

## Yew Tree Farm Ascott – Under - Wychwood

Sustainable Drainage Statement dated March 2021

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#### 1.0 Site Location Plan

1.1 The site is located on the High Street, Ascott – Under Wychwood OX7 6AW as shown by the location plan included within Appendix A.

### 2.0 Topographical Survey

2.1 The topographical survey is included within Appendix B. The site has a level of 98.04m AOD at the north western corner of the site and a level of 100.71m AOD on the north eastern corner of the site. The site slopes from east to west with a level of 100.52m AOD on the south eastern corner of the site and 98.00m AOD on the south western corner of the site.

### 3.0 Site Geology & Hydrology

- 3.1 No site investigation works have been undertaken to date. A percolation test was however undertaken on 15<sup>th</sup> October 2018 when made ground was found overlying a clay subsoil.
- 3.2 A percolation test was undertaken in accordance with BRE Digest 365 on the site. The water level did not fall during the test indicating that infiltration rates were negligible due to the clay subsoil.
- 3.3 The percolation test established that the use of soakaways on the site for surface water discharge is not feasible. The results also show that the use of drainage fields to act as an outfall for a sewerage treatment plant is also not feasible.

## 4.0 Proposed Type of Development

4.1 The development proposals are to redevelop the site from currently vacant farm buildings to a residential development comprising of 7 no. houses on the eastern side of the High Street as shown by the site layout plan included within Appendix C.

#### 5.0 Flood Risk

5.1 The EA Flood risk map for the site is included within Appendix I and indicates that the site is not susceptible to flooding from rivers or the sea.

- 5.2 The percolation test indicated that the water table was at least 1m below existing ground levels and thus not susceptible to flooding from groundwater.
- 5.3 Local residents have reported that surface water sheds across the fields from the north east causing surcharging of the adjacent ditches. The surcharging is believed to be caused by poor maintenance of the ditches.
- 5.4 HDL drawing no. 20-3575-922 P3, included within Appendix D shows pre and post development impermeable hardstanding and roof areas. The drawings demonstrate that the area of hardstanding within the red line will be reduced from the current area of 2,373m² to 1,936m² as a result of the proposed development

### 6.0 Sustainable Drainage Proposals

- 6.1 The Code of Practice for Sustainable Drainage Systems provides a flexible approach to drainage systems with a wide range of components and includes a hierarchy of techniques. These are:-
  - 1. Prevention The use of good site design and housekeeping measures on site to prevent run-off and pollution.
  - 2. Source Control Control of run off at or very near to its source.
  - 3. Site Control Management of water from several sub catchment areas.
  - 4. Regional Control Management of run off from several sites, typically in a detention pond or wetland.
- 6.2 With the above in mind surface water disposal will respect the hierarchy of techniques outlined above.
- 6.3 Prevention will be at the forefront of the development of the site with the site set out to maximise the areas of soft landscaping.
- 6.4 Source control is to be introduced in the following way:-
  - The recent percolation test indicates that the geology will have negligible infiltration characteristics negating the use of soakaways for surface water drainage discharge.

- Adjacent ditches are available for surface water discharge as shown by the topographical survey included within Appendix B.
   These will be used for surface water discharge.
- 6.5 HDL drawing no. 20-3575-922 P3, included within Appendix D, indicates that the impermeable area of roofs and hardstanding prior to development will be reduced as a result of the proposed development.
- 6.6 Permeable paved areas, as shown by HDL drawing included within Appendix E, are to be adopted with an impermeable tanking membrane to store the 1 in 100 year storm with 40% climate change allowance prior to discharge to the adjacent ditch via a petrol interceptor and hydrobreak with a controlled flow to ensure that surface water run off is no greater than that prior to development as required by the Environment Agency / Planning Authority.
- 6.7 Rainfall within soft landscaped areas will be allowed to permeate through the ground in order to mimic as closely as possible the natural drainage from the site before development.

### 7.0 Sustainable Drainage Design

7.1 Surface water calculations, included within Appendix F, show that there is sufficient storage capacity within the permeable paving, details included within Appendix E, to accept the 1 in 100 year storm with 40% climate change allowance.

## 8.0 Surface Water Drainage Calculations

8.1 Drainage calculations have been included within Appendix F to demonstrate runoff rates and the sufficiency of the storage within the proposed permeable paving make up.

