



Hampshire
County Council

MEADOWLANDS INFANT SCHOOL RE-DEVELOPMENT

FLOOD RISK ASSESSMENT

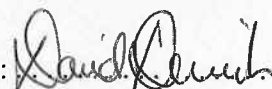
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Job No: R.J502728



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1 Introduction

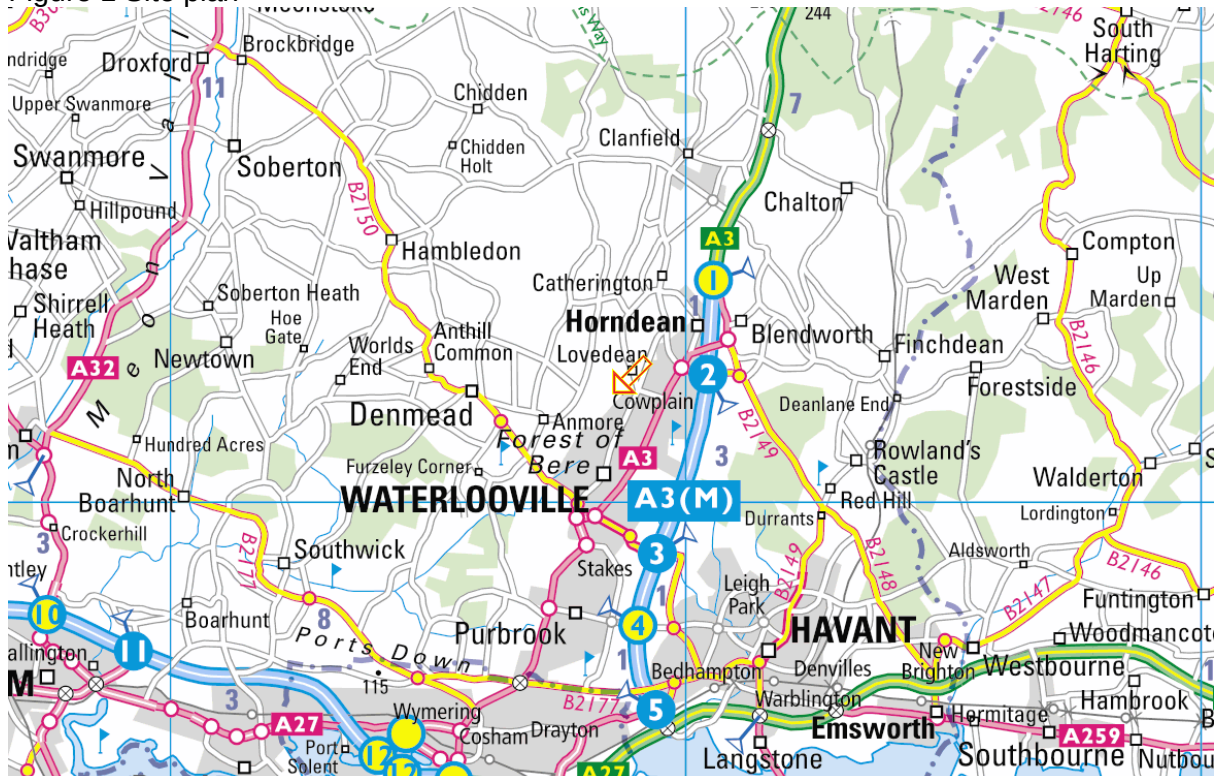
The Meadowlands site comprises an Infant School plot (recently demolished), a Primary School and associated playing fields. Figure 3, overleaf, shows the aerial photograph of the site. The building on the left is the now demolished Infant School and the red-line shows the land within the site as a whole that is being proposed for development.

The area previously occupied by the infant school is to be partly re-developed for housing and partly retained by the Primary School to be used as a playground area.

The area within the red-line in Figure 3 is to be developed for the construction of approximately 43 new housing units. The proposed development area is more than 1.4 hectare in area and hence requires an FRA to be prepared.

The site location is shown in Figure 1, below. The address is 35-37, Woodcroft Lane, Waterlooville, Hampshire, PO8 9QD.

