TECHNICAL DESIGN NOTE

Hydrock

Project name	Himley Village - Reserved Matters Application		
Design note title	Drainage Strategy		
Document reference	16153-HYD-XX-XX-TN-C-001		
Author	R Austin		
Revision	P02		
Date	21 May 2021	Approved	☐

This Technical Note has been produced in order to support the Reserved Matters planning application for a 500-unit Phase of the Himley Village development at Himley Farm on land north of Middleton Stoney Road.

The below strategy note regarding the foul & surface water drainage strategies should be read in conjunction with the Flood Risk Assessment (FRA) produced by Alan Baxter & Associates in 2014 and approved during the outline application.

Introduction:

The site currently benefits from an outline permission ref 14/02121/OUT from Cherwell District Council, dated January 30th 2020, and the requirements of surface water drainage designs can be understood from the following condition;

> ***Condition 11***.
>
> *Prior to the submission of the first reserved matters application, a full surface water drainage scheme for the site, based on sustainable drainage principles and an assessment of the hydrological and hydro-geological context of the development, shall have been submitted to and approved in writing by the local planning authority. The scheme shall subsequently be implemented in accordance with the approved details before the development is completed.*
>
> *The scheme shall also include:*
> *· Discharge Rates*
> *· Discharge Volumes*
> *· Sizing of features - attenuation volume*
> *· Infiltration in accordance with BRE365*
> *· Detailed drainage layout with pipe numbers*
> *· SUDS - Swales, Ponds, Permeable Paving, Filter Strips, Rain Gardens*
> *· Network drainage calculations*
> *· Phasing*
>
> *Reason - To mitigate the risk of surface water flooding, protect water quality and biodiversity on the site in accordance with Government guidance contained within the Eco Town PPS and the National Planning Policy Framework. This information is required prior to commencement of any development as it is fundamental to the acceptability of the scheme.*

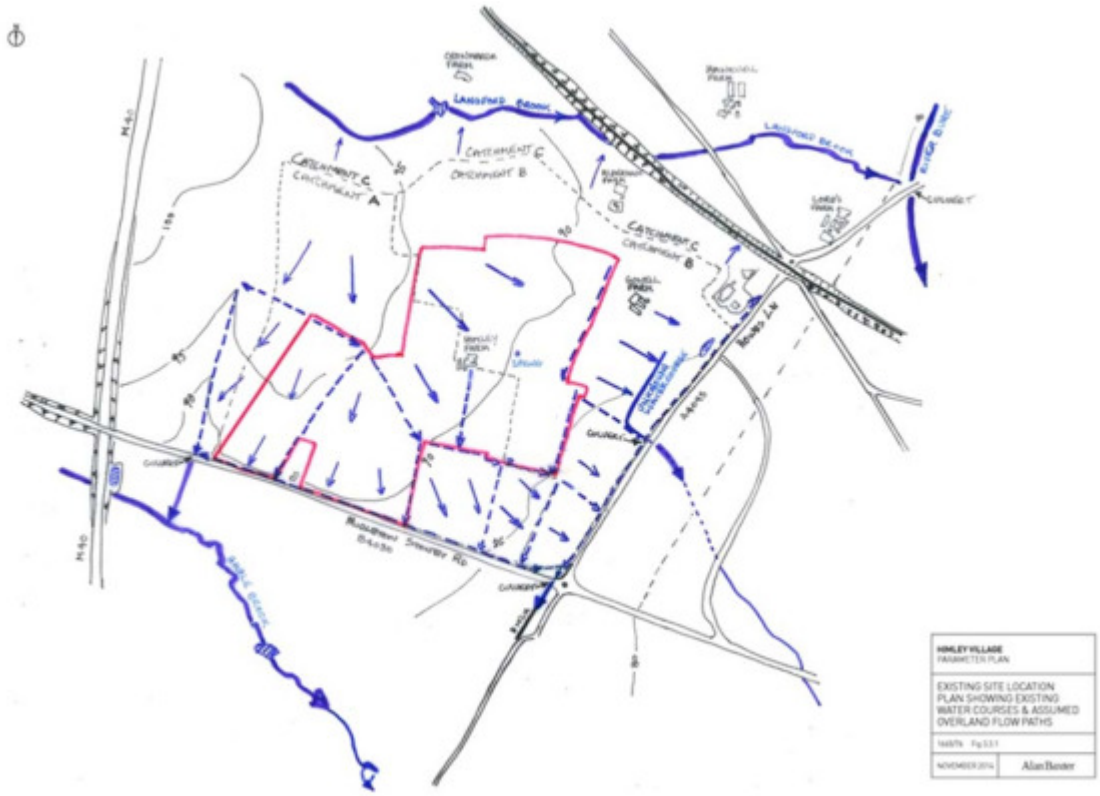
Condition 34.

