Stocking Lane, Shenington

Banbury

Flood Risk Assessment & Outline Drainage Strategy Report

Project Ref: **13171**

Report Ref: **R100**

First Issue

February 2022

Client

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REPORT STATUS

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1 Introduction

Baynham Meikle Partnership Limited has been commissioned on behalf of Elan Homes to prepare a Flood Risk Assessment and Drainage Strategy for the outline planning application for the development of a 49 no. residential units with associated car parking area development and private roads.

The existing greenfield site is located in Cherwell District Council (CDC) and will be accessed off Rattlecombe Road. The development area is approximately 2.76 hectares in total and the Ordnance Survey Grid reference is E436935, N242770. A Site location plan is included in Appendix A.

It is a requirement for planning applications to consider the potential risk of flooding to the proposed development over its expected lifetime and any possible impacts on flood risk elsewhere in terms of its effects on flood flows and runoff.

This Flood Risk Assessment has been prepared following guidance set out in the National Planning Policy Framework (NPPF) and is undertaken in consultation with other relevant bodies.

The following aspects of flood risk that have been addressed within this report are:

- The area liable to flooding.
- The probability of flooding occurring now and over time.
- The extent and standard of existing flood defences and their effectiveness over time.
- The rates of flow likely to be involved.
- The likelihood of impacts on other areas, properties, and habitats.
- The effects of climate change which currently requires designs to include 1 in 100-year rainfall events + 40% climate change allowance.
- The nature and current expected lifetime of the development proposed and the extent to which it is designed to deal with flood risk.

Further guidance has been obtained from:

- The SuDs Manual V6 (CIRIA c753).
- “Interim Code of Practice for Sustainable Drainage Systems 2004” (ICOP SUDS).
- “Interim National Procedures” point 3, 10.2 & 10.3.
- The council’s in subject Strategic Flood Risk Assessment for this area.

2 Existing Site

2.1 Site Location

The development site is situated between Rattlecombe Road and Stocking Lane, with the nearest postcode being OX15 6NF. The Ordnance Survey National Grid reference to the centre of the site is E436935, N242770. A site location plan can be found in Appendix A. The site is irregularly shaped and occupies an approximate area of 2.76 ha. The neighbouring land use is as follows:

North	The site is bound to the north by Stocking Lane.
East	The site is bound to the east by Rattlecombe Road.
South	The site is bound to the south by agricultural land.
West	The site is bound to the west by agricultural land and Shenington Church of England Primary School.

2.2 Topography

The site generally falls from north west to south east, with levels ranging between 179.55 - 180.25mAOD along the north west boundary and levels ranging between 178.08 - 177.81mAOD along with south east boundary.

The existing site is undeveloped and classed as greenfield.

A topographical survey can be found in Appendix A.

2.3 Existing Ground Conditions

The ground conditions at the site where in general accordance with those anticipated from the geological mapping and included grass overlying topsoil which in turn were found to overlie the Marlstone Rock Formation. A summary of the ground conditions encountered in presented in the below table:

Strata & General Description	Depth Encountered (m bgl)	Thickness Range (m)
1 TOPSOIL Grass overlying brown, orange-brown, yellow-orange-brown sandy clayey GRAVEL, and sandy gravelly CLAY with occasional fine rootlets (< 5mm diameter). Gravel is brown sub-rounded fine to medium quartzite and brown becoming dark brown sub-angular fine to medium sandstone with occasional iron staining. (All exploratory hole locations)	**Ground Level – 0.75**	**0.15 – 0.75**
2 MARLSTONE ROCK FORMATION Medium dense and dense becoming very dense orange-brown slightly clayey sandy GRAVEL. Gravel is orange-brown occasionally black sub-angular occasionally tabular, fine to medium, becoming medium to coarse sandstone with iron staining and occasional iron deposits. (DS102 to DS107 inclusive)	**0.15 – 4.25**	**1.90 – 6.25+**
Loose and very loose orange-brown slightly gravelly clayey SAND. Gravel is orange-brown occasionally black sub-angular, fine to medium, becoming medium to coarse sandstone with iron staining and occasional iron deposits. (DS101 and DS102 only)	**3.00 – 6.45+**	**1.15 – 6.25+**
Firm orange-brown very sandy CLAY (DS102 to DS106 inclusive)	**0.50 – 1.90**	**0.30 – 1.15**
Orange-brown and dark brown occasionally dark grey thinly laminated SANDSTONE with regular iron staining and iron deposits. Occasional bands of fine to medium orange sand. (TP101 to TP107 inclusive)	**1.75 – 3.00**	**0.50 – 1.05**

Groundwater monitoring wells were installed across the site determine if shallow groundwater exists over the long term at the site. To date no groundwater has been encountered during any of the monitoring visits (4 no. undertaken to date at the issue of this report).
As such, it is deemed that the groundwater table is at greater depth than the depths to which the intrusive works were able to be achieve.

A total of six infiltration tests were undertaken at the site, 3 each within TP102 and TP105. Once excavated, 1m3 of water was added to the excavation and allowed to drain in accordance with BRE 365.
All tests undertaken achieved full drainage. Rates were then calculated, with a minimum rate of 1.01 x 10-3 m/s recorded in TP105. As such is can be concluded that discharging surface water flows to ground is viable.

2.4 Aquifer Designation

An extract from the geographic information map (Figure & Figure) provided by Natural England indicates that the site is located on a Superficial Drift classed as unproductive strata meaning these are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

The Bedrock is classed as Secondary A, this means that it has permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally the water-bearing parts of the former non-aquifers.

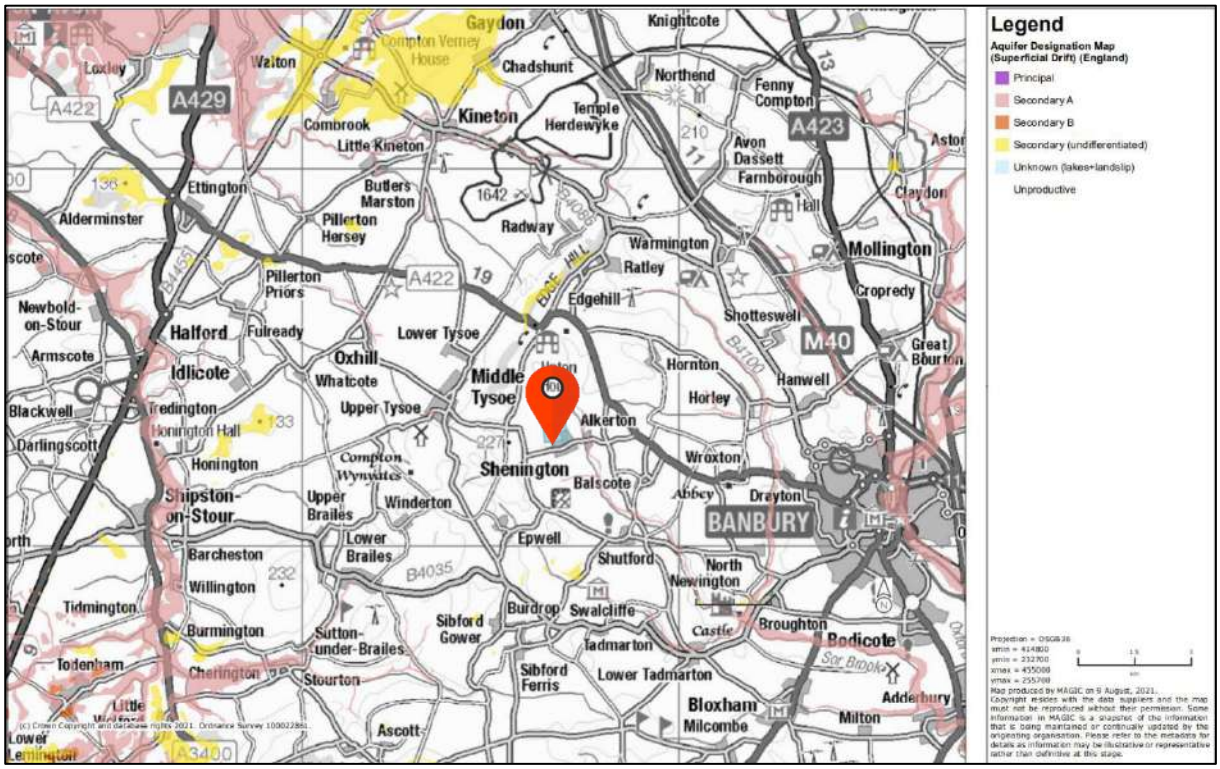

Figure 3. Aquifer Superficial Drift designation map

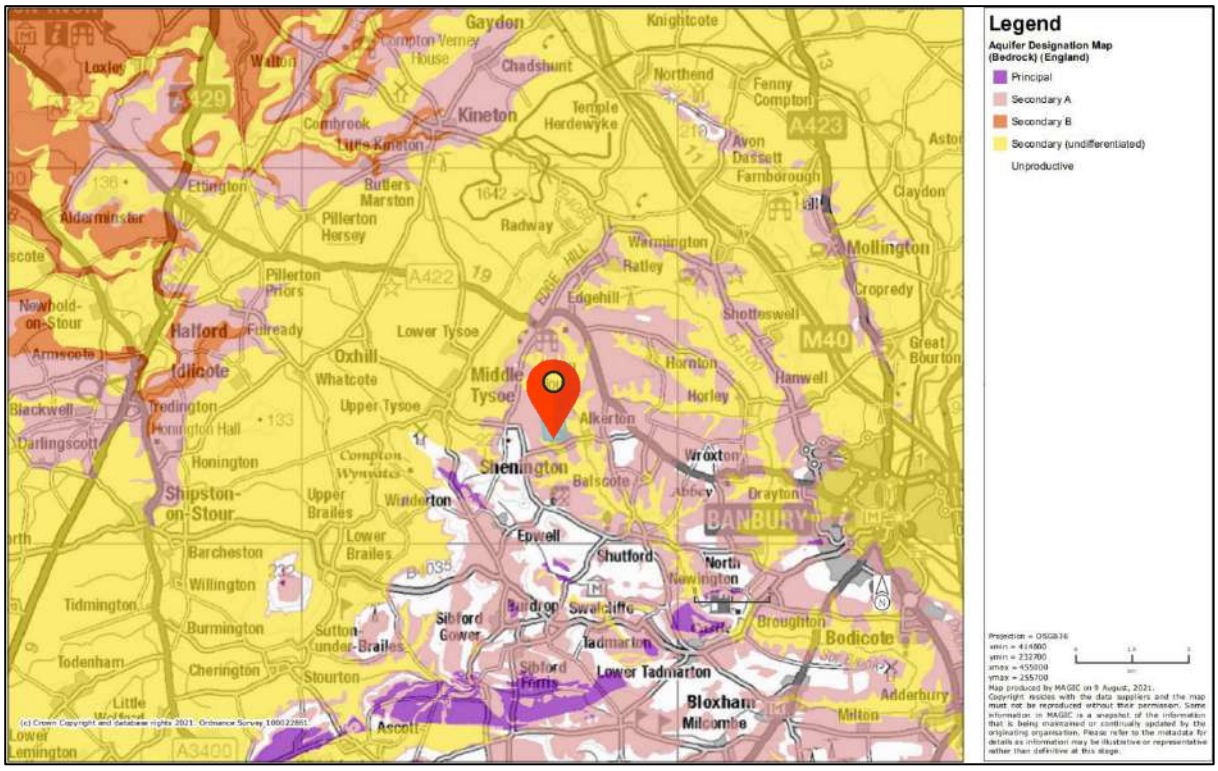

Figure 4. Aquifer Bedrock designation map

2.5 Site Specific Flood Risks

This section reviews the possible sources of flooding relevant for the site and assesses the impacts both on the development itself and on other areas as a result of the proposed development.

The Environment Agency is responsible for the provision of information pertaining to flood risk from tidal and main watercourses throughout England and Wales. The EA provides an online information service through its flood map data. An extract from the flood map is given in Figure which indicates that the site is in Flood Zone 1. The EA identifies the land having a less than 1 in 1,000 annual probability of river or sea flooding.

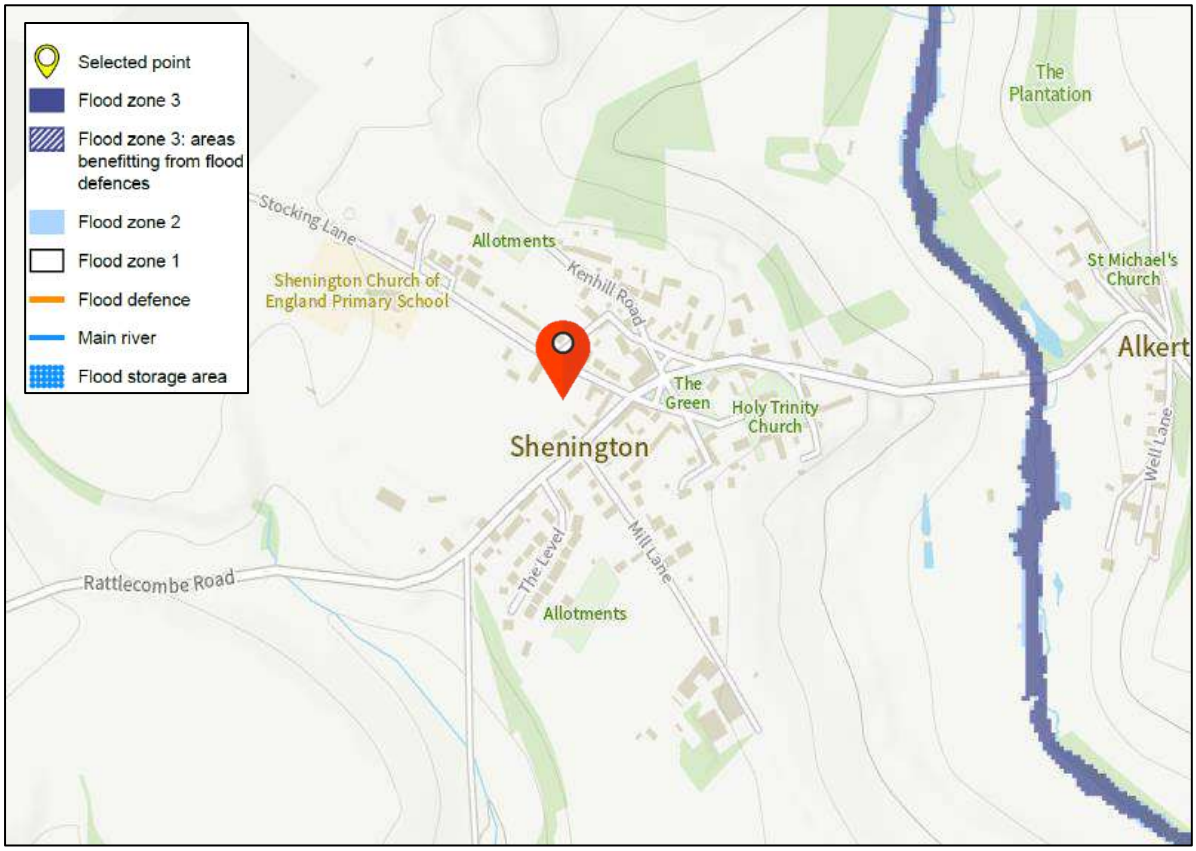

Figure 5. Flood Map for Planning by EA

2.5.1 Tidal/Fluvial Flooding

Tidal/Fluvial flooding occurs when sea levels rise and flow into a water course causing the water table levels to rise or water levels rise as a result of high or intense rainfall flowing into a watercourse, resulting in water courses overflowing their banks.