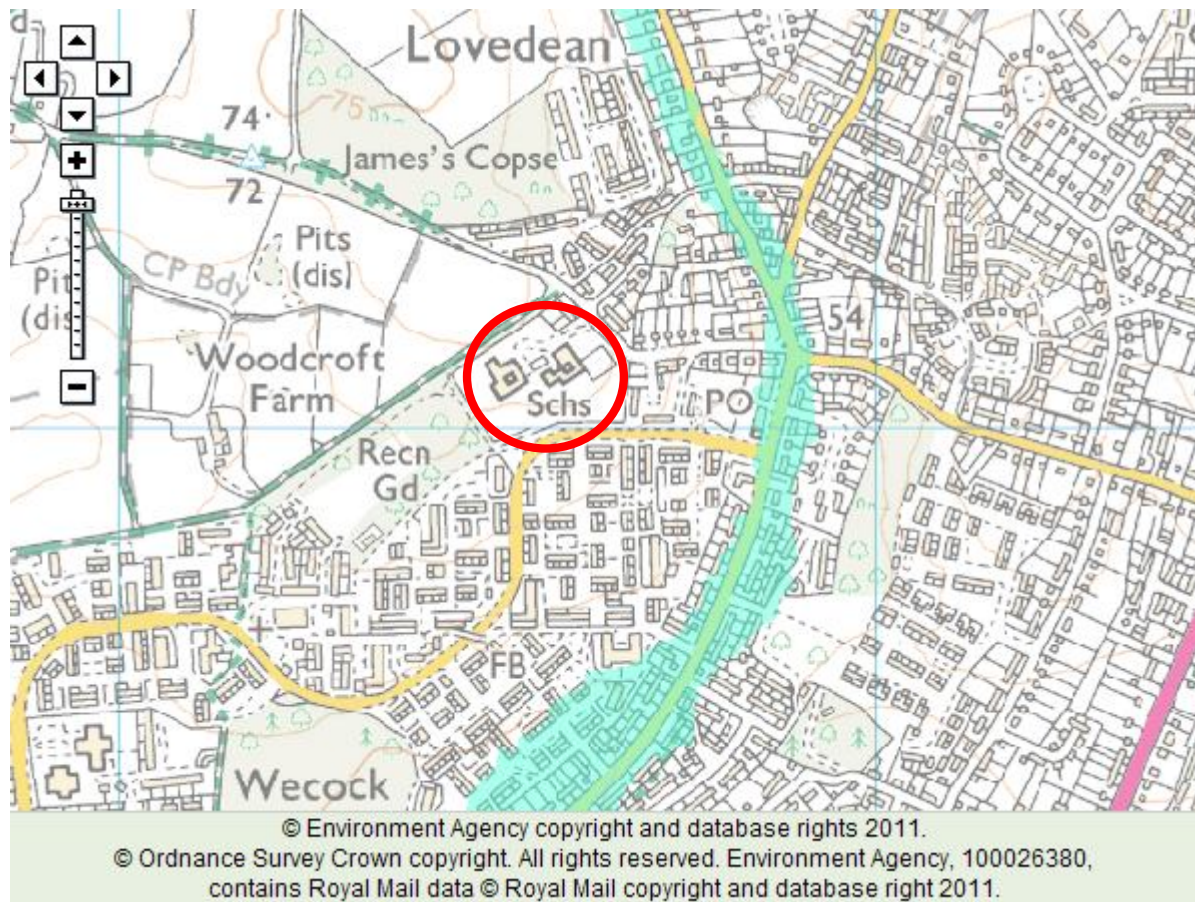
Figure 1 Site plan



Environment Agency maps indicate that the site is located in Flood Zone 1 where the lowest annual probability of flooding occurs, that being of less than 1 in 1000 for any given year.

The Environment Agency Flood Zone Map (Figure 2) illustrates that there are areas within Waterlooville, which are within Flood Zone 3 but that the site does not fall within them and also would not become an isolated island as the result of an extreme event and there would be safe access and egress from the site to the B2150 via Eagle Avenue during the event.

Figure 2: Environment Agency Flood Zone Map with the Meadowlands Schools site highlighted.



Although the site is located within Flood Zone 1, as it is over 1 hectare in area, according to paragraph 103 and footnote 20 of the National Planning Policy Framework a Flood Risk Assessment is required to support the planning application.

2 Objectives

The main objectives of this report are to:

- Identify potential sources of flooding;
- Identify the probability of flooding;
- Provide justification for the development of the site in terms of the Sequential Test;
- Provide a conceptual surface water drainage strategy for the site.

