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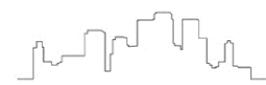
16871

Flood Risk Assessment Compliance

For Camp Road, Upper Heyford Parcel D5a

> Revision 1 March 2015

16871/B4





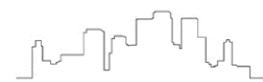


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1.0 **Introduction**

- This Flood Risk Assessment Compliance report has been prepared on behalf of the 1.1 Dorchester Group in support of their Reserved Matters application for Parcel D5a of the redevelopment off Camp Road, Upper Heyford.
- 1.2 The purpose of this report is to demonstrate that the proposed drainage design for Parcel D5a complies with the approved Flood Risk Assessment (FRA) carried out by Waterman dated October 2010 (Ref C11234 ES 001).
- Parcel D5a is a Dorchester Group development located to the north east of the development 1.3 (refer to the Site Residential Parcel Plan given in **Appendix A**).
- 1.4 This report is intended to assist in the discharge of any planning conditions that requires the developer to demonstrate compliance with the approved FRA.





2.0 Overview of Approved FRA

- 2.1 The entire site is located within Flood Zone 1.
- 2.2 The FRA sets out a detailed approach to attenuation across the Upper Heyford site which comprises of areas identified for retention, areas for refurbishment and areas for redevelopment to provide new residential dwellings.
- 2.3 The Environment Agency (EA) has confirmed that areas identified solely for retention and refurbishment do not require attenuation of existing surface water discharge.
- 2.4 The fundamental principle of the FRA is that runoff from proposed areas of redevelopment should be attenuated to existing 1 in 100 year flows with a 30% allowance for climate change.
- 2.5 Attenuation is to be provided through the use of balancing ponds, permeable paving and attenuation tanks where necessary. Swales will be incorporated through the site where appropriate.
- 2.6 The FRA splits the development into four main catchment areas and provides a series of calculations for each.
- 2.7 The FRA also requires a 10% betterment of existing flows entering the eastern tributary of the Gallos Brook.





3.0 Proposed Development

- 3.1 Parcel D5a of the proposed development is located to the north east of the Upper Heyford Site taking its main access off Camp Road via Soden Road.
- 3.2 Parcel D5a is a Dorchester Group development and comprises of 71 dwellings and 2.46 hectares (refer to **Appendix B** for proposed layouts).
- 3.3 The FRA denotes parcel D5a as being located within Catchment Area 4 as identified in the approved FRA.
- 3.4 The Indicative Surface Water Drainage Layout within the approved FRA suggests attenuation of surface water for Catchment 4 is provided by the use of, attenuation tanks, however due to the area of soft landscaping available, a pond has been proposed as an alternative. It is located on the parcel and upstream of the outfall which leads to the existing watercourse.

Discharge Strategy

- 3.5 Paragraph 3.20 of the FRA states: "In accordance with PPS25, local policy and EA guidance the rate of surface water runoff from new development would be controlled so that it does not increase over the existing situation for the 1 in 100 year even, while taking climate change into account".
- 3.6 Paragraph 3.21 also goes on to require a 10% betterment of flows discharging to the east of the site, which includes Parcel D5a.
- 3.7 It is proposed to connect the new balancing pond and on parcel attenuation pond to the existing network at run 1.004 on the proposed calculations. This existing system provides an outfall for existing and new development to the tributary of the Gallos Brook to the east of the site.
- 3.8 Following a detailed assessment of the topographical survey, site visits and proposed layout below are the Microdrainage simulation results:

Parcel D5a		
Existing 1 in 100yr	Allowable 1 in 100yr	Actual 1 in 100yr
Discharge rate	Discharge rate + CC	Discharge rate + CC
(l/s)	incl 10% betterment (l/s)	incl 10% betterment (l/s)
174.8 l/s	157.3 l/s	96.6 l/s

- 3.9 The existing discharge rate is derived from runs 2.001 and 8.002 in the existing calculations
- 3.10 The proposed discharge rate is derived from runs 6.009 in the proposed calculations





Attenuation Strategy

- 3.12 Due to parcel D5a being part of a separate catchment to the majority of the scheme, it is proposed to deal with the D5a attenuation on parcel.
- 3.13 Soakaway tests at suitable depths have not been undertaken due to solid rock being encountered from 1.6m onwards in the on parcel borehole.
- 3.14 In accordance with the FRA permeable paving is to be provided on driveways. This will be lined and have a positive connection into the drainage system and will provide some at source attenuation and water quality improvement.
- 3.15 The attenuation pond will cater for the majority of the attenuation required and either be maintained by the Water Company or a management company.
- 3.16 The final discharge from the parcel will be controlled using a hydro-brake vortex controller.
- 3.17 Living roofs have been discounted as they are not in keeping with the strict urban planning requirements within a conservation area. Rain water harvesting has also been discounted due to ongoing maintenance issues and integration into domestic plumbing. Water butts will be provided on social units.







4.0 **Hydraulic Performance** Parcel D5a

- 4.1 A detailed Microdrainage model has been constructed to simulate the 1 in 100 year (plus climate change) storm in both existing and proposed systems.
- The Microdrainage model (refer to Appendix D) demonstrates that the proposed 1 in 100 4.2 year (plus climate change) discharge rate does not exceed 157.3 l/s at run 6.009.
- The achieved discharge rate (96.6l/s) is significantly lower than the calculated allowable 4.3 discharge.

Exceedance

- 4.4 If an area of the drainage network was to become blocked or in instances where a storm in excess of the designated storm occurs, there is the potential for the storage structures and drainage system to be overwhelmed, leading to flooding. Finished floor levels and external levels have been designed in consideration of these, so that during these periods flood water will be directed away from the proposed building entrances and into the roads and soft landscaping areas. See Appendix E for layout showing an indication of flood routes.
- 4.5 Flood water entering the parcel in the above scenarios via or arising from road 2 or from the western area of road 3 will flow north and ultimately overtop the kerb and flow to the west into the soft landscaping or re-enter the drainage network when capacity is available.
- 4.6 Flood water entering the parcel in the above scenarios via or arising from road 1, 3 or 4 will flow north and east ultimately overtopping the kerb and flowing off the parcel into the existing flood route or re-enter the drainage network when capacity is available.
- 4.7 This existing flood route to the north of the parcel runs east into the existing watercourse.

