



**MILLER HOMES
LAND AT NORTH COLWELL FARM
HAYWARDS HEATH**

**FLOOD RISK ASSESSMENT AND
DRAINAGE STRATEGY**

FEBRUARY 2025



the journey is the reward

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**Miller Homes
Land at North Colwell Farm
Haywards Heath
Flood Risk Assessment and Drainage Strategy**

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1 Introduction

- 1.1 Mayer Brown Limited have been commissioned by Miller Homes to produce a Flood Risk Assessment and Drainage Strategy to support the Outline Planning Application for the proposed residential development at North Colwell Farm, Lewes Road in Haywards Heath.
- 1.2 According to the Environment Agency's (EA) indicative flood map (see **Appendix A**) the site is located in a low-risk Flood Zone 1. The EA Risk of Flooding from Surface Water Flood Map (refer to **Appendix B**) shows that the majority of the site is located at a very low to low risk of surface water flooding; however, a section along the eastern boundary and a relatively small area in the southern section of the site is located at a high and medium risk of surface water flooding.
- 1.3 This Flood Risk Assessment & Drainage Strategy has been compiled in accordance with "National Planning Policy Framework" published by Ministry of Housing, Communities and Local Government in December 2024, "Technical Guidance to the National Planning Policy Framework" and 'CIRIA C624: Development and Flood Risk Guidance'.

2 Existing Site

- 2.1 The application site is located in Haywards Heath, immediately south of Lewes Road, A272. The surrounding area is a mixture of urban and rural with residential and commercial property to the northwest and west, and greenfield land located east and south. Please refer to the site location plan in **Appendix C**.
- 2.2 The site falls under the administrative boundary of Mid Sussex District Council. The approximate co-ordinates to the centre of the site are E535304, N123280.
- 2.3 The existing site is approximately 6.25ha and is greenfield.

Topography

- 2.4 A topographical survey has been undertaken by Survey Solutions in December 2023 and can be found in **Appendix D**.
- 2.5 The topographic survey shows that western development parcel slopes from the west and north to the south with levels ranging from 68.50m AOD to 58.50m AOD. The central development parcel slopes from north to south with levels ranging from 69.00m AOD to 56.00m AOD. The eastern development parcel slopes from north to south with levels ranging from 66.00m AOD to 54.40m AOD.

Geology

- 2.6 According to the Phase II Site Appraisal (**Appendix E**) undertaken by Patrick Parsons in July 2024, the site is underlain by Upper Tunbridge Wells Sand – sandstone and siltstone.
- 2.7 Infiltration testing in accordance with BRE Digest 365 was undertaken at a number of locations across the site by Patrick Parsons in April and May 2024. The infiltration rates measured varied between 1.25×10^{-6} m/s and 3.30×10^{-6} m/s.

Hydrology and Hydrogeology

- 2.8 The closest watercourse to the site is the Pellingford Brook approximately 1.15km south of the site.
- 2.9 A number of ditches run alongside the perimeter of the site boundary, which eventually discharge into the Pellingford Brook downstream via the existing interconnecting ditch network.
- 2.10 According to the Department for Food and Rural Affairs Magic Map, the site is not located within a Source Protection Zone.

Existing Drainage

Surface Water Drainage

- 2.11 The Southern Water sewer records (**Appendix F**) indicate that there are no existing public surface water sewers within close proximity of the site.
- 2.12 As the site is currently greenfield, it is expected that the surface water originating from the site soaks into the ground via infiltration and/or flows overland into the adjacent ditches.

Foul Water Infrastructure

- 2.13 As the site is greenfield, there is currently no discharge of foul effluent. Therefore, the topographic survey and sewer records did not record any drainage features, routes, or details regarding an existing foul drainage system within the site.
- 2.14 The Southern Water sewer records (**Appendix F**) show a 150mm public foul sewer along Lewes Road, A272, flowing from east to west.

3 Proposed Development

- 3.1 The proposals are for an application for outline planning permission for the construction of a new residential development for up to 80 dwellings with associated roads, parking and amenity areas. Refer to Figure 3.1 below and **Appendix G** for the Indicative Layout.



Figure 3.1: Indicative Layout

- 3.2 In terms of hard landscaping, below is an approximate breakdown of how the 6.250ha site will be divided:

• Buildings:	0.417ha
• Garages:	0.072ha
• Access road and parking:	0.947ha
• Footways and other hardstanding:	0.299ha
• Total hardstanding:	1.735ha
• Total soft landscaping:	4.515ha
• Site boundary:	6.250ha

4 Flood Risk Overview

4.1 In theory there are six principal types/sources of flooding that could affect the proposed development which are described below along with any mitigation measures required.

- **Fluvial** – The site is located in a low-risk Flood Zone 1 (**Appendix A**). This means that it has an annual probability of <0.1% of experiencing flooding from fluvial sources. There are no mitigation measures required and it will not be addressed further in this report.
- **Tidal** – The site is located in a low-risk Flood Zone 1 (**Appendix A**). This means that it has an annual probability of <0.1% of experiencing flooding from tidal sources. There are no mitigation measures required and it will not be addressed further in this report.
- **Groundwater** – The Phase II Site Appraisal (**Appendix E**) included boreholes at a number of locations across the site. Groundwater was encountered at shallow depths in the centre and north-east of the site however this is considered to be perched groundwater. Deeper groundwater was encountered in the west of the site at 2.20m bgl which is considered to be representative of groundwater levels. No basements are proposed and the finished floor levels of the buildings will be set above existing ground levels therefore the development is considered to be at a low risk of groundwater flooding.
- **Surface Water Runoff** – The EA Surface Water Flood Risk Map (**Appendix B**) identifies that the majority of the site is at a very low to low risk of surface water flooding with some isolated areas of medium to high risk. A review of the EA's surface water flood information in conjunction with the topographic survey has been undertaken and is discussed in the surface water flood risk section below.
- **Infrastructure Failure** – The Mid Sussex Council SFRA provides a table showing recorded incidents of sewer flooding by postcode area. In the postcode area RH17 7 there has only been one recorded incident of sewer flooding and there is no evidence to suggest this event happened close to the site. Therefore, the site is considered to be at a low risk from sewer flooding; no mitigation measures are required, and it will not be addressed further in this report.
- **Reservoirs** – The EA's flood map indicates that risk of reservoir flooding is unlikely and therefore it is considered as low risk, indicating that no mitigation measures are required, and it will not be addressed further in this report.

Surface Water Flood Risk

- 4.2 The EA Surface Water flood maps (**Appendix B**) show that the majority of the site is at a very low to low risk of surface water flooding however there are small, isolated sections that are at a high and medium risk.
- 4.3 The areas of surface water flooding are shown to be located along the site boundaries and within the tree belts that split the site. These are areas of dense vegetation and shallow ditches that currently provide land drainage.
- 4.4 Upon review of the levels, these areas fall sharply from north to south showing that surface water would not accumulate and would flow south within these channels and away from the site boundary entirely. These existing tree belts and ditches are to be retained and are outside of the developable area of the site. A road and footpath will need to cross the ditches however the surface water flow paths through these areas will be maintained ensuring the surface water continues to flow away from the site via these tree belts without increasing surface water flooding to the site.
- 4.5 There is one area of medium risk of surface water flooding in the centre of the site that does not appear to be contained to the existing ditch network and tree belts. However, a review of the topographic survey and LIDAR data downloaded from the government website shows that the levels fall from approximately 60m AOD to 57.00 m AOD with no low points or bunds that would allow surface water to accumulate. Therefore, the surface water would flow unimpeded into the existing ditch network and travel south off-site into the interconnecting ditch network and eventually into the Pellingford Brook as opposed to accumulating in this area. Despite the fact that surface water would not accumulate in this area, it has been left undeveloped as part of the master planning process.
- 4.6 The areas of surface water flood risk shown on the EA mapping are outside of the developable area and confined to the ditches and tree belts that are to remain as existing and undeveloped, refer to Appendix L. The area of flood risk shown to be within the developable area falls steeply from north to south with no low points or bunds to allow water to accumulate and therefore this area is considered to be at a low risk of surface water flooding. Despite this, the area has been left as soft landscaping.
- 4.7 As all development is located within the low-risk areas of the site, including the access route, as per paragraph 175 of the updated NPPF guidance, the sequential test is not required.

4.8 A suitable surface water drainage strategy will be implemented which will ensure surface water is managed on site and the risk of flooding to the site is not increased which is discussed further in Section 5 below.

4.9 A flood risk summary of the site is shown below in Table 4.1;

Flood Mechanism	Source	Flood Risk to the Development	Mitigation Required?
Fluvial	N/A	Low	No
Tidal	N/A	Low	No
Groundwater	Underlying geology and groundwater levels	Low	No basement development proposed & FFLs set above existing ground levels.
Surface Water / Overland Flow	Runoff from surrounding elevated land.	Low	Small areas of the site shown to be at a medium to high risk of flooding. However areas of flood risk within the development parcels have been assessed in further detail using the topographic survey which shows surface water will not pond in these areas so they are at low risk but have been left undeveloped or soft landscaping anyway.
Infrastructure Failure	Surface water systems, water mains and reservoirs	Low	No

Table 4.1: Flood Risk Summary

5 Surface Water Drainage

Existing Surface Water Drainage

- 5.1 The proposed site is greenfield therefore has no formal drainage system. Rainfall on the permeable surfaces runs through the ground to the drainage ditches to Pellingford Brook.

Infiltration & Underlying Geology

- 5.2 The infiltration testing in accordance with BRE Digest 365 was undertaken at a number of locations across the site by Patrick Parsons in July 2024 (**Appendix E**). Following the infiltration testing Patrick Parsons have recommended a design infiltration rate of $1.25 \times 10^{-6} \text{m/s}$.
- 5.3 Groundwater was encountered at shallow depths in the centre and north-east of the site however this is considered to be perched groundwater. Deeper groundwater was encountered in the west of the site at 2.20m bgl which is considered to be more representative of groundwater levels.
- 5.4 A trial pit was dug in the location of the proposed basin down to a depth of 2m and no groundwater was encountered.
- 5.5 The above demonstrates that infiltration drainage is possible at the application site although the preliminary calculations identify it is not possible to achieve the required half drain down time of 24 hours by providing an infiltration basin alone.

Sustainable Drainage (SuDS) and Drainage Hierarchy

- 5.6 West Sussex County Council, as the Lead Local Flood Authority (LLFA), are predominantly concerned about the quantity, rate and quality of surface water run-off leaving the development site.
- 5.7 West Sussex County Council SuDS proforma has been completed and can be seen in **Appendix H**.
- 5.8 Sustainable Urban Drainage Systems (SuDS) are a range of techniques that aim to mimic the way rainfall drains in natural systems and so reduces the hydraulic and hydrological impact on the local area and downstream catchments. There are a number of options available to impose surface water restrictions on proposed development plots such as oversized sewers, below ground storage tanks, attenuation ponds and basins, swales, permeable paving, or infiltration systems.

5.9 To determine the most sustainable method of surface water disposal the hierarchy from approved document part H was used, see below:

- **An adequate soakaway or some other adequate infiltration system –**
 - o The Phase II Site Appraisal concluded that infiltration is feasible at the site however initial calculations demonstrate that it is not possible to achieve the required half drain down time of 24 hours by providing an infiltration basin alone.
- **A Watercourse –**
 - o A number of ditches run alongside the perimeter of the site boundary, which eventually discharge into the Pellingford Brook downstream via the existing interconnecting ditch network.
- **A Sewer –**
 - o The Southern Water sewer records (**Appendix F**) show that there are no existing public surface water sewers within close proximity of the site.

5.10 As the infiltration rates do not achieve the required half drain down time of 24hrs, it is proposed to adopt a hybrid system with partial infiltration and an overland flow outfall to the surrounding ditch network restricted to greenfield run-off rates.

Surface Water Disposal

5.11 A surface water drainage strategy has been undertaken for the site and can be seen in **Appendix I**.

5.12 The proposed SuDS features will reduce the rate of discharge by providing storage during heavy rainfall events, reducing the risk of flooding.

5.13 The rainwater downpipes from the buildings will drain into a piped system in the road which will follow the contours of the ground and flows towards the south of the site and into the basin.

5.14 The carparking areas/driveways will be constructed with permeable paving which will collect and store surface water falling onto these and the surrounding areas and discharge it into the piped network.

5.15 A 1.5m deep basin is proposed in the south of the site. The entire basin will be unlined to allow for infiltration losses and will be sufficient to discharge surface water runoff for the majority of rainfall events. There will be an overflow at 0.8m above the invert level of the basin which will allow the excess surface water to discharge overland to the surrounding ditch network at greenfield runoff rates via a flow control.

- 5.16 In order to provide a gravity outfall and avoid the RPAs and woodland buffer where possible, it is proposed to outfall the surface water via a shallow ditch/depression just upstream of the existing ditch network and allow surface water to travel overland through the woodland buffer and into the ditch.
- 5.17 The permeable paving and basin will provide surface water treatment before water is discharged from the site.
- 5.18 All infrastructure has been located outside of the buffer for the ancient woodland where possible.
- 5.19 Ordinary watercourse consent and any other appropriate permissions to discharge surface water into the surrounding drainage ditch network will be obtained at the detailed design stage if required.

Calculations & Results

- 5.20 The existing greenfield rates from the 1.735ha of positively drained area at the site have been calculated using the IH124 method in Causeway Flow, see below (for full calculations refer to **Appendix J**):
- Q1 years: 8.5l/s
 - Q30 years: 24.1l/s
 - Q100 years: 32.0l/s
 - QBar: 10.0l/s
- 5.21 When the basin is infiltrating for the lesser storm events, the discharge rates from the site will be restricted back to the infiltration rate of the underlying soils which is 1.25×10^{-6} m/s. When the water level in the basin reaches the overflow level of 0.8m, the excess water will be discharged from the site at a maximum rate of 10l/s.
- 5.22 The hybrid basin has been modelled in Causeway Flow which demonstrates that no flooding will occur for up to and including the 1in100yr+45% climate change event (**Appendix K**).
- 5.23 The CV values are set to 1, the MADD Factor has been set to 0 and a 10% increase for urban creep has been allowed for.

Exceedance Flows

- 5.24 In the event the capacity of the proposed surface water drainage network is exceeded, the excess water will follow the topography of the ground and flow overland and offsite to the south, into the surrounding ditch network, leaving properties unaffected.

Surface Water Treatment

5.25 Table 26.2 of the SuDS Manual identifies the pollution hazard level associated with the land uses within the Proposed Development as being 'Low'. On a scale from 0-1 a 'Low' pollution hazard level relates to the following pollution hazard indices (See table 26.2 of the SuDS Manual). This is applicable to residential development:

- Total Suspended Solids = 0.5
- Metals = 0.4
- Hydrocarbons = 0.4

5.26 Table 26.3 of the SuDS Manual sets out the indicative mitigation indices provided by different SuDS features for discharges to surface water.

Permeable Paving

5.27 Permeable paving will be used to construct the parking bays which will drain the parking areas and adjacent road enabling rainwater falling onto these areas to be treated by microorganisms while passing through the drainage medium, see Figure 5.1 below.

5.28 Permeable paving provides suitable pollution mitigation for runoff from low hazard land uses and provides mitigation indices of 0.7, 0.6, and 0.7, satisfying the requirements set out in para 5.25.

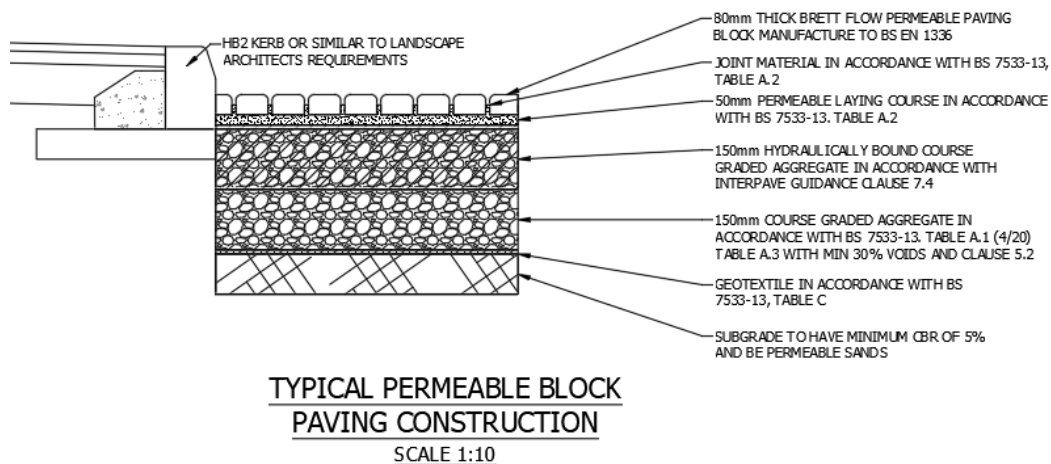


Figure 5.1: Typical Permeable Block Paving Construction

Basin

5.29 The basin provides surface water treatment primarily via the gravitational settling of particles.

5.30 Basins provide suitable pollution mitigation for runoff from low hazard land uses and provides pollution mitigation indices of 0.5, 0.5, and 0.6 which is in excess of the requirement set out in paragraph 5.25.

