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map for Planning – all land outside Zones 2, 3a and 3b).
Zone 2 Medium Probability	Land having between a 1% and 0.1% annual probability of river flooding; or land having between a 0.5% and 0.1% annual probability of sea flooding. (Land shown in light blue on the Flood Map).
Zone 3a High Probability	Land having a 1% or greater annual probability of river flooding; or land having a 0.5% or greater annual probability of sea. (Land shown in dark blue on the Flood Map).
Zone 3b The Functional Floodplain	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of function floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: - Land having a 3.3% or greater annual probability of flooding, with any existing flood management infrastructure operating effectively; or - Land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability flooding). Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not

	separately distinguished from Zone 3a on the Flood Map).
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- 5.2.3 Flood Maps for Planning, Surface Water, largely identify the site as being at 'Very Low' risk of surface water flooding.
- 5.2.4 Small and isolated areas are identified to be affected by potential surface water flooding ranging from 'Low' (1 in 1000) to 'High' (1 in 30) risk. The extents identified are highly localised and are not connected to any wider surface water conveyance flow route/overland flow. Drawing **PL004** has been prepared to demonstrate the areas identified as being at risk of surface water flooding, relative to the site topographic survey and proposed site layout.

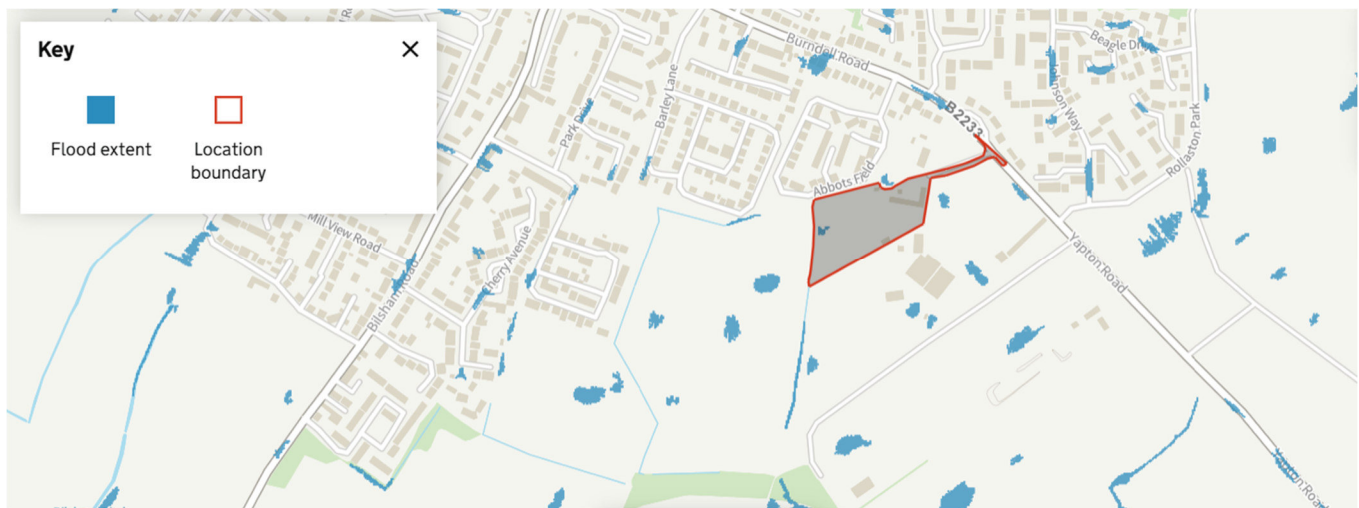


Figure 10. Flood Maps for Planning 30yr – Climate Change (Gov.uk)

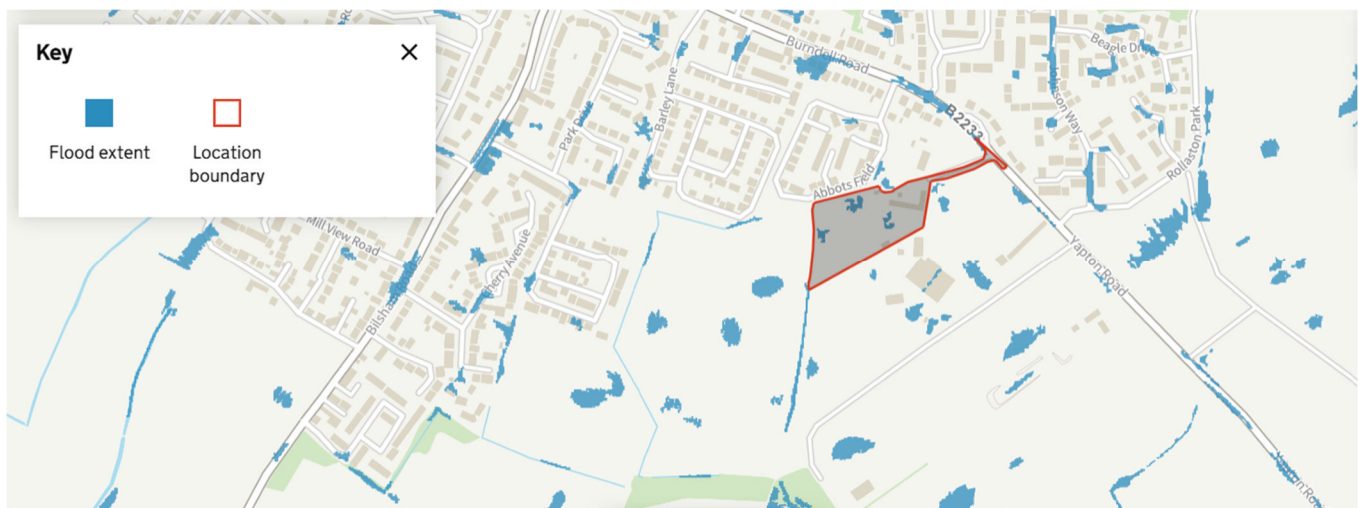


Figure 11. Flood Maps for Planning 100yr – Climate Change (Gov.uk)

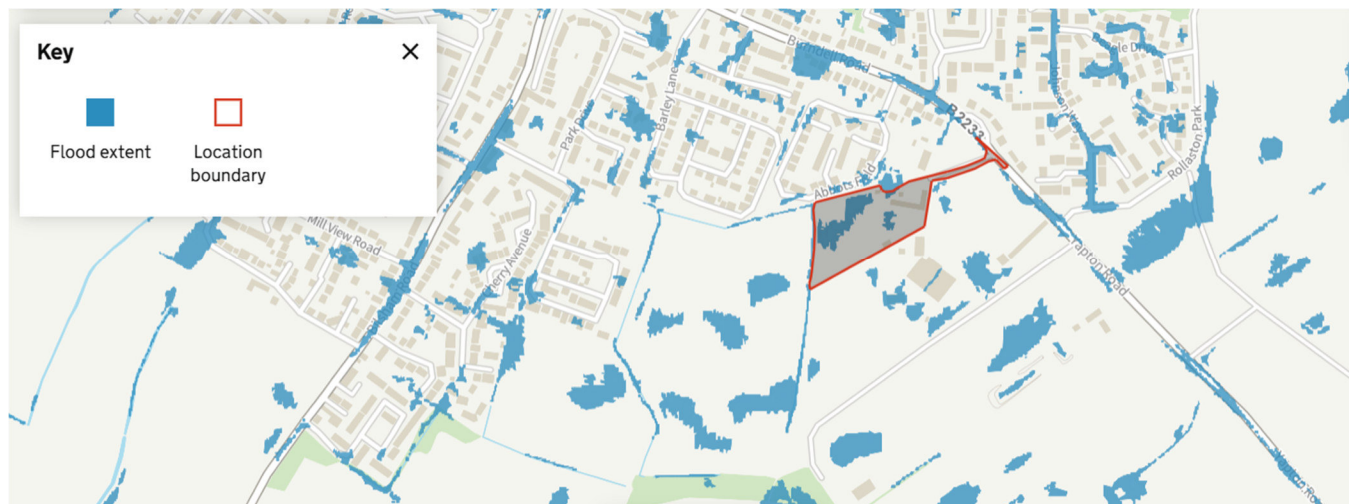


Figure 12. Flood Maps for Planning 1000yr – Climate Change (Gov.uk)

- 5.2.5 The Long-term Flood Risk Service indicates that groundwater and/or reservoir flooding is 'unlikely' at the site.

Other flood risks
[More about groundwater and reservoirs](#)

Groundwater
 Flooding from groundwater is unlikely in this area.

Reservoirs
 Flooding from reservoirs is unlikely in this area.

Figure 9. Flood Maps for Planning (Gov.uk)

- 5.2.6 BP Civils has requested Flood Risk Assessment Data (formerly 'Product 4') from the Environment Agency. The data provides recorded evidence of historic flooding and hydraulic modelling local to the site. The Environment Agency has confirmed that no such information is available for the site.

5.3 Strategic Flood Risk Assessment

- 5.3.1 Arun District Council has a published Strategic Flood Risk Assessment, dated November 2016.
- 5.3.2 The site is not specifically referenced within the Strategic Flood Risk Assessment.
- 5.3.3 It is noted that the Arun District Council Strategic Flood Risk Assessment pre-dates current mapping and modelling, as per Flood Maps for Planning.

5.4 Historic Flooding

- 5.4.1 No instances of historic flooding have been identified from the sources of information reviewed in the preparation of this flood risk assessment within the bounds of the site.
- 5.4.2 Although no records of flooding have been identified on site in the undertaking of this flood risk assessment, it is not to say that flooding has not occurred, only that it has not been recorded.

5.5 Summary of Flood Risk

5.5.1 The potential sources of flooding are:

Source of Flooding	Level of Risk
Rivers and Coastal	Very Low The site is located within Flood Zone 1.
Surface Water	Low - Medium Based upon EA mapping the site is largely identified as being at 'Very Low' risk of surface water flooding. Isolated extents are identified as being at increased risk of surface water flooding ranging from 'Low' to High'. The extents identified have been assessed as being localised low points in topography, as opposed to demonstrating a wider surface water conveyance route through the site.
Groundwater	Low Winter groundwater monitoring (2024/25) has identified peak groundwater levels at less than 200mm below ground level across the site. No instances of historic groundwater flooding have been recorded at the site.
Sewers	Very Low No instances of historic sewer flooding have been identified within the wider vicinity of the area of proposed development.
Artificial Sources	None The site is not shown to be at risk of flooding due to artificial sources.

5.5.2 Development proposals shall be developed around site constraints, such as areas identified as being at risk of flooding.

6 PROPOSED DEVELOPMENT

6.1 Description of Development

- 6.1.1 This FRA supports an application seeking outline planning permission. The proposed development will involve the construction of up to 40 No. dwellings as demonstrated by the development proposals contained within **Appendix A**.
- 6.1.2 The type of development proposed falls within the "More Vulnerable" flood risk vulnerability classification (Annex 3: Flood risk vulnerability classification, NPPF) and is appropriate in Flood Zone 1 (Flood Risk and Coastal Change Table 2, Planning Practice Guidance).

Flood Zones	Flood Risk Vulnerability Classification				
	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone 1	✓	✓	✓	✓	✓
Flood Zone 2	✓	Exception Test Required	✓	✓	✓
Flood Zone 3a†	Exception Test Required †	✗	Exception Test Required	✓	✓
Flood Zone 3b*	Exceptions Test Required *	✗	✗	✗	✓*
✓ = Development is appropriate ✗ = Development should not be permitted					

- 6.1.3 The proposed development will result in the introduction of new impermeable areas at the site.
- 6.1.4 The post-development impermeable area (**PL007**) has been determined to be 7057m² (0.7Ha).
- 6.1.5 Greenfield run-off rates have been established in relation to this area using HR Wallingford's 'Greenfield run-off rate estimation' tool. The calculated rates are as follows:
- QBAR: 5.3 l/s
- 1 in 1-Year: 4.5 l/s
- 1 in 2-Year: 4.6 l/s
- 1 in 10-Year: 8.5 l/s
- 1 in 30-Year: 12.1 l/s
- 1 in 100-Year: 16.8 l/s
- 1 in 200-Year: 19.7 l/s
- 6.1.6 The use of SuDS methods and techniques, where site conditions and constraints allow, will be utilised to assist in the management of surface water run-off generated by the proposed development, whilst adhering to the principles and standards contained within the National Standard for Sustainable Drainage Systems (June 2025).
- 6.1.7 The specific surface water and foul water drainage proposals are detailed in **Section 8** of this report.

7 SEQUENTIAL AND EXCEPTION TESTS

7.1 Sequential Test

- 7.1.1 Paragraph 024 of Flood Risk and Coastal Change confirms that 'The Sequential Test ensures that a sequential, risk-based approach is followed to steer new development to areas with the lowest risk of flooding, taking all sources of flood risk and climate change into account. Where it is not possible to locate development in low-risk areas, the Sequential Test should go on to compare reasonably available sites; within medium risk areas; and then, only where there are no reasonably available sites in low and medium risk areas, within high-risk areas.'
- 7.1.2 Paragraph 027 of the NPPF states 'n applying paragraph 175 a proportionate approach should be taken. Where a site-specific flood risk assessment demonstrates clearly that the proposed layout, design, and mitigation measures would ensure that occupiers and users would remain safe from current and future surface water flood risk for the lifetime of the development (therefore addressing the risks identified e.g. by Environment Agency flood risk mapping), without increasing flood risk elsewhere, then the sequential test need not be applied.'
- 7.1.3 The proposed development is essentially all located within Flood Zone 1 for the purposes of the proposed development scheme.
- 7.1.4 The site is largely identified as being at 'Very Low' risk of surface water flooding, albeit with isolated extents identified as being at increased risk of surface water flooding, ranging from 'Low' to 'High'. These extents are identified on drawing **PL004** relative to the site topographic survey and proposed site layout.
- 7.1.5 The site layout has been developed to ensure that residential development, classified as 'more vulnerable' is exclusively contained within Flood Zone 1 and avoids areas of the site identified as being at increased risk of surface water flooding.
- 7.1.6 As the proposed development is to be located within Flood Zone 1, with the layout developed to avoid areas of the site identified as being at increased risk of surface water flooding and mitigated by SuDS design, the Sequential Test is not required to be undertaken.

7.2 Exception Test

- 7.2.1 As detailed in 6.1.3, "More Vulnerable" development is appropriate in Flood Zone 1 and (at 7.1), the proposed development will be exclusively located in Flood Zone 1 meaning the Sequential Test is not required and therefore neither is the exception test having regard to national planning policy and guidance in the PPG.

8 PROPOSED SURFACE WATER DRAINAGE STRATEGY

8.1.1 The National Standards for Sustainable Drainage Systems (June 2025) detail principles and standards for the management of surface water run-off for new infrastructure and development.

8.1.2 There are two types of standards:

- The hierarchy standard (Standard 1) gives criteria for prioritising the choice of final run-off destination
- Fixed standards (Standards 2 to 7) state the minimum design criteria that all surface water drainage systems should satisfy and how they should be built, maintained and operated.

Both types of standards have accompanying requirements which provide details on how to interpret, deliver and evaluate each standard.

8.1.3 The seven standards are complementary, and the delivery of each standard should support delivery of the other standards. A surface water drainage system design that delivers multiple benefits will include a range of features and each of these should contribute to the delivery of several, if not all, of the standards.

8.1.4 There may be specific circumstances or constraints, such as the type or size of a development that mean it is not possible to deliver one or more of the standards. In these circumstances the opportunity to meet the standard shall be maximised and justification be developed in consultation with the approving body, who may agree to a departure unless regulatory controls prohibit such a departure.

8.1.5 The National Standards for Sustainable Drainage Systems can be viewed at <https://www.gov.uk/government/publications/national-standards-for-sustainable-drainage-systems/national-standards-for-sustainable-drainage-systems-suds>

8.2 Standard 1: Run-off Destinations

A 'SuDS approach' shall be adopted to address the management of surface water by the development and where it should be discharged. Runoff shall be treated as a resource and managed in a way that avoids negative impacts of the development on flood risk, the morphology and water quality of receiving waters and the associated ecology.

Runoff from the development shall be discharged to the following final destinations, to the maximum extent practicable, in accordance with the below hierarchy:

- Collected for non-potable use
- Infiltrated to ground
- Discharged to an above ground surface water body
- Discharged to a surface water sewer, or another piped surface water drainage system
- Discharged to a combined sewer
- To utilise a lesser priority final destination, appropriate evidence shall be provided that demonstrates all higher priority final destinations have been utilised to the maximum extent practicable.

Note 1: priority 1 is the highest priority and priority 5 is the lowest.

Note 2: for the purposes of this standard, a combined sewer is a sewer intended to receive both foul sewage and surface runoff and does not include a sewer intended to receive only foul sewage, even if it has the capacity to accommodate additional flows or has an element of surface water in it already.

To utilise a lesser priority final destination, appropriate evidence shall be provided that demonstrates all higher priority final destinations have been utilised to the maximum extent practicable. Higher cost alone shall not be a reason to utilise lower priority final destinations.

Where more than one final destination is utilised, each final destination's ability to accept runoff shall be maximised in order of priority.

- 8.2.1 Potential run-off destinations have been considered, in accordance with the hierarchy detailed within the National Standards for Sustainable Drainage Systems (June 2025), in respect of the proposed development:

Run-off Destination	Viable?	Justification
Collected for non-potable use	Yes	Standard 1 states that rainwater harvesting shall be considered where there is a demand for non-potable water, as well as if there is a need for landscape irrigation. The site is suitable for rainwater re-use and will be proportionate to the scale of development. Traditional rainwater butts are to be provided in conjunction with SuDS Planters. Other features will be considered at detailed design stage in coordination with the landscaping plan.
Infiltrated to ground	Yes (Hybrid Strategy)	Shallow groundwater levels have been recorded on site. West Sussex County Council (Lead Local Flood Authority) accepts that infiltration is not viable for the core parcel of the development, however part of the elevated access can be installed as a permeable pavement promoting a hybrid approach to reduce run-off where feasible.

Discharged to an above ground surface water body	Yes	Highest ranking potential run-off destination.
Discharged to a surface water sewer, or another piped surface water drainage system	No	Higher ranking opportunities exist.
Discharged to a combined sewer	No	Higher ranking opportunities exist.

- 8.2.2 Rainwater re-use can be incorporated into the proposed design. Rainwater butts are to be provided in conjunction with SuDS Planters.
- 8.2.3 The proposals will include additional features such as green (sedum) roofs for flat garages, below ground rain gardens, above ground rain garden planters.
- 8.2.4 Whilst shallow groundwater levels have been encountered on site, this small self draining catchment will be unlined allowing infiltration techniques. The first section (approx. 170m) of main access road will be installed as a permeable pavement promoting infiltration to the natural ground.
- 8.2.5 In addition to the above, any catchment associated with the Public Highway will be drained via bespoke highway drainage to the existing watercourse at this location.
- 8.2.6 The core parcel of the development will attenuate run-off on site, with a restricted discharge to the ordinary watercourse network with 2 No outfalls within the vicinity of the site as demonstrated by drawing **PL005**.
- 8.2.7 Attenuation will be provided in the form of 2 No. geocellular storage tanks, supplemented by areas of permeable paving.
- 8.2.8 Run-off will be restricted to a maximum of 1.5 l/s for all simulated storm events, up to and including the 1 in 100-year event, inclusive of climate change allowances.
- 8.2.9 The proposed surface water drainage arrangement is shown on drawings **PL005**.

8.3 Standard 2: Management of Everyday Run-off (Interception)

Apply a 'SuDS approach' so that at least the first 5mm of rainfall for the majority of rainfall events does not result in run-off from the site to surface waters or piped drainage systems.

Evidence shall be provided that the approach to managing run-off from 'everyday' rainfall has been developed alongside and in support of the management of run-off quality (Standard 4) and the delivery of amenity and biodiversity benefits (Standards 5 and 6).

- 8.3.1 Rainwater re-use can be incorporated into the proposed design. Rainwater butts are to be provided in conjunction with SuDS Planters.
- 8.3.2 All permeable surfaces, whether lined or not, shall be assumed to comply provided there is no additional

area drained to the permeable pavement.

8.4 Standard 3: Management of Extreme Rainfall and Flooding

A 'SuDS approach' shall be adopted to address the management of development run-off during extreme rainfall, including allowances for climate change and urban creep to:

- protect people and property on the development from flooding of the surface water drainage system
- mitigate any increased flood risk to people and property adjacent to or downstream of the development
- protect the receiving water body from morphological damage or minimise the impact on sewer capacity

When discharging to an infiltration feature, the system shall be appropriately sized to accommodate the design event based on ground conditions and contributing areas.

When discharging to an above ground surface water body, sewer or other piped drainage system, the surface water run-off (rate and volume) for the 1% annual exceedance probability (AEP) event shall be controlled to ensure the run-off from the development does not increase flood risk elsewhere.

When discharging to an above ground surface water body, sewer or other piped drainage system, the surface water run-off rate for the 50% AEP event shall be controlled to ensure development run-off from an event of this magnitude has no negative impact.

Any flooding from the surface water drainage system for events up to the 1% AEP event shall be managed within the development.

Any flooding from off-site sources for the 1% AEP event should be managed on site or safely routed through the site, ensuring any downstream risks are not increased compared to the pre-development scenario.

The risks (both on and off the development) associated with flooding from the surface water drainage system for exceedance events greater than the 1% AEP event shall be appropriately managed.

- 8.4.1 Flows discharging off site will be limited to a maximum of 1.5 l/s (pro-rata QBAR is 3.10 l/s).
- 8.4.2 The surface water drainage system for the site has been designed to accommodate a 1 in 100-year storm event, inclusive of allowances for climate change.
- 8.4.3 In respect of climate change, Gov.uk provides guidance for local planning authorities preparing strategic flood risk assessments and developers and their agents preparing flood risk assessments for planning applications, and development consent orders for nationally significant infrastructure projects.
- 8.4.4 Climate change allowances are predictions of anticipated change for peak river flow, peak rainfall intensity, sea level rise and offshore wind speed and extreme wave height.
- 8.4.5 Allowance for climate change shall be provided in the undertaking of site-specific flood risk assessments where new development is proposed to minimise vulnerability and provide resilience to flooding and coastal change.
- 8.4.6 The 'Peak Rainfall Allowances Map' shows anticipated changes in peak rainfall intensity.

- 8.4.7 Based on the latest allowances, for the 3.3% annual exceedance rainfall event, an increase of 40% should be applied to peak rainfall in relation to the proposed development.
- 8.4.8 For the 1% annual exceedance rainfall event, an increase of 45% should be applied to peak rainfall in relation to the proposed development.

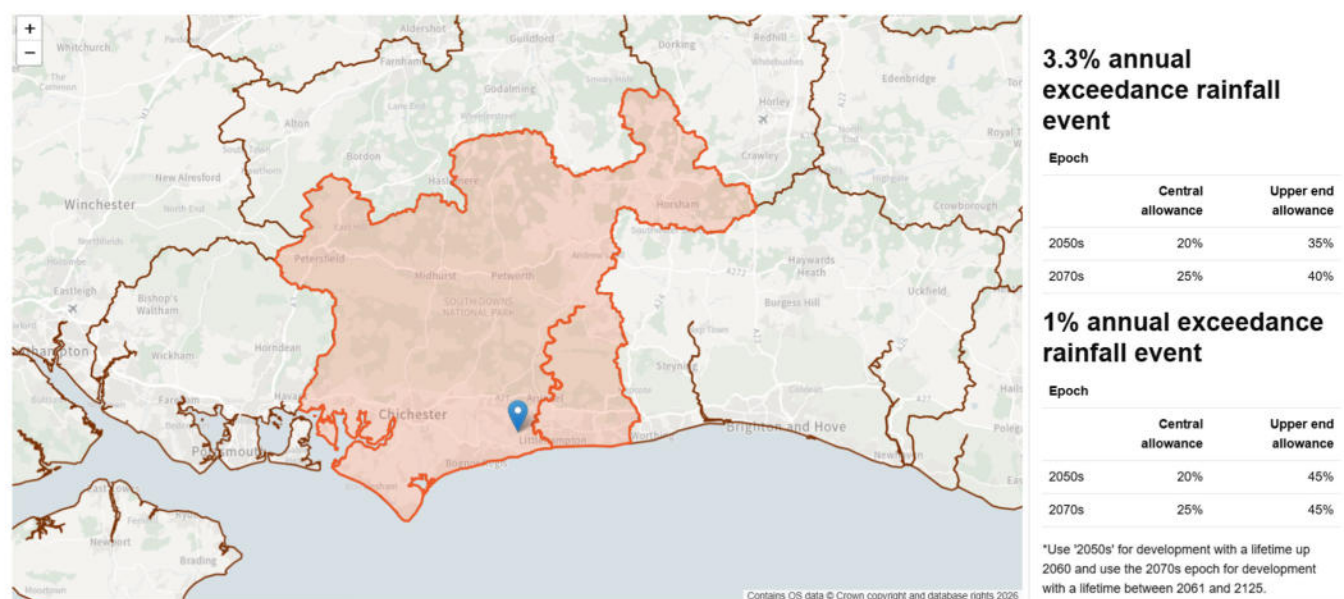


Figure 13. Climate Change Allowances – Peak Rainfall Allowances (Gov.uk)

- 8.4.9 Additionally, an allowance of 10% has been made in respect of the proposed roof areas for the potential impacts of urban creep.

8.5 Standard 4: Water Quality

Apply a 'SuDS approach' that protects surface waters, groundwater and coastal waters by managing the quality of the surface water run-off to adequately address water quality risks from development.

The proposed SuDS management train(s) shall be based on robust water quality risk assessment, appropriate to the pollution hazard and sensitivity of receiving waters, reflecting industry recognised guidance or other quantitative assessment as agreed with the approving body and permitting requirements.

- 8.5.1 In accordance with the SuDS Manual (CIRIA C753) regarding methods for managing pollution risks, the risk posed by surface water run-off to the receiving environment depends on the pollution hazard at the site (the source), SuDS treatment techniques (the pathway), and the sensitivity of the environment (the receptor).
- 8.5.2 The simple index approach considers whether SuDS techniques are appropriate for the site. The states that for SuDS components to deliver adequate treatment, the total pollution mitigation index for each contaminant type should equal or exceed the pollution hazard index.
- 8.5.3 The SuDS Manual outlines three categories of pollution hazard identification, which vary depending on proposed land use, which are as follows:

- Total Suspended Solids (TSS).
- Metals (M).
- Hydrocarbons (H).

8.5.4 In accordance with C753 Table 26.2, the proposed land uses at the site are categorised as follows:

- Residential roofs – TSS=0.2/M=0.2/H=0.05
- Individual property driveways, residential car parks, low traffic roads TSS=0.5/M=0.4/H=0.4

8.5.5 In accordance with C753 Table 26.3, the values of SuDS Mitigation indices are provided for the following measures:

- Permeable Paving – TSS=0.7/M=0.6/H=0.7
- Green Roof – TSS=0.8/M=0.9/H=0.5
- Hydrodynamic vortex separator – TSS=0.5/M=0.4/H=0.4

8.5.6 As the pollution hazard index does/will not exceed any pollution mitigation index for any contaminant type, the proposed SuDS methods will provide sufficient treatment for the proposed development.

8.6 Standard 5: Amenity

A 'SuDS approach' shall be adopted that maximises benefits for amenity through the creation of multi-functional places and landscapes.

- 8.6.1 The surface water drainage design should seek to positively contribute to placemaking and environmental enhancement by keeping surface water run-off at or close to the ground surface.
- 8.6.2 Surface water run-off shall be conveyed or attenuated utilising features that maximise the opportunity for public appreciation.
- 8.6.3 Permeable paving is proposed which provides a useable multi-purpose surface.
- 8.6.4 The development, beyond drainage design, has been designed to consider amenity and separate assessment is provided by the relevant disciplines.

8.7 Standard 6: Biodiversity

A 'SuDS approach' shall be adopted to ensure the surface water drainage system maximises biodiversity benefits throughout the development lifecycle.

The surface water drainage system shall add biodiversity value by:

- creating diverse, self-sustaining, resilient local ecosystems which contribute to net gains in biodiversity
- supporting and promoting natural local habitat and species, for example, through local nature recovery strategies
- contributing to the delivery of local biodiversity strategies
- contributing to habitat connectivity

- 8.7.1 Evidence of consideration and inclusion of biodiversity, proportionate to both the scale and ecological sensitivity of the site, shall be provided to the approving body.
- 8.7.2 A wider biodiversity assessment has been undertaken at the site by the relevant consultant and is incorporated within the development proposals presented at the site.
- 8.7.3 Specifically in respect of surface water drainage, the existing watercourse to the west boundary of the site is being retained. Collection trenches and tree pits features could be installed alongside parts of the road forming part of the landscaping proposals.

8.8 Standard 7: Design of Drainage for Construction, Operation, Maintenance, Decommissioning and Structural Integrity

A 'SuDS approach' shall be adopted to ensure that surface water drainage systems are designed so they can be easily and safely constructed, operated and maintained taking account of the need to minimise negative impacts on natural resources and the environment.

The designer shall provide a management and maintenance plan that supports the design objectives detailed in standards 1 to 6 and ensures the performance of the surface water drainage system with regards to run-off destinations, everyday and extreme rainfall, water quality, amenity and biodiversity is maintained throughout the lifetime of the development.

Surface water drainage design shall examine for the likelihood and consequences of potential failure scenarios that may occur during the operation phase and safely manage the associated risks.

The surface water drainage system shall be designed to ensure structural integrity of all components under anticipated loading conditions for the design life of the development so that it does not affect the structural integrity of any existing or proposed components within, or adjacent to, the development.

