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Surface Water Assessment Report

on

Proposed Development

at
18 &19 Dianmer Close
Hook
Wootton Bassett

ADDITIONAL

Client:

Dr Habib Aslam
19 Dianmer Close
Hook
Wootton Bassett
SN4 8EA

Consultant:

DG Engineering Consultancy Limited
The Laurels, Lower Road
Woolavington
Bridgwater
Somerset
TA7 8EF

Tel: 01278 685568

Date: March 2010

Surface Water Assessment

Consultant's Report

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Appendix

Drawing No 09 1026 05C – Prepared by JT Plan & Design

1. Introduction

1.1 This Surface Water Report has been commissioned to determine the storage capacity required on site to ensure that surface water run-off from the site will not be greater than "Greenfield" run-off in the event of a 1 in 100 year storm event.

1.2 The proposal for which Planning Permission has been sought comprises the demolition of existing stables and concrete apron together with an outbuilding and the erection of three detached dwellings to the rear of 18 & 19 Dianmer Close, Hook, Wootton Bassett.

1.3 This Report addresses the proposed surface water run-off system, storage, recycling of water and final discharge to the highway drain through an existing 100mm diameter pipe on the southern boundary.

2. Site Description

2.1 The site at the rear of 18 and 19 Dianmer Close comprises existing stables and concrete apron in predominantly garden area. It slopes gently from the northwest corner at 51.80 m (Assumed datum level of 50.00 at Base Station D1 on Topographical Plan) to 49.75m at the access onto Dianmer Close.

2.2 An open ditch is located along the western boundary falling from north to south. The base level of the ditch at the south west corner, adjacent to the Verge in Dianmer Close is 49.21m.

2.3 The existing stables are to be demolished and a Planning Application has been submitted for the erection of three new dwellings.

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3. Surface Water Run-off Calculations

3.1 The site has not been known to flood nor has drainage from the property caused any known problems on site or off site.

3.2 The total site area, not including the two existing properties 18 and 19 Dianmer Close, is 1,620 m^2.

3.3 The roof area of the stables, outbuilding and concrete apron is an impermeable area of 130 m^2. The whereabouts of an existing soakaway for surface water is unknown. However, it is unlikely that the surface water enters any designated system and it is assumed that roof and apron run-off is allowed to disperse into the ground naturally.

3.4 The roof area of the proposed dwellings is 355.8 m^2. The proposed driveways are to be permeable Paving Blocks.

3.5 According to the Soil Survey of England and Wales 1983/84, the geology of Hook is "Jurassic and Cretaceous Clay" and the soil characteristics are "Slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils. Some fine loamy over clayey soils with only slight seasonal waterlogging and some slowly permeable calcareous clayey soils.

3.6 Soakaways are unlikely to work effectively in this type of soil although a slow percolation can be expected. It is therefore suggested that storage is provided on site to accommodate the 1 in 100 year storm event with the additional 30% allowance for climate change all in accordance with Planning Policy Statement 25 (PPS25).

3.7 The volume of storage required has been calculated in the tables below, using the FEH CD ROM for rainfall intensities and soil type.

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CALCULATION SHEET

Client:	Dr Habib Aslam	Job No.:	
Project:	18-19 Dianmer Close, Hook, Wootton Bassett	Page No.:	1
Title:	Estimation of 'Greenfield' Runoff and Storage Volumes for Attenuation	Date:	12/03/2010

Methodology

Estimation of 'Greenfield' runoff using Institute of Hydrology Report 124 'Flood Estimation for Small Catchments'

For catchments of less than 50ha the 'greenfield' runoff rate is scaled according to the size of the catchment in relation to a 50ha site. This is achieved by estimating the runoff rate for a 50ha site, using the catchment descriptors - rainfall (SAAR) and soil type (SPRHOST) taken from the FEH CD ROM to derive QBAR[50ha].

$$QBAR(50) = 0.00108 \times AREA^{0.89} \times SAAR^{1.17} \times SOIL^{2.17}$$

Where SAAR = Standard Annual Average Rainfall and SOIL = SPRHOST / 100

The QBAR[50ha] value is then scaled on the ratio of the development site area to the 50ha 'control', to derive the estimated peak 'greenfield' runoff for the undeveloped site (QBAR[site]) for the Mean Annual Flood.