Adoption and Maintenance

- 5.31 The proposed surface water network will remain in private ownership and be maintained by a management company organised by the developer. This should enable tight control over the operation and maintenance of the drainage/SuDS systems on site.

Design Criteria

- 5.32 The positive drainage will be designed in accordance with Design and Construction Guidance, BS EN 752 – Drain and Sewer Systems Outside Buildings and the Building Regulations - Part H (2015).
- 5.33 The surface water network design and rate of surface water run-off is based on the Flood Estimation Handbook data downloaded from the FEH Web Services.
- 5.34 The positive surface water system would be designed such that:
- The pipes remain unsurcharged during the 1 in 1 year design storm;
 - The system should not flood during the worst case 1 in 30 year storm with a free outfall;
 - The surface water run-off from the proposed development would be contained on site for up to and including the worst case 1 in 100 year storm event, plus an additional 45% increase in peak rainfall intensity for climate change;
 - The pipe velocities are such that self-cleansing is achieved at lesser more moderate storm intensities: -
 - o Pipe roughness (ks) = 0.6
 - o Minimum pipe velocity at full flow = 0.75m/s
 - o Percentage Impermeable areas:
 - Buildings = 100%
 - Carriageways, footpaths and parking = 100%
 - Private and Communal Parking = 100%
 - Soft Landscaping = 0%

6 Foul Drainage

Existing Foul Drainage

- 6.1 As the site is greenfield, there is currently no discharge of foul effluent. Therefore, the topographic survey and sewer records did not record any drainage features, routes, or details regarding an existing foul drainage system within the site.
- 6.2 The Southern Water sewer records (**Appendix F**) show a 150mm public foul sewer along Lewes Road, A272, flowing from east to west.

Proposed Layout

- 6.3 It is proposed to discharge foul effluent from the development into the existing Southern Water foul sewer that runs in Lewes Rd on the northern edge of the site.
- 6.4 Based on a review of the Southern Water sewer records (**Appendix F**) and the Topographic Survey (**Appendix E**), it is likely that a pumped solution will be required.
- 6.5 The foul pump station has been designed adoptable standards as a Type 3, as per the Design and Construction Guidance, with access for a tanker and a 15m offset from all buildings.

Proposed Discharge Rates

- 6.6 The proposals are for up to 80 dwellings.
- 6.7 Using the Design and Construction Guidance calculation method for residential development, 4000 litres per dwelling per day, a peak flow of 3.70l/s will be generated:
- Peak flow: $(80 \times 4000) / 86,400 = 3.70 \text{ l/s}$
- 6.8 A capacity check will be submitted to Southern Water to confirm there is sufficient capacity within their network to accept the pumped foul flows from the development.
- 6.9 A section 106 application to connect will be made to Southern Water at the detailed design stage in order to gain permission to connect to the public sewer.

Design Criteria

- 6.10 The proposed foul sewers will be designed in accordance with the Design and Construction Guidance, BS EN 752 – Drain and sewer systems outside buildings and Building Regulations - part H (2015).

Adoption and Maintenance

- 6.11 The proposed foul network will remain in private ownership and be maintained by a management company organised by the developer. This should enable tight control over the operation and maintenance of the drainage systems on site.

7 Conclusion

- 7.1 The EA flood maps show the site is located in a low risk Flood Zone 1. There are small sections of the site that are shown to be at a medium to high risk of surface water flooding. However, the areas of flood risk within the development parcels have been assessed in further detail using the topographic survey which show that surface water will not pond in these areas. It will continue to fall south, offsite into the surrounding ditch network, so these areas are in fact at a low risk of flooding but have been left undeveloped or as soft landscaping anyway.
- 7.2 A summary of the flood risk to the site is provided in Table 7.1 below.

Flood Mechanism	Source	Flood Risk to the Development	Mitigation Required?
Fluvial	N/A	Low	No
Tidal	N/A	Low	No
Groundwater	Underlying geology and groundwater levels	Low	No basement development proposed & FFLs set above existing ground levels.
Surface Water / Overland Flow	Runoff from surrounding elevated land.	Low	Small areas of the site shown to be at a medium to high risk of flooding. However areas of flood risk within the development parcels have been assessed in further detail using the topographic survey which shows surface water will not pond in these areas so they are at low risk but have been left undeveloped or soft landscaping anyway.
Infrastructure Failure	Surface water systems, water mains and reservoirs	Low	No

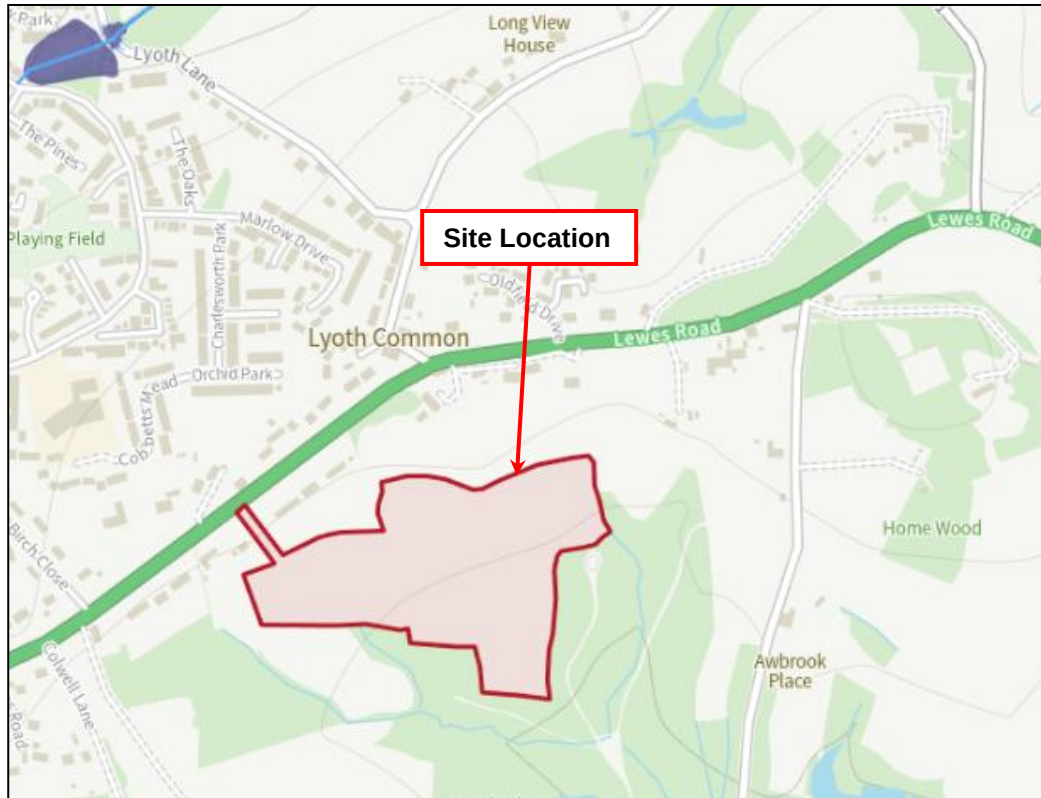
Table 7.1: Flood Risk Summary Table

- 7.3 It is proposed to discharge surface water via a hybrid solution with infiltration to ground and discharge overland to surrounding ditch network at a restricted rate via a SuDS system. The SuDS features will ensure excess water will be safely contained within the site boundary for all storm events up to and including the 1 in 100-year event plus 45% climate change.
- 7.4 Surface water treatment will be provided at the site via permeable paving and a basin.

- 7.5 In the event the capacity of the proposed surface water drainage network is exceeded, the excess water will follow the topography of the ground and flow overland and offsite to the south, into the surrounding ditch network, leaving properties unaffected.
- 7.6 It is proposed to discharge foul effluent from the development to the existing Southern Water foul sewer that runs in Lewes Rd to the north of the site. Due to the existing topography, a pumping station will be required to discharge foul effluent into the public sewer.
- 7.7 Therefore, having completed this Flood Risk Assessment and Drainage Strategy, the conclusion is that the proposed development at North Colwell Farm, can be safely drained without increasing the risk of flooding to downstream/surrounding areas.

APPENDIX A: EA Indicative Flood Map

ENVIRONMENT AGENCY FLOOD MAP
(June 2024)
North Colwell Farm, Haywards Heath



Mid Sussex District Council, Post code: RH17 7TB Co-ords: E535304, N123280

1. Floodplain

A floodplain is the area that would naturally be affected by flooding if a river rises above its banks, or high tides and stormy seas cause flooding in coastal areas.

There are two different kinds of area shown on the Flood Map. They can be described as follows:

- **Flood Zone 3**  shows the area that could be affected by flooding, either from rivers or the sea, if there were no flood defences. This area could be flooded:
 - from the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year;
 - or from a river by a flood that has a 1% (1 in 100) or greater chance of happening each year.
- **Flood Zone 2**  shows the additional extent of an extreme flood from rivers or the sea. These outlying areas are likely to be affected by a major flood, with up to a 0.1% (1 in 1000) chance of occurring each year.

These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements.

- Where there is no blue shading, this shows the area where flooding from rivers and the sea is very unlikely. There is less than a 0.1% (1 in 1000) chance of flooding occurring each year.

2. Flood Defences

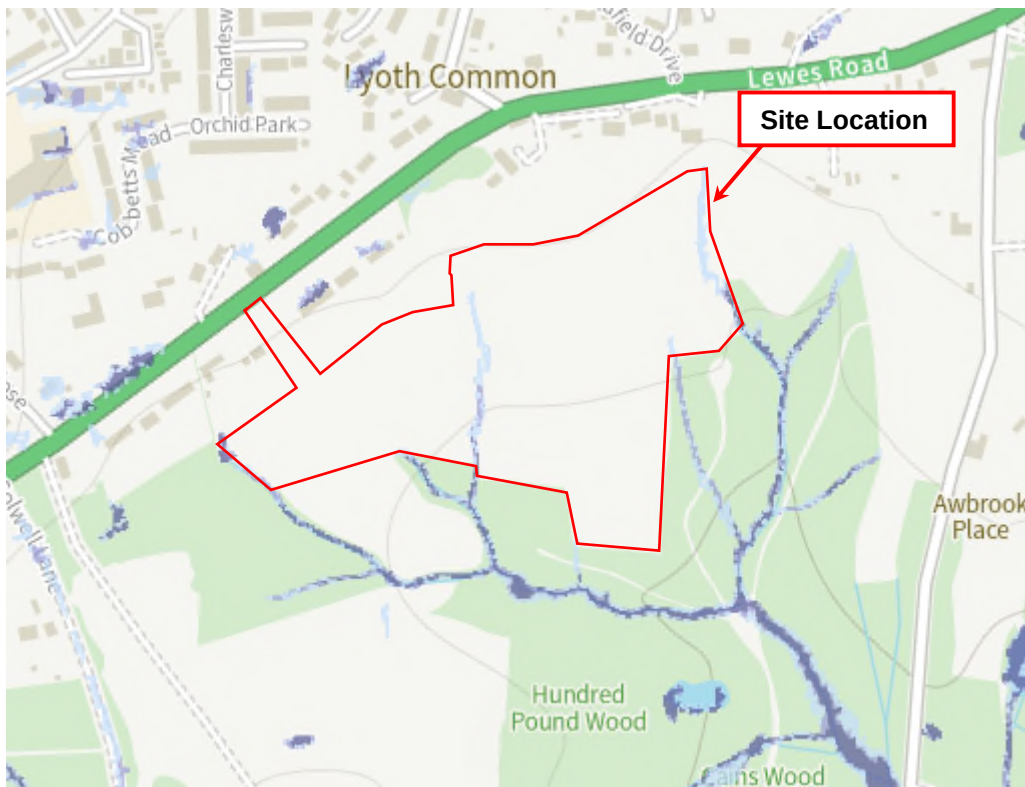
- The purple line  shows all flood defences built in the last five years to protect against river floods with a 1% (1 in 100) chance of happening each year, or floods from the sea with a 0.5% (1 in 200) chance of happening each year, together with some, but not all, older defences and defences which protect against smaller floods. Flood defences that are not yet shown, and the areas that benefit from them, will be gradually added.
- Hatched areas  benefit from the flood defences shown, in the event of a river flood with a 1% (1 in 100) chance of happening each year, or a flood from the sea with a 0.5% (1 in 200) chance of happening each year. If the defences were not there, these areas would be flooded.

3. Main Rivers

The blue line  shows the main rivers, these are usually larger streams and rivers.

APPENDIX B: EA Surface Water Flood Risk Map

ENVIRONMENT AGENCY SURFACE WATER FLOOD MAP
(February 2025)
North Colwell Farm, Haywards Heath



Mid Sussex District Council, Post code: RH17 7TB Co-ords: E535304, N123280

Risk of Flooding from Surface Water

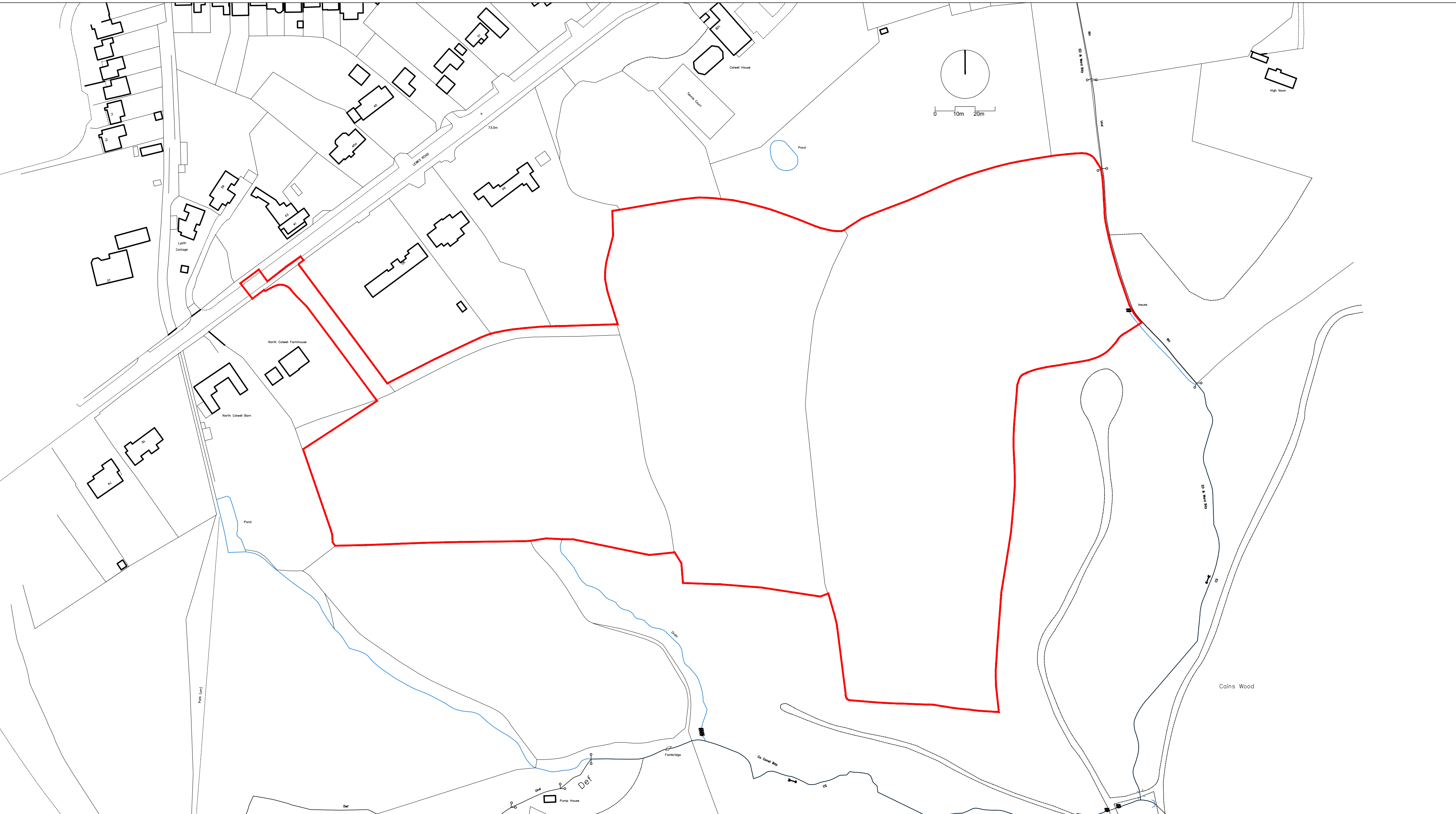
Surface water flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead.