- 8.8.1 Maintenance is required to ensure the long-term operational performance of the proposed surface water drainage system.
- 8.8.2 The drainage system has been designed to minimise maintenance requirements; however a number of

key tasks will need to be undertaken so that the system remains in optimal condition. Maintenance requirements are detailed within the separate maintenance document (D2298/DM).

- 8.8.3 The responsibility of maintenance regime will rest with TBC/or their appointed third-parties. It is anticipated that this element will be dealt with by planning conditions and Section 106. At this stage it is not feasible to conclude if any highway or drainage apparatus will be formally offered for adoption. The responsibility of any adopted infrastructure will fall to the Highway Authority and/or Sewer Authority.
- 8.8.4 Infrastructure which is 'shared' but unadopted (i.e. serving more than a single plot and/or falling outside of any individual plot's curtilage) will be the responsibility of the Management Company.
- 8.8.5 The responsibility of any drainage infrastructure supporting a single dwelling/plot will be the sole responsibility of the owner/occupier of the associated dwelling.
- 8.8.6 It is not envisaged that any materials are to be stored on site once the development has been completed, which could cause major spills and/or potential pollution issues within the drainage system.
- 8.8.7 If this situation alters in the future consultation with a specialist will be required in order to confirm if any upgrades to the existing system are necessary.
- 8.8.8 Any future alterations to the foul and/or surface water drainage systems should be confirmed by a specialist.

9 PROPOSED FOUL WATER DRAINAGE STRATEGY

- 9.1.1 The proposed foul water drainage arrangement is shown on drawings **PL005**.
- 9.1.2 It is proposed that the site will establish a connection to the public foul water sewer located beneath Burndell Road, to the east of the site at manhole 7701.
- 9.1.3 Post development, there will be an estimated increase in peak foul water flows to 1.85 l/s (based on Sewer Sector Guidance, Appendix C, Design and Construction Guidance for 40 No dwellings).
- 9.1.4 The principles of development will prioritise the use of a gravity fed system on site, incorporating a foul pumping station to connect into the public foul water sewer via a break chamber.
- 9.1.5 Connection to the public foul water sewer will be subject to a S106 application, and approval from Southern Water.
- 9.1.6 Recent changes to infrastructure and connection charges (OFWAT Charging Rules) place the onus on the sewerage undertaker to reinforce their network should there no longer be sufficient capacity to serve the new development. Funding for this is provided by revised charging arrangements for infrastructure and connection charges for each dwelling constructed comprising a Network Reinforcement Charge and Site-Specific Charges. The revised charging arrangement (funded by the developer) covers alterations to the Existing Sewer Network and the sewerage undertaker remains responsible for the cost of reinforcing their Strategic Assets. The developer is responsible for connecting the development to the public sewer network.

10 LIDSEY DRAINAGE IMPACT ASSESSMENT

- 10.1.1 The site is located partially within the Lidsey wastewater treatment catchment area.
- 10.1.2 Communities which fall within the catchment area have, historically, experienced foul water flooding of roads and property which has also led to the pollution of watercourses. The stated cause is assumed to have been as a result of the sewerage system being overloaded, as a result of groundwater infiltration/ingress and surface water inundation of the sewerage system.
- 10.1.3 West Sussex County Council has published the Lidsey Surface Water Management Plan (2014) which does not identify the site as falling within any of the defined Local Flood Risk Zones.
- 10.1.4 The site itself is not identified as being within the defined extents of this Local Flood Risk Zone.
- 10.1.5 The site is not currently served by piped surface water drainage infrastructure. Post development, run-off will drain to the ordinary watercourse network within the vicinity of the site. Attenuation is to be provided on-site, and will be subject of a separate Ordinary Watercourse Consent application.
- 10.1.6 Foul flows generated by the proposed development will drain to Southern Water's public foul water sewer located beneath Burndell Road, to the east of the site via a pumped rising main connection.
- 10.1.7 The proposed drainage arrangements will ensure that foul and surface water flows are kept separated, with both following the respective drainage hierarchies for foul and surface water drainage. No surface water or groundwater will communicate with the public foul water sewer network.
- 10.1.8 Southern Water is responsible for ensuring that capacity exists within their network to support new development, with financial contributions collected from developers under S106 of the Water Industry Act 1991.

11 RESIDUAL RISK AND MITIGATION

11.1 Residual Risk

11.1.1 The following residual risks have been identified in relation to the proposed development:

- i. Increased flow through watercourses as a result of climate change causing flooding to the site
- ii. Blockage of watercourses as a result of debris or otherwise, causing flooding to the site
- iii. Extreme rainfall events that exceed the design criteria used for the drainage system causing surface water flooding
- iv. Blockage/failure of the proposed drainage system causing flooding to the site
- v. Groundwater flooding to the site caused by groundwater levels exceeding the ground surface level
- vi. Surface water flooding of proposed buildings

11.2 Mitigation

11.2.1 Consideration has been taken to the residual risks stated in Section 10.1, and the following mitigation measures are proposed:

- i. Should flows increase within the ordinary watercourse network as a result of climate change, there is potential for flooding to occur. Should this occur, exceedance flows will follow the wider topography of the site and surrounding areas. There are no prevailing significant falls demonstrated on-site, therefore any potential flood waters would stand until able to naturally drain away.
- ii. Blockage of the ordinary watercourse network may result in flooding. Improvement works are proposed in respect of the existing ordinary watercourse network given existing defects identified by Arun District Council's drainage officer. Maintenance plays an important role in managing and alleviating flood risk. Maintenance requirements will be covered at detailed design stage in accordance with CIRIA guidance.
- iii. The drainage strategy has been developed to capture run-off up to a 1 in 100-year critical design rainfall event, with a 45% allowance for climate change in addition to an allowance for the potential impacts of urban creep. However, should a more extreme rainfall event occur, there is the potential for the drainage system to be exceeded. Exceedance flows would follow the natural topography of the site, and the topography as per the on-site levels design.

- iv. The proposed drainage system will attenuate and store run-off up to the design event. Blockage of the drainage system has the potential to cause flooding on the site. Maintenance requirements will be covered at detailed design stage in accordance with CIRIA guidance.
- v. Groundwater has been recorded at shallow depths below ground level across the site. Consideration during design shall be afforded to such scenarios, to ensure that potential emerging groundwater is ideally directed away from proposed structures.
- vi. The site is identified as largely being at 'Very Low' risk of surface water flooding. The risk of surface water flooding is not likely, however, consideration in design shall be afforded to ensure that run-off from proposed areas of hardstanding is directed away from structures to prevent water ingress and flooding. Areas identified as being susceptible to surface water flooding, as per Flood Maps for Planning, have been avoided in the development of the site layout.

12 FLOOD RISK MANAGEMENT

12.1 Safe Access and Egress

- 12.1.1 Access to the site is to be provided off of Burndell Road, at the existing site access location.
- 12.1.2 The proposed access location is located within Flood Zone 1 (present day and in respect of current climate change projections) and is identified as being at 'Very Low' risk of surface water flooding.
- 12.1.3 The proposed development is located fully within Flood Zone 1, whilst isolated extents identified as being at increased risk of surface water flooding on site have been avoided, or mitigated by design.
- 12.1.4 In view of the above factors, access and egress from the site would be safe for the lifetime of the development.

13 OFFSITE IMPACTS

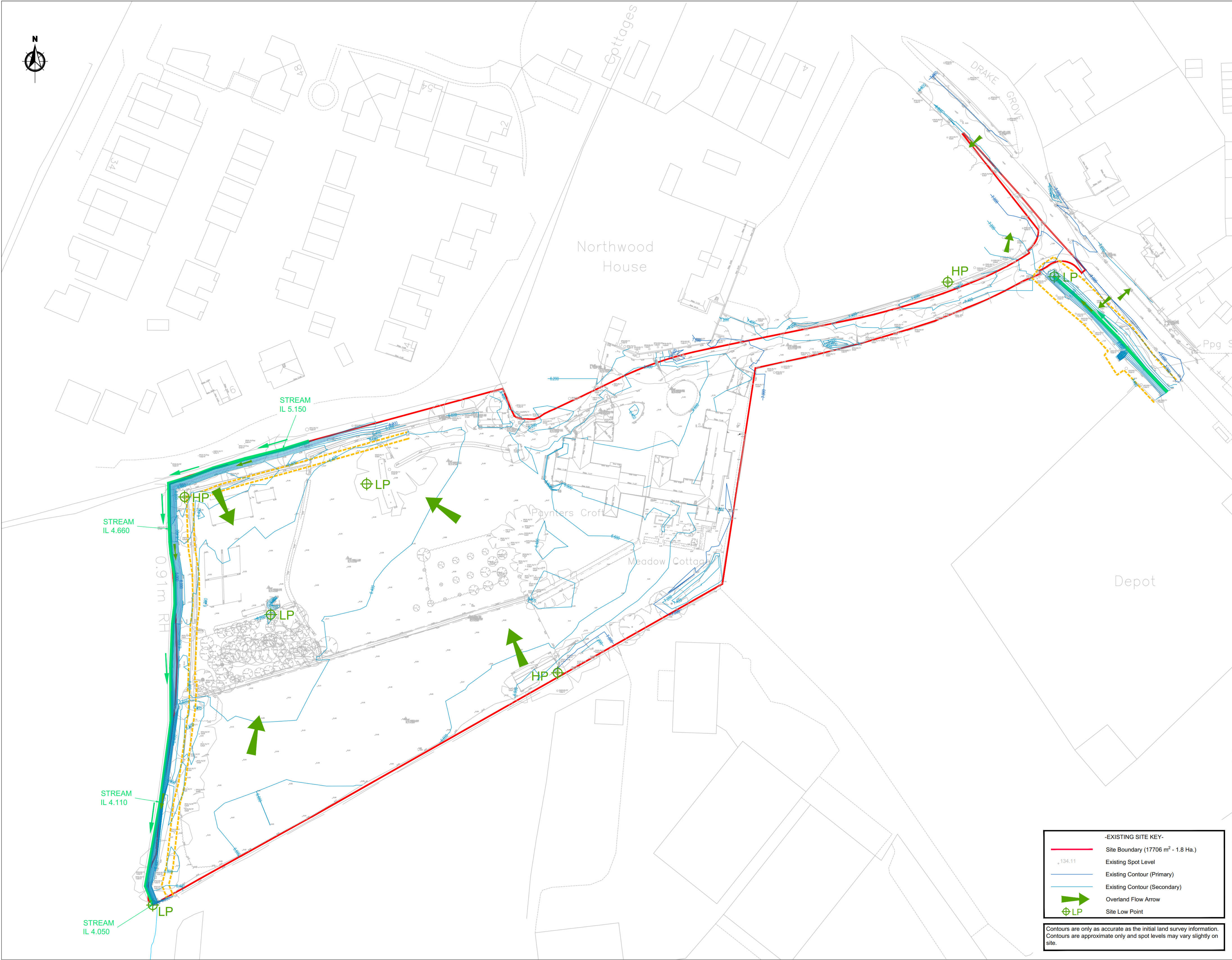
- 13.1.1 Post-development run-off will discharge to the ordinary watercourse network at a rate of 1.50 l/s, mimicking existing greenfield run-off rates.
- 13.1.2 The potential effects of both climate change and urban creep have been considered in the proposed surface water drainage design to ensure there is no off-site impact.
- 13.1.3 In respect of foul drainage, the principles of development will prioritise the use of a gravity fed system, incorporating a foul pumping station where gravity fed is not feasible. This will be fully resolved at the reserved matters stage as part of the detailed layout design for the site.

14 SUMMARY

- 14.1.1 The proposed development will involve the construction of up to 40 No. dwellings as demonstrated by the development proposals contained within **Appendix A**. By way of overall conclusion this development is feasible and acceptable in flood risk and drainage terms, subject to necessary planning conditions that will secure the detailed design at the appropriate reserved matters stage. The proposed development is located in an area at low risk of flooding and mitigation measures have been recommended in order to ensure that the site does not increase the risk of flooding elsewhere.
- 14.1.2 It is therefore concluded that the proposed development complies with ADC, EA and NPPF policies and guidance.
- 14.1.3 In terms of Flood Risk:
- The proposed development is located in Flood Zone 1 (Low Risk) for current day and for future climate change considerations.
 - The site is largely identified as being at 'Low-Medium' risk of surface water flooding.
 - The completion of the development will not increase flood risk on or off the site.
- 14.1.4 In terms of surface water drainage:
- The site currently drains naturally, and is not served by formal surface water drainage infrastructure. The site topographic survey identifies levels in the range of 6.200m AOD and 7.600m AOD. The site is flat with no significant prevailing falls. Within the wider vicinity of the site, surface water drains to the ordinary watercourse network, discharging to the watercourse at Hill Lane.
 - Intrusive site investigation has confirmed clay becoming very silty/fine sandy with gravel. Chalk was also exposed at approx. 4.0mbgl. Made ground was present in 1 No. borehole at a depth of 1.5mbgl.
 - Groundwater monitoring has also been conducted over 2 No. winters spanning the winter of 2024/25. Peak groundwater levels were recorded at depths less than 450mm/660mm below ground level.
 - Infiltration is not viable owing to the presence of shallow groundwater. Surface water will instead be attenuated on site before discharging to the ordinary watercourse along the west boundary.
 - The surface water drainage system has been designed to accommodate a 1 in 100-year storm event, inclusive of allowances for both climate change and urban creep. Attenuation will be provided in the form of 3 cellular storage tanks and permeable paving. Run-off leaving the site will be restricted to a maximum rate of 1.50 l/s.
- 14.1.5 In terms of foul water drainage:
- The development will take advantage of the public sewer network and existing sewerage infrastructure adjacent to the site.
 - Foul water from the proposed development will drain to Southern Water's public foul water sewer network via the existing manhole (7701) on Burndell Road.
 - Subject to final design, gravity sewers will serve the site draining to the existing foul sewer network via pumping station.

DRAWINGS

- PL001** Topographic Survey with Contours
- PL002** Constraints Plan
- PL003** Geotechnical Testing Plan
- PL004** Surface Water Flood Map Assessment
- PL005** Drainage Strategy
- PL006** Levels & Contours
- PL007** Catchment Areas



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P03	20/05/26	General Update
P02	06/02/25	Additional survey added
P01	20/01/25	Updated red line boundary
-	-	Original Issue

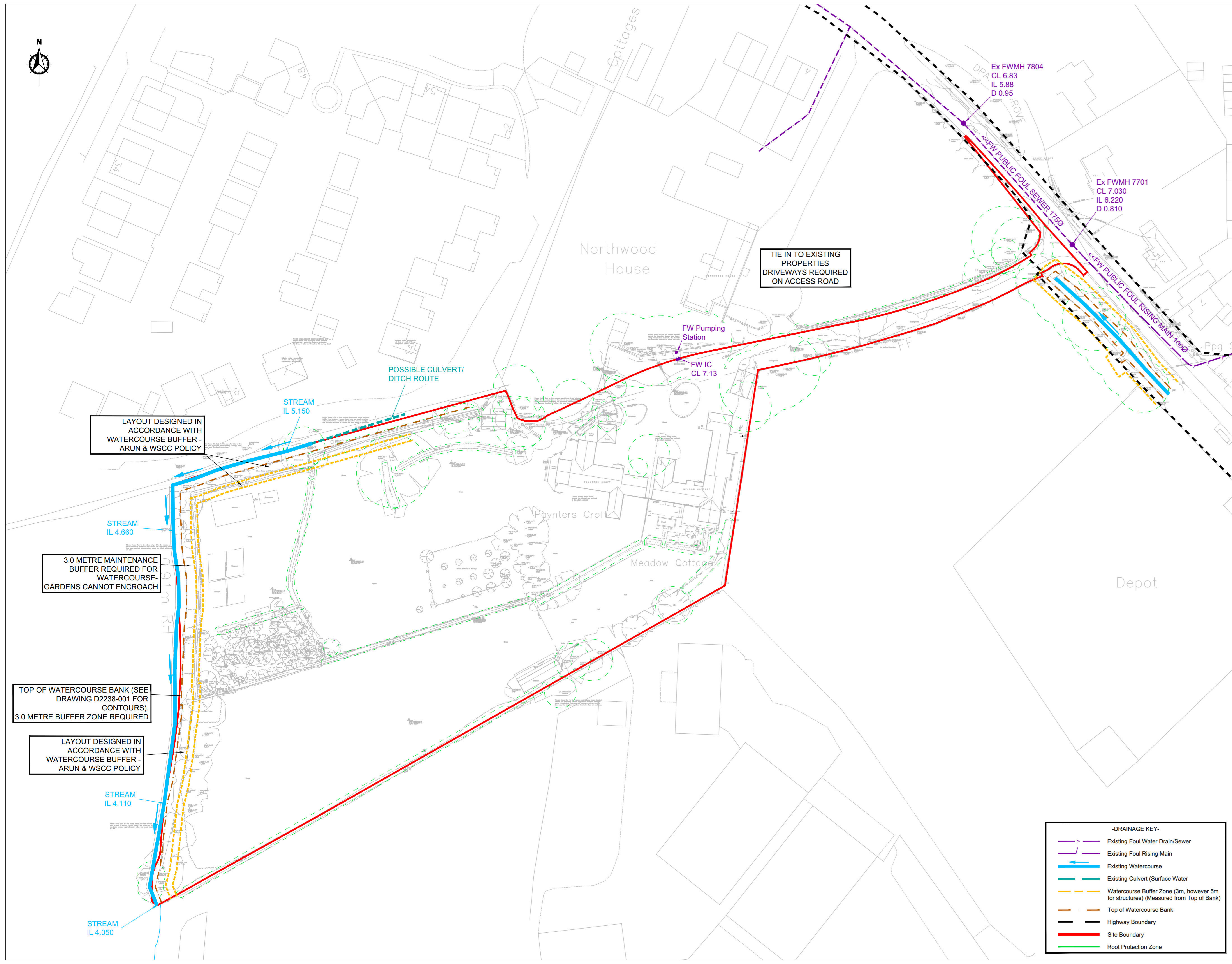
Rev.	Date	Amendments

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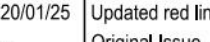
Drawing Status		FOR INFORMATION	
		NOT FOR CONSTRUCTION	
Client		Jeremy Napthine	
Project		Land off Burndell Road, Yapton, BN18 0GB	
Drawing Title		Topographic Survey with Contours	
Scale at A1	Date	Drawn By	Checked By
1:500	Jan 25	JHL	MJA
Drawing Code	Drawing No.	Rev.	
000-BPC-WD-ZZ-D-C	PL001	P03	

-EXISTING SITE KEY-	
	Site Boundary (17706 m ² - 1.8 Ha.)
	Existing Spot Level
	Existing Contour (Primary)
	Existing Contour (Secondary)
	Overland Flow Arrow
	Site Low Point

Contours are only as accurate as the initial land survey information. Contours are approximate only and spot levels may vary slightly on site.



A1

- | P02 | 20/05/06 | Pumping Station Added, General Update |
|------|----------|---------------------------------------|
| P01 | 20/01/25 | Updated red line boundary |
| - | - | Original Issue |
| Rev. | Date | Amendments |
- 

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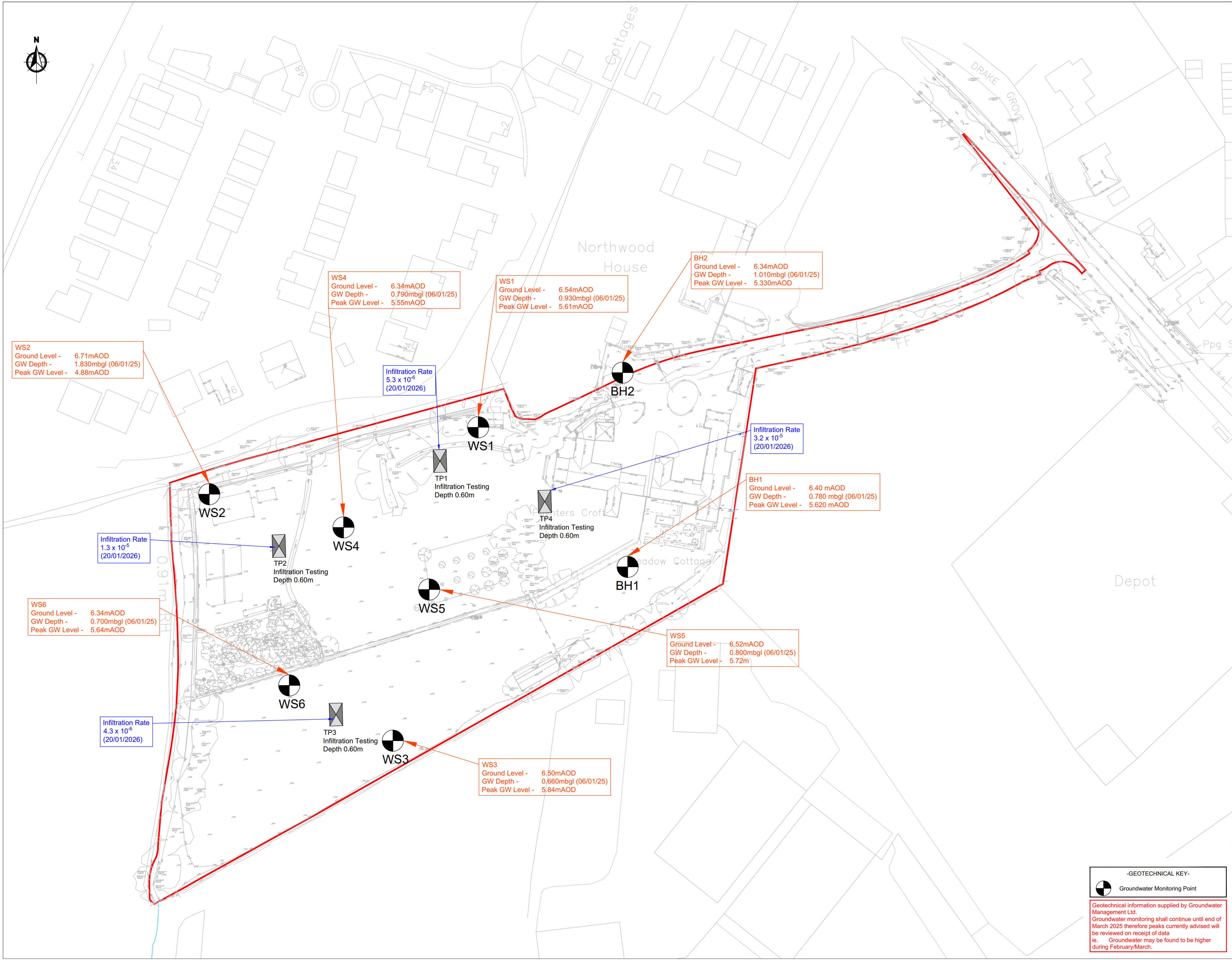
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Client **Jeremy Napthine**

Drawing Title

Constraints Plan

Scale at A1 1:500	Date Jan 25	Drawn By JHL	Checked By MJA	Project No. D2338
Drawing Code 000-BPC-WD-ZZ-D-C			Drawing No. PL002	Rev. P02



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P02	20/05/26	General update
P01	20/01/25	Updated red line boundary
-	-	Original Issue

Rev.	Date	Amendments
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Client
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Project
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Yapton, BN18 0GB

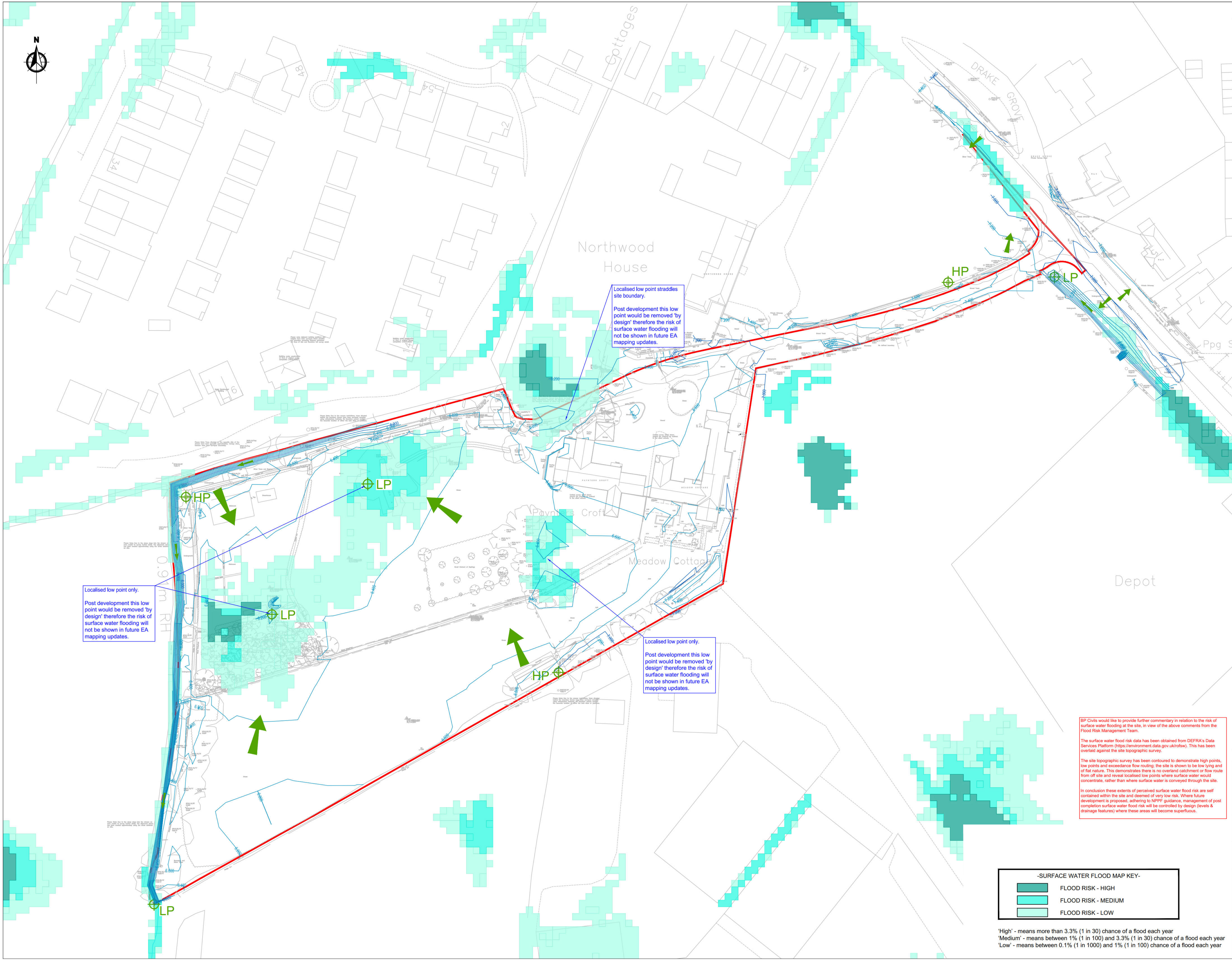
Drawing Title
Geotechnical Testing Plan

Scale at A1	Date	Drawn By	Checked By	Project No.
1:500	Jan 25	JHL	MJA	D2338

Drawing Code	Drawing No.	Rev.
000-BPC-WD-ZZ-D-C	PL003	P02

-GEOTECHNICAL KEY-
Groundwater Monitoring Point

Geotechnical information supplied by Groundwater Management Ltd.
Groundwater monitoring shall continue until end of March 2025 therefore peaks currently advised will be reviewed on receipt of data
ie. Groundwater may be found to be higher during February/March.

