Report

Flood Risk Assessment & Drainage Strategy

Springwell Nursery, Walden Road, Little Chesterford, Essex

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1 Introduction

Sweco UK Ltd (formerly MLM) has been appointed by Springwell Nursery Limited to undertake a Flood Risk Assessment (FRA) and Drainage Strategy (DS) associated with the proposed development at Springwell Farm, Walden Road, Little Chesterford, Essex CB10 1UE.

This report has been prepared for the sole use of Springwell Nursery Limited and the contents should not be relied upon by others without the express written authority of Sweco. If any unauthorised third party makes use of this report they do so at their own risk and Sweco owes them no duty of care or skill.

This report has been completed in accordance with the National Planning Policy Framework (NPPF) and its accompanying Planning Practice Guidance (PPG) as well as the Uttlesford Level 1 Strategic Flood Risk Assessment (2016). The report is an assessment of flood risk to the development, from on and off-site sources, and to off-site receptors caused by the change of use of the site.

The review of the Environment Agency (EA) Flood map for planning (see Figure 1) shows that the site lies in Flood Zone 1 (low risk), except for the south-western section of the site, which appears to be located in Flood Zones 2 and 3 (medium and high risk, respectively).

Flood Zone 1 is the area described as having a less than 0.1% annual probability of river or sea flooding. Flood Zone 2 is the area described as having between a 1% and 0.1% annual probability of fluvial flooding. Flood Zone 3 is the area described as having a 1% or greater annual probability of fluvial flooding.

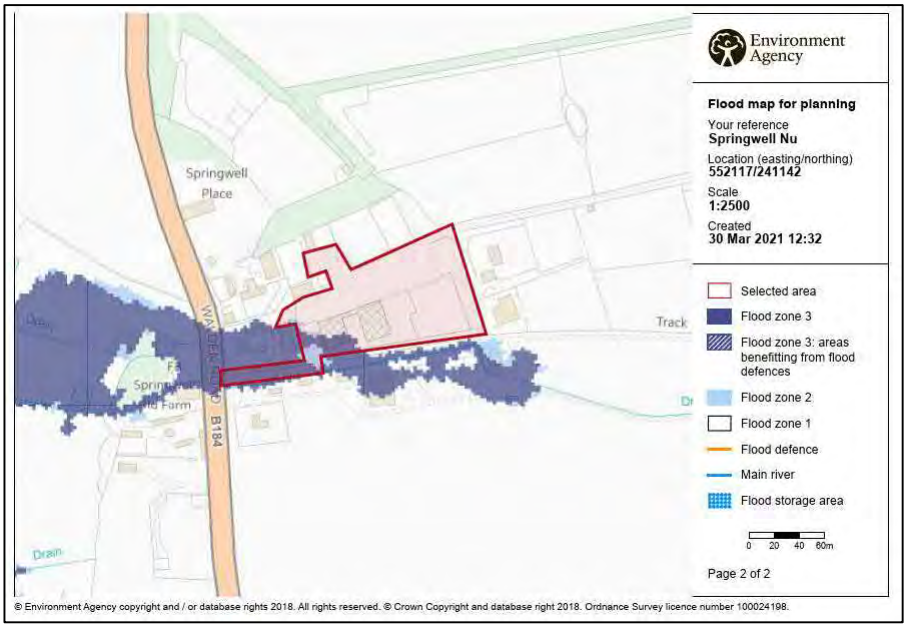


Figure 1 - EA Flood map for planning

The Sequential Test, the aim of which is to steer new development to the areas with the lowest possibility of flooding, is required to be passed for developments proposed in Flood Zone 3.

This report includes a surface water drainage strategy for the site which sets out how the proposals will not increase off-site flood risk. The report also discusses the use of sustainable drainage systems (SuDS) features at the site for the attenuation and removal of pollutants prior to discharge. The surface water drainage strategy has been prepared in accordance with the guidelines set out in the Department for Environment, Food and Rural Affairs (DEFRA) publication Sustainable Drainage Systems *Non-statutory technical standards for sustainable drainage systems* dated March 2015 and the Essex County Council (ECC) *Sustainable Drainage Systems Design Guide* (SuDS Design Guide) dated February 2020 and CIRIA publication The SuDS Manual (C753) dated November 2015.

The report concludes that in flood risk context, the proposals are safe and appropriate and do not cause increased flood risk.

2 Policy Context

2.1 National Planning Policy Framework (February 2019)

The NPPF was enacted in March 2012 and updated in February 2019. Chapter 14 establishes the Planning Policy relating to flood risk management. The PPG (March 2014) provides details on policies relating to flood risk.

2.2 Flood and Water Management Act (2010)

The Flood and Water Management Act 2010 defines clearer roles and responsibilities for the implementation of Sustainable Drainage Systems (SuDS) in developments, by requiring drainage systems to be approved against a set of draft National standards.

In December 2014 the government set out changes to planning that apply to major development from April 2015. This change confirmed that in considering planning applications, the Local Planning Authority (LPA) should consult the relevant Lead Local Flood Authority (LLFA) on the management of surface water to satisfy themselves that the proposed minimum standards of operation are appropriate and ensure, through the use of planning conditions or planning obligations, that there are clear arrangements in place for ongoing maintenance over the lifetime of the development.

In April 2015, the LLFA became a statutory consultee on surface water and SuDS proposals.

2.3 Essex County Council Sustainable Drainage Systems Design Guide (2020)

The ECC SuDS Design Guide sets out policy requirements in relation to the drainage of surface water run- off at the site. The guide provides information on the planning, design and delivery of SuDS schemes. The LLFA comment on surface water drainage strategies based on this guide and approve or place holding objection to a planning application based on this.