Pollution prevention

- 4.7 As the parking areas are smaller than 800m sq, PPG3 states that trapped gullies will provide suitable protection against contamination. Permeable areas will filter through granular material.
- 4.8 It is noted that the offsite sewer passes through a petrol interceptor before discharge into the existing watercourse which meets the requirements of PPG3. This interceptor is to be replaced with a modern version to ensure water quality remains high post-development.

5.0 **Summary and Conclusions**

- 5.1 This report has been prepared to allow discharge of any planning conditions which require evidence of compliance with the approved Waterman Flood Risk Assessment.
- 5.2 The FRA confirms no attenuation is required for areas being refurbished or retained.
- 5.3 The FRA requires surface water runoff from new developments to be restricted to existing 1 in 100 year runoff rates, and flows attenuated including a 30% allowance for climate change. A 10% betterment is to be provided on existing flows discharging to the eastern tributary of Gallos Brook.
- 5.4 The Microdrainage models demonstrate a significant betterment in parcel discharge rates.

APPENDIX A

Residential Parcel Plan

APPENDIX B

Proposed levels and drainage layouts

APPENDIX C

Existing Microdrainage Calculations

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<u> </u> PN 1.000	n Design Min Vel Min S Networl Length (m)	k Des (m) (n) (m) (n)	ign Ta Slope (1:X) 57.2	btimisati sign only imisation esigned w ble for I.Area	(m/s) (m/s) (1:X) (1:X) (ith Lev SW EA T.E. (mins) 5.00	ST E Ba	EXIST: (1/s) 0.0	ING 15 k	HYD SECT	13.S DIA	1.200 0.75 500 WS Auto Desig	
<u> </u> PN 1.000	n Design Min Vel Min S Networl Length (m)	k Des (m) (n) (m) (n)	ign Ta Slope (1:X) 57.2	ble for I.Area (ha)	(m/s) (m/s) (1:X) (1:X) (ith Lev SW EA T.E. (mins) 5.00	ST E Ba	EXIST: (1/s) 0.0	ING 15 k (mm) 0.600	HYD SECT	13.S DIA (mm) 225	1.200 0.75 500 WS Auto Desig	
PN 1.000 1.001 2.000	n Design Min Vel Min S Networl Length (m) 35.951 26.411 14.225	k Des Fall (m) 0.622 0.225	a for Op Auto Des For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8	ble for I.Area (ha) 0.031 0.056 0.090	on (m) 7 (m/s) 1 (1:X) with Lev 5.00 0.00 5.00	ST E Ba	EXIST (1/s) 0.0 0.0 0.0	ING 15 k (mm) 0.600 0.600 0.600	HYD SECT o	13.S DIA (mm) 225 150 150	1.200 0.75 500 WS Auto Desig	
PN 1.000 1.001 2.000	n Design Min Vel Min S Networl Length (m) 35.951 26.411 14.225	k Des Fall (m) 0.622 0.225	a for Op Auto Des For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8	ble for I.Area (ha) 0.031 0.056	on (m) 7 (m/s) 1 (1:X) with Lev SW EA T.E. (mins) 5.00 0.00	ST E Ba	EXIST (1/s) 0.0 0.0 0.0	ING 15 k (mm) 0.600 0.600	HYD SECT o	13.S DIA (mm) 225 150	1.200 0.75 500 WS Auto Desig	
PN 1.000 1.001 2.000 2.001	n Design Min Vel Min S Networl Length (m)) 35.951 26.411) 14.225 22.148	k Des k Des Fall (m) 0.622 0.221 0.225 0.198	a for Op Auto Des For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 5 63.2 8 111.9	ble for I.Area (ha) 0.031 0.056 0.090	on (m) y (m/s) h (1:X) vith Lev : SW EA T.E. (mins) 5.00 0.00 5.00 0.00	Ba Ba	EXIST: (1/s) 0.0 0.0 0.0 0.0 0.0	k (mm) 0.600 0.600 0.600 0.600	HYD SECT	13.S DIA (mm) 225 150 150 300	1.200 0.75 500 WS Auto Desig	
PN 1.000 1.001 2.000 2.001	n Design Min Vel Min S Networl Length (m)) 35.951 26.411) 14.225 22.148	k Des k Des Fall (m) 0.622 0.221 0.225 0.198	a for Op Auto Des For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 5 63.2 8 111.9 4 99.2	ble for I.Area (ha) 0.031 0.056 0.090 0.200	on (m) y (m/s) h (1:X) vith Lev : SW EP T.E. (mins) 5.00 0.00 5.00 0.00	Ba Ba Flow	(1/s) 0.0 0.0 0.0 0.0 0.0	k (mm) 0.600 0.600 0.600 0.600	HYD SECT	13.S DIA (mm) 225 150 150 300	1.200 0.75 500 WS Auto Desig	
<u>P</u> N 1.000 1.001 2.000 2.001 1.002 PN Ra	n Design Min Vel Min S Networl Length (m) 35.951 26.411 0 14.225 22.148 2 10.321 ain T	k Des Fall (m) 0.622 0.215 0.225 0.104 .0.104 .C.	a for Op Auto Des For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 5 63.2 8 111.9 4 99.2 <u>1</u> US/IL	ble for I.Area (ha) 0.031 0.056 0.090 0.200 0.100 Network E I.Area	on (m) (m/s) (1:X) with Lev SW EA T.E. (mins) 5.00 0.00 5.00 0.00 0.00 Result Δ Eas	Ba Ba Flow	EXIST: (1/s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	ING 1: k (mm) 0.600 0.600 0.600 0.600 0.600 Add F	HYD SECT 0 0 0 0	13.S DIA (mm) 225 150 300 300 300	1.200 0.75 500 WS Auto Desig	Flow
<u>P</u> N 1.000 1.001 2.000 2.001 1.002 PN Ra	n Design Min Vel Min S Networl Length (m) 35.951 26.411 0 14.225 22.148 2 10.321 ain T	k Des Fall (m) 0.622 0.215 0.225 0.104 .0.104 .C.	a for Op Auto Des For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 5 63.2 8 111.9 4 99.2 <u>1</u> US/IL	ble for I.Area (ha) 0.031 0.056 0.090 0.200 0.100 Network	on (m) (m/s) (1:X) with Lev SW EA T.E. (mins) 5.00 0.00 5.00 0.00 0.00 Result Δ Eas	Ba Ba Flow	EXIST: (1/s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	ING 1: k (mm) 0.600 0.600 0.600 0.600 0.600 Add F	HYD SECT 0 0 0 0	13.S DIA (mm) 225 150 300 300 300	1.200 0.75 500 WS Auto Desig	Flow