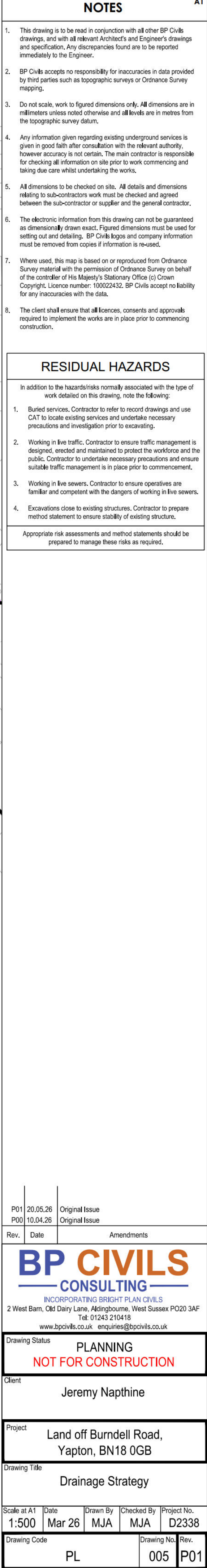


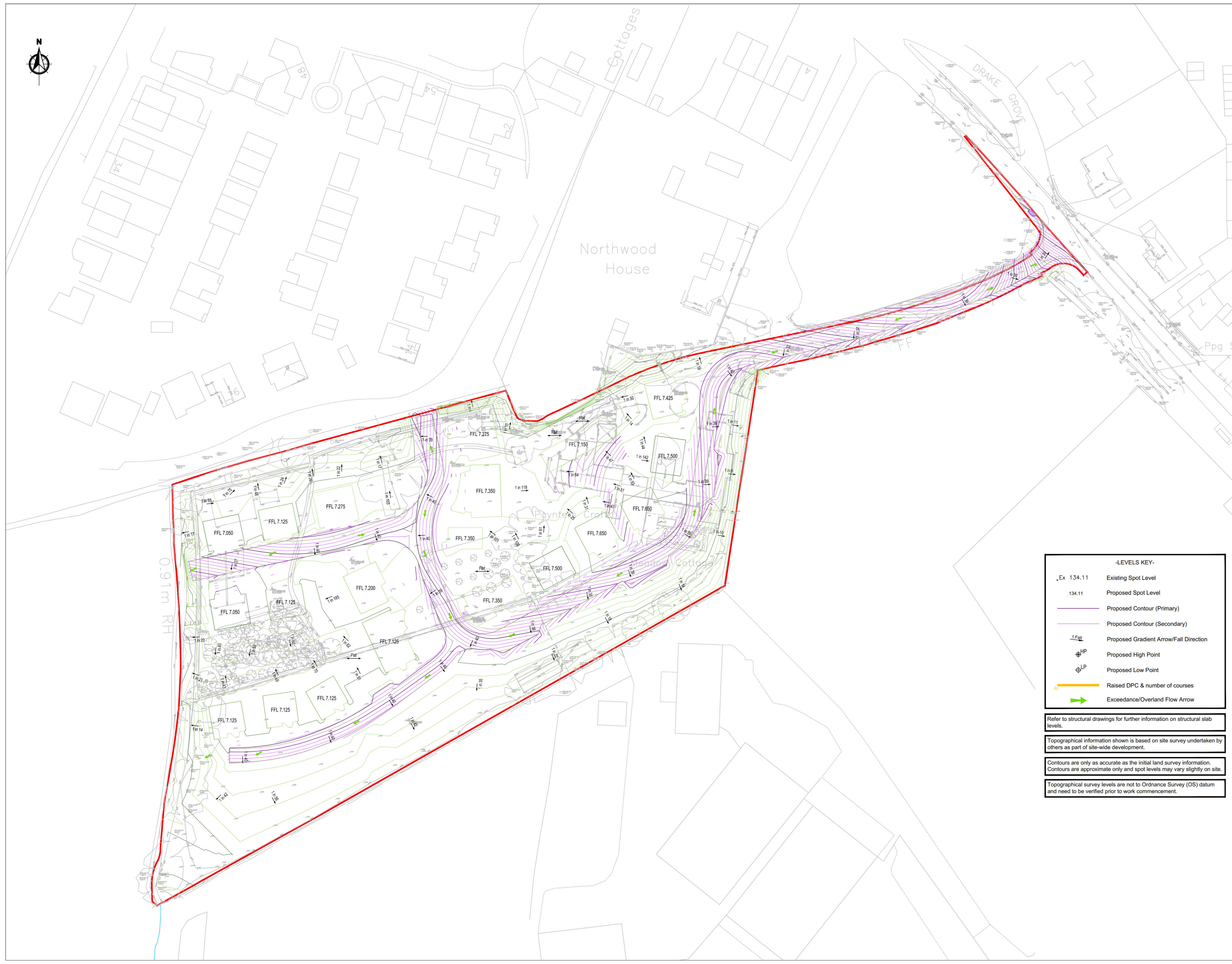
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P00	20.05.26	Original Issue
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Drawing Status				
FOR INFORMATION				
NOT FOR CONSTRUCTION				
Client				
Jeremy Napthine				
Project				
Land off Burndell Road, Yapton, BN18 0GB				
Drawing Title				
Risk of Flooding from Surface Water Map Assessment				
Scale at A1	Date	Drawn By	Checked By	Project No.
1:500	Jul 25	JHL	MJA	D2338
Drawing Code	Drawing No.	Rev.		
000-BPC-WD-ZZ-D-C	PL004	P00		





A1

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Ex 134.11	Existing Spot Level
134.11	Proposed Spot Level
	Proposed Contour (Primary)
	Proposed Contour (Secondary)
	Proposed Gradient Arrow/Fall Direction
	Proposed High Point
	Proposed Low Point
	Raised DPC & number of courses
	Exceedance/Overland Flow Arrow

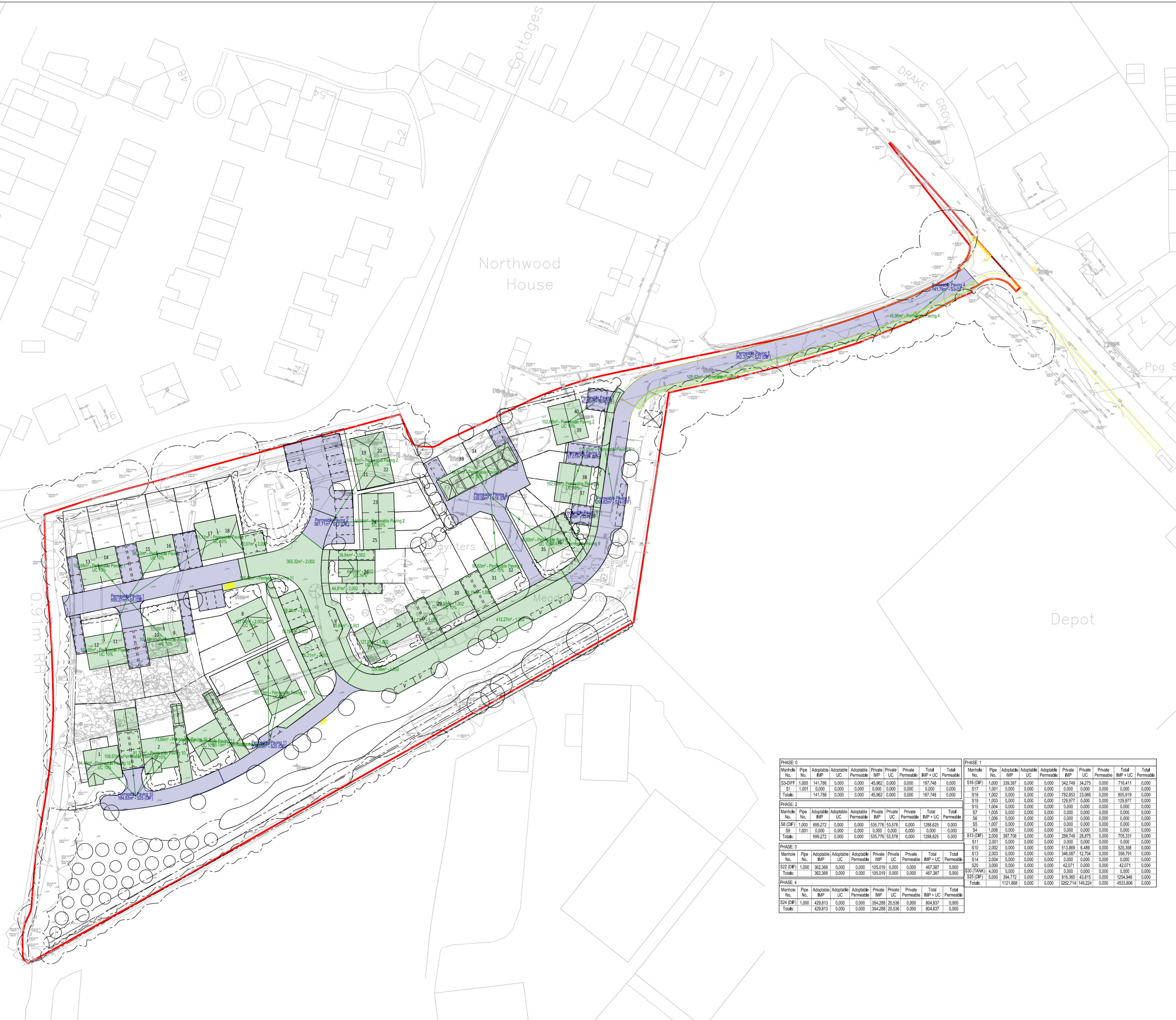
Refer to structural drawings for further information on structural slab levels.

Topographical information shown is based on site survey undertaken by others as part of site-wide development.

Contours are only as accurate as the initial land survey information.
Contours are approximate only and spot levels may vary slightly on

Topographical survey levels are not to Ordnance Survey (OS) datum and need to be verified prior to work commencement.

P00	11.06.26	Original Issue			
Rev.	Date	Amendments			
 INCORPORATING BRIGHT PLAN CIVILS 2 West Barn, Old Dairy Lane, Akingbourne, West Sussex PO20 3AF Tel: 01243 254118 www.bpcivils.co.uk enquiries@bpcivils.co.uk					
Drawing Status		FOR INFORMATION NOT FOR CONSTRUCTION			
Client Jeremy Napthine					
Project Land off Burndell Road, Yapton, BN18 0GB					
Drawing Title Levels and Contours (with Post Exceedance Flow)					
Scale at A1	Date	Drawn By	Checked By	Project No.	
1:500	MAY 26	LM	MJA	D2338	
Drawing Code			Drawing No.		Rev.
000-BPC-WD-ZZ-D-C			PL006		P00



PHASE: 0										PHASE: 1									
Manhole No.	Pipe No.	Adoptable IMP	Adoptable UC	Adoptable Permeable	Private IMP	Private UC	Private Permeable	Total IMP + UC	Total Permeable	Manhole No.	Pipe No.	Adoptable IMP	Adoptable UC	Adoptable Permeable	Private IMP	Private UC	Private Permeable	Total IMP + UC	Total Permeable
S3-DIFF	1,000	141,786	0,000	0,000	45,962	0,000	0,000	187,748	0,000	S16 (DIF)	1,000	339,367	0,000	0,000	342,749	34,275	0,000	716,411	0,000
S1	1,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	S17	1,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Totals:		141,786	0,000	0,000	45,962	0,000	0,000	187,748	0,000	S18	1,002	0,000	0,000	0,000	782,853	23,066	0,000	805,919	0,000
PHASE: 2										PHASE: 3									
Manhole No.	Pipe No.	Adoptable IMP	Adoptable UC	Adoptable Permeable	Private IMP	Private UC	Private Permeable	Total IMP + UC	Total Permeable	Manhole No.	Pipe No.	Adoptable IMP	Adoptable UC	Adoptable Permeable	Private IMP	Private UC	Private Permeable	Total IMP + UC	Total Permeable
S8 (DIF)	1,000	699,272	0,000	0,000	535,776	53,578	0,000	1,288,625	0,000	S19	1,003	0,000	0,000	0,000	129,977	0,000	0,000	129,977	0,000
S9	1,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	S15	1,004	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Totals:		699,272	0,000	0,000	535,776	53,578	0,000	1,288,625	0,000	S7	1,005	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
PHASE: 3										PHASE: 4									
Manhole No.	Pipe No.	Adoptable IMP	Adoptable UC	Adoptable Permeable	Private IMP	Private UC	Private Permeable	Total IMP + UC	Total Permeable	Manhole No.	Pipe No.	Adoptable IMP	Adoptable UC	Adoptable Permeable	Private IMP	Private UC	Private Permeable	Total IMP + UC	Total Permeable
S22 (DIF)	1,000	362,368	0,000	0,000	105,019	0,000	0,000	467,387	0,000	S20	3,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Totals:		362,368	0,000	0,000	105,019	0,000	0,000	467,387	0,000	S11	2,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
PHASE: 4										PHASE: 5									
Manhole No.	Pipe No.	Adoptable IMP	Adoptable UC	Adoptable Permeable	Private IMP	Private UC	Private Permeable	Total IMP + UC	Total Permeable	Manhole No.	Pipe No.	Adoptable IMP	Adoptable UC	Adoptable Permeable	Private IMP	Private UC	Private Permeable	Total IMP + UC	Total Permeable
S24 (DIF)	1,000	429,813	0,000	0,000	354,288	20,536	0,000	804,637	0,000	S13	2,003	0,000	0,000	0,000	513,869	6,428	0,000	520,358	0,000
Totals:		429,813	0,000	0,000	354,288	20,536	0,000	804,637	0,000	S13	2,004	0,000	0,000	0,000	346,087	12,704	0,000	358,791	0,000
										S23	4,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
										S23 (TANK)	4,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
										S25 (DIF)	5,000	394,772	0,000	0,000	816,360	43,815	0,000	1,254,948	0,000
										Totals:		112,868	0,000	0,000	3,262,714	149,224	0,000	4,533,806	0,000

NOTES

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PO0 11.06.26 Original Issue

Rev. Date Amendments

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Drawing Status
FOR INFORMATION
NOT FOR CONSTRUCTION

Client
Jeremy Napthine

Project
Land off Burndell Road,
Yapton, BN18 0GB

Drawing Title
Catchment Areas

Scale at A1 Date Drawn By Checked By Project No.
1:500 May 26 LM MJA D2338

Drawing Code Drawing No. Rev.
000-BPC-WD-ZZ-D-C PL007 PO0

APPENDICES

Appendix A Architectural Development Proposals



Romsey T: 01794 367703
Portishead T: 01275 407000
London T: 01794 367703

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Rev	Description
P1	Preliminary Issue
P2	Amendments to layout to accommodate parking requirements
P3	Updated to Latest Layout
P4	Updated to Latest Layout

Date	Au	Ch
07.03.25	GR/SP	~/-~
12.03.25	GR/SP	CW
23.02.26	IW/BC	AL
14.04.26	IW/BC	

Project Burndell Road, Yapton
Drawing Illustrative Masterplan - 01

Client	EDGE BP	Date	07.03.25
Job no.	EDGE240620	Rev.	P3
Dwg no.	IMP-01	Scale	1:500@A1
Author	GR/SP	Checked	CW
Status	PRELIMINARY	Office	Romsey
Client ref.	-		



Appendix B Topographic Survey

Appendix C Geotechnical Site Investigation (Ground Management)

SOAKAGE TESTING
AT
BURNDILL ROAD (PAYNTERS CROFT) YAPTON
FOR
SALT EARTH LTD

G6623

19 February 2026



Ground Management Ltd
Civil and Geotechnical Engineering Services

DOCUMENT CONTROL

Report Title: Soakage Testing
 Burndell Road (Paynters Croft) Yapton

Report No./ Issue: G6623-01/1

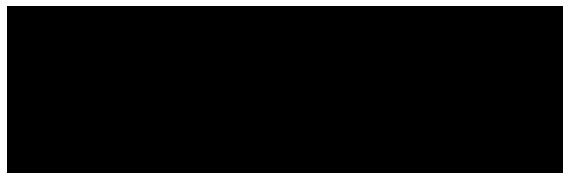
Report Status: Issued for Client Comment

Distribution: Salt Earth Ltd PDF copy 19 February 2026

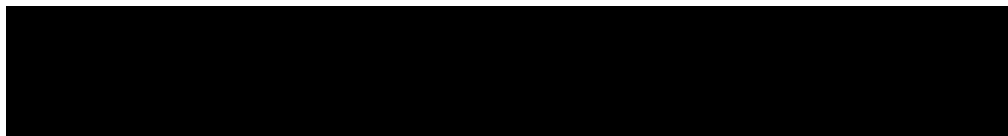
BP Civils

Prepared by: Alistair Tyler BSc MSc DIC CEng MICE

Signed:



Ground Management Ltd Robin Hill Farm Clay Lane Fishbourne Chichester West Sussex PO18 8AB



CONTENTS

1.0 Introduction

Figure 1: Site Location Plan

Figure 2: Exploratory Hole Location Plan

Exploratory Hole Logs: Trial Pits TP1, TP2, TP3 & TP4

Soakage Test Results

Groundwater Monitoring

Site Photographs

1.0 INTRODUCTION

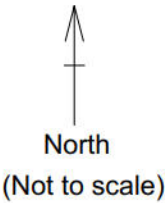
- 1.1 Ground Management Ltd have carried out soakage testing at Paynters Croft, Burndell Road, Yapton (site location indicated on Figure 1) to inform drainage design for a proposed residential development.
- 1.2 Test locations were agreed with the drainage designer BP Civils, and targeted areas of proposed permeable paving. Locations were as indicated on Figure 2.
- 1.3 Depth of testing was decided followed review of previous groundwater monitoring and preliminary drainage design.
- 1.4 Four trial pits, referenced as TP1 to TP4, were excavated by hand during a visit on 20 January 2026. The pits each extended to a depth of 0.6m and were used for soakage testing carried out in accordance with BRE365. Testing comprised three fills of each pit and was concluded on 21 January 2026 when pits were backfilled with compacted arisings. (Trial pit TP4 that recorded an initial high infiltration rate that slowed during subsequent tests received 4 fills)
- 1.5 Details of the soils encountered are presented on the appended exploratory hole logs together with soakage test results and groundwater monitoring carried out to date and includes the standpipe observations made during the period of soakage testing.
- 1.6 Tests were recorded by manual observation supplemented in some pits with continuous recording by dataloggers. A summary of the infiltration test results and the derived infiltration rates is presented below:

Trial Pit	Pit Dimensions LxWxD (metres)	Test No.	Water Level at start of test (mm below ground level)	Duration of test (mins)	Fall of water level during test (mm)	Infiltration Coefficient (m/s) (see note)
TP1	0.35 x 0.9 x 0.6	1	115	187	465	1.5×10^{-5}
		2	90	90	260	* 9.5×10^{-6}
		3	95	309	385	5.3×10^{-6}
TP2	0.3 x 0.93 x 0.6	1	110	108	500	2.7×10^{-5}
		2	100	205	500	1.4×10^{-5}
		3	95	235	505	1.3×10^{-5}
TP3	0.3 x 0.9 x 0.6	1	115	164	435	1.3×10^{-5}
		2	90	320	510	8.4×10^{-6}
		3	65	520	485	4.3×10^{-6}
TP4	0.3 x 0.93 x 0.6	1	100	23	470	1.1×10^{-4}
		2	95	50	485	6.6×10^{-5}
		3	75	70	495	3.2×10^{-5}
		4	90	68	400	2.9×10^{-5}

Note: Infiltration coefficients marked * were derived from projected results

- 1.7 The work was carried out for Salt Earth Ltd with instruction from BP Civils Ltd. Nothing in this report confers or purports to confer on any third party, any benefit or any right to enforce any term of this report pursuant to the Contract (Rights of Third Parties) Act 1999.

Ground Management Ltd Civil and Geotechnical Engineering Services		PROJECT NO:	G6623
		FIGURE REF:	Figure 1
PROJECT:	Burndell Road, Yapton	PREPARED:	AJHT
SECTION:	Soakage Testing	CHECKED:	AJHT
TITLE:	Site Location Plan	DATE:	Jan 2026



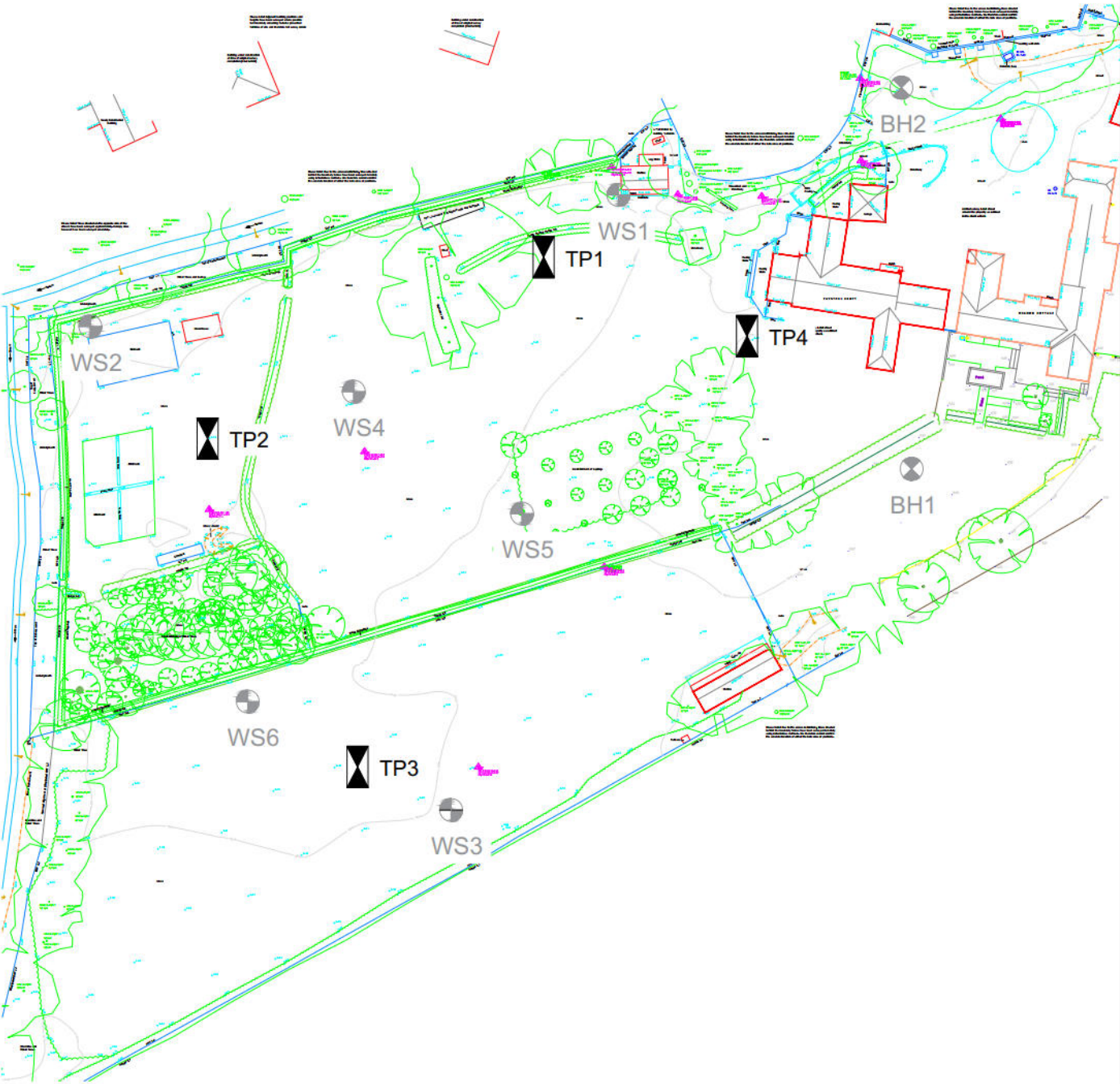
Site Location

Ground Management Ltd Civil and Geotechnical Engineering Services	Robin Hill Farm Clay Lane Fishbourne CHICHESTER West Sussex PO18 8AB	PROJECT NO: G6623
		FIGURE REF: Figure 2
PROJECT: Burndell Road, Yapton		PREPARED: AJHT
SECTION: Soakage Testing		CHECKED: AJHT
TITLE: Exploratory Hole Location Plan		DATE: Jan 2026

HOLE LOCATIONS ARE INDICATIVE ONLY UNLESS DIMENSIONED

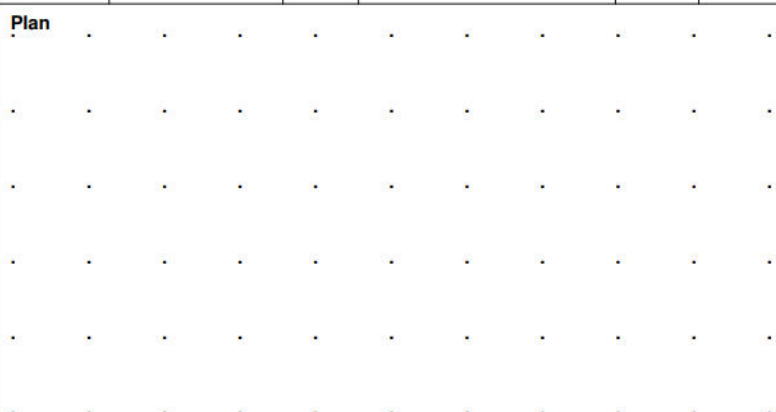
STANDPIPES WS1 TO WS6 PREVIOUSLY INSTALLED BY IMPACT GEOTECHNICAL

STANDPIPES BH1 AND BH2 PREVIOUSLY INSTALLED BY GROUND MANAGEMENT LTD



Excavation Method Hand dug	Dimensions 0.35 x 0.9	Ground Level (mOD) 6.27	Client Salt Earth Ltd	Job Number G6623
	Location See location plan	Dates 20/01/2026	Engineer BP Civils	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						Grass over moist dark brown slightly clayey silt TOPSOIL with occasional coarse medium and fine subangular flint gravel . Some rootlets and roots up to 10mm dia.		
					(0.30)	... locally cobble size brick flint and concrete at 0.2m		
				5.97	0.30	Soft to firm orange brown silty CLAY with occasional coarse medium and fine subangular flint gravel		
					(0.30)			
				5.67	0.60	Complete at 0.60m		

Plan 	Remarks Pit sides stable and vertical during excavation Groundwater was not encountered Ground level estimated by reference to D&H Surveys Ltd's Feb 2024 topographic survey		
	Scale (approx) 1:10	Logged By AT	Figure No. G6623.TP1

Ground Management Ltd Civil and Geotechnical Engineering Services				Robin Hill Farm Clay Lane Fishbourne CHICH om		Site Burndell Road (Paynters Croft), Yapton		Trial Pit Number TP2	
Excavation Method Hand dug		Dimensions 0.3 x 0.93		Ground Level (mOD) 6.38		Client Salt Earth Ltd		Job Number G6623	
		Location See location plan		Dates 20/01/2026		Engineer BP Civils		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
						Grass over moist brown / orange brown slightly sandy slightly clayey silt TOPSOIL with rare medium and fine subangular flint gravel. (0.25) becoming ..			
				6.13	0.25	Soft to firm orange brown very silty CLAY with occasional coarse medium and fine subangular to subrounded flint gravel (0.35)			
				5.78	0.60	Complete at 0.60m			
Plan						Remarks Pit sides stable and vertical during excavation Groundwater was not encountered Ground level estimated by reference to D&H Surveys Ltd's Feb 2024 topographic survey			
						Scale (approx) 1:10	Logged By AT	Figure No. G6623.TP2	

Ground Management Ltd Civil and Geotechnical Engineering Services				Robin Hill Farm Clay Lane Fishbourne CHICHESTER West Sussex PO18 8AB		Site Burndell Road (Paynters Croft), Yapton		Trial Pit Number TP3	
Excavation Method Hand dug		Dimensions 0.3 x 0.9		Ground Level (mOD) 6.46		Client Salt Earth Ltd		Job Number G6623	
		Location See location plan		Dates 20/01/2026		Engineer BP Civils		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
						Grass over moist brown / orange brown slightly sandy slightly clayey silt TOPSOIL with rare medium and fine subangular flint gravel. (0.25) becoming ..			
				6.21	0.25	Soft to firm orange brown very silty CLAY with occasional coarse medium and fine subangular to subrounded flint gravel (0.35)			
				5.86	0.60	Complete at 0.60m			
Plan						Remarks Pit sides stable and vertical during excavation Groundwater was not encountered Ground level estimated by reference to D&H Surveys Ltd's Feb 2024 topographic survey			
						Scale (approx) 1:10	Logged By AT	Figure No. G6623.TP3	

Excavation Method Hand dug	Dimensions 0.3 x 0.9	Ground Level (mOD) 6.47	Client Salt Earth Ltd	Job Number G6623
	Location See location plan	Dates 20/01/2026	Engineer BP Civils	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						Grass over moist dark brown slightly sandy slightly clayey silt TOPSOIL / MADE GROUND with some coarse medium and fine subangular flint gravel.		
					(0.25)	... concrete cobble at 0.2m and locally much coarse rounded flint gravel at 0.25m		
				6.22	0.25	Soft to firm orange brown very silty CLAY with occasional coarse medium and fine subangular to subrounded flint gravel		
					(0.33)			
				5.89	0.58	Complete at 0.58m		

Plan	Remarks Pit sides stable and vertical during excavation Groundwater was not encountered Ground level estimated by reference to D&H Surveys Ltd's Feb 2024 topographic survey		
	Scale (approx)	Logged By	Figure No.
	1:10	AT	G6623.TP3

G6623 Paynters Croft / Burndell Road Yapton BN18 0HR
Soakage Test

TP1 Test 1

Test Start Date: 20-Jan-26

Dimensions (m):

width = 0.35

length = 0.90

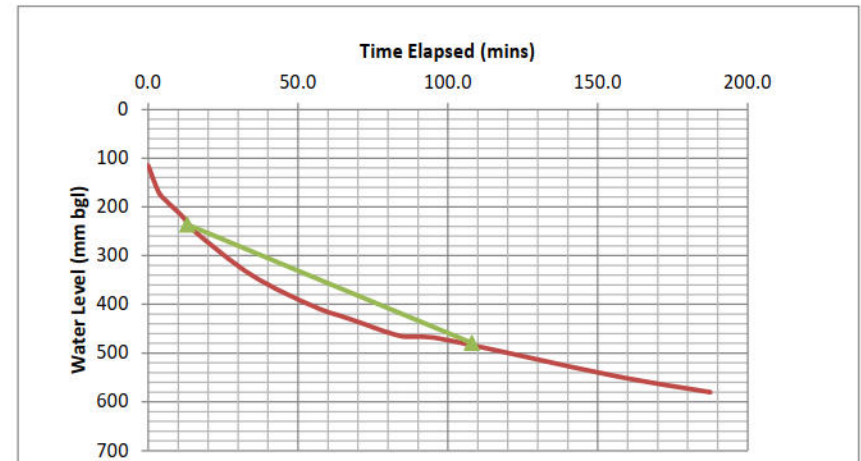
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[illegible]

End Fit

Weather

Mainly
dry



0

0 Projected

Time (mins)

t0	115	
t25	236.25	13
t50	357.5	
t75	478.75	108
t100	600	
fall		0.485
t25 - t75		0.2425
Area t50		0.92125

Infiltration Coefficient = 1.5E-05 m/s

G6623 Paynters Croft / Burndell Road Yapton BN18 0HR
Soakage Test

TP1 Test 2

Test Start Date: 20-Jan-26

Dimensions (m):

width = 0.35

length = 0.90

depth = 0.60

[illegible]