Sea (Tidal) Flooding – The site is not located in the vicinity of the coast, and is therefore not at risk of flooding due to tidal flows.

River (Fluvial) Flooding –The site is not located adjacent to any river. Therefore, there is no risk of flooding from fluvial flows.

From Figure 6. Tidal/Fluvial Flood Risk Map, we can see that the proposed site is in a very low risk area. Meaning, each year this area has a chance of flooding less than 1 in 1,000 (0.1%) from tidal and fluvial flows.

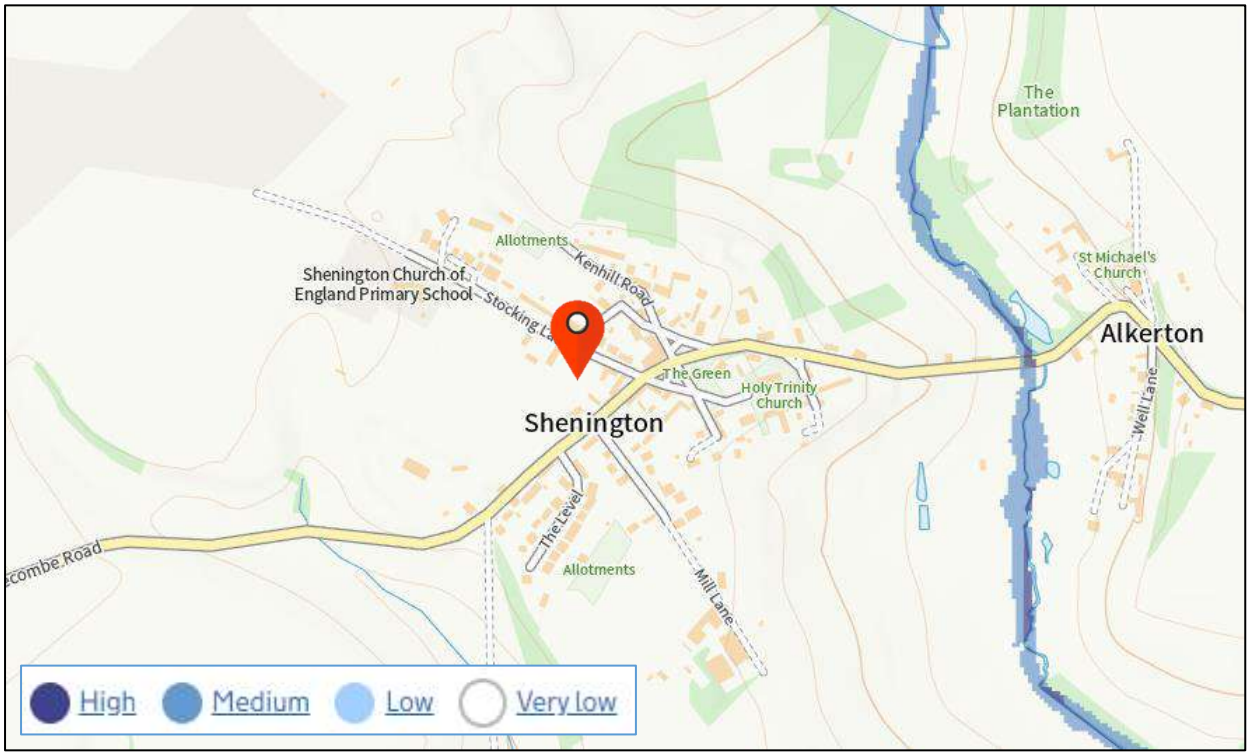

Figure 6. Tidal/Fluvial Flood Risk Map

2.5.2 Surface Water Flooding (Pluvial Flooding)

Surface water flooding can occur when heavy rainfall overwhelms the local drainage network and also depends on existing ground levels, rainfall and the local drainage network. The EA website contains mapping of areas believed vulnerable to surface water flooding. An extract from the flood map is given in Figure 7. This shows that the site is in a very low flood risk area. Meaning that each year this area has a chance of pluvial flooding of less than 0.1%.

Although the development is in a very low risk area of flooding from surface water flows, it is important to note that the newly developed site will include a drainage system that can cope with large storm events, reducing the risks and/or limit surface water flooding during extreme storm events to areas such as carparks.

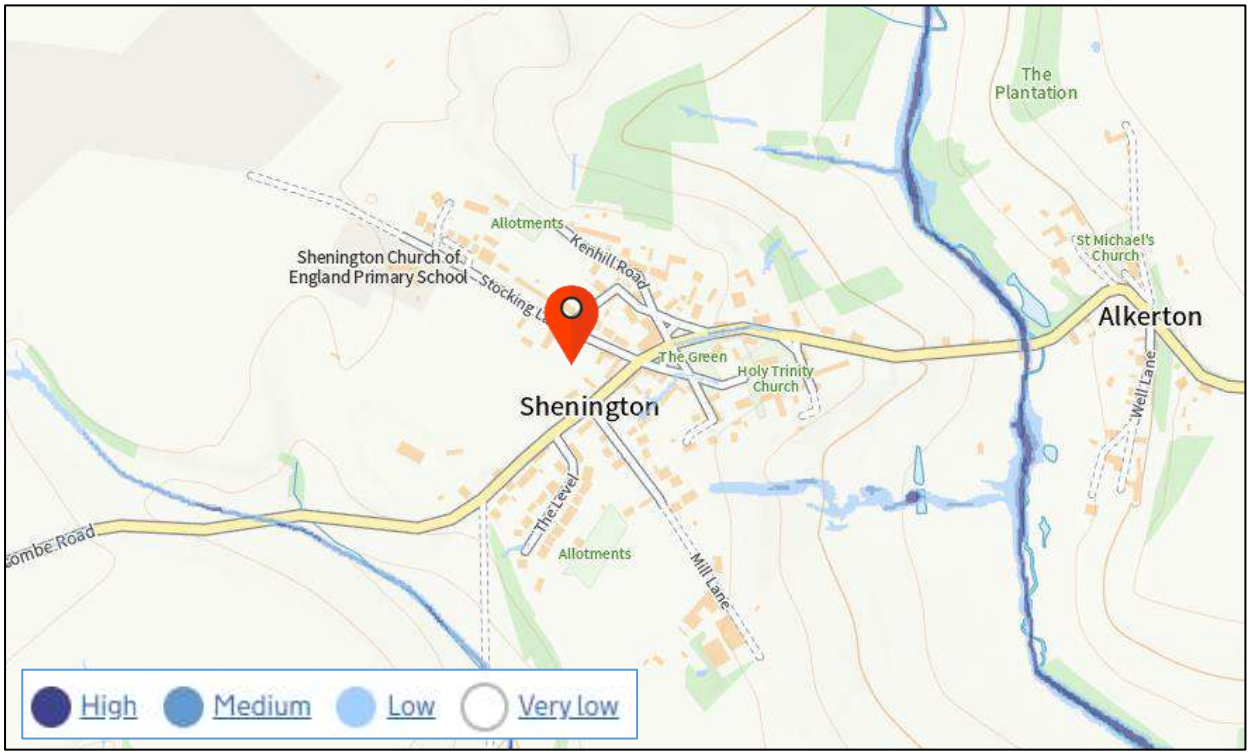

Figure 7. Surface Water Flood Risk Map

2.5.3 Artificial Sources of Flooding

Artificial sources include any water bodies not covered under other categories and typically include canals, lakes and reservoirs.

Cherwell district has two main reservoirs; Clattercote Reservoir and Grimsbury Reservoir, however neither of these are located within the vicinity of the site, therefore there is no risk of flooding due to artificial sources. This can be seen in Figure 8 below.

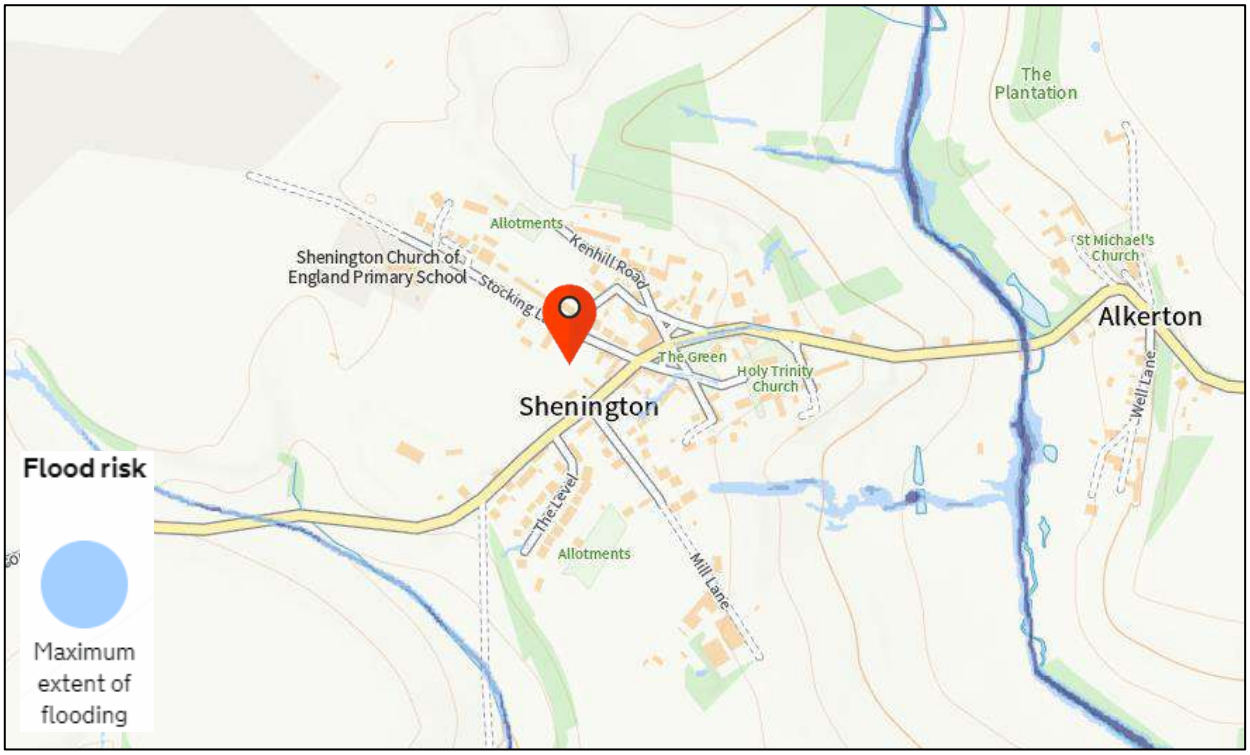

Figure 8. Artificial Source Flood Risk Map

2.5.4 Historic Flooding

From the CDC SFRA it is clear that there have been multiple historic flooding events within the Cherwell District which has predominantly been cause by the River Cherwell. However, with that said, none of these flooding events occurred within the vicinity of the proposed development site location and has therefore never caused any impact/damage to the site. It is important to note that previous severe flooding event occurred a significant period of time ago (in 1998) before major flood defences were put in place. In addition, according to the CDC SFRA there has been no historic flooding events within the Shenington area.

A copy of the CDC SFRA's historical flooding incidents map is included in Appendix B.

2.5.5 Sewer Flooding

Sewer flooding coincides with heavy rainfall, and may occur if the amount of rainfall exceeds the capacity of the sewer system, the system becomes blocked and/or water surcharges (i.e. rises above the ground) due to high water levels in the receiving watercourse.

As stated in section 2.5.2 of this report, the development plot will include a drainage system that can cope with large storm events, reducing the risks and/or limit surface water flooding during the most extreme storm events.

According to the CDC SFRA there has been 0-5 incidents of sewer flooding within the development area.

A map of Historical Sewer Flooding Events in Cherwell has been included in Appendix B. This map indicates areas reported to Thames Water that have experienced flooding during the last 20-year period as a result of insufficient hydraulic capacity in the seer network. The dataset identifies that the development site has experienced between 0-5 incident(s).

2.5.6 Groundwater Flooding

Groundwater flooding occurs as a result of water rising up from the underlying aquifers or from water flowing from springs. This tends to occur after long periods of sustained heavy rainfall and can be sporadic in both location and time, often lasting longer than a river or surface water flood.

A copy of the EA's Areas Susceptible to Groundwater Flooding Map is included in Appendix B and indicates that the site is located within an area of less than 25 percent susceptibility to groundwater flooding. Therefore, this area of the Cherwell District can be concluded as a low risk of groundwater flooding.

2.6 Source Protection Zone

The EA have defined Source Protection Zones (SPZs) for 2000 groundwater sources such as wells, boreholes and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk. The maps show three main zones (inner which is buffered around the abstraction point, outer and total catchment) and a fourth zone of special interest.

The zones are used in conjunction with the EA's Groundwater Protection Policy to set up pollution prevention measures in areas which are at a higher risk, and to monitor the activities of potential polluters nearby.

As shown in 9, the proposed development is not near or within any source protection zone.

Figure 9. Source protection zones map

3 Proposed Site

3.1 Description of development

The current site is classed as greenfield. The current proposed application is to develop 49 no. dwellings with associated car parking and access roads. A site layout plan has not been provided at this time.

The proposed development has an impermeable area of 1.01 ha and a permeable area of 1.75 ha. These figures are subject to change as the layout detail progresses.

The proposed site levels will be set such that they try to (where possible) follow the contours of the existing site so as to minimise the requirement for any retaining walls and also adhere to best practice and building regulation design standards.

Proposed development levels will also be set such that they try to minimise any surface water flooding from the new development drainage network and ensure that should any flooding occur it is controlled and kept within the new development boundaries and does not affect neighbouring properties or highway land.

4 Drainage Policy & Consultation

4.1 Drainage Authority

At this stage, the relevant Water Authority (Thames Water) has not been contacted for information regarding the public storm and foul water sewers.

Based on online satellite imagery, there appears to be an existing manhole and gully located along Stocking Lane. This, however is to be confirmed through the purchase of Thames Water's public sewer map to understand the number of public sewers located within the vicinity of the development and an approximate location.

4.2 Lead Local Flood Authority

The Lead Local Flood Authority (LLFA) is Oxfordshire Council; however, Cherwell District Council (CDC) a Strategic Flood Risk Assessment (SFRA) and Local Plan which define flooding and drainage requirements.

Key items within the SFRA are:

- It should be demonstrated through a Surface Water Drainage Strategy or as part of a site-specific Flood Risk Assessment, that the proposed drainage scheme, and site layout and design, will prevent properties from flooding from surface water.
- An allowance for climate change should be taken into account when considering development, in accordance with the EA published updated climate change guidance.
- Use of SuDS (where possible use of strategic SuDS should be made)
- 1 in 100-year attenuation of surface water, taking into account climate change.