Thus: QBAR[site] = QBAR(50ha) x ratio (development site area / 50ha)

Site National Grid Reference:

Receiving Watercourse:

Site Description: Construction of 3 No. Dwellings to replace existing stables and outbuildings in rear garden

Total Site Area	1620	m^2	
Existing impermeable area	130	m^2	
Proposed Roof Area	355.8	m^2	
Parking area / hardstandings	500	m^2	Permeable Block Paving
Effective area of Parking		m^2	
Total development area	355.8	m^2	
% Impermeability	0.22		22.0 %

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Input Data

Site area (ha)	0.162
'Control' area (ha)	50
Area ratio	0.00324
SAAR (mm) - FEH CD	721
SPRHOST - FEH CD	33
Impermeable Area (ha)	0.036

Output

'Greenfield' Peak Discharge	m3/sec	l/sec
QBAR[50ha] (IH124)	0.1160	116.0
QBAR[site]	0.0004	0.376
1year in 100 Allowable Discharge	0.0009	0.910
Actual controlled discharge in 100mm dia. Overflow		1.000

Estimated Storage	Duration	FEH Rainfall	Climate Change	Storage
1-year in 100 return period	hrs	mm	30%	(m^3)
	0.0	0.0	0.0	0.0
	0.5	36.6	47.6	15.1
	1.0	43.4	56.4	16.5
	1.5	48.0	62.4	16.8
	2.0	51.5	67.0	16.6
	2.5	54.3	70.6	16.1
	3.0	56.8	73.8	15.5
	3.5	59.0	76.7	14.7
	4.0	61.0	79.3	13.8
1-year in 30 return period	0.0	0.0	0.0	0.0
	0.5	25.4	33.0	9.9
	1.0	30.8	40.0	10.6
	1.5	34.4	44.7	10.5
	2.0	37.3	48.5	10.1
	2.5	39.6	51.5	9.3
	3.0	41.7	54.2	8.5
	3.5	43.5	56.6	7.5
	4.0	45.1	58.6	6.5

Graphical Output

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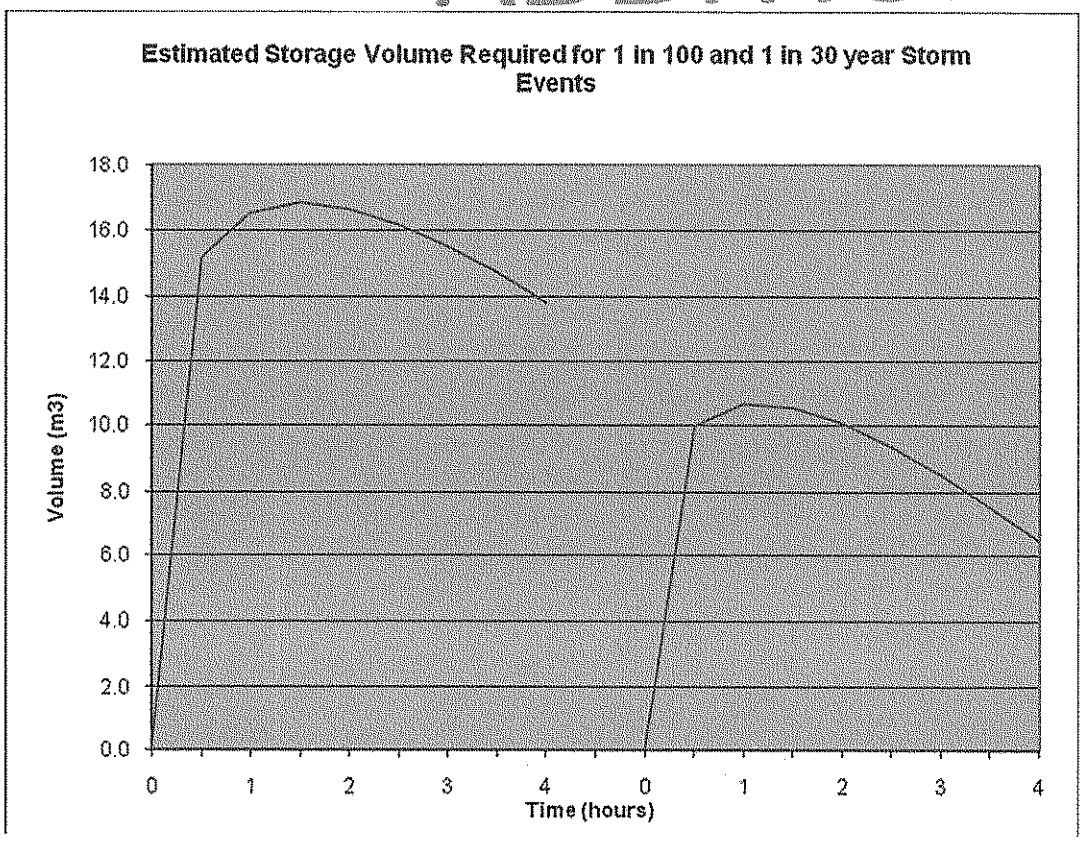

4. Proposals

4.1 The natural run-off from the development site is into the local adjacent ditch on the western boundary, or natural percolation into the ground.