PN 1.000 1.001 2.000 2.001 1.002 PN Ra (mm.	n Design Min Vel Min S Networl Length (m) 35.951 26.411 14.225 22.148 210.321 ain T /hr) (m	k Des k Des	a for Op Auto Des For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 5 63.2 8 111.9 4 99.2 <u>1</u> US/IL	ble for I.Area (ha) 0.031 0.056 0.090 0.200 0.100 Network 2 I.Area (ha)	<pre>con (m) y (m/s) h (1:X) with Lev SW EP T.E. (mins) 5.00 0.00 5.00 0.00 Result A Σ Ba Flow (</pre>	Ba Ba Flow	EXIST: (1/s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	k (mm) 0.600 0.600 0.600 0.600 0.600 0.600 Add F (1/)	HYD SECT 0 0 0 0 0	13.S DIA (mm) 225 150 300 300 300 Vel m/s)	1.200 0.75 500 WS Auto Desig	Flow (1/s)
PN 1.000 1.001 2.001 1.002 PN Ra (mm, 1.000	n Design Min Vel Min S Networl Length (m) 35.951 26.411 14.225 22.148 210.321 ain T /hr) (m	k Des k Des	a for Op Auto Das For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 5 63.2 8 111.9 4 99.2 <u>1</u> US/IL (m) 20.021	ble for I.Area (ha) 0.031 0.056 0.090 0.200 0.100 Network E I.Area (ha) 0.031	<pre>con (m) y (m/s) h (1:X) vith Lev c SW EP T.E. (mins) 5.00 0.00 5.00 0.00 0.00 Resul a Σ Ba Flow (</pre>	Ba Ba Flow ts T ise 1/s)	EXIST: (1/s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	k (mm) 0.600 0.600 0.600 0.600 0.600 0.600 Add F (1/:	HYD SECT 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.5 DIA (mm) 225 150 300 300 300 Vel m/s) 1.73	1.200 0.75 500 WS Auto Desig	Flow (1/s) 0.0
PN 1.000 1.001 2.000 2.001 1.002 PN Ra (mm, 1.000 1.001	n Design Min Vel Min S Networl Length (m) 0 35.951 2 26.411 0 14.225 2 2.148 2 10.321 ain T /hr) (m) 0.00	k Des k Des Fall (m) 0.622 0.222 0.104 .0.104 .C. ins) 5.35 1	a for Op Auto Des For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 5 63.2 8 111.9 4 99.2 <u>1</u> US/IL (m) 20.021 19.392	ble for I.Area (ha) 0.031 0.056 0.090 0.200 0.100 Network Σ I.Area (ha) 0.031 0.056 0.090 0.200 0.100	on (m) (m/s) (1:X) with Lev SW EA T.E. (mins) 5.00 0.00 5.00 0.00 0.00 0.00 Result A Σ Ba Flow (LST F Ba Flow ts T. ise 1/s) 0.0 0.0	EXIST: (1/s) 0.0 0.0 0.0 0.0 0.0 0.0 able Foul (1/s) 0.0 0.0	k (mm) 0.600 0.600 0.600 0.600 0.600 0.600 Add F (1/:	HYD SECT 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.S DIA (mm) 225 150 300 300 300 Vel m/s) 1.73 0.91	1.200 0.75 500 WS Auto Desig	Flow (1/s) 0.0 0.0
1.000 1.001 2.000 2.001 1.002 PN Ra (mm 1.000 1.001 2.000	n Design Min Vel Min S Networl Length (m) 0 35.951 2 6.411 0 14.225 2 2.148 2 10.321 ain T /hr) (m 0.00 0.00	k Des k Des Fall (m) 0.625 0.215 0.104 0.104 .C. ins) 5.35 1 5.35 1	a for Op Auto Des For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 5 63.2 8 111.9 4 99.2 <u>19.392</u> 19.600	ble for I.Area (ha) 0.031 0.056 0.090 0.200 0.100 Network Σ I.Area (ha) 0.031 0.056 0.090 0.200 0.100 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000 0.00000000	<pre>on (m) 7 (m/s) 1 (1:X) with Lev SW EP T.E. (mins) 5.00 0.00 5.00 0.00 Resul A Σ Ba Flow (7 </pre>	LST F Ba Flow ts T. Use 1/s) 0.0 0.0	EXIST: (1/s) 0.0 0.0 0.0 0.0 0.0 able Foul (1/s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	k (nmn) 0.600 0.600 0.600 0.600 0.600 Add F (1/)	HYD SECT 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.S DIA (mm) 225 150 300 300 300 300 1.73 0.91 1.27	1.200 0.75 500 WS Auto Desig Cap (1/s) 68.9 16.0 22.4	Flow (1/s) 0.0 0.0
PN 1.000 1.001 2.000 2.001 1.002 PN Ra (mm 1.000 1.001 2.000 2.001	n Design Min Vel Min S Networl Length (m) 35.951 26.411 0 14.225 22.148 2 10.321 ain T /hr) (m 0.00 0.00 0.00	<pre>k Depth for # lope f k Des Fall (m) 0.625 0.215 0.225 0.104 0.104 .C. ins) 5.35 1 5.83 1 5.19 1 5.44 1</pre>	a for Op Auto Das For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 5 63.2 8 111.9 4 99.2 <u>19.392</u> 19.600 19.225	ble for i.Area (ha) 0.031 0.056 0.090 0.200 0.100 Vetwork Σ I.Area (ha) 0.031 0.056 0.090 0.200 0.100 0.200 0.100	<pre>on (m) 7 (m/s) 1 (1:X) with Lev 5.00 0.00 5.00 0.00 0.00 Result Flow (7 7 </pre>	Est T. Set 1/s) 0.0 0.0 0.0	EXIST: (1/s) 0.0 0.0 0.0 0.0 0.0 0.0 able Foul (1/s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	k (mm) 0.600 0.600 0.600 0.600 0.600 Add F (1/;	HYD SECT 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.S DIA (mm) 225 150 300 300 300 300 300 150 300 300 150 300 300 1.73 0.91 1.27 1.49	1.200 0.75 500 WS Auto Desig Cap (1/s) 68.9 16.0 22.4 105.0	Flow (1/s) 0.0 0.0 0.0
PN 1.000 1.001 2.000 2.001 1.002 PN Ra (mm 1.000 1.001 2.000 2.001	n Design Min Vel Min S Networl Length (m) 35.951 26.411 0 14.225 22.148 2 10.321 ain T /hr) (m 0.00 0.00 0.00	<pre>k Depth for # lope f k Des Fall (m) 0.625 0.215 0.225 0.104 0.104 .C. ins) 5.35 1 5.83 1 5.19 1 5.44 1</pre>	a for Op Auto Das For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 5 63.2 8 111.9 4 99.2 <u>19.392</u> 19.600 19.225	ble for I.Area (ha) 0.031 0.056 0.090 0.200 0.100 Network Σ I.Area (ha) 0.031 0.056 0.090 0.200 0.100 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000 0.00000000	<pre>on (m) 7 (m/s) 1 (1:X) with Lev 5.00 0.00 5.00 0.00 0.00 Result Flow (7 7 </pre>	Est T. Set 1/s) 0.0 0.0 0.0	EXIST: (1/s) 0.0 0.0 0.0 0.0 0.0 0.0 able Foul (1/s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	k (mm) 0.600 0.600 0.600 0.600 0.600 Add F (1/;	HYD SECT 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.S DIA (mm) 225 150 300 300 300 300 300 150 300 300 150 300 300 1.73 0.91 1.27 1.49	1.200 0.75 500 WS Auto Desig Cap (1/s) 68.9 16.0 22.4	Flow (1/s) 0.0 0.0 0.0