2.4 Uttlesford Level 1 Strategic Flood Risk Assessment (2016)

The Uttlesford Level 1 SFRA (2016) collates relevant and up to date information on the risk of flooding to the Borough from all sources including the impact of climate change in the future

3 Site Description

3.1 Site context

The site lies approximately 1 kilometre (km) south of Little Chesterford in Essex, to the east of Walden Road, and is centred on approximate Ordnance Survey (OS) grid reference 552113,241115.

The existing site comprises a nursery, garden centre and three greenhouse buildings (see Figure 2 and Appendix A).

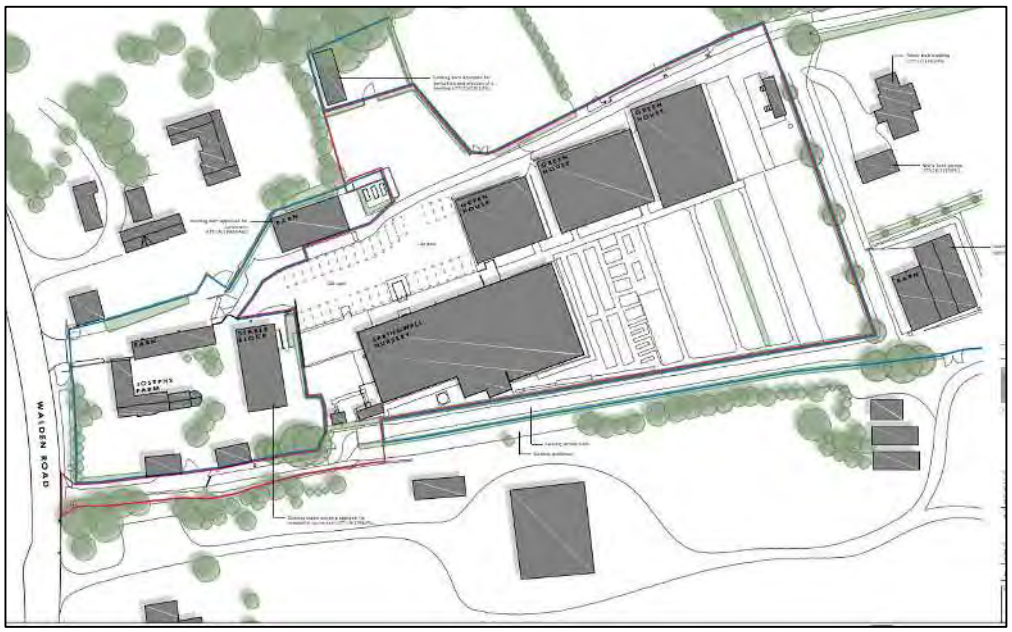


Figure 2 - Existing Site Layout

The site is bound to the north and south by residential properties, to the west by Joseph Farm and to the east by agricultural barns and garages.

The existing site use is classified as 'Less Vulnerable' in accordance with *Table 2: Flood Risk Vulnerability Classification* of the PPG.

3.2 Topography

The topographical survey shows the site falls from north-east towards south-west (see Appendix A). Ground levels in the northwest are circa 51.0 metres Above Ordnance Datum (mAOD) falling to circa 43.0 mAOD in the far south and west of the site. The developed areas of the site are generally on the higher plateau area.

3.3 Geology

British Geological Survey (BGS) mapping shows the site to have a bedrock geology of New Pit Chalk Formation (Chalk). There are no records of superficial deposits available for this site.

3.4 Hydrology

There is an unnamed watercourse located approximately 13 metres (m) to the south of the site boundary, which flows in a westerly direction. This watercourse, which is classed as an 'Ordinary Watercourse', is a tributary of the River Cam which is situated approximately 500 metres (m) west of the site.

The EA have stated that the primary source of fluvial flooding from the site would be from this unnamed watercourse, however this is not represented in the EA's Flood Map for Planning.

3.5 Proposed site

It is proposed to demolish the existing nursery building and garden centre as well as the three greenhouses and develop seven residential dwellings (see Figure 3 and Appendix A). A communal open space is proposed on the east of the site. The existing access onto Walden Road will be retained and upgraded to Highways requirements.

Figure 3 - Proposed site layout

The proposed residential development is classified as 'More Vulnerable' in accordance with *Table 2: Flood Risk Vulnerability Classification* of the PPG.

4 Flood Risk

The NPPF requires flood risk from the following sources to be assessed:

- Tidal and fluvial sources (sea and river flooding);
- Pluvial sources (flooding resulting from overland flows);
- Groundwater sources;
- Artificial sources, canals, reservoirs etc., and;
- Increases in surface water discharge.

Each of the sources are addressed separately below.

4.1 Tidal and fluvial

Tidal flooding is typically the result of extreme tidal conditions caused by severe weather which may cause a storm surge where water is pushed onshore through elements such as high winds and other storms.

Fluvial flooding occurs when excessive rainfall over an extended period of time or heavy snow melt causes a river to exceed its capacity.

As shown in Figure 1 above, the review of the EA 'Flood map for planning' that the site lies in Flood Zone 1 (low risk), except for the south-western section of the site which appears to be located in Flood Zones 2 and 3 (medium and high risk, respectively).

The EA have stated that the primary source of fluvial flooding would be from the unnamed Ordinary Watercourse, which abuts the southern boundary of the site. The EA Product 4 data was requested for this site, however, the EA stated that as this is an Ordinary Watercourse it has not been represented in the EA's 'Flood map for planning' and therefore there is flood level data available for this site.

In the absence of an EA Product 4 flood level data, site specific modelling was commissioned by the Client in 2020 and the assessment was undertaken by JBA for the site located immediately to the west of this site (Joseph Farm – Planning reference UTT/19/1786/FUL).

