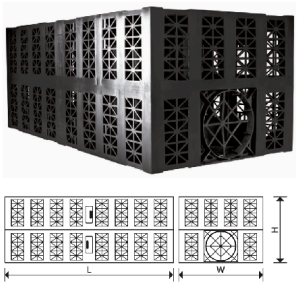
21-22

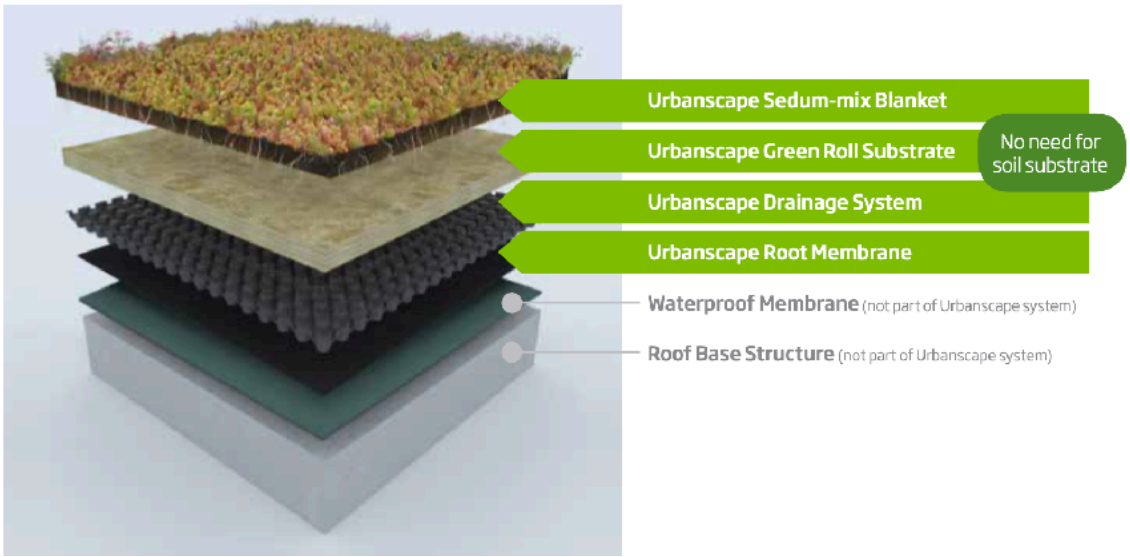
NEW DWELLING, LAND TO THE SIDE OF 8 STOCK LANE, WHADDON, MK17 0LS

Sustainable Drainage Statement



For: Mr Peter Hudec

Date: 19 July 2022



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APPENDIX:

INTRODUCTION

1. A separate Design Statement (reference 21-22) sets out the principles and approach to the design for a new dwelling on land to the side of 8 Stock Lane, Whaddon. Please read this report first alongside the application drawings.