4.3 Application of Flood Risk Policy

Based on the EA's flood maps it is possible to undertake an initial site flood risk compatibility assessment to ascertain whether the proposed development site is presently suitable for development by referring to the flood zone compatibility matrix (Table 1).

Table 1.Flood Risk Vulnerability and Flood Zone Compatibility

		Essential infrastructure	**Water compatible**	**Highly vulnerable**	**More vulnerable**	**Less vulnerable**
Flood Zones	**Zone 1**	√	√	√	√	√
	Zone 2	√	√	Exception Test required	√	√
	Zone 3a	Exception Test required	√	x	Exception Test required	√
	Zone 3b Functional Floodplain	Exception Test required	√	x	x	x

Key: √ - Development is appropriate

x - Development should not be permitted

Notes to table:

This table does not show:

- The application of the Sequential Test which guides development to Flood Zone 1 first, then Zone 2 and then Zone 3.
- Flood Risk Assessment requirements, or
- The Policy aims for each flood zone.

Table 2. Flood Risk Vulnerability Classification

Essential Infrastructure	• Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations and water treatment works that need to remain operational in times of flood. • Wind turbines.
Highly Vulnerable	• Police stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent (where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations or need to be located in other high flood risk areas, in these instances the facilities should be classified as “essential infrastructure”).
More Vulnerable	• Hospitals. • Residential institutions such as residential care homes, children’s homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non-residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities and hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable	• Police, ambulance and fire stations which are not required to be operational during flooding. • Buildings used for shops, financial, professional and other services, restaurants and cafes, hot food takeaways, offices, general industry, storage and distribution, non-residential institutions not included in “more vulnerable” and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (expect landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Navigations facilities. • Ministry of Defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

Water Compatible Development	• Water treatment works which do not need to remain operational during times of flood. • Sewerage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place). • Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewerage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves.

4.3.1 Sequential Test

The Sequential Test is intended to direct new development to an area of lowest probability of flood risk and ensure development is in the most appropriate flood zone.

As the development's extents of the site are within Flood Zone 1, the development can be considered appropriate for the proposed use, and therefore passes the Sequential Test.

4.3.2 Exception Test

The Exception Test is not required as the site is located within Flood Zone 1.

4.3.3 Flood Risk Assessment Summary & Mitigation Measures

Table 1 contains a summary of the flood risks to the proposed site. Mitigation measures to address the identified risks are discussed below.

Table 3. Summary of Flood Risks

Flood Risk	**Risk Level**	**Action Required**
Tidal/Fluvial	Very Low	None
Surface Water	Very Low	None
Sewers	Low	None
Groundwater	Low	None
Artificial	N/A	None
Run-off	Low	Mitigation Required

It can be concluded that there is no risk to flooding on the development itself. Mitigation measures are required to ensure that run-off from the proposed development will not adversely impact areas downstream.

5 Drainage Strategy

5.1 Hierarchy of Disposal

Generally, the aim should be to discharge surface water run-off as high up the following hierarchy of drainage options as reasonably practicable.

- Into the ground (infiltration)
- To a surface water body
- To a surface water sewer, highway drain, or other drainage systems
- To a combined sewer

5.1.1 Infiltration

As mentioned in section 2.3 of this report, geotechnical/geoenvironmental site investigation has been completed and suggested that discharging surface water to ground via infiltration techniques is a viable option for this development. As such the current drainage strategy includes an infiltration basin which has been designed for the 100 year + 40%CC.

5.1.2 Water Body

Current drainage strategy is infiltration.

5.1.3 Surface Water Sewer/Combined Sewer

Current drainage strategy is infiltration.

5.2 Sustainable Drainage

Potential SuDS techniques considered for the proposed site have been outlined below.

5.2.1 Rainwater harvesting

Rainwater harvesting (RWH) is the collection of rainwater runoff for use. Runoff can be collected from roofs and other impermeable areas, stored, treated (where required) and then used as a supply water for domestic, commercial and/or institutional properties.

The rainwater harvesting will be disproportionate in terms of cost and function in regards to the proposed development nature (residential). Therefore, rainwater harvesting has been disregarded.

5.2.2 Green Roofs

Green roofs comprise a multi-layered system that covers the roof of a building or podium structure with vegetation cover, over a drainage layer. They are designed to intercept and retain precipitation, reducing the volume of run-off and attenuating peak flows.

Green roofs have been disregarded due to the pitched roofs.

5.2.3 Soakaways

Soakaways are square or circular excavations either filled with rubble or lined with brickwork, precast concrete or polyethylene rings/perforated storage structures surrounded by granular backfill. They can be grouped and linked together to drain large areas including highways. The supporting structure and backfill can be substituted by modular geo-cellular units. Soakaways provide storm water attenuation, storm water treatment and groundwater recharge.
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An infiltration has been used as a way to discharge surface water flows to ground for this development.

5.2.4 Swales

Swales are linear vegetated drainage features in which surface water can be stored or conveyed. They can be designed to allow infiltration, where appropriate. They should promote low flow velocities to allow much of the suspended particulate load in the storm water runoff to settle out, thus providing effective pollutant removal. Roadside swales can replace conventional gullies and drainage pipes.

Swales have not been incorporated into the design due to the nature of the development.

5.2.5 Pervious Pavements

Pervious pavements provide a pavement suitable for pedestrian and/or vehicular traffic while allowing rainwater to infiltrate through the surface and into the underlying layers. The water is temporarily stored between infiltration to the ground, reuse or discharge to a watercourse or other drainage system. Pavements with aggregate sub-bases can provide good water quality treatment.

When permeable paving for car parking bays is used, the stone sub-base not only stores and slows down the rate of discharge, but also raises the water quality. It should not be used in the loading yard areas, due to the impact of the heavily loaded HGVs on the long-term durability of the pavement finish.

Pervious pavements have been incorporated into the private drives, this will ensure water quality and filtration of hydrocarbons from the run off prior to entering the adoptable system

5.2.6 Geo-cellular/Modular Systems

Modular plastic geo-cellular systems with a high void ratio can be used to create a below ground storage structure. Modular tanks can be used for runoff attenuation but require silt trap protection and a suitable means of access for cleaning and inspection.

A Geo-cellular system has not been used within the drainage strategy and an infiltration basin has been used as an alternative for attenuation.

5.2.7 Ponds/Infiltration Basin

Ponds can provide both storm water attenuation and treatment. They are designed to support emergent and submerged aquatic vegetation along their shoreline. Runoff from each rain event is detained and treated in the pool. The retention time promotes removal of silt through sedimentation and the opportunity for biological uptake mechanisms to reduce nutrient concentrations.

An infiltration basin has been included within the design.

5.3 Sustainable Drainage Maintenance

The various SuDS features will remain privately owned and be maintained by the client. The exact details of this arrangement will be defined when future tenants are confirmed.

The SuDS operation and maintenance strategy will be in accordance with CIRIA C753 best practice, as tabled below:

Table 4. SuDS Operation and maintenance requirements

Monthly	Inspect upstream catchpits for silt and vortex control manhole for debris. Clean out if necessary, using vacuum tanker.
Every Six Months	Remove sediment from the inlet catchpit with a vacuum tanker twice a year as necessary, ideally at the start of Spring when general landscaping tidying up is carried out after winter damage and autumn leaf fall.
Annually	Annually inspect/check all sumps, inlets, outlets, vents to tanks to ensure that they are in good condition and operating as designed. Inspect distribution pipe by CCTV. If necessary clean out.
Remediation Inspection & tasks following significant storm events	Inspect upstream and downstream catchpits for silt and vortex control manhole for debris. Clean out as necessary using vacuum tanker.
Contingency plan details	Exceedance flows as defined in the Drainage Strategy Drawing.

6 Drainage Strategy – Surface Water

6.1 Proposed Surface Water Runoff Rate

As the proposed drainage plan implements the used of soakaway techniques, as a result there will be no positive discharge from the site into the surrounding sewer network.

Rate of infiltration following site specific testing within this area was 1.01 x 10-3 m /s or 3.636 m / hr.

6.2 Proposed Surface Water Drainage Strategy

The building roofs are to discharge into the private drainage system which surrounds the dwellings, this will ultimately discharge into the adoptable drainage system within the highway. Surface water flows from external areas are proposed to be collected via traditional methods including gully's drainage channels and slot drains. The infiltration basin has been adequately sized to accommodate the 100 yr + 40% CC flows based on infiltration rates gathered from site specific intrusive testing by Discovery CE.

Levels should be designed at the appropriate detailed design stage such that critical 100 year plus climate change storm events are contained above ground, but safely within the site boundaries without risk to surrounding properties, the building or that restricts access / egress.

For the 1 in 100 years plus climate change event should any flooding occur at the surface level this would be of no more than 100mm in depth and be contained safely on site, in parking areas, without risk to proposed or existing buildings.

7 Drainage Strategy – Foul Sewerage

7.1 Proposed foul drainage strategy

At the time of writing this report a site layout plan was unavailable, therefore it is difficult to determine an exact foul strategy for the development. However, it is clear that foul drainage will be required to serve the development.

The proposed foul network strategy will connect to the nearest foul public sewer. Thames Water's public sewer map has not yet been obtained; therefore, the location of an existing foul network is unknown. The location of an existing foul network will be confirmed once Thames Water's public sewer map has been obtained.

8 Summary

The development's proposal is to develop multiple dwellings with associated car parking and access roads. The existing site is currently undeveloped and is therefore classed as a greenfield site.

The EA Flood Map for planning depicts the site is located within Flood Zone 1, with very low risk of flooding from tidal & fluvial, surface water and extremely low risk of flooding from artificial sources. The proposed development is classed as less vulnerable usage and it is located in Flood Zone 1 which therefore meets the sequential test. An exception test is not required.

The use of SuDS features has been considered and can be incorporated within the design. Pervious pavements have been incorporated into the private drives, this will ensure water quality and filtration of hydrocarbons from the run off prior to entering the adoptable system

The surface water will be designed to cater for storm events up to 1 in 100 years plus 40% climate change. Surface water flows will be discharged to ground via an infiltration basin with a rate of 1.01×10^{-3} m/s.

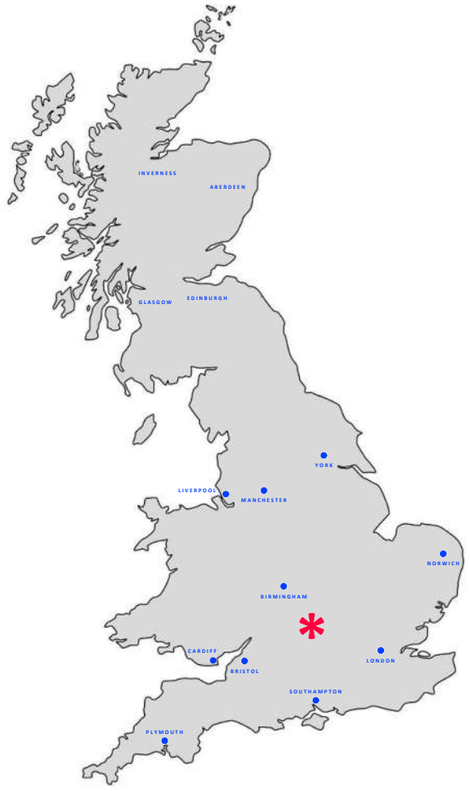
The site does not pose any increased flood risk to the site itself or adjacent developments, and is not susceptible to flooding by other means.

Appendix A – Existing Information

A.1 Site Location Plan

A.2 Topographical Survey

A3 NOTES



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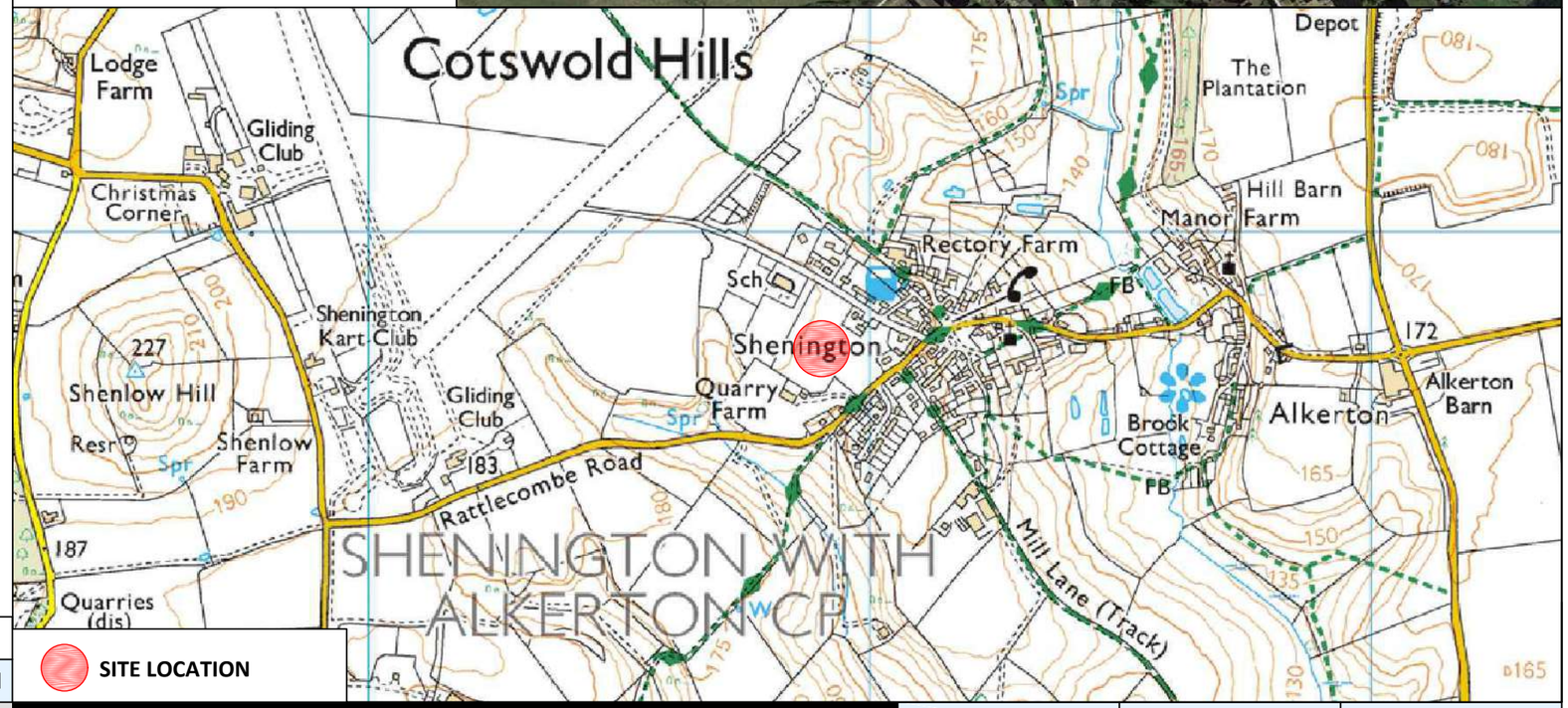
WORKS BOUNDARY