4.2 A bund is proposed along the northern boundary of the site to prevent ingress of surface water onto the site from adjacent land. Any such run-off would be directed into the ditch in item 4.1

4.3 The roof water run-off will be collected and conveyed in a new surface water sewer to a dedicated storage tank.

4.4 The storage of water on site from the above calculations is 16.8m^3 to accommodate a 1 in 100 year storm and 10.6m^3 for a 1 in 30 year storm assuming the rate of run-off from the site is limited to Greenfield run-off i.e. 1.0 l/s.

4.5 It is proposed to provide storage capacity of 17m^3 beneath the new driveway with a 100mm diameter discharge pipe to limit the outflow to Greenfield run-off of 1.0 l/s. This pipe will connect into the existing100mm diameter surface water sewer pipe in the front garden and serving No. 19 Dianmer Close which is already connected to the highway drain.

4.6 All driveways and parking areas shall be constructed using porous paving techniques. Either porous paving blocks or solid paving blocks with gaps between the individual units, on a permeable sub-base. This construction allows surface water to penetrate into the sub-base and disperse naturally over a period of time dependant on the porosity of the soil. All in accordance with Sustainable Urban Drainage Systems design manual. (SUDS)

5. Conclusions

5.1 The site for the proposed demolition of stables and outbuildings and the erection of three new dwellings and garages is being undertaken with due consideration to the management of surface water run-off and the overall reduction in surface water emanating from the site.

5.2 The site is 1,620 m^2 of which 355.8 m^2 will be impermeable.

5.3 The calculated run-off from this area in a 100 year storm is 43.4 mm/m^2/hr plus 30% for climate change. This equates to a storage volume of 16.8 m^3 or 16,800 litres when discharge is limited to Greenfield run-off.

5.4 Surface water from roof run-off shall be directed to a dedicated storage tank of capacity 17m^3, which is in excess of the calculated storage volume of 16.8 m^3 of surface run-off water.

5.5 The discharge from the storage tank will be connected into the existing 100mm diameter surface water pipe that discharges into the highway drain at the front of 18 & 19 Dianmer Close. There shall be no change to this 100mm connection, therefore, there will be no increase in maximum rate of discharge.

5.5.1 All driveways and parking areas shall be constructed using porous paving techniques, whereby run-off is stored within the construction layer for natural percolation into the ground. All in accordance with SUDS.

5.6 The above proposals avoid, reduce and delay the discharge of rainfall to the local watercourse, thus reducing the risk of local flooding, pollution and other environmental damage both on-site and off-site. The provision of 17m^3 of storage capacity on site is considered adequate for the 1 in 100 year event including for climate change as required in PPS25.

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6. References

6.1 The following References have been consulted in the preparation of this Assessment:

i. Department of Transport, Local Government and the Regions - Planning Policy Statement 25 'Development and Flood Risk'

ii. Environment Agency - National Standing Advice to Local Planning Authorities for Planning Applications - Development and Flood Risk - User Guidance Note

iii. Environment Agency - Guidance Relating to Planning Policy Statement 25

iv. CIRIA Report C624 'Development and flood risk - guidance for the construction industry'