3 Existing land use

The development site currently comprises the infant school and the associated playground areas including green fields. The total hardstanding area is 0.363 ha, the total Greenfield area is 1.114 ha.

Figure 3 Aerial Photo



The site slopes from west to south-east. The site investigation undertaken in October 2008 by WYG indicates that the site lies in an area of Reading Formation and Head Deposit and comprises sandy and stiff clay.

Ground water was not encountered during the site investigation. Trial pits were excavated to a maximum depth of 4.0m.

4 Existing watercourses

There is no main river in the vicinity of the site. The nearest ordinary watercourses are the easterly tributaries of the River Wallington that flow through the conurbation of Cowplain, Waterlooville and Purbrook. The nearest water feature in the vicinity of the site is a land drain running approximately 850m to the south-west of the site. This land drain connects to the network of tributaries of the River Wallington.

The site is located outside of the area affected by tidal flooding, so the potential for flooding by the sea is negligible.

There are no reservoirs or other artificial water sources nearby to contribute a flood risk.

5 Historic Flooding

The Development site is located outside of the River Wallington flood plain and there is no history of the site flooding.

A SFRA (Strategic Flood Risk Assessment) was undertaken by Atkins in December 2007 on behalf of the Partnership for Urban South Hampshire (PUSH), which comprises Hampshire County Council and the Local Planning Authorities.

Section 4 of the SFRA addresses the mapping outputs from the SFRA study and looks at the flood zones, the potential sources of flooding, areas benefiting from flood defences and the effects of the climate change.

In the SFRA for PUSH district map 1F-4 shows the site as being located within the area of high potential of overland flooding. This is due to the site being located in an urban area. There is a good network of surface water sewers in the catchment area. Careful design of finished levels in the vicinity of access point and buildings will ensure that overland flooding will be routed away from sensitive areas. The probability of flooding from overland flow is assessed therefore as low.

The "South East Hampshire Catchment Management Plan" has recorded one flooding incident in Waterlooville in 2000/2001 from surface water and drainage source. This flooding incident has affected only one property in the Waterlooville and it was not in vicinity of the development site.

6 Flooding from other sources

The sources of flooding within the River Wallington catchment relate to underlying geology and urban development. Changes in the type of flooding in recent times have possibly been most affected by increasing urban development.

"South East Hampshire Catchment Flood Management Plan" prepared by the Environment Agency in 2007 states the flooding of Wallington River is mostly caused by surface water system overwhelmed by surface water runoff, made worse by poor maintenance.

The SFRA for PUSH district map 1F-5 shows the historic incidents of surface water flooding caused solely by the incapacity of the drainage infrastructure, termed 'hydraulic overload' by Southern Water and there are no recorded historic incidents of surface water flooding at the site address.

The SFRA provides information regarding the potential risk of groundwater flooding in the PUSH region, by analysing the special variation of permeability across the district. The development site is located outside of the area with the potential of ground water flooding. There is no recorded ground water flooding incidents on the site.

7 Proposed development

The new development area will be approximately 1.4 hectares of which 0.662ha will be impermeable area comprising house roofs, highways and driveways. The proposed finished floor level of the new buildings has to be yet established, this will be done during the detailed design. The proposed development layout can be found in Appendix A.

8 Sequential assessment

The Environment Agency Flood Zone Map indicates that the proposed site is within Flood Zone 1. In accordance with the terms of Technical Guidance to the National Planning Policy Framework (March 2012), the proposed development passes the Sequential Test and is appropriate for development.

9 Surface water drainage strategy

The proposed drainage strategy for the site has considered the results obtained from the site investigation and is based on the worst case ground condition being clay. The geology of the site will preclude natural infiltration to the ground. Therefore the use of soakaways is not a viable option for dealing with storm water drainage on Meadowlands development site.

The objectives of the drainage strategy are:

- Attenuate runoff from the proposed development to the existing 1 in 30 year flow. Southern Water have been approached with regards to the capacity in their pipework and the final response is still awaited;
- Manage surface water runoff from the site so that it does not increase third party's flood risk;
- Proposed design levels on site to ensure that during severe storm events flooding from the failure in the overland flooding will be rerouted away from the buildings and access point.
- Attenuate surface water flows for the 100 year return period flows plus 30% (allowance for climate change) in below ground attenuation and SUDS features such as permeable paving;
- Determine an appropriate means of discharging surface water from the site

Historically both schools discharge surface water to the 225mm diameter public sewer in Woodcroft Lane via the private school sewer network. The school has an un-attenuated point of connection to this sewer.