SITE LOCATION

SITE DETAILS		
Address:	STOCKING LANE, SHENINGTON, BANBURY	
Nearest Postcode:	OX15 6NF	
Grid Co-Ordinates:	E: 436935	N: 242770

FOR INFORMATION

Rev	Date	Description	By	Chkd
—	11/08/2021	FIRST ISSUE.	C.R.	-

Revision Schedule

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Project Title

STOCKING LANE SHENINGTON

Drawing Title

SITE LOCATION PLAN

Drawn by	Checked by	Project Engineer
C.R.	—	G.L.
Date: AUG 2021		Scale @ A3: N.T.S.
Project No.: 13171	Drawing No.: SK100	Rev: —

NOTES

A1

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6. Background plan based on topographic survey data created by others and supplied for the purpose of carrying our engineering works. We cannot be held responsible for the content, completeness and accuracy provided to us by others.
   Topographical survey taken from AD Horner Ltd plan reference:
   - 5924-21JAN20-01-02-03-2D

FOR INFORMATION

Rev	Date	Description	By	Chkd
—	11/08/2021	FIRST ISSUE.	C.R.	-

Revision Schedule

Project Title

STOCKING LANE
SHENNINGTON

Drawing Title

TOPOGRAPHICAL SURVEY PLAN

Drawn by **C.R.** Checked by **—** Project Engineer **G.L.**

Date	Scale @ A1	Project No.	Drawing No.	Rev
AUG 2021	**1:500**	**13171**	**SK101**	**—**

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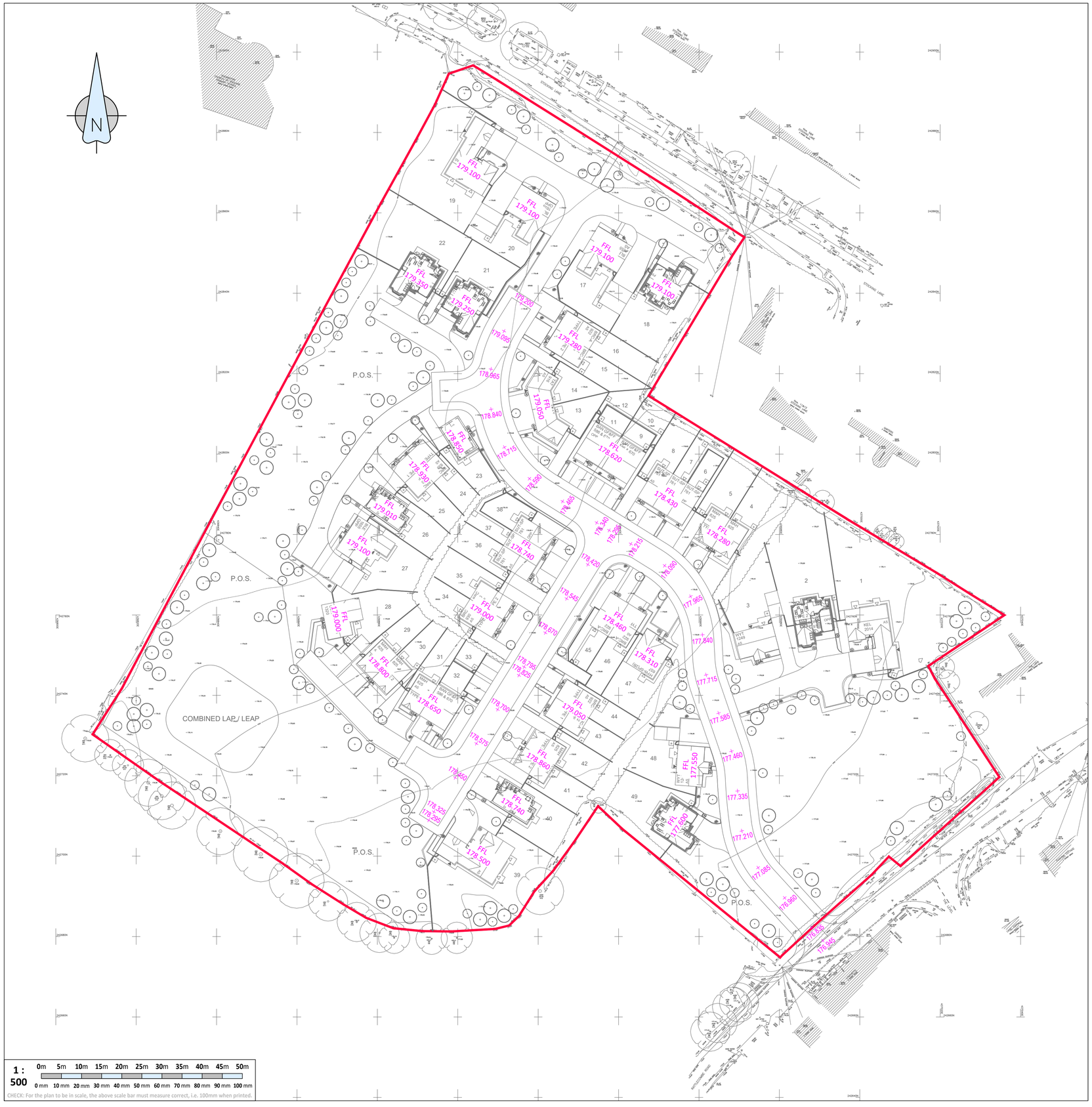
Appendix B – EA & SFRA Information

B.1 Proposed Impermeable Areas Plan

B.2 Proposed Drainage Strategy

B.3 Proposed Levels Plan



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A1

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   Topographical survey taken from AD Horner Ltd plan reference:
   - 5924-21JAN20-01-02-03-2D
7. Architectural layout taken from Elan Homes plan reference:
   - SHN-Planning REVB(Dated 10.01.2022).

SUBJECT TO DETAILED DESIGN

FOR PLANNING

Rev	Date	Description	By	Chkd
A	05/02/2022	AMENDED TO SUIT UPDATED LAYOUT.	JH	JH
—	16/09/2021	FIRST ISSUE.	C.R.	JH

Revision Schedule

Project Title
STOCKING LANE, SHENINGTON

Drawing Title
PROPOSED LEVELS STRATEGY

Drawn by **C.R.** Checked by **J.H.** Project Engineer **G.L.**

Date	Scale @ A1	Project No.	Drawing No.	Rev
SEPT 2021	1:500	13171	SK103	A

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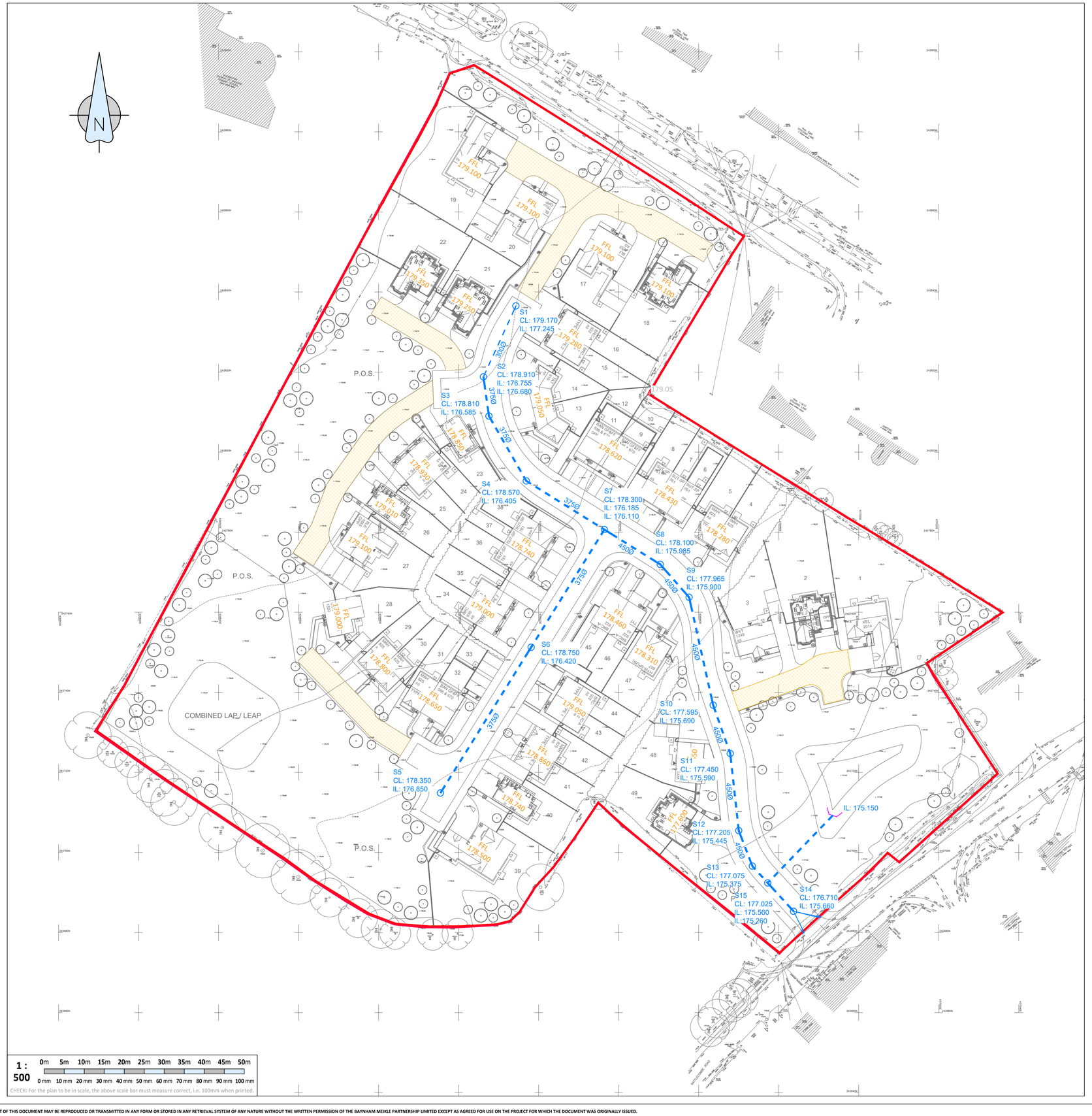

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6. Background plan based on topographic survey data created by others and supplied for the purpose of carrying our engineering works. We cannot be held responsible for the content, completeness and accuracy provided to us by others. Topographical survey taken from AD Horner Ltd plan reference:
   - 5924-21JAN20-01-02-03-2D
7. Architectural layout taken from Elan Homes plan reference:
   - SHN-SK-001_REVA (Dated 07/07/2021).

KEY

- PROPOSED SURFACE WATER SEWER
- PROPOSED CELLULAR STORAGE
- PROPOSED PERMEABLE SURFACE

SUBJECT TO DETAILED DESIGN

FOR PLANNING

Rev	Date	Description	By	Chkd
A	04/02/2022	AMENDED TO SUIT LAYOUT AMENDMENTS AND RECIEPT OF SI.	J.H.	J.H.
—	16/09/2021	FIRST ISSUE.	C.R.	-

Revision Schedule

Project Title

STOCKING LANE, SHENINGTON

Drawing Title

PROPOSED DRAINAGE STRATEGY

Drawn by **C.R.** Checked by **—** Project Engineer **G.L.**

Date	Scale @ A1	Project No.	Drawing No.	Rev
SEPT 2021	1:500	13171	SK104	A

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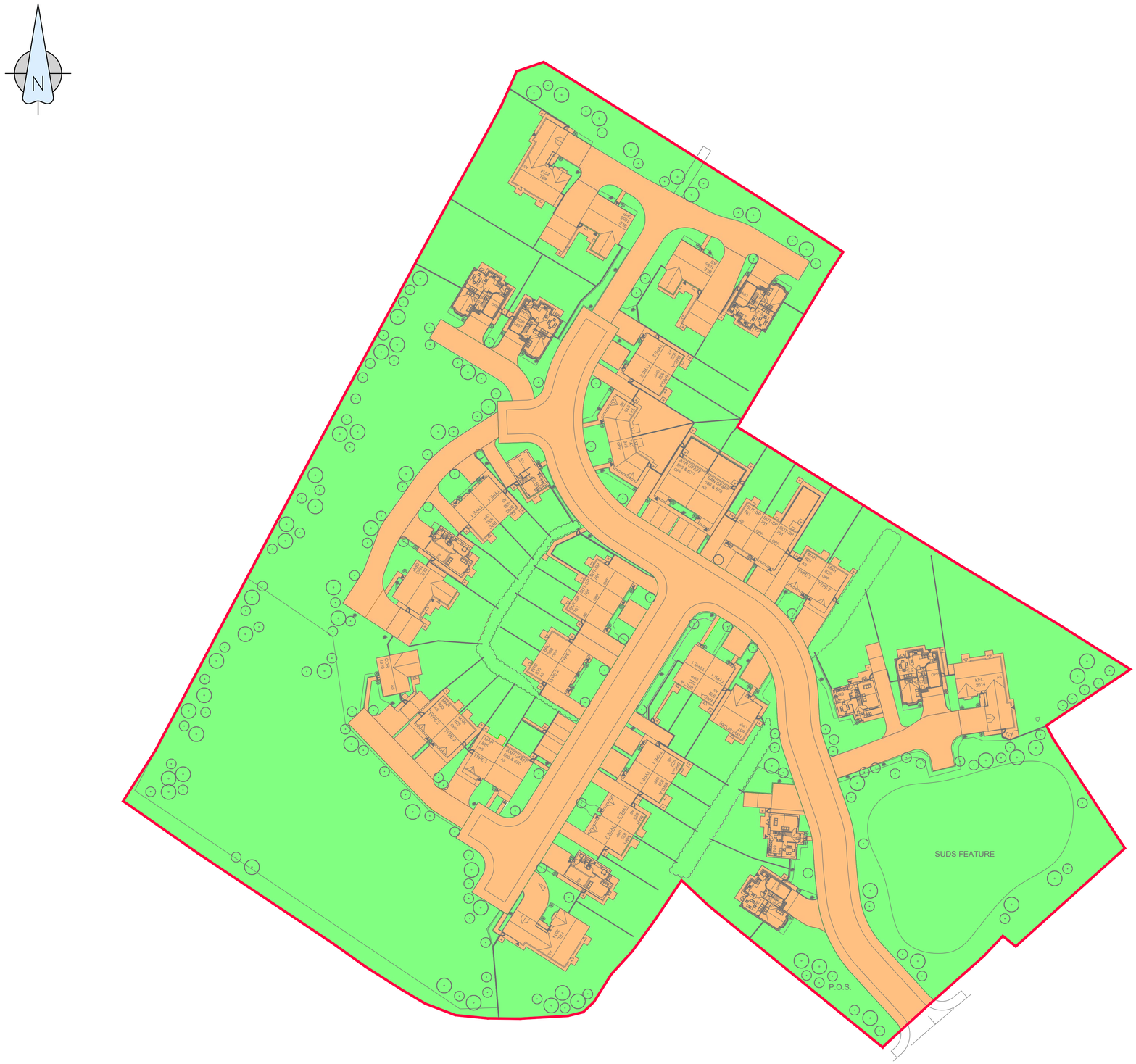

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2. This drawing is to be read in conjunction with all relevant Architects, Engineers and Specialists drawings and specifications.