	Hardw											Pag	je 1
15-17	Goldi	ngton	Road									5	
Bedfor	d											14	~
MK40 3	NH											M	icro
Date 2	3/12/	2014 1	3:00		De	signed	i by	a.tew	5				
File S	W Tre	nchard	exist	ting 2	Ch	ecked	by					DI	ain
Micro	Drain	age			Ne	twork	2014	.1.1					
	1	Networ	k Desi	lgn Tak	ole for	SW E	AST E	XISTI	NG 15.	.07.	13.S	WS	
	PN	Length	Fall	Slope	I.Area	T.E.	Ba	ase	k	HYD	DIA	Auto	0
		(m)	(m)	(1:X)	(ha)	(mins)	Flow	(1/s)	(mm)	SECT	(mm)	Desig	jn
	3.000	20.687	0.097	213.3	0.363	5.00		0.0	0.600	0	375	ō	
	4.000	30, 988	0.327	94.8	0.293	5.00		0.0	0.600		225		
					0.132				0.600		375		
					0.099				0.600		100		
					0.000				0.600		375		
	6.000	3.241	0.135	24.0	0.030	5.00		0.0	0.600	0	150	6	
					0.000			0.0	0.600		525	200	
					0.000				0.600		525		
					0.159				0.600				
					0.000				0.600				
	7.002	7.950	0.001	/950.0	0.046	0.00		0.0	0.600	0	300		
	8.000	20.838	0.169	123.3	0.515	5.00		0.0	0.600	0	225	-	
				N	etwork	Resul	ts Ta	able					
PN	Ra	in T	.c. 1	JS/IL	Σ I.Area	ΣΒ	ase	Foul	Add F1	ow	Vel	Cap	Flo
	(mm	/hr) (m	nins)	(m)	(ha)	Flow	(1/s)	(1/s)	(1/s)	(1	m∕s)	(1/s)	(1/s
3.0	00	0.00	5.28 1	19.600	0.363		0.0	0.0	0	.0	1.24	136.6	0.
4.0	00	0.00	5.38 1	19.980	0.293		0.0	0.0	0	.0	1.34	53.4	0.
3.0	01	0.00	5.80 1	19.503	0.788		0.0	0.0	0	.0	1.75	192.7	0.
5.0	00	0.00	5.60 1	19.583	0.099		0.0	0.0	0	.0	0.70	5.5	0.
3.0	02	0.00	6.31 1	19,097	0.887		0.0	0.0	0	.0	1.05	115.5	0
					0.916		0.0					122.1	
6.0	00	0.00	5.03 1	19.257	0.030		0.0	0.0	0	.0	2.06	36.5	ο.
				18.917	1.423			0.0				257.2 225.9	
7.0	00	0.00	5.15 1	18.929	0.159	0	0.0	0.0	0	.0	0.92	36.5	0.
				18.887				0.0				40.8	
7.0	02	0.00	6.57 1	18.572	0.205		0.0	0.0	0	.0	0.17	11.8	0.
8.0	00	0.00	5.30 1	19.471	0.515	i.	0.0	0.0	0	.0	1.18	46.8	0.

MK40 3NI Date 23,		2014 1	3:00		Des	signed	by	a.tew				Mic	
File SW	Tre	nchard	exi	sting 2	Che	ecked	by					DIG	inage
Micro D	raina	age			Net	work	2014	.1.1					
	N	letwor	k Des	sign Tak	ole for	SW EA	ST E	XISTI	NG 15.	07.1	3.SI	1S	
	PN	Length (m)	(m)	1 Slope (1:X)	I.Area (ha)				k (mm)			Auto Design	
	8.002	21.439	0.19	1 146.0 3 111.1 2 95.1	0.135	0.00		0.0	0.600	0	225	ĕ	
)1 7429.0					0.600	_		-	
	9.000	56.396	0.15	0 376.0	0.156	5.00			0.600				
				30 291.7 50 391.8					0.600				
	1.005	37.754	0.09	389.2	0.000	0.00		0.0	0.600	0	825	ô	
				08 235.1 70 250.0					0.600			-	
	1.006	19.044	0.02	952.2	0.000	0.00		0.0	0.600	1/	40	٥	
				39 318.6 0 907.6					0.600			-	
				5 127.7									
				N	etwork	Pogult	te T	blo					
				1	erwork	Result	15 10	IDIE					
PN				US/IL : (m)								_	Flow (1/s)
				119.302				0.0		.0 1			0.0
				118.991 118.798				0.0		.0 1 .0 1			0.0
7.003	(0.00	7.29	118.571	1.075		0.0	0.0	0	.0 0	.17	12.2	0.0
9.000				118.570 118.420	0.156		0.0	0.0				248.8	0.0
9.001	8 20			118.390	0.156		0.0	0.0				243.6	0.0
1.005	. (0.00	7.71	118.297	2.654		0.0	0.0	0	.0 1	.50	801.2	0.0
10.000				118.268 118.210	0.063		0.0	0.0		.0 0		3.9	0.0
1.006				117.700	2.717		0.0	0.0				7493.7	0.0
11.000				118.143	0.070		0.0	0.0		.0 0		3.3	0.0
11.001				118.104	0.076		0.0	0.0		.00 .00		1.9	0.0