The shading on the map shows the yearly chance of flooding from surface water between 2040 and 2060 in this particular area.

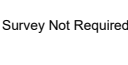
There are four different kinds of area shown on the Flood Map. They can be described as follows:

-  High Risk Area – Each year this area has a greater than 1in30 (3.3%) chance of flooding from surface water:
-  Medium Risk Area – Each year this area has between a 1in100 and a 1in30 (1%-3.3%) chance of experiencing flooding from Surface Water:
-  Low Risk Area – Each year this area has a between a 1in1000 and 1in100 (0.1%-1%) chance of experiencing flooding from Surface Water.
-  Very Low Risk Area – Each year this area has a less than 1in1000 (0.1%) chance of experiencing flooding from Surface Water.

APPENDIX C: Site Location Plan



APPENDIX D: Topographic Survey

[illegible]

Topographical Surveys

Trees are drawn to scale showing the average canopy spread. Description heights should be used as a guide only.

All building names, descriptions, number of storeys, construction type and roof line details are indicative only and taken externally from ground level.

All below ground details including drainage, voids and services have been identified from above ground and therefore all details relating to these features including; sizes, depth, description etc will be approximate only. All critical dimensions and connections should be checked and verified prior to start

Detail, services and features may not have been surveyed if obstructed or reasonably visible at the time of the survey.

Surveyed physical features may not necessarily represent the legal boundary line.

Measured Building Surveys

Measurements to internal walls are taken to the wall finishes at approx. 1m above the floor level and the wall assumed to be vertical.

Cill heights are measured as floor to the cill and head heights are measured from cill to the top of window.

General

The contractor must check and verify all site and building dimensions, level, utilities and drainage details and connections prior to commencing work. Any errors or discrepancies must be notified to Survey Solutions immediately.

The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

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Do not scale from this drawing.

SURVEY GRID AND LEVEL DATUM

The coordinate system established for this survey is related to Ordnance Survey (OS) national grid at a single point using Smartnet, then orientated to grid north with a scale factor of 1.000.

The level datum established for this survey is related to Ordnance Survey (OS) using GPS Smartnet.

To avoid discrepancies any coordinated data used in conjunction with this survey must be derived directly from this control data.

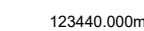


SURVEY SOLUTIONS

**LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING**

0845 040 5969
survey-solutions.co.uk

IPSWICH BEDFORD COVENTRY GLASGOW LONDON MANCHESTER NORWICH

[illegible]

Topographical Surveys

All building names, descriptions, number of storeys, construction type and roof line details are indicative only and taken externally from ground level.

Detail, services and features may not have been surveyed if obstructed or reasonably visible at the time of the survey.

Measured Building Surveys

Measurements to internal walls are taken to the wall finishes at approx. 1m above the floor level and the wall assumed to be vertical.

General

The contractor must check and verify all site and building dimensions, level, utilities and drainage details and connections prior to commencing work.

The survey control listed is only to be used for topographical surveys at the stated scale. All control must be checked and verified prior to use.

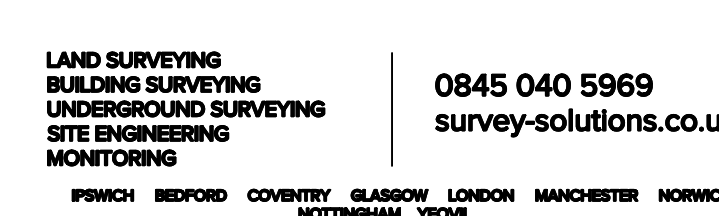
Do not scale from this drawing

SURVEY GRID AND LEVEL DATUM

The coordinate system established for this survey is related to Ordnance Survey (OS) national grid at a single point using Smartnet, then orientated to grid north with a scale factor of 1.000.

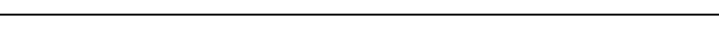
The level datum established for this survey is related to Ordnance Survey (OS) using GPS Smartnet.

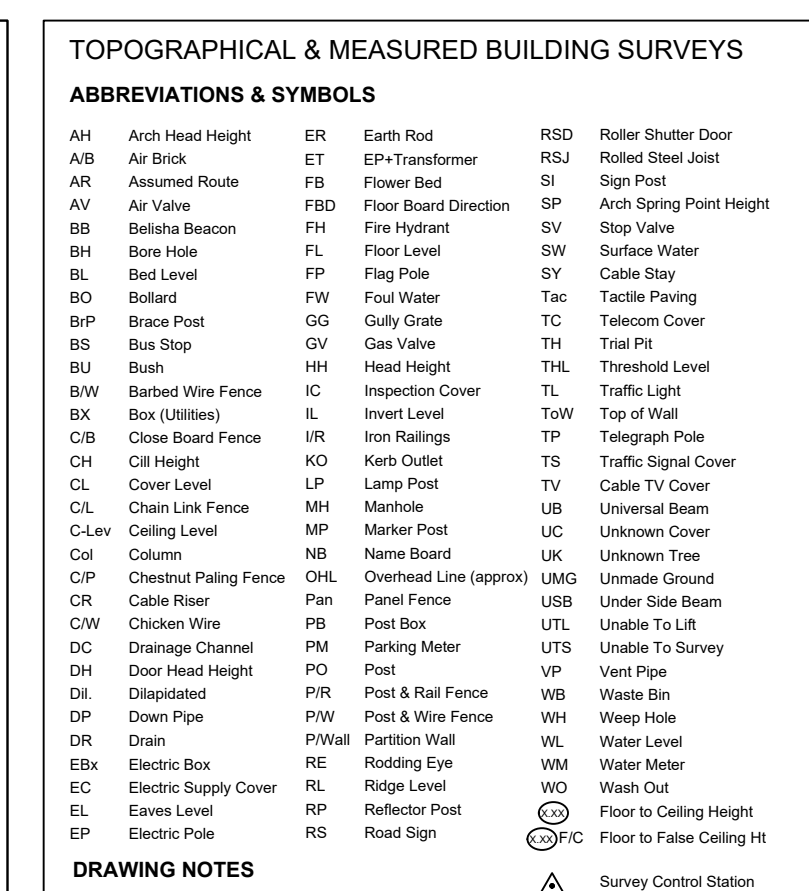
To avoid discrepancies any coordinated data used in conjunction with this s must be derived directly from this control data.



DRAWING DETAIL
TOPOGRAPHICAL SURVEY

SURVEYOR AK	SURVEY DATE 06/12/2023	CHECKED BY MS	APPROVED BY ADK	DWG ST FINAL
DRAWING NUMBER 62713BWLS-05			REVISION	ISSUE D 12/12/





All building names, descriptions, number of storeys, construction type including roof line details are indicative only and taken externally from ground level.

All below ground details including drainage, voids and services have been identified from above ground and therefore all details relating to these features including; sizes, depth, description etc will be approximate only. All critical dimensions and connections should be checked and verified prior to starting work.

Measured Building Surveys

Measurements to internal walls are taken to the wall finishes at approx. 1m above the floor level and the wall assumed to be vertical.

Cill heights are measured as floor to the cill and head heights are measured from cill to the top of window.

General

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work. Any errors or discrepancies must be notified to Survey Solutions immediately.

The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

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Do not scale from this drawing.

SURVEY GRID AND LEVEL DATUM

The coordinate system established for this survey is related to Ordnance Survey (OS) national grid at a single point using Smartnet, then orientated to grid north with a scale factor of 1.000.

The level datum established for this survey is related to Ordnance Survey (OS) using GPS Smartnet.

To avoid discrepancies any coordinated data used in conjunction with this survey

must be derived directly from this control data.



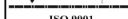
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APPENDIX E: Phase II Site Appraisal Extracts

2.0 Summary of Phase I Site Appraisal

The following is a summary of the findings of the Phase I Site Appraisal Report undertaken by PP in December 2023 and should not be read in isolation. For full details reference should be made to the report outlined in section 1.5.

- The site is an irregularly shaped parcel of land comprising three undeveloped fields lined with semi mature and mature trees. The site comprises grassed and roughly vegetated fields which slope gently towards the south. Shallow streams run along the north to south field boundaries and flow towards the south. The site is approximately 6.32ha in size and is located approximately 2.3km southeast of Haywards Heath town centre, centred at OS grid reference 535320, 123292. The nearest postcode is RH17 7SX.
- The site is bound by a wood adjacent to its southern boundary. A wood and an undeveloped field are located on the eastern boundary. Residential properties with gardens are located on the northern boundary. Immediately to the west of the site is a residential property with a garden. The immediate surrounding area for the most part is residential properties to the north and undeveloped fields and wooded areas to the east, south and west.
- Historical mapping indicates the site to have comprised tree lined fields since 1874 with no significant changes recorded.
- The site has been classified as low risk of UXO. As such no further mitigation measures are considered to be required.
- There are no recorded superficial deposits below the site. The bedrock geology beneath the site is recorded to comprise the Upper Tunbridge Wells Sand (interbedded sandstone and siltstone). There are no records of superficial deposits, artificial ground or Made Ground recorded near the site. There are no recorded BGS boreholes present on or within 250m of the site.
- There are 5no. records of BritPits within 500m of the site, the nearest record being 255m south of the site for 'Cains Wood Pit'. There are 5no. records of surface ground workings within 250m of the site, all records relate to ponds, the closest being 108m southeast of the site.
- The site is not within a Radon Affected Area, as less than 1% of properties are above the action level; as such, radon protection measures are not required for new properties.
- The bedrock aquifer is recorded as a Secondary (A) Aquifer. There are 2no. records of groundwater abstractions within 2000m of the site. The nearest is for a historical licence 939m south of the site from a well at Home Farm, Slugwash.
- The site is not located within a Source Protection Zone (SPZ).
- There are 15no. surface water features recorded within 250m of the site. The closest record being an inland river mapped on site. The site is not recorded to be in a Flood Zone 2 or Flood Zone 3.
- There are 17no. recorded historical industrial land uses within 500m of the site. The closest record is for a Nursery located 87m northwest of the site present from 1961-1973. Additional records include pits, unspecified heaps, and a boathouse.
- There are 8no. records of historical tanks within 500m of the site. The nearest is an unspecified tank first recorded 116m west of the site in 1897.
- There are 5no. records of historical energy features recorded within 500m of the site. All records relate to electricity substations, the most pertinent record dating from 1994 for an electricity substation, located 124m southwest of the site.
- There are 2no. records of recent industrial land use within 250m of the site. The nearest record is located 124m southwest of the site relating to a pump house.

- There are 5no. records of licensed discharges to controlled waters within 500m of the site. The nearest is a historical license located 201m north of the site at Oldfield, Lyoth Lane, Haywards Heath and is for sewage discharges.

No specific contaminants of concern were expected to be present on-site due to the site being used as an undeveloped field for over 140 years. However, general contaminants of concern are likely to include heavy metals, polyaromatic hydrocarbons (PAHs) and asbestos.

4.0 Phase II Ground Investigation

4.1 Fieldwork

The ground investigation (including fieldwork, sampling and laboratory analysis) has been designed to identify and assess potential ground related problems and to allow cost-effective solutions to be advised. It has been planned based on the desk study. All fieldwork and soil descriptions were carried out in general accordance with relevant British Standards.

The exploratory holes have been positioned to determine the general ground/groundwater conditions below the site, with representative samples obtained for geotechnical and environmental laboratory analysis. The resultant exploratory hole density is considered to be appropriate with the complexity of the site conditions revealed in the desk study and detail of information required for this phase of the investigation.

The ground investigation was undertaken on the 26th, 29th and 30th April and the 28th, 29th and 30th May 2024 and comprised a total of 10no. machine excavated trial pits (3no. installed as soakaway tests) to a maximum depth of 2.50m below existing ground level (begl) (TP03 and TP05), and 6no. window sample boreholes to a maximum depth of 2.00m begl.

The exploratory hole location plan and exploratory hole logs are presented in Appendix B.

4.2 Ground Conditions

Topsoil was encountered in all exploratory holes across the site, typically comprising soft brown silty clay with rootlets throughout and to depths of between 0.30m and 0.50m begl.

The topsoil is underlain by weathered bedrock deposits of firm orangish brown silty sandy clay. The sand within this unit is fine.

Weathered deposits of the Upper Tunbridge Wells Sand were encountered at depths of between 0.30m (SA01-03, TP04, TP05, WS01, WS02, WS03, WS04 and WS06) and 2.20m begl (TP03).

These weathered soils become stiff to very stiff light yellowish brown sandy gravelly silt with gravel sized lithorelicts of siltstone and sandstone.

SPT N-60 values within the weathered deposits of Upper Tunbridge Well Sand were between 9 and 50 at 1.00m begl and were 50 at 2.00m begl.

In-situ hand shear vane tests were undertaken in the weathered bedrock geology. Readings of between 30-40kPa were recorded in shallower soils at TP03, TP04 and TP05. TP03 recorded soft silty sandy clay (30kPa) at greater depths of up to 2.00m begl. All other locations recorded shear values of between 60-90 kPa at approximately 2.00m begl.

An extremely weak light yellowish brown and light grey siltstone was encountered at the base of the window sample locations between depths of 1.0m and 2.0m begl resulting in SPT refusals at these depths.

4.3 Groundwater

Groundwater ingress was encountered during the investigation within three exploratory hole locations SA01, TP01 and TP03 at depths of between 0.60m begl (TP03) and 2.30m begl (SA01).

4.4 Contamination Observations

No visual or olfactory evidence of contamination was identified during the ground investigation.

4.5 Chemical Analysis

Chemical laboratory analyses were selected to provide the parameters necessary to assess the suitability for the re-use of soils on the site as well as to inform risk assessment for site end users and controlled waters receptors. The choice of analysis was based on the commonly occurring potential contaminants as identified within the Phase I Site Appraisal and on-site visual observations of soils. The chemical analysis results from the investigation are presented in Appendix D and E respectively. In summary the following testing has been completed:

- 7no. soil samples for a general suite of contaminants - metals, inorganics, speciated polyaromatic hydrocarbons and asbestos.

4.6 Geotechnical Testing

Geotechnical testing has been undertaken as part of the ground investigation to provide the parameters necessary for the preliminary design of the development. The geotechnical test results are presented in Appendix E. In summary the following testing has been completed:

- 4no. for Atterberg limit tests.
- 4no. for pH and water-soluble sulphate.
- 3no. for California Bearing Ratio.

7.0 Controlled Waters Risk Assessment

7.1 Risk Assessment

The ground investigation has not identified any significant Made Ground or grossly contaminated soils. As such no significant source has been identified.

The bedrock geology of the Upper Tunbridge Wells Sand is recorded to be a Secondary A Aquifer, however, the site is not recorded to be within a Source Protection Zone and the closest active groundwater abstraction is, located 1723m to the southwest of the site.

There are 15no. surface water features recorded within 250m of the site. The nearest is an unnamed stream on site.

Groundwater ingress was encountered during the investigation at shallow depths in TP03 and SA02 and is considered likely to be perched groundwater. Deeper groundwater was encountered in SA01 at 2.20m bgl within the weathered bedrock which is considered to be representative of groundwater levels.

For controlled waters, the primary receptors are considered to be the Secondary A Aquifer (bedrock geology) and the streams on site. The aquifer has been determined to be of low sensitivity given the site is not in a Source Protection Zone and the nearest abstraction is over 1500m from the site.

The primary pathways would be through infiltration and leaching of potential contaminants to groundwater and migration within the groundwater. Given the predominantly cohesive soils, however permeability and infiltration is likely to be limited.

Given that Made Ground has not been recorded on the site and no contamination has been recorded, it is considered that there is no plausible source. The pathway is restricted by low permeability soils and the receptors are also considered to be of low sensitivity. The risk to controlled waters receptors is therefore considered to be negligible.

11.3 New Access Roads and Car Parking

The proposed development includes parking areas and access roads. Based off the laboratory CBR testing that has been carried out. CBR values of between 3.7% and 21% were recorded, as such a design CBR value of 3% should be achievable. The above CBR values should be verified by in-situ testing at formation level.

11.4 Soakaway Drainage Tests

Soakaway testing was carried out within SA01, SA02, and SA03 in accordance with BRE365.

Location	Test 1 Infiltration rate	Test 2 Infiltration rate	Test 3 Infiltration rate
SA01	1.25×10^{-6} m/s	3.12×10^{-6} m/s	3.30×10^{-6} m/s
SA03	1.35×10^{-6} m/s	1.43×10^{-6} m/s	-
SA02	FAILED	-	-

Location SA02 did not successfully drain 75% total head of water during the 24-hour test period and as such failed in accordance with BRE365.

Overall, it is considered that based on the above, a preliminary design infiltration rate of 1.25×10^{-6} m/s should be assumed for the soils where excess surface water will be discharged into in the southeast and southwest of the site based on the results from SA01 and SA03.

11.5 Slope Stability

Based on the current site gradients it is considered that a slope stability assessment will not need to be undertaken. Subject to confirmation of final levels and gradients.