3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.

4. The contractor is to check and verify all dimensions and levels before commencing work.

5. Any discrepancies noted on site are to be reported to the Engineer immediately.

7. Architectural layout taken from Elan Homes plan reference:
- X - 2022.01.06 - SHN-Planning-Rev B .

Key: Proposed Areas

Impermeable Areas:
1.01 Ha

Permeable Areas:
1.75 Ha

FOR INFORMATION

Rev	Date	Description	By	Chkd
A	14/01/2022	AMENDED TO SUIT LAYOUT AMENDMENTS	E.D.B.	J.H.
-	XX/08/2021	FIRST ISSUE.	C.R.	G.L.

Revision Schedule

Project Title

**STOCKING LANE,
SHENNINGTON**

Drawing Title

PROPOSED IMPERMEABLE AND PERMEABLE PLAN

Drawn by **E.D.B.** Checked by **J.H.** Project Engineer **G.L.**

Date	Scale @ A1	Project No.	Drawing No.	Rev
JAN 2022	1 : 500	13171	SK105	A

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1 : 500

0m 5m 10m 15m 20m 25m 30m 35m 40m 45m 50m

0 mm 10 mm 20 mm 30 mm 40 mm 50 mm 60 mm 70 mm 80 mm 90 mm 100 mm

CHECK: For the plan to be in scale, the above scale bar must measure correct, i.e. 100mm when printed.

Appendix C – Calculations

C.1 Microdrainage Calculations

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	19.200	Add Flow / Climate Change (%)	0
Ratio R	0.400	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	19.490	0.490	39.8	0.126	7.00	0.0	0.600	o	300	Pipe/Conduit	
1.001	9.885	0.095	104.1	0.042	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.002	18.702	0.180	103.9	0.126	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.003	22.989	0.220	104.5	0.074	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.000	42.911	0.430	99.8	0.161	7.00	0.0	0.600	o	375	Pipe/Conduit	
2.001	34.611	0.235	147.3	0.067	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.004	16.458	0.125	131.7	0.098	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.005	10.931	0.085	128.6	0.037	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.006	27.603	0.210	131.4	0.083	0.00	0.0	0.600	o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	44.51	7.13	177.245	0.126	0.0	0.0	0.0	2.50	176.7	15.2
1.001	44.22	7.22	176.680	0.168	0.0	0.0	0.0	1.78	196.2	20.1
1.002	43.69	7.40	176.585	0.294	0.0	0.0	0.0	1.78	196.3	34.8
1.003	43.05	7.61	176.405	0.368	0.0	0.0	0.0	1.77	195.7	42.9
2.000	43.70	7.39	176.850	0.161	0.0	0.0	0.0	1.81	200.3	19.1
2.001	42.57	7.78	176.420	0.228	0.0	0.0	0.0	1.49	164.7	26.3
1.004	42.14	7.94	176.110	0.694	0.0	0.0	0.0	1.77	281.5	79.2
1.005	41.86	8.04	175.985	0.731	0.0	0.0	0.0	1.79	284.9	82.9
1.006	41.16	8.30	175.900	0.814	0.0	0.0	0.0	1.77	281.8	90.7

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.007	12.804	0.100	128.0	0.108	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.008	19.377	0.145	133.6	0.014	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.009	9.494	0.070	135.6	0.046	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.010	5.700	0.040	142.5	0.115	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.000	9.577	0.100	95.8	0.014	7.00	0.0	0.600	o	150	Pipe/Conduit	
1.011	33.719	0.110	306.5	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.012	20.000	-3.000	-6.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.007	40.86	8.42	175.690	0.922	0.0	0.0	0.0	1.80	285.5	102.0
1.008	40.39	8.60	175.590	0.936	0.0	0.0	0.0	1.76	279.4	102.4
1.009	40.16	8.69	175.445	0.982	0.0	0.0	0.0	1.74	277.4	106.8
1.010	40.02	8.75	175.375	1.097	0.0	0.0	0.0	1.70	270.5	118.9
3.000	44.43	7.16	175.660	0.014	0.0	0.0	0.0	1.03	18.1	1.7
1.011	38.87	9.23	175.260	1.111	0.0	0.0	0.0	1.16	183.8	118.9
1.012	32.49	12.83	175.150	1.111	0.0	0.0	0.0	0.09	1.6«	118.9

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S1	179.170	1.925	Open Manhole	1200	1.000	177.245	300				
S2	178.910	2.230	Open Manhole	1350	1.001	176.680	375	1.000	176.755	300	
S3	178.810	2.225	Open Manhole	1350	1.002	176.585	375	1.001	176.585	375	
S4	178.570	2.165	Open Manhole	1350	1.003	176.405	375	1.002	176.405	375	
S5	178.350	1.500	Open Manhole	1350	2.000	176.850	375				
S6	178.750	2.330	Open Manhole	1350	2.001	176.420	375	2.000	176.420	375	
S7	178.300	2.190	Open Manhole	1350	1.004	176.110	450	1.003	176.185	375	
								2.001	176.185	375	
S8	178.100	2.115	Open Manhole	1350	1.005	175.985	450	1.004	175.985	450	
S9	177.965	2.065	Open Manhole	1350	1.006	175.900	450	1.005	175.900	450	
S10	177.595	1.905	Open Manhole	1350	1.007	175.690	450	1.006	175.690	450	
S11	177.450	1.860	Open Manhole	1350	1.008	175.590	450	1.007	175.590	450	
S12	177.205	1.760	Open Manhole	1350	1.009	175.445	450	1.008	175.445	450	
S13	177.075	1.700	Open Manhole	1350	1.010	175.375	450	1.009	175.375	450	
S14	176.710	1.050	Open Manhole	1200	3.000	175.660	150				
S15	177.025	1.765	Open Manhole	1350	1.011	175.260	450	1.010	175.335	450	75
								3.000	175.560	150	
POND	176.650	1.500	Open Manhole	50	1.012	175.150	150	1.011	175.150	450	
	178.900	0.750	Open Manhole	0		OUTFALL		1.012	178.150	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	436914.329	242836.517	436914.329	242836.517	Required	
S2	436906.205	242818.801	436906.205	242818.801	Required	
S3	436907.585	242809.012	436907.585	242809.012	Required	
S4	436916.920	242792.806	436916.920	242792.806	Required	
S5	436895.457	242714.848	436895.457	242714.848	Required	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S6	436918.140	242751.274	436918.140	242751.274	Required	
S7	436936.435	242780.654	436936.435	242780.654	Required	
S8	436950.405	242771.955	436950.405	242771.955	Required	
S9	436957.613	242763.737	436957.613	242763.737	Required	
S10	436963.629	242736.797	436963.629	242736.797	Required	
S11	436967.893	242724.724	436967.893	242724.724	Required	
S12	436970.020	242705.464	436970.020	242705.464	Required	
S13	436973.420	242696.599	436973.420	242696.599	Required	
S14	436983.720	242685.317	436983.720	242685.317	Required	
S15	436977.263	242692.390	436977.263	242692.390	Required	
POND	436998.723	242718.398	436998.723	242718.398	Required	
	437014.289	242730.956			No Entry	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	300	S1	179.170	177.245	1.625	Open Manhole	1200
1.001	o	375	S2	178.910	176.680	1.855	Open Manhole	1350
1.002	o	375	S3	178.810	176.585	1.850	Open Manhole	1350
1.003	o	375	S4	178.570	176.405	1.790	Open Manhole	1350
2.000	o	375	S5	178.350	176.850	1.125	Open Manhole	1350
2.001	o	375	S6	178.750	176.420	1.955	Open Manhole	1350
1.004	o	450	S7	178.300	176.110	1.740	Open Manhole	1350
1.005	o	450	S8	178.100	175.985	1.665	Open Manhole	1350
1.006	o	450	S9	177.965	175.900	1.615	Open Manhole	1350
1.007	o	450	S10	177.595	175.690	1.455	Open Manhole	1350
1.008	o	450	S11	177.450	175.590	1.410	Open Manhole	1350
1.009	o	450	S12	177.205	175.445	1.310	Open Manhole	1350
1.010	o	450	S13	177.075	175.375	1.250	Open Manhole	1350
3.000	o	150	S14	176.710	175.660	0.900	Open Manhole	1200
1.011	o	450	S15	177.025	175.260	1.315	Open Manhole	1350
1.012	o	150	POND	176.650	175.150	1.350	Open Manhole	50

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	19.490	39.8	S2	178.910	176.755	1.855	Open Manhole	1350
1.001	9.885	104.1	S3	178.810	176.585	1.850	Open Manhole	1350
1.002	18.702	103.9	S4	178.570	176.405	1.790	Open Manhole	1350
1.003	22.989	104.5	S7	178.300	176.185	1.740	Open Manhole	1350
2.000	42.911	99.8	S6	178.750	176.420	1.955	Open Manhole	1350
2.001	34.611	147.3	S7	178.300	176.185	1.740	Open Manhole	1350
1.004	16.458	131.7	S8	178.100	175.985	1.665	Open Manhole	1350
1.005	10.931	128.6	S9	177.965	175.900	1.615	Open Manhole	1350
1.006	27.603	131.4	S10	177.595	175.690	1.455	Open Manhole	1350
1.007	12.804	128.0	S11	177.450	175.590	1.410	Open Manhole	1350
1.008	19.377	133.6	S12	177.205	175.445	1.310	Open Manhole	1350
1.009	9.494	135.6	S13	177.075	175.375	1.250	Open Manhole	1350
1.010	5.700	142.5	S15	177.025	175.335	1.240	Open Manhole	1350
3.000	9.577	95.8	S15	177.025	175.560	1.315	Open Manhole	1350
1.011	33.719	306.5	POND	176.650	175.150	1.050	Open Manhole	50
1.012	20.000	-6.7		178.900	178.150	0.600	Open Manhole	0

Network Classifications for Storm

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
1.000	S1	300	1.625	1.855	Unclassified	1200	0	1.625	Unclassified
1.001	S2	375	1.850	1.855	Unclassified	1350	0	1.855	Unclassified
1.002	S3	375	1.790	1.850	Unclassified	1350	0	1.850	Unclassified
1.003	S4	375	1.740	1.790	Unclassified	1350	0	1.790	Unclassified
2.000	S5	375	1.125	1.955	Unclassified	1350	0	1.125	Unclassified
2.001	S6	375	1.740	1.955	Unclassified	1350	0	1.955	Unclassified
1.004	S7	450	1.665	1.740	Unclassified	1350	0	1.740	Unclassified
1.005	S8	450	1.615	1.665	Unclassified	1350	0	1.665	Unclassified
1.006	S9	450	1.455	1.615	Unclassified	1350	0	1.615	Unclassified
1.007	S10	450	1.410	1.455	Unclassified	1350	0	1.455	Unclassified
1.008	S11	450	1.310	1.410	Unclassified	1350	0	1.410	Unclassified
1.009	S12	450	1.250	1.310	Unclassified	1350	0	1.310	Unclassified
1.010	S13	450	1.240	1.250	Unclassified	1350	0	1.250	Unclassified
3.000	S14	150	0.900	1.315	Unclassified	1200	0	0.900	Unclassified
1.011	S15	450	1.050	1.315	Unclassified	1350	0	1.315	Unclassified
1.012	POND	150	0.600	1.350	Unclassified	50	0	1.350	Unclassified

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.012		178.900	178.150	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.200	Storm Duration (mins)	30
Ratio R	0.400		

Storage Structures for Storm

Infiltration Basin Manhole: POND, DS/PN: 1.012

Invert Level (m) 175.150 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 3.63600 Porosity 1.00
Infiltration Coefficient Side (m/hr) 3.63600

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	114.0	1.500	466.5

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.400
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.200	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S1	15 Winter	1	+0%	100/15 Summer			
1.001	S2	15 Winter	1	+0%	30/15 Summer			
1.002	S3	15 Winter	1	+0%	30/15 Summer			
1.003	S4	15 Winter	1	+0%	30/15 Summer			
2.000	S5	15 Winter	1	+0%	100/15 Summer	100/15 Summer		
2.001	S6	15 Winter	1	+0%	30/15 Summer			
1.004	S7	15 Winter	1	+0%	30/15 Summer	100/15 Winter		
1.005	S8	15 Winter	1	+0%	30/15 Summer	100/15 Winter		
1.006	S9	15 Winter	1	+0%	30/15 Summer			
1.007	S10	15 Winter	1	+0%	30/15 Summer	100/15 Winter		
1.008	S11	15 Winter	1	+0%	30/15 Summer			
1.009	S12	15 Winter	1	+0%	30/15 Summer			
1.010	S13	15 Winter	1	+0%	30/15 Summer			
3.000	S14	15 Winter	1	+0%	30/15 Summer			
1.011	S15	15 Winter	1	+0%	30/15 Summer			
1.012	POND	15 Winter	1	+0%	30/15 Summer			

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S1	177.307	-0.238	0.000	0.09			14.4	OK	
1.001	S2	176.779	-0.276	0.000	0.16			19.0	OK	
1.002	S3	176.700	-0.260	0.000	0.20			33.0	OK	
1.003	S4	176.531	-0.249	0.000	0.25			41.2	OK	
2.000	S5	176.929	-0.296	0.000	0.10			18.2	OK	3
2.001	S6	176.525	-0.270	0.000	0.17			25.3	OK	
1.004	S7	176.304	-0.256	0.000	0.38			76.6	OK	1
1.005	S8	176.205	-0.230	0.000	0.48			80.8	OK	1
1.006	S9	176.091	-0.259	0.000	0.37			89.4	OK	
1.007	S10	175.931	-0.209	0.000	0.56			100.0	OK	1
1.008	S11	175.808	-0.232	0.000	0.47			100.9	OK	
1.009	S12	175.704	-0.191	0.000	0.63			105.8	OK	
1.010	S13	175.662	-0.163	0.000	0.73			116.4	OK	
3.000	S14	175.692	-0.118	0.000	0.10			1.6	OK	
1.011	S15	175.547	-0.163	0.000	0.73			116.4	OK	
1.012	POND	175.280	-0.020	0.000	0.00		6	0.0	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.400
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.200	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S1	15 Winter	30	+0%	100/15 Summer			
1.001	S2	15 Winter	30	+0%	30/15 Summer			
1.002	S3	15 Winter	30	+0%	30/15 Summer			
1.003	S4	15 Winter	30	+0%	30/15 Summer			
2.000	S5	15 Winter	30	+0%	100/15 Summer	100/15 Summer		
2.001	S6	15 Winter	30	+0%	30/15 Summer			
1.004	S7	15 Winter	30	+0%	30/15 Summer	100/15 Winter		
1.005	S8	15 Winter	30	+0%	30/15 Summer	100/15 Winter		
1.006	S9	15 Winter	30	+0%	30/15 Summer			
1.007	S10	15 Winter	30	+0%	30/15 Summer	100/15 Winter		
1.008	S11	15 Winter	30	+0%	30/15 Summer			
1.009	S12	15 Summer	30	+0%	30/15 Summer			
1.010	S13	15 Summer	30	+0%	30/15 Summer			
3.000	S14	15 Winter	30	+0%	30/15 Summer			
1.011	S15	15 Summer	30	+0%	30/15 Summer			
1.012	POND	30 Winter	30	+0%	30/15 Summer			