The hydraulic modelling was carried out to predict flood levels on and off site, and the outcomes were used to inform an FRA which formed part of the above-mentioned planning application. It is understood that the hydraulic model was accepted by the EA and the results were used to inform the design of finished floor levels for the adjacent site. As the hydraulic modelling assessment also includes this site, the modelling report produced in 2020 has been provided to us by the client to inform this FRA report (refer to Appendix B).

The hydraulic modelling report concludes that the entire Springwell Nursery site, including the proposed Unit 7, would be outside of the 1 in 20 year, 100 year, 100 year plus 35% Climate Change (CC), 100 year plus 65% CC and 1000 year fluvial flood extents (see Figure 4); the indicative site outline is marked in green.

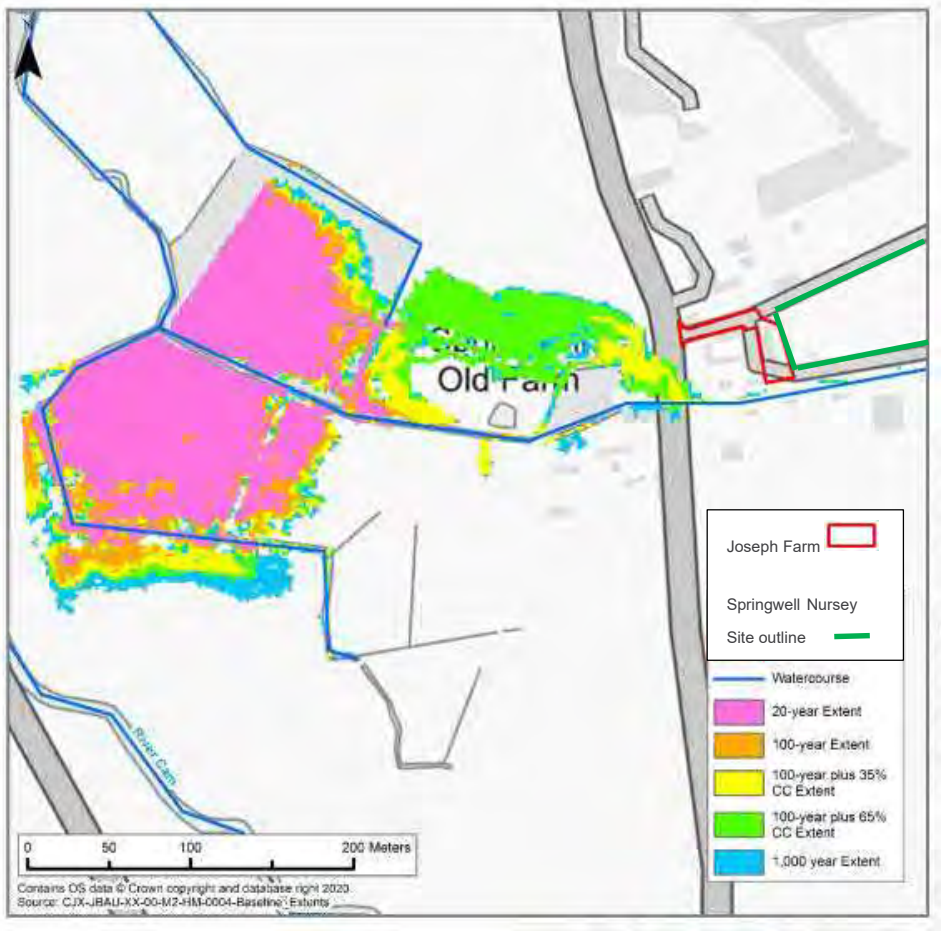


Figure 4 - Predicted flood extents as part of the 2020 JBA model for the site at Joseph Farm

It has been demonstrated that the predicted flood depth along Waldon Road (B184) will not exceed 0.2 m during the 1 in 100 year plus 35% CC fluvial flood event. The B184 access has a 'low' hazard to people and therefore a safe route of access and egress to and from the site is available at all times during the 1 in 100 year plus 35% CC event.

Therefore, the site is not at significant risk of tidal or fluvial flooding.

4.2 Pluvial

There is always a potential risk of surface water flooding from very high intensity rainfall events exceeding the capacity of drainage systems and causing flooding, especially in urban areas. Surface water run-off can be channelled either by natural features such as valley lines or by artificial features such as highways, to low points in the topography. If surface water is not able to flow away from the low points then pluvial flooding can occur.

OS mapping shows the site falls from north-east to south-west towards Walden Road. Surrounding land also falls in the same direction and as such surface water could be shed towards the south western section of the site, particularly in the vicinity of the unnamed watercourse and the access road.

The GOV.UK 'Extent of flooding from surface water' mapping (see Figure 5) shows the majority of the site to be at very low risk of surface water flooding. The south-western section of the site is shown to be at low risk of flooding.

