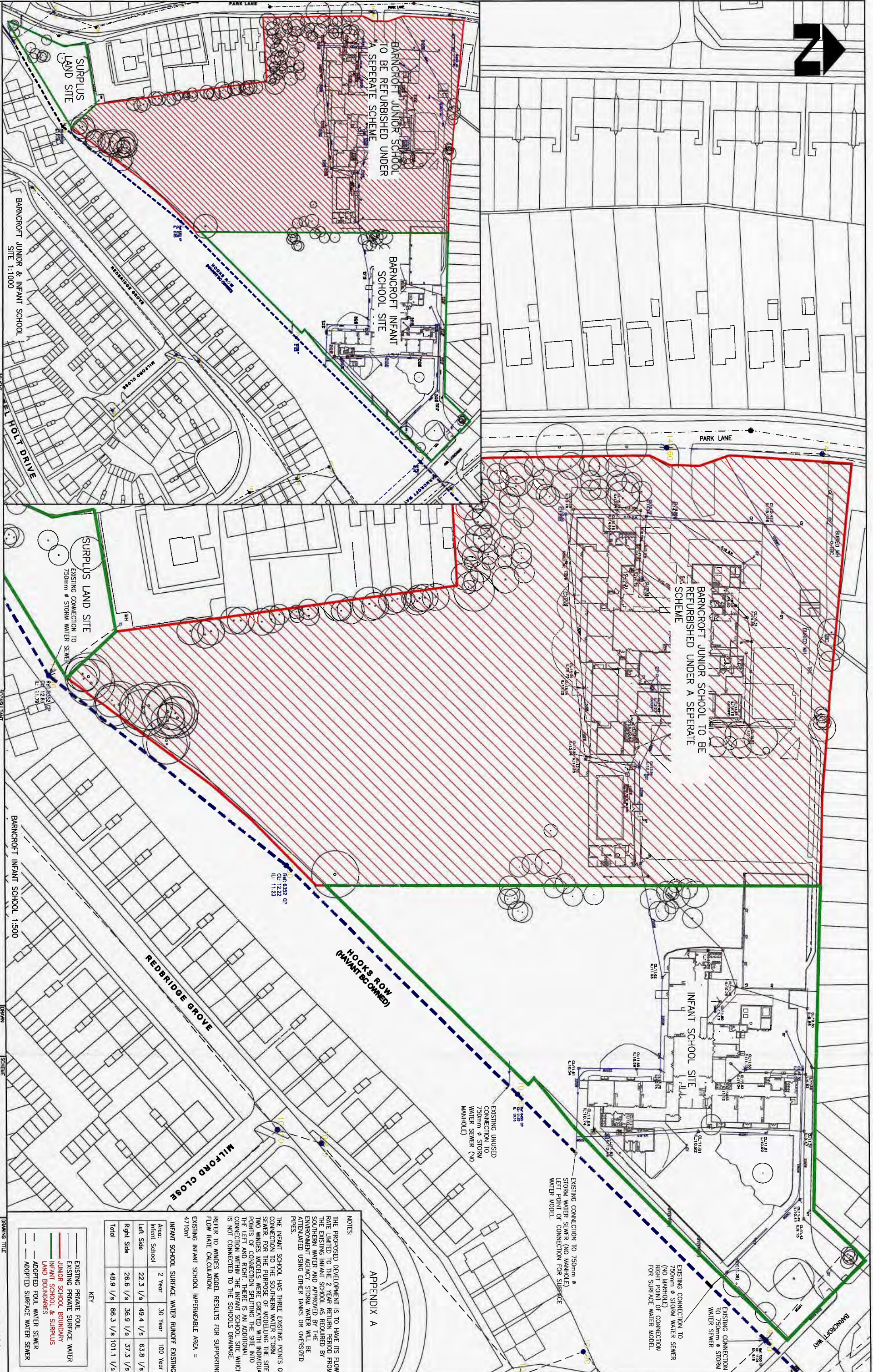




APPENDIX A

NOTES:
THE PROPOSED DEVELOPMENT IS TO HAVE ITS FLOW RATE EXISTING INFANT SCHOOL AS REQUIRED BY SOUTHERN WATER AND APPROVED BY THE ENVIRONMENT AGENCY. STORM WATER WILL BE ATTENUATED USING EITHER TANKS OR OVERSIZED PIPES.
THE INFANT SCHOOL HAS THREE EXISTING POINTS OF CONNECTION TO THE SOUTHERN WATER STORM SEWER. FOR THE PURPOSE OF MODELING THE SITE TWO WINDS MODELS WERE CREATED WITH INDIVIDUAL POINTS OF CONNECTION THERE IS AN ADDITIONAL CONNECTION WITHIN THE INFANT SCHOOL SITE WHICH IS NOT CONNECTED TO THE SCHOOLS DRAINAGE. REFER TO WINDS MODEL RESULTS FOR SUPPORTING FLOW RATE CALCULATION.

EXISTING INFANT SCHOOL IMPERMEABLE AREA = 4710m²

INFANT SCHOOL SURFACE WATER RUNOFF EXISTING	2 Year	30 Year	100 Year
Area	2	30	100
Infant School	22.3 l/s	49.4 l/s	63.8 l/s
Left Side	26.6 l/s	36.9 l/s	37.3 l/s
Right Side	48.9 l/s	86.3 l/s	101.1 l/s
Total	48.9 l/s	86.3 l/s	101.1 l/s

- KEY
- EXISTING PRIVATE FOUL
 - EXISTING PRIVATE SURFACE WATER
 - INFANT SCHOOL BOUNDARY
 - INFANT SCHOOL & SURPLUS LAND BOUNDARIES
 - ADOPTED FOUL WATER SEWER
 - ADOPTED SURFACE WATER SEWER

REV.

AMENDMENT

DATE

DRAWN

CHKD

APPD

CLIENT

HAMPSHIRE COUNTY COUNCIL
PROPERTY, BUSINESS & REGULATORY SERVICE
ARCHITECTS PRACTICE

CONSULTANT

Hampshire County Council
Engineering
CONSULTANT
ALISON QUANT BSC MSc MRTP, DIRECTOR OF ENVIRONMENT, THE CASTLE, WINCHESTER.

DRAWN

NM

BL

NM

BL

APPROVED

SF

SCHEME

BARNCROFT INFANT SCHOOL
REDEVELOPMENT FEASIBILITY STUDY

APP NO.

R.J509775.03

SCALE

1:500

DATE

16/06/10

SHEET NO.

1

DRAWING TITLE

EXISTING INFANT SCHOOL
DRAINAGE SCHEME
& STORM RUNOFF RATES
APPENDIX A

DWG NO.

R.J502775.03/001

REV

P

SUFFIX

P



David Nuttall
Senior Planning Engineer
Water & Environment
Atkins Limited,
Anglo St James House
39A Southgate Street
Winchester
SO23 9EH

Environment Department
The Castle, Winchester
Hampshire SO23 8UD
Telephone 01962 847612
Fax 01962 847055
www.hants.gov.uk/environment

<i>Enquiries to:</i>	Neil Mugford	My reference:	RJ502775/01NM-SW
<i>Direct Line:</i>	01962 84 7612	Your reference:	
<i>Date:</i>	28 th June 2010	E-mail:	Neil.Mugford@hants.co.uk

Dear Mr Nuttall

Proposed surface water run off rates for Barncroft Junior & Infant School

Location: Barncroft Infant School, Barncroft Way, Havant, PO9 3AG

With regards to our emails concerning the surface water runoff from Barncroft Junior school and Infant school I would like to summarise the two sites in one letter. I would like to point out that the Junior and Infant school sites are totally independent and are being refurbished and redeveloped independently by different departments within Hampshire County Council.

The intention is for the Junior school to commence refurbishment & extension work in early 2011.

Upon completion of the refurbishment of the Junior school the Infant school is to be redeveloped by Hampshire County Council.

The Junior and Infant school's date from the 1960's and currently discharge into the Southern Water at an un-attenuated rate.

We would like to come to an agreement for separate approved attenuated discharge rates to the sewer based on the existing 2 year storm return period for the Junior and Infant school. This will offer a significant betterment over the current discharge rates.

Following flow surveys of the site and WinDes modelling of the Junior & Infant school the following flow rates have been calculated. Please note that the Infant school has two points of connection to the storm sewer so these were modelled separately.

Table one details the flows generated for each site for the 2, 30 & 100 year return periods. We propose to limit the flows to the 2 year return period.

Director of Environment
Stuart Jarvis BSc DipTP FCIHT MRTPI



Table 1:

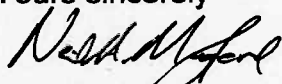
	Impermeable Area	Storm Duration	2 Year Return Period	30 Year Return Period	100 Year Return Period
Existing Junior school	6958.6m ²	30 min	64.5 l/s	91.4 l/s	95.0 l/s
Existing Junior school	Left half 1781.36m ²	30 min	22.3 l/s	49.4 l/s	63.8 l/s
	Right half 2929.26m ²	30 min	26.6 l/s	36.9 l/s	37.3 l/s
	Total 4710.62m ²	30 min	48.9 l/s	86.3 l/s	101.1 l/s

Supporting information for the Junior school has already been submitted and reviewed by yourself. Information for the Infant school will be attached with this letter.