2. Site address:

   8 Stock Lane

   Whaddon

   MK17 0LS

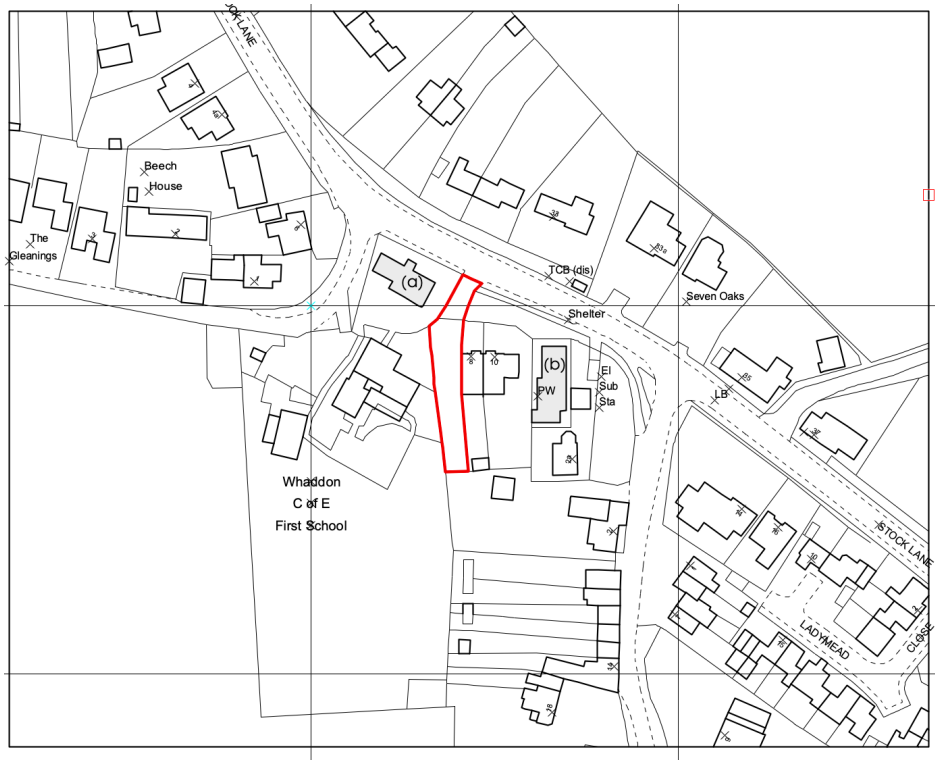


Fig 1: Location map, red line boundary identifying the site.

ANALYSIS

3. The site is located in flood zone 1, an area with a low probability of flooding.

4. There are no rivers or watercourses within the local area.

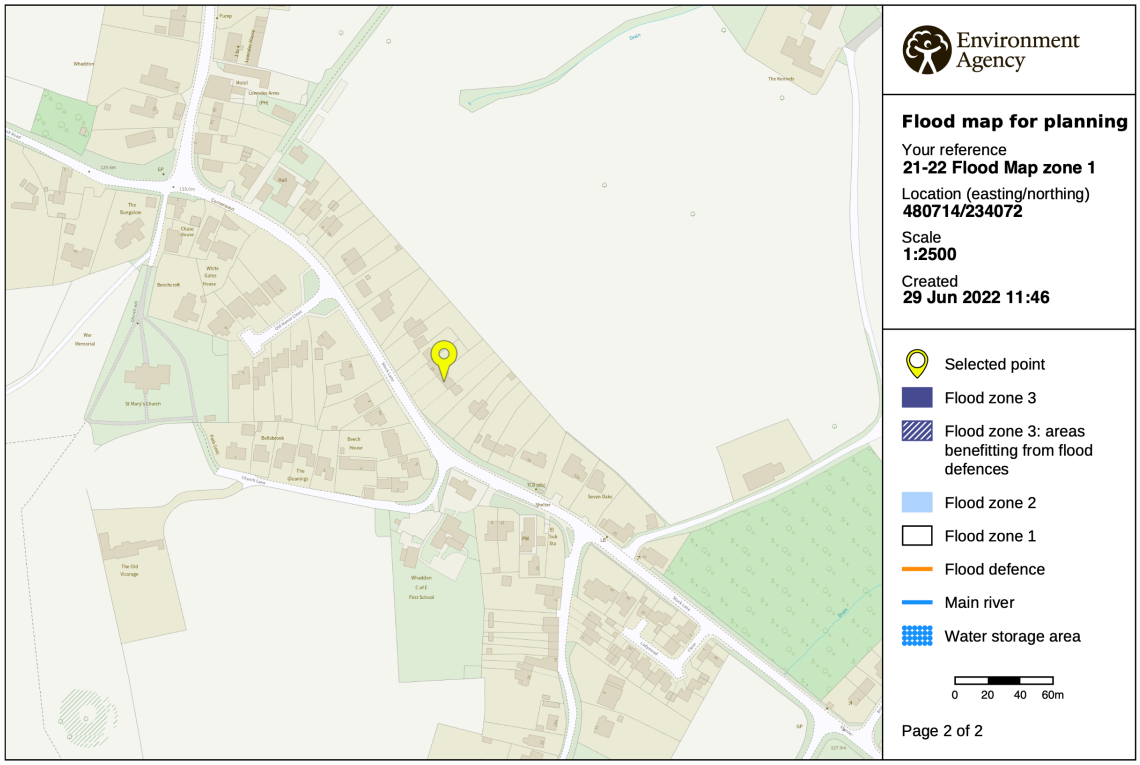


Fig 2: extract from Environment Agency flood map for planning (see appendix for details)

5. Geology: Boulder clay, with limestone flags and chalk refer to borehole data in appendix[1].

6. A topographical survey of the site has been commissioned by the applicant and included on the existing site plan.

7. Site area = 370 m2.

8. The proposed dwelling is a small detached 2 bedroom house with a nominal roof area of approximately 75 m2.

[1] http://scans.bgs.ac.uk/sobi_scans/boreholes/15951832/images/15509130.html

9. The existing driveway is gravel.

10. Large parts of the existing site are concrete hardstanding, which will be removed as part of the proposals and replaced with lawn and planted domestic landscaping.