11.6 Retaining Structures

Given the existing topography in the areas of proposed development it is considered that retaining structures are likely to be required to create level development plateaus. Should retaining structures be required they should be designed by a suitably qualified structural engineer.

12.0 Further Investigation

Based on the ground conditions encountered in the site investigation it is considered that some further works may be required.

- Completion of the gas and groundwater monitoring programme.
- Validation testing of site topsoil for re-use in private gardens and soft landscaping.

Following review of this report a copy of it should be submitted to the Local Authority planning department prior to any development works as this is often a condition of planning.



Site
**LAND AT NORTH COLWELL
FARM, HAYWARDS HEATH**

Drawing
Concept masterplan

Scale
NTS

Date
11.11.19

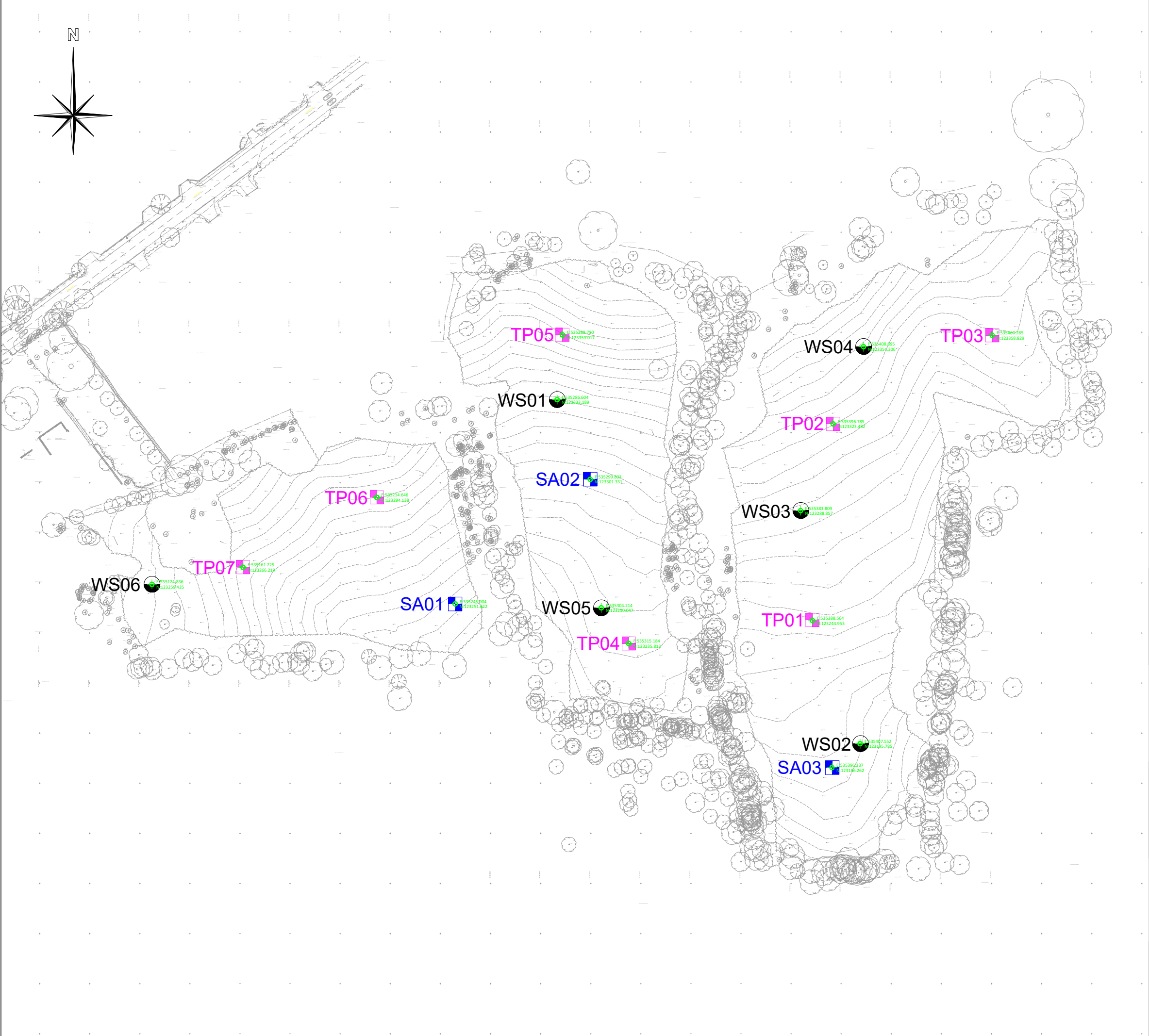
drawing ref 1293.03

KEY

 Site boundary

MASTERPLAN COMPONENTS

- 1** Proposed new vehicular access from Lewes Road with hedgerow replaced if required, to allow for visibility splays.
- 2** Additional planting to protect amenity of existing housing and the setting of the Conservation Area
- 3** Landscape buffer to protect the setting of the Conservation Area and North Colwell House (Grade II)
- 4** Additional planting to contain extent of built up area and parish boundary
- 5** 20m minimum buffer to ancient woodland to the south of the site
- 6** Open sustainable drainage feature
- 7** Existing field boundaries retained to provide ecological links
- 8** Low density housing adjacent to the Conservation Area and in the more elevated parts of the site
- 9** Medium density housing in the lower parts of the site
- 10** Additional landscape planting within the site to enhance the landscape character
- 11** Area of low density development to maintain the setting of the Conservation Area with additional planting to maintain views from Lewes Road.
- 12** Potential location for Childrens Play Area , if required.



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- Window Sample
- Soakaway
- Trial Pit

P1	INITIAL ISSUE.					
	AAA	11.11.11	AAA	11.11.11	AAA	11.11.11
REV.	REVISION NOTE/COMMENT					
	DRW BY	DATE	CCK BY	DATE	APP BY	DATE



40 St. Paul's Square
Birmingham
B3 1FQ
United Kingdom

T. +44 (0)121 592 0000
E. info@patrickparsons.co.uk
W. www.patrickparsons.co.uk

Client
MILLER HOMES

Project
LEWES ROAD, HAYWARDS
HEATH

Drawing
EXPLORATORY HOLE LOCATION
PLAN

Drawn RFH	Date 24.04.24
Patrick Parsons Project No. 12066	Scale @ A3 NTS

Status Description CONSTRUCTION RECORD	CR
Drawing No. (project-originator-volume-level-type-role-number) HHL-PPC-00-XX-DR-G-704	Revision P1

				Trial Pit Log			TrialPit No SA01 Sheet 1 of 1	
Project Name: Lewes Road, Haywards Heath				Project No. 12066		Co-ords: 535245.90 - 123251.62 Level: 59.75		Date
Location: Haywards Heath						Dimensions (m): 2.00		Scale 1:25
Client: Miller Homes						Depth 2.30		Logged RFH
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	59.45		TOPSOIL: Grass over soft brown silty clay. Rootlets throughout.	
							Firm orangish reddish brown silty sandy CLAY. Sand is fine. (WEATHERED UPPER TUNBRIDGE WELLS SAND)	
				1.30	58.45		Light yellowish brown sandy gravelly SILT. Sand is fine. Gravel is subangular lithorelic pieces of siltstone and sandstone. (UPPER TUNBRIDGE WELLS SAND)	
				2.30	57.45		End of Pit at 2.30m	
							1	
							2	
							3	
							4	
							5	
Remarks: 1) Trial pit scanned with a CAT and genny before excavation. 2) No groundwater encountered. 3) Trial pit backfilled with 20mm gravel to allow future soakaway testing.								
Stability: Stable								

				Trial Pit Log			Trial Pit No SA02 Sheet 1 of 1	
Project Name: Lewes Road, Haywards Heath				Project No. 12066		Co-ords: 535299.80 - 123301.33 Level: 60.72		Date
Location: Haywards Heath						Dimensions (m): 2.00		Scale 1:25
Client: Miller Homes						Depth 1.50		Logged RFH
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	60.42		TOPSOIL: Grass over soft brown silty clay. Rootlets throughout.	
				0.50	60.22		Firm orangish brown silty sandy CLAY. Sand is fine.	
							(WEATHERED UPPER TUNBRIDGE WELLS SAND) Light yellowish brown sandy gravelly SILT. Sand is fine. Gravel is subangular lithorelic pieces of siltstone and sandstone.	
				1.50	59.22		(UPPER TUNBRIDGE WELLS SAND)	
							End of Pit at 1.50m	
1 2 3 4 5								
Remarks: 1) Trial pit scanned with a CAT and genny before excavation. 2) No groundwater encountered. 3) Trial pit backfilled with 20mm gravel to allow future soakaway testing.								
Stability: Stable								

				Trial Pit Log			Trial Pit No SA03 Sheet 1 of 1	
Project Name: Lewes Road, Haywards Heath				Project No. 12066		Co-ords: 535396.34 - 123186.26 Level: 56.40		Date
Location: Haywards Heath						Dimensions (m): 2.00		Scale 1:25
Client: Miller Homes						Depth 2.00		Logged RFH
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	56.10		TOPSOIL: Grass over soft brown silty clay. Rootlets throughout.	
				1.00	55.40		Firm orangish brown silty sandy CLAY. Sand is fine. (WEATHERED UPPER TUNBRIDGE WELLS SAND)	
							Light yellowish brown sandy gravelly SILT. Sand is fine. Gravel is subangular lithorelic pieces of siltstone and sandstone. (UPPER TUNBRIDGE WELLS SAND)	
							End of Pit at 2.00m	
2.00	54.40							
Remarks: 1) Trial pit scanned with a CAT and genny before excavation. 2) No groundwater encountered. 3) Trial pit backfilled with 20mm gravel to allow future soakaway testing. Stability: Stable								

				Trial Pit Log			TrialPit No TP01 Sheet 1 of 1	
Project Name: Lewes Road, Haywards Heath				Project No. 12066		Co-ords: 535388.56 - 123244.95 Level: 58.40		Date
Location: Haywards Heath						Dimensions (m): 2.00		Scale 1:25
Client: Miller Homes						Depth 2.00		Logged RFH
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.30	ES	HVP=60	0.40	58.00		TOPSOIL: Grass over soft brown silty clay. Rootlets throughout.	
	0.50	D					Firm orangish brown silty sandy CLAY. Sand is fine. (WEATHERED UPPER TUNBRIDGE WELLS SAND)	
	1.00							
	1.20	D					Light yellowish brown sandy gravelly SILT. Sand is fine. Gravel is subangular lithorelic pieces of siltstone and sandstone. (UPPER TUNBRIDGE WELLS SAND)	
	2.00	D		2.00	56.40		End of Pit at 2.00m	
Remarks: 1) Trial pit scanned with a CAT and genny before excavation. 2) No groundwater encountered. 3) Trial pit backfilled with arisings upon completion.								
Stability: Stable								

Trial Pit Log

TrialPit No

TP02

Sheet 1 of 1

Project Name: Lewes Road, Haywards Heath

Project No.
12066

Co-ords: 535396.79 - 123323.48
Level: 62.00

Date

Location: Haywards Heath

Dimensions (m): 2.00

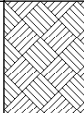
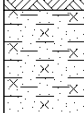
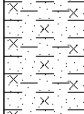
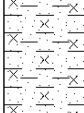
Scale
1:25

Client: Miller Homes

Depth
1.70

0.60

Logged
RFH

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.60	B	HVP=75	0.40	61.60		TOPSOIL: Grass over soft brown silty clay. Rootlets throughout.	
	1.00						Firm orangish brown and grey silty sandy CLAY. Sand is fine. (WEATHERED UPPER TUNBRIDGE WELLS SAND)	
	1.20	D					Becoming stiff.	1
	1.60	D		1.50	60.50		Stiff orangish brown and grey silty CLAY.	
				1.65	60.35		(WEATHERED UPPER TUNBRIDGE WELLS SAND)	
				1.70	60.30		Light yellowish brown sandy gravelly SILT. Sand is fine. Gravel is subangular lithorelic pieces of siltstone and sandstone. (UPPER TUNBRIDGE WELLS SAND) End of Pit at 1.70m	2
								3
								4
								5

Remarks: 1) Trial pit scanned with a CAT and genny before excavation. 2) No groundwater encountered. 3) Trial pit backfilled with arisings upon completion.

Stability: Stable



Project Name: Lewes Road, Haywards Heath

Project No.
12066

Co-ords: 535460.29 - 123358.83
Level: 61.75

Date

Location: Haywards Heath

Dimensions (m): 2.00

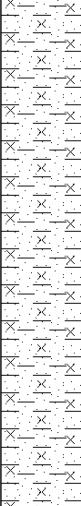
Scale
1:25

Client: Miller Homes

Depth
2.50

0.60

Logged
RFH

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
▼				0.50	61.25		TOPSOIL: Grass over soft brown silty clay. Rootlets throughout.	
	0.90 1.00	D	HVP=30				Soft orangish brown silty sandy CLAY. Sand is fine. (WEATHERED UPPER TUNBRIDGE WELLS SAND)	1
	2.00		HVP=30					2
	2.30	D		2.20	59.55		Light yellowish brown sandy gravelly SILT. Sand is fine. Gravel is subangular lithorelic pieces of siltstone and sandstone.	
				2.50	59.25		(UPPER TUNBRIDGE WELLS SAND) End of Pit at 2.50m	3
								4
								5

Remarks: 1) Trial pit scanned with a CAT and genny before excavation. 2) No groundwater encountered. 3) Trial pit backfilled with arisings upon completion.

Stability: Stable

				Trial Pit Log			TrialPit No TP04 Sheet 1 of 1	
Project Name: Lewes Road, Haywards Heath				Project No. 12066		Co-ords: 535315.18 - 123235.81 Level: 58.60		Date
Location: Haywards Heath						Dimensions (m): 2.00		Scale 1:25
Client: Miller Homes						Depth 1.50		Logged RFH
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	ES	HVP=30	0.30	58.30		TOPSOIL: Grass over soft brown silty clay. Rootlets throughout.	
	0.50						Soft orangish brown silty sandy CLAY. Sand is fine. (WEATHERED UPPER TUNBRIDGE WELLS SAND)	
	1.00	B	1.00	57.60		Light yellowish brown sandy gravelly SILT. Sand is fine. Gravel is subangular lithorelic pieces of siltstone and sandstone. (UPPER TUNBRIDGE WELLS SAND)		
			1.50	57.10		End of Pit at 1.50m		
								1
								2
								3
								4
								5
Remarks: 1) Trial pit scanned with a CAT and genny before excavation. 2) No groundwater encountered. 3) Trial pit backfilled with arisings upon completion.								
Stability: Stable								

				Trial Pit Log			Trial Pit No TP05 Sheet 1 of 1	
Project Name: Lewes Road, Haywards Heath				Project No. 12066		Co-ords: 535288.75 - 123359.02 Level: 66.00		Date
Location: Haywards Heath						Dimensions (m): 2.00		Scale 1:25
Client: Miller Homes						Depth 2.50		Logged RFH
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	65.70		TOPSOIL: Grass over soft brown silty clay. Rootlets throughout.	
	0.50		HVP=30				Soft orangish brown silty sandy CLAY. Sand is fine. (WEATHERED UPPER TUNBRIDGE WELLS SAND)	
	0.70 0.70	D	HVP=70				<i>Becoming stiff.</i>	
	1.20	D						
				2.00	64.00		Light yellowish brown sandy gravelly SILT. Sand is fine. Gravel is subangular lithorelic pieces of siltstone and sandstone. (UPPER TUNBRIDGE WELLS SAND)	
			2.50	63.50		End of Pit at 2.50m		
Remarks: 1) Trial pit scanned with a CAT and genny before excavation. 2) No groundwater encountered. 3) Trial pit backfilled with arisings upon completion.								
Stability: Stable								

				Trial Pit Log			Trial Pit No TP06 Sheet 1 of 1	
Project Name: Lewes Road, Haywards Heath				Project No. 12066		Co-ords: 535214.65 - 123294.14 Level: 64.00		Date
Location: Haywards Heath						Dimensions (m): 2.00 		Scale 1:25
Client: Miller Homes						Depth 2.00		Logged RFH
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.50		HVP=70	0.35	63.65		TOPSOIL: Grass over soft brown silty clay. Rootlets throughout.	
	1.00		HVP=90				Stiff orangish brown silty sandy CLAY. Sand is fine. (WEATHERED UPPER TUNBRIDGE WELLS SAND)	
	1.30	D		1.20	62.80		Light yellowish brown sandy gravelly SILT. Sand is fine. Gravel is subangular lithorelic pieces of siltstone and sandstone.	
	1.50	D					(UPPER TUNBRIDGE WELLS SAND)	
				2.00	62.00		End of Pit at 2.00m	
1 2 3 4 5								
Remarks: 1) Trial pit scanned with a CAT and genny before excavation. 2) No groundwater encountered. 3) Trial pit backfilled with arisings upon completion.								
Stability: Stable								

Trial Pit Log

Trial Pit No

TP07

Sheet 1 of 1

Project Name: Lewes Road, Haywards Heath

Project No.
12066

Co-ords: 535161.23 - 123266.22
Level: 64.47

Date

Location: Haywards Heath

Dimensions (m): 2.00

Scale
1:25

Client: Miller Homes

Depth
2.20

0.60

Logged
RFH

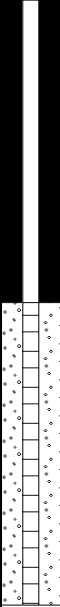
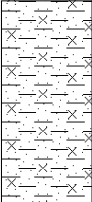
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
							TOPSOIL: Grass over soft brown silty clay. Rootlets throughout.	
	0.60	B		0.50	63.97		Firm orangish brown silty sandy CLAY. Sand is fine. (WEATHERED UPPER TUNBRIDGE WELLS SAND)	
	1.00		HVP=65				Becoming stiff.	1
	1.30	D						
	2.00 2.00	D	HVP=80	2.10 2.20	62.37 62.27		Light yellowish brown sandy gravelly SILT. Sand is fine. Gravel is subangular lithorelic pieces of siltstone and sandstone. (UPPER TUNBRIDGE WELLS SAND) End of Pit at 2.20m	2
								3
								4
								5

Remarks: 1) Trial pit scanned with a CAT and genny before excavation. 2) No groundwater encountered. 3) Trial pit backfilled with arisings upon completion.