15-17 Goldi Bedford MK40 3NH	ngton F	load		2								
MK40 3NU											2	~
											Mir	
Date 23/12/	2014 13	:00		De	signed	by a	a.tew				Dra	in
File SW Tre		exist	ing 2.		ecked	-					DIC	
Micro Drain	age			Ne	twork	2014.	.1.1					
1	Network	Desi	gn Tab	le for	SW E	ST E	XISTI	NG 15	.07.	13.SI	WS	
PN	Length (m)	Fall (m)		I.Area (ha)			se (1/s)	k (mm)		DIA (mm)		1
1.00	7 31.260	0.035	893.1	0.000	0.00		0.0	0.600	V	40	6	
13.00	0 33.909	0.096	353.2	0.107	5.00		0.0	0.600	0	100	#	
1.00	8 4.365	0.005	873.0	0.000	0.00		0.0	0.600	V	40	Ô	
			N	etwork	Resul	ts Ta	ble					
				I.Area				Add F			Cap	
11 11 11 11 11	/hr) (mi	10/22/2010/04	17 (H10)	100.000							(1/s)	
1.007											7739.1	
13.000							0.0		0.0			
1.008	0.00 8	.18 11	7.645	2.906		0.0	0.0		0.0	1.99	7828.5	
Free	Flowin	g Out:	fall D)etails	for S	SW EA	ST EX	ISTIN	IG 15	.07.	13.SWS	
			Name		evel I.	(m)	I. L (1	evel n)				
	Simulat										15	
	Dimuta		LICEL.	IA IVI	UN EA	DI DA	10111	10 10				
Manhole	Hot S	leducti lot Sta Start L Coeff	on Fact rt (min evel (m (Globa	tor 1.00 ns) nm) al) 0.50	0 0 0 Flow 0	MADD	Facto erson	Inlei per Da	Om³/ha t Coef ay (1/ un Tim	a Stor fieci /per/d ne (mi	rage 1. ient 0. day) 0. ins)	000
	Numb	er of (Online (rographs Controls Controls	s O Num	ber of	Time	/Area	Diagr	ams O		
			Synt	hetic	Rainfa	all D	etail	s				
	Ret	urn Pe	C D1 D2		B 4505	00 225	250 SE	2 5050	FI 10 2525 -0.02 0.32 0.30 0.30	00 50 23 28 09		

Woods Hardwick		Page 4
15-17 Goldington Road		
Bedford		Ly
MK40 3NH		Micco
Date 23/12/2014 13:00	Designed by a.tew	Micro Drainage
File SW Trenchard existing 2		Diamage
Micro Drainage	Network 2014.1.1	
Curthet	in Deinfall Debeile	
Synchec	ic Rainfall Details	
	F (1km) 2.461	
	Summer Storms No	
	Winter Storms Yes Cv (Summer) 0.750	
	Cv (Winter) 0.840	
Storm I	Duration (mins) 15	
01000	-2014 XP Solutions	

Woods Hard	wick			15		Page
15-17 Gold	ington R	oad				
Bedford						4
MK40 3NH						146-
Date 23/12	/2014 13	:00		Designed 1	by a tew	MIC
				-	1	Drai
		existi	ig z	Checked b Network 2		
Micro Drai	nage			Network 2	014.1.1	
Summary o	f Critica	al Resu	ilts by	Maximum Le	vel (Rank 1) for SW EAST EXI
				15.07.13.S	WS	
	Areal R	eduction		imulation Cri 1.000 Addi		% of Total Flow 0.0
						10m3/ha Storage 1.0
	Hot St	tart Lev	el (mm)	0	In	let Coeffiecient 0.8
					er Person per	Day (1/per/day) 0.0
Foul	Sewage pe:	r hectar	e (1/s)	0.000		
		-		-	er of Storage	
					er of Time/Are er of Real Tim	
			Cunth	atia Deinfell	Dotaila	
		Rainfal		etic Rainfall	Details	FEH
		Site L	ocation	GB 450500 225	250 SP 50500	25250
			C (1km)			0.023
			1 (1km)			0.328
			2 (1km) 3 (1km)			0.309
			E (1km)			0.292
			F (1km)			2.461
			Summer)			0.750
		Cv (Winter)			0.840
	Margin for	Flood 1	Risk War	ning (mm)		300.0
					Second Incre	ment (Extended)
				TS Status		ON
				VD Status		ON
			Inert	ia Status		ON
		Pro	file(s)		Su	mmer and Winter
				15, 30, 60, 1	20, 240, 360,	480, 960, 1440
	Return Per					100
	CIII	nate Cha	nge (3)			0
PN	Storm			First X Surcharge	First Y Flood	First Z O/F Lv Overflow Act. Exc
	15 Winter		8	00		
	15 Winter 15 Winter				r 100/15 Summ	er
	15 Winter				r 100/15 Summ	
	15 Winter				r 100/15 Summ	
	15 Winter		0%	100/15 Summe	r 100/15 Summ	er
	15 Winter				er 100/15 Summ	
	15 Winter				r 100/15 Summ	
	15 Summer				r 100/15 Summ	
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3.002	15 Minter	100	08	TOOLTO SAUMUE	4	
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3.002 3.003 6.000 1.003	15 Winter	100 100	0%		r	