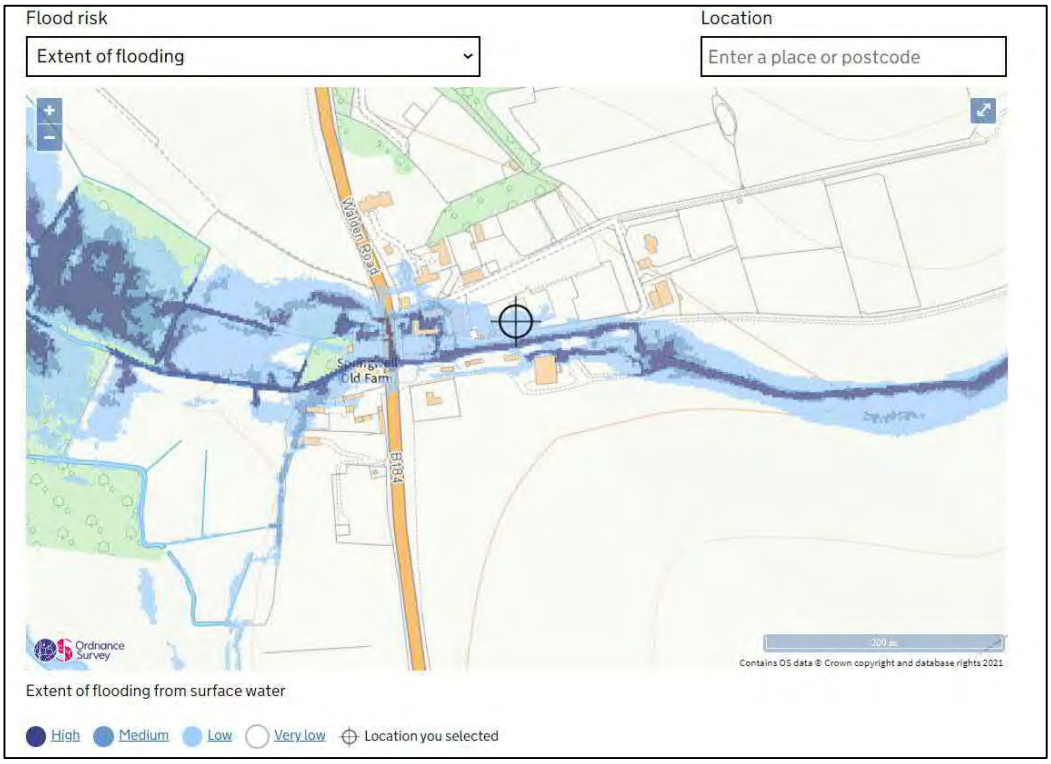


Figure 5 - GOV.UK Flood risk – Extent of flooding map from surface water

As shown in Figure 5 above, the surface water flood risk to the south-western section of the site is likely to be associated with the unnamed watercourse. The flood depth across the south western section of the site is likely to be below 300mm (see Figure 6 below). There is a small area between the existing office building and the nursery that is likely to have flood depths between 300mm and 900mm. The mapping does not take account of any local drainage features which may be present on site.

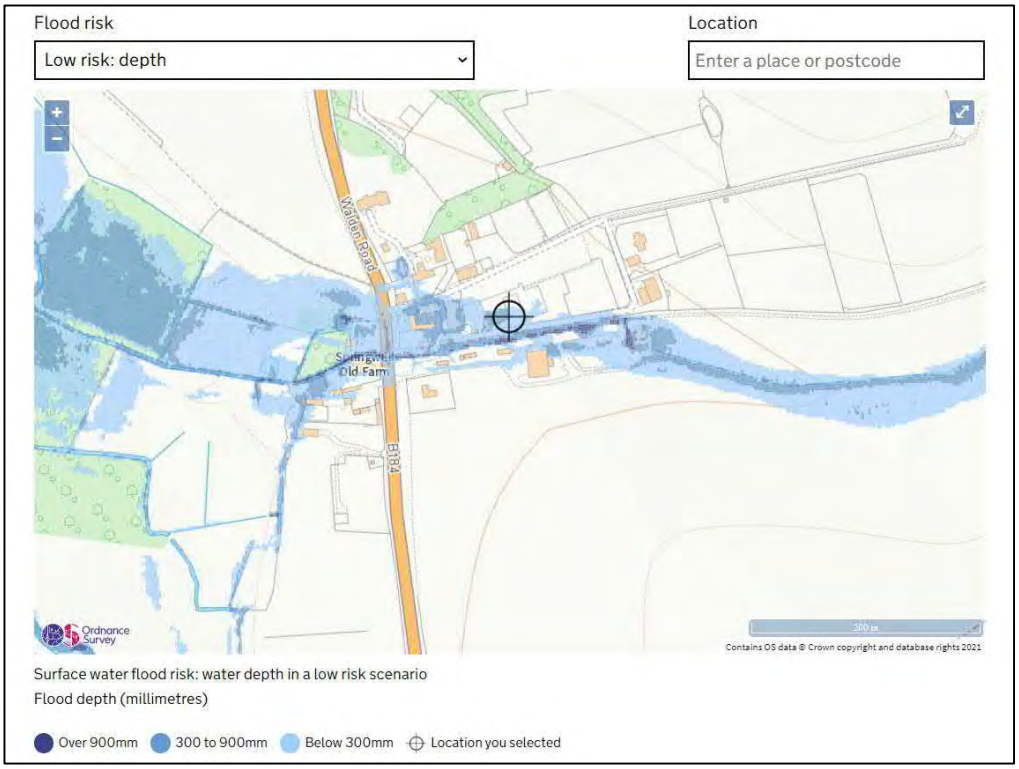


Figure 6 - GOV.UK Surface water flood risk: water depth in a low risk scenario

The unnamed watercourse falls in the same direction as the site (east to west) towards Walden Road.

Finished floor levels should adhere to normal good practice and be raised above surrounding ground level with falls away from buildings. This should minimise the risk of any minor localised ponding or overland surface water flow from entering the proposed buildings. The EA mapping shows that the proposed dwellings could be subject to up to 300mm of flooding and it is therefore recommended that finished floor levels are raised at least 300mm above existing ground levels. In addition openings into buildings should not be situated in potential flow paths of surface water run-off.

As long as the recommendation above is implemented the risk of flooding from this source is considered to be low.