STRATEGY

11. The surface water drainage strategy will reduce the impact on the existing mains storm water drainage system in three ways:
    A. Extensive green roof system (planted Sedum mat) to the flat roof gutter area to provide attenuation of storm water.
    B. Rainwater collection feature that feeds into a SUDs below ground crate attenuation system providing local infiltration subject to ground condition test.
    C. Porous natural self binding gravel hand-standing to the driveway

12. A. Extensive green roof system: 17.5 m2 area of sedum blanket is proposed providing 4-12mm water buffer, details available in appendix A. Options include:
    1. 20 mm substrate to provide water rendition: 17 l/m2
    2. 40 mm substrate to provide water rendition: 29 l/m2

13. B. Rainwater collection and SUDs below ground crate attenuation system
    1. The roof is designed so that rainwater run off is collected in a water feature located in the garden that in turn connects to a below ground SUDs attenuation system.
    2. An area along the new driveway has been identified on the proposed site plan for the below ground system.
    3. A outflow rate of 2 l/s can be achieved with 2.5 units as set out in the appendix B.
    4. Specification and system capacity will be subject to final calculations by a specialist.

14. C. Porous landscaping:
    1. Proposed gravel driveway area approx. 143 m2 to provide natural infiltration of rainwater.
    2. Garden, free draining soft landscaping area 60 m2

CONCLUSION

15. The proposals demonstrate an integrated sustainable drainage strategy.
16. There is a low probability of flooding for the site.
17. The proposed single detached dwelling will have minimal impact on the existing drainage system

APPENDIX:

1. Environment Agency flood-map-planning-2022-06-29T10_46_07.985Z
2. British Geological Survey borehole data - Stock Lane

A. Green roof system data.
B. Below ground attenuation site calculation.

Flood map for planning

Your reference	Location (easting/northing)	Created
21-22 Flood Map zone 1	**480714/234072**	**29 Jun 2022 11:46**

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following:**

- bigger that 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Environment Agency

Flood map for planning

Your reference
21-22 Flood Map zone 1

Location (easting/northing)
480714/234072

Scale
1:2500

Created
29 Jun 2022 11:46

- Selected point
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Water storage area

0 20 40 60m

LOCATION : Stock Lane, Whaddon

BOREHOLE No. Two

DATE OF BORING: 09.02.1989

Description of Strata	STRATA CHANGE			SAMPLES		SPT CPT N-VALUE	WATER LEVEL M
	LEGEND	DEPTH M	O.D. LEVEL M	DEPTH M	TYPE		
BOULDER CLAY Moist dark olive-grey, slightly sandy silty CLAY with abundant limestone flags.		1.00		1.00	Bulk		
- brown grey, with abundant chalk		2.00		2.00	Bulk		
- grey-brown		3.00		3.00	Bulk		
		4.00		4.00	Bulk		
		5.00		5.00	Bulk		
		6.00		6.00	Bulk		
		7.00		7.00	Bulk		
		8.00					
		9.00					
		10.00					Dry

BOREHOLE DIAMETER : 100mm

LINING TUBES :

GROUND LEVEL :