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	S1	177.342	-0.203	0.000	0.23			35.3	OK
1.001	S2	177.208	0.153	0.000	0.40			47.8	SURCHARGED
1.002	S3	177.096	0.136	0.000	0.55			90.3	SURCHARGED
1.003	S4	176.930	0.150	0.000	0.62			103.7	SURCHARGED
2.000	S5	176.977	-0.248	0.000	0.24			44.6	OK
2.001	S6	176.899	0.104	0.000	0.39			57.5	SURCHARGED
1.004	S7	176.791	0.231	0.000	0.81			161.9	SURCHARGED
1.005	S8	176.666	0.231	0.000	0.96			163.1	SURCHARGED
1.006	S9	176.559	0.209	0.000	0.73			175.2	SURCHARGED
1.007	S10	176.411	0.271	0.000	1.08			192.7	SURCHARGED
1.008	S11	176.293	0.253	0.000	0.91			195.5	SURCHARGED
1.009	S12	176.163	0.268	0.000	1.23			208.0	SURCHARGED
1.010	S13	176.028	0.203	0.000	1.47			233.9	SURCHARGED
3.000	S14	175.853	0.043	0.000	0.27			4.4	SURCHARGED
1.011	S15	175.839	0.129	0.000	1.48			236.9	SURCHARGED
1.012	POND	175.556	0.256	0.000	0.00		11	0.0	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	S1	
1.001	S2	
1.002	S3	
1.003	S4	
2.000	S5	3
2.001	S6	
1.004	S7	1
1.005	S8	1
1.006	S9	
1.007	S10	1
1.008	S11	
1.009	S12	
1.010	S13	
3.000	S14	
1.011	S15	
1.012	POND	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.400
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.200	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S1	15 Winter	100	+40%	100/15 Summer			
1.001	S2	15 Winter	100	+40%	30/15 Summer			
1.002	S3	15 Winter	100	+40%	30/15 Summer			
1.003	S4	15 Winter	100	+40%	30/15 Summer			
2.000	S5	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
2.001	S6	15 Winter	100	+40%	30/15 Summer			
1.004	S7	15 Winter	100	+40%	30/15 Summer	100/15 Winter		
1.005	S8	15 Winter	100	+40%	30/15 Summer	100/15 Winter		
1.006	S9	15 Winter	100	+40%	30/15 Summer			
1.007	S10	15 Winter	100	+40%	30/15 Summer	100/15 Winter		
1.008	S11	15 Winter	100	+40%	30/15 Summer			
1.009	S12	15 Winter	100	+40%	30/15 Summer			
1.010	S13	15 Winter	100	+40%	30/15 Summer			
3.000	S14	30 Winter	100	+40%	30/15 Summer			
1.011	S15	30 Winter	100	+40%	30/15 Summer			
1.012	POND	30 Winter	100	+40%	30/15 Summer			

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	S1	178.970	1.425	0.000	0.42			65.0	FLOOD RISK
1.001	S2	178.715	1.660	0.000	0.68			82.4	FLOOD RISK
1.002	S3	178.623	1.663	0.000	0.77			126.0	FLOOD RISK
1.003	S4	178.483	1.703	0.000	0.92			153.6	FLOOD RISK
2.000	S5	178.360	1.135	10.117	0.53			97.4	FLOOD
2.001	S6	178.392	1.597	0.000	0.74			109.8	SURCHARGED
1.004	S7	178.300	1.740	0.064	1.17			233.5	FLOOD
1.005	S8	178.100	1.665	0.240	1.49			252.0	FLOOD
1.006	S9	177.908	1.558	0.000	1.19			284.7	FLOOD RISK
1.007	S10	177.597	1.457	2.127	1.77			314.9	FLOOD
1.008	S11	177.331	1.291	0.000	1.48			317.7	FLOOD RISK
1.009	S12	177.038	1.143	0.000	1.96			330.7	FLOOD RISK
1.010	S13	176.686	0.861	0.000	2.37			378.5	SURCHARGED
3.000	S14	176.275	0.465	0.000	0.29			4.7	SURCHARGED
1.011	S15	176.260	0.550	0.000	2.23			357.6	SURCHARGED
1.012	POND	175.882	0.582	0.000	0.00		13	0.0	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	S1	
1.001	S2	
1.002	S3	
1.003	S4	
2.000	S5	3
2.001	S6	
1.004	S7	1
1.005	S8	1
1.006	S9	
1.007	S10	1
1.008	S11	
1.009	S12	
1.010	S13	
3.000	S14	
1.011	S15	
1.012	POND	

Appendix D – SI Extracts

D.1 Site Investigation Extracts.

Discovery CE Ltd
The Granary, Broadwell House Farm
Rugby, Warwickshire, CV23 8HF

DYNAMIC SAMPLING LOG

Discovery Geotechnical & Environmental Engineers

Project				BOREHOLE No
Stocking Lane, Shenington				DS101
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	29-09-21 29-09-21	179.98	E 436,911.0 N 242,885.0	
Contractor				Sheet
Discovery CE				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.20	ES			179.38		(0.60) 0.60	Grass overlying firm light orange-brown slightly gravelly sandy CLAY. Gravel is brown sub-rounded fine to medium quartzite and sub-angular fine to medium sandstone with iron staining. Occasional fine rootlets (less than 5 mm diameter).		
0.75	ES						TOPSOIL		
1.00	D						Medium dense becoming very dense orange-brown slightly gravelly very clayey SAND. Gravel is orange-brown occasionally black sub-angular fine to medium sandstone with iron staining.		
1.00		N46 7,9/ 12,13,13,8							
1.50	B					(2.40)	MARLSTONE ROCK FORMATION		
2.00		N40 7,10/ 13,3,4,20		176.98		3.00			
3.00		N4 10,4/ 1,1,1,1					Loose and very loose becoming very dense orange-brown slightly gravelly clayey SAND. Gravel is orange-brown occasionally black sub-angular medium iron stained sandstone.		
4.00		N4 1,1/ 1,1,1,1				(3.45)	MARLSTONE ROCK FORMATION		
5.00	D								
5.00		N1 1,0/ 0,0,0,1							
5.80	D								
6.00		N50 3,2/ 3,15,17,15		173.53		6.45			

GENERAL REMARKS

No groundwater encountered. SPT refusal at 6.45 m. Installed with groundwater and ground gas standpipe to 5.0 m.

All dimensions in metres Scale 1:50	Client Elan Homes Limited	Method/ Plant Used Competitor DART	Logged By ET

Discovery CE Ltd
The Granary, Broadwell House Farm
Rugby, Warwickshire, CV23 8HF

DYNAMIC SAMPLING LOG

Discovery Geotechnical & Environmental Engineers

Project				BOREHOLE No
Stocking Lane, Shenington				DS102
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	29-09-21 29-09-21	179.17	E 436,943.0 N 242,820.0	
Contractor				Sheet
Discovery CE				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.30	ES			178.42		(0.75) 0.75	Grass overlying light orange-brown slightly gravelly sandy CLAY. Gravel is brown sub-rounded fine to medium quartzite and sub-angular fine to medium sandstone with iron staining. Occasional fine rootlets (less than 5 mm diameter). TOPSOIL		
1.00		N24 4,5/ 5,5,7,7		177.67		(0.75) 1.50	Stiff orange-brown slightly gravelly sandy CLAY. Gravel is brown and dark brown sub-rounded and sub-angular fine to medium sandstone with iron staining.		
1.50	D			177.27		(0.40) 1.90	MARLSTONE ROCK FORMATION. Firm orange-brown very sandy CLAY.		
2.00 2.00	B	N14 8,5/ 3,3,3,5		176.17		(1.10) 3.00	MARLSTONE ROCK FORMATION Medium dense orange-brown slightly clayey gravelly SAND. Gravel is dark brown and brown angular and sub-angular fine to medium sandstone with iron staining. MARLSTONE ROCK FORMATION		
3.00		N1 10,2/ 1,0,0,0		175.37		(0.80) 3.80	NO RECOVERY Possibly very loose becoming very dense orange-brown clayey gravelly SAND. Gravel is angular and sub-angular medium sandstone with iron staining.		
3.80		N50/240mm 20,5/ 3,20,20,7		174.92		(0.45) 4.25	MARLSTONE ROCK FORMATION NO RECOVERY Very dense orange-brown clayey gravelly SAND. Gravel is angular and sub-angular medium snadstone with iron staining. MARLSTONE ROCK FORMATION		

GENERAL REMARKS

No groundwater encountered. Terminated early due to SPT refusal at 4.25 m. Backfilled with clean gravel.

All dimensions in metres Scale 1:50	Client Elan Homes Limited	Method/ Plant Used Competitor DART	Logged By ET

Discovery CE Ltd
The Granary, Broadwell House Farm
Rugby, Warwickshire, CV23 8HF

DYNAMIC SAMPLING LOG

Discovery Geotechnical & Environmental Engineers

Project				BOREHOLE No
Stocking Lane, Shenington				DS103
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	29-09-21 29-09-21	177.93	E 436,974.0 N 242,690.0	
Contractor				Sheet
Discovery CE				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.15	ES					(0.60)	Grass overlying light orange-brown slightly gravelly sandy CLAY. Gravel is brown sub-rounded fine to medium quartzite and sub-angular fine to medium sandstone with iron staining. Occasional fine rootlets (less than 5 mm diameter).		
0.50	D			177.33		0.60			
				177.03		0.90	TOPSOIL		
0.90	ES						Firm orange-brown slightly gravelly sandy CLAY. Gravel is brown and dark brown sub-rounded and sub-angular fine to medium sandstone with iron staining.		
1.00	D					(0.55)			
1.00		N50/20mm 6,8/ 13,20,17		176.48		1.45	MARLSTONE ROCK FORMATION.		
							Very dense orange-brown-yellow sandy GRAVEL. Gravel is dark brown and orange angular and sub-angular medium to coarse sandstone with iron staining.		
							MARLSTONE ROCK FORMATION		

GENERAL REMARKS

No groundwater encountered. Terminated early due to SPT refusal at 1.45 m. Installed with groundwater and ground gas standpipe to 1.0 m.

All dimensions in metres Scale 1:50	Client Elan Homes Limited	Method/ Plant Used Competitor DART	Logged By ET

Discovery CE Ltd
The Granary, Broadwell House Farm
Rugby, Warwickshire, CV23 8HF

DYNAMIC SAMPLING LOG

Discovery Geotechnical & Environmental Engineers

Project				BOREHOLE No
Stocking Lane, Shenington				DS104
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	29-09-21 29-09-21	178.78	E 436,922.0 N 242,747.0	
Contractor				Sheet
Discovery CE				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.40	ES			178.28		(0.50) 0.50	Grass overlying light orange-brown slightly gravelly sandy CLAY. Gravel is brown sub-rounded fine to medium quartzite and sub-angular fine to medium sandstone with iron staining. Occasional fine rootlets (less than 5 mm diameter). TOPSOIL		
1.00		N60/225mm 6,10/ 15,16,29		177.78		(0.50) 1.00	Medium dense orange-brown clayey sandy GRAVEL. Gravel is brown and dark brown sub-rounded and sub-angular fine to medium sandstone with iron staining. MARLSTONE ROCK FORMATION.		
				177.33		(0.45) 1.45	Very dense yellow-brown-orange sandy GRAVEL. Gravel is angular medium to coarse sandstone with iron staining. MARLSTONE ROCK FORMATION		

GENERAL REMARKS

No groundwater encountered. Terminated early due to SPT refusal at 1.45 m. Backfilled with clean gravel.

All dimensions in metres Scale 1:50	Client Elan Homes Limited	Method/ Plant Used Competitor DART	Logged By ET

Discovery CE Ltd
The Granary, Broadwell House Farm
Rugby, Warwickshire, CV23 8HF

DYNAMIC SAMPLING LOG

Discovery Geotechnical & Environmental Engineers

Project				BOREHOLE No
Stocking Lane, Shenington				DS105
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	29-09-21 29-09-21	177.84	E 437,020.0 N 242,727.0	
Contractor				Sheet
Discovery CE				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.50	ES			177.19		(0.65) 0.65	Grass overlying light orange-brown slightly gravelly sandy CLAY. Gravel is brown sub-rounded fine to medium quartzite and sub-angular fine to medium sandstone with iron staining. Occasional fine rootlets (less than 5 mm diameter).		
				176.84		1.00	TOPSOIL		
1.00		N20 4,3/ 5,5,5,5		176.34		(0.50) 1.50	Orange-brown slightly gravelly sandy CLAY. Gravel is brown and dark brown sub-rounded and sub-angular fine to medium sandstone with iron staining.		
1.50	D						MARLSTONE ROCK FORMATION.		
1.90		N50/35mm 15,10/ 50		175.39		(0.95) 2.45	Stiff brown-orange slightly gravelly very sandy CLAY. Gravel is brown-orange angular fine and medium sandstone gravel.		
							MARLSTONE ROCK FORMATION		
							Dense becoming very dense brown slightly clayey sandy GRAVEL. Gravel is orange-brown angular and sub-angular medium sandstone with iron staining.		
							MARLSTONE ROCK FORMATION		

GENERAL REMARKS

No groudwater encountered. Terminated early due to SPT refusal at 2.45 m. Backfilled with clean gravel.

All dimensions in metres Scale 1:50	Client Elan Homes Limited	Method/ Plant Used Competitor DART	Logged By ET

Discovery CE Ltd
The Granary, Broadwell House Farm
Rugby, Warwickshire, CV23 8HF

DYNAMIC SAMPLING LOG

Discovery Geotechnical & Environmental Engineers

Project				BOREHOLE No
Stocking Lane, Shenington				DS106
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	29-09-21 29-09-21	179.34	E 436,827.0 N 242,740.0	
Contractor				Sheet
Discovery CE				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.10	ES			178.69		(0.65) 0.65	Grass overlying light orange-brown slightly gravelly sandy CLAY. Gravel is brown sub-rounded fine to medium quartzite and sub-angular fine to medium sandstone with iron staining. Occasional fine rootlets (less than 5 mm diameter).		
0.80	ES			178.39		0.95	TOPSOIL		
1.00		N33 10,10/ 12,12,6,3		177.89		(0.50) 1.45	Medium dense orange-brown clayey sandy GRAVEL. Gravel is brown and dark brown sub-rounded and sub-angular fine to medium sandstone with iron staining.		
1.40	D						MARLSTONE ROCK FORMATION.		
2.00		N20 13,5/ 11,3,3,3				(2.00)	Dense orange-yellow-brown slightly clayey sandy GRAVEL. Gravel is angular medium and coarse sandstone with iron staining and rare iron deposits. MARLSTONE ROCK FORMATION		
2.80	D						Medium dense becoming very dense orange-brown-yellow slightly gravelly clayey SAND. Gravel is orange-brown angular fine to medium sandstone with iron staining.		
3.00		N50/160mm 10,10/ 3,22,25		175.89		3.45	MARLSTONE ROCK FORMATION		

GENERAL REMARKS

No groundwater encountered. Terminated early due to SPT refusal at 3.45 m. Installed with groundwater and ground gas standpipe to 3.00 m.

