



**The Former Wessex Site, 8 New Lane, Havant
PO9 2JH**

Surface Water Drainage Strategy

December 2017

1.0 Introduction

- 1.1 A planning application has been submitted to Havant Borough Council for planning permission to construct 39 one and two bedroom apartments with associated car parking, cycle and refuse storage at the former Wessex Site, 8 New Lane, Havant PO9 2JH. The proposed site layout is shown on HDL drawing no. 16-2730-500 P3 attached to this report.
- 1.2 The existing site layout comprises buildings surrounded by concrete hard standing as shown by HDL drawing no. 16-2730-900 P1. The surface of the site is currently 100% impermeable with a site area of 3224 m²
- 1.3 The proposed site layout shown on HDL drawing no. 16-2730-500 P3 comprises 3 storey residential units fronting onto New Lane and Eastern Road with gardens and car parking areas to the rear. The total proposed impermeable area is 2464 m² which is less than the impermeable area of the site prior to development.
- 1.4 The Phase 2 Ground Investigation Works undertaken by Soils Limited, report reference 15295/GIR dated January 2016, identifies contamination within the existing ground with the potential for contamination of groundwater.
- 1.5 The site is located above an aquifer used for water extraction.

2.0 Surface Water Drainage Strategy

- 2.1 In accordance with the recommendations in the NPPF the design of new developments will adopt measures to reduce the impact of surface water runoff through the use of sustainable drainage techniques.
- 2.2 The EA generally require the assessment of the use of sustainable drainage systems using the following hierarchy of techniques:-
 - Surface water drainage attenuated through the use of infiltration methods such as soakaways unless ground conditions are proven to be inappropriate due to insufficient porosity or if gross contamination is present.
 - Surface water drainage attenuated through the use of above ground sustainable drainage techniques such as swales, attenuation ponds, green detention areas and or permeable paving.
 - If the above cannot contain the full attenuation of the volumes required then consideration will be given to their use in a combined system with other attenuation techniques.

- 2.3 The local planning authority, after consultation with Hampshire County Council, the Environment Agency as well as Portsmouth Water have indicated that surface water run off from the development site will not be permitted to percolate into the ground via soakaways due to the presence of an aquifer below the site used for water extraction.
- 2.4 There are no watercourses within the site and thus the drainage strategy adopted for the discharge of surface water is to the Southern Water Public Surface Water network within New Lane. The scheme allows for attenuation of surface water flows to ensure that surface water run off rates do not exceed greenfield surface water run off rates even though the area of impermeable surfaces has been reduced as a result of the development.
- 2.5 The proposed surface water drainage layout is shown on HDL drawing no. 16-2730-500 P3 attached to this report. Rainwater downpipes connect to the impermeable tanked permeable paving system located below the rear car parking area. Run off from the vehicular hard standing discharges directly to the impermeable tanked permeable paving system and outfalls to the public sewer in New Lane via a catchpit, hydrobreak and petrol interceptor. The hydrobreak restricts the flows to the public surface water sewer to greenfield run off rates. The petrol interceptor separates out hydrocarbons prior to discharge to the public surface water sewer. Construction details for the tanked porous paving, catchpit, hydrobreak and petrol interceptor are shown on HDL drawing no. 16-2730-512 P2.
- 2.6 The attached calculations show the rainwater run off calculations for the 1 in 100 return period with a 40% allowance for climate change. The storage required for rainwater attenuation is also calculations.

3.0 Conclusions

- 3.1 From the above it can be seen that the proposed development will reduce the impermeable area of the site with the introduction of soft landscaping areas to the rear of the site whilst restricting surface water run off to greenfield rates by the adoption of attenuation techniques with the use of an impermeable tanked permeable paving system which outfalls to the public sewer via a catchpit, hydrobreak and petrol interceptor.
- 3.2 The surface water drainage proposals not only reduces the rate of surface water run off from the site but also eliminates the possibility of contaminating the groundwater within the aquifer located below the development site.

Drawings

1. THIS DRAWING IS COPYRIGHT AND SHOULD NOT BE REPRODUCED WITHOUT
APPROVAL.

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE ARCHITECT'S DRAWINGS.
ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF BOTH PARTIES
IMMEDIATELY.