4.3 Groundwater

BGS mapping shows the sites bedrock geology to be New Pit Chalk Formation (Chalk). The underlying geology is expected to generally be of medium permeability. If groundwater did express at the surface, then it would be routed around buildings as described above.

The site is not considered to be at significant risk of flooding from groundwater.

4.4 Water bodies

There are no lakes, large ponds, or reservoirs etc shown within the immediate vicinity of the site which are at an elevation equal to or higher than the site or otherwise likely to pose a flood risk to the site.

The GOV.UK 'Extent of flooding from reservoirs' online mapping (see Figure 7) shows that the site is not at risk of flooding from this source.,

Figure 7 - GOV.UK Extent of flooding from reservoirs

4.5 Infrastructure

Anglian Water (AW) sewer records (see Appendix C) show no assets in the vicinity of the site.

If surcharging or blockage of any private off or on site sewers/drains did occur it is possible that there may be localised surface flooding in areas surrounding the site.

The site is considered to be at low risk of flooding from this source.

4.6 Increased surface water discharge

The impermeable area of the site will increase slightly throughout the development proposals and as such the rate and volume of surface water being discharged from the site should be managed appropriately.

Surface water run-off from the site will be collected and attenuated on-site prior to a restricted discharge from the site in accordance with the SuDS hierarchy and ECC requirements.

5 Surface Water Drainage

5.1 Existing

The existing site is brownfield land with an impermeable area of approximately 0.257 ha.

Surface water gullies and rainwater pipes are shown on the topographical survey for the site. It is assumed that surface water run-off from hardstanding areas is currently discharged directly to the watercourse. There is no indication of any existing attenuation or flow restriction and as such it is assumed that surface water discharges to the watercourse at an unrestricted rate.

The existing surface water run-off rate has been calculated using the Modified Rational Method (see Brownfield Calculations in Appendix D) and is based on the existing impermeable area of the site. The pre-development discharge rates for the site are summarised in Table 1 below.

Table 1: Brownfield discharge rates

AEP Event	Brownfield Discharge Rate (l/s)
100%	26.7
3.3%	65.7
1%	85.4

5.2 SuDS Hierarchy

The proposed development will result in a decrease in impermeable area at the site, however, the surface water run-off generated by the development should still be properly managed in order to not increase off-site flood risk and comply with planning requirements for the development of sites.

The SuDS hierarchy requires that surface water run-off is controlled and preferably re-used wherever possible. In the event that it cannot be re-used it should be disposed of to a receptor in the order of preference described in Building Regulations Part H and C753:

- Infiltration;
- Watercourse;
- Sewers.

5.2.1 Infiltration

Ground conditions, as described in Section 3, are not likely to be suitable for the use of infiltration drainage techniques.

5.2.2 Watercourse

There is a watercourse located to the south of the site. It is proposed to discharge surface water to this watercourse, similar to the existing regime.

5.3 Proposed surface water drainage strategy

The surface water drainage strategy is shown on drawing 65202774-SWE-ZZ-XX-DR-C-0110 in Appendix D. Surface water generated by roof and hardstanding areas is collected and directed to a mix of open and underground attenuation located on-site. Surface water is discharged to the watercourse at a restricted rate.

The DEFRA guidance requires that discharge of surface water run-off from the site should be restricted to greenfield rates. The greenfield run-off discharge rates have been calculated using the ICP SuDS method in MicroDrainage and FEH data and are based on the proposed impermeable area of the site (0.267 ha) (see Greenfield Calculations in Appendix D). The greenfield rates for the site are summarised in Table 2 below.

Table 2 - Greenfield discharge rates

AEP Event	Greenfield Discharge Rate (l/s)
100%	0.1
Qbar	0.1
3.3%	0.2
1%	0.3

The attenuation has been sized to accommodate the temporary rainfall run-off from the roof and hardstanding areas for rainfall events up to and including the 1% AEP event inclusive of 40% climate change (see MicroDrainage Calculations in Appendix D). The total volume of storage required is 392.5 m3 provided in a mix of open and underground features.

The basin sizing has been checked to determine whether it meets the 24 hour half drain time for the 1 in 30 year event inclusive of 40% climate change which was not met. Where this criterion is not met the basin has been assessed to confirm that there is sufficient spare volume for a subsequent 10 year six hour rainfall event to be attenuated within the basin (see MicroDrainage calculations in Appendix D). The calculations show that the basin has capacity to store the additional volume required.

The MicroDrainage calculations also provide details of how the strategy would meet the requirement for limiting discharge to the 100% AEP greenfield rate in line with the ECC requirements. Due to the low 100% greenfield rate (0.1 l/s) the surface water discharge from the proposed site is limited by a flow control device to a maximum rate of 1.0 l/s up to and including the 1% AEP including 40% climate change rainfall scenario.

5.4 Surface water treatment

SuDS systems should be designed to incorporate a number of surface water treatment stages based on the level of pollution entering the system. The table below discusses types of SuDS (based upon C753) and whether they could be utilised at this site.

Table 3 - SuDS site suitability

SuDS Component	Suitability	Description
Green roofs	✕	Not usually suitable for pitched roof development.
Soakaways	✕	Not suitable due to underlying soils.
Rainwater harvesting systems	✓	Could be utilised for W.C. flushing etc. to reduce the use of potable water for the development, subject to financial viability.
Filter strips	✓	Could be used for collection/treatment, subject to site layout and space requirements.
Filter trenches	✓	Could be used for conveyance/treatment, subject to site layout and space requirements.
Infiltration trenches	✕	Not suitable due to underlying soils.
Swales	✕	Not suitable due to site layout.
Bioretention	✕	Not suitable due to site layout.
Pervious pavements	✓	Should be used for collection/treatment on hardstanding areas.
Geocellular systems	✓	Required to provide additional storage.
Infiltration basins	✕	Not suitable due to underlying soils.
Attenuation basins	✓	Proposed to be used to provide temporary storage of surface water run-off.
Ponds	✕	Not suitable due to site layout.
Stormwater wetlands	✕	Not suitable due to size of development.
Proprietary Devices	✕	Not required.
Rain gardens	✕	Not suitable due to site layout.