The total impermeable area of the infant school, now demolished, including roofs and all external hard standing areas was 3631m².

Total runoff from the site has been calculated for the 1 in 30 year rainfall as 50.8l/s.

The housing proposal is still at a preliminary stage but the latest general arrangement plan shows an increase in impermeable area, over and above the 3631m² of the demolished school, of 2985m². The total impermeable area of a new residential development will therefore be 6616m², of which 2910m² will be a highway, 2954m² will be house roofs and 1112m² will be driveways. It is proposed to build the driveways with permeable paving.

The drainage will be designed to ensure that there is no increase in surface water runoff by using attenuation within the site boundary prior to discharge off-site at a controlled rate. Southern Water have been approached to undertake a Level 2 capacity study of their sewer network in vicinity of the site to confirm that there is sufficient capacity to accept the flows from the site.

We have calculated, using WinDes by Microdrainage, the approximate attenuation storage volume required to accommodate 1 in 100 year storm plus 30% allowance for climate change. We have assumed a discharge equal to the existing school discharge rate of 50.8l/s and this produces a required storage volume of 247m³. The calculation for this volume is shown in Appendix B.

The actual form the storage will be refined through detailed design but could be one of many different features or a mixture of features.

The majority of this runoff could be store in permeable parking areas. The total area of the car parking on site is 1112m². Allowing a sub-base depth of 400mm and a porosity of 30%, 133m³ of storage could be provided in this way and easily increased by increasing the sub-base thickness. Additional storage could be provided within underground attenuation features such as tanks or oversized pipes.

In the event of exceedance of the system, surface water will shed to the grass landscaped areas and to the adjacent road where it will be stored and attenuated by the highway drainage and will not pose any risk to the site occupants or to adjacent properties.

The drainage strategy for the Meadowlands development site is shown in Appendix C and is a subject to detailed design.

The maintenance of the drainage will be incorporated within the general site management plan.

10 Conclusions

The proposed housing development site at Meadowlands school, Waterloooville is to comprise 43 dwellings.

Historical flooding from the Wallington River tributaries has not affected the Meadowlands site. The flooding in 2000/1 did affect the Waterloooville area but did not affect the development site.

No flooding from sewers or other sources has been recorded on the Meadowlands site.

The SFRA for PUSH area has identified the site as being located within the area of overland flooding. This is due to the site being located in an urban area.

Proposed design levels on site to ensure that during severe storm events flooding from the failure in the overland flooding will be rerouted away from the buildings and access point.

The site is located in Flood Zone 1 where the annual probability of flooding is less than 1 in 1000 for any given year. Safe access and egress to the site can be provided by the B2150 even during the 1 in 100 year plus 30% climate change storm event.

Surface water runoff will be managed on site using a mixture of SUDS and attenuation features. Permeable paving will be used in driveway areas whilst roof water and the remaining runoff from the development site will be attenuated within attenuation features such as tanks or oversized pipes.

An existing discharge rate for the demolished school has been calculated at 50.8l/s for the 1 in 30 year storm. This discharge rate currently goes to the public sewer and we intend to restrict the run-off from the development site to the same rate. The design is at the preliminary stage and detailed design of this proposal will require to be submitted to Water Authority.

The soil investigation confirmed that there is very limited potential for the site to drain to ground. There is also no watercourse in the area and so an attenuated discharge to surface water sewer will be required to drain the site.