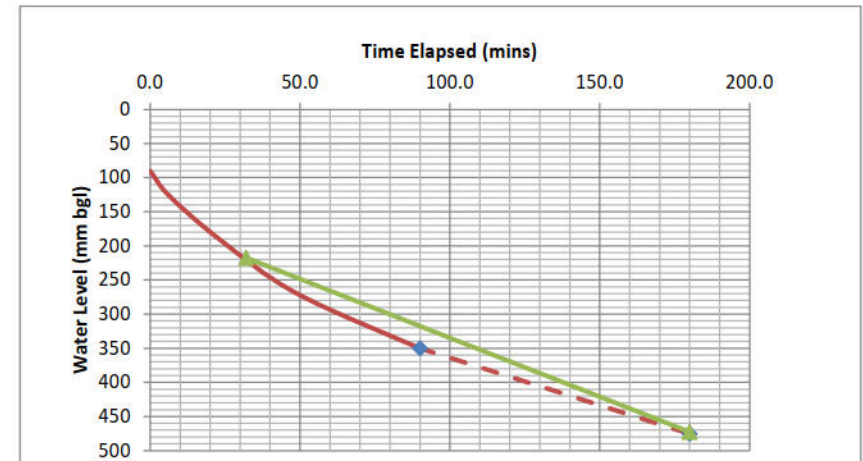
End Fit

Weather

Mainly
dry

350

475 Projected



	Time (mins)	
t0	90	
t25	217.5	32
t50	345	
t75	472.5	180
t100	600	
fall		0.51
t25 - t75		0.255
Area t50		0.9525

Infiltration Coefficient = 9.5E-06 m/s

G6623 Paynters Croft / Burndell Road Yapton BN18 0HR
Soakage Test

TP1 Test 3

Test Start Date: 21-Jan-26

Dimensions (m):

width = 0.35

length = 0.90

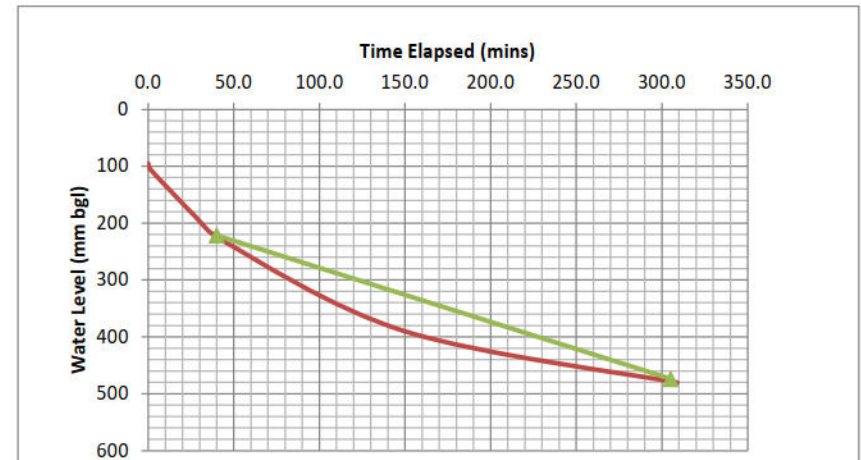
depth = 0.60

[illegible]

End Fit

Weather

Heavy
o'night
rain then
showers



0

0 Projected

Time (mins)

t0	95	
t25	221.25	40
t50	347.5	
t75	473.75	305
t100	600	
fall		0.505
t25 - t75		0.2525
Area t50		0.94625

Infiltration Coefficient = 5.3E-06 m/s

G6623 Paynters Croft / Burndell Road Yapton BN18 0HR
Soakage Test

TP2 Test 1

Test Start Date: 20-Jan-26

Dimensions (m):

width = 0.30

length = 0.93

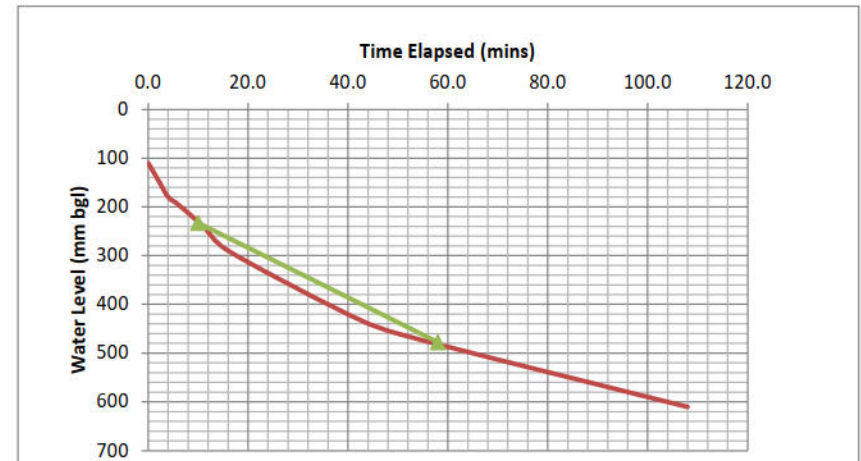
depth = 0.60

[illegible]

End Fit

Weather

Mainly
dry



0

0 Projected

Time (mins)

t0	110	
t25	232.5	10
t50	355	
t75	477.5	58
t100	600	
fall		0.49
t25 - t75		0.245
Area t50		0.8817

Infiltration Coefficient = 2.7E-05 m/s

G6623 Paynters Croft / Burndell Road Yapton BN18 0HR
Soakage Test

TP2 Test 2

Test Start Date: 20-Jan-26

Dimensions (m):

width = 0.30

length = 0.93

depth = 0.60

[illegible]

End Fit

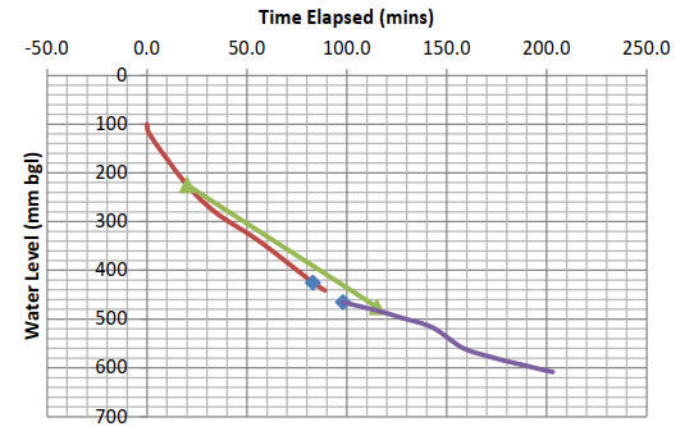
Weather

Mainly
dry

425

465 Projected

some rain



		Time (mins)
t0	100	
t25	225	20
t50	350	
t75	475	115
t100	600	
	fall	0.5
	t25 - t75	0.25
	Area t50	0.894

Infiltration Coefficient = 1.4E-05 m/s

G6623 Paynters Croft / Burndell Road Yapton BN18 0HR
Soakage Test

TP2 Test 3

Test Start Date: 21-Jan-26

Dimensions (m):

width = 0.30

length = 0.93

depth = 0.60

[illegible]

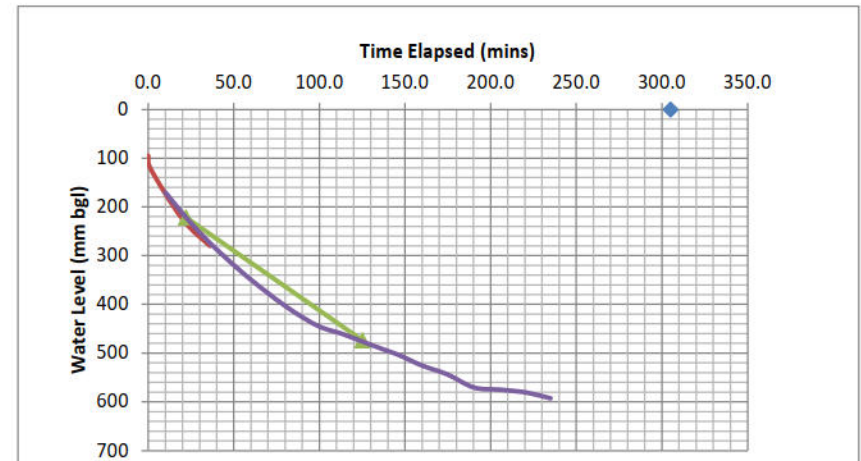
End Fit

Weather

Heavy
o'night
rain then
showers

0

0 Projected



	Time (mins)	
t0	95	
t25	221.25	22
t50	347.5	
t75	473.75	125
t100	600	
fall		0.505
t25 - t75		0.2525
Area t50		0.90015

Infiltration Coefficient =	1.3E-05 m/s
----------------------------	-------------

G6623 Paynters Croft / Burndell Road Yapton BN18 0HR
Soakage Test

TP3 Test 1

Test Start Date: 20-Jan-26

Dimensions (m):

width = 0.30

length = 0.93

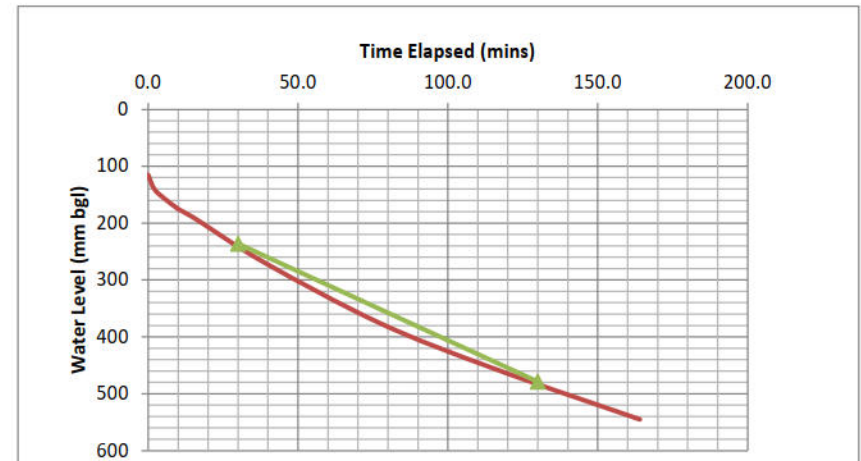
depth = 0.60

[illegible]

End Fit

Weather

Mainly
dry



0

0 Projected

Time (mins)

t0	115	
t25	236.25	30
t50	357.5	
t75	478.75	130
t100	600	
fall		0.485
t25 - t75		0.2425
Area t50		0.87555

Infiltration Coefficient = 1.3E-05 m/s

G6623 Paynters Croft / Burndell Road Yapton BN18 0HR
Soakage Test

TP3 Test 2

Test Start Date: 20-Jan-26

Dimensions (m):

width = 0.30

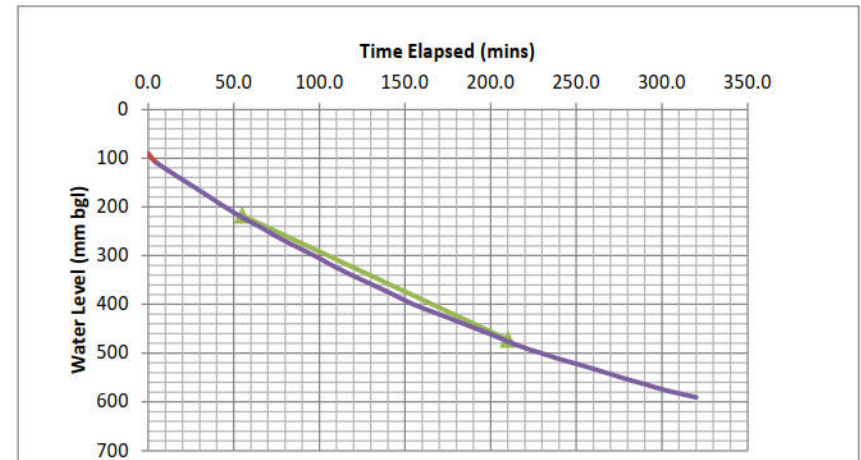
length = 0.93

depth = 0.60

[illegible]

Weather

Mainly
dry



0

0 Projected

	Time (mins)	
t0	90	
t25	217.5	55
t50	345	
t75	472.5	210
t100	600	
fall		0.51
t25 - t75		0.255
Area t50		0.9063

Infiltration Coefficient = 8.4E-06 m/s

G6623 Paynters Croft / Burndell Road Yapton BN18 0HR
Soakage Test

TP3 Test 3

Test Start Date: 21-Jan-26

Dimensions (m):

width = 0.30

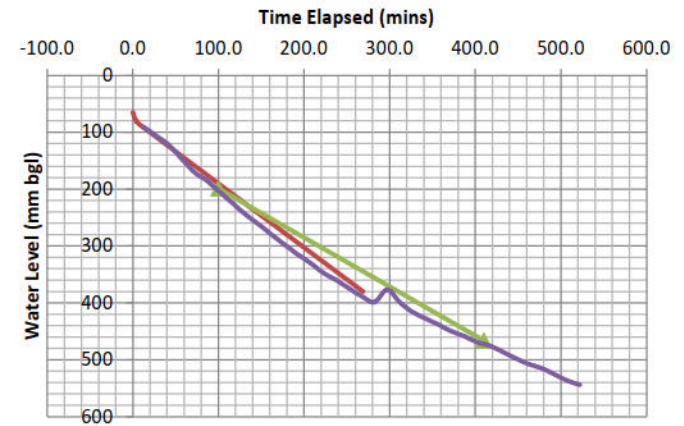
length = 0.93

depth = 0.60

[illegible]

Weather

Heavy
o'night
rain then
showers



0
0 Projected

	Time (mins)
t0	65
t25	198.75
t50	332.5
t75	466.25
t100	600
fall	0.535
t25 - t75	0.2675
Area t50	0.93705

Infiltration Coefficient = 4.3E-06 m/s

G6623 Paynters Croft / Burndell Road Yapton BN18 0HR
Soakage Test

TP4 Test 1

Test Start Date: 20-Jan-26

Dimensions (m):

width = 0.30

length = 0.90

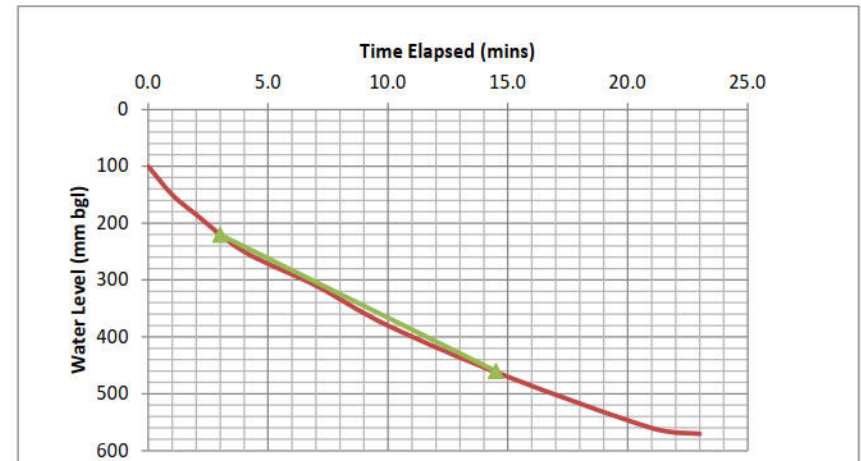
depth = 0.58

[illegible]

End Fit

Weather

Mainly
dry



0

0 Projected

		Time (mins)
t0		100
t25		220
t50		340
t75		460
t100		580
	fall	0.48
	t25 - t75	0.24
	Area t50	0.846

Infiltration Coefficient = 1.1E-04 m/s

G6623 Paynters Croft / Burndell Road Yapton BN18 0HR
Soakage Test

TP4 Test 2

Test Start Date: 20-Jan-26

Dimensions (m):

width = 0.30

length = 0.90

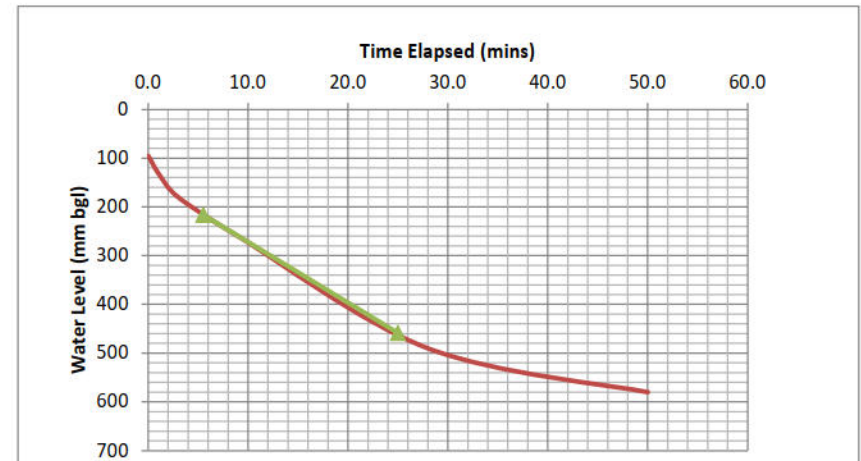
depth = 0.58

[illegible]

End Fit

Weather

Mainly
dry



0

0 Projected

	Time (mins)	
t0	95	
t25	216.25	5.5
t50	337.5	
t75	458.75	25
t100	580	
fall		0.485
t25 - t75		0.2425
Area t50		0.852

Infiltration Coefficient =	6.6E-05 m/s
----------------------------	-------------

Soakage Test

TP4 Test 3

Test Start Date: 20-Jan-26

Dimensions (m):

width = 0.30

length = 0.90

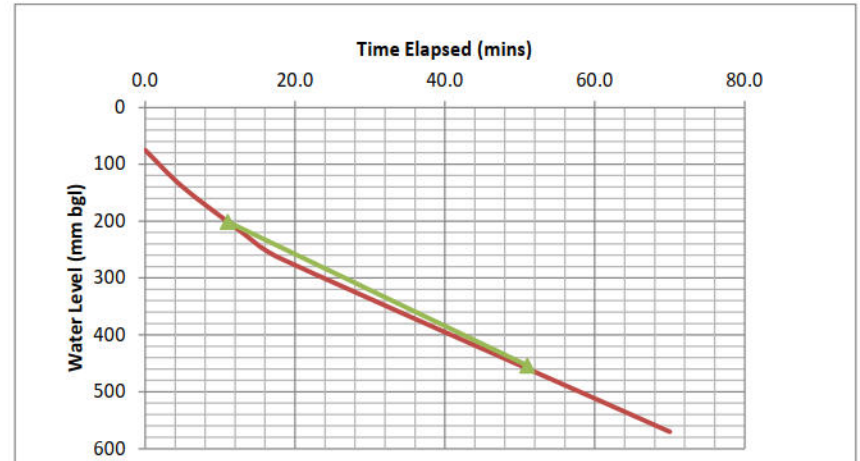
depth = 0.58

[illegible]

End Fit

Weather

Mainly
dry



0

0 Projected

Time (mins)

t0 75

t25	201.25	11
-----	--------	----

t50	327.5
-----	-------

t75	453.75	51
-----	--------	----

t100	580
------	-----

fall	0.505
------	-------

t25 - t75	0.2525
-----------	--------

Area t50 0.876

Infiltration Coefficient = 3.2E-05 m/s

G6623 Paynters Croft / Burndell Road Yapton BN18 0HR
Soakage Test

TP4 Test 4

Test Start Date: 20-Jan-26

Dimensions (m):

width = 0.30

length = 0.90

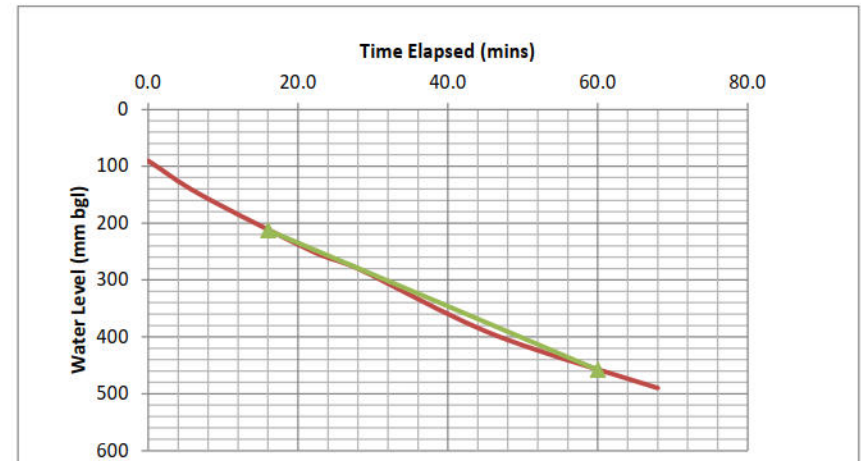
depth = 0.58

[illegible]

End Fit

Weather

Mainly
dry



0

0 Projected

Time (mins)

t0	90	
t25	212.5	16
t50	335	
t75	457.5	60
t100	580	

fall	0.49
------	------

t25 - t75	0.245
-----------	-------

Area t50 0.858

Infiltration Coefficient = 2.9E-05 m/s

Project No: G6623
Burndell Road, Yapton
20-Jan-26

		BH1	BH2	WS1	WS2	WS3	WS4	WS5	WS6
Upstand (m)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Ground Level (mAOD)	6.600	6.400	6.540	6.750	6.600	6.300	6.550	6.350
	Cover level (mAOD)	6.600	6.400	6.540	6.750	6.600	6.300	6.550	6.350
	Base dip (m)			4.000	3.49	2.77	2.76	2.76	3.05

mAOD: metres Above Ordnance Datum

Ground levels estimated by reference to topographic survey by D&H Surveys Ltd dated Feb 2024

[illegible]

G6623 Burndell Road Yapton
Water Level Monitoring (relative to ground level)

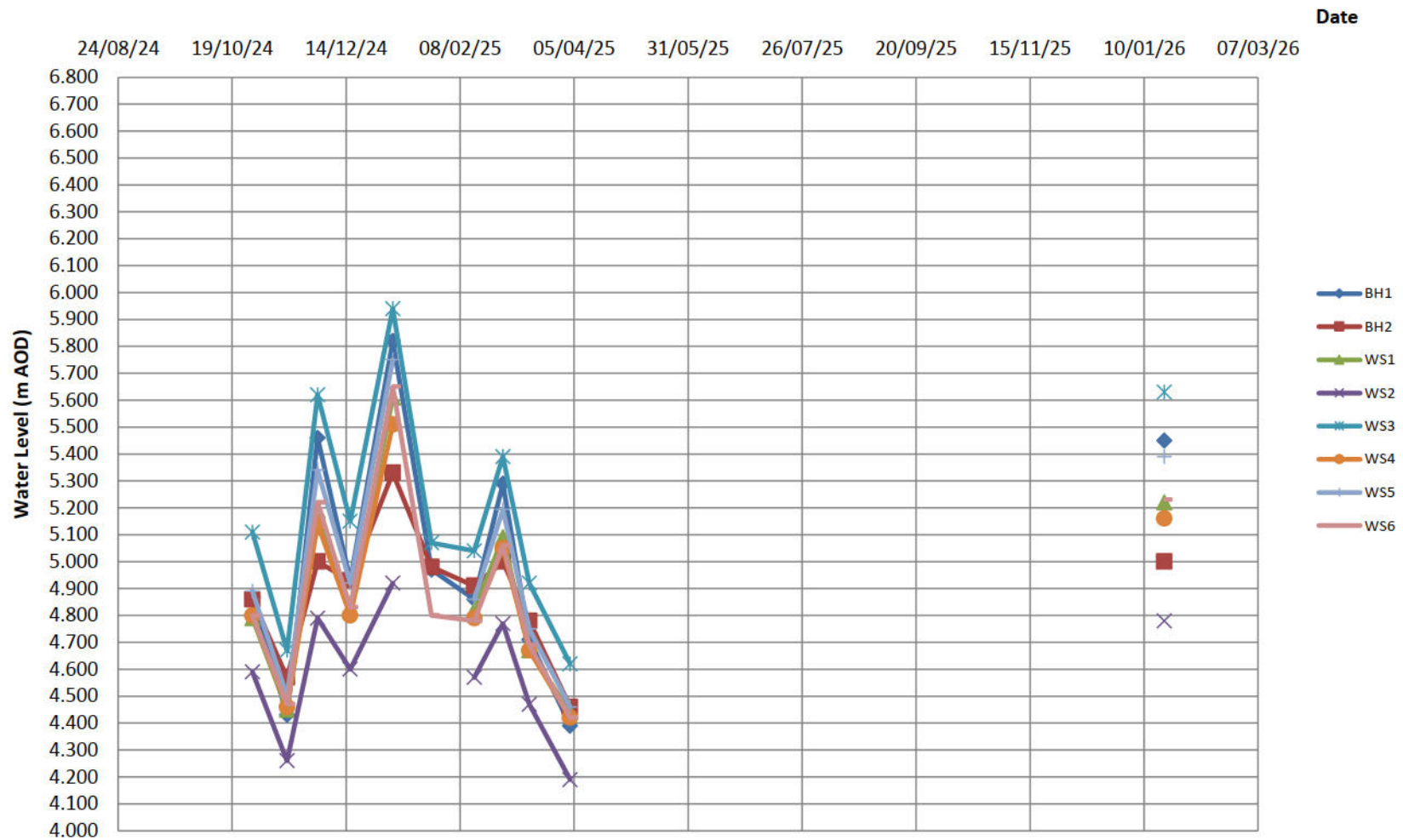
Date _____

Water Level (m below ground level)

24/08/24 19/10/24 14/12/24 08/02/25 05/04/25 31/05/25 26/07/25 20/09/25 15/11/25 10/01/26 07/03/26

0.000
0.100
0.200
0.300
0.400
0.500
0.600
0.700
0.800
0.900
1.000
1.100
1.200
1.300
1.400
1.500
1.600
1.700
1.800
1.900
2.000
2.100
2.200
2.300
2.400
2.500
2.600
2.700

G6623 Burndell Road Yapton Water Level Monitoring (relative to Ordnance Datum)





Photograph 1 : Trial Pit TP1 Location



Photograph 2 : Trial Pit TP1



Photograph 3 : Trial Pit TP2 Location



Photograph 4 : Trial Pit TP2 under test



Photograph 5 : Trial Pit TP3 Location



Photograph 6 : Trial Pit TP3

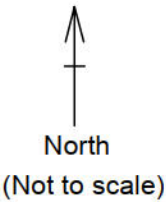


Photograph 7 : Trial Pit TP4 Location



Photograph 8 : Trial Pit TP4 after test

Ground Management Ltd Civil and Geotechnical Engineering Services	Robin Hill Farm, Clay Lane, Fishbourne CHICHESTER, West Sussex PO18 8UB	PROJECT NO: G6623
		FIGURE REF: Figure 1
PROJECT: Burndell Road, Yapton		PREPARED: AJHT
SECTION: Further Groundwater Monitoring		CHECKED: AJHT
TITLE: Site Location Plan		DATE: Oct 2024

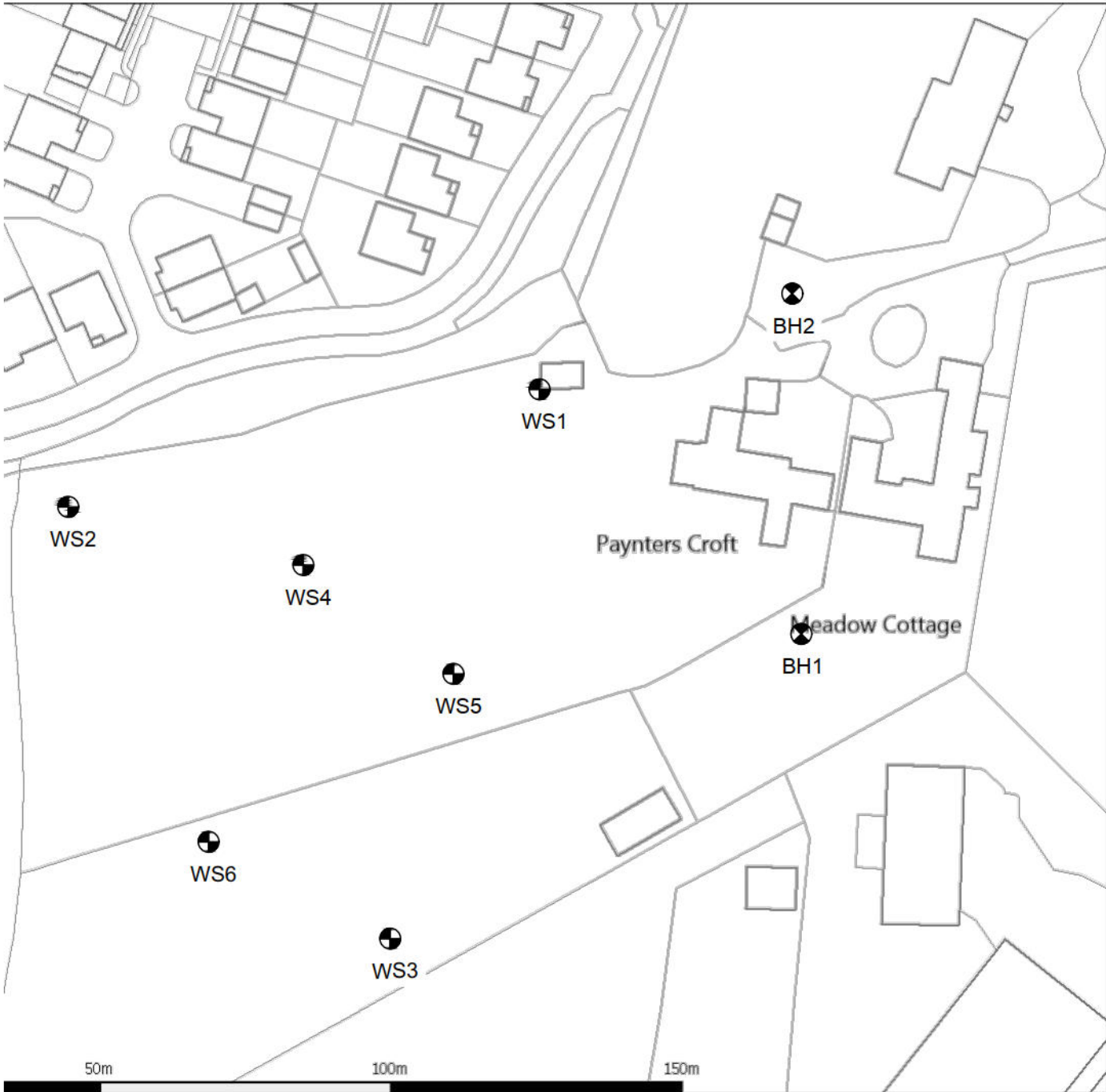


Ground Management Ltd Civil and Geotechnical Engineering Services	Robin Hill Farm, Clay Lane, Fishbourne CHICHESTER, West Sussex PO18 8AB	PROJECT NO: G6623
		FIGURE REF: Figure 2
PROJECT: Burndell Road, Yapton	PREPARED: AJHT	
SECTION: Further Groundwater Monitoring	CHECKED: AJHT	
TITLE: Exploratory Hole Location Plan	DATE: Oct 2024	