At this stage it is suggested that an attenuation basin should be designed into the site layout to provide suitable treatment to surface water run-off. As not all of the surface water will pass through the basin, a proprietary device is also proposed to ensure that all surface water run-off from the site is treated prior to discharge to the watercourse.

The site is proposed for residential use; the appropriate pollution hazard indices for the land uses from Table 26.2 of C753 are shown in Figure 8 below:

TABLE 26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways[3]	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways[1]	High	0.8[2]	0.8[2]	0.9[2]

Figure 8 - Table 26.2 of C753

The maximum pollution hazard indices are therefore:

- TSS = 0.5
- Metals = 0.4
- Hydrocarbons = 0.4

Mitigation can be achieved through treatment stages based on the SuDS Mitigation Indices given in Table 26.3 of C753 (see Figure 9).

TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters			
	Mitigation indices[1]		
Type of SuDS component	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4[2]	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond[4]	0.7[3]	0.7	0.5
Wetland	0.8[3]	0.8	0.8
Proprietary treatment systems[5,6]	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Figure 9 - Table 26.3 of C753

When the migitation indices for the detention basin are compared to the pollution hazard indices, it shows that the detention basin matches or exceeds the level of treatment required.

A proprietary device is provided to treat surface water that doesn't pass through the basin, the mitigation indices for this product are shown on the data sheet in Appendix D and summarised below:

- TSS = 0.85
- Metals = 0.64
- Hydrocarbons = 0.99

The proprietary device therefore exceeds the level of treatment required.

5.5 SuDS Management & maintenance

To ensure that the SuDS features remain optimised and fully functional during the lifetime of the development, thus preventing an increase in the flood risk both within the site and elsewhere, maintenance of the system is crucial across the short, medium and long term timescales. At this stage it is envisaged that a maintenance company would be responsible for maintaining the SuDS features. A draft management and maintenance plan is provided in Appendix E.

6 Foul Water Drainage

6.1 Existing foul water drainage

The existing site is assumed to discharge foul water to a septic tank (or similar).

A review of the Anglian Water (AW) sewer records (see Appendix C) shows no foul water sewers in the vicinity of the site.

6.2 Proposed foul water drainage strategy

It is proposed that the foul water from the site is connected to a private package treatment works located on-site as shown on the drawing in Appendix C.
The package treatment works would discharge to the watercourse to the south of the site (see drawing in Appendix D).

As this proposal relates to foul water discharge to a watercourse, the EA will need to be consulted as the proposals could be subject to an Environmental Permit, which is separate from the planning process and planning consent does not guarantee the EA will consent to a foul discharge to a watercourse.

7 Conclusions

The EA 'Flood map for planning' shows that the site lies in Flood Zone 1 (low risk), except for the south-western section of the site, which appears to be located in Flood Zones 2 and 3 (medium and high risk, respectively).

The EA confirmed that the primary source of fluvial flooding would be from the unnamed Ordinary Watercourse, which abuts the southern boundary of the site. This watercourse has not been represented in the EA's 'Flood map for planning', and therefore there are no flood level data available for this site.

In the absence of an EA Product 4 flood level data, a site specific modelling was commissioned by the client in 2020 and the assessment was undertaken by JBA for the site located immediately to the east of this site (Joseph Farm – Planning Reference UTT/19/1786/FUL). The hydraulic modelling was accepted by the EA and the outputs were used to inform this FRA report. The modelling assessment demonstrated that the entire Springwell Nursery site, including the access road, is in Flood Zone 1. Therefore, the site is not considered to be at risk from fluvial flooding.

Risk of flooding from surface water appears to be low in the south western section of the site, with flood depth likely to be below 300 mm. Finished floor levels should adhere to normal good practice and be raised above surrounding ground level with falls away from buildings. This should minimise the risk of any minor localised ponding or overland surface water flow from entering the proposed buildings.

Risk of flooding from other sources is considered to be low.

The proposed development will result in a decrease in impermeable area at the site.

Ground conditions are not likely to be suitable for the use of infiltration drainage techniques.

It is proposed to discharge surface water to this watercourse, similar to the existing regime. Surface water generated by roof and hardstanding areas is collected and directed to a mix of open and underground attenuation located on-site. Surface water is discharged to the watercourse at a restricted rate of 1.0 l/s.

Suitable treatment to surface water is proposed in line with C753.

It is proposed that the foul water from the site is connected to a private package treatment works located on-site which discharges to the watercourse to the south. The EA will need to be consulted over permitting for this discharge activity.