3. ANY DIMENSIONS/LEVELS INDICATED "vd." REFERS TO ASSUMED/EXISTING
DIMENSIONS WHICH ARE TO BE SET CHECKED PRIOR TO THE COMMENCEMENT OF
ANY WORK.

11. ANGLE LEVELS AND POSITIONS OF EXISTING BRANDS /CHARACTERS /SYMBOLS TO NEW CONNECTIONS ARE TO BE MADE MUST BE CHECKED AND CONFIRMED TO THE DESIGNER PRIOR TO THE COMMENCEMENT OF ANY WORKS.

12. ALL DRAWING WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY, ENVIRONMENT AGENCY AND IN CONJUNCTION WITH ALL RELEVANT BRANCH STANDARDS, CODES OF PRACTICE AND STANDARDS FOR ADOPTION AS APPROPRIATE.

13. ALL DRAWING SHALL COMPLY WITH THE TYPICAL DETAILS AND THE REQUIREMENTS OF BS2152.

14. REFER TO MANHOLE SCHEDULE FOR MANHOLE TYPES, SIZE, FINISHES AND SPECIAL REQUIREMENTS.

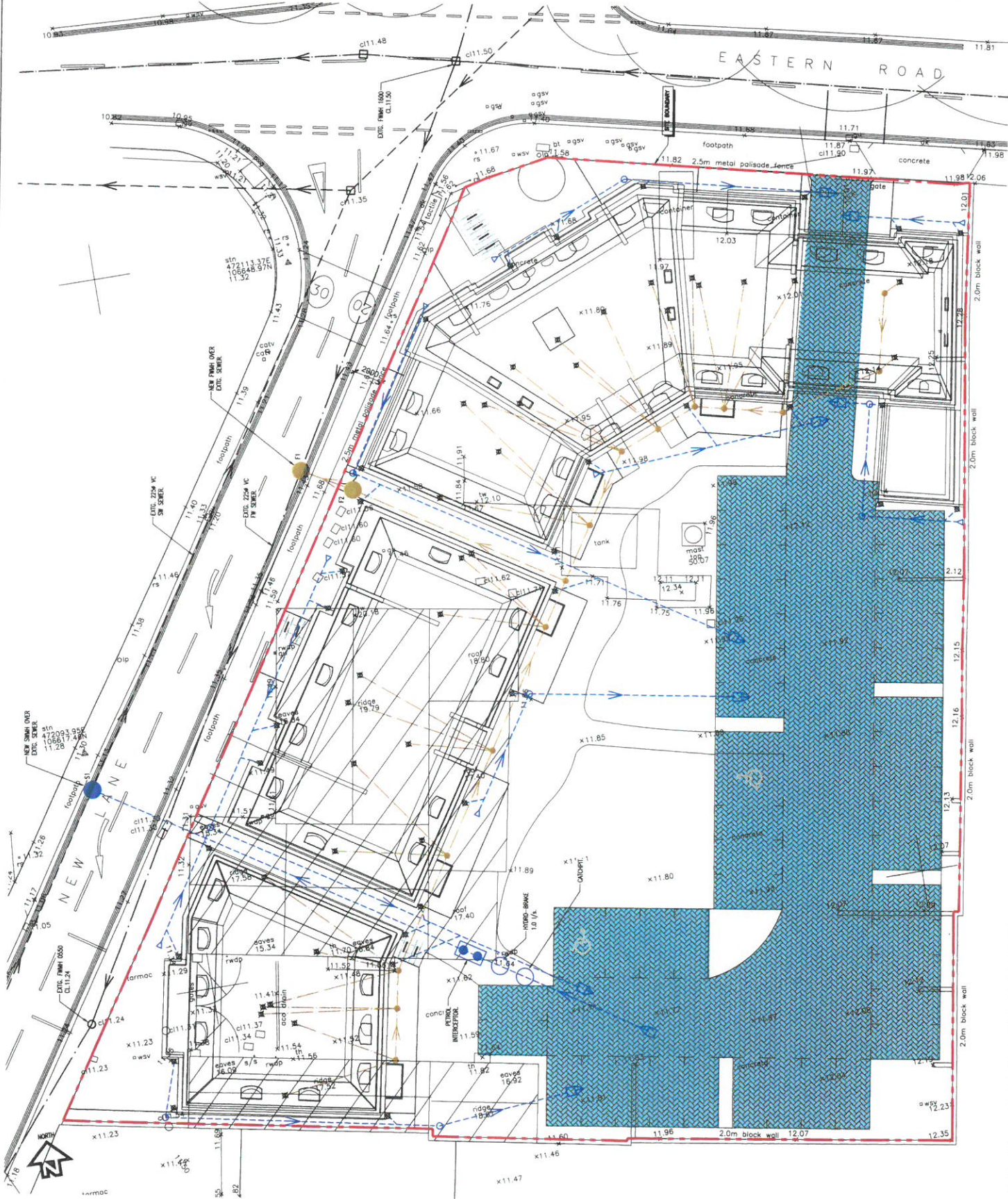
- [illegible]