HOLE LOCATIONS ARE INDICATIVE ONLY UNLESS DIMENSIONED

STANDPIPES WS1 TO WS6 PREVIOUSLY INSTALLED BY IMPACT GEOTECHNICAL

STANDPIPES BH1 AND BH2 INSTALLED BY GROUND MANAGEMENT LTD



Excavation Method Handheld window sampling	Dimensions 80mm to 1.10m 60mm to 2.00m 50mm to 3.00m	Ground Level (mOD)	Client Salt Earth Ltd	Job Number G6623
	Location See Location Plan	Dates 29/10/2024	Engineer BP Civils	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.15) 0.15	Grass over moist brown slightly sandy (fine) slightly clayey silt TOPSOIL with occasional coarse medium and fine subangular flint gravel		
						Soft to firm orange brown mottled brown silty CLAY with occasional / rare fine and medium subangular flint gravel		
						... becoming firm below 0.5m		
			HV at 0.6m : 60, 65, 65 kPa		(1.05)			
								
			HV at 1.0m : 50, 60, 60 kPa					
								
					1.20	Recovered as soft to firm and soft slightly sandy very silty CLAY with thin laminations and inclusions of silty fine to medium sand		
					(0.55)			
			HV at 1.4m 30, 30, 30 kPa					
					1.75	Wet yellow brown slightly silty fine to medium SAND with a little coarse medium and fine angular flint gravel		
					(0.85)			
					2.60	Wet light brown / yellow brown silty fine to medium SAND with much coarse medium and fine angular to subangular flint gravel and some chalk gravel		
					(0.40)			
					3.00	Complete at 3.00m		

33mm dia standpipe installed to 3m. 2m slotted with geosoc and gravel surround, 1m plain with bentonite pellet seal. Flush cover
Groundwater at 1.7m after 30 minutes

1:20

AT

G6623 BH1

Ground Management Ltd Civil and Geotechnical Engineering Services				Robin Hill Farm, Clay Lane, Fishbourne CHICHESTER, West Sussex PO18 8AB		Site Burndell Road Yapton		Number BH2	
Excavation Method Handheld window sampling		Dimensions 80mm to 1.00m 60mm to 1.30m 50mm to 3.00m		Ground Level (mOD)		Client Salt Earth Ltd		Job Number G6623	
		Location See Location Plan		Dates 29/10/2024		Engineer BP Civils		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
					0.10	Grass over moist brown slightly sandy (fine) slightly clayey silt TOPSOIL with a little medium and fine subangular flint gravel and occasional charcoal			
						MADE GROUND of soft to firm brown and orange brown silty clay with occasional coarse medium and fine subangular flint gravel			
					0.80	... abundant subangular flint cobbles and concrete between 0.5m and 0.8m			
					0.90	MADE GROUND recovered as coarse medium and fine gravel size subangular to subrounded concrete fragments with some silt and sand			
					0.40				
					1.30	MADE GROUND of layered yellow brown silty fine to medium sand with a little fine to medium subangular flint gravel			
					0.10				
					0.10	MADE GROUND of moist dark brown soft clayey silt			
					0.10				
					1.60	MADE GROUND of compact coarse medium and fine subrounded to rounded flint gravel with some comminuted chalk			
						Recovered as soft to firm yellow brown / brown sandy silty CLAY with some thin fine to medium sand laminations / inclusions and occasional medium and fine subangular flint gravel			
					1.15				
					2.75	Off white CHALK recovered as medium and fine rounded and subangular chalk gravel in compact / firm matrix of comminuted chalk. Some coarse medium and fine subangular flint gravel			
					0.25				
					3.00	Complete at 3.00m			
Remarks 33mm dia standpipe installed to 3m. 2m slotted with geosoc and gravel surround, 1m plain with bentonite pellet seal. Flush cover Groundwater at 1.54m after 30 minutes Possible slight hydrocarbon odour							Scale (approx) 1:20	Logged By AT	Figure No. G6623.BH2

Project No: G6623
Burndell Road, Yapton
01-Mar-25

		BH1	BH2	WS1	WS2	WS3	WS4	WS5	WS6
Upstand (m)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Ground Level (mAOD)	6.600	6.400	6.540	6.750	6.600	6.300	6.550	6.350
	Cover level (mAOD)	6.600	6.400	6.540	6.750	6.600	6.300	6.550	6.350
	Base dip (m)			4.000	3.49	2.77	2.76	2.76	3.05

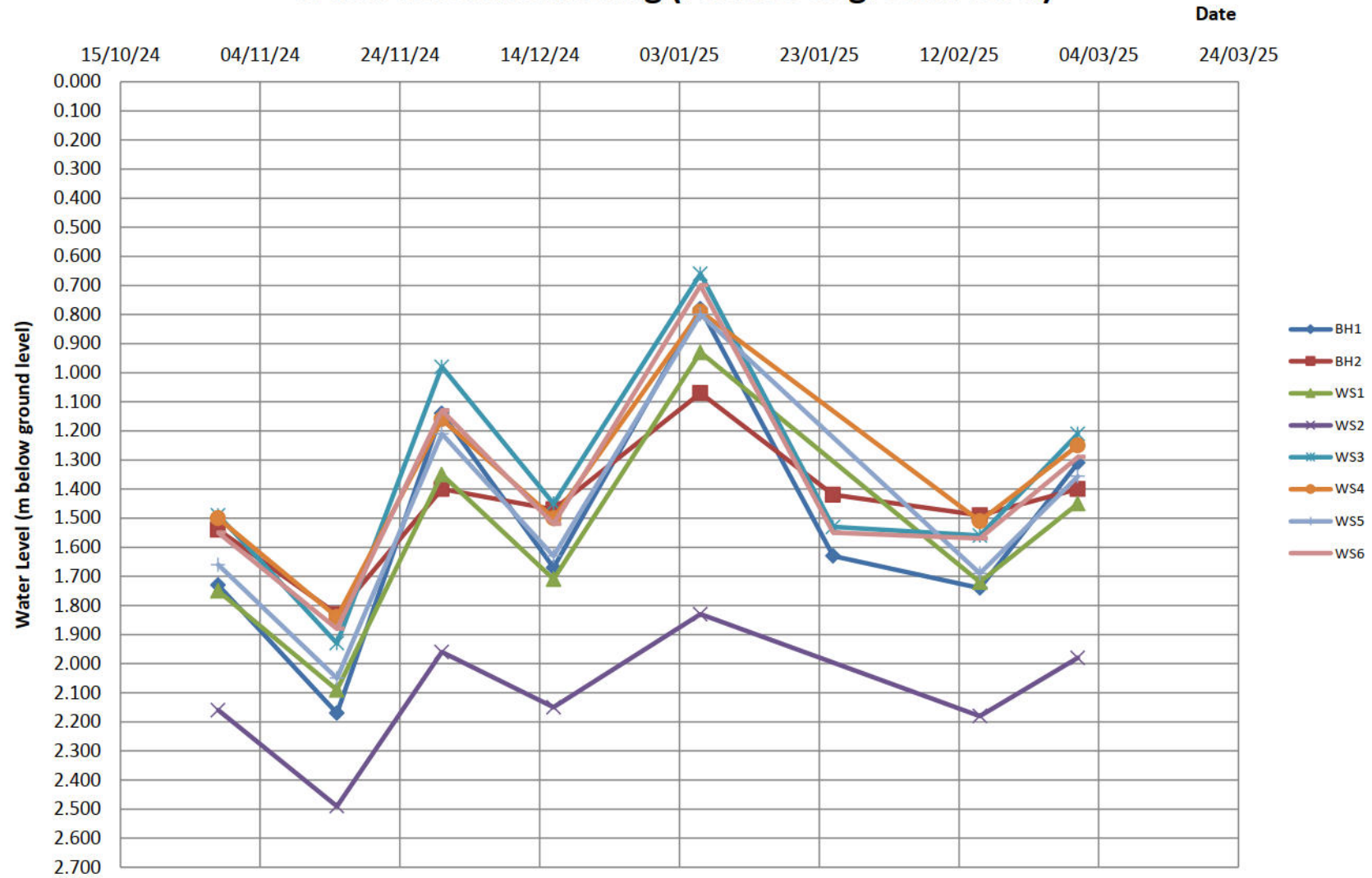
mAOD: metres Above Ordnance Datum

Ground levels estimated by reference to topographic survey by D&H Surveys Ltd dated Feb 2024

[illegible]

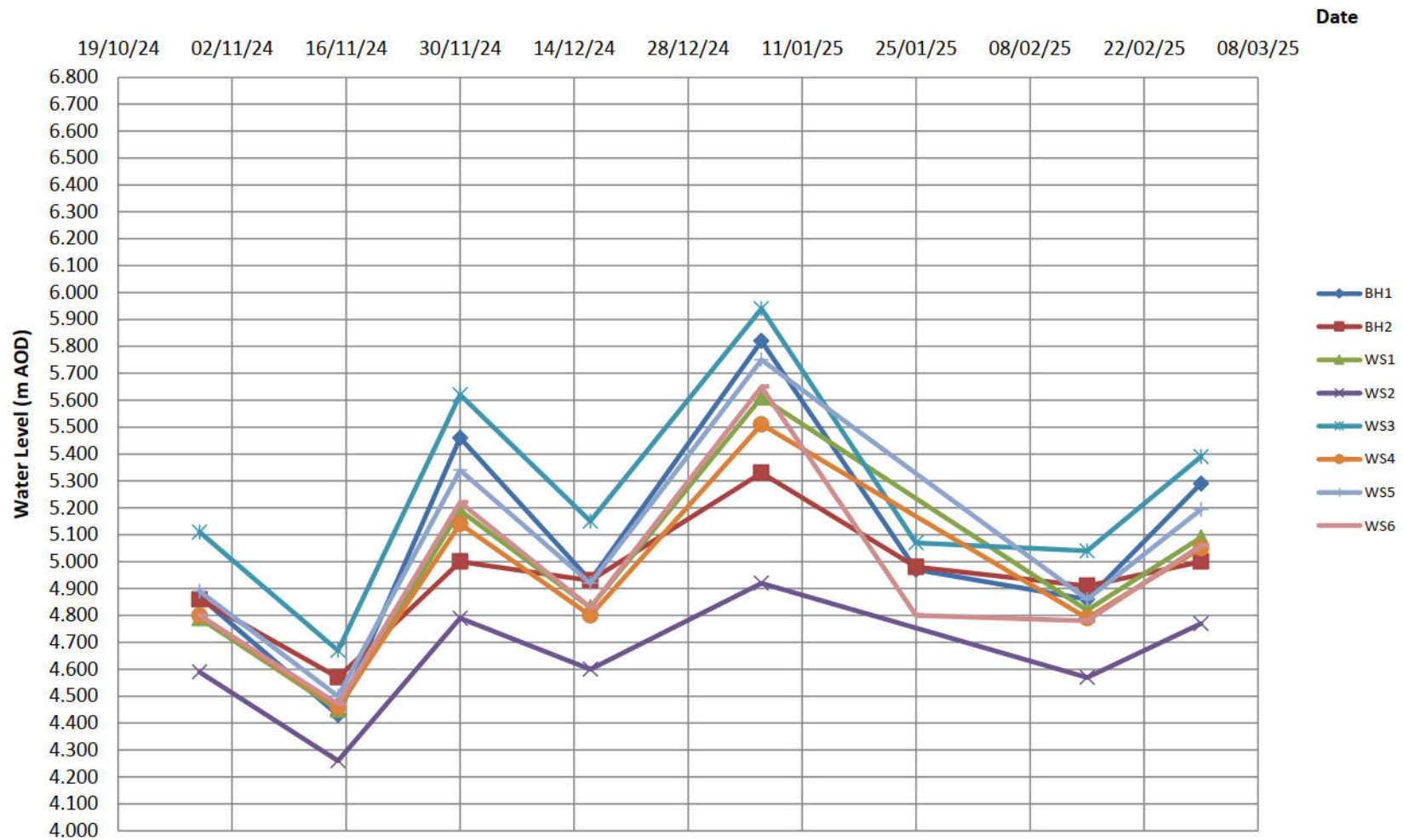
G6623 Burndell Road Yapton

Water Level Monitoring (relative to ground level)



G6623 Burndell Road Yapton

Water Level Monitoring (relative to Ordnance Datum)



Appendix D Geotechnical Site Investigation (Impact Geotechnical)



Notes:

1. Do not scale from this drawing.
2. All dimensions must be checked on site prior to commencement of work.
3. Where applicable this drawing is to be read in conjunction with other consultants drawings.
4. This drawing is the copyright of Impact Geotechnical Ltd.

Drawing Title:

Hole Location Plan

Site Name:

Paynters Croft GWM

Project Reference:

P19.160

Revision: 0

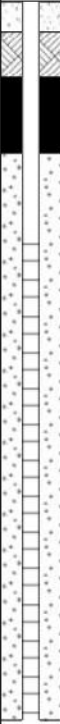
Drawn by: RM
Scale: Not to Scale



IMPACT
GEO TECHNICAL

Percussion Drilling Log

Project Name: Paynters Croft		Client: Mr J Napthine		Date: 29/11/2019	
Location: Yapton, West Sussex		Contractor: Impact Geotechnical Ltd			
Project No. : P19.160		Crew Name: SG		Drilling Equipment: Archway Dart	
Borehole Number WS1	Hole Type WLS	Level	Logged By RM	Scale 1:50	Page Number Sheet 1 of 1

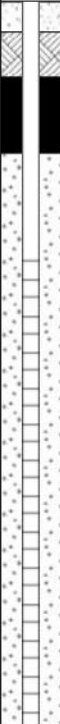
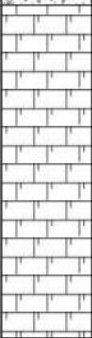
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20			0.20			MADE GROUND: Grass over brown silty sandy Clay. Sand is fine to coarse. Rare subangular to subrounded fine to coarse sized flint (Topsoil). (Soft to firm) brown mottled orange brown silty sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to coarse sized flint (RIVER TERRACE DEPOSITS).	1
		0.50	D						
		1.00	SPT	N=8 (1,1/2,2,2,2)					
		1.50	D						
		2.00	SPT	N=10 (1,2/2,3,2,3)				Becoming firm below 2.00mbgl.	2
		2.50	D					Below 2.30mbgl becoming very silty/fine sandy with gravel of flint and chalk.	
		3.00	SPT	N=13 (1,2/2,3,3,5)					3
		3.50	D						4
		4.50	D					4.40-4.60mbgl: band of very fine sandy Silt.	
		5.00			5.00			End of Borehole at 5.000m	5
									6
									7
									8
									9
									10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks
 Hand dug starter pit dug to 1.00mbgl. Groundwater encountered at 3.00mbgl and noted to rise to 2.80mbgl and 4.50mbgl noted to rise to 1.05mbgl. 35mm diameter standpipe installed to 4.75mbgl.

Percussion Drilling Log

Project Name: Paynters Croft		Client: Mr J Napthine		Date: 29/11/2911	
Location: Yapton, West Sussex		Contractor: Impact Geotechnical Ltd			
Project No. : P19.160		Crew Name: SG		Drilling Equipment: Archway Dart	
Borehole Number WS2	Hole Type WLS	Level	Logged By RM	Scale 1:50	Page Number Sheet 1 of 1

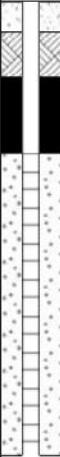
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.50	D					Grass over brown very silty sandy CLAY. Sand is fine, Rare subangular to subrounded fine to coarse sized gravel of flint (RIVER TERRACE DEPOSITS).	1
		1.00	SPT	N=5 (1,1/1,1,1,2)					
		1.50	D						
		2.00	SPT	N=0 (0,0/0,0,0,0)	2.00			(Very loose) orange brown very silty very clayey SAND. Sand is fine to medium. Rare subangular to subrounded fine to medium gravel of flint (RIVER TERRACE DEPOSITS). <i>2.00mbgl: band of silty fine SAND.</i>	2
		2.50	D		2.80				
		3.00	SPT	N=16 (3,3/4,4,4,4)				White sandy gravelly SILT of CHALK. Sand is fine to medium. Gravel is subangular to subrounded fine to coarse sized weak chalk (LEWES NODULAR CHALK FORMATION).	3
		3.50	D						
		4.00	SPT	N=21 (3,4/5,5,5,6)					
		4.50	D						
					5.00			End of Borehole at 5.000m	5
									6
									7
									8
									9
									10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks
 Hand dug starter pit dug to 1.00mbgl. Groundwater encountered at 1.00mbgl and noted to rise to 1.20mbgl. 35mm diameter standpipe installed to 4.80mbgl.

Percussion Drilling Log

Project Name: Paynters Croft		Client: Mr J Napthine		Date: 29/11/2019	
Location: Yapton, West Sussex		Contractor: Impact Geotechnical Ltd			
Project No. : P19.160		Crew Name: SG		Drilling Equipment: Archway Dart	
Borehole Number WS3	Hole Type WLS	Level	Logged By RM	Scale 1:50	Page Number Sheet 1 of 1

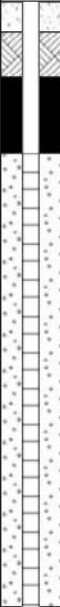
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.50	D		0.30 0.40			MADE GROUND: Grass over brown silty sandy Clay. Sand is fine to coarse. Rare subangular to subrounded fine to coarse sized flint (Topsoil). Brown silty sandy Gravel. Sand is fine to medium. Gravel is rounded medium to coarse sized flint. (Soft to firm) brown silty slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to coarse sized flint (RIVER TERRACE DEPOSITS). <u>1.00-1.10mbgl: fine to medium Sand band (wet).</u> <u>Below 1.60mbgl locally very sandy.</u>	1
		1.00	SPT	N=8 (1,1/1,1,2,4)					
		1.50	D						
		2.00	SPT	N=3 (0,1/0,1,1,1)	2.00			Orange brown clayey very silty slightly gravelly SAND. Sand is fine to medium. Gravel is subangular to subrounded fine to coarse sized flint and chalk (RIVER TERRACE DEPOSITS).	2
		2.50	D						
		3.00	SPT	N=11 (2,3/3,3,2,3)					3
		3.50	D						
					3.80 4.00			Pale grey mottled white sandy gravelly CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to coarser sized flint and chalk (RIVER TERRACE DEPOSITS). End of Borehole at 4.000m	4
									5
									6
									7
									8
									9
									10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks
 Hand dug starter pit dug to 1.00mbgl. Groundwater encountered at 1.00mbgl. Borehole collapsed back from 4.00m to 3.00mbgl. 35mm diameter standpipe installed to 3.00mbgl.

Percussion Drilling Log

Project Name: Paynters Croft		Client: Mr J Napthine		Date: 18/12/2019	
Location: Yapton, West Sussex		Contractor: Impact Geotechnical Ltd			
Project No. : P19.160		Crew Name: SG		Drilling Equipment: Archway Dart	
Borehole Number WS4	Hole Type WLS	Level	Logged By RM	Scale 1:50	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
								Grass over brown very silty sandy CLAY. Sand is fine, Rare subangular to subrounded fine to coarse sized gravel of flint (RIVER TERRACE DEPOSITS).	1
					2.00			(Very loose) pale brown very silty very clayey SAND. Sand is fine to medium. Rare subangular to subrounded fine to medium gravel of flint (RIVER TERRACE DEPOSITS).	2
					2.50			Pale brown mottled white clayey silty sandy GRAVEL. Sand is fine to medium. Gravel is angular to subangular fine to coarser sized flint and chalk (RIVER TERRACE DEPOSITS).	3
					3.10			White sandy gravelly SILT of CHALK. Sand is fine to medium. Gravel is subangular to subrounded fine to coarse sized weak chalk (LEWES NODULAR CHALK FORMATION).	4
					4.00			End of Borehole at 4.000m	4
									5
									6
									7
									8
									9
									10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks
 Hand dug starter pit dug to 1.00mbgl. Groundwater encountered at 1.00mbgl and noted to rise to 0.82mbgl. 35mm diameter standpipe installed to 4.00mbgl.

Percussion Drilling Log

Project Name: Paynters Croft		Client: Mr J Napthine		Date: 18/12/2019	
Location: Yapton, West Sussex		Contractor: Impact Geotechnical Ltd			
Project No. : P19.160		Crew Name: SG		Drilling Equipment: Archway Dart	
Borehole Number WS5	Hole Type WLS	Level	Logged By RM	Scale 1:50	Page Number Sheet 1 of 1

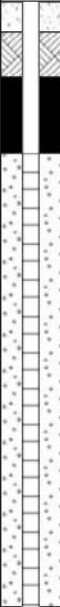
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
								Grass over brown very silty sandy CLAY. Sand is fine, Rare subangular to subrounded fine to coarse sized gravel of flint (RIVER TERRACE DEPOSITS).	1
					2.00			(Very loose) orange brown very silty very clayey SAND. Sand is fine to medium. Rare subangular to subrounded fine to medium gravel of flint (RIVER TERRACE DEPOSITS).	2
					3.50				3
					4.00			Pale grey mottled orange brown clayey very silty SAND. Sand is fine to medium. Rare subangular to subrounded fine to medium gravel of flint (RIVER TERRACE DEPOSITS). End of Borehole at 4.000m	4
									5
									6
									7
									8
									9
									10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks
 Hand dug starter pit dug to 1.00mbgl. Groundwater encountered at 1.00mbgl and noted to rise to 0.84mbgl. 35mm diameter standpipe installed to 4.00mbgl.

Percussion Drilling Log

Project Name: Paynters Croft		Client: Mr J Napthine		Date: 18/12/2019	
Location: Yapton, West Sussex		Contractor: Impact Geotechnical Ltd			
Project No. : P19.160		Crew Name: SG		Drilling Equipment: Archwat Dart	
Borehole Number WS6	Hole Type WLS	Level	Logged By RM	Scale 1:50	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
								Grass over brown very silty sandy CLAY. Sand is fine, Rare subangular to subrounded fine to coarse sized gravel of flint (RIVER TERRACE DEPOSITS).	1
					2.00			(Very loose) orange brown very silty very clayey SAND. Sand is fine to medium. Rare subangular to subrounded fine to medium gravel of flint (RIVER TERRACE DEPOSITS).	2
					3.80				3
					4.00			White sandy gravelly SILT of CHALK. Sand is fine to medium. Gravel is subangular to subrounded fine to coarse sized weak chalk (LEWES NODULAR CHALK FORMATION). End of Borehole at 4.000m	4
									5
									6
									7
									8
									9
									10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks
 Hand dug starter pit dug to 1.00mbgl. Groundwater encountered at 1.00mbgl and noted to rise to 0.86mbgl. 35mm diameter standpipe installed to 4.00mbgl.

Measurement equates to depth below ground level at location of monitoring well.

2019.11.29 2019.12.18 2020.01.03 2020.01.17 2020.01.31 2020.02.14 2020.02.28 2020.03.13 2020.03.27

The graph displays the water level (depth in meters) for six monitoring wells (MW 1 to MW 6) from November 2019 to March 2020. The Y-axis is inverted, with 0.00 at the top and 2.00 at the bottom. MW 2 consistently shows the highest water level (lowest depth), while MW 5 shows the lowest water level (highest depth) in early 2020. All wells show a significant increase in depth (decrease in water level) starting in late January 2020.

Date of measurement	MW 1	MW 2	MW 3	MW 4	MW 5	MW 6
2019.11.29	1.05	1.20	1.10	1.05	1.10	1.05
2019.12.18	1.00	1.75	0.68	0.82	0.85	0.88
2020.01.03	1.12	1.78	0.88	1.00	1.05	1.12
2020.01.17	1.05	1.76	0.88	0.98	1.00	1.02
2020.01.31	1.25	1.83	1.08	1.05	1.18	1.15
2020.02.14	0.50	1.55	0.28	0.45	0.28	0.55

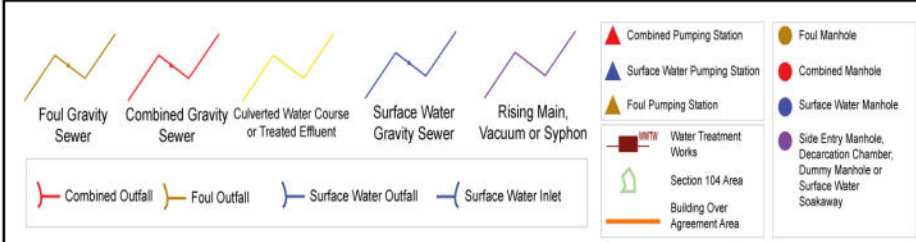
Appendix E Public Sewer Records



(c) Crown copyright and database rights 2020 Ordnance Survey 100031673 Date: 28/10/20 Scale: 1:1250 Map Centre: 498595,102723 Data updated: 19/10/20 Our Ref: 452989 - 1 Wastewater Plan A2

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2020 Ordnance Survey 100031673. This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.
WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.



m.akmenkalns@bpcivils.co.uk
D1906



Appendix F Wallingford Greenfield Run-off Calculations (Pre-development)

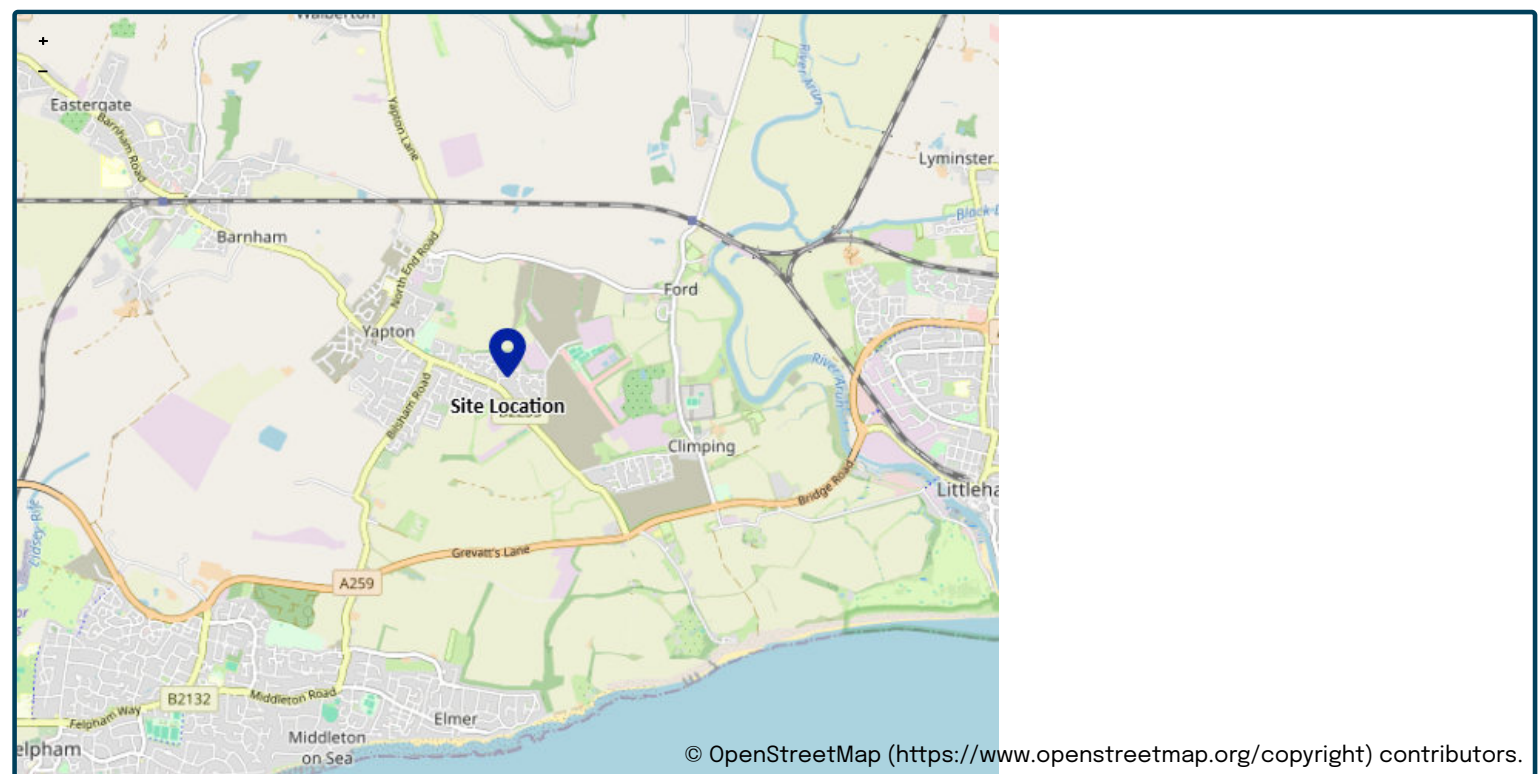
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	19/05/2026
Calculated by	MJA
Reference	D2338
Model version	2.2.3

Location

Site name	Burndell Road
Site location	Yapton



Site easting (British National Grid)	498730
Site northing (British National Grid)	102785

Site details

Total site area (ha)	1.77	ha
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Greenfield runoff

Method

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

FEH statistical (2025)

	<u>My value</u>	<u>Map value</u>
SAAR9120 (mm)	795	mm
BFIHOST19scaled	.589	
QMed-QBar conversion	1.136	1.136
QMed (l/s)	4.6	l/s
QBar (FEH statistical 2025) (l/s)	5.3	l/s

Growth curve factors

	<u>My value</u>	<u>Map value</u>
Hydrological region	7	7
1 year growth factor	0.85	
2 year growth factor	0.88	
10 year growth factor	1.62	
30 year growth factor	2.3	
100 year growth factor	3.19	
200 year growth factor	3.74	

Results

Method	FEH statistical (2025)	
Flow rate 1 year (l/s)	4.5	l/s
Flow rate 2 year (l/s)	4.6	l/s
Flow rate 10 years (l/s)	8.5	l/s
Flow rate 30 years (l/s)	12.1	l/s
Flow rate 100 years (l/s)	16.8	l/s
Flow rate 200 years (l/s)	19.7	l/s

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.