## 9.0 Foul Water Drainage Outfalls

- 9.1 The sketch drawing included within Appendix G and the topographical survey included within Appendix B indicates the location of existing foul drainage manholes serving Yew Tree Farm.
- 9.2 The proposed foul drainage system is to be connected to the public sewer at this location. An application for a section 106 agreement to connect to the public sewer will be made to Thames Water at the construction stage of the proposed development.

- 9.3 Concerns have been raised by local residents regarding historic sewer flooding. The results of a sewer flooding history enquiry are included within Appendix J and concludes that there have been no incidents of flooding in the area as a result of surcharging of public sewers.
- 9.4 In the unlikely event that Thames Water refuse an application for a Section 106 agreement to connect to the public sewer system a private sewerage treatment plant will be installed, sized in accordance with 'British Water Code of Practice Flows and Loads 4 Sizing Criteria, Treatment Capacity for Sewerage Treatment Systems', with discharges from the sewerage treatment plant to an underground storage tank to be emptied by tanker on a monthly basis. This is not the favoured option for dealing with foul sewerage discharges due to the significant additional capital and maintenance costs and also ongoing service charges and thus will only be implemented if Thames Water refuse to accept the foul discharges from the development.

### 10.0 Third Party Agreements

10.1 A Section 106 application will be made to Thames Water for the discharge of the on-site foul drainage system to the existing public foul water adoptable drainage system.

### 11.0 Construction Stage Drainage

11.1 The Permeable hardstanding areas with porous sub base will be constructed as the first stage of construction to allow surface water discharges to be controlled and managed during the construction of the development.

## 12.0 SuDS Management & Maintenance Plan

#### Permeable Paving

- 12.1 The surface blocks have a design life equivalent to standard block paving.
- 12.2 All paved surfaces will require occasional cleaning. In normal circumstances regular sweeping will be sufficient. Cleaning should be carried out in the Spring and after leaf fall in Autumn.
- 12.3 Lighter coloured blocks may exhibit tyre marks and may require more cleaning and maintenance.
- 12.4 Following routine maintenance it may be necessary to redress the surface with 2 4mm clean gritstone.

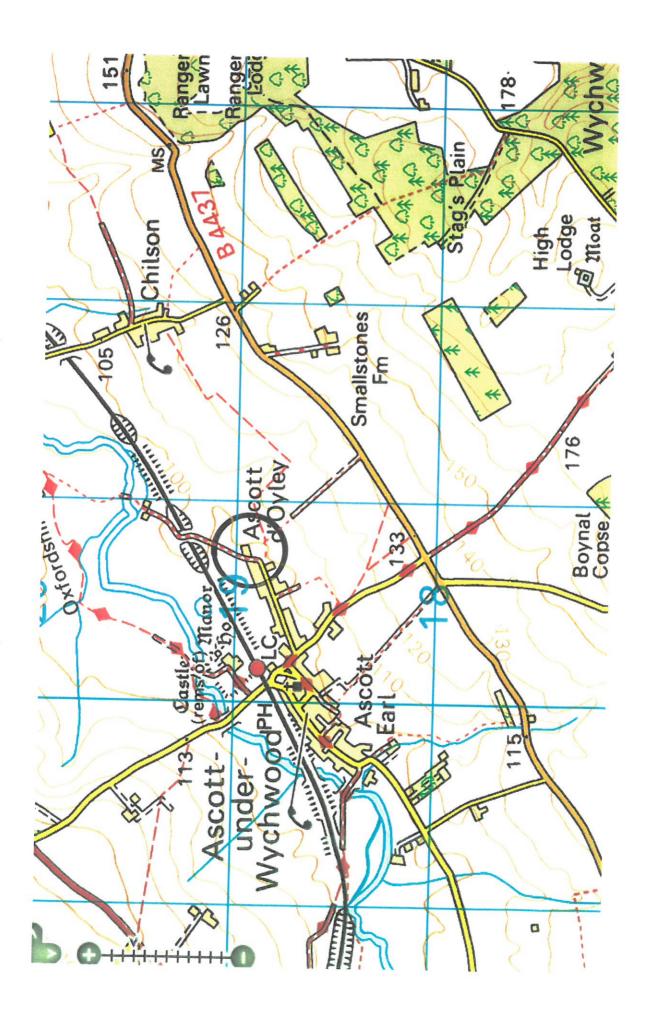
- 12.5 Ultimately after 25 years or more areas of the laying course may become filled with silts and toxins. If this occurs the surface blocks should be uplifted and the affected areas of laying course material and geotextile disposed of. Fresh geotextile and laying course stone should be installed and the existing surface blocks re-laid.
- 12.6 A management company will be set up with responsibility for the maintenance of all common areas of the site including external areas and on-site foul and surface water drainage.