Prior to the commencement of the development, a foul drainage strategy for conveyance and treatment, detailing any on and/or off site drainage works, shall be submitted to and approved by the Local Planning Authority. No discharge of foul or surface water from the site shall be accepted into the public system until the drainage works referred to in the strategy have been completed. No dwelling shall be occupied until the foul drainage has been provided in accordance with the approved strategy.

Reason - The development may lead to sewage flooding; to ensure that sufficient capacity is made available to treat and convey foul flows from the new development; and in order to avoid adverse environmental impact upon the community and water environment in accordance with Government guidance contained within the Eco Town PPS and the National Planning Policy Framework. This information is required prior to commencement of any development as it is fundamental to the acceptability of the scheme

Existing Drainage:

As an agricultural greenfield site, the application site benefits from numerous ditches to control surface water runoff, this network of ditches can be viewed in Figure 3.3 of the Ala Baxter FRA (reproduced below)



The ditches on the application site form a land drainage network to serve the site and they convey surface water to existing water courses. The site predominantly falls to the south and east through the ditches and a long ditch that runs parallel to the B4030, the ditch is culverted along the new commercial development in the south east and is piped to the south where it is understood to discharge into the Gable Brook.

Proposed Surface Water Drainage Strategy

In accordance with the approved FRA, the drainage strategy utilises positive outfalls into the local ditch network at 2l/s/ha in all rainfall events up to and including the 1:100 + 40% Climate Change event. The pre-existing drainage rates per 1ha of catchment are reproduced below from a Microdrainage assessment based on a 0.255 soil factor. The 2l/s/ha is considered as log term storage "trickle rate" and whilst it sits above the current QBar and 1:1 year rates is below the current 30 and 100 year return period discharge rates.

ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.255
Area (ha)	1.000	Urban	0.000
SAAR (mm)	683	Region Number	Region 6

Results	l/s
QBAR Rural	1.2
QBAR Urban	1.2
Q1 year	1.1
Q1 year	1.1
Q30 years	2.8
Q100 years	4.0

The drainage strategy for this development relies on sustainable methods such as basins, swales (where possible) and porous paving to ensure a suitable level of treatment is provided along with the correct volume of attenuation to permit the restricted flow rates.

The current proposal allows for three distinct catchments, each with independent connections to the existing network, all utilise "green" initiatives for attenuation. These are;

The Western access network - 0.479 ha with a swale for storage

The "Main" network - 7.02 ha with numerous basins & swales for storage

The Eastern access - 2.13 ha with a large basin and secondary swale for storage

The impermeable catchment area (not site area), peak flow rate and maximum discharge volume for each catchment are shown below.

Network	Impermeable area	Exg Qbar runoff rate	Exg Q100 runoff rate	Max Proposed Discharge Rate (1:100+40%CC)	Max Discharge Vol (1440 minute 100 year Winter + 40 %)
Main Network	7.02 ha	8.5 l/s	28.08 l/s	14.5 l/s	1700 m^3
Eastern Network	2.13 ha	2.55 l/s	6.13 l/s	4.0 l/s	622 m^3

Western Access Network	0.479 ha	0.56 l/s	1.9 l/s	1.0 l/s	153 m^3

The volumes of individual attenuation are displayed on Hydrock drawings 16153-HYD-XX-XX-DR-C-2204, 2205 & 2206 with an overview of the whole site on 2203 P03. The drawings also display the pipe sizes and invert/cover levels along with pipe references required to read the appended hydraulic calculations

Ground Conditions/Infiltration

Infiltration has not been utilised in the drainage strategy at this site due to the existing ground conditions and shallow groundwater presence.

Hydrock have undertaken an intrusive Geotechnical Investigation ref 16153-HYD-XX-XX-GE-RP-1002-P1-S2 (Jan 2021) and an extract of table 5.4 is reproduced below to confirm that infiltration is not viable.

Table 5.4: Infiltration test results

Stratum	Location	Depth to base of pit (m bgl)	Infiltration rate (m/s)	
			Run 1 (Runs 2 & 3 not undertaken where no or low infiltration)	Additional Notes
Head Deposits / Cornbrash Formation	TP04	1.60	No infiltration	Shallow groundwater recorded before start of the test at 0.53mbgl.
	TP46	1.50	No infiltration	Shallow groundwater recorded before start of the test at 0.47mbgl.
	TP51	1.50	No infiltration	Shallow groundwater recorded before start of the test at 0.84mbgl.
	TP77	1.50	No infiltration	Shallow groundwater recorded before start of the test at 0.53mbgl.
Cornbrash Formation	TP37	1.30	No infiltration	Shallow groundwater recorded before start of the test at 1.08mbgl.