Appendix A – Proposed Development Layout

Land south of Woodcroft Primary
School Block Plan

- LEGEND
- Application site boundary
 - Adjacent land in applicant's ownership
 - Existing development
 - Grass/landscaping
 - Existing/retained trees
 - Proposed landscaping
 - Trees to be removed
 - Sloping land
 - Proposed housing
 - Adoptable roads
 - Adoptable footways
 - Private/shared surface
 - Bin stores
 - Access point to proposed dwellings
 - Indicative location of future pedestrian cycle link to be provided by Woodcroft Farm
 - Indicative alignment of future access road to Woodcroft Farm
- Proposed access
 - Replacement lay-by from Woodcroft Lane
 - Secure boundary to Woodcroft School
 - Removable bollards control entrance to emergency access
 - Emergency access
 - Staggered cycle access barriers for safety. Removable for emergency vehicles.
 - Secure gated access to school
 - Central green space (0.08ha)
 - Bin collection points
 - Ground floor balconies overlook adjacent open space
 - Short-stay cycle parking loops for 26-31
 - Existing footpath link to school retained in advance of Woodcroft Farm access road
- P = Private dwelling
A = Affordable dwelling
S = Storey height
b = Number of bedrooms

0m 30m

Drawing No: Y00422-mb-03
Rev. C Date: 27/06/2012
Scale: 1:500 @ A1

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Key Dimensions*

Unit No.	Depth	Width	Height	GIA (sqm)
1	9m	6m	8m	91 sqm
2	9m	6m	8m	91 sqm
3	5.8m	8.9m	8m	91 sqm
4	8.6m	9.4m	8.1m	92 sqm
5	8.6m	9.4m	8.1m	92 sqm
6	6m	9m	8m	91 sqm
7	6m	9m	8m	91 sqm
8	6.1m	9m	8m	92 sqm
9	7.4m	9m	8m	116 sqm
10	7.4m	9m	8m	116 sqm
11	9.5m	5.3m	8m	85 sqm
12	9.5m	5.3m	8m	85 sqm
13	6m	9m	8.3m	91 sqm
14	10.7m	8m	8.3m	138 sqm
15	10.7m	8m	8.3m	138 sqm
16	10.7m	8m	8.3m	138 sqm
17	10.7m	8m	8.3m	138 sqm
18	6m	9m	8m	91 sqm
19	4.4m	9m	8m	64 sqm
20	4.4m	9m	8m	64 sqm
21	4.4m	9m	8m	64 sqm
22	4.4m	9m	8m	64 sqm
23	4.8m	9.3m	9.4m	95 sqm
24	5.6m	9m	9.4m	99 sqm
25	5.6m	9m	9.4m	99 sqm
26				51 sqm
27				51 sqm
28				51 sqm
29	17m	10.5	11.5m	68 sqm
30				68 sqm
31				68 sqm
32	4.7m	9.5m	8m	75 sqm
33	4.4m	9m	8m	64 sqm
34	4.4m	9m	8m	64 sqm
35	4.4m	9m	8m	64 sqm
36	4.4m	9m	8m	64 sqm
37	4.4m	9m	8m	64 sqm
38	5.3m	8.2m	9.4m	98 sqm
39	6m	9m	9.4m	99 sqm
40	5.6m	9m	9.4m	99 sqm
41	5.6m	9m	9.4m	99 sqm
42	5.6m	9m	9.4m	99 sqm
43	5.6m	9m	9.4m	99 sqm
2 space cycle store	2.2m	1.2m	1.4m	
Bin Store 26-31	2.6m	3.5m	2m	
Bin store 9-12	0.88m	1.14m	1.2m	
Bin store 8, 40-43	1.68m	1.14m	1.2m	
Car port	5m	2.5m	3.8m	

*All dimensions for the maximum and minimum sizes of the dwellings. Landscape features are indicative for outline planning application purposes. Final details will be dealt with at reserved matters or a subsequent full planning application.



Appendix B – Surface Water Attenuation Calculation



Calculation Sheet

Project Name: MEADOWLANDS SCHOOLS Project Ref: RJ502728

Calc Details: SURFACE WATER DRAINAGE

Prepared by: WDN

Date: 18/05/2011 Sheet: 1 of 1

Total area of impermeable (from ACad) = 3631 m^2
based on topo survey E793/2007/2000

Total proposed area of impermeable (from ACad) = 6616 m^2
based on latest Masterplan dated Jan 2011

This comprises:

- Highways = 2910 m^2
- House roofs = 2594 m^2
- Driveways = 1112 m^2

Quick Storage estimate identifies approximate storage requirements of between 141 m^3 and 247 m^3 .