### 13.0 Utility Search

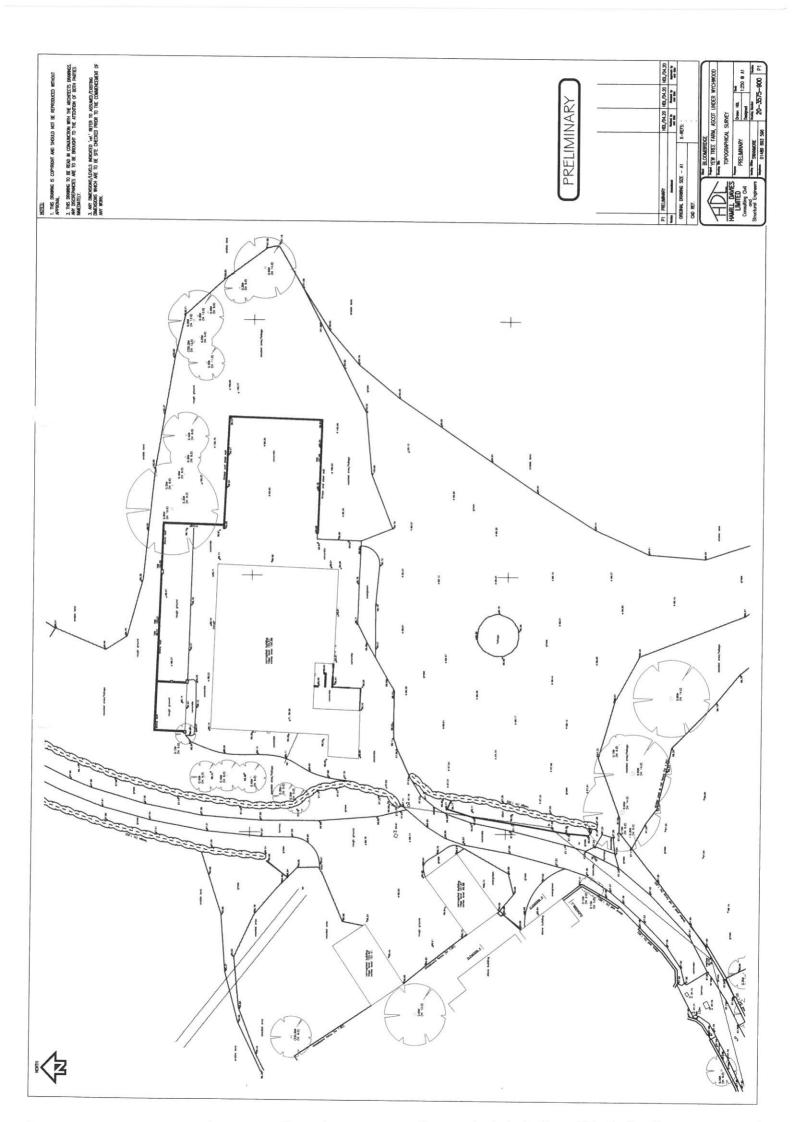
13.1 A desktop utilities search has been undertaken and the results of the search are included within Appendix K.