REMARKS : Borehole drilled from existing ground level

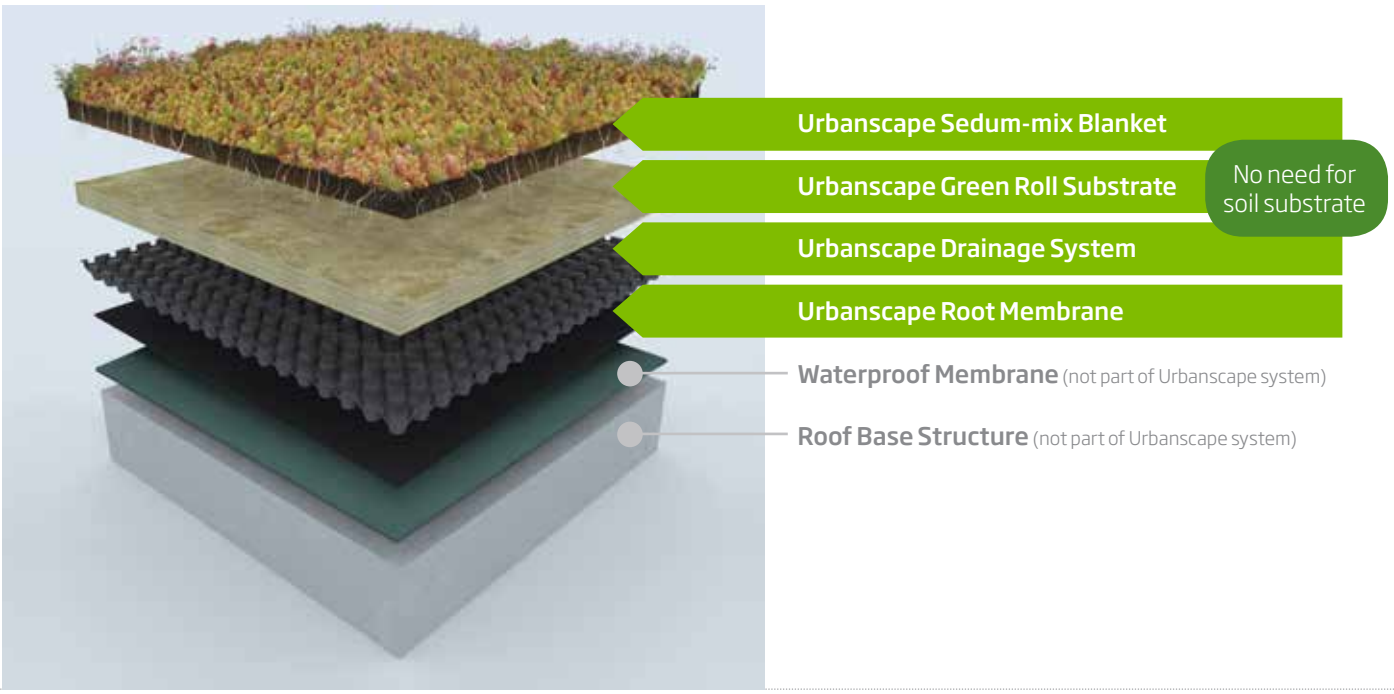
▽ - Water strike
▼ - Water (standing level)
W - Water Sample
B/J - Bulk/Jar Sample
S.P.T. - Standard Penetration Test
C.P.T. - Cone Penetration Test
(U) - Undisturbed Sample (38mm & 100mm)

Date.	BOREHOLE LOG	Report No.
February 1989		S.1148

Urbanscape Green Roof System

Urbanscape is an innovative, lightweight and easy to install system with high water retention capacity designed specifically for green roofs on residential, non-residential and industrial buildings in urban areas.

Urbanscape Green Roof is a complete system, which consists of a Root Membrane, Drainage System with buffer, Green Roll Substrate (made of Knauf Insulation's unique, patented and specially needled virgin Rock Mineral Wool) - and a Sedum-mix vegetation layer.

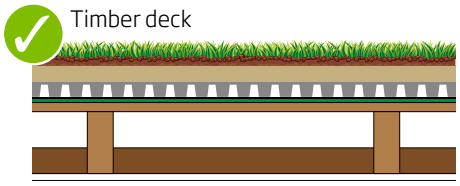


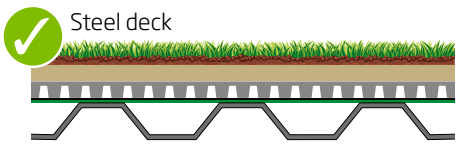
Types of roofs

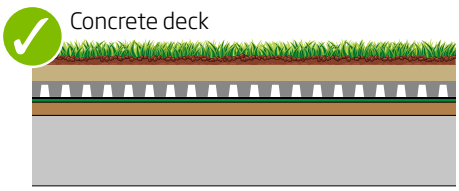
Urbanscape Green Roof System can be installed on any type of roof construction: on timber, steel, or concrete deck, inverted roof construction or any other type of material used on roofs. The green roof elements are the same in all cases, only the demands on the insulation and the position of waterproof membrane change.

Applications

Urbanscape is light enough to be installed in all these applications.







Urbanscape – Complete Solution

Urbanscape Sedum-mix Blanket

The biodegradable **Urbanscape Sedum-mix Blankets** comprise of eight to twelve different species of Sedum. The blankets boast at least 95% coverage upon delivery. Urbanscape vegetation blankets are produced in accordance with FLL guidelines. The sebaceous Sedum plants are adept at storing water in their leaves and are therefore extremely suitable for varying weather conditions.

Thickness	20-40 mm
Standard size	1 x 1.2 m
Max roll length	20-25 m
Weight dry	15 kg/m²
Weight saturated	23 kg/m²

Urbanscape Sedum-mix Blanket

Urbanscape Green Roll Substrate

Urbanscape Green Roll Substrate is a super lightweight green roof substrate made solely of virgin Rock Mineral Wool fibres specially needled to form a compact and dimensionally stable felt. Urbanscape Green Roll ensures excellent water retention and conservation in green roofs and is a good growing medium removing the need for traditional soil substrates. Urbanscape Green Roll Substrate is manufactured at a width of 1m, and with a thickness of either 20mm or 40mm.