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15-17 Gold:	ington	Road		6						
Bedford				1					4	~
MK40 3NH									N	licco
Date 23/12,	/2014	13:00		Desi	gned b	y a.te	∋W			
File SW Tre	enchar	d existin	ng 2		-	1			U	rainage
Micro Drain			-		ork 20		1			
	-									
Summary of	Crit:	ical Resu	ilts by	Maxim	um Lev	el (R	ank 1)) for	SW EAST H	EXISTING
				15.07	.13.SW	IS				
PN	Store	Return Period	Climate		st X harge		rst Y lood		rst Z O/F rflow Act.	
PN	Stori	i Period	change	Sure	narge	-	1000	ove	FIIOW ACC.	Exc.
7.000	15 Wint	er 100	0%	100/15	Summer	100/1	5 Summ	er		4
		er 100			Summer		5 Summe	er		2
7.002	15 Wint	er 100	08	100/15	Summer Summer	100/1	5 Cumm			11
8.001	15 Wint	er 100	08	100/15	Summer	100/1	5 Summe	er		6
8.002	15 Wint	er 100 er 100	0%	100/15	Summer	100/1	5 Summe	er		3
8.003	15 Wint	er 100	0%	100/15	Summer					
		er 100			Summer	8				
9.000	15 Wint	er 100	0%		Summer					
9.002	15 Wint	er 100 er 100	0%		Summer					
1.005	15 Wint	er 100	0%							
		er 100					5 Summ	er		8
		er 100			Summer					
1.006	15 Wint	er 100	0%		Summer	100/1	5 Summ			8
11.000	15 Wint	er 100	0%	100/15	Summor		5 Summe	er		0
12.000	15 Wint	er 100 er 100 er 100	0%	100/15	Summer					
1.007	15 Wint	er 100	0%							
		er 100			Summer	100/1	5 Summ	er		10
1.000	15 WIII	.er 100	0.5							
		Water		FL	ooded			Pipe		
		/MH Level							-	
	PN Na	ume (m)	Depth	(m) (m ³)	Cap.	(1/s)	(1/s)	Status	
		759 120.13			0.000	0.28		18.0		
		761 120.08			1.059	1.62		24.7		
		212 120.54 211 120.23		794	6.547	1.89		38.9 112.4		
1	002 0	764 110.04		620		1.02		147.7	FLOOD	
		MH 120.73			1.471	0.95		109.3		
		257 120.81			1.742					
		760 120.67 763 120.41			0.449 9.104	1.05		185.5		
		762 120.25			0.017	1.82		186.6		
		MH 119.90			0.000	2.24			SURCHARGED	
		767 119.70			0.000	0.76			FLOOD RISK	
		766 119.62 DI 119.10			0.000	2.31			FLOOD RISK	
		PI 119.10 745 120.10			0.000 7.480	2.81		60.3	SURCHARGED	
		746 119.95			0.145	1.53		59.3		
7	.002 1	200 110.49	5 0.	620	0.000	2.30	0.0	02.3	SUBCILARCED	
		711 120.16		469 12		1.20		50.8		
		952 120.11			5.474	1.43		58.4 62.4		
		953 120.19 206 120.07			6.280 0.000	1.39			FLOOD RISK	
		MH 119.38			0.000	4.80			SURCHARGED	
		768 119.09			0.000	0.37	0.0	82.8	OK	
9									SURCHARGED	

Woods Hardwick									Da - 7
15-17 Goldingt		ad		-					Page 7
Bedford	OII RO	au							2
MK40 3NH									1 mm
Date 23/12/201	4 12.	0.0		Do	signed	by a t	0.14		— Micro
File SW Trench					-	-	ew		Drainag
Micro Drainage		xisting	2	_	twork 2		1		
MICIO DIAINAGE				ne	CWOIK 2	.014.1.	1		
Summary of Cr	itical	l Resul	ts by	Max	kimum Le	evel (H	Rank 1) for	SW EAST EXISTING
					.07.13.				
		Water		'ad	Flooded Volume		O' flow	Pipe	
PN	Name				(m ³)				Status
	-								
1 005	0769	118.948 118.911	- 0	211	0.000	0 91	0.0	574 6	SURCHARGED OK
10.000	1226	118.907	0.	539	9.196	2.37	0.0	8.8	FLOOD
10.001	1285	118.611	0.	301	0.000	2.31	0.0	8.4	FLOOD RISK
1.006	Ditch 1267	118.238	-0.	133	12 673	0.29	0.0	5/9.6	FLOOD FLOOD RISK OK FLOOD RISK SURCHARGED
11.000	1288	118.441	0.	237	0.000	3.58	0.0	9.2	FLOOD RISK
12.000	1287	118.207	0.	040	0.000	0.25	0.0	3.5	SURCHARGED
1.007	Ditch 1225	118.204	-0.	747	0.000	0.18	0.0	577.9	OK
1.008	Ditch	118.144	-0.	772	0.000 21.987 0.000	0.17	0.0	581.8	OK
			©1982	-20	14 XP S	olutio	ns		