Stability: Stable



				Borehole Log				Borehole No. WS01 Sheet 1 of 1	
Project Name: Lewes Road, Haywards Heath				Project No. 12066		Co-ords: 535287E - 123333N		Hole Type WS	
Location: Haywards Heath				Level: 63.00		Scale 1:25		Logged By RFH	
Client: Miller Homes				Dates:					

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.30	63.00	 TOPSOIL: Grass over soft brown silty clay. Rootlets throughout.	1	
							 Soft brown silty sandy CLAY. Sand is fine. (WEATHERED UPPER TUNBRIDGE WELLS SAND)		
		0.80	D						
		1.00	SPT	N=9 (2,2/2,3,2,2)			 <u>Becoming firm.</u>		
					1.30	62.70	 Stiff orangish brown and grey silty CLAY. (WEATHERED UPPER TUNBRIDGE WELLS SAND)		
		1.70	D						
		2.00	SPT	N=50 (8,9/10,12,16,12)	1.95 2.00	61.70 61.05	 Stiff light yellowish brown sandy gravelly SILT. Sand is fine. Gravel is subangular lithorelic pieces of siltstone and sandstone. Becomes very weak SILTSTONE at 2.00m begl. (UPPER TUNBRIDGE WELLS SAND) End of Borehole at 2.00m	2	
								3	
								4	
								5	

Remarks

1) Borehole scanned with a CAT and genny and service avoidance pit dug before drilling. 2) No groundwater encountered. 3) Borehole installed with monitoring well upon completion.



				Borehole Log			Borehole No. WS02 Sheet 1 of 1			
Project Name: Lewes Road, Haywards Heath				Project No. 12066		Co-ords: 535408E - 123196N		Hole Type WS		
Location: Haywards Heath				Level: 56.00		Scale 1:25		Logged By RFH		
Client: Miller Homes				Dates:						
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.10	ES		0.30	56.00		TOPSOIL: Grass over soft brown silty clay. Rootlets throughout.		
								Firm orangish brown silty sandy CLAY. Sand is fine. (WEATHERED UPPER TUNBRIDGE WELLS SAND)		
		0.70	D							
		1.00	SPT	50 (20,20/50 for 190mm)	0.95 1.00	55.70 55.05		Stiff light yellowish brown sandy gravelly SILT. Sand is fine. Gravel is subangular lithorelic pieces of siltstone and sandstone. Becomes very weak SILTSTONE at 1.00m begl. (UPPER TUNBRIDGE WELLS SAND) End of Borehole at 1.00m		
Remarks 1) Borehole scanned with a CAT and genny and service avoidance pit dug before drilling. 2) No groundwater encountered. 3) Borehole installed with monitoring well upon completion.										

				Borehole Log			Borehole No. WS03 Sheet 1 of 1		
Project Name: Lewes Road, Haywards Heath				Project No. 12066		Co-ords: 535384E - 123289N		Hole Type WS	
Location: Haywards Heath				Level: 60.47		Scale 1:25		Logged By RFH	
Client: Miller Homes				Dates:					
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES		0.30	60.47		TOPSOIL: Grass over soft brown silty clay. Rootlets throughout.	
		0.50	D			Firm orangish brown silty sandy CLAY. Sand is fine. (WEATHERED UPPER TUNBRIDGE WELLS SAND)			
		1.00	SPT		50 (15,16/50 for 190mm)	0.90 1.00	60.17 59.57		
Remarks 1) Borehole scanned with a CAT and genny before drilling. 2) No groundwater encountered. 3) Borehole backfilled with arisings upon completion.									

					Borehole Log			Borehole No. WS04 Sheet 1 of 1	
Project Name: Lewes Road, Haywards Heath					Project No. 12066		Co-ords: 535409E - 123354N		Hole Type WS
Location: Haywards Heath					Level: 63.40			Scale 1:25	
Client: Miller Homes					Dates:			Logged By RFH	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES	N=22 (2,3/4,5,6,7)	0.30	63.40		TOPSOIL: Grass over soft brown silty clay. Rootlets throughout.	1
								Firm orangish brown silty sandy CLAY. Sand is fine. (WEATHERED UPPER TUNBRIDGE WELLS SAND)	
		1.00	SPT					<u>Becoming stiff.</u>	
		1.20	D						
					1.50	63.10		Stiff light yellowish brown sandy gravelly SILT. Sand is fine. Gravel is subangular lithorelic pieces of siltstone and sandstone. Becomes very weak SILTSTONE at 2.00m begl.	2
		2.00	SPT	50 (5,7/50 for 40mm)	2.00	61.90		(UPPER TUNBRIDGE WELLS SAND) End of Borehole at 2.00m	
									3
									4
									5
Remarks 1) Borehole scanned with a CAT and genny before drilling. 2) No groundwater encountered. 3) Borehole backfilled with arisings upon completion.									

					Borehole Log			Borehole No. WS05 Sheet 1 of 1	
Project Name: Lewes Road, Haywards Heath					Project No. 12066		Co-ords: 535304E - 123250N		Hole Type WS
Location: Haywards Heath					Level: 58.80			Scale 1:25	
Client: Miller Homes					Dates:			Logged By RFH	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES	N=29 (6,8/8,7,7,7)	0.35	58.80		TOPSOIL: Grass over soft brown silty clay. Rootlets throughout.	1
		0.50	D					Firm orangish brown silty sandy CLAY. Sand is fine. (WEATHERED UPPER TUNBRIDGE WELLS SAND)	
							0.80	SPT	
		1.50	D			End of Borehole at 2.00m			
		2.00	SPT				N=50 (3,6/9,12,13,16)	2.00	
									3
									4
									5
Remarks 1) Borehole scanned with a CAT and genny before drilling. 2) No groundwater encountered. 3) Borehole backfilled with arisings upon completion.									

				Borehole Log			Borehole No. WS06 Sheet 1 of 1			
Project Name: Lewes Road, Haywards Heath				Project No. 12066		Co-ords: 535125E - 123259N		Hole Type WS		
Location: Haywards Heath				Level: 67.00		Scale 1:25		Logged By RFH		
Client: Miller Homes				Dates:						
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.20	ES		0.30	67.00		TOPSOIL: Grass over soft brown silty clay. Rootlets throughout.		
					0.50	66.70		Firm orangish brown silty sandy CLAY. Sand is fine. (WEATHERED UPPER TUNBRIDGE WELLS SAND)		
								Firm light yellowish brown sandy gravelly SILT. Sand is fine. Gravel is subangular lithorelic pieces of siltstone and sandstone. Becomes very weak SILTSTONE at 2.00m begl. (UPPER TUNBRIDGE WELLS SAND)		
		1.00	SPT	N=18 (3,4/4,4,5,5)						1
		1.40	D							
		2.00	SPT	N=50 (8,10/10,12,14,14)	2.00	66.50		End of Borehole at 2.00m	2	
									3	
									4	
									5	
Remarks 1) Borehole scanned with a CAT and genny before drilling. 2) No groundwater encountered. 3) Borehole installed with monitoring well upon completion.										

Appendix E

Gas Monitoring Results

Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS:

Client: Miller Homes
Site: Haywards Heath
Date: 05/07/2024

Job No: 12066
Visit No: 1 of 6
Operator: JM

Project Manager: HA

[illegible]

METEOROLOGICAL AND SITE INFORMATION:

State of ground:

Wind:

Cloud cover:

Precipitation:

Barometric pressure (mbar):

Pressure trend:

Air Temperature (Deg. C):

(Select correct box with X or enter data, as applicable)

	X			1000		17
--	---	--	--	------	--	----

X	Wet
	Moderate
	Cloudy
	Moderate

	Steady
--	--------

	Snow
	Strong
X	Overcast
	Heavy
1002	After
X	Rising
18	After

☐ Frozen

Appendix F

Soakaway Test Results

INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 2007

Client: Miller Homes
Site: Lewes Rd, Haywards Heath
Job No: 10706 Test No: SA01 Test 1

CALCULATION OF SOIL INFILTRATION RATE

Time (min)	Depth (m)
0	1.03
1	1.08
2	1.10
6	1.13
13	1.18
20	1.21
30	1.25
60	1.34
120	1.45
180	1.54
1200	1.74

Gravel Filled Y/N Y
Depth at start of test (m bgl) = 1.03
Depth at end of test (m bgl) = 1.74
Depth of Loss in test (m) 0.71
75% level = 1.23
50% level = 1.43
25% level = 1.62

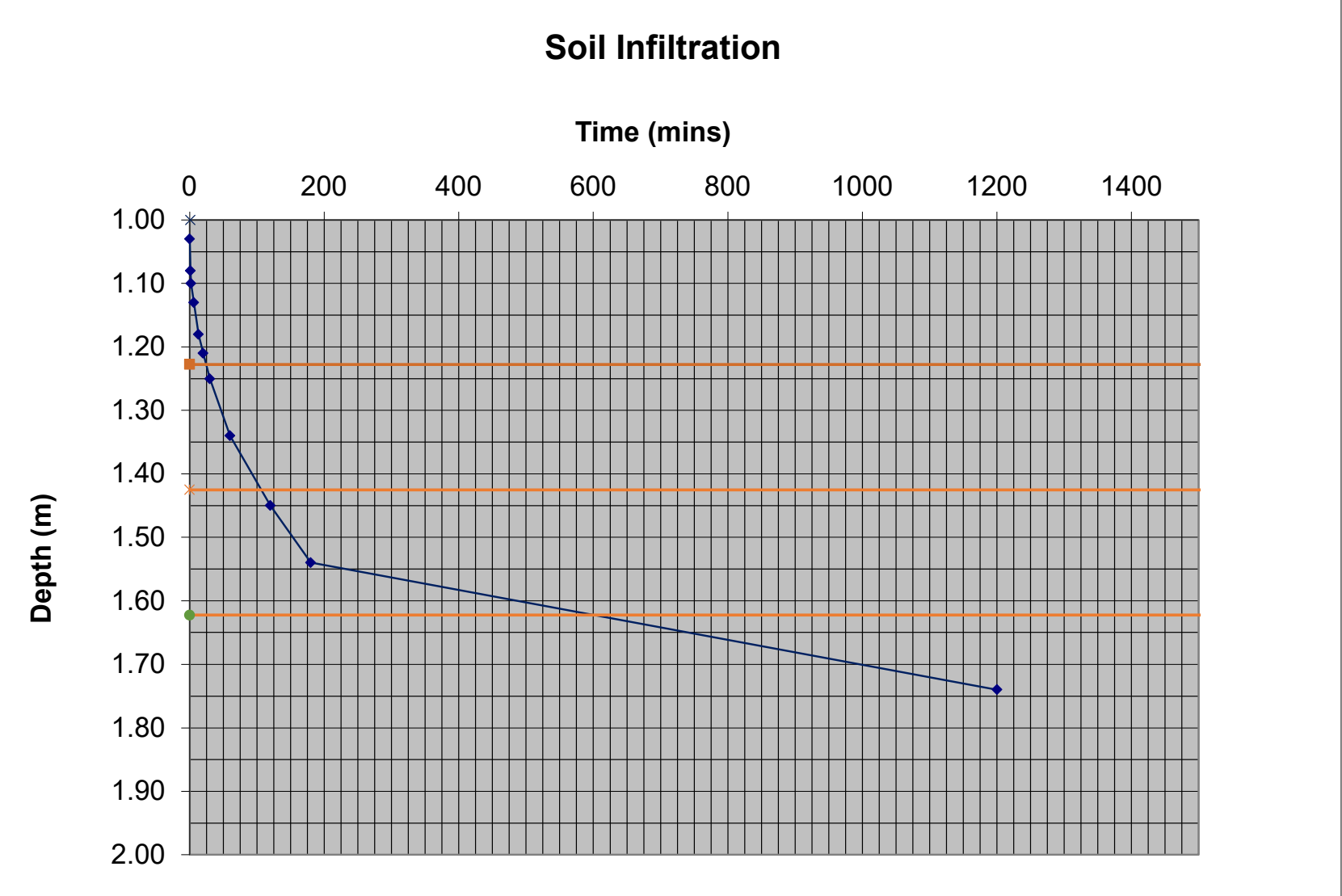
Size of Soakaway		
Pit Dimensions		Depth of Water
Length (m) =	2.50	0.79
Width (m) =	0.60	
Depth (m) =	1.82	

Base area of pit (m2) = 1.500
ap₅₀, area of loss (m2) = 3.949
Volume outflow 75 - 25% (m3) = 0.593

From the graph:	
tp 75 (min) =	25
tp 25 (min) =	625

Soil infiltration rate, f, (m/s) = 1.25E-06

Input: RFH Checked: HA Date: 28/05/2024



INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 2007

Client: Miller Homes

Site: Lewes Rd, Haywards Heath

Job No: 10706 Test No: SA01 Test 1

CALCULATION OF SOIL INFILTRATION RATE

Time (min)	Depth (m)
0	1.05
1	1.06
2	1.07
3	1.08
4	1.09
5	1.10
10	1.14
20	1.18
60	1.31
120	1.42
180	1.49
240	1.55
300	1.60
360	1.63

Gravel Filled Y/N Y

Depth at start of test (m bgl) = 1.05

Depth at end of test (m bgl) = 1.63

Depth of Loss in test (m) 0.58

75% level = 1.22

50% level = 1.40

25% level = 1.57

Base area of pit (m2) = 1.500

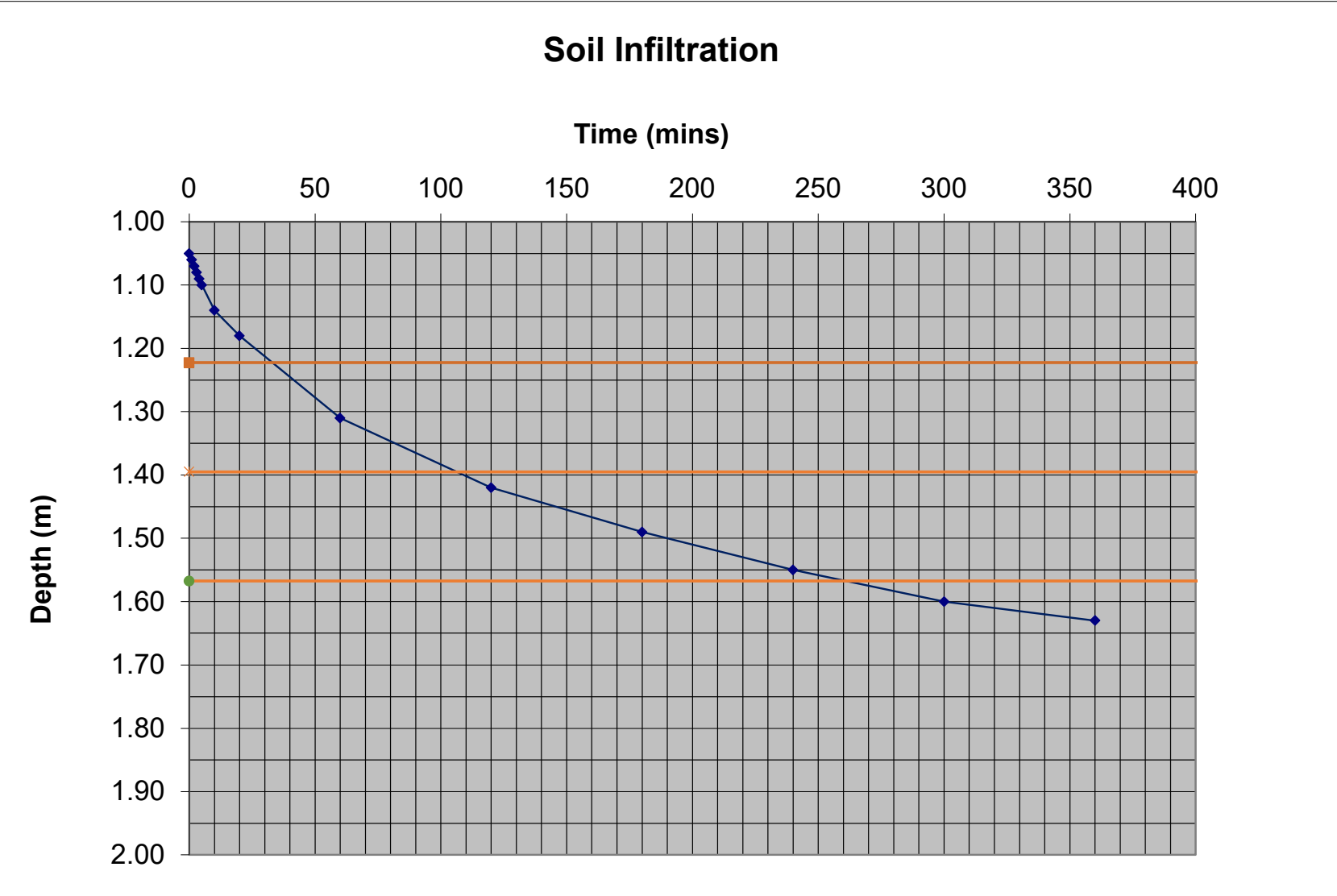
ap₅₀, area of loss (m2) = 3.639

Volume outflow 75 - 25% (m3) = 0.518

From the graph:	
tp 75 (min) =	32
tp 25 (min) =	260

Soil infiltration rate, f, (m/s) = 3.12E-06

Input: RFH Checked: HA Date: 29/05/2024



INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 2007

Client: Miller Homes

Site: Lewes Rd, Haywards Heath

Job No: 10706 Test No: SA01 Test 1

CALCULATION OF SOIL INFILTRATION RATE

Time (min)	Depth (m)
0	1.05
1	1.07
2	1.09
3	1.10
4	1.11
5	1.12
20	1.21
30	1.26
60	1.45
120	1.53
180	1.60
240	1.62
300	1.65
360	1.69
420	1.69
1320	1.81