Thickness	**20mm**
Water retention	17 l/m²
Weight	2.20 kg/m²

Thickness	**40mm**
Water retention	291/m²
Weight	4.40 kg/m²

Urbanscape Green Roll (HTC GR)

Urbanscape Drainage System with buffer /Drainmat Roll

The **Urbanscape Drainage System with buffer** is a double sided drainage and reservoir board made from high-impact recycled polystyrene with excellent load bearing capacity specifically designed for green roofs and is lighter and more compact when compared to regular drainage layers. The **Urbanscape Drainmat Roll** is a three dimensional, light and flexible composite matting made up of a draining core, providing a high drainage capacity covered on both sides with a non woven filter fabric.

	Drainage System with buffer	**Drainmat Roll**
Height	25mm	20mm
Width	1.1m	1m
Length	2.02m	35m
Water flow capacity	0.77 (10KPa; i=0.01)	0.12 (10KPa; i=0.01)
Rain water retention capacity	11.8 l/m²m²	-
Compressive strength	444 kN/m²m²	-

Urbanscape Drainage System with buffer /Drainmat Roll

Urbanscape Root Membrane

Urbanscape Root Membrane is made from black LD Polyethylene regenerate foil which is used to prevent the roots from penetrating the green roofs.

Average thickness	0.5 (+/-10%) mm
Width	4 (+/-2%) m
Length	25 (+/-3%) m
Size	2500 m²/pallet
Weight	0.5 kg/m²

Urbanscape Root Membrane

Wavin Stormwater Management

Project Details

Project Name	8 Stock Lane	**Produced By**	Robert Grindley
Client Name	Peter Hudec		
Site Address	8 Stock Lane, Whaddon, MK17 0LS	**Date**	04/07/2022

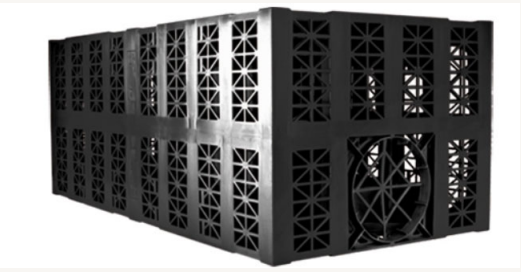
Modular Units and Tank Details - 21-22 A

Length	2.5m	2.5 units
Width	0.5m	1 units
Depth	0.4m	1 units
Total Number of Units		**2.5 units**

Void	95%
Cover Depth	0.9m
Installation Depth	1.3m

Recommended Unit

Wavin recommend using the following unit for your installation.



AquaCell Core R

Product Number: 6LB150
AquaCell Core R has been designed for use in deep applications, subject to both regular and heavy traffic loadings, such as cars and HGV's (for vehicles up to 44 tonnes).

Drainage Details

Area	75m^2
Catchment Type	Roof + Hardstanding
Area Reduction Factor	0.9
Soil Type	Medium dense sand and gravel

Allowable Discharge	2 ltr/sec
Climate Change	40%
Effective Area	94.5m^2
Factor of Safety	1

Rainfall Data

R Value	0.40
M5-60	20

Storm Return Period	1 in 30 years
County	Buckinghamshire

Time	Z1 Value	y mm	Z2 Value	p mm	Inflow	Outflow	Storage Volume
5min	0.38	7.6	1.44	10.94	1.03	0.6	0.43
10min	0.52	10.4	1.47	15.29	1.44	1.2	0.24
15min	0.63	12.6	1.47	18.52	1.75	1.8	-0.05
30min	0.8	16	1.51	24.16	2.28	3.6	-1.32
1hr	1	20	1.52	30.4	2.87	7.2	-4.33
2hr	1.19	23.8	1.52	36.18	3.42	14.4	-10.98
4hr	1.44	28.8	1.51	43.49	4.11	28.8	-24.69
6hr	1.59	31.8	1.49	47.38	4.48	43.2	-38.72
10hr	1.81	36.2	1.49	53.94	5.1	72	-66.9
24hr	2.35	47	1.45	68.15	6.44	172.8	-166.36
48hr	2.69	53.8	1.41	75.86	7.17	345.6	-338.43

Critical storm duration (hrs)	5min
Required Storage Height	0.43m
Volume from Dimensions	0.48m^3