All dimensions in metres Scale 1:50	Client Elan Homes Limited	Method/ Plant Used Competitor DART	Logged By ET

Discovery CE Ltd
The Granary, Broadwell House Farm
Rugby, Warwickshire, CV23 8HF

DYNAMIC SAMPLING LOG

Discovery Geotechnical & Environmental Engineers

Project				BOREHOLE No
Stocking Lane, Shenington				DS107
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	29-09-21 29-09-21	178.47	E 436,922.0 N 242,712.0	
Contractor				Sheet
Discovery CE				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.20	ES			178.17		0.30	Grass overlying orange-brown-yellow gravelly SAND. Gravel is orange-brown-yellow angular and sub-angular fine to medium sandstone with iron staining. TOPSOIL		
1.00		N50/295mm 5,6/ 6,14,15,15				(1.15)	Very dense orange-brown occasionally yellow sandy GRAVEL. Gravel is orange-dark brown angular and sub-angular fine to medium sandstone with iron staining.		
				177.02		1.45	MARLSTONE ROCK FORMATION		

GENERAL REMARKS

No groundwater encountered. Terminated early due to SPT refusal at 1.45 m. Backfilled with clean gravel.

All dimensions in metres Scale 1:50	Client Elan Homes Limited	Method/ Plant Used Competitor DART	Logged By ET

Discovery CE Ltd
The Granary, Broadwell House Farm
Rugby, Warwickshire, CV23 8HF

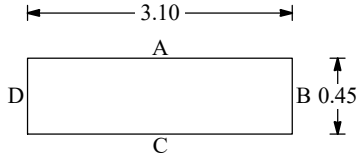
TRIAL PIT LOG

Discovery Geotechnical & Environmental Engineers

Project				TRIAL PIT No
Stocking Lane, Shenington				**TP101**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	22-09-21 22-09-21	179.86	E 436,855.0 N 242,794.0	
Contractor				Sheet
Discovery CE				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.25			Grass overlying light orange-brown slightly gravelly clayey SAND. Gravel is brown sub-rounded fine to medium quartzite and sub-angular fine to medium sandstone with iron staining. Occasional fine rootlets (less than 5 mm diameter).			
0.25-0.70			TOPSOIL Orange-brown gravelly very sandy CLAY. Gravel is brown and dark brown sub-rounded and sub-angular fine to medium sandstone with iron staining. MARLSTONE ROCK FORMATION.			
0.70-0.80			Firm orange-brown slightly gravelly very sandy CLAY. Gravel is brown and dark brown angular medium sandstone with occasional iron staining.	0.70	ES	
0.80-1.50			MARLSTONE ROCK FORMATION. Orange-brown sandy cobbly GRAVEL. Gravel is dark brown angular occasionally tabular medium to coarse sandstone with iron staining. MARLSTONE ROCK FORMATION			
1.50-1.60			Firm orange-brown-yellow gravelly sandy CLAY. Gravel is dark brown angular and sub-angular fine to medium sandstone with iron staining.			
1.60-2.00			MARLSTONE ROCK FORMATION Orange-brown sandy cobbly GRAVEL. Gravel is dark brown angular occasionally tabular medium to coarse sandstone with iron staining.	1.60	ES	
2.00-2.50			MARLSTONE ROCK FORMATION Orange-brown and dark brown thinly laminated SANDSTONE with regular iron staining and iron deposits. Occasional bands of fine orange sand. MARLSTONE ROCK FORMATION.			

Shoring/Support: None
Stability: Stable



GENERAL REMARKS

No groundwater encountered. Terminated at 2.50 m bgl due to hard digging. Gas and groundwater monitoring pipe installed, response zone 0.00 - 2.50 m. Backfilled with arisings.

All dimensions in metres Scale 1:25	Client Elan Homes Limited	Method/ Plant Used JCB 3CX	Logged By ET

Discovery
Geotechnical & Environmental Engineers
THE GRANARY
BROADWELL HOUSE FARM
BROADWELL
WARWICKSHIRE
CV21 8HF
TEL: 01926 813909

Trial Pit No
TP101
Trial Pit Photos

Project Name Stocking Lane	Project No. 21076J	Co-ords: Level:	Date 22/09/2021
Location: Shenington		Dimensions: 3.10m Depth 2.50m 0.45m	Scale NTS
Client: Elan Homes Limited			Logged By ET

General Notes

No groundwater encountered. Terminated at 2.50 m due to hard digging. Gas and groundwater monitoring pipe installed, response zone 0.0 – 2.50 m. backfilled with arisings

Discovery CE Ltd
The Granary, Broadwell House Farm
Rugby, Warwickshire, CV23 8HF

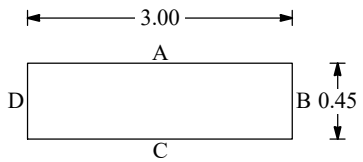
TRIAL PIT LOG

Discovery Geotechnical & Environmental Engineers

Project				TRIAL PIT No
Stocking Lane, Shenington				**TP102**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	22-09-21 22-09-21	178.88	E 436,918.0 N 242,774.0	
Contractor				Sheet
Discovery CE				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.25			Grass overlying orange-brown slightly gravelly sandy CLAY. Gravel is brown sub-rounded fine to medium quartzite and sub-angular fine to medium sandstone with iron staining. Occasional fine rootlets (less than 5 mm diameter).			
0.25-0.60			TOPSOIL	0.30	ES	
			Orange-brown gravelly very sandy CLAY. Gravel is brown and dark brown sub-rounded and sub-angular fine to medium sandstone with iron staining.			
0.60-1.60			MARLSTONE ROCK FORMATION.			
			Orange-brown sandy GRAVEL. Gravel is brown and dark brown angular occasionally tabular medium to coarse sandstone with occasional iron staining and iron deposits. Occasional cobbles.	0.90	ES	
			MARLSTONE ROCK FORMATION.	1.00	ES	
				1.50	D	
1.60-2.00			Orange-brown sandy cobbly GRAVEL. Gravel is dark brown angular occasionally tabular medium to coarse sandstone with iron staining.			
			MARLSTONE ROCK FORMATION	1.80	B	
2.00-2.60			Orange-brown and dark brown thinly laminated SANDSTONE with regular iron staining and iron deposits. Occasional bands of fine to medium orange sand.			
			MARLSTONE ROCK FORMATION.			
				2.40	B	

Shoring/Support: None
Stability: Stable



GENERAL REMARKS

No groundwater encountered. Terminated at 2.60 m bgl due to hard digging. Used for infiltration testing. Backfilled with arisings.

All dimensions in metres Scale 1:25	Client Elan Homes Limited	Method/ Plant Used JCB 3CX	Logged By ET

Discovery
Geotechnical & Environmental Engineers
THE GRANARY
BROADWELL HOUSE FARM
BROADWELL
WARWICKSHIRE
CV21 8HF
TEL: 01926 813909

Trial Pit No
TP102
Trial Pit Photos

Project Name Stocking Lane	Project No. 21076J	Co-ords: Level:	Date 22/09/2021
Location: Shenington		Dimensions: 3.00m Depth 2.40m 0.45m	Scale NTS
Client: Elan Homes Limited			Logged By ET

General Notes

No groundwater encountered. Terminated at 2.40 m due to hard digging. Used for infiltration testing. Backfilled with arisings.

Discovery CE Ltd
The Granary, Broadwell House Farm
Rugby, Warwickshire, CV23 8HF

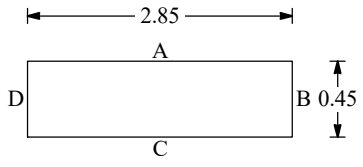
TRIAL PIT LOG

Discovery Geotechnical & Environmental Engineers

Project				TRIAL PIT No
Stocking Lane, Shenington				**TP103**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	22-09-21 22-09-21	178.49	E 436,984.0 N 242,780.0	
Contractor				Sheet
Discovery CE				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.35			Grass overlying light orange-brown slightly gravelly sandy CLAY. Gravel is brown sub-rounded fine to medium quartzite and sandstone. Fine rootlets (less than 5 mm diameter). TOPSOIL			
0.35-1.40			Orange-brown sandy GRAVEL. Gravel is brown and dark brown angular occasionally tabular medium to coarse angular sandstone with iron staining and rare iron deposits. Occasional cobbles. MARLSTONE ROCK FORMATION.	0.80	ES	
1.40-1.90			Orange-brown sandy cobbly GRAVEL. Gravel is dark brown angular occasionally tabular medium to coarse sandstone with iron staining. MARLSTONE ROCK FORMATION	1.50	D	
1.90-3.00			Orange-brown and dark brown occasionally very dark grey thinly laminated SANDSTONE with regular iron staining and iron deposits. Occasional bands of fine to medium orange sand. MARLSTONE ROCK FORMATION.	2.10	B	

Shoring/Support: None
Stability: Stable



GENERAL REMARKS

No groundwater encountered. Terminated at 3.00 m bgl due to hard digging. Backfilled with arisings.

All dimensions in metres Scale 1:25	Client Elan Homes Limited	Method/ Plant Used JCB 3CX	Logged By ET

Discovery CE
Geotechnical & Environmental Engineers
THE GRANARY
BROADWELL HOUSE FARM
BROADWELL
WARWICKSHIRE
CV21 8HF
TEL: 01926 813909

Trial Pit No
TP103
Trial Pit Photos

Project Name Stocking Lane	Project No. 21076J	Co-ords: Level:	Date 22/09/2021
Location: Shenington		Dimensions: 2.85m Depth 3.00m 0.45m	Scale NTS
Client: Elan Homes Limited			Logged By ET

General Notes

No groundwater encountered. Terminated at 3.00 m. Backfilled with arisings.

Discovery CE Ltd
The Granary, Broadwell House Farm
Rugby, Warwickshire, CV23 8HF

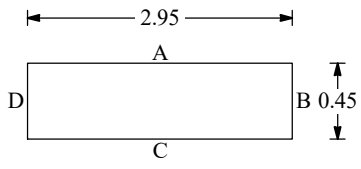
TRIAL PIT LOG

Discovery Geotechnical & Environmental Engineers

Project				TRIAL PIT No
Stocking Lane, Shenington				**TP104**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	22-09-21 22-09-21	178.02	E 437,004.0 N 242,735.0	
Contractor				Sheet
Discovery CE				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.35			Grass overlying light orange-brown slightly gravelly very sandy CLAY. Gravel is brown sub-rounded fine to medium quartzite and sub-angular fine to medium sandstone. Occasional fine rootlets (less than 5 mm diameter). TOPSOIL			
0.35-1.50			Orange-brown sandy GRAVEL. Gravel is brown becoming dark brown angular occasionally tabular medium to coarse sandstone with iron staining and rare iron deposits. Occasional cobbles. MARLSTONE ROCK FORMATION.	0.60 1.00	ES ES	
1.50-2.20			Orange-brown and dark brown gravelly COBBLES. Gravel is angular and tabular coarse sandstone. Cobbles are angular and tabular if sandstone. Occasional iron staining and occasional fine to medium orange sand. MARLSTONE ROCK FORMATION.	1.50	B	
2.20-2.40			Orange-brown and dark brown thinly laminated SANDSTONE with regular iron staining and iron deposits. Occasional bands of fine orange sand. MARLSTONE ROCK FORMATION.	2.30	D	

Shoring/Support: None
Stability: Stable



GENERAL REMARKS

No groundwater encountered. Terminated at 2.50 m bgl due to hard digging. Backfilled with arisings.

All dimensions in metres Scale 1:25	Client Elan Homes Limited	Method/ Plant Used JCB 3CX	Logged By ET

Discovery
Geotechnical & Environmental Engineers
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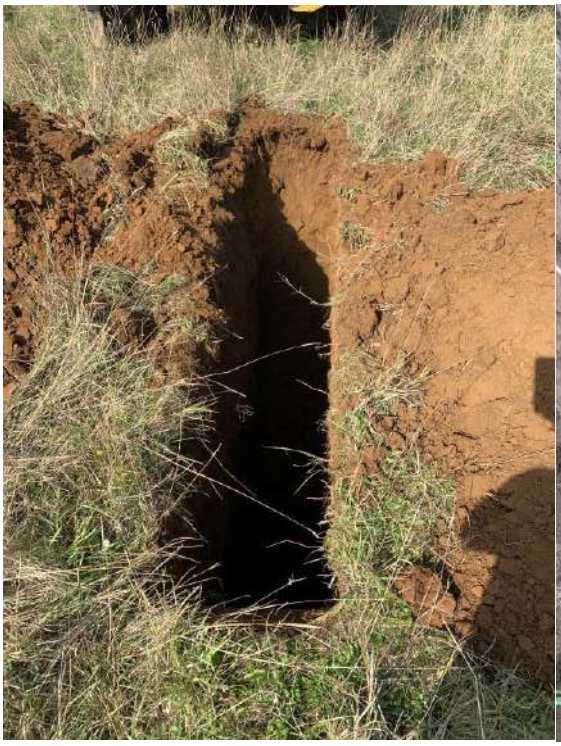
BROADWELL
WARWICKSHIRE
CV21 8HF
TEL: 01926 813909

Trial Pit No
TP104
Trial Pit Photos

Project Name Stocking Lane	Project No. 21076J	Co-ords: Level:	Date 22/09/2021
Location: Shenington		Dimensions: 2.95m Depth 2.50m 0.45m	Scale NTS
Client: Elan Homes Limited			Logged By ET



General Notes

No groundwater encountered. Terminated at 2.50 m. Backfilled with arisings.

Discovery CE Ltd
The Granary, Broadwell House Farm
Rugby, Warwickshire, CV23 8HF

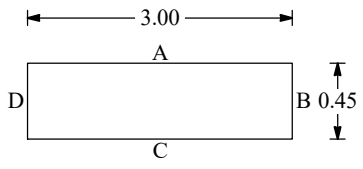
TRIAL PIT LOG

Discovery Geotechnical & Environmental Engineers

Project				TRIAL PIT No
Stocking Lane, Shenington				**TP105**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	22-09-21 22-09-21	178.30	E 436,973.0 N 242,739.0	
Contractor				Sheet
Discovery CE				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.20			Grass overlying light orange-brown slightly gravelly very sandy CLAY. Gravel is brown sub-rounded fine to medium quartzite and sub-angular fine to medium sandstone. Occasional fine rootlets (less than 5 mm diameter).			
0.20-1.60			TOPSOIL Orange-brown sandy GRAVEL. Gravel is angular occasionally tabular medium to coarse sandstone. Occasional cobbles.	0.50	ES	
			MARLSTONE ROCK FORMATION.	1.20	ES	
1.60-1.75			Orange-brown and dark brown angular occasionally tabular coarse sandstone GRAVEL with cobbles, occasional iron staining and occasional medium orange sand.			
1.75-2.00			MARLSTONE ROCK FORMATION.	1.80	D	
			Orange-brown and dark brown gravelly COBBLES. Gravel is angular and tabular coarse sandstone. Cobbles are angular and tabular if sandstone. Occasional iron staining and occasional fine to medium orange sand.	2.00 2.00	B D	
			MARLSTONE ROCK FORMATION.			