APPENDIX D

Proposed Microdrainage Calculations

Is-17 Goldington Road Designed by a.tew Date 18/03/2015 12:29 Designed by a.tew Checked by File SW Trenchard proposed 1 Checked by Checked by STORM SEWER DESIGN by the Modified Rational Method Design Criteria for SW Proposed Pipe Sizes Proposed Manhole Sizes Proposed 2 FEH Rainfall Model 2 Return Period (years) 2 D1 (lkm) 0.328 D2 (lkm) 0.309 D3 (lkm) 0.2422 F (lkm) 0.2422 Maximum Rainfall (mm/hr) 0 Miniman Rackdrop Beight (m) 0.0000	Woods Hardw	ick										Pag	ge O	
MK40 3NH Designed by a.tew Checked by Designed by a.tew Checked by Micro Drainage Network 2014.1.1 STORM SEWER DESIGN by the Modified Rational Method Design Criteria for SW Proposed Designed by a.tew Checked by Micro Drainage STORM SEWER DESIGN by the Modified Rational Method Designed Manhole Sizes Proposed Designed Manhole Sizes Proposed File SW Trenchard (years) C (1km) 0 Maximum Rathdrop Reight (n) 0 Maximum Rathdrop Reight (n) Maximum Rathdrop Reight (n) Mathexit proposed <td colsp<="" td=""><td>15-17 Goldi</td><td>ngton I</td><td>Road</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td>	<td>15-17 Goldi</td> <td>ngton I</td> <td>Road</td> <td></td>	15-17 Goldi	ngton I	Road										
Date 18/03/2015 12:29 Designed by a.tew Checked by Network 2014.1.1 Designed by a.tew Checked by File SN Trenchard proposed 1 STORM SEWER DESIGN by the Modified Rational Method Design Criteria for SW Proposed Pipe Sizes Proposed Manhole Sizes Proposed File SN Trenchard proposed (annote the size proposed) 2 FEH Rainfall Model 2 Return Period (years) 2 Di (ikm) 0.328 Di (ikm) 0.300 Fool Sewage (1/s/ha) 0.000 Maximum Rainfall (mm/hr) 0 Maximum Backdrop Height (m) 0.000 Min Vel for Auto Design only (m/s) 0.75 Min Slope for Optimisation (1:X) 500 Di 2.200 0.000 0.000 0.00 Min Vel for Auto Design Table for SW Proposed 1.000 15.215 12.2.8 0.056 0.000 0.000 0.000 0.000	Bedford											4		
File SW Trenchard proposed 1 Checked by Micro Drainage Network 2014.1.1 STORM SEWER DESIGN by the Modified Rational Method Design Criteria for SW Proposed FILE Rainfall Model Return Period (years) 2 Site location GB 405000 225250 SP 50500 25250 Di (km) 0.023 Di kine Change (b) 0 Maximum Rainfall (mn/hr) 0 Min Slope I Are	MK40 3NH											1.4		
Micro Drainage Network 2014.1.1 STORM SEWER DESIGN by the Modified Rational Method Design Criteria for SW Proposed Design Criteria for SW Proposed Pipe Sizes Proposed Manhole Sizes Proposed File Sizes Proposed Manhole Sizes Proposed File Cation GB 450500 25250 SP 50500 25250 C (1km) C (1km) Dig (1km) Dig (1km)	Date 18/03/	2015 12	2:29		De	signed	by a	a.tew	r.				luu	
Micro Drainage Network 2014.1.1 STORM SEWER DESIGN by the Modified Rational Method Design Criteria for SW Proposed Pipe Sizes Proposed Manhole Sizes Proposed FER Rainfall Model Return Period (years) 2 Site Location GB 450500 225250 SP 50500 225250 C (1km) -0.023 DI (1km) -0.023 Maximum Rainfall (mm/hr) 0 Maximum Rainfall (mm/hr) 0 Maximum Rainfall (mm/hr) 0 Maximum Rainfall (mm/hr)	File SW Tre	nchard	prop	osed 1	1 Ch	ecked	by					DI	alhay	
STORM SEWER DESIGN by the Modified Rational Method Design Criteria for SW Proposed File Sizes Proposed Manhole Sizes Proposed File Mainfall Model C Size Location GB 490500 22520 SP 50500 2520 C C DI (lim) 0.023 DI (lim) OL (lim)<			1 1					1.1						
Design Criteria for SW Proposed Fipe Sizes Proposed Manhole Sizes Proposed Fife Rainfall Model Return Period (years) C (lkm) 0.2020 SP 50500 25250 C (lkm) 0.2020 SP 50500 25250 0 (lkm) 0.2020 SP 50500 25250 0 (lkm) 0.2020 SP 50500 25250 0 (lkm)														
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	PN 1.000 1.000 2.000 3.000 PN R (mm 1.000	Length (m) 0 35.951 1 26.411 2 10.321 0 20.687 0 30.988 ain T. (/hr) (mi 0.000 5	Depth for A lope f Net Fall (m) 0.629 0.215 0.104 0.097 0.327 0.327	twork slope (1:X) 57.2 122.8 99.2 213.3 94.8 US/IL (m) 20.021	ptimisati sign only imisation esigned n Design I.Area (ha) 0.031 0.056 0.100 0.363 0.293 Network E I.Area (ha) 0.031	<pre>(n (m) (m/s) (1:X) (it) (it) (it) (it) (it) (it) (mins) 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.0</pre>	for s Bas Flow (ts Ta (1/s) 0.0	SW Pr (1/s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	k (mm) 0.600 0.600 0.600 0.600 0.600 0.600	HYD SECT	DIA (mm) 225 150 300 375 225 Vel (m/s) 1.73	1.200 0.75 500 Auto Desig	Flow (1/s) 0.0	
3.000 0.00 5.38 119.980 0.293 0.0 0.0 0.0 1.34 53.4 0.0	PN 1.000 1.003 2.000 3.000 PN R (mm 1.000 1.001	Length (m) 0 35.951 1 26.411 2 10.321 0 20.687 0 30.988 ain T. (/hr) (mi 0.00 1	Depth for A lope f Net Fall (m) 0.629 0.215 0.104 0.097 0.327 0.327 C. 1 ins) 0.35 1 0.83 1	twork slope (1:X) 57.2 122.8 99.2 213.3 94.8 05/IL (m) 20.021 19.392	ptimisati sign only imisation esigned n Design I.Area (ha) 0.031 0.056 0.100 0.363 0.293 Network E I.Area (ha) 0.031 0.08	<pre>(n (m) (m/s) (1:X) (1:X) (ith Lev Table T.E. (mins) 5.00 0.00 0.00 5.00 5.00 5.00 5.00 5.0</pre>	for : Bas Flow (ts Ta ase (1/s) 0.0 0.0	SW Pr (1/s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 bble Foul (1/s) 0.0 0.0	k (mm) 0.600 0.600 0.600 0.600 0.600 0.600 Add F (1/s	HYD SECT 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	DIA (mm) 225 150 300 375 225 Vel (m/s) 1.73 0.91	1.200 0.75 500 Auto Desig	Flow (1/s) 0.0 0.0	
	PN 1.000 1.002 2.000 3.000 PN R (mm 1.000 1.001 1.002	Length (m) 0 35.951 1 26.411 2 10.321 0 20.687 0 30.988 ain T. (/hr) (mi) 0.00 \$ 0.00 \$	Depth for A lope f Net Fall (m) 0.629 0.215 0.104 0.097 0.327 0.327 0.327	twork slope (1:X) 57.2 122.8 99.2 213.3 94.8 US/IL (m) 20.021 19.392 19.027	ptimisati sign only imisation esigned u Design I.Area (ha) 0.031 0.056 0.100 0.363 0.293 Network E I.Area (ha) 0.031 0.293	<pre>ion (m)</pre>	for : Bas Flow (ts Ta (1/s) 0.0 0.0 0.0	SW Pr (1/s) 0.0 0.0 0.0 0.0 0.0 0.0 tble Foul (1/s) 0.0 0.0 0.0	k (mm) 0.600 0.600 0.600 0.600 0.600 0.600	HYD SECT 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	DIA (mm) 225 150 300 375 225 Vel (m/s) 1.73 0.91 1.58	1.200 0.75 500 Auto Desig	Flow (1/s) 0.0 0.0	