FORMPAVE OUTLET - REFER DRG. No. 15-2524-512 FOR FORMPAVE DETAILS

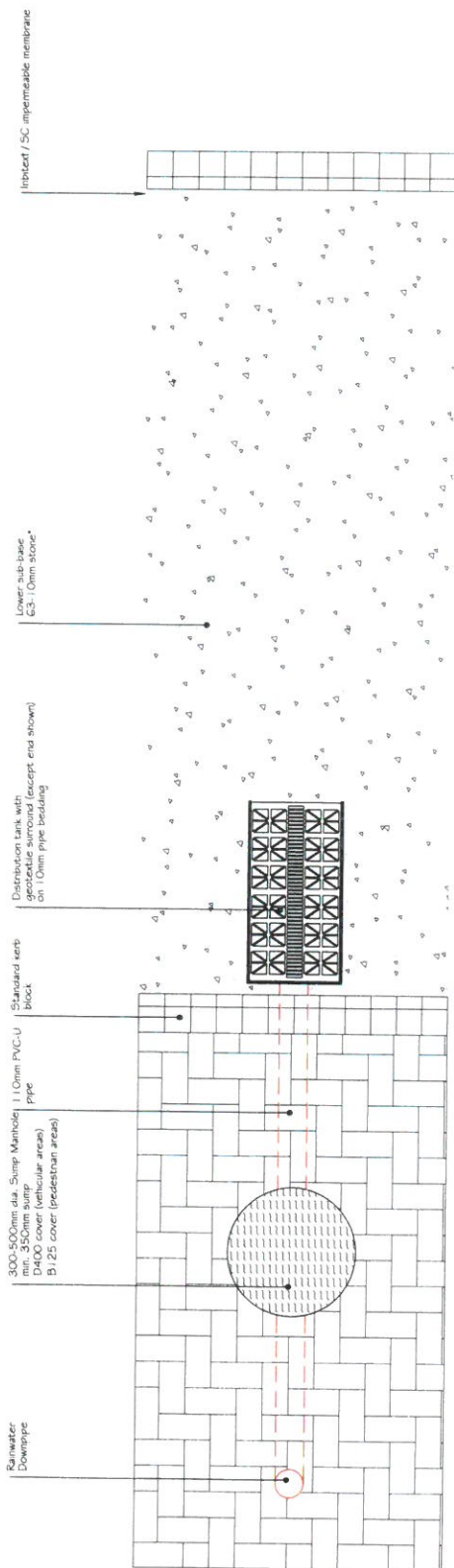
FORMPAVE POROUS PAVING - REFER TO DRG. No. 15-2524-512 FOR FORMPAVE DETAILS (AREA 929.6m²)

ORIGINAL DRAWING SIZE - A1		X-REFS.	
Assembled		Sheet No.	Sheet Title
PREFABRIMAT	HDZ/12/17	HDZ/12/17	HDZ/12/17
PREFABRIMAT	HDZ/11/17	HDZ/11/17	HDZ/11/17
PREFABRIMAT	HDZ/05/17	HDZ/05/17	HDZ/05/17
CONSTRUCTION	HDZ/02/16	HDZ/02/16	HDZ/02/16