Shoring/Support: None
Stability: Stable



GENERAL REMARKS

No groundwater encountered. Terminated at 2.50 m bgl due to hard digging. Used for infiltration testing. Backfilled with arisings.

All dimensions in metres Scale 1:25	Client Elan Homes Limited	Method/ Plant Used JCB 3CX	Logged By ET

AGS3 UK TP 21076J SHENINGTON LOGS - USE THIS ONE.GPJ GINT STD AGS 3_1.GDT 15/11/21

Discovery
Geotechnical & Environmental Engineers
THE GRANARY
BROADWELL HOUSE FARM
BROADWELL
WARWICKSHIRE
CV21 8HF
TEL: 01926 813909

Trial Pit No
TP105
Trial Pit Photos

Project Name Stocking Lane	Project No. 21076J	Co-ords: Level:	Date 22/09/2021
Location: Shenington		Dimensions: 3.00m Depth 2.40m 0.45m	Scale NTS
Client: Elan Homes Limited			Logged By ET

General Notes

No groundwater encountered. Terminated at 2.40 m due to hard digging. Used for infiltration testing. Backfilled with arisings.

Discovery CE Ltd
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Rugby, Warwickshire, CV23 8HF

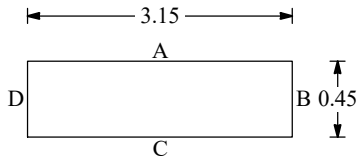
TRIAL PIT LOG

Discovery Geotechnical & Environmental Engineers

Project				TRIAL PIT No
Stocking Lane, Shenington				**TP106**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	22-09-21 22-09-21	178.10	E 436,898.0 N 242,690.0	
Contractor				Sheet
Discovery CE				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.15			Grass overlying light orange-brown slightly gravelly SAND. Gravel is brown sub-rounded fine to medium quartzite and sub-angular fine to medium sandstone with iron staining.			
0.15-0.50			Occasional fine rootlets (less than 5 mm diameter). TOPSOIL			
0.50-1.65			Orange-brown slightly gravelly very sandy CLAY. Gravel is brown and dark brown sub-rounded and sub-angular fine to medium sandstone with iron staining. MARLSTONE ROCK FORMATION.			
			Orange-brown sandy GRAVEL. Gravel is brown becoming dark brown angular occasionally tabular medium to coarse sandstone with iron staining and rare iron deposits. Occasional cobbles.	0.70	ES	
			MARLSTONE ROCK FORMATION.	1.00	D	
				1.50	D	
1.65-2.10			Orange-brown and dark brown gravelly COBBLES. Gravel is angular and tabular coarse sandstone. Cobbles are angular and tabular if sandstone. Occasional iron staining and occasional fine to medium orange sand. MARLSTONE ROCK FORMATION.			
2.10-2.50			Orange-brown and dark brown thinly laminated SANDSTONE with regular iron staining and iron deposits. Occasional bands of fine orange sand. MARLSTONE ROCK FORMATION.	2.30	D	

Shoring/Support: None
Stability: Stable



GENERAL REMARKS

No groundwater encountered. Terminated at 2.50 m bgl due to hard digging. Gas and groundwater monitoring pipe installed, response zone 0.00 - 2.50 m.

All dimensions in metres Scale 1:25	Client Elan Homes Limited	Method/ Plant Used JCB 3CX	Logged By ET

Discovery
Geotechnical & Environmental Engineers
THE GRANARY
BROADWELL HOUSE FARM
BROADWELL
WARWICKSHIRE
CV21 8HF
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Trial Pit No
TP106
Trial Pit Photos

Project Name Stocking Lane	Project No. 21076J	Co-ords: Level:	Date 22/09/2021
Location: Shenington		Dimensions: 3.15m Depth 2.50m 0.45m	Scale NTS
Client: Elan Homes Limited			Logged By ET

General Notes

No groundwater encountered. Terminated at 2.50 m. Backfilled with arisings.

Discovery CE Ltd
The Granary, Broadwell House Farm
Rugby, Warwickshire, CV23 8HF

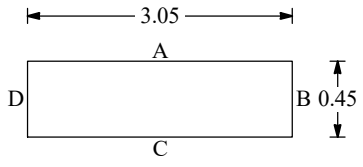
TRIAL PIT LOG

Discovery Geotechnical & Environmental Engineers

Project				TRIAL PIT No
Stocking Lane, Shenington				**TP107**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	22-09-21 22-09-21	178.90	E 436,880.0 N 242,730.0	
Contractor				Sheet
Discovery CE				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.30			Grass overlying light orangey-brown slightly gravelly sandy CLAY. Gravel is brown sub-rounded fine to medium quartzite and sub-angular fine to medium sandstone. Occasional fine rootlets (less than 5 mm diameter).			
0.30-0.80			TOPSOIL.			
			Orange-brown and dark brown slightly gravelly very sandy CLAY. Gravel is brown becoming dark brown sub-rounded and sub-angular fine to medium sandstone with rare iron staining.	0.40	ES	
			MARLSTONE ROCK FORMATION.			
0.80-1.75			Orange-brown sandy GRAVEL. Gravel is dark brown angular occasionally tabular medium to coarse sandstone. Occasional cobbles.			
			MARLSTONE ROCK FORMATION.	1.40	ES	
1.75-2.00			Orange-brown and dark brown gravelly COBBLES. Gravel is angular and tabular coarse sandstone. Cobbles are angular and tabular if sandstone. Occasional iron staining and occasional fine to medium orange sand.	1.80	B	
2.00-2.70			MARLSTONE ROCK FORMATION.			
			Orange-brown and dark brown thinly laminated SANDSTONE with regular iron staining and iron deposits. Occasional bands of fine orange sand.	2.10	B	
			MARLSTONE ROCK FORMATION.			

Shoring/Support: None
Stability: Minor collapse on eastern face



GENERAL REMARKS

No groundwater encountered. Terminated at 2.70 m bgl due to hard digging. Backfilled with arisings.

All dimensions in metres Scale 1:25	Client Elan Homes Limited	Method/ Plant Used JCB 3CX	Logged By ET

Discovery
Geotechnical & Environmental Engineers
THE GRANARY
BROADWELL HOUSE FARM
BROADWELL
WARWICKSHIRE
CV21 8HF
TEL: 01926 813909

Trial Pit No
TP107
Trial Pit Photos

Project Name Stocking Lane	Project No. 21076J	Co-ords: Level:	Date 22/09/2021
Location: Shenington		Dimensions: 3.05m Depth 2.70m 0.45m	Scale NTS
Client: Elan Homes Limited			Logged By ET

General Notes

No groundwater encountered. Terminated at 2.70 m. Backfilled with arisings.

Discovery CE Ltd
The Granary, Broadwell House Farm
Rugby, Warwickshire, CV23 8HF

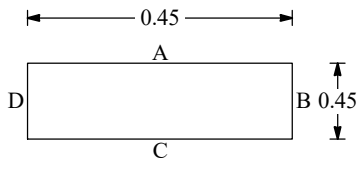
TRIAL PIT LOG

Discovery Geotechnical & Environmental Engineers

Project				TRIAL PIT No
Stocking Lane, Shenington				HP101
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	13-10-21 13-10-21	179.98	E 436,910.0 N 242,885.0	
Contractor				Sheet
Discovery CE				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.60			Grass overlying firm light orange-brown slightly gravelly sandy CLAY. Gravel is brown sub-rounded fine to medium quartzite and sub-angular fine to medium sandstone with iron staining. Occasional fine rootlets (less than 5 mm diameter). TOPSOIL	0.50	B	
0.60-0.75			Medium dense orange-brown slightly gravelly very clayey SAND. Gravel is brown and dark brown sub-rounded and sub-angular fine to medium sandstone with iron staining. MARLSTONE ROCK FORMATION.	0.75	D	

Shoring/Support:
Stability:



GENERAL REMARKS

No groundwater encountered. Hand dug trial pit. Terminated at 0.75 m bgl due to hard digging. Backfilled with arisings.

All dimensions in metres Scale 1:25	Client Elan Homes Limited	Method/ Plant Used	Logged By ET

Discovery CE Ltd
The Granary, Broadwell House Farm
Rugby, Warwickshire, CV23 8HF

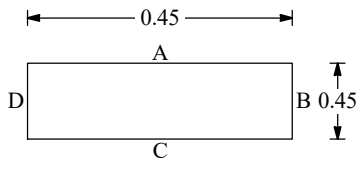
TRIAL PIT LOG

Discovery Geotechnical & Environmental Engineers

Project				TRIAL PIT No
Stocking Lane, Shenington				HP102
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	13-10-21 13-10-21	179.17	E 436,942.0 N 242,820.0	
Contractor				Sheet
Discovery CE				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.75			Grass overlying firm light orange-brown slightly gravelly sandy CLAY. Gravel is brown sub-rounded fine to medium quartzite and sub-angular fine to medium sandstone with iron staining. Occasional fine rootlets (less than 5 mm diameter). TOPSOIL	0.40	B	
0.75-1.00			Firm orange-brown slightly gravelly sandy CLAY. Gravel is brown and dark brown sub-rounded and sub-angular fine to medium sandstone with iron staining. MARLSTONE ROCK FORMATION.	1.00	D	

Shoring/Support:
Stability:



GENERAL REMARKS

No groundwater encountered. Hand dug trial pit. Terminated at 1.00 m bgl due to hard digging. Backfilled with arisings.

All dimensions in metres Scale 1:25	Client Elan Homes Limited	Method/ Plant Used	Logged By ET

Discovery CE Ltd
The Granary, Broadwell House Farm
Rugby, Warwickshire, CV23 8HF

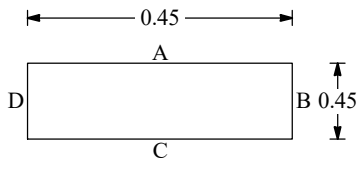
TRIAL PIT LOG

Discovery Geotechnical & Environmental Engineers

Project				TRIAL PIT No
Stocking Lane, Shenington				HP103
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	13-10-21 13-10-21	177.93	E 436,973.0 N 242,690.0	
Contractor				Sheet
Discovery CE				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.60			Grass overlying firm light orange-brown slightly gravelly sandy CLAY. Gravel is brown sub-rounded fine to medium quartzite and sub-angular fine to medium sandstone with iron staining. Occasional fine rootlets (less than 5 mm diameter). TOPSOIL	0.30	B	
0.60-0.90			Firm orange-brown slightly gravelly sandy CLAY. Gravel is brown and dark brown sub-rounded and sub-angular fine to medium sandstone with iron staining. MARLSTONE ROCK FORMATION.	0.80	D	

Shoring/Support:
Stability:



GENERAL REMARKS

No groundwater encountered. Hand dug trial pit. Terminated at 0.90 m bgl due to hard digging. Backfilled with arisings.

All dimensions in metres Scale 1:25	Client Elan Homes Limited	Method/ Plant Used	Logged By ET

Discovery CE Ltd
The Granary, Broadwell House Farm
Rugby, Warwickshire, CV23 8HF

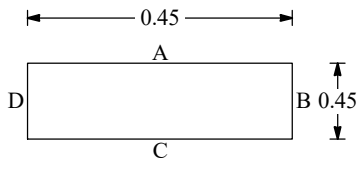
TRIAL PIT LOG

Discovery Geotechnical & Environmental Engineers

Project				TRIAL PIT No
Stocking Lane, Shenington				HP104
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	13-10-21 13-10-21	178.78	E 436,921.0 N 242,747.0	
Contractor				Sheet
Discovery CE				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.50			Grass overlying firm light orange-brown slightly gravelly sandy CLAY. Gravel is brown sub-rounded fine to medium quartzite and sub-angular fine to medium sandstone with iron staining. Occasional fine rootlets (less than 5 mm diameter). TOPSOIL			
0.50-1.00			Medium dense orange-brown clayey sandy GRAVEL. Gravel is brown and dark brown sub-rounded and sub-angular fine to medium sandstone with iron staining. MARLSTONE ROCK FORMATION.	0.60 0.60	B D	

Shoring/Support:
Stability:



GENERAL REMARKS

No groundwater encountered. Hand dug trial pit. Terminated at 1.00 m bgl due to hard digging. Backfilled with arisings.

All dimensions in metres Scale 1:25	Client Elan Homes Limited	Method/ Plant Used	Logged By ET

Discovery CE Ltd
The Granary, Broadwell House Farm
Rugby, Warwickshire, CV23 8HF

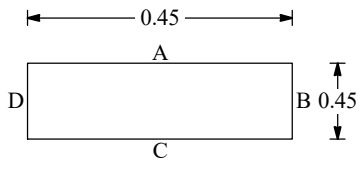
TRIAL PIT LOG

Discovery Geotechnical & Environmental Engineers

Project				TRIAL PIT No
Stocking Lane, Shenington				HP105
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	13-10-21 13-10-21	177.84	E 437,019.0 N 242,727.0	
Contractor				Sheet
Discovery CE				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.65			Grass overlying firm light orange-brown slightly gravelly sandy CLAY. Gravel is brown sub-rounded fine to medium quartzite and sub-angular fine to medium sandstone with iron staining. Occasional fine rootlets (less than 5 mm diameter). TOPSOIL	0.50	D	
0.65-1.00			Firm orange-brown gravelly sandy CLAY. Gravel is brown and dark brown sub-rounded and sub-angular fine to medium sandstone with iron staining. MARLSTONE ROCK FORMATION.	0.75	B	

Shoring/Support:
Stability:



GENERAL REMARKS

No groundwater encountered. Hand dug trial pit. Terminated at 1.00 m bgl due to hard digging. Backfilled with arisings.

All dimensions in metres Scale 1:25	Client Elan Homes Limited	Method/ Plant Used	Logged By ET

Discovery CE Ltd
The Granary, Broadwell House Farm
Rugby, Warwickshire, CV23 8HF

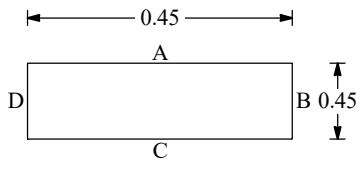
TRIAL PIT LOG

Discovery Geotechnical & Environmental Engineers

Project				TRIAL PIT No
Stocking Lane, Shenington				HP106
Job No	Date	Ground Level (m)	Co-Ordinates ()	
21076J	13-10-21 13-10-21	179.34	E 436,826.0 N 242,740.0	
Contractor				Sheet
Discovery CE				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.65			Grass overlying firm light orange-brown slightly gravelly sandy CLAY. Gravel is brown sub-rounded fine to medium quartzite and sub-angular fine to medium sandstone with iron staining. Occasional fine rootlets (less than 5 mm diameter). TOPSOIL	0.40	D	
0.65-0.95			Orange-brown clayey sandy GRAVEL. Gravel is brown and dark brown sub-rounded and sub-angular fine to medium sandstone with iron staining. MARLSTONE ROCK FORMATION.	0.80	B	

Shoring/Support:
Stability:



GENERAL REMARKS

No groundwater encountered. Hand dug trial pit. Terminated at 0.95 m bgl due to hard digging. Backfilled with arisings.

All dimensions in metres Scale 1:25	Client Elan Homes Limited	Method/ Plant Used	Logged By ET