Appendix A

Location Plan



# Appendix B Topographical Survey

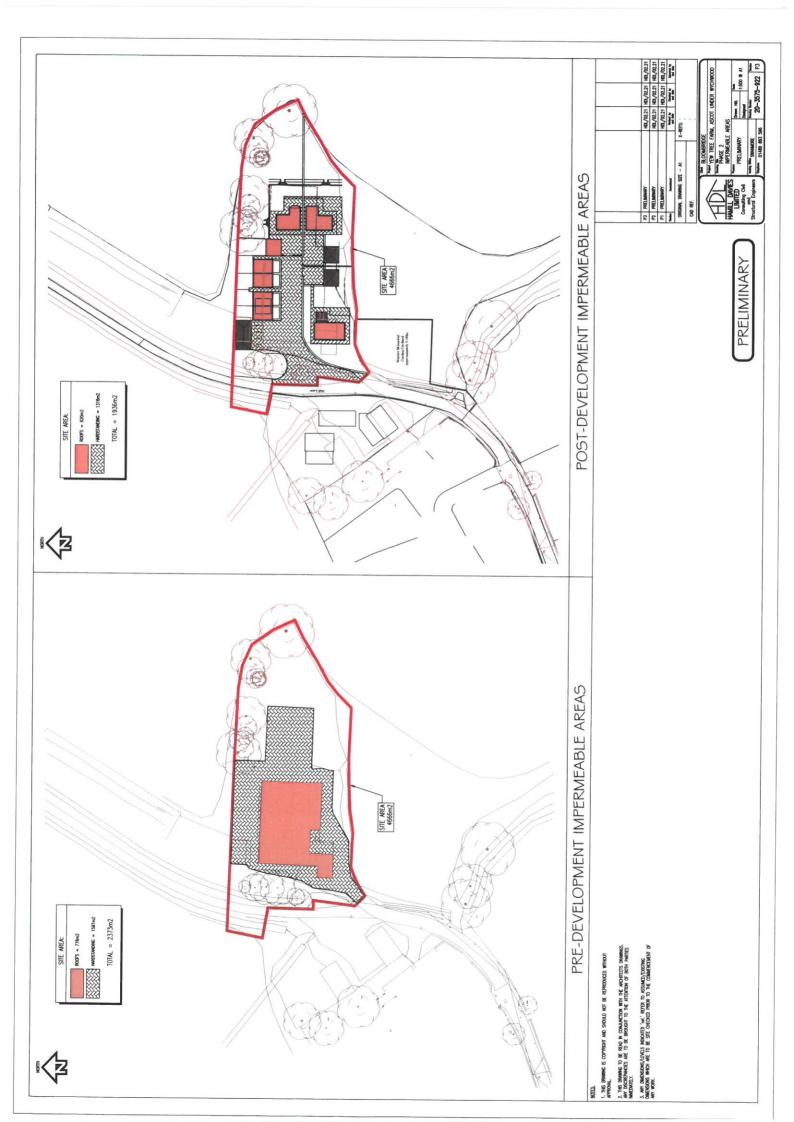


Appendix C
Site Layout Plan

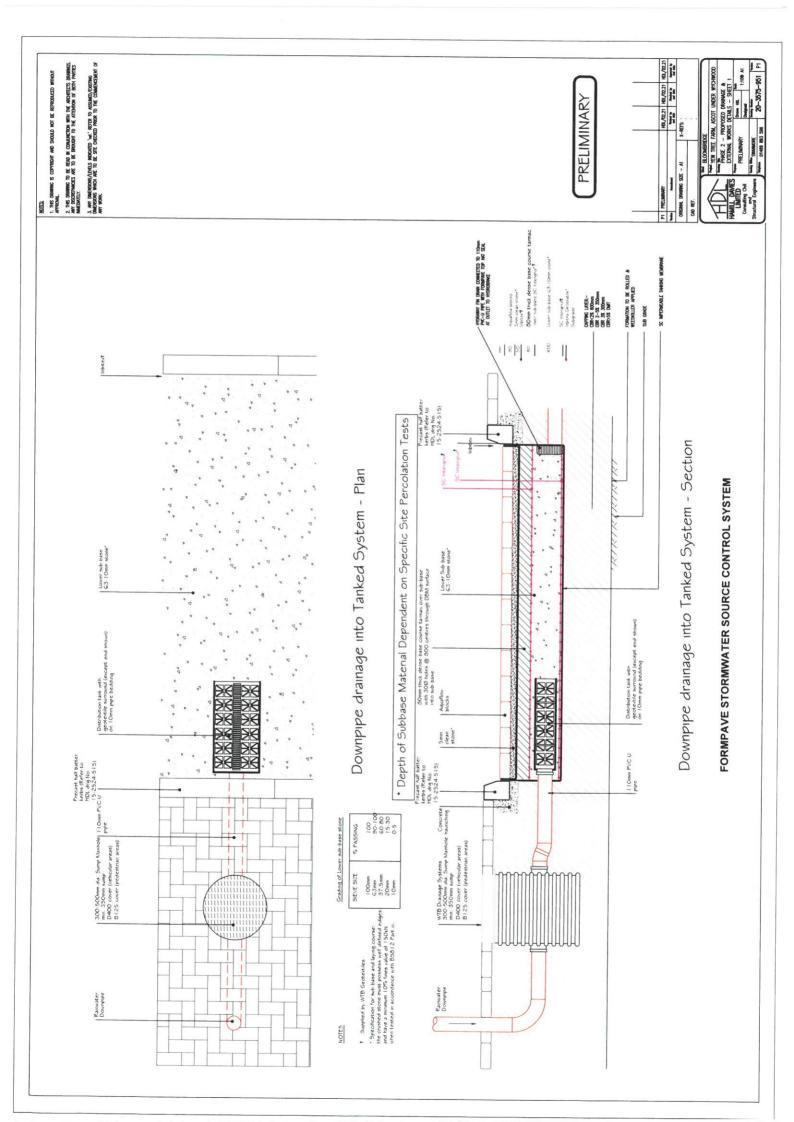


## Appendix D

Pre & Post Development Impermeable Areas



# Appendix E Foul & Surface Water Drainage Details



# Appendix F Drainage Calculations

You TREE FARM Job No/ 20 35 Engineer Checked SUCCALE MATER EVRFACE NATER DEAN-AGE TO SE DESIGNED FOR 1 IN 100 YEAR STORM 40% Cumare CHARGE Perfect to HD L DRG NO 20-3575-922 P3 FOR PLE of POST DEVELOPMENT Infelmentet Afens PREDETERORMENT OU SITE IMPERIENTER ALAS 2373 m2 fort DEVELORMENT ON SITE IMPERINTABLE ARKS 1936 m2 From ATTACHED MASTERDAN COMPATE PRINT OUT POST BENEROPMENT STORTER LEW > 165.2 m3 STORAGE PROVIDED WITHIN BROWS PANIL SUB BASE 400 mm DEEP. 1316×0:33×0.4: 173:7m3 :.06 thouse polous Pavice WITH 400m DelTH of Polovs SUBSAST of Mysloslar 2.07 1/5 Form 3



#### MasterDrain HY 10.07

## HAMILL DAVIES LIMITED

Consulting Civil & Structural Engineers lvydale,Lower Chase Road, Swanmore, Hampshire, SO32 2PB
Tel: 01489 893 596 Fax: 01489 890 715 brian.w.hamill@btopenworld.com

Area to other SUDS = 0.0000 ha Post-dev flow to drain = 2.07 l/s

Job No. 20-3575
Sheet no. 1
Date 04/03/21

By Checked Reviewed

Yew Tree Farm - Phase 2

Title BREEAM SUR1 calculations for Oxford

By Checked Reviewed