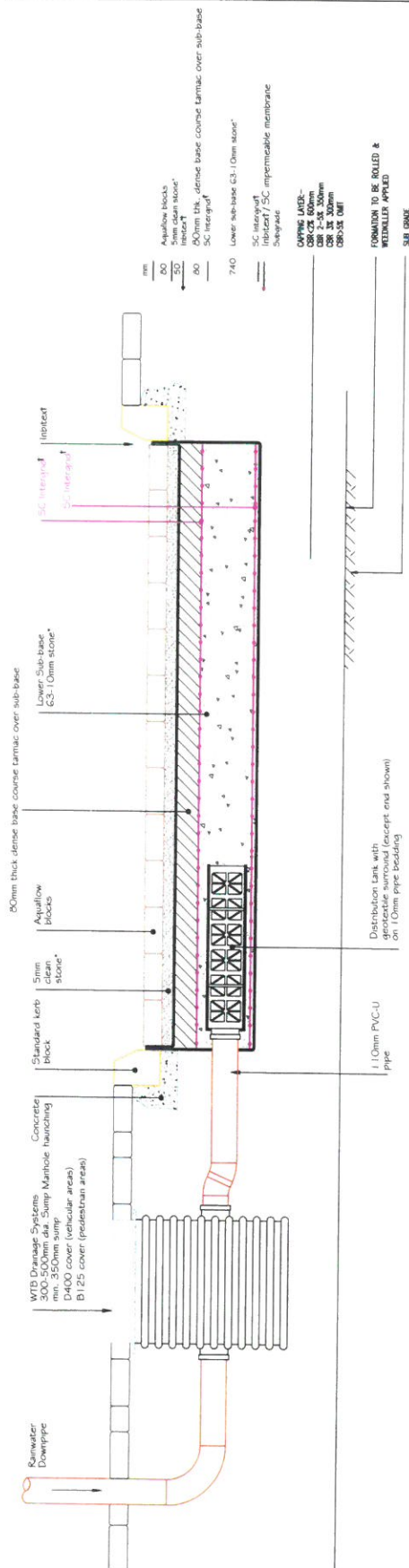
 HILL DAVIES LIMITED Consulting Civil and Structural Engineers		PAUL BOX REDEVELOPMENT, NEW ROAD, HAWAII DRAINAGE LAYOUT	
Project Preliminary	Drawn: HCL Designed	Date 1:125 @ A1	Drawing Number 16-2730-500
Working Files 01489 031 506	Scale 16-2730-500	P3	



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Downpipe drainage into Impermeable Tanked System - Plan



PRELIMINARY

[illegible]

Downpipe drainage into Impermeable Tanked System - Section

FORMPAVE STORMWATER SOURCE CONTROL SYSTEM

NOTES:

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2. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE ARCHITECT'S DRAWINGS. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF BOTH PARTIES IMMEDIATELY.
3. ANY DIMENSIONS/LEVELS INDICATED "H.C." REFERS TO ASSIGNED/EXISTING HIGHWAYS WHICH ARE TO BE SITE CHECKED PRIOR TO THE COMMENCEMENT OF ANY WORK.