Should you have any queries regarding the information provided then please let me know.

I look forward to your response to this proposal.

Yours sincerely



Neil Mugford
Senior Engineer
Hampshire County Council

End



Environment Department
Hampshire County Council
The Castle
Winchester
Hampshire
SO23 8UD



ATKINS

Atkins Limited
Anglo St James House
39A Southgate Street
Winchester
Hampshire SO23 9EH

Telephone +44 (0)1962 858688
Fax +44 (0)1962 810296

Your Ref Winchester.enquiries@atkinsglobal.com
RJ502775/01NM-SW

Our Ref
HCC/1
Date

29/06/2010

Dear Mr Mugford

Proposed surface water run off rates for Barncroft Junior and Infant Schools

Thank you for your letter of 28/06/2010.

I am happy to confirm that the proposed rates of discharge as outlined in your letter would be acceptable to Southern Water.

We look forward in due course to receipt of detailed proposals for the attenuation and storage required to limit discharges to the agreed rates.

Yours sincerely

David Nuttall
Network Development
Atkins Ltd, for Southern Water

Tel 01962 858688
Fax 01962 810296
E mail southernwaterplanning@atkinsglobal.com



Miss Laura Bourke
Planning Liaison Officer
Environment Agency
Colvedene Court
Wessex Business Park
Wessex Way
Colden Common
Winchester
SO21 1WP

Environment Department
The Castle, Winchester
Hampshire SO23 8UD
Telephone 01962 847612
Fax 01962 847055
Fax (abnormal loads) 01962 854045
www.hants.gov.uk/environment

Enquiries to: Neil Mugford

My reference: RJ502775.03/100630/01NM

Direct Line: 01962 84 7612

Your
reference:

Date: 30th June 2010

E-mail: Neil.Mugford@hants.co.uk

**PROPOSED RE-DEVELOPMENT OF THE EXISTING BARNCROFT
INFANT SCHOOLS INTO HOUSING AND THE ADJACENT LAND OF
THE JUNIOR SCHOOL.**

Dear Laura,

Hampshire County Council are investigating the feasibility of redeveloping Barncroft Infant school and a parcel of land of Barncroft Junior school into housing. The proposed developments will increase the impermeable area. We propose to attenuate the increased flows to the current runoff rate using either attenuation tanks or oversized pipes that will be adopted by Southern Water under a section 104 agreement. Drawing R.J502775.03/004 shows the concept drainage design.

At this stage we would like to come to an agreement about the discharge rate. Detailed design of the site would not occur until after the refurbishment of the adjacent Junior school.

Please note that the redevelopment of the Infant school is a totally separate scheme to the Barncroft Junior school refurbishment.

We have been in discussion with Southern Water regarding the proposed discharge rate which is shown in Table 1 below and who have now approved the flow rate. They have requested that we limit any discharge to the 2 year return period which offers a significant betterment over the current un-attenuated discharge rate. Please see the attached letter from their Developer Services team and my letter to Southern Water Developer Services summarising the proposal for both the Junior & Infant school.

To achieve the agreement we also provided information on the existing drainage and the surface water flow routing. Drawings R.J502775.03/001 and 004 provide this information.

Director of Environment
Stuart Jarvis BSc DipTP FCIHT MRTPI



Flow rates:

Modelling the existing infant school using the two year storm return period, the following flow rates are developed.

Table 1:

Existing Infant school	Left half 1781.36m ²	2 year	22.3 l/s	49.4 l/s	63.8 l/s
	Right half 2929.26m ²	2 year	26.6 l/s	36.9 l/s	37.3 l/s
	Total 4710.62m ²	30 min	48.9 l/s	86.3 l/s	101.1 l/s

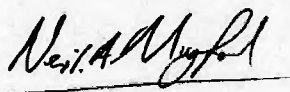
The Micro Drainage storm simulation results are also enclosed. The school has two main points of connection to the sewer which were modelled separately and flows combined for the purposes of the table above.

We propose to redevelop Barncroft infant school and the small parcel of land to the south west into housing with multiple discharge points where the overall surface water discharge is limited to **48.9 l/s**.

Should you have any questions or queries regarding my proposal then please phone or email.

I look forward to your response to my flow rate proposal.

Regards



Neil Mugford BEng (Hons)
Senior Engineer
Engineering Consultancy
Hampshire County Council

T: 01962 847612

E: neil.mugford@hants.gov.uk

Enc: Drawing RJ502775.03/001,
Drawing RJ502775.03/004
Drawing RJ502775.03/005
Micro Drainage Calculations
HCC/1: Southern Water letter to HCC
RJ502775/01NM-SW: HCC letter to Southern Water

CC: John Bannister – HCC Estates Department
Christine Byrant – HCC Estates Department

Mr Neil Mugford - Senior Engineer
Capital House Andover Road
Winchester
Hampshire
SO23 7BH

Our ref: HA/2010/110278/01-L01
Your ref: HCC/2010/0070
Date: 27 July 2010

Dear Mr Mugford

**SURFACE WATER PROPOSAL-A FEASIBILITY STUDY INTO RE-DEVELOPING
THE INFANT SCHOOL FOR HOUSING**

**BARNCROFT INFANT SCHOOL, PARK LANE, BEDHAMPTON, HAVANT PO9
3HN**

Thank you for consulting the Environment Agency on the above site which we received on 30 June 2010. We would like to make the following comments.

Flood Risk

Your proposals to limit the discharge rate from the site so that it is no greater than the existing 1 in 2 year flow are acceptable. If there is this the possibility of reducing this rate further then we would welcome it.

For on/near site flooding, the PPS25 Practice Guide at paragraph 5.51 states that: "For events with a return-period in excess of 30 years, surface flooding of open spaces such as landscaped areas or car parks is acceptable for short periods, but the layout and landscaping of the site should aim to route water away from any vulnerable property, and avoid creating hazards to access and egress routes (further guidance in CIRIA publication C635 Designing for exceedence in urban drainage - good practice). No flooding of property should occur as a result of a one in 100 year storm event (including an appropriate allowance for climate change). In principle, a well-designed surface water drainage system should ensure that there is little or no residual risk of property flooding occurring during events well in excess of the return-period for which the sewer system itself is designed. This is called designing for event exceedence." The CIRIA publication 'Designing for exceedence in urban drainage-good practice' can be accessed via the following link <http://www.ciria.org/acatalog/C635.html>.

Environment Agency
Colvedene Court (Wessex Business Park) Wessex Way, Colden Common, Winchester, SO21 1WP.
Customer services line: 08708 506 506
Email: enquiries@environment-agency.gov.uk
www.environment-agency.gov.uk
Cont/d..

For off-site flooding, the PPS25 Practice Guide states at paragraph 5.54: "For the range of annual flow rate probabilities up to and including the one per cent annual exceedence probability (1 in 100 years) event, including an appropriate allowance for climate change, the developed rate of run-off into a watercourse, or other receiving water body, should be no greater than the existing rate of run-off for the same event. Run-off from previously-developed sites should be compared with existing rates, not greenfield rates for the site before it was developed. Developers are, however, strongly encouraged to reduce runoff rates from previously-developed sites as much as is reasonably practicable. Volumes of run-off should also be reduced wherever possible using infiltration and attenuation techniques. Interim guidance on calculation of site run-off rates can be found at :

[http://www.ciria.org/suds/pdf/preliminary rainfall runoff mgt for development.pdf](http://www.ciria.org/suds/pdf/preliminary_rainfall_runoff_mgt_for_development.pdf)".

The above comments have been provided to address your pre-planning enquiry only. Please be aware that we may raise additional issues affecting this proposal when a formal detailed planning application is submitted.

The view expressed in this letter by the Environment Agency is a response to an enquiry only and does not represent our final view in relation to any future planning, or licence, application made in relation to this site. We reserve the right to change our position should new information, or updates to guidance occur, in relation to any such application.

If you have any queries regarding the information set out above please contact me on the number below.

Yours sincerely

Miss Laura Bourke
Planning Liaison Officer

Direct dial 01962764847

Direct fax 01962711712

Direct e-mail laura.bourke@environment-agency.gov.uk

**ATKINS**

Atkins Limited
Anglo St James House
39A Southgate Street
Winchester
Hampshire SO23 9EH

Telephone +44 (0)1962 858688
Fax +44 (0)1962 810296

info@atkinsglobal.com
www.atkinsglobal.com

Anta. Lenton

Your Ref.
KW/PAE/14295/10
Our Ref.
WW/1004739
Date
22 November 2007
Contact
Tel: 01962 858688
Fax: 01962 810296

Gifford & Partner's
Hounslow House
Hounslow Business Park
Bulls Copse Road
Southampton
SO40 9LX

F.A.O: Mr Graham Cook,

Dear Sir,

Site: Bargate School, Havant, Hampshire

I am now in receipt of the results of the capacity check you requested for the above development site.

Foul Water

Following initial investigations, there is currently inadequate capacity in the local network to provide foul sewage disposal to service the proposed development. The proposed development would increase flows to the public sewerage system, and existing properties and land may be subject to a greater risk of flooding as a result. Additional off-site sewers, or improvements to existing sewers, will be required to provide sufficient capacity to service the development.