Appendix G Site3D Hydraulic Calculations

Network Details

Manhole Schedule

Manhole	Catchment Area (ha)	Size (mm)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
S3-DIFF	0.019	1000x500	Unknown	7.349	6.619	0.580	498722.380	102785.666
S1	0.000	1350	Type C	7.220	6.300	0.770	498726.107	102787.835
S2	0.000	---	Type C	7.000	6.200	0.650	498730.135	102783.128

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (mm)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	S3-DIFF	6.619	S1	6.300	Circ	150	4.312	14	0.600	0.580	0.770
1.001	S1	6.300	S2	6.200	Circ	150	6.195	62	0.600	0.770	0.650

Permeable Paving Schedule

Permeable Paving	Assigned Manhole	Effective Storage Volume (m3)	CL (m)	IL (m)	Storage Infil Rate (m/hr)	Safety Factor	Easting (m)	Northing (m)
Permeable Paving 4	S3-DIFF	19.141	7.349	6.769	0.03600000	3.00	498719.523	102785.190

Outfall Details

Outfall Manhole S2 : Surcharged (Constant Level)

Surcharged Constant

Water Elevation (m)	Water Depth (m)
6.800	0.600

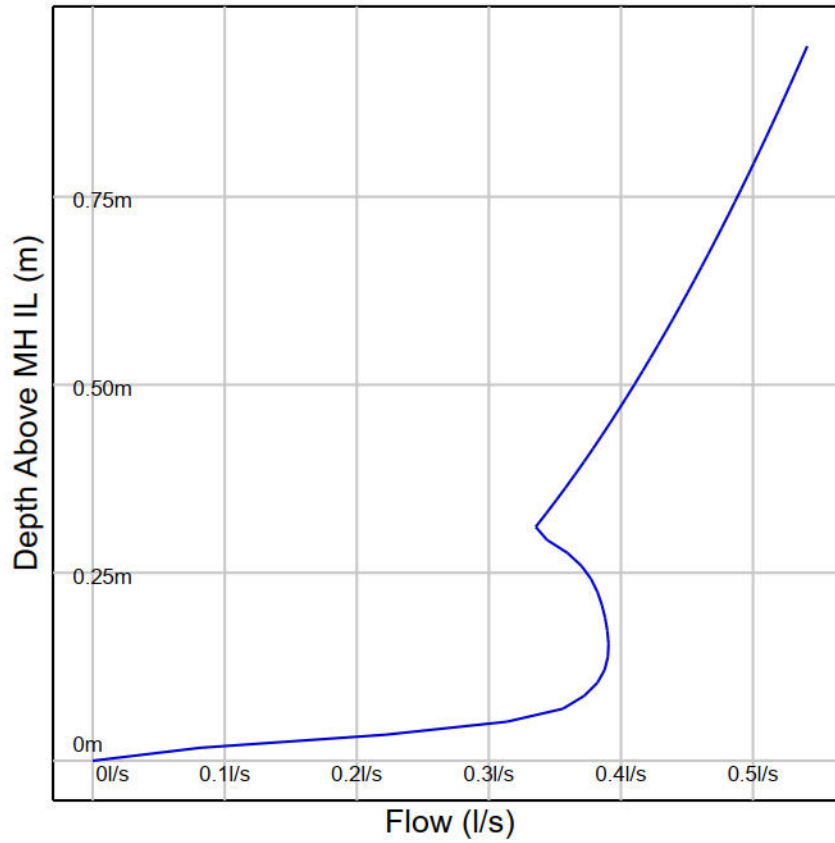
Flow Control Details

Controls within Manhole S1

Hydro-Brake® Optimum Control

Model Ref	Design Depth (m)	Design Flow (l/s)	Invert Offset (m)	FF Head (m)	FF Flow (l/s)	KF Head (m)	KF Flow (l/s)
SHE-0034-5000-0800-5000	0.800	0.500	0.000	0.152	0.391	0.303	0.332

Hydro-Brake® Optimum Control from S1 to S2



Simulation Settings

FEH2022 (point): Filename=FEH_Point_Descriptors_498852_102569_v5_0_1.xml

Summer (Cv: 1.00), Winter (Cv: 1.00)

Global Time of Entry: 5.0 mins

Durations (mins): 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440

Return Periods (yrs) + Climate Change: (2, +0%), (10, +0%), (30, +10%), (100, +0%), (100, +45%)

Manhole Flood Risk Freeboard: 0.300m

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
2Yr 15Min Winter	32.729	0.00	2.26	30Yr+10% 360Min Summer	9.998	0.00	0.77
2Yr 15Min Summer	32.729	0.00	2.26	30Yr+10% 360Min Winter	9.998	0.00	0.78
2Yr 30Min Winter	21.200	0.00	2.10	30Yr+10% 480Min Summer	7.928	0.00	0.73
2Yr 30Min Summer	21.200	0.00	2.10	30Yr+10% 480Min Winter	7.928	0.00	0.74
2Yr 60Min Summer	13.400	0.00	1.92	30Yr+10% 600Min Summer	6.600	0.00	0.70
2Yr 60Min Winter	13.400	0.00	1.92	30Yr+10% 600Min Winter	6.600	0.00	0.70
2Yr 120Min Winter	9.277	0.00	1.63	30Yr+10% 720Min Summer	5.668	0.00	0.68
2Yr 120Min Summer	9.277	0.00	1.63	30Yr+10% 720Min Winter	5.668	0.00	0.69
2Yr 180Min Summer	7.325	0.00	1.47	30Yr+10% 960Min Summer	4.452	0.00	0.65
2Yr 180Min Winter	7.325	0.00	1.47	30Yr+10% 960Min Winter	4.452	0.00	0.65
2Yr 240Min Winter	5.964	0.00	1.39	30Yr+10% 1440Min Summer	3.178	0.00	0.59
2Yr 240Min Summer	5.964	0.00	1.39	30Yr+10% 1440Min Winter	3.178	0.00	0.58
2Yr 360Min Summer	4.462	0.00	1.27	100Yr 15Min Summer	103.399	0.00	1.44
2Yr 360Min Winter	4.462	0.00	1.27	100Yr 15Min Winter	103.399	0.00	1.46
2Yr 480Min Summer	3.613	0.00	1.19	100Yr 30Min Summer	69.267	0.00	1.21
2Yr 480Min Winter	3.613	0.00	1.19	100Yr 30Min Winter	69.267	0.00	1.20
2Yr 600Min Summer	3.039	0.00	1.13	100Yr 60Min Summer	44.286	0.00	1.00
2Yr 600Min Winter	3.039	0.00	1.14	100Yr 60Min Winter	44.286	0.00	1.00
2Yr 720Min Winter	2.627	0.00	1.10	100Yr 120Min Summer	26.475	0.00	0.86
2Yr 720Min Summer	2.627	0.00	1.09	100Yr 120Min Winter	26.475	0.00	0.87
2Yr 960Min Summer	2.097	0.00	1.01	100Yr 180Min Summer	19.388	0.00	0.80
2Yr 960Min Winter	2.097	0.00	1.02	100Yr 180Min Winter	19.388	0.00	0.80
2Yr 1440Min Summer	1.537	0.00	0.89	100Yr 240Min Summer	15.576	0.00	0.75
2Yr 1440Min Winter	1.537	0.00	0.90	100Yr 240Min Winter	15.576	0.00	0.76
10Yr 15Min Summer	63.792	0.00	1.84	100Yr 360Min Summer	11.303	0.00	0.70
10Yr 15Min Winter	63.792	0.00	1.85	100Yr 360Min Winter	11.303	0.00	0.70
10Yr 30Min Summer	41.732	0.00	1.62	100Yr 480Min Summer	8.965	0.00	0.66
10Yr 30Min Winter	41.732	0.00	1.61	100Yr 480Min Winter	8.965	0.00	0.68
10Yr 60Min Summer	26.321	0.00	1.40	100Yr 600Min Summer	7.477	0.00	0.64
10Yr 60Min Winter	26.321	0.00	1.40	100Yr 600Min Winter	7.477	0.00	0.65
10Yr 120Min Summer	16.527	0.00	1.19	100Yr 720Min Summer	6.434	0.00	0.63
10Yr 120Min Winter	16.527	0.00	1.19	100Yr 720Min Winter	6.434	0.00	0.62
10Yr 180Min Summer	12.405	0.00	1.09	100Yr 960Min Summer	5.065	0.00	0.59
10Yr 180Min Winter	12.405	0.00	1.09	100Yr 960Min Winter	5.065	0.00	0.60
10Yr 240Min Summer	9.960	0.00	1.03	100Yr 1440Min Summer	3.613	0.00	0.55
10Yr 240Min Winter	9.960	0.00	1.03	100Yr 1440Min Winter	3.613	0.00	0.54
10Yr 360Min Summer	7.273	0.00	0.95	100Yr+45% 15Min Summer	149.929	0.00	1.15
10Yr 360Min Winter	7.273	0.00	0.96	100Yr+45% 15Min Winter	149.929	0.00	1.16
10Yr 480Min Winter	5.791	0.00	0.91	100Yr+45% 30Min Summer	100.437	0.00	0.93
10Yr 480Min Summer	5.791	0.00	0.90	100Yr+45% 30Min Winter	100.437	0.00	0.92
10Yr 600Min Summer	4.826	0.00	0.87	100Yr+45% 60Min Summer	64.215	0.00	0.76
10Yr 600Min Winter	4.826	0.00	0.88	100Yr+45% 60Min Winter	64.215	0.00	0.76
10Yr 720Min Summer	4.146	0.00	0.84	100Yr+45% 120Min Summer	38.388	0.00	0.65
10Yr 720Min Winter	4.146	0.00	0.84	100Yr+45% 120Min Winter	38.388	0.00	0.65
10Yr 960Min Summer	3.269	0.00	0.79	100Yr+45% 180Min Summer	28.112	0.00	0.60
10Yr 960Min Winter	3.269	0.00	0.79	100Yr+45% 180Min Winter	28.112	0.00	0.60
10Yr 1440Min Summer	2.346	0.00	0.71	100Yr+45% 240Min Summer	22.585	0.00	0.56
10Yr 1440Min Winter	2.346	0.00	0.72	100Yr+45% 240Min Winter	22.585	0.00	0.56
30Yr+10% 15Min Summer	90.659	0.00	1.55	100Yr+45% 360Min Summer	16.390	0.00	0.52
30Yr+10% 15Min Winter	90.659	0.00	1.57	100Yr+45% 360Min Winter	16.390	0.00	0.52
30Yr+10% 30Min Summer	60.213	0.00	1.32	100Yr+45% 480Min Summer	13.000	0.00	0.49
30Yr+10% 30Min Winter	60.213	0.00	1.31	100Yr+45% 480Min Winter	13.000	0.00	0.49
30Yr+10% 60Min Summer	38.223	0.00	1.10	100Yr+45% 600Min Summer	10.842	0.00	0.47
30Yr+10% 60Min Winter	38.223	0.00	1.11	100Yr+45% 600Min Winter	10.842	0.00	0.48

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
30Yr+10% 120Min Summer	23.276	0.00	0.95	100Yr+45% 720Min Summer	9.330	0.00	0.46
30Yr+10% 120Min Winter	23.276	0.00	0.95	100Yr+45% 720Min Winter	9.330	0.00	0.46
30Yr+10% 180Min Summer	17.193	0.00	0.87	100Yr+45% 960Min Summer	7.344	0.00	0.44
30Yr+10% 180Min Winter	17.193	0.00	0.88	100Yr+45% 960Min Winter	7.344	0.00	0.46
30Yr+10% 240Min Summer	13.779	0.00	0.83	100Yr+45% 1440Min Winter	5.239	0.00	0.42
30Yr+10% 240Min Winter	13.779	0.00	0.83	100Yr+45% 1440Min Summer	5.239	0.00	0.42

Simulation Results

Return Period (yrs) + Climate Change (%):
2yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S3-DIFF	240 min Summer	151	6.824	0.205	0.096		Surcharged
S1	360 min Summer	215	6.825	0.525	0.062		Surcharged
S2	15 min Winter	0	6.800	0.600	0.373		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	30 min Summer	28	S3-DIFF	S1	0.150	0.044	0.515	0.011	Surcharged
1.001	360 min Summer	215	S1	S2	0.150	0.008	0.144	0.006	Surcharged

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 4	360 min Summer	215	6.825	0.056	0.422			OK

Return Period (yrs) + Climate Change (%):
10yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S3-DIFF	240 min Summer	146	6.856	0.237	0.143		Surcharged
S1	180 min Summer	116	6.856	0.556	0.225		Surcharged
S2	15 min Summer	0	6.800	0.600	0.373		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Winter	18	S3-DIFF	S1	0.150	0.115	1.712	0.035	Surcharged
1.001	240 min Summer	146	S1	S2	0.150	0.018	0.323	0.014	Surcharged

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 4	180 min Summer	116	6.856	0.087	0.889			OK

Return Period (yrs) + Climate Change (%):
30yr+10%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S3-DIFF	180 min Summer	118	6.892	0.273	0.314		Surcharged
S1	180 min Summer	117	6.893	0.593	0.086		Surcharged
S2	15 min Summer	0	6.800	0.600	0.373		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Winter	16	S3-DIFF	S1	0.150	0.176	2.851	0.059	Surcharged
1.001	180 min Summer	117	S1	S2	0.150	0.021	0.376	0.017	Surcharged

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 4	180 min Summer	119	6.892	0.123	0.883			OK

Return Period (yrs) + Climate Change (%):
100yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S3-DIFF	180 min Summer	121	6.910	0.291	0.297		Surcharged
S1	180 min Summer	122	6.911	0.611	0.107		Surcharged
S2	15 min Summer	0	6.800	0.600	0.373		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	30 min Winter	20	S3-DIFF	S1	0.150	0.135	2.158	0.044	Surcharged
1.001	180 min Summer	122	S1	S2	0.150	0.022	0.384	0.017	Surcharged

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 4	180 min Summer	121	6.911	0.142	0.905			OK

Return Period (yrs) + Climate Change (%):
100yr+45%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S3-DIFF	180 min Summer	134	6.991	0.372	0.111		Surcharged
S1	180 min Summer	130	6.991	0.691	0.374		Flood Risk
S2	15 min Summer	0	6.800	0.600	0.373		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Winter	14	S3-DIFF	S1	0.150	0.178	1.832	0.038	Surcharged
1.001	180 min Summer	106	S1	S2	0.150	0.022	0.391	0.017	Surcharged

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 4	180 min Summer	131	6.991	0.222	1.391			OK

Network Details

Manhole Schedule

Manhole	Catchment Area (ha)	Size (mm)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
S16 (DIF)	0.072	1000x500	Unknown	7.214	6.484	0.580	498589.707	102725.051
S17	0.000	1350	Type C	7.284	5.949	1.035	498592.275	102720.121
S18	0.081	1350	Type C	7.315	5.858	1.156	498605.267	102696.036
S19	0.013	1350	Type C	6.979	5.702	0.977	498564.017	102673.959
S13 (DIF)	0.071	1000x500	Unknown	7.017	6.135	0.733	498539.273	102715.373
S11	0.000	1350	Type C	7.030	5.802	0.928	498538.358	102709.419
S20	0.004	1350	Type C	6.991	5.850	0.841	498527.679	102705.537
S10	0.052	1350	Type C	7.032	5.781	0.951	498538.517	102703.227
S13	0.036	1350	Type C	6.987	5.747	0.940	498540.210	102693.098
S14	0.000	1350	Type C	6.909	5.686	0.923	498547.203	102676.248
S15	0.000	1350	Type C	7.018	5.657	1.060	498551.590	102668.836
S7	0.000	1350	Type C	6.857	5.593	0.965	498534.895	102658.828
S30 (TANK)	0.000	1350	Type C	6.800	5.550	0.950	498521.910	102645.522
S6	0.000	1350	Type C	6.848	5.533	1.015	498520.006	102648.731
S5	0.000	1350	Type C	6.840	5.463	1.077	498500.721	102640.772
S25 (DIF)	0.125	1000x500	Unknown	6.817	5.700	0.817	498489.405	102637.922
S4	0.000	1350	Type C	6.829	5.400	1.279	498481.991	102638.158
S3	0.000	---	Type C	6.190	5.200	0.840	498464.251	102637.921

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (mm)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	S16 (DIF)	6.484	S17	6.150	Circ	150	5.559	17	0.600	0.580	0.984
1.001	S17	5.949	S18	5.858	Circ	300	27.366	300	0.600	1.035	1.156
1.002	S18	5.858	S19	5.702	Circ	300	46.787	300	0.600	1.156	0.977
1.003	S19	5.702	S15	5.657	Circ	300	13.441	300	0.600	0.977	1.060
2.000	S13 (DIF)	6.135	S11	5.952	Circ	150	6.024	33	0.600	0.733	0.928
2.001	S11	5.802	S10	5.781	Circ	300	6.194	300	0.600	0.928	0.951
3.000	S20	5.850	S10	5.781	Circ	300	11.082	161	0.600	0.841	0.951
2.002	S10	5.781	S13	5.747	Circ	300	10.269	300	0.600	0.951	0.940
2.003	S13	5.747	S14	5.686	Circ	300	18.243	300	0.600	0.940	0.923
2.004	S14	5.686	S15	5.657	Circ	300	8.614	300	0.600	0.923	1.060
1.004	S15	5.657	S7	5.593	Circ	300	19.465	300	0.600	1.060	0.965
1.005	S7	5.593	S6	5.533	Circ	300	17.990	302	0.600	0.965	1.015
4.000	S30 (TANK)	5.550	S6	5.533	Circ	300	3.731	219	0.600	0.950	1.015
1.006	S6	5.533	S5	5.463	Circ	300	20.862	300	0.600	1.015	1.077
1.007	S5	5.463	S4	5.400	Circ	300	18.912	300	0.600	1.077	1.129
5.000	S25 (DIF)	5.700	S4	5.400	Circ	300	7.417	25	0.600	0.817	1.129
1.008	S4	5.400	S3	5.200	Circ	150	17.742	89	0.600	1.279	0.840

Permeable Paving Schedule

Permeable Paving	Assigned Manhole	Effective Storage Volume (m3)	CL (m)	IL (m)	Storage Infil Rate (m/hr)	Safety Factor	Easting (m)	Northing (m)
Permeable Paving 3	S16 (DIF)	61.090	7.214	6.484	0.00000000	2.00	498589.771	102725.793
Permeable Paving 2	S13 (DIF)	69.787	7.017	6.287	0.00000000	2.00	498544.731	102718.541
Permeable Paving 10	S25 (DIF)	33.269	6.817	6.087	0.00000000	2.00	498489.192	102640.870
Permeable Paving 11	S25 (DIF)	37.790	6.817	6.087	0.00000000	2.00	498527.002	102655.505

Outfall Details

Outfall Manhole S3 : Surcharged (Constant Level)

Surcharged Constant

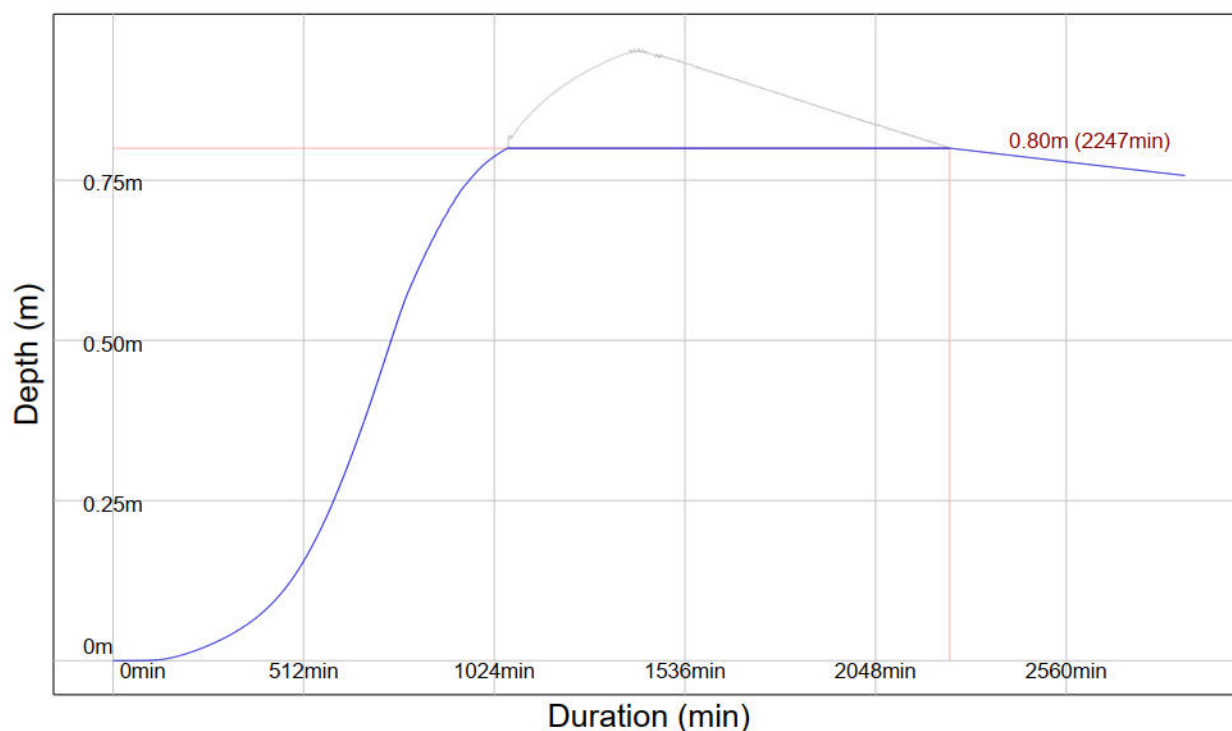
Water Elevation (m)	Water Depth (m)
5.500	0.300

Flow Control Details

Tank Structure at Manhole S30 (TANK)

Tank Invert (m)	Tank Height (m)	Porosity Ratio (%)	Area (m2)	Effective Area (m2) Area x Porosity Ratio	Max Storage (m3) Effective Area x Height	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
5.550	0.800	95.00	497.000	472.150	377.720	0.00000000	0.00000000	2.00

Tank 1 at S30 (TANK) (100Yr+45% 1440Min Winter)

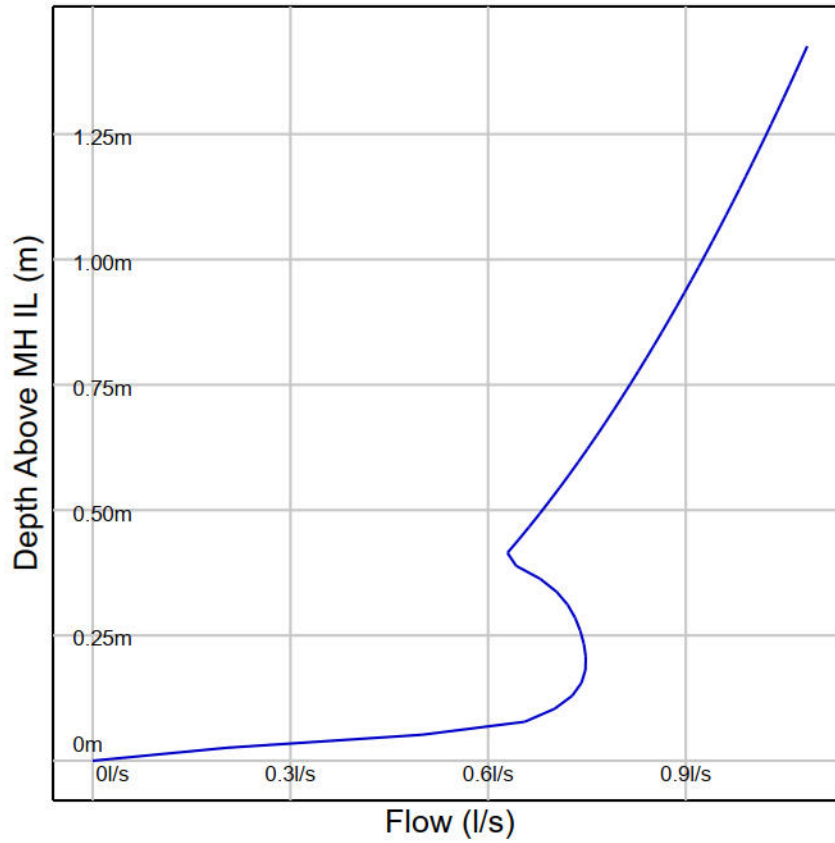


Controls within Manhole S4

Hydro-Brake® Optimum Control

Model Ref	Design Depth (m)	Design Flow (l/s)	Invert Offset (m)	FF Head (m)	FF Flow (l/s)	KF Head (m)	KF Flow (l/s)
SHE-0045-1000-1200-1000	1.200	1.000	0.000	0.197	0.748	0.401	0.620

Hydro-Brake® Optimum Control from S4 to S3



Simulation Settings

FEH2022 (point): Filename=FEH_Point_Descriptors_498852_102569_v5_0_1.xml

Summer (Cv: 1.00), Winter (Cv: 1.00)

Global Time of Entry: 5.0 mins

Durations (mins): 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440

Return Periods (yrs) + Climate Change: (2, +0%), (10, +0%), (30, +10%), (100, +0%), (100, +45%)