Gravel Filled Y/N Y

Depth at start of test (m bgl) = 1.05

Depth at end of test (m bgl) = 1.81

Depth of Loss in test (m) 0.76

75% level = 1.24

50% level = 1.44

25% level = 1.63

Size of Soakaway		
Pit Dimensions		Depth of Water
Length (m) =	2.50	0.77
Width (m) =	0.60	
Depth (m) =	1.82	

Base area of pit (m2) = 1.500

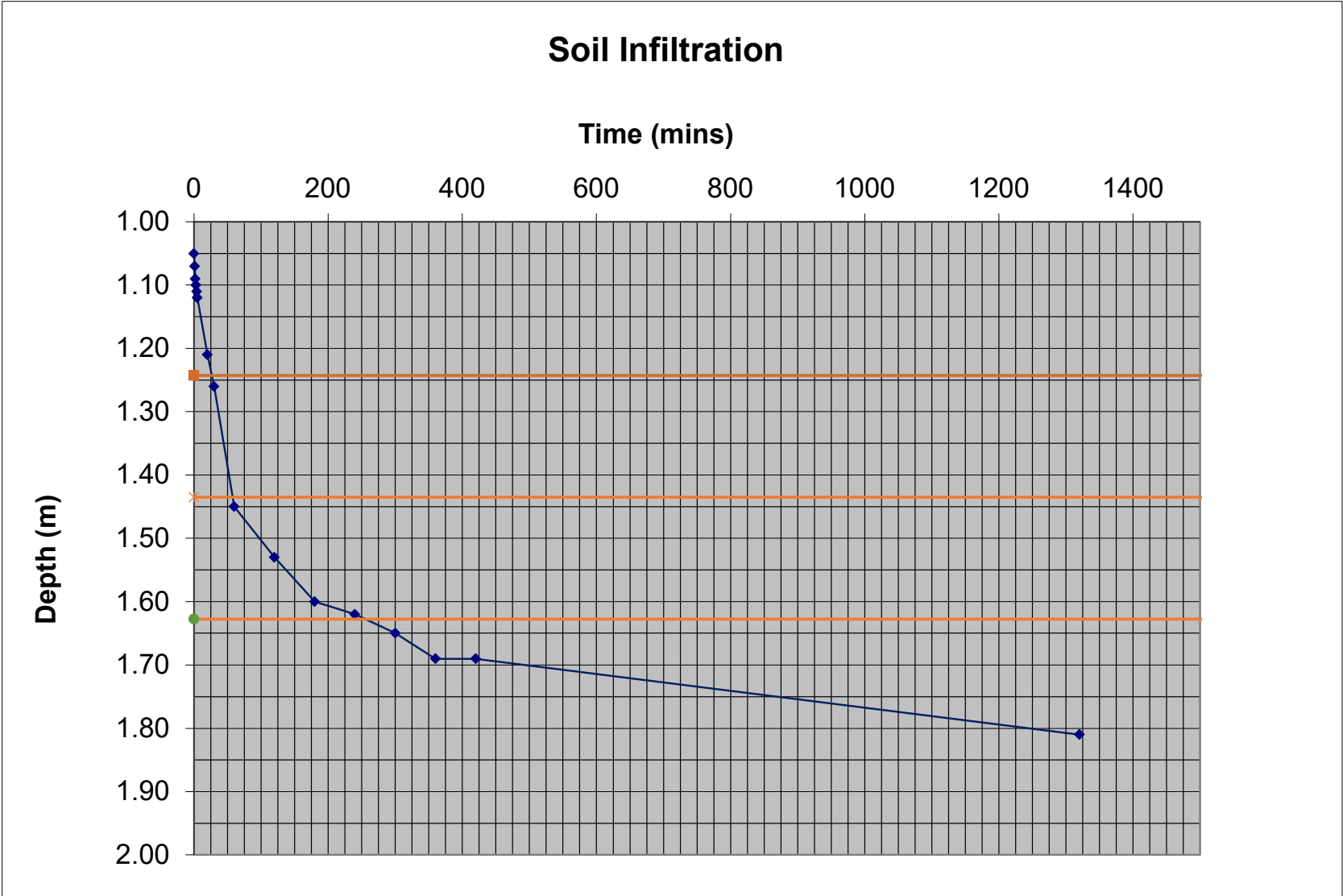
ap₅₀, area of loss (m2) = 3.887

Volume outflow 75 - 25% (m3) = 0.578

From the graph:		
	tp 75 (min) =	25
	tp 25 (min) =	250

Soil infiltration rate, f, (m/s) = 3.30E-06

Input: RFH Checked: HA Date: 30/05/2024



INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 2007

Client: Miller Homes
Site: Lewes Rd, Haywards Heath
Job No: 10706 Test No: SA02 Test 1

CALCULATION OF SOIL INFILTRATION RATE

Time (min)	Depth (m)
0	0.50
1	0.57
2	0.57
3	0.57
4	0.57
5	0.57
10	0.57
20	0.58
30	0.58
60	0.58
120	0.59
180	0.60
1080	0.56
1170	0.56
1560	0.56
2640	0.62

Gravel Filled
Depth at start of test (m bgl) =
Depth at end of test (m bgl) =
Depth of Loss in test (m)

75% level = 0.55
50% level = 0.61
25% level = 0.66

Y/N	Y
	0.50
	0.62
	0.12

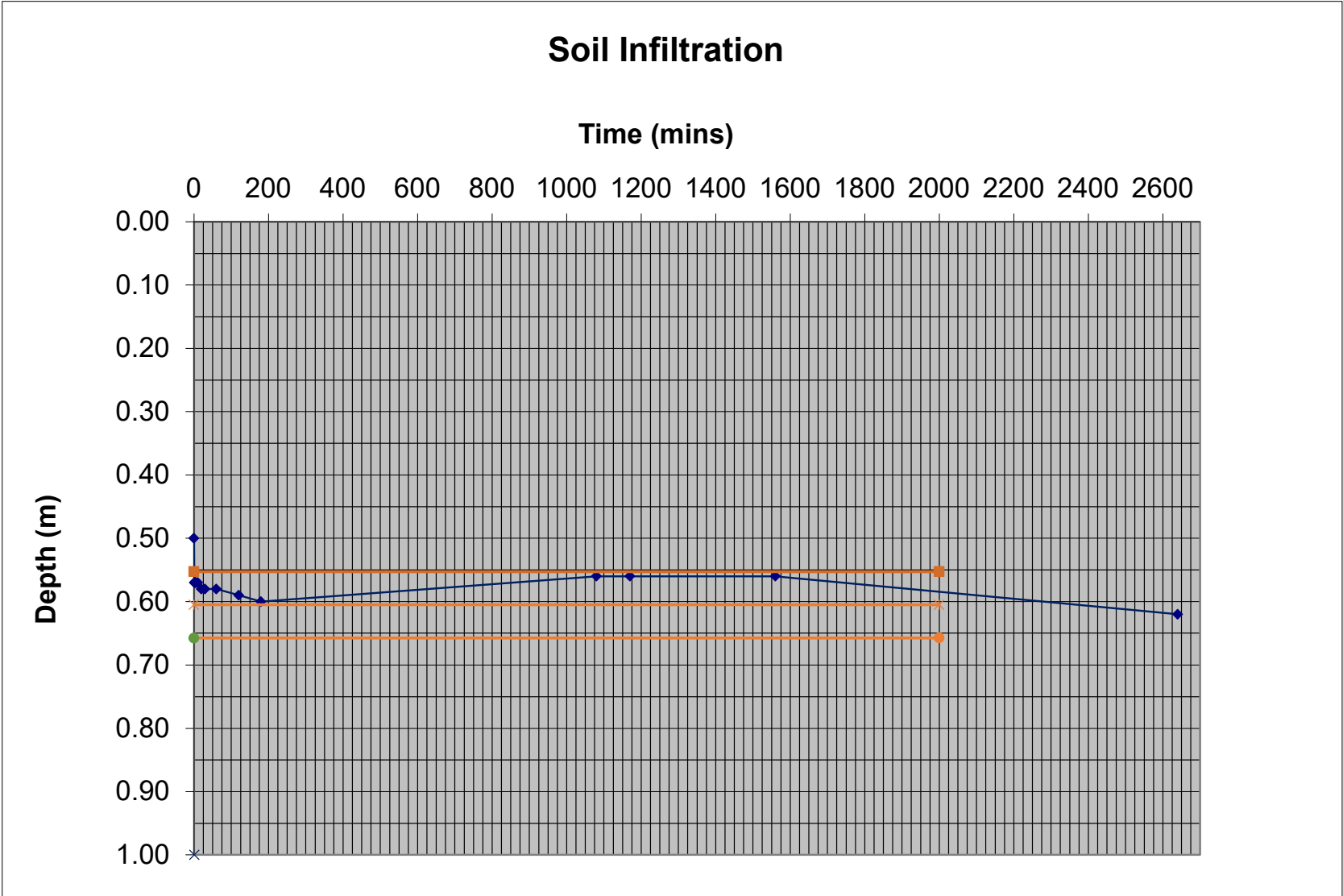
Size of Soakaway	
Pit Dimensions	
Length (m) =	2.50
Width (m) =	0.60
Depth (m) =	0.71
Depth of Water	
0.21	

Base area of pit (m2) = 1.500
ap₅₀, area of loss (m2) = 2.151
Volume outflow 75 - 25% (m3) = 0.158

From the graph:	
tp 75 (min) =	
tp 25 (min) =	

Soil infiltration rate, f, (m/s) = #DIV/0!

Input: RFH Checked: HA Date: 28/05/2024



INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 2007

Client: Miller Homes

Site: Lewes Rd, Haywards Heath

Job No: 10706 Test No: SA03 Test 1

CALCULATION OF SOIL INFILTRATION RATE

Time (min)	Depth (m)
0	0.40
1	0.46
2	0.51
3	0.54
4	0.56
5	0.59
10	0.66
20	0.71
60	0.83
120	0.92
180	1.00
240	1.08
300	1.10
360	1.13
1440	1.41

Gravel Filled Y/N Y

Depth at start of test (m bgl) = 0.40

Depth at end of test (m bgl) = 1.13

Depth of Loss in test (m) 0.73

75% level = 0.67

50% level = 0.93

25% level = 1.20

Base area of pit (m2) = 1.500

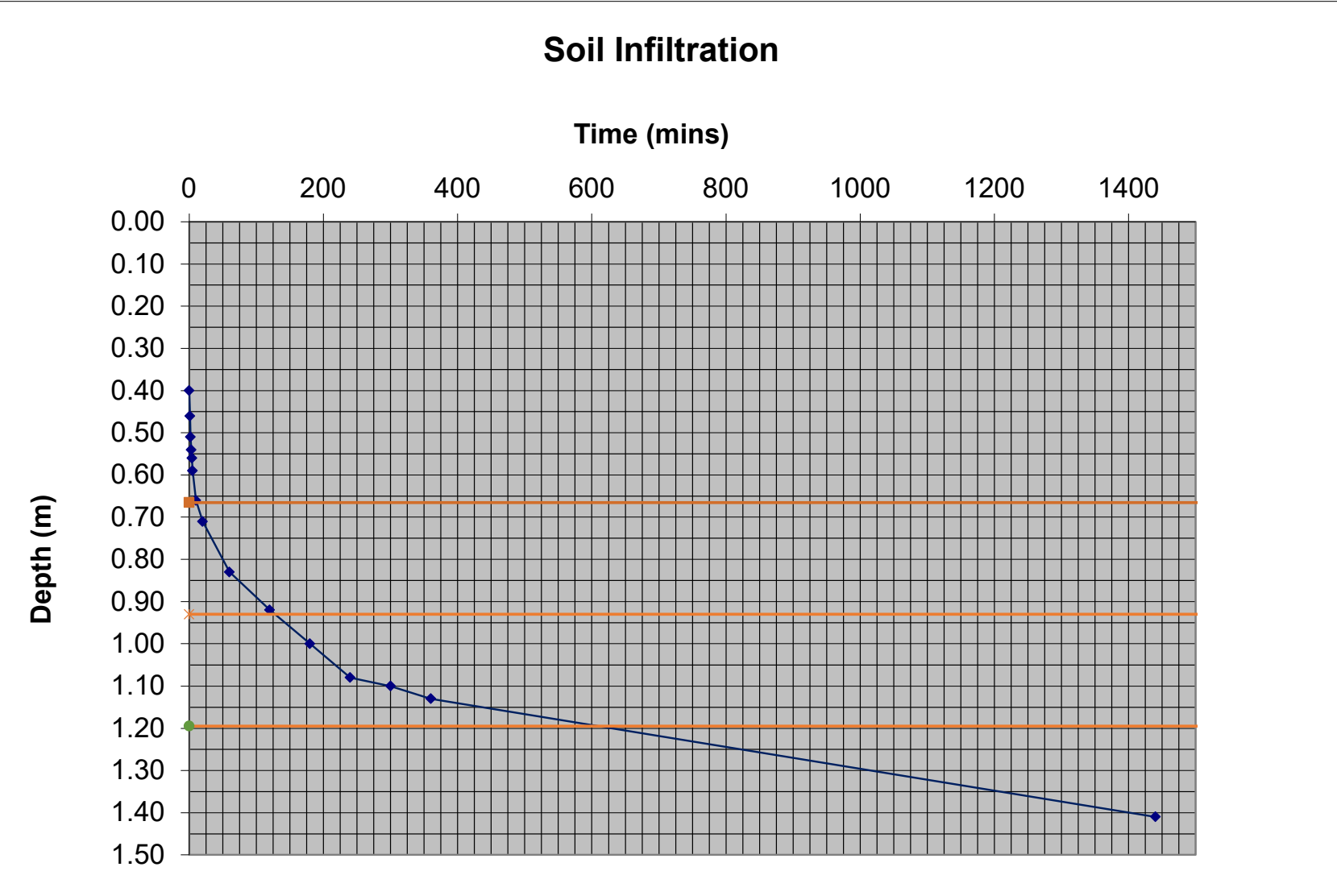
ap₅₀, area of loss (m2) = 4.786

Volume outflow 75 - 25% (m3) = 0.795

From the graph:	
tp 75 (min) =	12
tp 25 (min) =	625

Soil infiltration rate, f, (m/s) = 1.35E-06

Input: RFH Checked: HA Date: 28/05/2024



INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 2007

Client: Miller Homes

Site: Lewes Rd, Haywards Heath

Job No: 10706 Test No: SA03 Test 2

CALCULATION OF SOIL INFILTRATION RATE

Time (min)	Depth (m)
0	0.50
1	0.59
2	0.63
3	0.65
4	0.66
5	0.67
10	0.73
20	0.78
60	0.86
120	0.92
180	1.01
240	1.16
300	1.17
360	1.18
420	1.19
1560	1.47