The nearest point where capacity is currently available is at/downstream of manhole reference 2804 located approximately 640 metres south of the proposed development site. Section 98 of the Water Industry Act 1991 provides a legal mechanism through which the appropriate infrastructure can be requested (by the developer) and provided to drain a specific location. Alternatively, carry out off site reinforcement works in order to provide capacity for the proposed foul flow to be accommodated within the local sewerage system. The extent of the works required to provide capacity for the development site could be obtained via a level 2 Capacity Assessment (Application forms enclosed).

Unfortunately, it may be several years before adequate infrastructure is provided via a prioritised capital expenditure programme. Therefore, this proposed development would be considered premature until such time adequate sewerage infrastructure could be provided.

Before any connection/s are made, an application form needs to be completed and approved by Southern Water services.

Page 1 of 2

-1-

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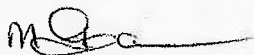
Surface Water

Following initial investigations, there is currently adequate capacity in the local surface water system to accommodate a surface water flow of 50.0 l/s at/downstream of manhole reference 6450. Any excess surface water should be disposed of by alternative means i.e. Soakaways or any local drainage watercourses, subject to all interested parties approval.

Please note that if the excess surface water flows are to be attenuated on site, it could have a significant effect on any proposed Section 104 Agreements. Any attenuation proposals should be agreed before any works are implemented on site. Where capacity is limited/restricted, agreement should be sought if you are to include any highway drainage within your proposals as Southern Water is not obligated to accept highway flows. Before any connections are made, an application form needs to be completed and approved by Southern Water services.

Please let me know if we can be of any further assistance in this matter.

Yours faithfully



Mike Godwin
Network Development

Please note: -
The information provided above does not grant approval for any designs/drawings submitted for the capacity analysis.
The results quoted above are only valid for 12 months from the date of issue of this letter.

Infant School Site + Surplus Land Off of Park Lane

Infant School Site

Houses:

- 4-Bed x 1
- 3-Bed x 18
- 2-Bed x 5

Flats:

- 2-Bed x 9

FOGs:

- 1-Bed x 1

Surplus land off of Park Lane

Houses:

- 3-Bed x 3

Flats:

- 2-Bed x 2

Total No. of Units = 39

% Flats = 31%

% 1/2 Bed Units = 43.5%

Gross Density = 34dph



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Development and Projects Group,
Estates Practice,
Property, Business & Regulatory Services,
The Castle, Winchester,
SO23 9DS
9th September 2009.
Scale approx. 1:1,000 @ A3

N.B. Drawing for illustrative purposes only

Hampshire County Council		Page 1	Appendix D
Ashburton Court West The Castle Winchester SO23 8UD	Barncroft Infant School Development Site		
Date 24/06/10	Designed By NM		
File Surface Water network left of site....	Checked By		
Micro Drainage	Simulation W.11.4		

Global Variables

Region	FSR - England & Wales
Return Period (yrs)	2
M5-60 (mm)	20.000
Ratio R	0.400
Volumetric Runoff Coef	0.750
Profile Type	Summer
PIMP (%)	100
Areal Reduction Factor	1.000
Storm Duration (mins)	30
Hot Start (mins)	0
Hot Start Level (mm)	0
Manhole Headloss Coefficient	0.500
MADD Factor * 10m ³ /ha Storage	2.000
Foul Sewage/Hectare (l/s)	0.00
Additional Flow - % of Total Flow	0
Number of Input Hydrographs	0
Number of Time/Area Diagrams	0
Number of Bifurcations	0
Number of Overflows	0
Number of Off-Line Controls	0
Number of On-Line Controls	0

Starting Storm file name

K:\Eng\Roads\Schemes\RJ502775 Barncroft Development
Site\Microdrainage\Existing\Surface Water network left of site.sws

Freely Discharging Outfalls

Outfall Pipe Number	Outfall MH/No	C.Level (m)	I.Level (m)	D,L (mm)	B (mm)
1.004	9	10.455	9.930	1200	0

Hampshire County Council		Page 2
Ashburton Court West The Castle Winchester SO23 8UD	Barncroft Infant School Development Site	
Date 24/06/10	Designed By NM	
File Surface Water network left of site....	Checked By	
Micro Drainage	Simulation W.11.4	

Summary of Results

Return Period (years)	2
Storm Duration (mins)	30
Profile Type	Summer
Margin for Flood Risk warning (mm)	300
Analysis Time Step	Fine
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

PN	Water Lev. (m)	Surcharged Depth (m)	Flooded Vol (m ³)	Flow/ Capacity	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	11.095	-0.180	0.000	0.09	0.0	4.5	O K
1.001	10.825	-0.140	0.000	0.30	0.0	9.6	O K
1.002	10.762	-0.153	0.000	0.22	0.0	9.6	O K
1.003	10.610	-0.155	0.000	0.21	0.0	9.6	O K
2.000	11.240	-0.100	0.000	0.00	0.0	0.0	O K
2.001	10.957	-0.063	0.000	0.29	0.0	2.3	O K
2.002	10.517	-0.073	0.000	0.52	0.0	8.1	O K
1.004	10.425	-0.150	0.000	0.24	0.0	22.3	O K

Hampshire County Council		Page 1
Ashburton Court West The Castle Winchester SO23 8UD	Barncroft Infant School Development Site	
Date 24/06/10	Designed By NM	
File Surface Water network left of site....	Checked By	
Micro Drainage	Simulation W.11.4	

Global Variables

Region	FSR - England & Wales
Return Period (yrs)	30
M5-60 (mm)	20.000
Ratio R	0.400
Volumetric Runoff Coef	0.750
Profile Type	Summer
PIMP (%)	100
Areal Reduction Factor	1.000
Storm Duration (mins)	30
Hot Start (mins)	0
Hot Start Level (mm)	0
Manhole Headloss Coefficient	0.500
MADD Factor * 10m ³ /ha Storage	2.000
Foul Sewage/Hectare (l/s)	0.00
Additional Flow - % of Total Flow	0
Number of Input Hydrographs	0
Number of Time/Area Diagrams	0
Number of Bifurcations	0
Number of Overflows	0
Number of Off-Line Controls	0
Number of On-Line Controls	0

Starting Storm file name

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Site\Microdrainage\Existing\Surface Water network left of site.sws

Freely Discharging Outfalls

Outfall Pipe Number	Outfall MH/No	C.Level (m)	I.Level (m)	D,L (mm)	B (mm)
1.004	9	10.455	9.930	1200	0

Ashburton Court West
The Castle
Winchester SO23 8UD

Barncroft Infant School
Development Site



Date 24/06/10

Designed By NM

File Surface Water network left of site....

Checked By

Micro Drainage

Simulation W.11.4

Summary of Results

Return Period (years) 30
Storm Duration (mins) 30
Profile Type Summer
Margin for Flood Risk warning (mm) 300
Analysis Time Step Fine
DTS Status ON
DVD Status OFF
Inertia Status OFF

PN	Water Lev. (m)	Surcharged Depth (m)	Flooded Vol (m ³)	Flow/ Capacity	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	11.111	-0.164	0.000	0.17	0.0	8.5	O K
1.001	10.872	-0.093	0.000	0.64	0.0	20.2	O K
1.002	10.798	-0.117	0.000	0.47	0.0	20.2	O K
1.003	10.644	-0.121	0.000	0.44	0.0	20.1	O K
2.000	11.240	-0.100	0.000	0.00	0.0	0.0	O K
2.001	10.981	-0.039	0.000	0.67	0.0	5.2	O K
2.002	10.628	0.038	0.000	1.21	0.0	18.8	SURCH'ED
1.004	10.468	-0.107	0.000	0.54	0.0	49.4	O K

Ashburton Court West
The Castle
Winchester SO23 8UD

Barncroft Infant School
Development Site



Date 24/06/10

Designed By NM

File Surface Water network left of site....

Checked By

Micro Drainage

Simulation W.11.4

Global Variables

Region	FSR - England & Wales
Return Period (yrs)	100
M5-60 (mm)	20.000
Ratio R	0.400
Volumetric Runoff Coef	0.750
Profile Type	Summer
PIMP (%)	100
Areal Reduction Factor	1.000
Storm Duration (mins)	30
Hot Start (mins)	0
Hot Start Level (mm)	0
Manhole Headloss Coefficient	0.500
MADD Factor * 10m ³ /ha Storage	2.000
Foul Sewage/Hectare (l/s)	0.00
Additional Flow - % of Total Flow	0
Number of Input Hydrographs	0
Number of Time/Area Diagrams	0
Number of Bifurcations	0
Number of Overflows	0
Number of Off-Line Controls	0
Number of On-Line Controls	0

Starting Storm file name

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Site\Microdrainage\Existing\Surface Water network left of site.sws

Freely Discharging Outfalls

Outfall Pipe Number	Outfall MH/No	C.Level (m)	I.Level (m)	D,L (mm)	B (mm)
1.004	9	10.455	9.930	1200	0

Ashburton Court West
The Castle
Winchester SO23 8UD

Barncroft Infant School
Development Site



Date 24/06/10

Designed By NM

File Surface Water network left of site....