#### Data: -

Hydrology (FSR):-Location = Oxford WRAP Long reference = 453205 Grid reference = SP5305 M5-60 (mm) = 20.1SAAR (mm/yr) = 650 = 0.42Soil =0.47= 6 Hyd. area Hyd. zone Hydrograph = Summer Area = England & Wales

= 0.0000 ha

= 0.0000 ha

Site values used in design:-

= 0.4667 ha Total site area Climate change factor = 40% = 0.2373 ha 🗸 Pre-dev area drained Post-dev area drained = 0.1936 ha V Imperm runoff factor = 98% Perm runoff factor = 20% Pre-development Area to soakaways = 0.0000 haArea to other SUDS = 0.0000 haPerv. area to SUDS = 0.0000 haPre-dev flow to drain = 0.00 1/s Post-development

Perv. area to SUDS

Calculations: -

Area to soakaways

Revised Post-dev Imperm. area = 0.194 ha Equiv. Post-dev Imperm. area = 0.190 ha Equiv. Post-dev Perm. area = 0.055 ha Total Pre-dev equiv. area ha = 0.278 ha Total Post-dev equiv. area ha = 0.244 ha 100 yr 6 hour mean intensity = 10.26mm/hr

#### Results:-

Pre-dev peakflow runoff (1/s) (m3/s) R.P. 15 30 60 120 240 360 480 600 Max Final R.P. 1 96.7 63.6 40.2 24.1 14.7 11.1 8.9 7.5 96.7 N/A 1 235.6 152.1 93.9 56.2 33.0 24.0 19.1 16.0 235.6 N/A 30 30 100 306.0 199.2 123.4 73.9 43.0 31.1 24.7 20.7 306.0 N/A 100 Post-dev peakflow runoff (1/s) R.P. 15 30 60 120 240 360 480 600 Max CCF Final R.P. 84.8 55.8 35.3 21.2 12.9 9.8 7.8 6.6 84.8 40 206.8 133.5 82.4 49.4 28.9 21.0 16.8 14.1 206.8 40 268.5 174.8 108.3 64.9 37.8 27.3 21.7 18.1 268.5 40 1 40 118.8 1 30 289.5 30 100 375.9 100