Gravel Filled Y/N Y

Depth at start of test (m bgl) = 0.50

Depth at end of test (m bgl) = 1.47

Depth of Loss in test (m) 0.97

75% level = 0.74

50% level = 0.98

25% level = 1.22

Size of Soakaway		
Pit Dimensions		Depth of Water
Length (m) =	2.50	0.96
Width (m) =	0.60	
Depth (m) =	1.46	

Base area of pit (m2) = 1.500

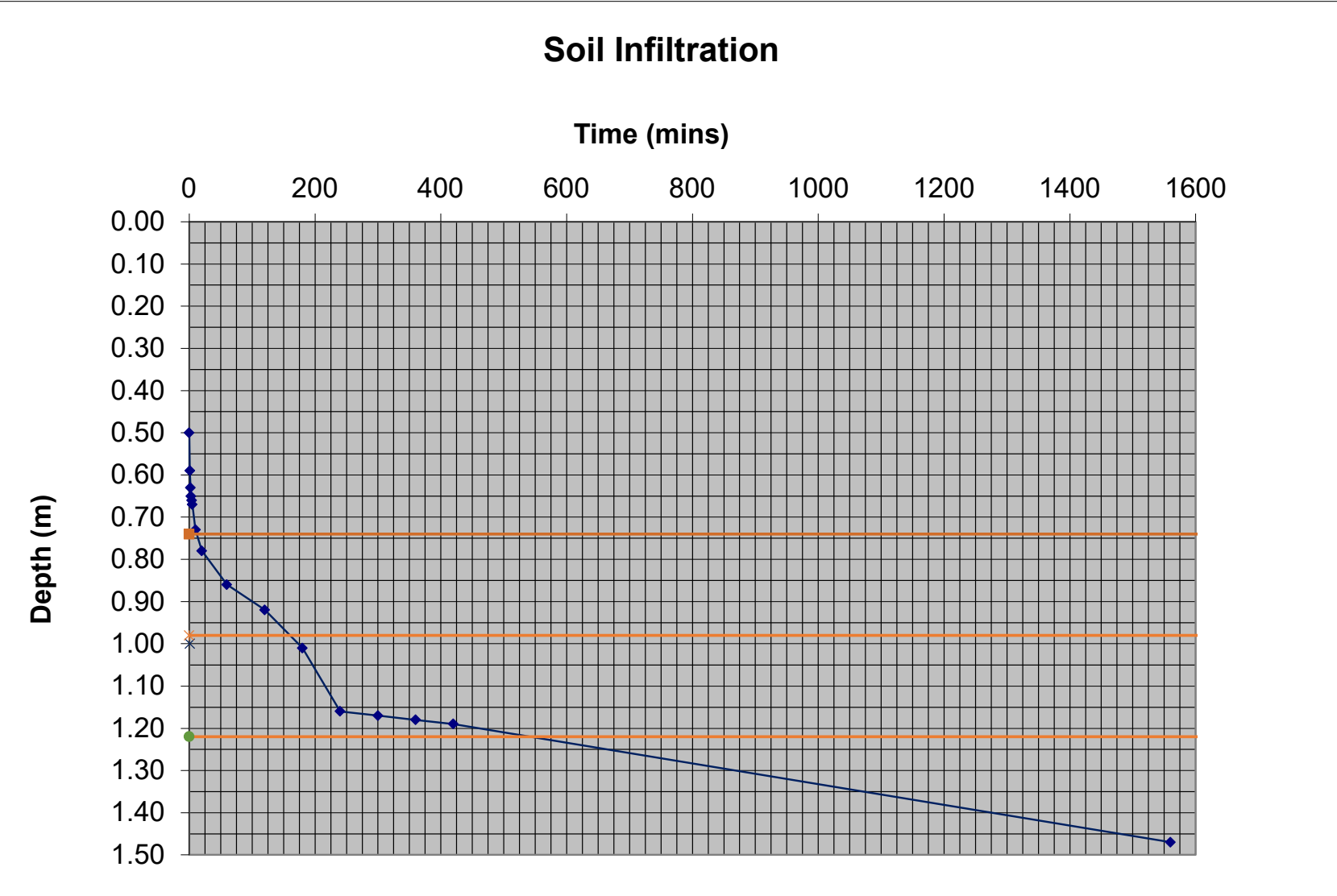
ap₅₀, area of loss (m2) = 4.476

Volume outflow 75 - 25% (m3) = 0.720

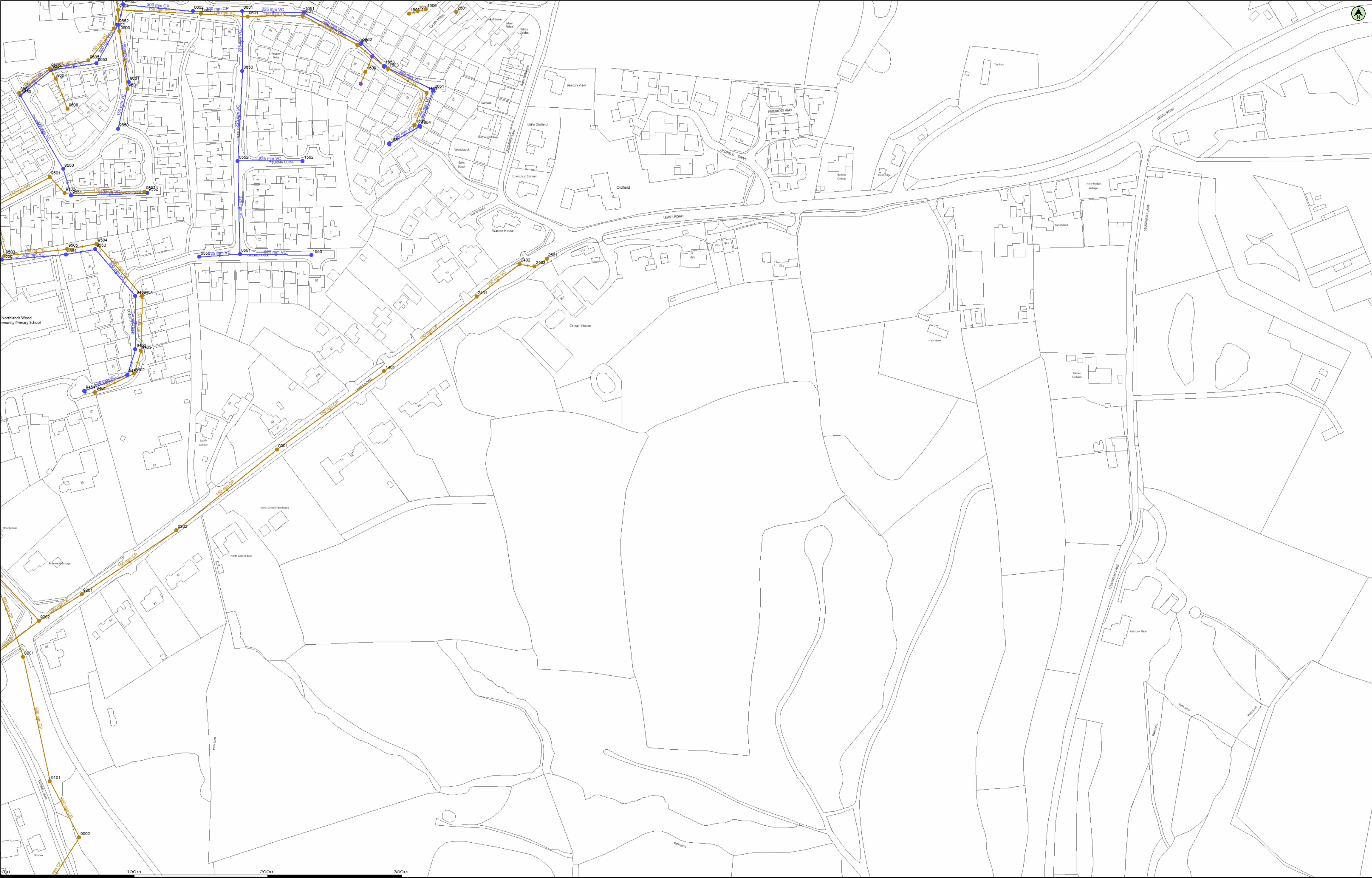
From the graph:	
tp 75 (min) =	11
tp 25 (min) =	575

Soil infiltration rate, f, (m/s) = 1.43E-06

Input: RFH Checked: HA Date: 30/05/2024



APPENDIX F: Southern Water Sewer Records



(c) Crown copyright and database rights 2024 Ordnance Survey 100031673

Date: 01/03/24

Scale: 1:1250

Map Centre: 535391.123378

Data updated: 12/01/24

Our Ref: 1409844 - 1

Wastewater Plan A1

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 2024 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.

faikhatib@mayerbrown.co.uk

MHHAYWARDSHEATH.23



APPENDIX G: Indicative Layout



CLIENT:
PROJECT TITLE:
PROJECT NO:

DRAWING TITLE:
DRAWING NO:
SCALE:

MILLER HOMES
LAND AT NORTH COLWELL FARM, HAYWARDS HEATH
02.38

ILLUSTRATIVE MASTERPLAN
02.38(01)02
1:500 @ A0



APPENDIX H: West Sussex County Council SuDS Proforma

Surface Water Drainage Proforma

West Sussex County Council (WSSCC) as Lead Local Flood Authority recommends this proforma is completed and submitted to support any planning application for a major development. The information contained in this form will be used by WSSCC officers in their role as 'statutory consultee' on surface water drainage. The proforma should accompany the site-specific Flood Risk Assessment and Drainage Strategy submitted as part of the planning application.

1. Site Details

No.	Requirement	Answer	Application Type
1.1	Address including postcode	North Colwell Farm, Lewes Road, Haywards Heath, RH17 7TB	Outline & Full
1.2	OS grid reference (easting and northing)	E535304, N123280	Outline & Full
1.3	Planning application reference	n/a	Outline & Full
1.4	Total site area (hectares)	6.25	Outline & Full
1.5	Pre-development use	Greenfield	Outline & Full
1.6	Proposed design life	100yrs +	Outline & Full
1.7	Have agreements in principle for discharge been provided (where applicable)? (YES/NO)	No	Outline & Full
1.8	Topographic Survey Plan showing existing site layout, site levels and drainage system	Yes, Appendix D.	Outline & Full

2. Discharge Hierarchy/Methods of Discharge¹

No.	Requirement	Answer	Application Type
2.1	Store rainwater for later use (reuse) (YES/NO)		Full
2.2	Infiltration techniques such as soakaways, permeable paving, etc (YES/NO)	Yes	Outline & Full
2.3	Hybrid (YES/NO)	Yes, partial infiltration, partial discharge to an existing watercourse	Outline & Full

¹ Runoff may be discharged via one or multiple methods.

No.	Requirement	Answer	Application Type
2.4	Attenuation with restricted discharge to watercourse (YES/NO)	Yes, partial infiltration, partial restricted discharge to an existing watercourse	Outline & Full
2.5	Attenuation with restricted discharge to surface water sewer (YES/NO)	No	Outline & Full
2.6	Attenuation with restricted discharge to combined sewer (YES/NO)	No	Outline & Full

3. Calculation Inputs

No.	Requirement	Answer	Application Type
3.1	Area within site which is drained by SuDS ² (hectares)	1.735	Outline & Full
3.2	Impermeable area drained pre-development ³ (hectares)	0	Outline & Full
3.3	Impermeable area drained post-development ³ (hectares)	1.735	Outline & Full
3.4	Urban Creep (hectares)	0.042	Outline & Full
3.5	Climate change factor applied (1 in 30 and 1 in 100) (percentage)	40% & 45%	Outline & Full

4. Infiltration Feasibility/Ground Investigations

No.	Requirement	Answer	Application Type
4.1	Has winter groundwater monitoring and infiltration been undertaken? (YES/NO)	Yes	Outline & Full
4.2	Period of winter groundwater monitoring (from/to)	TBC	Outline & Full
4.3	Depth to highest recorded groundwater level (mAOD)		Full
4.4	Infiltration rate	1.25x10-6	Outline & Full

² Impermeable area should be measured pre and post development. Impermeable surfaces include roofs, pavements, driveways and paths, where runoff is conveyed to the drainage system.

³ 10% Urban Creep should be added to the volumes required for storage and not increase discharge rates.

No.	Requirement	Answer	Application Type
4.5	Depth of infiltration structure (mAOD)		Full
4.6	Safety factor used for sizing infiltration storage	2	Outline & Full

5. Calculation Outputs: Greenfield Runoff Rates⁴

No.	Requirement	Answer	Application Type
5.1	Qbar (l/s)	10.0	Outline & Full
5.2	1 in 1 year rainfall (l/s)	8.5	Outline & Full
5.3	1 in 30 year rainfall (l/s)	24.1	Outline & Full
5.4	1 in 100 year rainfall (l/s)	32.0	Outline & Full

6. Calculation Outputs: Brownfield Runoff Rates (including Urban Creep) (if applicable)

No.	Requirement	Answer	Application Type
6.1	1 in 1 year rainfall (l/s)	n/a	Outline & Full
6.2	1 in 30 year rainfall (l/s)	n/a	Outline & Full
6.3	1 in 100 year rainfall (l/s)	n/a	Outline & Full

7. Calculation Outputs: Volume Control/Infiltration Provision

No.	Requirement	Answer	Application Type
7.1	Infiltration (m ³)	Total Volume 3121m ³	Outline & Full
7.2	Attenuation (m ³)	Total Volume 3121m ³	Outline & Full
7.3	Separate volume designated as long-term storage ⁵ (m ³)		Full
7.4	Total volume control (sum of inputs for 7.1 to 7.3) (m ³)		Full

⁴ Flows within long term storage areas should be infiltrated to the ground or discharged at low flow rate of maximum 2 litres per second per hectare (l/s/ha).

⁵ In calculations and for the avoidance of doubt FEH shall be used FSR is not acceptable, and CV values must equal 1.

8. Calculation Outputs: Attenuation/Restricted Discharge

No.	Requirement		Answer	Application Type
8.1	Proposed discharge rate (critical storm)	1 in 1 (100%) AEP (m/s)	0l/s	Outline & Full
		1 in 30 (3.33%) AEP (m/s)	0/s	Outline & Full
		1 in 30 (3.33%) AEP plus climate change (m/s)	4.9l/s	Outline & Full
		1 in 100 (1%) AEP (m/s)	1.5l/s	Outline & Full
		1 in 100 (1%) AEP plus climate change (m/s)	10l/s	Outline & Full
8.2	Calculations show critical storm durations (both by max height and max discharge) for 1 in 1, 1 in 30, 1 in 30 plus climate change, 1 in 100 and 1 in 100 year plus climate change allowance can be accommodated on site (YES/NO)		Yes	Outline & Full
8.3	Has treatment of potential contaminants been considered? (YES/NO)		Yes, surface water treatment is provided in line with the CIRIA SuDS Manual via the basin and permeable paving.	Outline & Full
8.4	Demonstration of source control features with substantive evidence why these cannot be used if not (YES/NO)			Full
8.5	If discharging into a watercourse, piped system or the sea, has the proposed drainage network been modelled against predicted top water levels for the 1 in 100 year storm event plus climate change allowance, within the existing system? (YES/NO)			Full

9. Other Supporting Details

No.	Requirement	Answer	Application Type
9.1	Plan detailing location of groundwater monitoring and infiltration testing	Yes, Appendix E	Outline & Full
9.2	Detailed drainage design layout		Full
9.3	Maintenance strategy		Full