*Where less than three tests were possible in a particular location the results provided should be considered indicative only and should not be used for design purposes. If infiltration is critical to the development of the site, multi-day infiltration testing should be undertaken.

Proposed Foul Water Drainage Strategy

There are no existing foul sewers within the application site itself.

A pre-development enquiry has been lodged with Thames Water and a suitable point of connection in Howse Lane to the east of the site boundary has been identified by them. The receiving sewers do not currently provide sufficient capacity for the development however Thames Water are obligated to upgrade to suit the phases of development as it proceeds.

The first 500-unit phase of the application site is to drain via gravity into a new foul pumping station in the north east of the site, this will then be conveyed in a rising main which will travel south into Middleton Stony Lane before heading east and north into Howse Lane where it will discharge into a new chamber constructed over the existing 225mm foul sewer.

The first 500 units will produce a peak flow of 23.4l/s and we expect the pumped rate to be half of this, at 11.7l/s. The pumping station will require emergency storage of 80m^3 which should be provided offline and adjacent to the station where practicable.

An extract of the proposed foul sewer route is shown below.

OS NORTH

Care Facility
2600sqm

Retail
700sqm

Pub
400sqm

Office
1000sqm
2 floors

Health Facility
1000sqm
2 floor

Health Facility
500sqm

Veterinary
1000sqm
2 floor

Veterinary
500sqm

Nursery
100sqm

Veterinary
500sqm

Energy Centre
375sqm

Water
450sqm

Hinley Farm

Pond

Pond

Lynch House

90.0m

88.6m

86.1m

82.1m

82.6m

Bignell Belt

Big Covert

Bignell Belt

Mast

El Sub Sta

ISIS AVENUE

NOTES

LEGEND

79.10 PROPOSED SLAB LEVEL

UB=600mm HEIGHT & LOCATION OF UNDERBUILD
(UB= represents maximum height of underbuild beneath normal anticipated outside ground level of 150mm below FFL.)

DRAINAGE LEGEND

PROPOSED ADOPTABLE SECTION 104 FOUL SEWER (Refer to manhole schedule for ring Ø)

PROPOSED ADOPTABLE SECTION 104 SURFACE SEWER (Refer to manhole schedule for ring Ø)

SECTION 104 RISING MAIN

TANKED PERMEABLE PAVING TO BS7533-13:2009

REVISIONS

Rev	Date	Description	By	Ckd	App
P02	28/05/2021	Red Line boundary added - new foul rising main route indicated.	RA	RA	..
P01	17/03/21	FIRST ISSUE	RA	RA	..

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CLIENT
COUNTRYSIDE PROPERTIES

PROJECT
HIMLEY VILLAGE, BICESTER

TITLE
PRELIMINARY DRAINAGE ASSESSMENT
500 UNITS OVERVIEW

HYDROCK PROJECT NO.	SCALE @ A0
C-16153-C	1:1250
STATUS DESCRIPTION: INFORMATION	STATUS: S2
DRAWING NO. (PROJECT-CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER): 16153-HYD-XX-XX-DR-C-2203	REVISION: P02

Permeable paving to discharge through orifice

DRAINAGE LEGEND:

- PROPOSED ADOPTABLE SECTION 104 FOUL SEWER (Refer to manhole schedule for ring Ø)
- PROPOSED ADOPTABLE SECTION 104 SURFACE SEWER (Refer to manhole schedule for ring Ø)
- SECTION 104 RISING MAIN
- TANKED PERMEABLE PAVING TO BS7533-13:2009

NOTES:
1. This drawing is proposed to show only the proposed foul connection from the site boundary to the Thames Water Ltd sewer connection point alongside Howes Lane.
2. a 3m easement is shown either side of the 225mm dia pipe.
3. The pipe is a 225mm pipe shown at 1:167.

REVISIONS

Rev	Date	Description	By	Ckd	App
P03	17/03/2021	Layout updated, amended to suit revised levels.	OD	RA	..
P02	25/02/2021	eastern catchment drainage updated, basin moved north. Tanked porous paving added	RA	RA	..
P01	10/02/2021	First Issue.	RA	RA	..

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CLIENT
COUNTRYSIDE PROPERTIES
PARTNERSHIPS NORTH

PROJECT
HIMLEY VILLAGE
BICESTER

TITLE
PRELIMINARY DRAINAGE ASSESSMENT
500 UNITS SHEET 2 OF 4

HYDROCK PROJECT NO.: C-16153-C
SCALE @ A0: 1 : 500
STATUS DESCRIPTION: INFORMATION
STATUS: S2
DRAWING NO. [PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER]: HVB-HYD-XX-XX-DR-C-2204
REVISION: P03