100 year 6 hour (x Climate Change Factor) storm gives:Pre-dev runoff volume m³ = 171.5m³
Post-dev rainfall volume = 210.7m³
Post-dev volume m³ (excess above SUDS) = 210.7m³
100 yr 6 hour mean intensity = 10.26mm/hr
Pre-dev volume to drain at 0 1/s = 0.0 m³
Post-dev volume to drain at 2.07 1/s = 45.5 m³
Post-dev storage volume = 165.2m³
Post-dev 5mm imperm volume = 9.7 m³
Post-dev 5mm perm volume = 13.7 m³

 $Q_{BAR(rural)} = 2.066 \text{ l/s}$  or 4.427 l/s/ha or 0.002 cumecs - from IoH 124.

The rainfall rates are calculated using the location specific values above in accordance with the Wallingford procedure.



#### MasterDrain HY 10.07

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20-3575
Sheet no. 2
Date 04/03/21

Project Yew Tree Farm - Phase 2

Title BREEAM SUR1 calculations for Oxford

By Checked Reviewed

#### Data summary.

#### Use the data below for the SUR1 form

#### Site areas:-

Total site area = 0.4667 ha ;4667.0 m² [3A]
Pre-development impermeable area = 0.2373 ha [3B]
Pre-development permeable area = 0.2294 ha

Post-development impermeable area = 0.1936 ha [3C]
Post-development permeable area = 0.2731 ha

#### Peak runoff:-

 $\begin{array}{lll} \mbox{Pre-development 1 year storm (15min)} &= & 96.7 \ \mbox{|/s} & [6A] \\ \mbox{Pre-development 100 year storm (15min)} &= & 306.0 \ \mbox{|/s} & [6C] \\ \mbox{Post-development 1 year storm (15min)} &= & 84.8 \ \mbox{|/s} & [6B] \\ \mbox{Post-development 100 year storm (15min)} &= & 268.53 \ \mbox{|/s} & [6D] \\ \end{array}$ 

#### Greenfield runoff:-

 $Q_{BAR(rural)} = 2.066 \text{ l/s}$  or 4.427 l/s/ha or 0.002 cumecs - from IoH 124.

Climate change factor:-CCF = 40%

#### Volumes: -

Pre-development 100 yr/6hr storm [12A] = 240.1m<sup>3</sup>

Post-development 100 yr/6hr storm (add. volume with no SUDS) [12B] =  $210.7m^3$ Post-development 100 yr/6hr storm (add. volume with SUDS) =  $210.7m^3$ Post-development add. predicted volume (No SUDS) [12C] =  $-29.4m^3$ 

#### You may also require

Data relating to the infiltration test calculations (if applicable) Evidence to show runoff reduction (if applicable) Information on calculation methods (if applicable see next sheet)

#### Note

Numbers in square brackets relate to the Nov. 2010 v1.1 / issued 11/02/10 copy of SUR1

/



MasterDrain HY 10.07

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brian.w.hamill@btopenworld.com

Job No. 20-3575
Sheet no. 3

Date 04/03/21

By Checked Reviewed

B.H.

Project Yew Tree Farm - Phase 2

Title BREEAM SUR1 calculations for Oxford

#### Definitions and methods

#### Hydrology

The hydrological constants are derived from the Wallingford maps. They are used to calculate location specific rainfall figures.

#### Site values and factors

Areas of the site should be entered in hectares (10000 m²). If the Pre-development site is a green field, this box is blank.

Climate Change Factor is initially set at 20% - this may be changed as required.

Greenfield runoff is calculated using the method described in IoH 124.

Runoff factors

The impermeable runoff factor is initially set at 98% The permeable runoff factor is initially set at 20%

Note: the CCF and the runoff factors may be changed by the user to suit the development The areas draining to soakaways and other SUDS are entered in the appropriate box (in hectares)

#### Calculations

The post-development area is reduced by subtracting the areas that drain to soakaways or other SUDS, to give a revised figure.

All areas are then multiplied by the appropriate runoff factor to give an equivalent area with 100% runoff. These are then summated.

This gives a total pre-development equivalent area, and a similar figure for the post-development area.

The 'Post-dev volume to drain (no SUDS)' gives the total runoff to drain if no SUDS were used.