Checked By

Micro Drainage

Simulation W.11.4

Summary of Results

Return Period (years) 100
Storm Duration (mins) 30
Profile Type Summer
Margin for Flood Risk warning (mm) 300
Analysis Time Step Fine
DTS Status ON
DVD Status OFF
Inertia Status OFF

PN	Water Lev. (m)	Surcharged Depth (m)	Flooded Vol (m ³)	Flow/ Capacity	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	11.121	-0.154	0.000	0.22	0.0	11.2	O K
1.001	10.900	-0.065	0.000	0.84	0.0	26.5	O K
1.002	10.817	-0.098	0.000	0.61	0.0	26.4	O K
1.003	10.663	-0.102	0.000	0.58	0.0	26.3	O K
2.000	11.240	-0.100	0.000	0.00	0.0	0.0	O K
2.001	11.031	0.011	0.000	0.83	0.0	6.5	SURCH'ED
2.002	10.712	0.122	0.000	1.54	0.0	24.0	SURCH'ED
1.004	10.490	-0.085	0.000	0.70	0.0	63.8	O K

Ashburton Court West
The Castle
Winchester SO23 8UD

Barncroft Infant School
Development Site



Date 24/06/10

Designed By NM

File Surface Water network right of sit...

Checked By

Micro Drainage

Simulation W.11.4

Global Variables

Region	FSR - England & Wales
Return Period (yrs)	2
M5-60 (mm)	20.000
Ratio R	0.400
Volumetric Runoff Coef	0.750
Profile Type	Summer
PIMP (%)	100
Areal Reduction Factor	1.000
Storm Duration (mins)	30
Hot Start (mins)	0
Hot Start Level (mm)	0
Manhole Headloss Coefficient	0.500
MADD Factor * 10m ³ /ha Storage	2.000
Foul Sewage/Hectare (l/s)	0.00
Additional Flow - % of Total Flow	0
Number of Input Hydrographs	0
Number of Time/Area Diagrams	0
Number of Bifurcations	0
Number of Overflows	0
Number of Off-Line Controls	0
Number of On-Line Controls	0

Starting Storm file name

K:\Eng\Roads\Schemes\RJ502775 Barncroft Development
Site\Microdrainage\Existing\Surface Water network right of site.sws

Freely Discharging Outfalls

Outfall Pipe Number	Outfall MH/No	C.Level (m)	I.Level (m)	D,L (mm)	B (mm)
1.003	Sewer	9.850	9.400	1200	0

Ashburton Court West
The Castle
Winchester SO23 8UD

Barncroft Infant School
Development Site



Date 24/06/10

Designed By NM

File Surface Water network right of sit...

Checked By

Micro Drainage

Simulation W.11.4

Summary of Results

Return Period (years)	2
Storm Duration (mins)	30
Profile Type	Summer
Margin for Flood Risk warning (mm)	300
Analysis Time Step	Fine
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

PN	Water Lev. (m)	Surcharged Depth (m)	Flooded Vol (m ³)	Flow/ Capacity	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	11.286	0.016	0.000	0.63	0.0	16.5	SURCH'ED
1.001	11.138	0.288	0.000	1.18	0.0	17.6	SURCH'ED
1.002	10.782	0.222	0.000	1.20	0.0	26.6	SURCH'ED
1.003	9.986	-0.064	0.000	0.62	0.0	26.6	O K

Ashburton Court West
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Barncroft Infant School
Development Site



Date 24/06/10

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File Surface Water network right of sit...

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Micro Drainage

Simulation W.11.4

Global Variables

Region	FSR - England & Wales
Return Period (yrs)	30
M5-60 (mm)	20.000
Ratio R	0.400
Volumetric Runoff Coef	0.750
Profile Type	Summer
PIMP (%)	100
Areal Reduction Factor	1.000
Storm Duration (mins)	30
Hot Start (mins)	0
Hot Start Level (mm)	0
Manhole Headloss Coefficient	0.500
MADD Factor * 10m ³ /ha Storage	2.000
Foul Sewage/Hectare (l/s)	0.00
Additional Flow - % of Total Flow	0
Number of Input Hydrographs	0
Number of Time/Area Diagrams	0
Number of Bifurcations	0
Number of Overflows	0
Number of Off-Line Controls	0
Number of On-Line Controls	0

Starting Storm file name

K:\Eng\Roads\Schemes\RJ502775 Barncroft Development
Site\Microdrainage\Existing\Surface Water network right of site.sws

Freely Discharging Outfalls

Outfall Pipe Number	Outfall MH/No	C.Level (m)	I.Level (m)	D,L (mm)	B (mm)
1.003	Sewer	9.850	9.400	1200	0

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Summary of Results

Return Period (years)	30
Storm Duration (mins)	30
Profile Type	Summer
Margin for Flood Risk warning (mm)	300
Analysis Time Step	Fine
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

PN	Water Lev. (m)	Surcharged Depth (m)	Flooded Vol (m ³)	Flow/ Capacity	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	11.638	0.368	8.031	0.86	0.0	22.4	FLOOD
1.001	11.551	0.701	0.981	1.52	0.0	22.6	FLOOD
1.002	11.485	0.925	0.000	1.67	0.0	37.0	FLD RISK
1.003	10.008	-0.042	0.000	0.86	0.0	36.9	O K

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Global Variables

Region	FSR - England & Wales
Return Period (yrs)	100
M5-60 (mm)	20.000
Ratio R	0.400
Volumetric Runoff Coef	0.750
Profile Type	Summer
PIMP (%)	100
Areal Reduction Factor	1.000
Storm Duration (mins)	30
Hot Start (mins)	0
Hot Start Level (mm)	0
Manhole Headloss Coefficient	0.500
MADD Factor * 10m ³ /ha Storage	2.000
Foul Sewage/Hectare (l/s)	0.00
Additional Flow - % of Total Flow	0
Number of Input Hydrographs	0
Number of Time/Area Diagrams	0
Number of Bifurcations	0
Number of Overflows	0
Number of Off-Line Controls	0
Number of On-Line Controls	0

Starting Storm file name

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Freely Discharging Outfalls

Outfall Pipe Number	Outfall MH/No	C.Level (m)	I.Level (m)	D,L (mm)	B (mm)
1.003	Sewer	9.850	9.400	1200	0

Ashburton Court West
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Date 24/06/10

Designed By NM

File Surface Water network right of sit...

Checked By

Micro Drainage

Simulation W.11.4

Summary of Results

Return Period (years)	100
Storm Duration (mins)	30
Profile Type	Summer
Margin for Flood Risk warning (mm)	300
Analysis Time Step	Fine
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

PN	Water Lev. (m)	Surcharged Depth (m)	Flooded Vol (m ³)	Flow/ Capacity	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	11.646	0.376	16.084	0.88	0.0	23.1	FLOOD
1.001	11.553	0.703	3.515	1.55	0.0	23.1	FLOOD
1.002	11.492	0.932	1.985	1.69	0.0	37.3	FLOOD
1.003	10.009	-0.041	0.000	0.87	0.0	37.3	O K



Calculation Sheet

Project Name: <i>Barncroft Infants School Redevelopment</i>		
Project Ref: R.J502775.03		
Calc Details: Attenuation Requirements		
Prepared by: N. Mugford	Date: 18/08/10	Sheet: 1

The proposed development as shown in Appendix E has four points of connection to the Southern Water storm sewer. Each point of connection will require its flow rate attenuating so that the overall discharge across the site does not exceed the 1 in 2 year storm discharge of 48.9 l/s. For the purpose of modelling each connection will have individual attenuation; a detailed design may incorporate fewer attenuation features that are linked together.

The infant school housing area has been broken down into Top, Middle and Bottom for modelling and there is the Surplus Land to the south west.

Location	Area /ha	% of Dev.Area	Flow / l/s	30 year / m ³	100 year +30% / m ³	100 year 30% Above ground storage / m ³
Top of Housing	0.245	43.99	21.51	20.4	49.6	29.2
Middle of Housing	0.088	15.80	7.72	7.3	17.8	10.5
Bottom of Housing	0.156	28.01	13.69	12.7	30.7	18
Surplus Land Site	0.068	12.21	5.97	5.6	13.7	8.1
Total	0.557ha	100	48.89 l/s	46 m³	111.8 m³	65.8m³