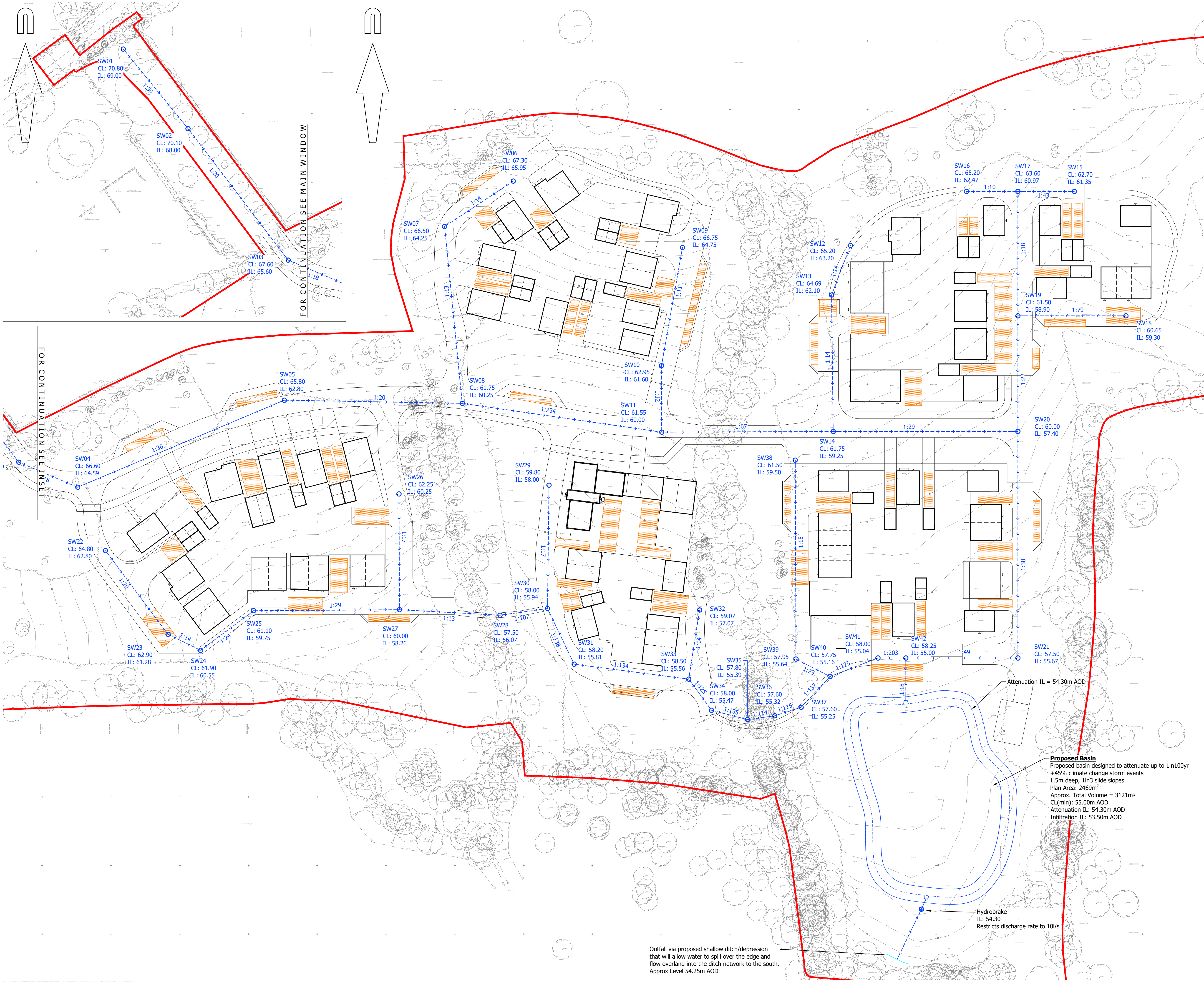
No.	Requirement	Answer	Application Type
9.4	Detailed development layout		Full
9.5	Impermeable area plan		Full
9.6	Phasing plan?		Full
9.7	If ground levels are being raised over 300mm above existing levels and is unavoidable, have detailed plans been provided, together with drainage proposals, to address any potential drainage related issues?		Full

The above form should be completed using evidence from information which should be appended to this form. The information being submitted should be proportionate to the site conditions, flood risks and magnitude of development. It should serve as a summary of the drainage proposals and should clearly show that the proposed discharge rate and volume as a result of development will not be increasing. Where there is an increase in discharge rate or volume, then the relevant section of this form must be completed with clear evidence demonstrating how the requirements will be met.

This form is completed using factual information and can be used as a summary of the surface water drainage strategy on this site.

Form completed by	Caroline Gower
Qualification of person responsible for signing off this proforma	BSc, GradCIWEM, GMICE
Company	Mayer Brown Ltd
On behalf of (client's details)	Miller Homes
Date	04/02/25

APPENDIX I: Proposed Drainage Strategy



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- KEY
- SITE BOUNDARY
 - PROPOSED SURFACE WATER SEWER AND MANHOLE
 - PROPOSED HYDROBRAKE
 - OUTFALL TRENCH
 - PROPOSED BASIN
 - PROPOSED HEADWALL
 - PROPOSED PERMEABLE PAVING

- NOTES:
- The proposed drainage strategy is indicative and is subject to detailed design.
 - This drawing is based on the topographic survey undertaken by Survey Solutions in December 2023.
 - This drawing is based on the proposed layout provided by The Core Design in February 2025.
 - CLS and ILS are based on the existing levels on the topographic survey and LiDAR and are subject to detailed design.
 - All infrastructure proposed has been positioned outside of the woodland buffer zone where possible.
 - The basin will be left unlined for infiltration, subject to further groundwater monitoring, which will be sufficient for most storm events. An overflow is provided at 0.8m above the invert level of the basin providing an overland flow outfall to the surrounding ditch network at greenfield run-off rates.
 - Ordinary watercourse consent and any other relevant permissions will be obtained at the detailed design stage where required.

PRELIMINARY
NOT FOR CONSTRUCTION

P3	Attenuation outfall updated (JC)	CG 06/02/2025
P2	Draft Watermark Removed (JC)	CG 08/01/2025
P1	Initial Issue (JC)	CG 18/12/2024

rev.	amendment	checked	date
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Mayer Brown Limited
Lion House, Oriental Road, Woking, Surrey, GU22 8AR
Telephone 01483 750 508
enquiry@mayerbrown.co.uk www.mayerbrown.co.uk

client	MILLER HOMES		
project	LAND AT NORTH COLWELL FARM HAYWARDS HEATH		
scale	1:500	drawn by	JC
		checked by	CG
date	FEBRUARY 2025	cad file	MASTER.DWG
title	SURFACE WATER DRAINAGE STRATEGY		

Mayer Brown Limited Jobcode	suitability	revision
MHHAYWARDSHEATH.23	-	P3
drawing number	MHHAYWARDSHEATH.23/23	

Proposed Basin
Proposed basin designed to attenuate up to 1in100yr +45% climate change storm events
1.5m deep, 1in3 slide slopes
Plan Area: 2469m²
Approx. Total Volume = 3121m³
CL(min): 55.00m AOD
Attenuation IL: 54.30m AOD
Infiltration IL: 53.50m AOD

Attenuation IL = 54.30m AOD

Hydrobrake
IL: 54.30
Restricts discharge rate to 10l/s

Outfall via proposed shallow ditch/depression that will allow water to spill over the edge and flow overland into the ditch network to the south.
Approx Level 54.25m AOD

APPENDIX J: Greenfield Run-off Calculations

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Starting Level (m)		100 year (l/s)	32.0
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	✓	Check Discharge Volume	x
Summer CV	1.000	Drain Down Time (mins)	10000	1 year (l/s)	8.5		
Winter CV	1.000	Additional Storage (m³/ha)	0.0	30 year (l/s)	24.1		

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	0	0	0
30	0	0	0	100	45	0	0
30	40	0	0				

Pre-development Discharge Rate

Site Makeup	Greenfield	Soil Index	4	Growth Factor 30 year	2.40	Q 1 year (l/s)	8.5
Greenfield Method	IH124	SPR	0.47	Growth Factor 100 year	3.19	Q 30 year (l/s)	24.1
Positively Drained Area (ha)	1.736	Region	7	Betterment (%)	0	Q 100 year (l/s)	32.0
SAAR (mm)	817	Growth Factor 1 year	0.85	QBar	10.0		

APPENDIX K: Proposed Network Calculations

Design Settings

Rainfall Methodology	FEH-22	Maximum Time of Concentration (mins)	30.00	Preferred Cover Depth (m)	1.200
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0	Include Intermediate Ground	✓
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00	Enforce best practice design rules	✓
CV	1.000	Connection Type	Level Inverts		
Time of Entry (mins)	5.00	Minimum Backdrop Height (m)	0.200		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Easting (m)	Northing (m)	Depth (m)
Storage Estimate	1.787	5.00	55.000	535368.290	123221.390	1.500
Outfall			54.000	535274.472	123238.855	1.000

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	Storage Estimate	Outfall	95.430	0.600	53.500	53.000	0.500	190.9	525	5.98	50.0

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Starting Level (m)	100 year (l/s)	32.0	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	✓	Check Discharge Volume	x
Summer CV	1.000	Drain Down Time (mins)	10000	1 year (l/s)	8.5		
Winter CV	1.000	Additional Storage (m³/ha)	0.0	30 year (l/s)	24.1		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	------

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0	100	0	0	0
30	0	0	0	100	45	0	0
30	40	0	0				

Pre-development Discharge Rate

Site Makeup	Greenfield	Soil Index	4	Growth Factor 30 year	2.40	Q 1 year (l/s)	8.5
Greenfield Method	IH124	SPR	0.47	Growth Factor 100 year	3.19	Q 30 year (l/s)	24.1
Positively Drained Area (ha)	1.736	Region	7	Betterment (%)	0	Q 100 year (l/s)	32.0
SAAR (mm)	817	Growth Factor 1 year	0.85	QBar	10.0		

Node Storage Estimate Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.000	Sump Available	✓
Replaces Downstream Link	✓	Product Number	CTL-SHE-0150-1000-0700-1000
Invert Level (m)	54.300	Min Outlet Diameter (m)	0.225
Design Depth (m)	0.700	Min Node Diameter (mm)	1200
Design Flow (l/s)	10.0		

Node Storage Estimate Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00450	Safety Factor	2.0	Invert Level (m)	53.500
Side Inf Coefficient (m/hr)	0.00450	Porosity	1.00	Time to half empty (mins)	8310

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1687.0	1687.0	0.800	2088.0	2088.0	1.500	2469.0	2469.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Storage Estimate	1440	53.789	0.289	17.0	508.8387	0.0000	OK
15 minute summer	Outfall	1	53.000	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Discharge Vol (m³)
1440 minute winter	Storage Estimate	Hydro-Brake®	Outfall	0.0	0.0
1440 minute winter	Storage Estimate	Infiltration		1.1	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Storage Estimate	1440	54.176	0.676	39.0	1254.0820	0.0000	SURCHARGED
15 minute summer	Outfall	1	53.000	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Discharge Vol (m³)
1440 minute winter	Storage Estimate	Hydro-Brake®	Outfall	0.0	0.0
1440 minute winter	Storage Estimate	Infiltration		1.3	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Storage Estimate	1410	54.394	0.894	54.7	1708.0610	0.0000	SURCHARGED
15 minute summer	Outfall	1	53.000	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Discharge Vol (m³)
1440 minute winter	Storage Estimate	Hydro-Brake®	Outfall	4.9	171.5
1440 minute winter	Storage Estimate	Infiltration		1.3	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Storage Estimate	1440	54.348	0.848	49.9	1610.5320	0.0000	SURCHARGED
15 minute summer	Outfall	1	53.000	0.000	0.0	0.0000	0.0000	OK

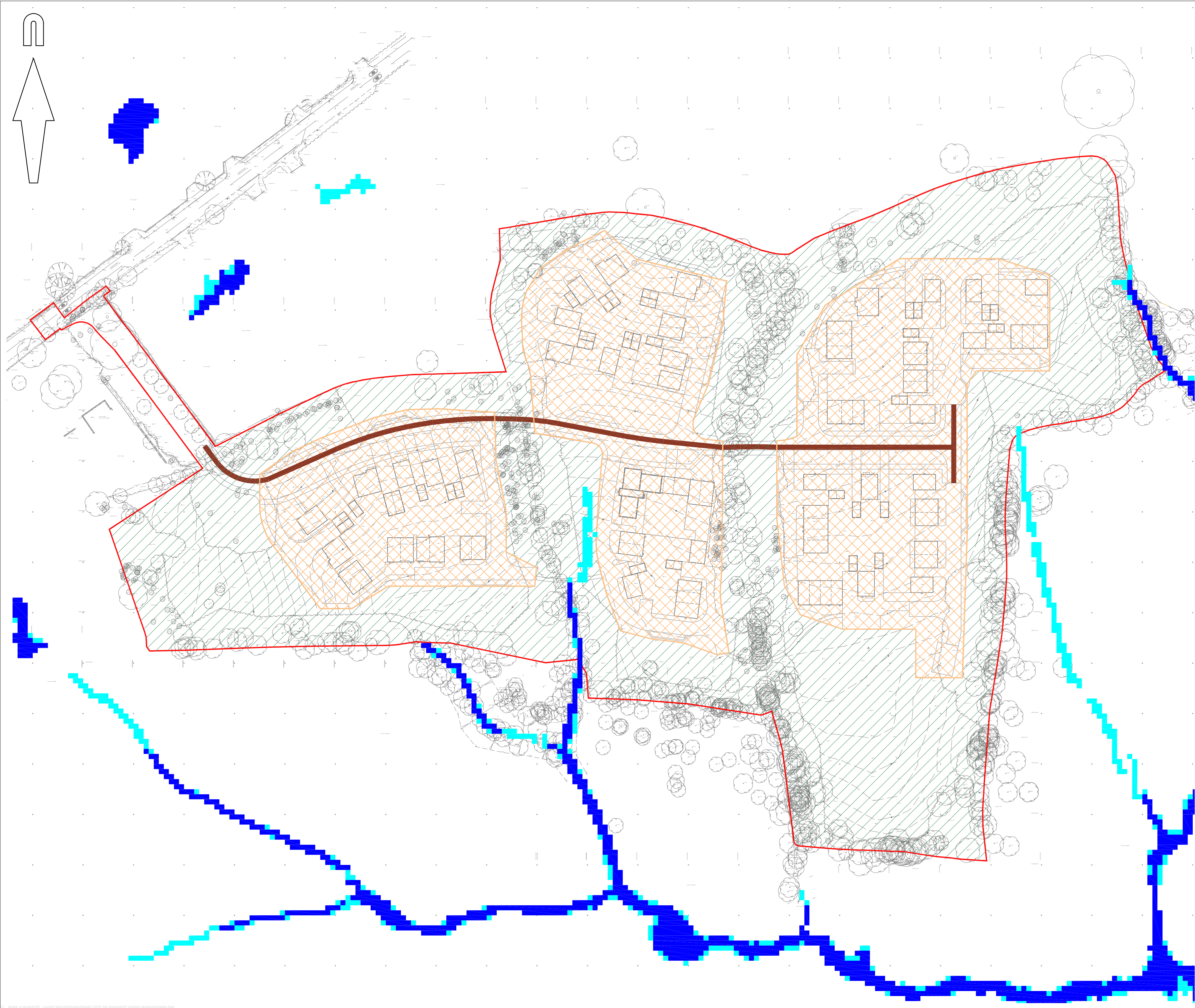
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Discharge Vol (m³)
1440 minute winter	Storage Estimate	Hydro-Brake®	Outfall	1.5	37.4
1440 minute winter	Storage Estimate	Infiltration		1.3	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Storage Estimate	1350	54.558	1.058	72.3	2065.9900	0.0000	SURCHARGED
15 minute summer	Outfall	1	53.000	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Discharge Vol (m³)
1440 minute winter	Storage Estimate	Hydro-Brake®	Outfall	10.0	727.4
1440 minute winter	Storage Estimate	Infiltration		1.4	

APPENDIX L: Surface Water Extents & Developable Areas



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KEY

- SITE BOUNDARY
- 1 IN 30YR SURFACE WATER FLOOD EXTENT
- 1 IN 100YR SURFACE WATER FLOOD EXTENT
- RESIDENTIAL DEVELOPMENT INC. RESIDENTIAL USE, VEHICULAR ROUTES, PEDESTRIAN/CYCLE ROUTES, CAR PARKING, PRIVATE AMENITY SPACE AND ASSOCIATED LANDSCAPING
- SUPPORTING INFRASTRUCTURE INC. PUBLIC OPEN SPACE, PLAY AREAS, INFORMAL KICKABOUT AREA, STRATEGIC LANDSCAPING & SUSTAINABLE DRAINAGE
- PROPOSED TREE LINED STREET

NOTES:

- This drawing is based on the topographic survey undertaken by Survey Solutions in December 2023.
- This drawing is based on the Parameters Plan provided by The Core Design on 8th January 2025.
- The Surface Water Flood Extents show the yearly chance of flooding for between 2040 and 2060.

FOR INFORMATION
NOT FOR CONSTRUCTION

P2	Surface Water Flood extents updated. (JC)	CG	05/02/25
P1	Initial Issue (CG)	SL	08/01/25

rev.	amendment	checked	date
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mayer brown

Mayer Brown Limited
Lion House · Oriental Road · Woking Surrey GU22 8AR
Telephone 01483 750 508
enquiry@mayerbrown.co.uk www.mayerbrown.co.uk

client			
MILLER HOMES			
project			
LAND AT NORTH COLWELL FARM HAYWARDS HEATH			
scale	drawn by		checked by
1:1000 @ A2	CG		SL
date	cad file		
FEBRUARY 2025	MASTER		
title			
SURFACE WATER FLOOD EXTENTS & DEVELOPABLE AREAS PLAN			
Mayer Brown Limited jobcode		suitability	revision
SL/MHHAYWARDSHEATH.23			P2
drawing number			
MHHAYWARDSHEATH.23/24			