#### Results

The pre- and post-development areas are subjected to 1,30 and 100 year return period storms with a duration of 15 to 600 minutes.

The Revised Post-dev Imperm. area is the area (in ha) that is not going to SUDS x impervious runoff factor.

The runoff rates are calculated for the chosen hydrograph (Summer or Winter) as I/s. Figures in red indicate m³/s The peak value is measured, multiplied by the CCF and the total maximum rate is shown.

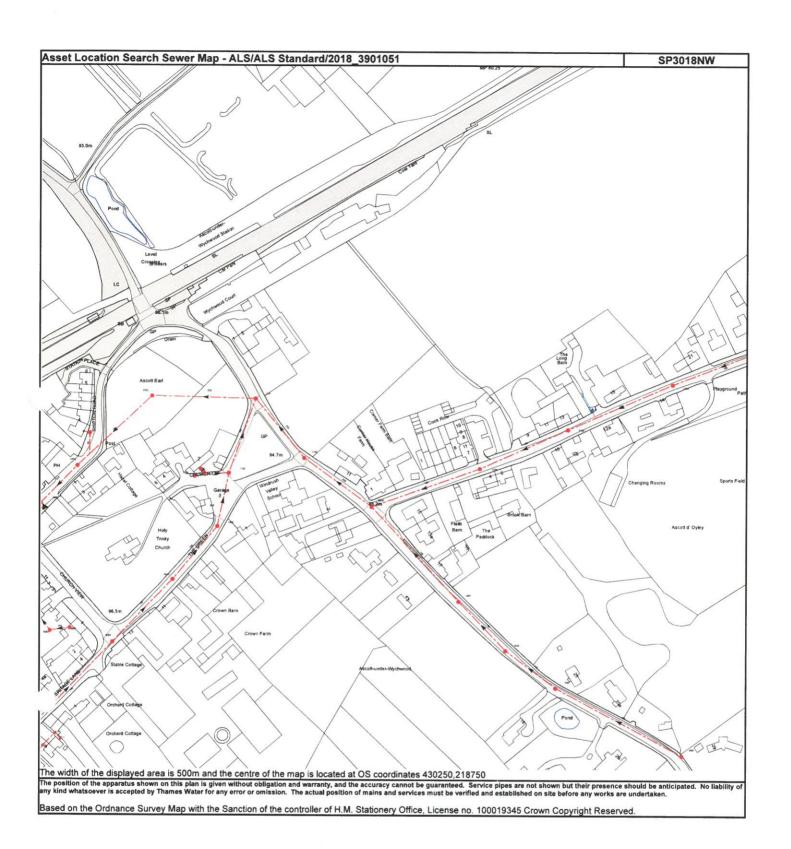
The pre- and post-development volumes for a 100 year / 6 hour storm are calculated from the area under the hydrograph curve.

Post-dev volume (i.e. excess above SUDS) is that volume produced by the drained area that does not go to SUDS. Qbar(rural) is calculated in accordance with the procedure laid down in IoH 124