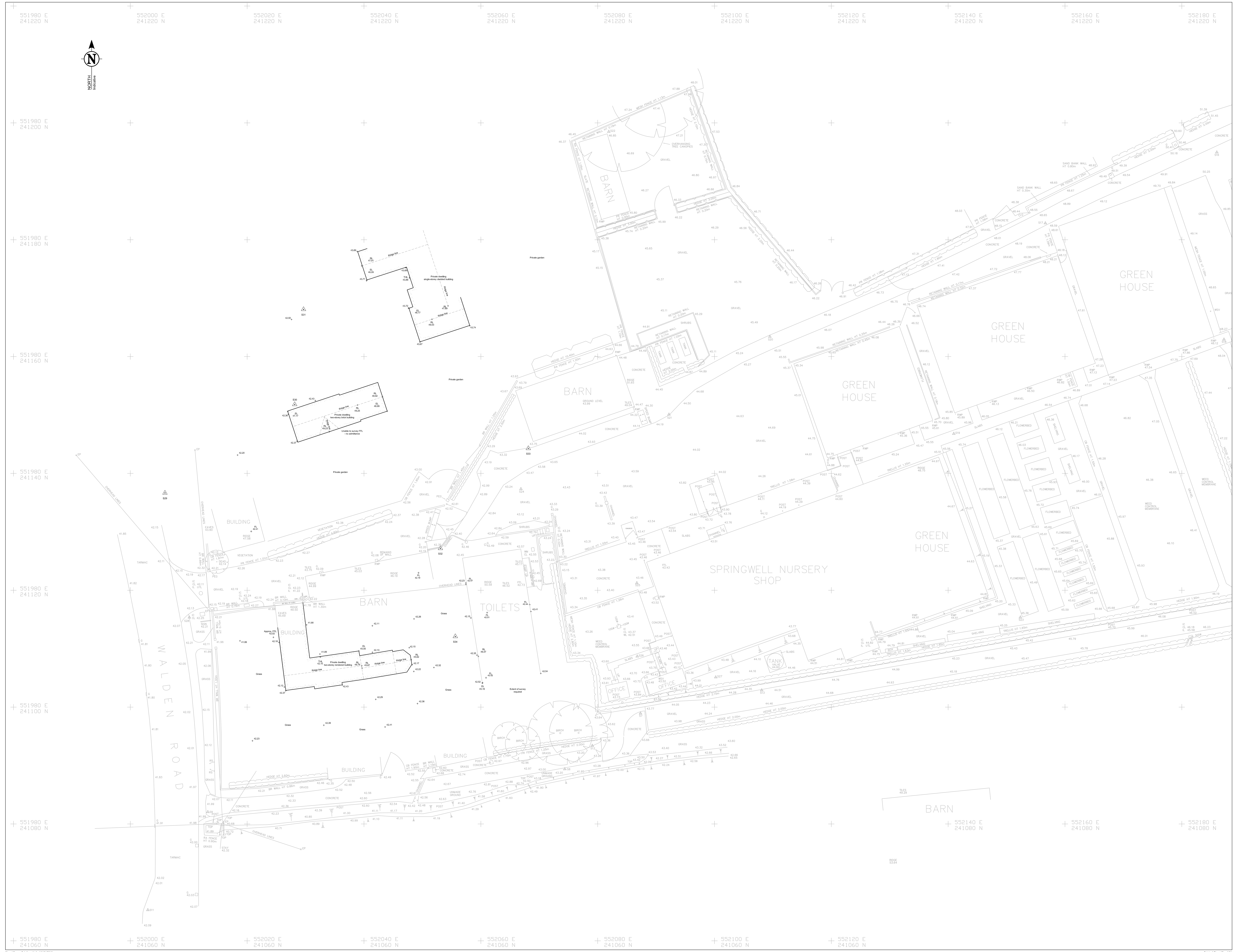
The report concludes that in flood risk context, the proposals are safe and appropriate and do not cause increased flood risk.

Appendix A – Existing & Proposed Site

Survey Solutions drawing 24817se-01 – Topographical Survey (Sheets 1 and 2)

BBR Architects drawing 18955 PL02 – Existing Site Plan

BBR Architects drawing 18955 PL03 – Proposed Site Plan



TOPOGRAPHICAL & MEASURED BUILDING SURVEYS

ABBREVIATIONS & SYMBOLS

AH	Arch Head Height	FH	Fire Hydrant	RSJ	Rolled Steel Joist
AR	Assumed Route	FBD	Floor Board Direction	SI	Sign Post
AV	Air Valve	FH	Fire Hydrant	SP	Arch Spring Point Height
BB	Belisha Beacon	FL	Floor Level	SV	Stop Valve
BH	Bore Hole	FP	Flag Pole	SW	Surface Water
BL	Bed Level	FW	Foul Water	SY	Stay
BO	Bollard	GG	Gully Grate	Tac	Tactile Paving
BrP	Brace Post	GV	Gas Valve	TC	Telecom Cover
BS	Bus Stop	HH	Head Height	TH	Trial Pit
BU	Bush	IC	Inspection Cover	THL	Threshold Level
B/W	Barbed Wire Fence	IL	Invert Level	TL	Traffic Light
BX	Box (Utilities)	I/R	Iron Railings	ToW	Top of Wall
C/B	Close Board Fence	KO	Kerb Outlet	TP	Telegraph Pole
CH	Cill Height	LP	Lamp Post	TV	Cable TV Cover
CL	Cover Level	MH	Manhole	UB	Universal Beam
C/L	Chain Link Fence	MP	Marker Post	UC	Unknown Cover
C-Lev	Ceiling Level	NB	Name Board	UK	Unknown Tree
Col	Column	OHL	Overhead Line (approx)	USB	Under Side Beam
C/P	Chestnut Paling Fence	Pan	Panel Fence	UTL	Unable To Lift
CR	Cable Riser	PB	Post Box	VP	Vent Pipe
DC	Drainage Channel	PM	Parking Meter	WB	Waste Bin
DH	Door Head Height	PO	Post	WH	Weep Hole
DP	Down Pipe	P/R	Post & Rail Fence	WL	Water Level
DR	Drain	P/W	Post & Wire Fence	WM	Water Meter
EL	Eaves Level	P/Wall	Partition Wall	WO	Wash Out
EP	Electric Pole	RE	Rodding Eye	(X.XX)	Floor to Ceiling Height
ER	Earth Rod	RL	Ridge Level		
ET	EP+Transformer	RP	Reflector Post	(X.XX)F/C	Floor to False Ceiling Ht
FB	Flower Bed	RS	Road Sign		
FBD	Floor Board Direction	RSD	Roller Shutter Door	△	Survey Control Station

DRAWING NOTE

Topographical Surveys

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

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

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

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

Measured Building Surveys

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

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

General

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

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Do not scale from this drawing.