Existing discharge rate = 50.8 l/s (subject to Southern Water approval)

Return period: 1 in 100 + 30% allowance for climate change

Total car park area = 1112 m^2

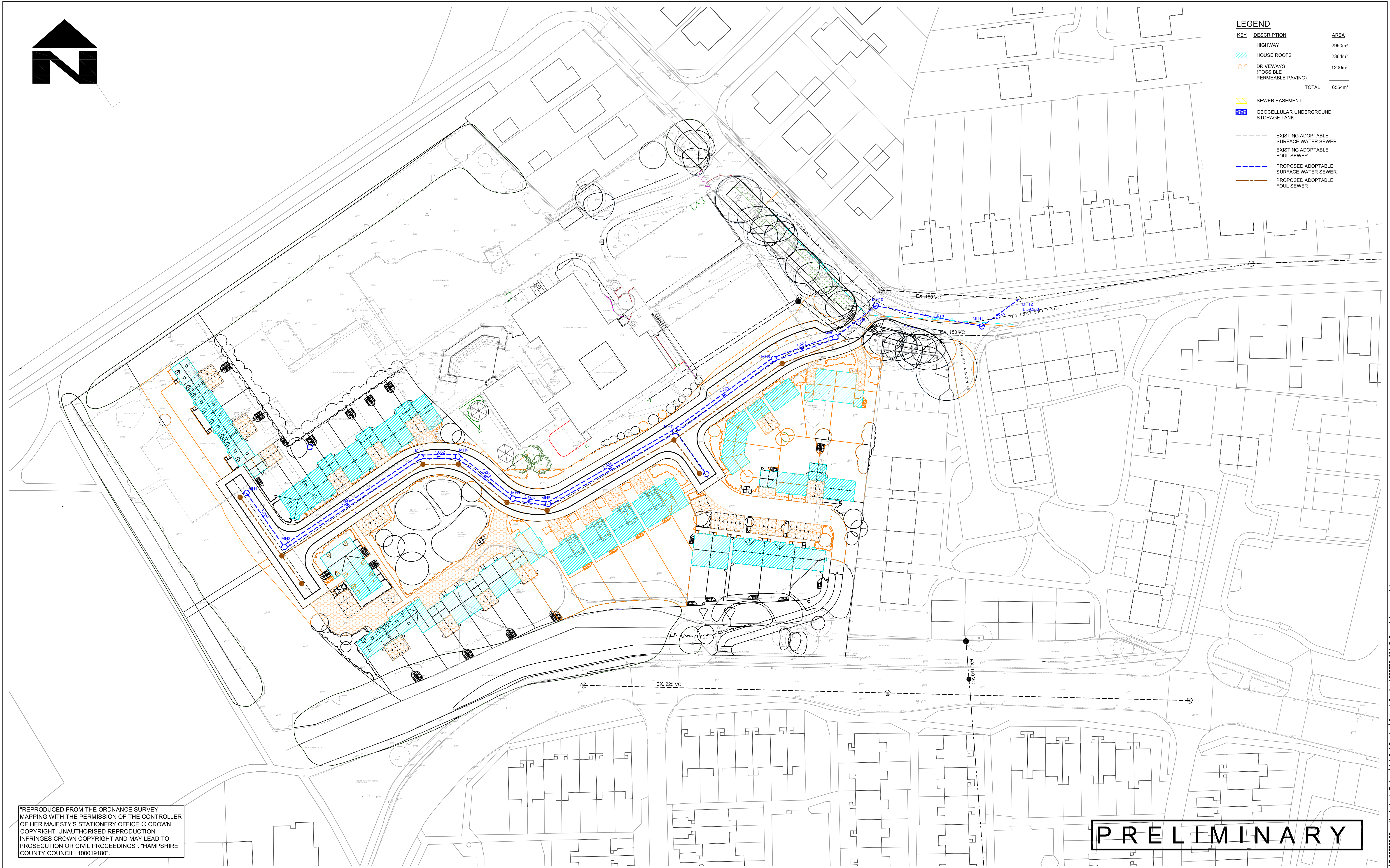
Porosity = 0.3

Total sub-base depth = 0.4m

$$V = 1112 \times 0.3 \times 0.4 = 133 \text{ m}^3 \quad (\text{to be attenuated within the porous sub-base with the positive overflow to the SW sewer})$$

The remaining runoff from the site will be stored within the underground attenuation feature such as attenuation tank or oversized pipes. Total volume of storage = 114 m^3

Appendix C – Preliminary Drainage Strategy Layout R.J502728/001



PRELIMINARY

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