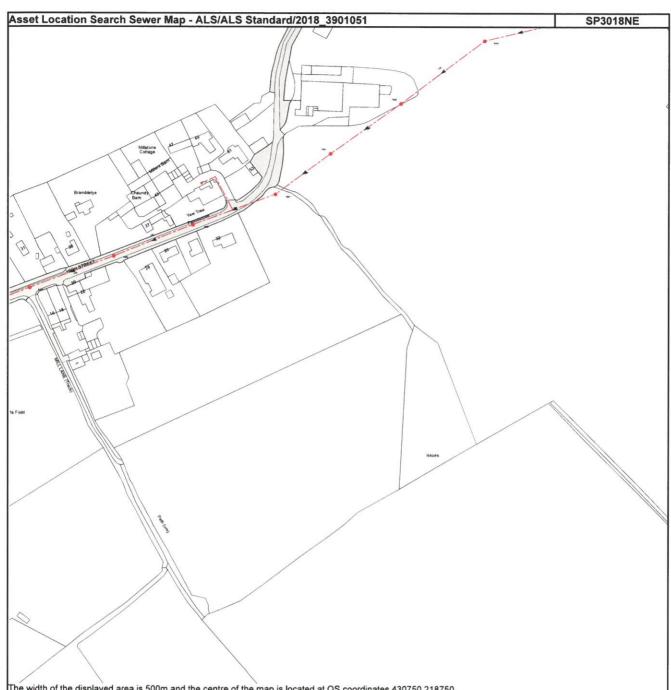
# Appendix G Existing Services

Conducte Chicago Conductes she cock Chicago Ch CNRDC Howley (Chippin Norton Rual District Council) Building to be domolished Pole w overhead supply to farm buildings 1533 Bored cable to fam boilding (elec) Tamac (elec/87??) Gravel ASCOTT UNDER WYCHGUOOD Electricity pole wo mansformer Lunit OF Public Highway - Fire Hydrant & Simplook. - Pole (BT) ( Hbc) BT pole w overhead supply. Aircha Overhead Live MILLLANE Public Row Footpath YEW TREE FARM

# Appendix H Thames Water Sewer Records



<u>Tharnes Water Utilities Ltd.</u> Property Searches, PO Box 3189, Slough SL1 4W, DX 151280 Slough 13 T 0845 070 9148 E searches@tharneswater.co.uk I www.tharneswater-propertysearches.co.uk



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 430750,218750

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
3701	95.37	93.49
3502	99.51	97.72
3501	101.71	100.09
3702	95.7	93.88
371A	n/a	n/a
4701	96.59	94,41
4501	106.65	105.01
0601	93.85	90.88
051C	n/a	n/a
0604	97.21	95.5
051B	n/a	n/a
051A	n/a	n/a
0605	96.82	96.08
0701	93.69	91.41
071A	94.02	92.3
0501	96.58	95.12
0702	93.64	91.58
0603	95.39	93.93
1704	n/a	n/a
1705	n/a	n/a
1710	n/a	n/a
1601	95.03	93.39
1703	94.51	92.97
1701	94.14	92.13
1702	94.65	92.41
2602	95.11	92.83
2601	97.6	95.93

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Manhole Reference	Manhole Cover Level	Manhole Invert Level
6801	97.33	95.84
681A	n/a	n/a
7801	97.3	96.27
7901	n/a	n/a
7902	n/a	n/a
8901	n/a	n/a
5801	96.82	94.92
5802	96.81	95.48

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

# Appendix I Flood Risk Map

Basic view

**Detailed view** 

Exit full screen x Location | OX7 6AW Ascott Hill Farm Flood risk from surface Flood risk from rivers **Extent of flooding** or the sea

Extent of flooding Extent of flooding Flood risk from reservoirs

Flood risk Location you Medium Very low selected High LOW Ascott d' Oyley Honeydale Farm 500 m

# Appendix J Sewer Flooding History

# **Sewer Flooding**



**History Enquiry** 

Hamill Davies Ltd

Lower Chase Lane

Search address supplied

4

High Street

Ascot under Wychwood

OX7 6AW

Your reference

Ascott under Wychwood

Our reference

SFH/SFH Standard/2018\_3901052

Received date

31 October 2018

Search date

6 November 2018



Thames Water Utilities Ltd Property Searches, PO Box 3189, Slough SL1 4WW DX 151280 Slough 13



searches@thameswater.co.uk www.thameswater-propertysearches.co.uk



0845 070 9148

# **Sewer Flooding**



**History Enquiry** 

Search address supplied: 4, High Street, Ascot under Wychwood, OX7 6AW

This search is recommended to check for any sewer flooding in a specific address or area

TWUL, trading as Property Searches, are responsible in respect of the following:-

- (i) any negligent or incorrect entry in the records searched;
- (ii) any negligent or incorrect interpretation of the records searched;
- (iii) and any negligent or incorrect recording of that interpretation in the search report
- (iv) compensation payments



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# **Sewer Flooding**

**History Enquiry** 



### **History of Sewer Flooding**

Is the requested address or area at risk of flooding due to overloaded public sewers?

The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

#### For your guidance:

- A sewer is "overloaded" when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter).
   Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
- "Internal flooding" from public sewers is defined as flooding, which enters
  a building or passes below a suspended floor. For reporting purposes,
  buildings are restricted to those normally occupied and used for
  residential, public, commercial, business or industrial purposes.
- "At Risk" properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company's reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water on Tel: 0800 316 9800 or website www.thameswater.co.uk



Thames Water Utilities Ltd Property Searches, PO Box 3189, Slough SL1 4WW DX 151280 Slough 13



searches@thameswater.co.uk www.thameswater-propertysearches.co.uk



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# Appendix K Utilities Search