PRELIMINARY

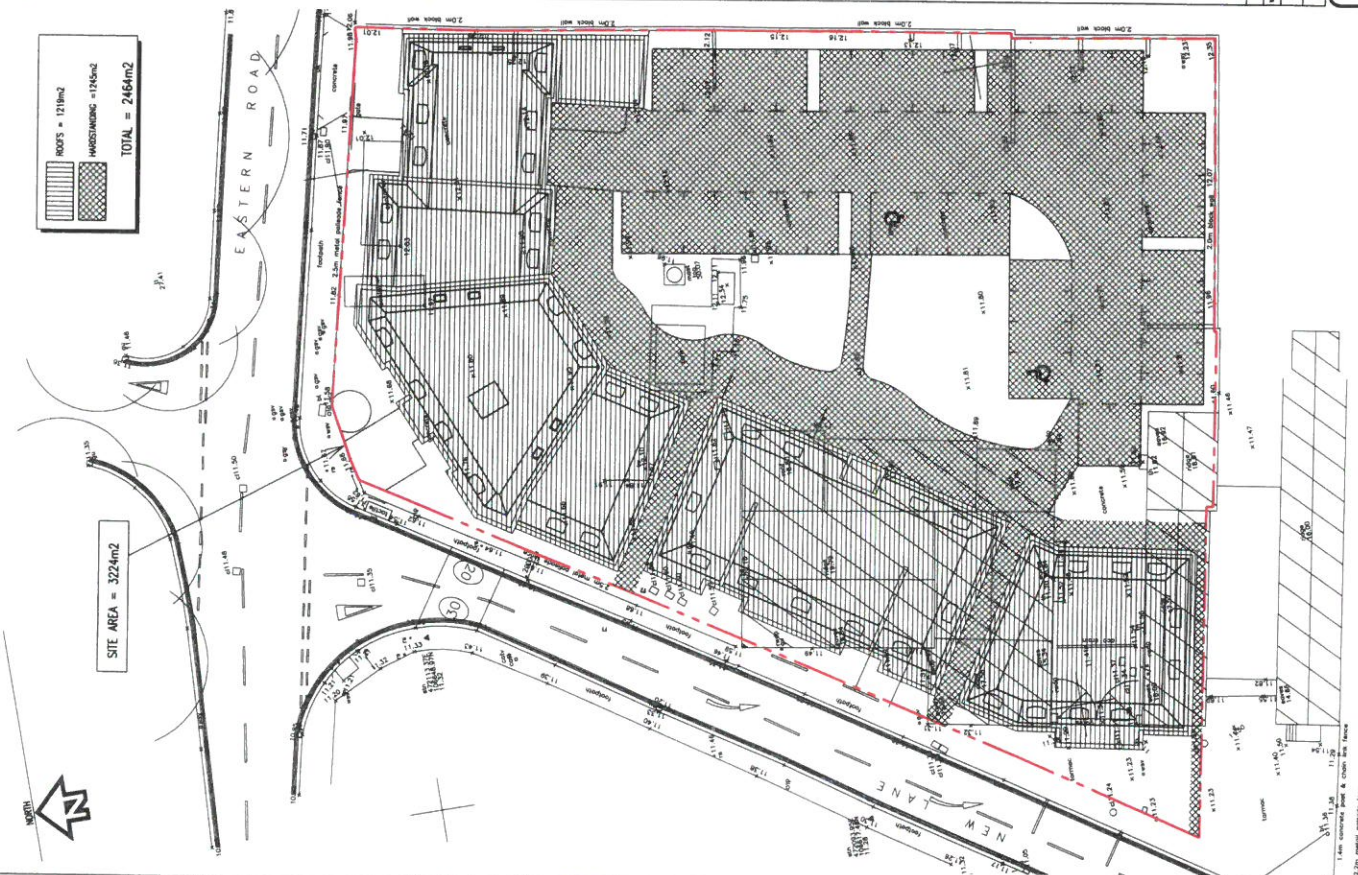
Sheet	Project	Scale	Date
P1	PRELIMINARY	1:100	18/11/17
ORIGINAL DRAWING SIZE - A1	1:100	1:100	1:100
DATE REV.			

HDL
HAMIL DAVIES LIMITED
 CONSULTANTS
 16-2730-900 P1

Project: REDEVELOPMENT, NEW ROAD, HAWT
 Drawing: IMPERMEABLE AREAS LAYOUT
 Scale: 1:100
 Date: 18/11/17
 Drawing No: 16-2730-900 P1

POST-DEVELOPMENT IMPERMEABLE AREAS

PRE-DEVELOPMENT IMPERMEABLE AREAS



Calculations



HAMILL DAVIES LIMITED

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

Job No.	16-2730		
Sheet no.	1		
Date	27/11/17		
By	B.H.	Checked	Reviewed

MasterDrain
HY 9.36

Project New Lane, Havant
Title BREEAM SUR1 calculations for HAVANT

Data:-

Hydrology:-

Location = HAVANT ✓
Long reference = 471106
M5-60 (mm) = 19
r = 0.35
Hyd. area = 7
Hydrograph = Summer

WRAP = 3
Grid reference = SU7106
SAAR (mm/yr) = 750
Soil = 0.37
Hyd. zone = 7
Area = England and Wales

Site values used in design:-

Total site area = 0.3224 ha ✓
Pre-dev area drained = 0.3224 ha ✓
Imperm runoff factor = 98% ✓

Climate change factor = 40% ✓
Post-dev area drained = 0.2464 ha ✓
Perm runoff factor = 20%