CONTROL CO-ORDINATES

STATIONS	EASTINGS	NORTHINGS	LEVEL	DESCRIPTION
S29	552005.927	241136.652	42.328	PK nail
S30	552028.138	241151.809	42.365	Hilti nail
S31	552029.652	241168.077	42.850	Hilti nail
S32	552053.081	241127.172	42.363	Hilti nail
S33	552068.130	241144.284	43.665	Hilti nail
S34	552055.630	241112.093	42.399	Hilti nail
S35	552195.700	241202.070	51.808	Hilti nail

SURVEY GRID AND LEVEL DATUM

The survey grid is based on the following existing survey control points which were previously established by others:

S18 - 552187.218mE, 241162.941mN
S19 - 552140.967mE, 241146.801mN

All levels relate to an existing survey control point S18 and taken as 48.189m which was previously established by others.

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

REV	DESCRIPTION	DRAWN	APPR	DATE

SURVEY SOLUTIONS

Ipswich Coventry Yeovil Norwich Perth Nottingham Brentwood

Tel No: 0845 0405 969
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LAND SURVEYING BUILDING SURVEYING UNDERGROUND SURVEYING

PROJECT TITLE
SPRINGWELL NURSERY, WALDON ROAD,
LITTLE CHESTERFORD, ESSEX, CB10 1UE.

DRAWING DETAIL
TOPOGRAPHICAL SURVEY
Sheet 1 of 2

CLIENT				SCALE
BRIAN CHRISTIAN BUILDING SURVEYOR				1:200
SURVEYOR	SURVEY DATE	CHECKED BY	APPROVED BY	DWG STATUS
MRD	28/03/2017	DWB	JM	FINAL
DRAWING NUMBER			REVISION	ISSUE DATE
19464se-01				04/04/2017

Original Sheet Size A0H

TOPOGRAPHICAL & MEASURED BUILDING SURVEYS

ABBREVIATIONS & SYMBOLS

AH	Arch Head Height	FH	Fire Hydrant	RSJ	Rolled Steel Joist
AR	Assumed Route	FBD	Floor Board Direction	SI	Sign Post
AV	Air Valve	FH	Fire Hydrant	SP	Arch Spring Point Height
BB	Bellsha Beacon	FL	Floor Level	SV	Stop Valve
BH	Bore Hole	FP	Flag Pole	SW	Surface Water
BL	Bed Level	FW	Foul Water	SY	Stay
BO	Bollard	GG	Gully Grate	Tac	Tactile Paving
BrP	Brace Post	GV	Gas Valve	TC	Telecom Cover
BS	Bus Stop	HH	Head Height	TH	Tred Rt
BU	Bush	IC	Inspection Cover	THL	Threshold Level
B/W	Barbed Wire Fence	IL	Invert Level	TL	Traffic Light
BX	Box (Utilities)	IR	Iron Railings	ToW	Top of Wall
C/B	Close Board Fence	KO	Kerb Outlet	TP	Telegraph Pole
CH	CB Height	LP	Lamp Post	TV	Cable TV Cover
CL	Chain Link	MH	Manhole Cover	UC	Unknown Cover
CL/Le	Chain Link Fence	MP	Marker Post	UG	Unknown Ground
CL/Le	Ceiling Level	NB	Name Board	UK	Unknown Tree
Cst	Column	OHL	Overhead Line (approx)	USB	Under Side Beam
C/P	Chestnut Paling Fence	Pan	Panel Fence	UTL	Unable To Lift
CR	Cattle Riser	PB	Post Box	VP	Vent Pipe
DC	Drainage Channel	PM	Parking Meter	WB	Waste Bin
DH	Door Head Height	PO	Post	WH	Weep Hole
DP	Down Pipe	P/R	Post & Rail Fence	WL	Water Level
DR	Drain	P/W	Post & Wire Fence	WM	Water Meter
EL	Eaves Level	P/Wall	Partition Wall	WO	Wash Out
EP	Electric Pole	RE	Rodding Eye		Floor to Ceiling Height
ER	Earth Rod	RL	Ridge Level		F/C Floor to Fallse Ceiling Ht
ET	EP+Transformer	RP	Reflector Post		
FB	Flower Bed	RS	Road Sign		
FBD	Floor Board Direction	RSD	Roller Shutter Door		Survey Control Station

DRAWING NOTE

Topographical Surveys

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

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

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

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

Measured Building Surveys

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

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

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S32	552053.081	241127.172	42.363	HBI nail
S33	552068.130	241144.284	43.665	HBI nail
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LAND SURVEYING BUILDING SURVEYING UNDERGROUND SURVEYING

PROJECT TITLE: SPRINGWELL NURSERY, WALDON ROAD, LITTLE CHESTERFORD, ESSEX, CB10 1UE.				
DRAWING DETAIL: TOPOGRAPHICAL SURVEY Sheet 2 of 2				
CLIENT: BRIAN CHRISTIAN BUILDING SURVEYOR				SCALE: 1:200
SURVEYOR: MRD	SURVEY DATE: 28/03/2017	CHECKED BY: DWB	APPROVED BY: JM	DWG STATUS: FINAL
DRAWING NUMBER: 19464sp-02			REVISION	ISSUE DATE: 04/04/2017

Original Sheet Size A0H