Summary of Results for 30 year Return Period

Half Drain Time : 7 minutes

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
15 Summer	16.2	0.0	16.2	98.9723	0.9723	11.1	O K
30 Summer	16.3	0.0	16.3	98.9773	0.9773	11.1	O K
60 Summer	15.4	0.0	15.4	98.8173	0.8173	9.3	O K
120 Summer	13.5	0.0	13.5	98.4558	0.4557	5.2	O K
180 Summer	13.2	0.0	13.2	98.1728	0.1727	2.0	O K
240 Summer	13.2	0.0	13.2	98.0133	0.0133	0.1	O K
360 Summer	10.2	0.0	10.2	98.0000	0.0000	0.0	O K
480 Summer	8.2	0.0	8.2	98.0000	0.0000	0.0	O K
600 Summer	6.9	0.0	6.9	98.0000	0.0000	0.0	O K
720 Summer	6.0	0.0	6.0	98.0000	0.0000	0.0	O K
960 Summer	4.8	0.0	4.8	98.0000	0.0000	0.0	O K
1440 Summer	3.5	0.0	3.5	98.0000	0.0000	0.0	O K
2160 Summer	2.5	0.0	2.5	98.0000	0.0000	0.0	O K
2880 Summer	2.0	0.0	2.0	98.0000	0.0000	0.0	O K
4320 Summer	1.5	0.0	1.5	98.0000	0.0000	0.0	O K
5760 Summer	1.2	0.0	1.2	98.0000	0.0000	0.0	O K
7200 Summer	1.0	0.0	1.0	98.0000	0.0000	0.0	O K
8640 Summer	0.8	0.0	0.8	98.0000	0.0000	0.0	O K
10080 Summer	0.7	0.0	0.7	98.0000	0.0000	0.0	O K
15 Winter	20.2	0.0	20.2	99.7807	1.7807	12.7	O K
30 Winter	18.9	0.0	18.9	99.4987	1.4987	12.4	O K
60 Winter	15.4	0.0	15.4	98.8223	0.8223	9.4	O K
120 Winter	13.2	0.0	13.2	98.2883	0.2882	3.3	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	76.03	13
30 Summer	49.50	22
60 Summer	30.81	38
120 Summer	18.61	70
180 Summer	13.72	100
240 Summer	10.99	124
360 Summer	8.03	0
480 Summer	6.43	0
600 Summer	5.40	0
720 Summer	4.69	0
960 Summer	3.74	0
1440 Summer	2.72	0
2160 Summer	1.98	0
2880 Summer	1.58	0
4320 Summer	1.14	0
5760 Summer	0.91	0
7200 Summer	0.76	0
8640 Summer	0.66	0
10080 Summer	0.58	0
15 Winter	76.03	14
30 Winter	49.50	23
60 Winter	30.81	40
120 Winter	18.61	74



Summary of Results for 30 year Return Period

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
180 Winter	12.6	0.0	12.6	98.0000	0.0000	0.0	O K
240 Winter	10.1	0.0	10.1	98.0000	0.0000	0.0	O K
360 Winter	7.4	0.0	7.4	98.0000	0.0000	0.0	O K
480 Winter	5.9	0.0	5.9	98.0000	0.0000	0.0	O K
600 Winter	5.0	0.0	5.0	98.0000	0.0000	0.0	O K
720 Winter	4.3	0.0	4.3	98.0000	0.0000	0.0	O K
960 Winter	3.4	0.0	3.4	98.0000	0.0000	0.0	O K
1440 Winter	2.5	0.0	2.5	98.0000	0.0000	0.0	O K
2160 Winter	1.8	0.0	1.8	98.0000	0.0000	0.0	O K
2880 Winter	1.5	0.0	1.5	98.0000	0.0000	0.0	O K
4320 Winter	1.1	0.0	1.1	98.0000	0.0000	0.0	O K
5760 Winter	0.8	0.0	0.8	98.0000	0.0000	0.0	O K
7200 Winter	0.7	0.0	0.7	98.0000	0.0000	0.0	O K
8640 Winter	0.6	0.0	0.6	98.0000	0.0000	0.0	O K
10080 Winter	0.5	0.0	0.5	98.0000	0.0000	0.0	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
180 Winter	13.72	0
240 Winter	10.99	0
360 Winter	8.03	0
480 Winter	6.43	0
600 Winter	5.40	0
720 Winter	4.69	0
960 Winter	3.74	0
1440 Winter	2.72	0
2160 Winter	1.98	0
2880 Winter	1.58	0
4320 Winter	1.14	0
5760 Winter	0.91	0
7200 Winter	0.76	0
8640 Winter	0.66	0
10080 Winter	0.58	0

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File Storage tank for Bottom of site 10...	Checked By	
Micro Drainage	Source Control W.11.4	

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 17 minutes

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
15 Summer	15.7	0.0	15.7	98.8648	0.8648	24.6	O K
30 Summer	16.0	0.0	16.0	98.9323	0.9323	26.6	O K
60 Summer	15.8	0.0	15.8	98.8958	0.8958	25.5	O K
120 Summer	14.9	0.0	14.9	98.7238	0.7238	20.6	O K
180 Summer	13.9	0.0	13.9	98.5443	0.5442	15.5	O K
240 Summer	13.2	0.0	13.2	98.3803	0.3802	10.8	O K
360 Summer	13.2	0.0	13.2	98.1323	0.1323	3.8	O K
480 Summer	13.2	0.0	13.2	98.0088	0.0088	0.2	O K
600 Summer	11.5	0.0	11.5	98.0000	0.0000	0.0	O K
720 Summer	10.0	0.0	10.0	98.0000	0.0000	0.0	O K
960 Summer	7.9	0.0	7.9	98.0000	0.0000	0.0	O K
1440 Summer	5.7	0.0	5.7	98.0000	0.0000	0.0	O K
2160 Summer	4.1	0.0	4.1	98.0000	0.0000	0.0	O K
2880 Summer	3.3	0.0	3.3	98.0000	0.0000	0.0	O K
4320 Summer	2.4	0.0	2.4	98.0000	0.0000	0.0	O K
5760 Summer	1.9	0.0	1.9	98.0000	0.0000	0.0	O K
7200 Summer	1.6	0.0	1.6	98.0000	0.0000	0.0	O K
8640 Summer	1.3	0.0	1.3	98.0000	0.0000	0.0	O K
10080 Summer	1.2	0.0	1.2	98.0000	0.0000	0.0	O K
15 Winter	16.4	0.0	16.4	99.0088	1.0088	28.7	O K
30 Winter	20.4	0.0	20.4	99.8402	1.8402	30.7	FLOOD RISK
60 Winter	16.5	0.0	16.5	99.0228	1.0228	29.1	O K
120 Winter	15.0	0.0	15.0	98.7448	0.7448	21.2	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	128.29	15
30 Summer	84.23	24
60 Summer	52.66	42
120 Summer	31.80	76
180 Summer	23.35	108
240 Summer	18.64	138
360 Summer	13.54	196
480 Summer	10.79	246
600 Summer	9.04	0
720 Summer	7.82	0
960 Summer	6.22	0
1440 Summer	4.49	0
2160 Summer	3.24	0
2880 Summer	2.57	0
4320 Summer	1.85	0
5760 Summer	1.46	0
7200 Summer	1.22	0
8640 Summer	1.05	0
10080 Summer	0.92	0
15 Winter	128.29	16
30 Winter	84.23	25
60 Winter	52.66	44
120 Winter	31.80	80

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Micro Drainage	Source Control W.11.4	

Summary of Results for 100 year Return Period (+30%)

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
180 Winter	13.6	0.0	13.6	98.4783	0.4782	13.6	O K
240 Winter	13.2	0.0	13.2	98.2378	0.2377	6.8	O K
360 Winter	12.5	0.0	12.5	98.0000	0.0000	0.0	O K
480 Winter	9.9	0.0	9.9	98.0000	0.0000	0.0	O K
600 Winter	8.3	0.0	8.3	98.0000	0.0000	0.0	O K
720 Winter	7.2	0.0	7.2	98.0000	0.0000	0.0	O K
960 Winter	5.7	0.0	5.7	98.0000	0.0000	0.0	O K
1440 Winter	4.1	0.0	4.1	98.0000	0.0000	0.0	O K
2160 Winter	3.0	0.0	3.0	98.0000	0.0000	0.0	O K
2880 Winter	2.4	0.0	2.4	98.0000	0.0000	0.0	O K
4320 Winter	1.7	0.0	1.7	98.0000	0.0000	0.0	O K
5760 Winter	1.3	0.0	1.3	98.0000	0.0000	0.0	O K
7200 Winter	1.1	0.0	1.1	98.0000	0.0000	0.0	O K
8640 Winter	1.0	0.0	1.0	98.0000	0.0000	0.0	O K
10080 Winter	0.8	0.0	0.8	98.0000	0.0000	0.0	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
180 Winter	23.35	114
240 Winter	18.64	144
360 Winter	13.54	0
480 Winter	10.79	0
600 Winter	9.04	0
720 Winter	7.82	0
960 Winter	6.22	0
1440 Winter	4.49	0
2160 Winter	3.24	0
2880 Winter	2.57	0
4320 Winter	1.85	0
5760 Winter	1.46	0
7200 Winter	1.22	0
8640 Winter	1.05	0
10080 Winter	0.92	0

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File Storage tank for Middle of site 30 ...	Checked By	
Micro Drainage		Source Control W.11.4