Pre-development

Area to soakaways = 0.0000 ha
Perv. area to SUDS = 0.0000 ha

Post-development

Area to soakaways = 0.0000 ha
Perv. area to SUDS = 0.0000 ha

Area to other SUDS = 0.0000 ha
Pre-dev flow to drain = 0.00 l/s

Area to other SUDS = 0.0000 ha
Post-dev flow to drain = 1.00 l/s ✓

Calculations:-

Revised Post-dev Imperm. area = 0.246 ha
Equiv. Post-dev Imperm. area = 0.241 ha
Equiv. Post-dev Perm. area = 0.015 ha
Total Pre-dev equiv. area ha = 0.316 ha
Total Post-dev equiv. area ha = 0.257 ha
100 yr 6 hour mean intensity = 10.50mm/hr

Results:-

Pre-dev peakflow runoff (l/s) (m³/s)

R.P.	15	30	60	120	240	360	480	600	Max	CCF	Final	R.P.
1	97.8	66.2	41.8	26.7	16.8	13.0	10.5	9.0	97.8	N/A	97.8	1
30	236.8	157.7	100.6	62.3	37.7	27.9	22.5	19.1	236.8	N/A	236.8	30
100	306.3	205.9	132.2	81.9	49.2	36.1	29.0	24.5	306.3	N/A	306.3	100

Post-dev peakflow runoff (l/s)

R.P.	15	30	60	120	240	360	480	600	Max	CCF	Final	R.P.
1	79.5	53.8	34.0	21.7	13.7	10.5	8.6	7.3	79.5	40	111.3	1
30	192.4	128.1	81.7	50.6	30.6	22.7	18.3	15.5	192.4	40	269.3	30
100	248.8	167.3	107.4	66.6	39.9	29.4	23.6	19.9	248.8	40	348.3	100

100 year 6 hour (x Climate Change Factor) storm gives:-

Pre-dev runoff volume m³ = 199.1m³
Post-dev rainfall volume = 226.5m³
Post-dev volume m³ (excess above SUDS) = 226.5m³
100 yr 6 hour mean intensity = 10.50mm/hr
Pre-dev volume to drain at 0 l/s = 0.0 m³
Post-dev volume to drain at 1.004 l/s = 22.0 m³
Post-dev storage volume = 204.4m³
Post-dev 5mm imperm volume = 12.3 m³
Post-dev 5mm perm volume = 3.8 m³

$Q_{BAR(rural)} = 1.004 \text{ l/s}$ or 3.114 l/s/ha or 0.001 cumecs - from IoH 124.

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

STORAGE REQ'D = 204.4 m³

STORAGE PROVIDED =

$$929.6 \times 0.3 \times 0.74 = 206.4 \text{ m}^3$$

Surface Area
of Form Pav

% Voids
in Subbase

Sub Base
Depth.





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HAMILL DAVIES LIMITED

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

Job No. 16-2730		
Sheet no. 2		
Date 27/11/17		
By B.H.	Checked	Reviewed

Project **New Lane, Havant**
Title **BREEAM SUR1 calculations for HAVANT**

Data summary.

Use the data below for the SUR1 form

Site areas:-

Total site area	=	0.3224 ha	; 3224.0 m ²	[3A]
Pre-development impermeable area	=	0.3224 ha		[3B]
Pre-development permeable area	=	0.0000 ha		
Post-development impermeable area	=	0.2464 ha		[3C]
Post-development permeable area	=	0.0760 ha		

Peak runoff:-

Pre-development 1 year storm (15min)	=	97.8 l/s	[6A]
Pre-development 100 year storm (15min)	=	306.3 l/s	[6C]
Post-development 1 year storm (15min)	=	79.5 l/s	[6B]
Post-development 100 year storm (15min)	=	248.81 l/s	[6D]

Greenfield runoff:-

$Q_{BAR(rural)} = 1.004 \text{ l/s}$ or 3.114 l/s/ha or 0.001 cumecs - from IoH 124.

Climate change factor:-

CCF = 40%

Volumes:-

Pre-development 100 yr/6hr storm	[12A]	=	278.8m ³
Post-development 100 yr/6hr storm (add. volume with no SUDS)	[12B]	=	226.5m ³
Post-development 100 yr/6hr storm (add. volume with SUDS)		=	226.5m ³
Post-development add. predicted volume (No SUDS)	[12C]	=	-52.3m 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
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HAMILL DAVIES LIMITED

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

Job No.
16-2730

Sheet no.
3

Date
27/11/17

Project
New Lane, Havant

Title
BREEAM SUR1 calculations for HAVANT

By
B.H.

Checked

Reviewed

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 LoH 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 l/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 LoH 124