Manhole Flood Risk Freeboard: 0.300m

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
2Yr 15Min Winter	32.729	0.00	0.00	30Yr+10% 360Min Summer	9.998	0.00	0.26
2Yr 15Min Summer	32.729	0.00	0.00	30Yr+10% 360Min Winter	9.998	0.00	0.26
2Yr 30Min Winter	21.200	0.00	0.00	30Yr+10% 480Min Summer	7.928	0.00	0.28
2Yr 30Min Summer	21.200	0.00	0.00	30Yr+10% 480Min Winter	7.928	0.00	0.28
2Yr 60Min Summer	13.400	0.00	0.00	30Yr+10% 600Min Summer	6.600	0.00	0.29
2Yr 60Min Winter	13.400	0.00	0.00	30Yr+10% 600Min Winter	6.600	0.00	0.29
2Yr 120Min Winter	9.277	0.00	0.00	30Yr+10% 720Min Summer	5.668	0.00	0.30
2Yr 120Min Summer	9.277	0.00	0.00	30Yr+10% 720Min Winter	5.668	0.00	0.30
2Yr 180Min Summer	7.325	0.00	0.00	30Yr+10% 960Min Summer	4.452	0.00	0.31
2Yr 180Min Winter	7.325	0.00	0.00	30Yr+10% 960Min Winter	4.452	0.00	0.31
2Yr 240Min Winter	5.964	0.00	0.00	30Yr+10% 1440Min Summer	3.178	0.00	0.30
2Yr 240Min Summer	5.964	0.00	0.00	30Yr+10% 1440Min Winter	3.178	0.00	0.30
2Yr 360Min Summer	4.462	0.00	0.00	100Yr 15Min Summer	103.399	0.00	0.02
2Yr 360Min Winter	4.462	0.00	0.00	100Yr 15Min Winter	103.399	0.00	0.04
2Yr 480Min Summer	3.613	0.00	0.00	100Yr 30Min Summer	69.267	0.00	0.07
2Yr 480Min Winter	3.613	0.00	0.00	100Yr 30Min Winter	69.267	0.00	0.08
2Yr 600Min Summer	3.039	0.00	0.00	100Yr 60Min Summer	44.286	0.00	0.11
2Yr 600Min Winter	3.039	0.00	0.00	100Yr 60Min Winter	44.286	0.00	0.10
2Yr 720Min Winter	2.627	0.00	0.00	100Yr 120Min Summer	26.475	0.00	0.20
2Yr 720Min Summer	2.627	0.00	0.00	100Yr 120Min Winter	26.475	0.00	0.20
2Yr 960Min Summer	2.097	0.00	0.00	100Yr 180Min Summer	19.388	0.00	0.26
2Yr 960Min Winter	2.097	0.00	0.00	100Yr 180Min Winter	19.388	0.00	0.26
2Yr 1440Min Summer	1.537	0.00	0.00	100Yr 240Min Summer	15.576	0.00	0.30
2Yr 1440Min Winter	1.537	0.00	0.00	100Yr 240Min Winter	15.576	0.00	0.30
10Yr 15Min Summer	63.792	0.00	0.00	100Yr 360Min Summer	11.303	0.00	0.36
10Yr 15Min Winter	63.792	0.00	0.00	100Yr 360Min Winter	11.303	0.00	0.36
10Yr 30Min Summer	41.732	0.00	0.00	100Yr 480Min Summer	8.965	0.00	0.41
10Yr 30Min Winter	41.732	0.00	0.00	100Yr 480Min Winter	8.965	0.00	0.40
10Yr 60Min Summer	26.321	0.00	0.00	100Yr 600Min Summer	7.477	0.00	0.44
10Yr 60Min Winter	26.321	0.00	0.00	100Yr 600Min Winter	7.477	0.00	0.44
10Yr 120Min Summer	16.527	0.00	0.00	100Yr 720Min Summer	6.434	0.00	0.46
10Yr 120Min Winter	16.527	0.00	0.00	100Yr 720Min Winter	6.434	0.00	0.45
10Yr 180Min Summer	12.405	0.00	0.03	100Yr 960Min Summer	5.065	0.00	0.47
10Yr 180Min Winter	12.405	0.00	0.03	100Yr 960Min Winter	5.065	0.00	0.47
10Yr 240Min Summer	9.960	0.00	0.04	100Yr 1440Min Summer	3.613	0.00	0.47
10Yr 240Min Winter	9.960	0.00	0.04	100Yr 1440Min Winter	3.613	0.00	0.47
10Yr 360Min Summer	7.273	0.00	0.07	100Yr+45% 15Min Summer	149.929	0.00	0.07
10Yr 360Min Winter	7.273	0.00	0.06	100Yr+45% 15Min Winter	149.929	0.00	0.06
10Yr 480Min Winter	5.791	0.00	0.08	100Yr+45% 30Min Summer	100.437	0.00	0.21
10Yr 480Min Summer	5.791	0.00	0.08	100Yr+45% 30Min Winter	100.437	0.00	0.21
10Yr 600Min Summer	4.826	0.00	0.08	100Yr+45% 60Min Summer	64.215	0.00	0.36
10Yr 600Min Winter	4.826	0.00	0.08	100Yr+45% 60Min Winter	64.215	0.00	0.36
10Yr 720Min Summer	4.146	0.00	0.09	100Yr+45% 120Min Summer	38.388	0.00	0.57
10Yr 720Min Winter	4.146	0.00	0.08	100Yr+45% 120Min Winter	38.388	0.00	0.57
10Yr 960Min Summer	3.269	0.00	0.09	100Yr+45% 180Min Summer	28.112	0.00	0.68
10Yr 960Min Winter	3.269	0.00	0.09	100Yr+45% 180Min Winter	28.112	0.00	0.68
10Yr 1440Min Summer	2.346	0.00	0.08	100Yr+45% 240Min Summer	22.585	0.00	0.74
10Yr 1440Min Winter	2.346	0.00	0.08	100Yr+45% 240Min Winter	22.585	0.00	0.74
30Yr+10% 15Min Summer	90.659	0.00	0.03	100Yr+45% 360Min Summer	16.390	0.00	0.84
30Yr+10% 15Min Winter	90.659	0.00	0.04	100Yr+45% 360Min Winter	16.390	0.00	0.84
30Yr+10% 30Min Summer	60.213	0.00	0.05	100Yr+45% 480Min Summer	13.000	0.00	0.89
30Yr+10% 30Min Winter	60.213	0.00	0.05	100Yr+45% 480Min Winter	13.000	0.00	0.89
30Yr+10% 60Min Summer	38.223	0.00	0.05	100Yr+45% 600Min Summer	10.842	0.00	0.95
30Yr+10% 60Min Winter	38.223	0.00	0.04	100Yr+45% 600Min Winter	10.842	0.00	0.93

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
30Yr+10% 120Min Summer	23.276	0.00	0.11	100Yr+45% 720Min Summer	9.330	0.00	0.94
30Yr+10% 120Min Winter	23.276	0.00	0.11	100Yr+45% 720Min Winter	9.330	0.00	0.96
30Yr+10% 180Min Summer	17.193	0.00	0.17	100Yr+45% 960Min Summer	7.344	0.00	0.99
30Yr+10% 180Min Winter	17.193	0.00	0.17	100Yr+45% 960Min Winter	7.344	0.00	0.99
30Yr+10% 240Min Summer	13.779	0.00	0.21	100Yr+45% 1440Min Winter	5.239	0.00	0.97
30Yr+10% 240Min Winter	13.779	0.00	0.21	100Yr+45% 1440Min Summer	5.239	0.00	0.97

Simulation Results

Return Period (yrs) + Climate Change (%):
2yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S16 (DIF)	180 min Summer	107	6.510	0.026	2.977		OK
S17	180 min Summer	108	5.992	0.043	2.975		OK
S18	15 min Summer	8	5.955	0.097	15.582		OK
S19	30 min Summer	21	5.890	0.188	6.320		OK
S13 (DIF)	180 min Summer	108	6.164	0.029	2.763		OK
S11	30 min Summer	20	5.893	0.091	0.671		OK
S20	30 min Summer	20	5.891	0.041	0.276		OK
S10	30 min Summer	20	5.891	0.110	4.910		OK
S13	30 min Summer	20	5.887	0.140	8.019		OK
S14	30 min Summer	21	5.888	0.202	5.262		OK
S15	30 min Summer	21	5.887	0.230	13.866		OK
S7	30 min Summer	21	5.887	0.294	14.469		OK
S30 (TANK)	960 min Winter	929	5.765	0.215	0.002		OK
S6	30 min Summer	20	5.883	0.350	15.798		Surcharged
S5	30 min Summer	20	5.882	0.419	4.887		Surcharged
S25 (DIF)	30 min Summer	20	5.882	0.182	4.976		OK
S4	30 min Summer	20	5.883	0.483	4.629		Surcharged
S3	15 min Winter	0	5.500	0.300	2.545		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	180 min Summer	107	S16 (DIF)	S17	0.025	1.511	2.977	0.068	OK
1.001	180 min Summer	108	S17	S18	0.054	0.387	2.976	0.047	OK
1.002	30 min Summer	18	S18	S19	0.126	0.672	13.355	0.210	OK
1.003	30 min Summer	21	S19	S15	0.209	0.513	14.307	0.225	OK
2.000	180 min Summer	108	S13 (DIF)	S11	0.029	1.152	2.763	0.089	OK
2.001	30 min Summer	25	S11	S10	0.101	0.399	2.119	0.033	OK
3.000	30 min Summer	20	S20	S10	0.076	0.091	0.965	0.011	OK
2.002	30 min Summer	20	S10	S13	0.125	0.518	9.310	0.146	OK
2.003	30 min Summer	21	S13	S14	0.171	0.660	15.231	0.239	OK
2.004	30 min Summer	21	S14	S15	0.216	0.495	14.215	0.223	OK
1.004	30 min Summer	21	S15	S7	0.262	0.793	26.659	0.419	OK
1.005	30 min Summer	26	S7	S6	0.297	0.642	23.327	0.368	OK
4.000	960 min Winter	2233	S30 (TANK)	S6	0.224	0.034	0.706	0.009	OK
1.006	15 min Summer	11	S6	S5	0.300	0.733	21.817	0.343	Surcharged
1.007	15 min Summer	10	S5	S4	0.300	0.279	11.567	0.182	Surcharged
5.000	30 min Summer	28	S25 (DIF)	S4	0.241	0.234	9.871	0.044	OK
1.008	15 min Summer	1	S4	S3	0.135	0.152	2.545	0.135	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 3	180 min Summer	107	6.545	0.061	2.963			OK
Permeable Paving 2	180 min Summer	108	6.341	0.054	2.776			OK
Permeable Paving 10	60 min Summer	42	6.132	0.045	4.168			OK
Permeable Paving 11	60 min Summer	42	6.137	0.050	4.933			OK

Return Period (yrs) + Climate Change (%):
10yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S16 (DIF)	120 min Summer	78	6.522	0.038	6.438		OK
S17	30 min Summer	19	6.108	0.159	1.686		OK
S18	30 min Summer	19	6.109	0.251	14.727		OK
S19	30 min Summer	20	6.095	0.393	17.636		Surcharged
S13 (DIF)	120 min Summer	76	6.179	0.044	6.054		OK
S11	30 min Summer	20	6.101	0.299	2.087		OK
S20	30 min Summer	20	6.101	0.251	0.542		OK
S10	30 min Summer	20	6.101	0.319	9.819		Surcharged
S13	30 min Summer	20	6.099	0.352	15.045		Surcharged
S14	30 min Summer	20	6.094	0.408	15.519		Surcharged
S15	30 min Summer	20	6.092	0.434	33.582		Surcharged
S7	15 min Summer	12	6.074	0.482	11.082		Surcharged
S30 (TANK)	1440 min Winter	1407	5.928	0.378	0.000		Surcharged
S6	15 min Summer	12	6.071	0.538	21.022		Surcharged
S5	15 min Summer	12	6.075	0.612	8.932		Surcharged
S25 (DIF)	15 min Summer	14	6.081	0.381	13.137		Surcharged
S4	15 min Summer	14	6.079	0.679	12.997		Surcharged
S3	15 min Summer	0	5.500	0.300	2.545		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	120 min Summer	78	S16 (DIF)	S17	0.037	1.870	6.437	0.147	OK
1.001	30 min Summer	23	S17	S18	0.205	0.549	7.003	0.110	OK
1.002	30 min Summer	19	S18	S19	0.275	0.709	24.015	0.377	OK
1.003	15 min Winter	10	S19	S15	0.300	0.558	25.982	0.408	Surcharged
2.000	30 min Summer	30	S13 (DIF)	S11	0.087	1.370	5.175	0.167	OK
2.001	30 min Summer	26	S11	S10	0.300	0.537	5.998	0.094	OK
3.000	30 min Summer	25	S20	S10	0.276	0.111	2.128	0.024	OK
2.002	15 min Winter	13	S10	S13	0.300	0.549	18.075	0.284	Surcharged
2.003	15 min Winter	11	S13	S14	0.300	0.727	29.164	0.458	Surcharged
2.004	15 min Winter	10	S14	S15	0.300	0.549	26.651	0.418	Surcharged
1.004	30 min Winter	25	S15	S7	0.300	0.800	51.506	0.809	Surcharged
1.005	30 min Winter	25	S7	S6	0.300	0.783	54.016	0.851	Surcharged
4.000	600 min Winter	1749	S30 (TANK)	S6	0.300	0.013	0.879	0.012	Surcharged
1.006	15 min Winter	8	S6	S5	0.300	0.794	25.152	0.395	Surcharged
1.007	15 min Winter	8	S5	S4	0.300	0.382	14.782	0.232	Surcharged
5.000	30 min Summer	25	S25 (DIF)	S4	0.300	0.428	21.787	0.097	Surcharged
1.008	15 min Winter	1	S4	S3	0.135	0.152	2.545	0.135	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 3	120 min Summer	78	6.585	0.101	6.633			OK
Permeable Paving 2	120 min Summer	76	6.378	0.091	7.101			OK
Permeable Paving 10	30 min Summer	24	6.165	0.078	10.515			OK
Permeable Paving 11	30 min Summer	25	6.173	0.086	11.280			OK

Return Period (yrs) + Climate Change (%):
30yr+10%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S16 (DIF)	60 min Summer	44	6.533	0.049	10.062		OK
S17	30 min Summer	19	6.296	0.347	3.223		Surcharged
S18	30 min Summer	19	6.299	0.441	23.892		Surcharged
S19	30 min Summer	19	6.274	0.572	28.890		Surcharged
S13 (DIF)	30 min Summer	19	6.292	0.158	3.097		Surcharged
S11	30 min Summer	19	6.289	0.487	3.184		Surcharged
S20	30 min Summer	19	6.287	0.437	1.067		Surcharged
S10	30 min Summer	19	6.288	0.507	18.533		Surcharged
S13	30 min Summer	19	6.284	0.537	28.692		Surcharged
S14	30 min Summer	19	6.271	0.585	29.457		Surcharged
S15	30 min Summer	19	6.263	0.606	59.343		Surcharged
S7	15 min Summer	11	6.213	0.621	44.868		Surcharged
S30 (TANK)	1440 min Winter	1412	6.091	0.541	0.005		Surcharged
S6	15 min Summer	11	6.179	0.647	42.970		Surcharged
S5	15 min Summer	12	6.176	0.713	13.992		Surcharged
S25 (DIF)	15 min Summer	13	6.178	0.478	1.852		Surcharged
S4	15 min Summer	12	6.176	0.776	14.575		Surcharged
S3	15 min Summer	0	5.500	0.300	2.545		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	30 min Summer	29	S16 (DIF)	S17	0.086	2.045	9.023	0.206	OK
1.001	30 min Winter	25	S17	S18	0.300	0.642	12.402	0.195	Surcharged
1.002	15 min Winter	10	S18	S19	0.300	0.770	32.877	0.516	Surcharged
1.003	30 min Winter	25	S19	S15	0.300	0.519	36.325	0.570	Surcharged
2.000	30 min Summer	31	S13 (DIF)	S11	0.150	1.553	8.306	0.267	Surcharged
2.001	30 min Winter	26	S11	S10	0.300	0.620	9.419	0.148	Surcharged
3.000	30 min Winter	24	S20	S10	0.300	0.094	3.052	0.035	Surcharged
2.002	15 min Winter	9	S10	S13	0.300	0.581	21.859	0.343	Surcharged
2.003	15 min Winter	9	S13	S14	0.300	0.749	35.514	0.558	Surcharged
2.004	60 min Summer	32	S14	S15	0.300	0.496	33.595	0.528	Surcharged
1.004	30 min Winter	24	S15	S7	0.300	0.979	69.179	1.086	Surcharged
1.005	30 min Winter	24	S7	S6	0.300	1.027	72.620	1.144	Surcharged
4.000	720 min Winter	1743	S30 (TANK)	S6	0.300	0.012	0.819	0.011	Surcharged
1.006	15 min Winter	7	S6	S5	0.300	0.881	30.255	0.475	Surcharged
1.007	15 min Winter	7	S5	S4	0.300	0.489	15.045	0.236	Surcharged
5.000	15 min Winter	17	S25 (DIF)	S4	0.300	0.588	29.969	0.134	Surcharged
1.008	15 min Winter	1	S4	S3	0.135	0.152	2.545	0.135	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 3	60 min Summer	44	6.620	0.136	10.092			OK
Permeable Paving 2	60 min Summer	45	6.408	0.121	9.520			OK
Permeable Paving 10	15 min Summer	15	6.190	0.103	12.835			OK
Permeable Paving 11	15 min Summer	16	6.196	0.109	21.831			OK

Return Period (yrs) + Climate Change (%):
100yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S16 (DIF)	60 min Summer	43	6.541	0.057	13.069		OK
S17	30 min Summer	18	6.388	0.439	2.847		Surcharged
S18	30 min Summer	18	6.388	0.529	34.886		Surcharged
S19	30 min Summer	18	6.345	0.643	38.207		Surcharged
S13 (DIF)	30 min Summer	18	6.355	0.220	2.623		Surcharged
S11	30 min Summer	18	6.357	0.555	2.617		Surcharged
S20	30 min Summer	18	6.356	0.506	1.680		Surcharged
S10	30 min Summer	18	6.357	0.576	22.546		Surcharged
S13	30 min Summer	18	6.353	0.606	33.798		Surcharged
S14	30 min Summer	18	6.336	0.650	33.359		Surcharged
S15	30 min Summer	18	6.327	0.670	70.533		Surcharged
S7	15 min Summer	11	6.274	0.681	55.396		Surcharged
S30 (TANK)	1440 min Winter	1414	6.161	0.611	0.004		Surcharged
S6	15 min Summer	11	6.224	0.692	55.333		Surcharged
S5	15 min Summer	11	6.212	0.749	27.103		Surcharged
S25 (DIF)	15 min Summer	12	6.200	0.500	20.560		Surcharged
S4	15 min Summer	12	6.202	0.802	20.961		Surcharged
S3	15 min Summer	0	5.500	0.300	2.545		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	30 min Winter	29	S16 (DIF)	S17	0.093	2.153	10.980	0.251	OK
1.001	30 min Winter	25	S17	S18	0.300	0.675	14.360	0.225	Surcharged
1.002	15 min Winter	10	S18	S19	0.300	0.782	37.003	0.581	Surcharged
1.003	60 min Summer	34	S19	S15	0.300	0.550	38.864	0.610	Surcharged
2.000	30 min Summer	29	S13 (DIF)	S11	0.150	1.641	10.317	0.332	Surcharged
2.001	30 min Winter	26	S11	S10	0.300	0.647	11.536	0.181	Surcharged
3.000	15 min Winter	9	S20	S10	0.300	0.122	3.356	0.038	Surcharged
2.002	30 min Winter	23	S10	S13	0.300	0.671	24.535	0.385	Surcharged
2.003	15 min Winter	8	S13	S14	0.300	0.760	39.885	0.626	Surcharged
2.004	60 min Summer	33	S14	S15	0.300	0.537	37.991	0.597	Surcharged
1.004	60 min Summer	34	S15	S7	0.300	1.089	76.998	1.209	Surcharged
1.005	30 min Winter	24	S7	S6	0.300	1.131	79.972	1.260	Surcharged
4.000	960 min Winter	1588	S30 (TANK)	S6	0.300	0.018	1.269	0.017	Surcharged
1.006	15 min Winter	7	S6	S5	0.300	0.876	28.489	0.447	Surcharged
1.007	15 min Winter	11	S5	S4	0.300	0.441	22.565	0.354	Surcharged
5.000	15 min Winter	17	S25 (DIF)	S4	0.300	0.636	39.196	0.175	Surcharged
1.008	15 min Winter	1	S4	S3	0.135	0.152	2.545	0.135	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 3	60 min Summer	43	6.636	0.152	12.606			OK
Permeable Paving 2	60 min Summer	44	6.424	0.137	11.347			OK
Permeable Paving 10	15 min Summer	16	6.217	0.130	19.253			OK
Permeable Paving 11	15 min Summer	16	6.220	0.133	21.869			OK

Return Period (yrs) + Climate Change (%):
100yr+45%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S16 (DIF)	30 min Summer	18	6.608	0.124	6.402		OK
S17	15 min Summer	10	6.623	0.673	11.445		Surcharged
S18	15 min Summer	10	6.630	0.772	56.933		Surcharged
S19	15 min Summer	11	6.565	0.862	41.099		Surcharged
S13 (DIF)	15 min Summer	11	6.505	0.370	17.076		Surcharged
S11	15 min Summer	10	6.571	0.769	19.816		Surcharged
S20	15 min Summer	10	6.573	0.723	2.972		Surcharged
S10	15 min Summer	10	6.573	0.792	37.797		Surcharged
S13	15 min Summer	10	6.571	0.824	40.933		Surcharged
S14	15 min Summer	11	6.549	0.863	31.160		Surcharged
S15	15 min Summer	11	6.540	0.882	78.636		Surcharged
S7	1440 min Winter	1424	6.505	0.913	0.509		Surcharged
S30 (TANK)	1440 min Winter	1413	6.506	0.956	0.773		Surcharged
S6	1440 min Winter	1401	6.505	0.972	1.031		Surcharged
S5	1440 min Winter	1400	6.504	1.041	0.589		Surcharged
S25 (DIF)	1440 min Winter	1412	6.518	0.818	0.000		Flood Risk
S4	1440 min Winter	1413	6.505	1.105	0.631		Surcharged
S3	15 min Summer	0	5.500	0.300	2.454		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	30 min Summer	34	S16 (DIF)	S17	0.137	2.376	16.319	0.372	OK
1.001	30 min Winter	26	S17	S18	0.300	0.766	18.432	0.289	Surcharged
1.002	30 min Summer	16	S18	S19	0.300	0.675	47.718	0.749	Surcharged
1.003	30 min Summer	18	S19	S15	0.300	0.759	53.621	0.842	Surcharged
2.000	30 min Winter	31	S13 (DIF)	S11	0.150	1.858	17.367	0.559	Surcharged
2.001	30 min Winter	25	S11	S10	0.300	0.675	19.673	0.309	Surcharged
3.000	30 min Summer	19	S20	S10	0.300	0.091	3.846	0.044	Surcharged
2.002	60 min Summer	33	S10	S13	0.300	0.489	34.576	0.543	Surcharged
2.003	60 min Summer	33	S13	S14	0.300	0.739	52.245	0.820	Surcharged
2.004	60 min Summer	33	S14	S15	0.300	0.728	51.484	0.808	Surcharged
1.004	60 min Summer	34	S15	S7	0.300	1.471	103.946	1.632	Surcharged
1.005	60 min Summer	34	S7	S6	0.300	1.471	103.975	1.638	Surcharged
4.000	480 min Summer	669	S30 (TANK)	S6	0.300	0.075	5.321	0.071	Surcharged
1.006	15 min Winter	10	S6	S5	0.300	0.920	43.371	0.681	Surcharged
1.007	15 min Winter	10	S5	S4	0.300	0.594	41.981	0.659	Surcharged
5.000	15 min Winter	18	S25 (DIF)	S4	0.300	0.771	54.466	0.243	Surcharged
1.008	15 min Summer	0	S4	S3	0.135	0.146	2.454	0.130	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 3	60 min Winter	48	6.688	0.204	15.514			OK
Permeable Paving 2	1440 min Winter	1404	6.502	0.215	0.163			OK
Permeable Paving 10	1440 min Winter	1386	6.503	0.416	0.198			OK
Permeable Paving 11	1440 min Winter	1387	6.503	0.416	0.232			OK

Network Details

Manhole Schedule

Manhole	Catchment Area (ha)	Size (mm)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
S8 (DIF)	0.129	1000x500	Unknown	6.720	5.840	0.730	498470.411	102693.384
S9	0.000	1350	Type C	6.802	5.500	1.152	498469.755	102696.589
S21	0.000	---	Type C	6.500	5.300	1.050	498465.712	102695.841

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (mm)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	S8 (DIF)	5.840	S9	5.500	Circ	150	3.272	10	0.600	0.730	1.152
1.001	S9	5.500	S21	5.300	Circ	150	4.112	21	0.600	1.152	1.050

Permeable Paving Schedule

Permeable Paving	Assigned Manhole	Effective Storage Volume (m3)	CL (m)	IL (m)	Storage Infil Rate (m/hr)	Safety Factor	Easting (m)	Northing (m)
Permeable Paving 1	S8 (DIF)	125.869	6.720	5.990	0.00000000	2.00	498486.852	102697.020

Outfall Details

Outfall Manhole S21 : Surcharged (Constant Level)

Surcharged Constant

Water Elevation (m)	Water Depth (m)
5.600	0.300

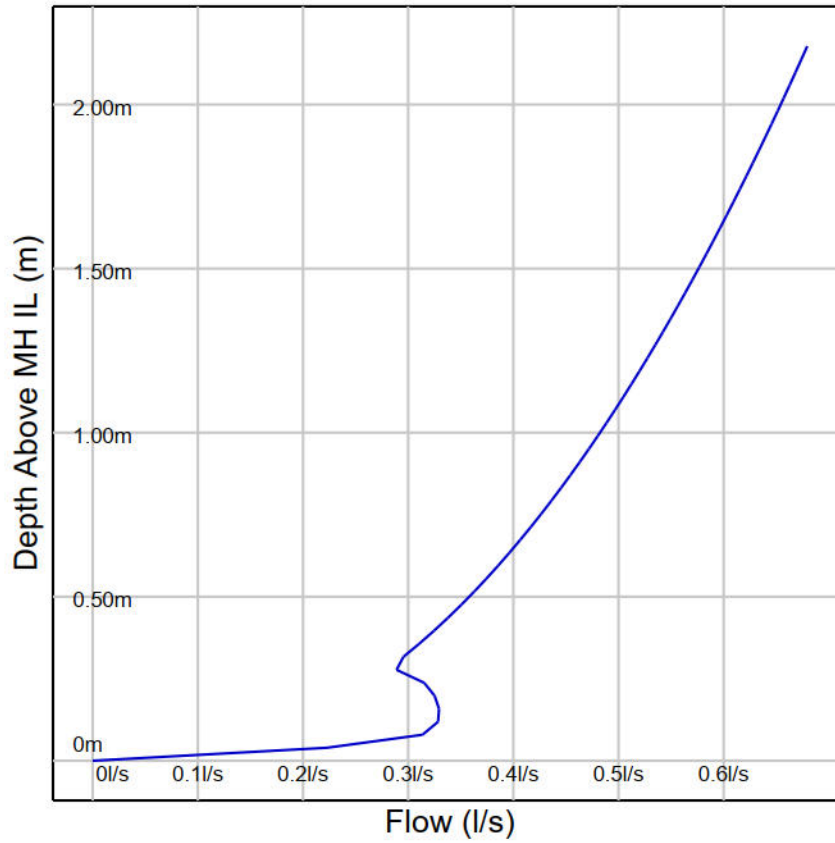
Flow Control Details

Controls within Manhole S9

Hydro-Brake® Optimum Control

Model Ref	Design Depth (m)	Design Flow (l/s)	Invert Offset (m)	FF Head (m)	FF Flow (l/s)	KF Head (m)	KF Flow (l/s)
SHE-0032-5000-1100-5000	1.100	0.500	0.000	0.142	0.330	0.283	0.282

Hydro-Brake® Optimum Control from S9 to S21



Simulation Settings

FEH2022 (point): Filename=FEH_Point_Descriptors_498852_102569_v5_0_1.xml

Summer (Cv: 1.00), Winter (Cv: 1.00)

Global Time of Entry: 5.0 mins

Durations (mins): 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440

Return Periods (yrs) + Climate Change: (2, +0%), (10, +0%), (30, +10%), (100, +0%), (100, +45%)

Manhole Flood Risk Freeboard: 0.300m

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
2Yr 15Min Winter	32.729	0.00	0.55	30Yr+10% 360Min Summer	9.998	0.00	0.22
2Yr 15Min Summer	32.729	0.00	0.55	30Yr+10% 360Min Winter	9.998	0.00	0.22
2Yr 30Min Winter	21.200	0.00	0.41	30Yr+10% 480Min Summer	7.928	0.00	0.21
2Yr 30Min Summer	21.200	0.00	0.41	30Yr+10% 480Min Winter	7.928	0.00	0.21
2Yr 60Min Summer	13.400	0.00	0.32	30Yr+10% 600Min Summer	6.600	0.00	0.20
2Yr 60Min Winter	13.400	0.00	0.32	30Yr+10% 600Min Winter	6.600	0.00	0.21
2Yr 120Min Winter	9.277	0.00	0.23	30Yr+10% 720Min Summer	5.668	0.00	0.20
2Yr 120Min Summer	9.277	0.00	0.22	30Yr+10% 720Min Winter	5.668	0.00	0.20
2Yr 180Min Summer	7.325	0.00	0.19	30Yr+10% 960Min Summer	4.452	0.00	0.19
2Yr 180Min Winter	7.325	0.00	0.19	30Yr+10% 960Min Winter	4.452	0.00	0.19
2Yr 240Min Winter	5.964	0.00	0.17	30Yr+10% 1440Min Summer	3.178	0.00	0.17
2Yr 240Min Summer	5.964	0.00	0.17	30Yr+10% 1440Min Winter	3.178	0.00	0.17
2Yr 360Min Summer	4.462	0.00	0.15	100Yr 15Min Summer	103.399	0.00	0.16
2Yr 360Min Winter	4.462	0.00	0.15	100Yr 15Min Winter	103.399	0.00	0.16
2Yr 480Min Summer	3.613	0.00	0.14	100Yr 30Min Summer	69.267	0.00	0.29
2Yr 480Min Winter	3.613	0.00	0.14	100Yr 30Min Winter	69.267	0.00	0.29
2Yr 600Min Summer	3.039	0.00	0.13	100Yr 60Min Summer	44.286	0.00	0.26
2Yr 600Min Winter	3.039	0.00	0.14	100Yr 60Min Winter	44.286	0.00	0.26
2Yr 720Min Winter	2.627	0.00	0.13	100Yr 120Min Summer	26.475	0.00	0.24
2Yr 720Min Summer	2.627	0.00	0.13	100Yr 120Min Winter	26.475	0.00	0.24
2Yr 960Min Summer	2.097	0.00	0.12	100Yr 180Min Summer	19.388	0.00	0.23
2Yr 960Min Winter	2.097	0.00	0.12	100Yr 180Min Winter	19.388	0.00	0.23
2Yr 1440Min Summer	1.537	0.00	0.11	100Yr 240Min Summer	15.576	0.00	0.22
2Yr 1440Min Winter	1.537	0.00	0.11	100Yr 240Min Winter	15.576	0.00	0.22
10Yr 15Min Summer	63.792	0.00	0.26	100Yr 360Min Summer	11.303	0.00	0.21
10Yr 15Min Winter	63.792	0.00	0.27	100Yr 360Min Winter	11.303	0.00	0.21
10Yr 30Min Summer	41.732	0.00	0.20	100Yr 480Min Summer	8.965	0.00	0.20
10Yr 30Min Winter	41.732	0.00	0.20	100Yr 480Min Winter	8.965	0.00	0.21
10Yr 60Min Summer	26.321	0.00	0.16	100Yr 600Min Summer	7.477	0.00	0.20
10Yr 60Min Winter	26.321	0.00	0.16	100Yr 600Min Winter	7.477	0.00	0.20
10Yr 120Min Summer	16.527	0.00	0.29	100Yr 720Min Summer	6.434	0.00	0.19
10Yr 120Min Winter	16.527	0.00	0.29	100Yr 720Min Winter	6.434	0.00	0.19
10Yr 180Min Summer	12.405	0.00	0.27	100Yr 960Min Summer	5.065	0.00	0.18
10Yr 180Min Winter	12.405	0.00	0.27	100Yr 960Min Winter	5.065	0.00	0.18
10Yr 240Min Summer	9.960	0.00	0.26	100Yr 1440Min Summer	3.613	0.00	0.17
10Yr 240Min Winter	9.960	0.00	0.26	100Yr 1440Min Winter	3.613	0.00	0.17
10Yr 360Min Summer	7.273	0.00	0.24	100Yr+45% 15Min Summer	149.929	0.00	0.28
10Yr 360Min Winter	7.273	0.00	0.25	100Yr+45% 15Min Winter	149.929	0.00	0.28
10Yr 480Min Winter	5.791	0.00	0.23	100Yr+45% 30Min Summer	100.437	0.00	0.25
10Yr 480Min Summer	5.791	0.00	0.23	100Yr+45% 30Min Winter	100.437	0.00	0.25
10Yr 600Min Summer	4.826	0.00	0.23	100Yr+45% 60Min Summer	64.215	0.00	0.23
10Yr 600Min Winter	4.826	0.00	0.23	100Yr+45% 60Min Winter	64.215	0.00	0.23
10Yr 720Min Summer	4.146	0.00	0.22	100Yr+45% 120Min Summer	38.388	0.00	0.21
10Yr 720Min Winter	4.146	0.00	0.22	100Yr+45% 120Min Winter	38.388	0.00	0.21
10Yr 960Min Summer	3.269	0.00	0.20	100Yr+45% 180Min Summer	28.112	0.00	0.21
10Yr 960Min Winter	3.269	0.00	0.20	100Yr+45% 180Min Winter	28.112	0.00	0.21
10Yr 1440Min Summer	2.346	0.00	0.18	100Yr+45% 240Min Summer	22.585	0.00	0.20
10Yr 1440Min Winter	2.346	0.00	0.18	100Yr+45% 240Min Winter	22.585	0.00	0.20
30Yr+10% 15Min Summer	90.659	0.00	0.18	100Yr+45% 360Min Summer	16.390	0.00	0.20
30Yr+10% 15Min Winter	90.659	0.00	0.18	100Yr+45% 360Min Winter	16.390	0.00	0.20
30Yr+10% 30Min Summer	60.213	0.00	0.31	100Yr+45% 480Min Summer	13.000	0.00	0.19
30Yr+10% 30Min Winter	60.213	0.00	0.31	100Yr+45% 480Min Winter	13.000	0.00	0.19
30Yr+10% 60Min Summer	38.223	0.00	0.28	100Yr+45% 600Min Summer	10.842	0.00	0.19
30Yr+10% 60Min Winter	38.223	0.00	0.28	100Yr+45% 600Min Winter	10.842	0.00	0.19