Summary of Results for 30 year Return Period

Half Drain Time : 6 minutes

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
15 Summer	9.7	0.0	9.7	99.0538	1.0538	6.4	O K
30 Summer	9.8	0.0	9.8	99.0778	1.0778	6.5	O K
60 Summer	9.1	0.0	9.1	98.8863	0.8863	5.5	O K
120 Summer	8.0	0.0	8.0	98.5598	0.5597	3.5	O K
180 Summer	7.1	0.0	7.1	98.3233	0.3232	2.0	O K
240 Summer	6.4	0.0	6.4	98.1618	0.1617	1.0	O K
360 Summer	5.7	0.0	5.7	98.0013	0.0013	0.0	O K
480 Summer	4.6	0.0	4.6	98.0000	0.0000	0.0	O K
600 Summer	3.9	0.0	3.9	98.0000	0.0000	0.0	O K
720 Summer	3.4	0.0	3.4	98.0000	0.0000	0.0	O K
960 Summer	2.7	0.0	2.7	98.0000	0.0000	0.0	O K
1440 Summer	2.0	0.0	2.0	98.0000	0.0000	0.0	O K
2160 Summer	1.4	0.0	1.4	98.0000	0.0000	0.0	O K
2880 Summer	1.1	0.0	1.1	98.0000	0.0000	0.0	O K
4320 Summer	0.8	0.0	0.8	98.0000	0.0000	0.0	O K
5760 Summer	0.7	0.0	0.7	98.0000	0.0000	0.0	O K
7200 Summer	0.5	0.0	0.5	98.0000	0.0000	0.0	O K
8640 Summer	0.5	0.0	0.5	98.0000	0.0000	0.0	O K
10080 Summer	0.4	0.0	0.4	98.0000	0.0000	0.0	O K
15 Winter	11.8	0.0	11.8	99.8222	1.8222	7.3	FLOOD RISK
30 Winter	11.4	0.0	11.4	99.6577	1.6577	7.1	O K
60 Winter	9.2	0.0	9.2	98.9013	0.9013	5.6	O K
120 Winter	7.5	0.0	7.5	98.4377	0.4377	2.7	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	76.03	13
30 Summer	49.50	22
60 Summer	30.81	38
120 Summer	18.61	70
180 Summer	13.72	100
240 Summer	10.99	130
360 Summer	8.03	184
480 Summer	6.43	0
600 Summer	5.40	0
720 Summer	4.69	0
960 Summer	3.74	0
1440 Summer	2.72	0
2160 Summer	1.98	0
2880 Summer	1.58	0
4320 Summer	1.14	0
5760 Summer	0.91	0
7200 Summer	0.76	0
8640 Summer	0.66	0
10080 Summer	0.58	0
15 Winter	76.03	13
30 Winter	49.50	22
60 Winter	30.81	40
120 Winter	18.61	72

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Summary of Results for 30 year Return Period

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
180 Winter	6.3	0.0	6.3	98.1508	0.1507	0.9	O K
240 Winter	5.7	0.0	5.7	98.0000	0.0000	0.0	O K
360 Winter	4.2	0.0	4.2	98.0000	0.0000	0.0	O K
480 Winter	3.3	0.0	3.3	98.0000	0.0000	0.0	O K
600 Winter	2.8	0.0	2.8	98.0000	0.0000	0.0	O K
720 Winter	2.4	0.0	2.4	98.0000	0.0000	0.0	O K
960 Winter	1.9	0.0	1.9	98.0000	0.0000	0.0	O K
1440 Winter	1.4	0.0	1.4	98.0000	0.0000	0.0	O K
2160 Winter	1.0	0.0	1.0	98.0000	0.0000	0.0	O K
2880 Winter	0.8	0.0	0.8	98.0000	0.0000	0.0	O K
4320 Winter	0.6	0.0	0.6	98.0000	0.0000	0.0	O K
5760 Winter	0.5	0.0	0.5	98.0000	0.0000	0.0	O K
7200 Winter	0.4	0.0	0.4	98.0000	0.0000	0.0	O K
8640 Winter	0.3	0.0	0.3	98.0000	0.0000	0.0	O K
10080 Winter	0.3	0.0	0.3	98.0000	0.0000	0.0	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
180 Winter	13.72	102
240 Winter	10.99	0
360 Winter	8.03	0
480 Winter	6.43	0
600 Winter	5.40	0
720 Winter	4.69	0
960 Winter	3.74	0
1440 Winter	2.72	0
2160 Winter	1.98	0
2880 Winter	1.58	0
4320 Winter	1.14	0
5760 Winter	0.91	0
7200 Winter	0.76	0
8640 Winter	0.66	0
10080 Winter	0.58	0

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File Storage tank for Middle of site 10...	Checked By	
Micro Drainage		Source Control W.11.4

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 16 minutes

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
15 Summer	9.1	0.0	9.1	98.8813	0.8813	14.2	O K
30 Summer	9.4	0.0	9.4	98.9618	0.9618	15.5	O K
60 Summer	9.3	0.0	9.3	98.9273	0.9273	15.0	O K
120 Summer	8.7	0.0	8.7	98.7673	0.7673	12.4	O K
180 Summer	8.2	0.0	8.2	98.6058	0.6058	9.8	O K
240 Summer	7.6	0.0	7.6	98.4657	0.4657	7.5	O K
360 Summer	6.8	0.0	6.8	98.2588	0.2587	4.2	O K
480 Summer	6.2	0.0	6.2	98.1223	0.1223	2.0	O K
600 Summer	5.9	0.0	5.9	98.0368	0.0367	0.6	O K
720 Summer	5.6	0.0	5.6	98.0000	0.0000	0.0	O K
960 Summer	4.5	0.0	4.5	98.0000	0.0000	0.0	O K
1440 Summer	3.2	0.0	3.2	98.0000	0.0000	0.0	O K
2160 Summer	2.3	0.0	2.3	98.0000	0.0000	0.0	O K
2880 Summer	1.8	0.0	1.8	98.0000	0.0000	0.0	O K
4320 Summer	1.3	0.0	1.3	98.0000	0.0000	0.0	O K
5760 Summer	1.0	0.0	1.0	98.0000	0.0000	0.0	O K
7200 Summer	0.9	0.0	0.9	98.0000	0.0000	0.0	O K
8640 Summer	0.8	0.0	0.8	98.0000	0.0000	0.0	O K
10080 Summer	0.7	0.0	0.7	98.0000	0.0000	0.0	O K
15 Winter	9.6	0.0	9.6	99.0278	1.0278	16.5	O K
30 Winter	12.1	0.0	12.1	99.9132	1.9132	17.8	FLOOD RISK
60 Winter	9.8	0.0	9.8	99.0873	1.0873	16.9	O K
120 Winter	8.8	0.0	8.8	98.7938	0.7938	12.8	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	128.29	15
30 Summer	84.23	24
60 Summer	52.66	42
120 Summer	31.80	74
180 Summer	23.35	108
240 Summer	18.64	138
360 Summer	13.54	198
480 Summer	10.79	256
600 Summer	9.04	312
720 Summer	7.82	0
960 Summer	6.22	0
1440 Summer	4.49	0
2160 Summer	3.24	0
2880 Summer	2.57	0
4320 Summer	1.85	0
5760 Summer	1.46	0
7200 Summer	1.22	0
8640 Summer	1.05	0
10080 Summer	0.92	0
15 Winter	128.29	15
30 Winter	84.23	24
60 Winter	52.66	44
120 Winter	31.80	80



Summary of Results for 100 year Return Period (+30%)

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
180 Winter	8.0	0.0	8.0	98.5598	0.5597	9.0	O K
240 Winter	7.3	0.0	7.3	98.3728	0.3727	6.0	O K
360 Winter	6.2	0.0	6.2	98.1168	0.1168	1.9	O K
480 Winter	5.6	0.0	5.6	98.0000	0.0000	0.0	O K
600 Winter	4.7	0.0	4.7	98.0000	0.0000	0.0	O K
720 Winter	4.1	0.0	4.1	98.0000	0.0000	0.0	O K
960 Winter	3.2	0.0	3.2	98.0000	0.0000	0.0	O K
1440 Winter	2.3	0.0	2.3	98.0000	0.0000	0.0	O K
2160 Winter	1.7	0.0	1.7	98.0000	0.0000	0.0	O K
2880 Winter	1.3	0.0	1.3	98.0000	0.0000	0.0	O K
4320 Winter	1.0	0.0	1.0	98.0000	0.0000	0.0	O K
5760 Winter	0.8	0.0	0.8	98.0000	0.0000	0.0	O K
7200 Winter	0.6	0.0	0.6	98.0000	0.0000	0.0	O K
8640 Winter	0.5	0.0	0.5	98.0000	0.0000	0.0	O K
10080 Winter	0.5	0.0	0.5	98.0000	0.0000	0.0	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
180 Winter	23.35	112
240 Winter	18.64	144
360 Winter	13.54	202
480 Winter	10.79	0
600 Winter	9.04	0
720 Winter	7.82	0
960 Winter	6.22	0
1440 Winter	4.49	0
2160 Winter	3.24	0
2880 Winter	2.57	0
4320 Winter	1.85	0
5760 Winter	1.46	0
7200 Winter	1.22	0
8640 Winter	1.05	0
10080 Winter	0.92	0

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Ashburton Court West The Castle Winchester SO23 8UD		
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Summary of Results for 30 year Return Period