v. Environment Agency Flood Map www.environment-agency.gov.uk/subjects/flood

vi. CIRIA C522 - Sustainable Urban Drainage Systems – Design Manual

vii. 1:10,000 and 1:2500 Scale Ordnance Survey Maps

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Date: 31 March 2010

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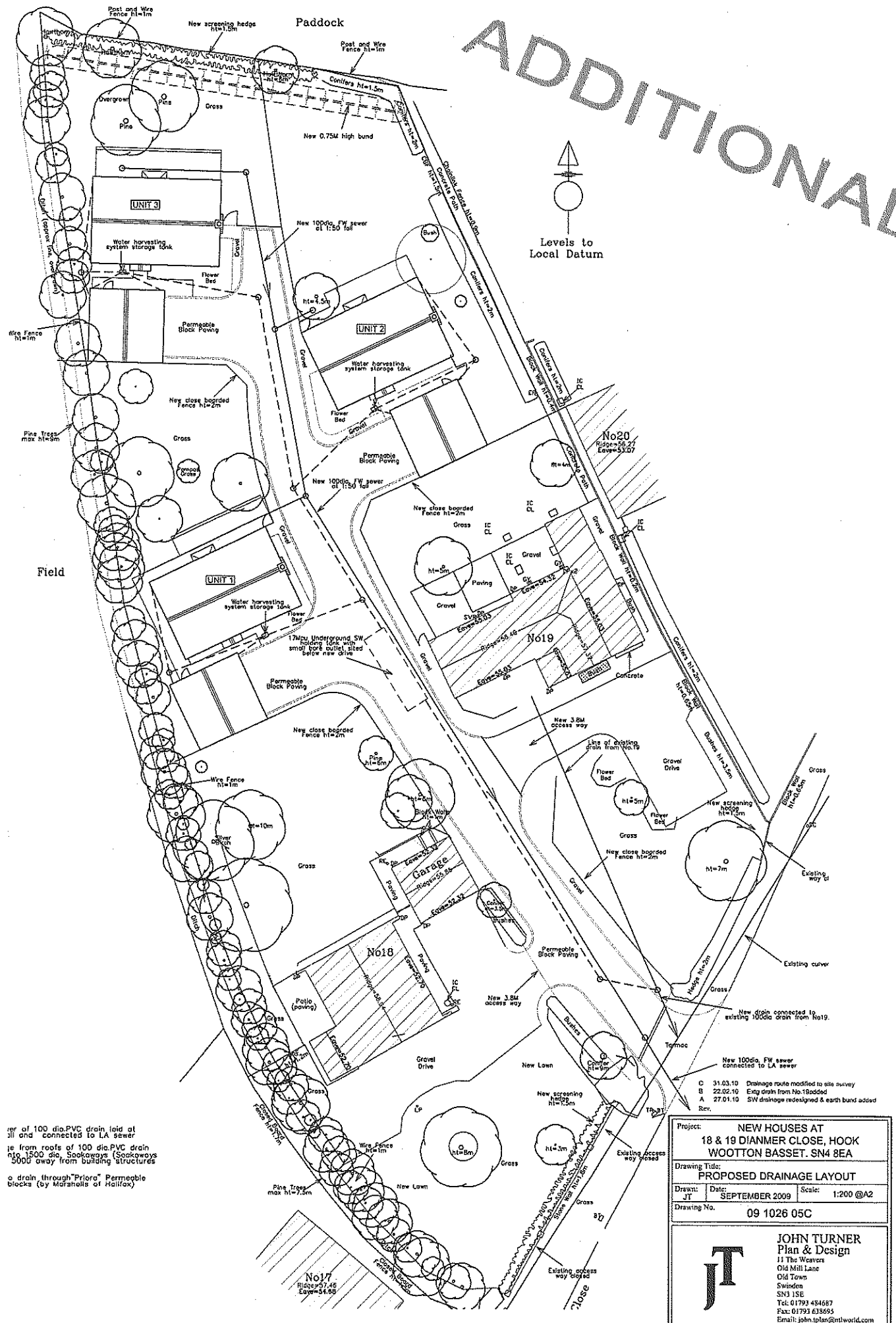

er of 100 dia.PVC drain laid at
ll and connected to LA sewer

e from roofs of 100 dia.PVC drain
nto 1500 dia. Soakaways (Soakaways
5000 away from building structures

o drain through"Priora" Permeable
blocks (by Marshalls of Halifax)

Rev.		
C	31.03.10	Drainage route modified to site survey
B	22.02.10	Extg drain from No.19added
A	27.01.10	SW drainage redesigned & earth bund added

Project: NEW HOUSES AT 18 & 19 DIANMER CLOSE, HOOK WOOTTON BASSET. SN4 8EA		
Drawing Title: PROPOSED DRAINAGE LAYOUT		
Drawn: JT	Date: SEPTEMBER 2009	Scale: 1:200 @A2
Drawing No. 09 1026 05C		

JOHN TURNER
Plan & Design
11 The Weavers
Old Mill Lane
Old Town
Swindon
SN3 1SE
Tel: 01793 484687
Fax: 01793 618695
Email: john.tplan@ntlworld.com