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
30Yr+10% 120Min Summer	23.276	0.00	0.25	100Yr+45% 720Min Summer	9.330	0.00	0.18
30Yr+10% 120Min Winter	23.276	0.00	0.25	100Yr+45% 720Min Winter	9.330	0.00	0.18
30Yr+10% 180Min Summer	17.193	0.00	0.24	100Yr+45% 960Min Summer	7.344	0.00	0.17
30Yr+10% 180Min Winter	17.193	0.00	0.24	100Yr+45% 960Min Winter	7.344	0.00	0.17
30Yr+10% 240Min Summer	13.779	0.00	0.23	100Yr+45% 1440Min Winter	5.239	0.00	0.16
30Yr+10% 240Min Winter	13.779	0.00	0.23	100Yr+45% 1440Min Summer	5.239	0.00	0.16

Simulation Results

Return Period (yrs) + Climate Change (%):
2yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S8 (DIF)	600 min Winter	552	6.115	0.275	0.074		Surcharged
S9	600 min Winter	557	6.115	0.615	0.380		Surcharged
S21	15 min Winter	0	5.600	0.300	1.328		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	30 min Summer	30	S8 (DIF)	S9	0.150	0.216	3.124	0.054	Surcharged
1.001	600 min Winter	493	S9	S21	0.131	0.023	0.363	0.009	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 1	600 min Winter	553	6.115	0.125	0.361			OK

Return Period (yrs) + Climate Change (%):

10yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S8 (DIF)	600 min Winter	581	6.216	0.376	0.003		Surcharged
S9	600 min Winter	580	6.216	0.716	0.393		Surcharged
S21	15 min Summer	0	5.600	0.300	1.328		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	30 min Winter	23	S8 (DIF)	S9	0.150	0.252	4.446	0.077	Surcharged
1.001	600 min Winter	581	S9	S21	0.131	0.025	0.391	0.010	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 1	600 min Winter	580	6.216	0.226	0.395			OK

Return Period (yrs) + Climate Change (%):
30yr+10%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S8 (DIF)	720 min Winter	697	6.320	0.480	0.078		Surcharged
S9	720 min Winter	698	6.320	0.820	0.414		Surcharged
S21	15 min Summer	0	5.600	0.300	1.328		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	30 min Summer	21	S8 (DIF)	S9	0.150	0.447	6.390	0.111	Surcharged
1.001	720 min Winter	698	S9	S21	0.131	0.027	0.419	0.011	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 1	720 min Winter	698	6.320	0.330	0.428			OK

Return Period (yrs) + Climate Change (%):

100yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S8 (DIF)	960 min Winter	927	6.375	0.535	0.152		Surcharged
S9	960 min Winter	922	6.374	0.874	0.433		Surcharged
S21	15 min Summer	0	5.600	0.300	1.328		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Winter	15	S8 (DIF)	S9	0.150	0.511	7.748	0.134	Surcharged
1.001	960 min Winter	926	S9	S21	0.131	0.027	0.432	0.011	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 1	960 min Winter	925	6.375	0.385	0.442			OK

Return Period (yrs) + Climate Change (%):
100yr+45%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S8 (DIF)	1440 min Winter	1371	6.586	0.746	0.092		Flood Risk
S9	1440 min Winter	1381	6.585	1.085	0.478		Flood Risk
S21	15 min Summer	0	5.600	0.300	1.328		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	30 min Summer	19	S8 (DIF)	S9	0.150	0.414	6.878	0.119	Surcharged
1.001	1440 min Winter	1382	S9	S21	0.131	0.030	0.479	0.012	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 1	1440 min Winter	1381	6.586	0.596	0.481			OK

Network Details

Manhole Schedule

Manhole	Catchment Area (ha)	Size (mm)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
S22 (DIF)	0.047	1000x500	Unknown	7.115	6.385	0.580	498630.412	102752.518
S23 (Dummy)	0.000	1350	Type C	7.169	6.300	0.719	498634.868	102752.399

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (mm)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	S22 (DIF)	6.385	S23 (Dummy)	6.300	Circ	150	4.457	53	0.600	0.580	0.719

Permeable Paving Schedule

Permeable Paving	Assigned Manhole	Effective Storage Volume (m3)	CL (m)	IL (m)	Storage Infil Rate (m/hr)	Safety Factor	Easting (m)	Northing (m)
Permeable Paving 5	S22 (DIF)	48.920	7.115	6.535	0.00360000	3.00	498664.180	102765.847

Outfall Details

Outfall Manhole S23 (Dummy) : Free Discharge

Flow Control Details

Controls within Manhole S23 (Dummy)

Weir Control

Invert Offset (m)	Weir Width (m)	Discharge Coeff
10.000	1.500	0.620

Simulation Settings

FEH2022 (point): Filename=FEH_Point_Descriptors_498852_102569_v5_0_1.xml

Summer (Cv: 1.00), Winter (Cv: 1.00)

Global Time of Entry: 5.0 mins

Durations (mins): 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440

Return Periods (yrs) + Climate Change: (2, +0%), (10, +0%), (30, +10%), (100, +0%), (100, +45%)

Manhole Flood Risk Freeboard: 0.300m

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
2Yr 15Min Winter	32.729	0.00	1.48	30Yr+10% 360Min Summer	9.998	0.00	0.32
2Yr 15Min Summer	32.729	0.00	1.46	30Yr+10% 360Min Winter	9.998	0.00	0.32
2Yr 30Min Winter	21.200	0.00	1.10	30Yr+10% 480Min Summer	7.928	0.00	0.31
2Yr 30Min Summer	21.200	0.00	1.11	30Yr+10% 480Min Winter	7.928	0.00	0.31
2Yr 60Min Summer	13.400	0.00	0.86	30Yr+10% 600Min Summer	6.600	0.00	0.31
2Yr 60Min Winter	13.400	0.00	0.86	30Yr+10% 600Min Winter	6.600	0.00	0.31
2Yr 120Min Winter	9.277	0.00	0.64	30Yr+10% 720Min Summer	5.668	0.00	0.30
2Yr 120Min Summer	9.277	0.00	0.64	30Yr+10% 720Min Winter	5.668	0.00	0.30
2Yr 180Min Summer	7.325	0.00	0.55	30Yr+10% 960Min Summer	4.452	0.00	0.29
2Yr 180Min Winter	7.325	0.00	0.55	30Yr+10% 960Min Winter	4.452	0.00	0.29
2Yr 240Min Winter	5.964	0.00	0.51	30Yr+10% 1440Min Summer	3.178	0.00	0.27
2Yr 240Min Summer	5.964	0.00	0.51	30Yr+10% 1440Min Winter	3.178	0.00	0.27
2Yr 360Min Summer	4.462	0.00	0.46	100Yr 15Min Summer	103.399	0.00	0.49
2Yr 360Min Winter	4.462	0.00	0.46	100Yr 15Min Winter	103.399	0.00	0.49
2Yr 480Min Summer	3.613	0.00	0.43	100Yr 30Min Summer	69.267	0.00	0.40
2Yr 480Min Winter	3.613	0.00	0.43	100Yr 30Min Winter	69.267	0.00	0.40
2Yr 600Min Summer	3.039	0.00	0.41	100Yr 60Min Summer	44.286	0.00	0.35
2Yr 600Min Winter	3.039	0.00	0.41	100Yr 60Min Winter	44.286	0.00	0.35
2Yr 720Min Winter	2.627	0.00	0.39	100Yr 120Min Summer	26.475	0.00	0.33
2Yr 720Min Summer	2.627	0.00	0.39	100Yr 120Min Winter	26.475	0.00	0.33
2Yr 960Min Summer	2.097	0.00	0.37	100Yr 180Min Summer	19.388	0.00	0.33
2Yr 960Min Winter	2.097	0.00	0.37	100Yr 180Min Winter	19.388	0.00	0.33
2Yr 1440Min Summer	1.537	0.00	0.33	100Yr 240Min Summer	15.576	0.00	0.33
2Yr 1440Min Winter	1.537	0.00	0.33	100Yr 240Min Winter	15.576	0.00	0.33
10Yr 15Min Summer	63.792	0.00	0.73	100Yr 360Min Summer	11.303	0.00	0.32
10Yr 15Min Winter	63.792	0.00	0.74	100Yr 360Min Winter	11.303	0.00	0.32
10Yr 30Min Summer	41.732	0.00	0.58	100Yr 480Min Summer	8.965	0.00	0.31
10Yr 30Min Winter	41.732	0.00	0.58	100Yr 480Min Winter	8.965	0.00	0.31
10Yr 60Min Summer	26.321	0.00	0.48	100Yr 600Min Summer	7.477	0.00	0.31
10Yr 60Min Winter	26.321	0.00	0.48	100Yr 600Min Winter	7.477	0.00	0.31
10Yr 120Min Summer	16.527	0.00	0.40	100Yr 720Min Summer	6.434	0.00	0.30
10Yr 120Min Winter	16.527	0.00	0.40	100Yr 720Min Winter	6.434	0.00	0.30
10Yr 180Min Summer	12.405	0.00	0.37	100Yr 960Min Summer	5.065	0.00	0.29
10Yr 180Min Winter	12.405	0.00	0.37	100Yr 960Min Winter	5.065	0.00	0.29
10Yr 240Min Summer	9.960	0.00	0.35	100Yr 1440Min Summer	3.613	0.00	0.28
10Yr 240Min Winter	9.960	0.00	0.35	100Yr 1440Min Winter	3.613	0.00	0.27
10Yr 360Min Summer	7.273	0.00	0.33	100Yr+45% 15Min Summer	149.929	0.00	0.38
10Yr 360Min Winter	7.273	0.00	0.33	100Yr+45% 15Min Winter	149.929	0.00	0.38
10Yr 480Min Winter	5.791	0.00	0.32	100Yr+45% 30Min Summer	100.437	0.00	0.34
10Yr 480Min Summer	5.791	0.00	0.32	100Yr+45% 30Min Winter	100.437	0.00	0.34
10Yr 600Min Summer	4.826	0.00	0.31	100Yr+45% 60Min Summer	64.215	0.00	0.34
10Yr 600Min Winter	4.826	0.00	0.31	100Yr+45% 60Min Winter	64.215	0.00	0.34
10Yr 720Min Summer	4.146	0.00	0.30	100Yr+45% 120Min Summer	38.388	0.00	0.33
10Yr 720Min Winter	4.146	0.00	0.30	100Yr+45% 120Min Winter	38.388	0.00	0.33
10Yr 960Min Summer	3.269	0.00	0.29	100Yr+45% 180Min Summer	28.112	0.00	0.33
10Yr 960Min Winter	3.269	0.00	0.29	100Yr+45% 180Min Winter	28.112	0.00	0.33
10Yr 1440Min Summer	2.346	0.00	0.26	100Yr+45% 240Min Summer	22.585	0.00	0.33
10Yr 1440Min Winter	2.346	0.00	0.26	100Yr+45% 240Min Winter	22.585	0.00	0.33
30Yr+10% 15Min Summer	90.659	0.00	0.54	100Yr+45% 360Min Summer	16.390	0.00	0.32
30Yr+10% 15Min Winter	90.659	0.00	0.55	100Yr+45% 360Min Winter	16.390	0.00	0.32
30Yr+10% 30Min Summer	60.213	0.00	0.44	100Yr+45% 480Min Summer	13.000	0.00	0.32
30Yr+10% 30Min Winter	60.213	0.00	0.43	100Yr+45% 480Min Winter	13.000	0.00	0.32
30Yr+10% 60Min Summer	38.223	0.00	0.37	100Yr+45% 600Min Summer	10.842	0.00	0.31
30Yr+10% 60Min Winter	38.223	0.00	0.37	100Yr+45% 600Min Winter	10.842	0.00	0.31

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
30Yr+10% 120Min Summer	23.276	0.00	0.34	100Yr+45% 720Min Summer	9.330	0.00	0.31
30Yr+10% 120Min Winter	23.276	0.00	0.34	100Yr+45% 720Min Winter	9.330	0.00	0.31
30Yr+10% 180Min Summer	17.193	0.00	0.33	100Yr+45% 960Min Summer	7.344	0.00	0.30
30Yr+10% 180Min Winter	17.193	0.00	0.33	100Yr+45% 960Min Winter	7.344	0.00	0.30
30Yr+10% 240Min Summer	13.779	0.00	0.33	100Yr+45% 1440Min Winter	5.239	0.00	0.29
30Yr+10% 240Min Winter	13.779	0.00	0.32	100Yr+45% 1440Min Summer	5.239	0.00	0.29

Simulation Results

Return Period (yrs) + Climate Change (%):
2yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S22 (DIF)	1440 min Winter	1102	6.631	0.246	0.000		Surcharged
S23 (Dummy)	1440 min Winter	1131	6.630	0.330	0.000		OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	60 min Summer	44	S22 (DIF)	S23 (Dummy)	0.150	0.568	1.912	0.078	Surcharged

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 5	1440 min Winter	1103	6.630	0.095	0.120			OK

Return Period (yrs) + Climate Change (%):
10yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S22 (DIF)	960 min Winter	911	6.697	0.312	0.000		Surcharged
S23 (Dummy)	960 min Summer	958	6.696	0.396	0.008		OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	30 min Summer	24	S22 (DIF)	S23 (Dummy)	0.150	0.631	3.223	0.131	Surcharged

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 5	960 min Winter	910	6.696	0.162	0.130			OK

Return Period (yrs) + Climate Change (%):
30yr+10%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S22 (DIF)	960 min Summer	960	6.772	0.388	0.000		Surcharged
S23 (Dummy)	960 min Summer	959	6.772	0.472	0.000		OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	30 min Winter	21	S22 (DIF)	S23 (Dummy)	0.150	0.618	3.203	0.131	Surcharged

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 5	960 min Summer	959	6.772	0.237	0.131			OK

Return Period (yrs) + Climate Change (%):
100yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S22 (DIF)	1440 min Summer	1435	6.813	0.428	0.000		Surcharged
S23 (Dummy)	1440 min Summer	1436	6.812	0.512	0.000		OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Winter	15	S22 (DIF)	S23 (Dummy)	0.150	0.663	3.260	0.133	Surcharged

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 5	1440 min Summer	1436	6.812	0.278	0.131			OK

Return Period (yrs) + Climate Change (%):
100yr+45%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S22 (DIF)	1440 min Summer	1439	6.967	0.583	0.000		Flood Risk
S23 (Dummy)	1440 min Summer	1438	6.967	0.667	0.000		Flood Risk

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	30 min Winter	19	S22 (DIF)	S23 (Dummy)	0.150	0.610	2.887	0.118	Surcharged

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 5	1440 min Summer	1438	6.967	0.432	0.137			OK

Network Details

Manhole Schedule

Manhole	Catchment Area (ha)	Size (mm)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
S24 (DIF)	0.080	1000x500	Unknown	7.319	6.439	0.730	498613.726	102700.706
S25 (Dummy)	0.000	1350	Type C	7.310	6.400	0.760	498616.289	102697.232

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (mm)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	S24 (DIF)	6.439	S25 (Dummy)	6.400	Circ	150	4.317	111	0.600	0.730	0.760

Permeable Paving Schedule

Permeable Paving	Assigned Manhole	Effective Storage Volume (m3)	CL (m)	IL (m)	Storage Infil Rate (m/hr)	Safety Factor	Easting (m)	Northing (m)
Permeable Paving 6	S24 (DIF)	53.931	7.319	6.589	0.00360000	3.00	498624.605	102724.739
Permeable Paving 7	S24 (DIF)	7.248	7.319	6.589	0.00360000	3.00	498620.150	102753.228
Permeable Paving 8	S24 (DIF)	10.262	7.319	6.589	0.00360000	3.00	498616.165	102737.609
Permeable Paving 9	S24 (DIF)	5.925	7.319	6.589	0.00360000	3.00	498615.543	102720.680

Outfall Details

Outfall Manhole S25 (Dummy) : Free Discharge

Flow Control Details

Controls within Manhole S25 (Dummy)

Weir Control

Invert Offset (m)	Weir Width (m)	Discharge Coeff
10.000	1.500	0.620

Simulation Settings

FEH2022 (point): Filename=FEH_Point_Descriptors_498852_102569_v5_0_1.xml

Summer (Cv: 1.00), Winter (Cv: 1.00)

Global Time of Entry: 5.0 mins

Durations (mins): 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440

Return Periods (yrs) + Climate Change: (2, +0%), (10, +0%), (30, +10%), (100, +0%), (100, +45%)

Manhole Flood Risk Freeboard: 0.300m

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
2Yr 15Min Winter	32.729	0.00	0.78	30Yr+10% 360Min Summer	9.998	0.00	0.26
2Yr 15Min Summer	32.729	0.00	0.77	30Yr+10% 360Min Winter	9.998	0.00	0.26
2Yr 30Min Winter	21.200	0.00	0.60	30Yr+10% 480Min Summer	7.928	0.00	0.26
2Yr 30Min Summer	21.200	0.00	0.61	30Yr+10% 480Min Winter	7.928	0.00	0.26
2Yr 60Min Summer	13.400	0.00	0.49	30Yr+10% 600Min Summer	6.600	0.00	0.26
2Yr 60Min Winter	13.400	0.00	0.49	30Yr+10% 600Min Winter	6.600	0.00	0.26
2Yr 120Min Winter	9.277	0.00	0.37	30Yr+10% 720Min Summer	5.668	0.00	0.25
2Yr 120Min Summer	9.277	0.00	0.37	30Yr+10% 720Min Winter	5.668	0.00	0.25
2Yr 180Min Summer	7.325	0.00	0.33	30Yr+10% 960Min Summer	4.452	0.00	0.25
2Yr 180Min Winter	7.325	0.00	0.33	30Yr+10% 960Min Winter	4.452	0.00	0.24
2Yr 240Min Winter	5.964	0.00	0.31	30Yr+10% 1440Min Summer	3.178	0.00	0.23
2Yr 240Min Summer	5.964	0.00	0.31	30Yr+10% 1440Min Winter	3.178	0.00	0.23
2Yr 360Min Summer	4.462	0.00	0.28	100Yr 15Min Summer	103.399	0.00	0.30
2Yr 360Min Winter	4.462	0.00	0.28	100Yr 15Min Winter	103.399	0.00	0.31
2Yr 480Min Summer	3.613	0.00	0.27	100Yr 30Min Summer	69.267	0.00	0.27
2Yr 480Min Winter	3.613	0.00	0.27	100Yr 30Min Winter	69.267	0.00	0.28
2Yr 600Min Summer	3.039	0.00	0.26	100Yr 60Min Summer	44.286	0.00	0.27
2Yr 600Min Winter	3.039	0.00	0.26	100Yr 60Min Winter	44.286	0.00	0.27
2Yr 720Min Winter	2.627	0.00	0.25	100Yr 120Min Summer	26.475	0.00	0.27
2Yr 720Min Summer	2.627	0.00	0.25	100Yr 120Min Winter	26.475	0.00	0.27
2Yr 960Min Summer	2.097	0.00	0.24	100Yr 180Min Summer	19.388	0.00	0.27
2Yr 960Min Winter	2.097	0.00	0.23	100Yr 180Min Winter	19.388	0.00	0.27
2Yr 1440Min Summer	1.537	0.00	0.21	100Yr 240Min Summer	15.576	0.00	0.27
2Yr 1440Min Winter	1.537	0.00	0.21	100Yr 240Min Winter	15.576	0.00	0.27
10Yr 15Min Summer	63.792	0.00	0.42	100Yr 360Min Summer	11.303	0.00	0.27
10Yr 15Min Winter	63.792	0.00	0.43	100Yr 360Min Winter	11.303	0.00	0.26
10Yr 30Min Summer	41.732	0.00	0.35	100Yr 480Min Summer	8.965	0.00	0.26
10Yr 30Min Winter	41.732	0.00	0.35	100Yr 480Min Winter	8.965	0.00	0.26
10Yr 60Min Summer	26.321	0.00	0.30	100Yr 600Min Summer	7.477	0.00	0.26
10Yr 60Min Winter	26.321	0.00	0.30	100Yr 600Min Winter	7.477	0.00	0.26
10Yr 120Min Summer	16.527	0.00	0.27	100Yr 720Min Summer	6.434	0.00	0.26
10Yr 120Min Winter	16.527	0.00	0.27	100Yr 720Min Winter	6.434	0.00	0.26
10Yr 180Min Summer	12.405	0.00	0.27	100Yr 960Min Summer	5.065	0.00	0.25
10Yr 180Min Winter	12.405	0.00	0.27	100Yr 960Min Winter	5.065	0.00	0.24
10Yr 240Min Summer	9.960	0.00	0.26	100Yr 1440Min Summer	3.613	0.00	0.23
10Yr 240Min Winter	9.960	0.00	0.26	100Yr 1440Min Winter	3.613	0.00	0.23
10Yr 360Min Summer	7.273	0.00	0.26	100Yr+45% 15Min Summer	149.929	0.00	0.28
10Yr 360Min Winter	7.273	0.00	0.26	100Yr+45% 15Min Winter	149.929	0.00	0.28
10Yr 480Min Winter	5.791	0.00	0.25	100Yr+45% 30Min Summer	100.437	0.00	0.28
10Yr 480Min Summer	5.791	0.00	0.25	100Yr+45% 30Min Winter	100.437	0.00	0.28
10Yr 600Min Summer	4.826	0.00	0.25	100Yr+45% 60Min Summer	64.215	0.00	0.28
10Yr 600Min Winter	4.826	0.00	0.25	100Yr+45% 60Min Winter	64.215	0.00	0.28
10Yr 720Min Summer	4.146	0.00	0.24	100Yr+45% 120Min Summer	38.388	0.00	0.28
10Yr 720Min Winter	4.146	0.00	0.24	100Yr+45% 120Min Winter	38.388	0.00	0.28
10Yr 960Min Summer	3.269	0.00	0.23	100Yr+45% 180Min Summer	28.112	0.00	0.27
10Yr 960Min Winter	3.269	0.00	0.23	100Yr+45% 180Min Winter	28.112	0.00	0.27
10Yr 1440Min Summer	2.346	0.00	0.22	100Yr+45% 240Min Summer	22.585	0.00	0.27
10Yr 1440Min Winter	2.346	0.00	0.22	100Yr+45% 240Min Winter	22.585	0.00	0.27
30Yr+10% 15Min Summer	90.659	0.00	0.33	100Yr+45% 360Min Summer	16.390	0.00	0.27
30Yr+10% 15Min Winter	90.659	0.00	0.33	100Yr+45% 360Min Winter	16.390	0.00	0.27
30Yr+10% 30Min Summer	60.213	0.00	0.28	100Yr+45% 480Min Summer	13.000	0.00	0.27
30Yr+10% 30Min Winter	60.213	0.00	0.28	100Yr+45% 480Min Winter	13.000	0.00	0.27
30Yr+10% 60Min Summer	38.223	0.00	0.27	100Yr+45% 600Min Summer	10.842	0.00	0.88
30Yr+10% 60Min Winter	38.223	0.00	0.27	100Yr+45% 600Min Winter	10.842	0.00	0.72

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
30Yr+10% 120Min Summer	23.276	0.00	0.27	100Yr+45% 720Min Summer	9.330	0.00	1.91
30Yr+10% 120Min Winter	23.276	0.00	0.27	100Yr+45% 720Min Winter	9.330	0.00	1.77
30Yr+10% 180Min Summer	17.193	0.00	0.27	100Yr+45% 960Min Summer	7.344	0.00	3.16
30Yr+10% 180Min Winter	17.193	0.00	0.27	100Yr+45% 960Min Winter	7.344	0.00	2.61
30Yr+10% 240Min Summer	13.779	0.00	0.27	100Yr+45% 1440Min Winter	5.239	0.00	4.31
30Yr+10% 240Min Winter	13.779	0.00	0.27	100Yr+45% 1440Min Summer	5.239	0.00	4.32

Simulation Results

Return Period (yrs) + Climate Change (%):
2yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S24 (DIF)	600 min Summer	601	6.748	0.309	0.000		Surcharged
S25 (Dummy)	1440 min Winter	1169	6.744	0.344	0.000		OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	30 min Summer	21	S24 (DIF)	S25 (Dummy)	0.150	0.555	2.658	0.158	Surcharged

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 6	1440 min Winter	1194	6.741	0.152	0.077			OK
Permeable Paving 7	1440 min Winter	1143	6.743	0.154	0.033			OK
Permeable Paving 8	1440 min Winter	1146	6.743	0.154	0.037			OK
Permeable Paving 9	1440 min Winter	1151	6.743	0.154	0.015			OK

Return Period (yrs) + Climate Change (%):
10yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S24 (DIF)	1440 min Summer	1435	6.836	0.397	0.142		Surcharged
S25 (Dummy)	1440 min Summer	1436	6.851	0.451	0.000		OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	30 min Winter	17	S24 (DIF)	S25 (Dummy)	0.150	0.567	2.960	0.176	Surcharged

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 6	1440 min Summer	1435	6.848	0.259	0.083			OK
Permeable Paving 7	1440 min Summer	1435	6.850	0.261	0.032			OK
Permeable Paving 8	1440 min Summer	1435	6.850	0.261	0.035			OK
Permeable Paving 9	1440 min Summer	1435	6.849	0.261	0.015			OK

Return Period (yrs) + Climate Change (%):
30yr+10%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S24 (DIF)	960 min Summer	960	6.955	0.516	0.142		Surcharged
S25 (Dummy)	1440 min Summer	1438	6.966	0.566	0.000		OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Winter	11	S24 (DIF)	S25 (Dummy)	0.150	0.683	2.892	0.172	Surcharged

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 6	1440 min Summer	1438	6.962	0.374	0.075			OK
Permeable Paving 7	1440 min Summer	1437	6.965	0.376	0.038			OK
Permeable Paving 8	1440 min Summer	1437	6.965	0.376	0.040			OK
Permeable Paving 9	1440 min Summer	1437	6.964	0.376	0.016			OK

Return Period (yrs) + Climate Change (%):
100yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S24 (DIF)	960 min Summer	960	7.013	0.574	0.142		Surcharged
S25 (Dummy)	1440 min Summer	1439	7.026	0.626	0.000		Flood Risk

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	60 min Summer	20	S24 (DIF)	S25 (Dummy)	0.150	0.510	2.322	0.138	Surcharged

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 6	1440 min Summer	1439	7.023	0.434	0.067			OK
Permeable Paving 7	1440 min Summer	1437	7.026	0.437	0.042			OK
Permeable Paving 8	1440 min Summer	1437	7.026	0.437	0.046			OK
Permeable Paving 9	1440 min Summer	1438	7.025	0.436	0.016			OK

Return Period (yrs) + Climate Change (%):
100yr+45%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S24 (DIF)	960 min Winter	775	7.318	0.879	0.000		Flood Risk
S25 (Dummy)	960 min Winter	773	7.310	0.910	0.434	0.065	Flood

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	30 min Winter	14	S24 (DIF)	S25 (Dummy)	0.150	0.618	3.429	0.204	Surcharged

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 6	960 min Winter	777	7.313	0.724	0.423			Flood Risk
Permeable Paving 7	960 min Winter	773	7.312	0.723	1.054			Flood Risk
Permeable Paving 8	960 min Winter	773	7.312	0.723	1.065			Flood Risk
Permeable Paving 9	960 min Winter	773	7.311	0.723	0.944			Flood Risk