Half Drain Time : 7 minutes

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
15 Summer	25.5	0.0	25.5	98.9288	0.9288	17.6	O K
30 Summer	25.6	0.0	25.6	98.9413	0.9413	17.9	O K
60 Summer	24.2	0.0	24.2	98.7908	0.7908	15.0	O K
120 Summer	21.3	0.0	21.3	98.4683	0.4682	8.9	O K
180 Summer	19.5	0.0	19.5	98.2173	0.2172	4.1	O K
240 Summer	19.1	0.0	19.1	98.0538	0.0538	1.0	O K
360 Summer	16.1	0.0	16.1	98.0000	0.0000	0.0	O K
480 Summer	12.9	0.0	12.9	98.0000	0.0000	0.0	O K
600 Summer	10.8	0.0	10.8	98.0000	0.0000	0.0	O K
720 Summer	9.4	0.0	9.4	98.0000	0.0000	0.0	O K
960 Summer	7.5	0.0	7.5	98.0000	0.0000	0.0	O K
1440 Summer	5.4	0.0	5.4	98.0000	0.0000	0.0	O K
2160 Summer	4.0	0.0	4.0	98.0000	0.0000	0.0	O K
2880 Summer	3.2	0.0	3.2	98.0000	0.0000	0.0	O K
4320 Summer	2.3	0.0	2.3	98.0000	0.0000	0.0	O K
5760 Summer	1.8	0.0	1.8	98.0000	0.0000	0.0	O K
7200 Summer	1.5	0.0	1.5	98.0000	0.0000	0.0	O K
8640 Summer	1.3	0.0	1.3	98.0000	0.0000	0.0	O K
10080 Summer	1.2	0.0	1.2	98.0000	0.0000	0.0	O K
15 Winter	30.3	0.0	30.3	99.5217	1.5217	20.4	O K
30 Winter	28.0	0.0	28.0	99.2308	1.2308	20.1	O K
60 Winter	24.3	0.0	24.3	98.8013	0.8013	15.2	O K
120 Winter	20.2	0.0	20.2	98.3322	0.3322	6.3	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	76.03	13
30 Summer	49.50	22
60 Summer	30.81	38
120 Summer	18.61	70
180 Summer	13.72	100
240 Summer	10.99	128
360 Summer	8.03	0
480 Summer	6.43	0
600 Summer	5.40	0
720 Summer	4.69	0
960 Summer	3.74	0
1440 Summer	2.72	0
2160 Summer	1.98	0
2880 Summer	1.58	0
4320 Summer	1.14	0
5760 Summer	0.91	0
7200 Summer	0.76	0
8640 Summer	0.66	0
10080 Summer	0.58	0
15 Winter	76.03	14
30 Winter	49.50	23
60 Winter	30.81	40
120 Winter	18.61	74



Summary of Results for 30 year Return Period

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
180 Winter	19.1	0.0	19.1	98.0138	0.0138	0.3	O K
240 Winter	15.9	0.0	15.9	98.0000	0.0000	0.0	O K
360 Winter	11.6	0.0	11.6	98.0000	0.0000	0.0	O K
480 Winter	9.3	0.0	9.3	98.0000	0.0000	0.0	O K
600 Winter	7.8	0.0	7.8	98.0000	0.0000	0.0	O K
720 Winter	6.8	0.0	6.8	98.0000	0.0000	0.0	O K
960 Winter	5.4	0.0	5.4	98.0000	0.0000	0.0	O K
1440 Winter	3.9	0.0	3.9	98.0000	0.0000	0.0	O K
2160 Winter	2.9	0.0	2.9	98.0000	0.0000	0.0	O K
2880 Winter	2.3	0.0	2.3	98.0000	0.0000	0.0	O K
4320 Winter	1.7	0.0	1.7	98.0000	0.0000	0.0	O K
5760 Winter	1.3	0.0	1.3	98.0000	0.0000	0.0	O K
7200 Winter	1.1	0.0	1.1	98.0000	0.0000	0.0	O K
8640 Winter	1.0	0.0	1.0	98.0000	0.0000	0.0	O K
10080 Winter	0.8	0.0	0.8	98.0000	0.0000	0.0	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
180 Winter	13.72	96
240 Winter	10.99	0
360 Winter	8.03	0
480 Winter	6.43	0
600 Winter	5.40	0
720 Winter	4.69	0
960 Winter	3.74	0
1440 Winter	2.72	0
2160 Winter	1.98	0
2880 Winter	1.58	0
4320 Winter	1.14	0
5760 Winter	0.91	0
7200 Winter	0.76	0
8640 Winter	0.66	0
10080 Winter	0.58	0

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File Storage tank for Top of site 100 y...	Designed By Hantsnet
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Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 20 minutes

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m³)	Status
15 Summer	24.7	0.0	24.7	98.8238	0.8238	39.1	O K
30 Summer	25.3	0.0	25.3	98.8903	0.8903	42.3	O K
60 Summer	25.0	0.0	25.0	98.8618	0.8618	40.9	O K
120 Summer	23.6	0.0	23.6	98.7053	0.7053	33.5	O K
180 Summer	22.0	0.0	22.0	98.5448	0.5447	25.9	O K
240 Summer	20.5	0.0	20.5	98.3998	0.3997	19.0	O K
360 Summer	19.5	0.0	19.5	98.1753	0.1752	8.3	O K
480 Summer	19.5	0.0	19.5	98.0293	0.0292	1.4	O K
600 Summer	18.1	0.0	18.1	98.0000	0.0000	0.0	O K
720 Summer	15.7	0.0	15.7	98.0000	0.0000	0.0	O K
960 Summer	12.4	0.0	12.4	98.0000	0.0000	0.0	O K
1440 Summer	9.0	0.0	9.0	98.0000	0.0000	0.0	O K
2160 Summer	6.5	0.0	6.5	98.0000	0.0000	0.0	O K
2880 Summer	5.1	0.0	5.1	98.0000	0.0000	0.0	O K
4320 Summer	3.7	0.0	3.7	98.0000	0.0000	0.0	O K
5760 Summer	2.9	0.0	2.9	98.0000	0.0000	0.0	O K
7200 Summer	2.4	0.0	2.4	98.0000	0.0000	0.0	O K
8640 Summer	2.1	0.0	2.1	98.0000	0.0000	0.0	O K
10080 Summer	1.8	0.0	1.8	98.0000	0.0000	0.0	O K
15 Winter	25.9	0.0	25.9	98.9588	0.9588	45.5	O K
30 Winter	26.9	0.0	26.9	99.0668	1.0668	49.6	O K
60 Winter	26.1	0.0	26.1	98.9778	0.9778	46.4	O K
120 Winter	23.8	0.0	23.8	98.7308	0.7308	34.7	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	128.29	15
30 Summer	84.23	24
60 Summer	52.66	42
120 Summer	31.80	76
180 Summer	23.35	108
240 Summer	18.64	140
360 Summer	13.54	198
480 Summer	10.79	250
600 Summer	9.04	0
720 Summer	7.82	0
960 Summer	6.22	0
1440 Summer	4.49	0
2160 Summer	3.24	0
2880 Summer	2.57	0
4320 Summer	1.85	0
5760 Summer	1.46	0
7200 Summer	1.22	0
8640 Summer	1.05	0
10080 Summer	0.92	0
15 Winter	128.29	15
30 Winter	84.23	25
60 Winter	52.66	44
120 Winter	31.80	80

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Summary of Results for 100 year Return Period (+30%)

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
180 Winter	21.5	0.0	21.5	98.4953	0.4952	23.5	O K
240 Winter	19.5	0.0	19.5	98.2933	0.2932	13.9	O K
360 Winter	19.5	0.0	19.5	98.0003	0.0003	0.0	O K
480 Winter	15.6	0.0	15.6	98.0000	0.0000	0.0	O K
600 Winter	13.1	0.0	13.1	98.0000	0.0000	0.0	O K
720 Winter	11.3	0.0	11.3	98.0000	0.0000	0.0	O K
960 Winter	9.0	0.0	9.0	98.0000	0.0000	0.0	O K
1440 Winter	6.5	0.0	6.5	98.0000	0.0000	0.0	O K
2160 Winter	4.7	0.0	4.7	98.0000	0.0000	0.0	O K
2880 Winter	3.7	0.0	3.7	98.0000	0.0000	0.0	O K
4320 Winter	2.7	0.0	2.7	98.0000	0.0000	0.0	O K
5760 Winter	2.1	0.0	2.1	98.0000	0.0000	0.0	O K
7200 Winter	1.8	0.0	1.8	98.0000	0.0000	0.0	O K
8640 Winter	1.5	0.0	1.5	98.0000	0.0000	0.0	O K
10080 Winter	1.3	0.0	1.3	98.0000	0.0000	0.0	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
180 Winter	23.35	114
240 Winter	18.64	146
360 Winter	13.54	184
480 Winter	10.79	0
600 Winter	9.04	0
720 Winter	7.82	0
960 Winter	6.22	0
1440 Winter	4.49	0
2160 Winter	3.24	0
2880 Winter	2.57	0
4320 Winter	1.85	0
5760 Winter	1.46	0
7200 Winter	1.22	0
8640 Winter	1.05	0
10080 Winter	0.92	0



Summary of Results for 30 year Return Period

Half Drain Time : 7 minutes

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
15 Summer	7.5	0.0	7.5	99.0373	1.0373	4.9	O K
30 Summer	7.5	0.0	7.5	99.0458	1.0458	4.9	O K
60 Summer	7.1	0.0	7.1	98.8718	0.8718	4.1	O K
120 Summer	6.2	0.0	6.2	98.5353	0.5352	2.5	O K
180 Summer	5.5	0.0	5.5	98.2933	0.2932	1.4	O K
240 Summer	5.0	0.0	5.0	98.1258	0.1258	0.6	O K
360 Summer	4.5	0.0	4.5	98.0000	0.0000	0.0	O K
480 Summer	3.6	0.0	3.6	98.0000	0.0000	0.0	O K
600 Summer	3.0	0.0	3.0	98.0000	0.0000	0.0	O K
720 Summer	2.6	0.0	2.6	98.0000	0.0000	0.0	O K
960 Summer	2.1	0.0	2.1	98.0000	0.0000	0.0	O K
1440 Summer	1.5	0.0	1.5	98.0000	0.0000	0.0	O K
2160 Summer	1.1	0.0	1.1	98.0000	0.0000	0.0	O K
2880 Summer	0.9	0.0	0.9	98.0000	0.0000	0.0	O K
4320 Summer	0.6	0.0	0.6	98.0000	0.0000	0.0	O K
5760 Summer	0.5	0.0	0.5	98.0000	0.0000	0.0	O K
7200 Summer	0.4	0.0	0.4	98.0000	0.0000	0.0	O K
8640 Summer	0.4	0.0	0.4	98.0000	0.0000	0.0	O K
10080 Summer	0.3	0.0	0.3	98.0000	0.0000	0.0	O K
15 Winter	8.8	0.0	8.8	99.6312	1.6312	5.6	O K
30 Winter	8.5	0.0	8.5	99.4877	1.4877	5.4	O K
60 Winter	7.1	0.0	7.1	98.8833	0.8833	4.2	O K
120 Winter	5.8	0.0	5.8	98.4083	0.4082	1.9	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	76.03	13
30 Summer	49.50	22
60 Summer	30.81	38
120 Summer	18.61	70
180 Summer	13.72	100
240 Summer	10.99	128
360 Summer	8.03	0
480 Summer	6.43	0
600 Summer	5.40	0
720 Summer	4.69	0
960 Summer	3.74	0
1440 Summer	2.72	0
2160 Summer	1.98	0
2880 Summer	1.58	0
4320 Summer	1.14	0
5760 Summer	0.91	0
7200 Summer	0.76	0
8640 Summer	0.66	0
10080 Summer	0.58	0
15 Winter	76.03	13
30 Winter	49.50	22
60 Winter	30.81	40
120 Winter	18.61	72



Summary of Results for 30 year Return Period

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
180 Winter	4.9	0.0	4.9	98.1038	0.1038	0.5	O K
240 Winter	4.4	0.0	4.4	98.0000	0.0000	0.0	O K
360 Winter	3.2	0.0	3.2	98.0000	0.0000	0.0	O K
480 Winter	2.6	0.0	2.6	98.0000	0.0000	0.0	O K
600 Winter	2.2	0.0	2.2	98.0000	0.0000	0.0	O K
720 Winter	1.9	0.0	1.9	98.0000	0.0000	0.0	O K
960 Winter	1.5	0.0	1.5	98.0000	0.0000	0.0	O K
1440 Winter	1.1	0.0	1.1	98.0000	0.0000	0.0	O K
2160 Winter	0.8	0.0	0.8	98.0000	0.0000	0.0	O K
2880 Winter	0.6	0.0	0.6	98.0000	0.0000	0.0	O K
4320 Winter	0.5	0.0	0.5	98.0000	0.0000	0.0	O K
5760 Winter	0.4	0.0	0.4	98.0000	0.0000	0.0	O K
7200 Winter	0.3	0.0	0.3	98.0000	0.0000	0.0	O K
8640 Winter	0.3	0.0	0.3	98.0000	0.0000	0.0	O K
10080 Winter	0.2	0.0	0.2	98.0000	0.0000	0.0	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
180 Winter	13.72	102
240 Winter	10.99	0
360 Winter	8.03	0
480 Winter	6.43	0
600 Winter	5.40	0
720 Winter	4.69	0
960 Winter	3.74	0
1440 Winter	2.72	0
2160 Winter	1.98	0
2880 Winter	1.58	0
4320 Winter	1.14	0
5760 Winter	0.91	0
7200 Winter	0.76	0
8640 Winter	0.66	0
10080 Winter	0.58	0

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Micro Drainage	Source Control W.11.4	

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 16 minutes

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
15 Summer	7.2	0.0	7.2	98.8888	0.8888	11.0	O K
30 Summer	7.4	0.0	7.4	98.9708	0.9708	12.0	O K
60 Summer	7.3	0.0	7.3	98.9333	0.9333	11.5	O K
120 Summer	6.8	0.0	6.8	98.7713	0.7713	9.5	O K
180 Summer	6.4	0.0	6.4	98.6078	0.6078	7.5	O K
240 Summer	6.0	0.0	6.0	98.4683	0.4682	5.8	O K
360 Summer	5.3	0.0	5.3	98.2628	0.2627	3.2	O K
480 Summer	4.8	0.0	4.8	98.1293	0.1293	1.6	O K
600 Summer	4.5	0.0	4.5	98.0448	0.0448	0.6	O K
720 Summer	4.3	0.0	4.3	98.0018	0.0018	0.0	O K
960 Summer	3.5	0.0	3.5	98.0000	0.0000	0.0	O K
1440 Summer	2.5	0.0	2.5	98.0000	0.0000	0.0	O K
2160 Summer	1.8	0.0	1.8	98.0000	0.0000	0.0	O K
2880 Summer	1.4	0.0	1.4	98.0000	0.0000	0.0	O K
4320 Summer	1.0	0.0	1.0	98.0000	0.0000	0.0	O K
5760 Summer	0.8	0.0	0.8	98.0000	0.0000	0.0	O K
7200 Summer	0.7	0.0	0.7	98.0000	0.0000	0.0	O K
8640 Summer	0.6	0.0	0.6	98.0000	0.0000	0.0	O K
10080 Summer	0.5	0.0	0.5	98.0000	0.0000	0.0	O K
15 Winter	7.5	0.0	7.5	99.0408	1.0408	12.8	O K
30 Winter	9.3	0.0	9.3	99.8262	1.8262	13.7	FLOOD RISK
60 Winter	7.7	0.0	7.7	99.1083	1.1083	13.0	O K
120 Winter	6.9	0.0	6.9	98.7958	0.7958	9.8	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	128.29	15
30 Summer	84.23	24
60 Summer	52.66	42
120 Summer	31.80	74
180 Summer	23.35	106
240 Summer	18.64	138
360 Summer	13.54	198
480 Summer	10.79	256
600 Summer	9.04	314
720 Summer	7.82	366
960 Summer	6.22	0
1440 Summer	4.49	0
2160 Summer	3.24	0
2880 Summer	2.57	0
4320 Summer	1.85	0
5760 Summer	1.46	0
7200 Summer	1.22	0
8640 Summer	1.05	0
10080 Summer	0.92	0
15 Winter	128.29	15
30 Winter	84.23	24
60 Winter	52.66	44
120 Winter	31.80	80

Hampshire County Council		Page 2
Ashburton Court West		
The Castle		
Winchester SO23 8UD		
Date 15 September 2010 12:02	Designed By Hantsnet	
File Storage tank for Lower Site 100 y...	Checked By	
Micro Drainage	Source Control W.11.4	

Summary of Results for 100 year Return Period (+30%)

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
180 Winter	6.2	0.0	6.2	98.5603	0.5602	6.9	O K
240 Winter	5.7	0.0	5.7	98.3742	0.3742	4.6	O K
360 Winter	4.8	0.0	4.8	98.1248	0.1248	1.5	O K
480 Winter	4.3	0.0	4.3	98.0008	0.0008	0.0	O K
600 Winter	3.6	0.0	3.6	98.0000	0.0000	0.0	O K
720 Winter	3.1	0.0	3.1	98.0000	0.0000	0.0	O K
960 Winter	2.5	0.0	2.5	98.0000	0.0000	0.0	O K
1440 Winter	1.8	0.0	1.8	98.0000	0.0000	0.0	O K
2160 Winter	1.3	0.0	1.3	98.0000	0.0000	0.0	O K
2880 Winter	1.0	0.0	1.0	98.0000	0.0000	0.0	O K
4320 Winter	0.7	0.0	0.7	98.0000	0.0000	0.0	O K
5760 Winter	0.6	0.0	0.6	98.0000	0.0000	0.0	O K
7200 Winter	0.5	0.0	0.5	98.0000	0.0000	0.0	O K
8640 Winter	0.4	0.0	0.4	98.0000	0.0000	0.0	O K
10080 Winter	0.4	0.0	0.4	98.0000	0.0000	0.0	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
180 Winter	23.35	112
240 Winter	18.64	144
360 Winter	13.54	202
480 Winter	10.79	246
600 Winter	9.04	0
720 Winter	7.82	0
960 Winter	6.22	0
1440 Winter	4.49	0
2160 Winter	3.24	0
2880 Winter	2.57	0
4320 Winter	1.85	0
5760 Winter	1.46	0
7200 Winter	1.22	0
8640 Winter	1.05	0
10080 Winter	0.92	0