15-17 Goldi Bedford MK40 3NH	ngton H	Road										- Cu
Date 18/03/	2015 12	2:29		De	signe	d by	a.tev	4				
File SW Tre	nchard	propo	sed 1	Ch	ecked	by					DI	ainage
Micro Drain	age	-		Ne	twork	2014	1.1.1					
		Net	work	Design	Table	for	SW P:	ropose	ed			
PN	Length (m)			I.Area (ha)			ase (l/s)				Auto Design	
2.001	43.746	0.406	107.7	0.132	0.00		0.0	0.600	0	375	٣	
4.000	25.387	0.211	120.3	0.099	5.00		0.0	0.600	0	100	đ	
				0.000	0.00		0.0	0.600	0	375	æ	
2.003	10.659	0.040	266.5	0.029	0.00		0.0	0.600	0	375	÷	
5.000	3.241	0.135	24.0	0.030	5.00		0.0	0.600	0	150	ð	
1.003	5.982	0.017	351.9	0.000	0.00		0.0	0.600	0	525		
				0.067				0.600				
7.000	8.639	0.150	57.6	0.058	5.00		0.0	0.600	0	150	Ō	
8.000	8.459	0.180	47.0	0.012	5.00		0.0	0.600	0	100	٢	
				0.046				0.600				
9.000	9.321	0.120		0.020 Network				0.600	0	100	ď	
			-	CCNOL A	nebu.	100 1	0010					
1100 400 2000	in T. /hr) (mi		(m)	Σ I.Area (ha)				Add F			Cap (1/s)	
2.001	0.00 5	.80 11	9.503	0.788	3	0.0	0.0	R I	0.0	1.75	192.7	0.0
4.000	0.00 5	.60 11	9.583	0.099	9	0.0	0.0		0.0	0.70	5.5	0.0
2.002 2.003	0.00 e					0.0	0.0				115.5 122.1	
5.000	0.00 5	.03 11	9.257	0.030	þ	0.0	0.0		0.0	2.06	36.5	0.0
1.003	0.00 6	.55 11	8.917	1.133	3	0.0	0.0		0.0	1.19	257.2	0.0
		.17 11		0.06		0.0					17.5	0.0
		.56 11		0.110		0.0					237.6	0.0
		. 11 11		0.05		0.0			0.0		23.5 8.9	0.0
		. 13 11		0.01		0.0					158.3	0.0
		.18 11		0.020		0.0					6.9	0.0
						_						

Bedfor MK40 3 Date 1 File S	BNH 18/03/2	015 12 chard	:29 propo		Cho	twork	by 2014	.1.1				– Mic Dra	ro inage
	PN	Length (m)		Slope	l.Area (ha)	T.E.	Ba	se	k	HYD		Auto Design	1
		8.500 17.464			0.027 0.025	5.00 0.00			0.600 0.600		150 225		
		9.923 44.707				0.00			0.600 0.600		450 450	_	
		20.794				5.00			0.600		100		
	6.005	14.925	0.040	373.1	0.017	0.00		0.0	0.600	0	450	<u>s</u>	
	13.000	54.575	0.285	191.5	0.048	5.00			0.600			2	
	13.001	9.910 38.354	0.200	191.8	0.145	5.00 0.00		0.0	0.600	0	375	Ð	
		4.116				0.00 5.00			0.600		375	-	
				N	etwork	Resul	ts Ta	able					
P		in T. (hr) (mi		(m)	Σ I.Area (ha)		ase (1/s)		Add F (1/s			Cap (1/s)	Flow (1/s)
10. 10.		0.00			0.027		0.0					15.5 36.1	0.0
		0.00 é			0.306		0.0	0.0				176.9 159.4	0.0
11.					0.043			0.0				8.5	0.0
	005 0	0.00	7.04 11	9.070	0.034	2	0.0	0.0		0.0	1.05	10.8 166.4	0.0
13.			7.36 11 5.80 12		0.541		0.0	0.0				172.2 80.1	0.0
14.	000 0	0.00 5	5.09 12	0.500	0.020	0	0.0	0.0		0.0	1.75	13.8	0.0
13. 13.			5.29 11 5.49 11		0.213		0.0	0.0				144.1 144.1	0.0
15.	000 0	0.00	5.03 12	0.070	0.057	7	0.0	0.0		0.0	2.28	17.9	0.0

@1982-2014 XP Solutions

Woods Hardw 15-17 Goldi		Road									Pag	e 3
Bedford											4	
MK40 3NH												rm
	0.015 1	0.00		Dec	4	1					- Mi	
Date 18/03/					signed	-	i.tew				Dra	ainage
File SW Tre	nchard	prop	posed 1.	Che	cked l	ЬУ					Bit	aniage
Micro Drain	age			Net	work :	2014.	1.1					
		Ne	twork D	esign 1	Table	for S	SW Pr	oposed	1			
						-						
PN	(m)	(m)	(1.V)	(ha)			(1/a)	k			Auto	
	(111)	(ш)	(1.4)	(114)	(mrns)		(1/8)	(many	DECI	(1111)	Desig	,
13.003	26.268	0.09	0 291.9	0.022	0.00		0.0	0.600	0	450		
			0 312.1					0.600			-	
			5 315.6					0.600			-	
			0 349.6		0.00			0.600				
10.000							2.0		-		•	
6.007	22.963	0.05	5 417.5	0.037	0.00		0.0	0.600	0	450	æ	
			5 541.1		0.00			0.600				
6.009	80.708	0.20	0 403.5	0.000	0.00		0.0	0.600	0	450		
			1 380.9					0.600			đ	
6.011	12.300	0.04	4 279.5	0.000	0.00		0.0	0.600	0	450	்	
			0 183.3		0.00			0.600				
			5 489.6 8 455.0		0.00			0.600		525 525	-	
1.000	0.190	0.01	0 400.0	0.000	0.00		0.0	0.000	0	525	đ	
16.000	8.461	0.04	2 201.5	0.059	5.00		0.0	0.600	0	225	n	
			0 161.2					0.600				
16.002	7.950	0.00	1 7950.0	0.046	0.00		0.0	0.600	0	300		
16.003	7.429	0.00	1 7429.0	0.000	0.00		0.0	0.600	0	300		
		192000	10 10 10 10 10 10	1 25/02/202				10000000			-	
17.000	56.396	0.15	0 376.0	0.156	5.00		0.0	0.600	0	525	ē	
			Ne	etwork	Result	s Ta	ble					
		. C.		Σ I.Area		ase		Add F1				Flow
(m	n/hr) (m	nins)	(m)	(ha)	Flow ((1/s)	(1/s)	(1/s) (m/s)	(1/s)	(1/s)
13.003	0.00	6.86	119.365	0.320		0.0	0.0	C	.0	1.18	188.4	0.0
13.004	0.00	7.18	119.275	0.406			0.0		.0	1.15	182.2	0.0
13.005				0.477			0.0				181.1	
13.006	0.00	8.28	119.000	0.529		0.0	0.0	C	.0	1.08	172.0	0.0
C 007	0.00	0.07	110 070	1		0.0	0.0			0.00	157 0	0.0
6.007			118.970 118.915									
6.008			118.915	1.107		0.0					294.0 160.0	0.0
			118.900	1.107		0.0	0.0				164.7	
6.011			118.669	1.107		0.0	0.0				192.6	0.0
1.004	0.00 1	0.52	118.550	2.240		0.0	0.0	C	.0	1.65	357.4	0.0
			118.540	2.240		0.0	0.0				217.7	
1.006	0.00 1	0.85	118.515	2.240		0.0	0.0		.0	1.04	225.9	0.0
				11-21-21-21-21-21-21-21-21-21-21-21-21-2								
16.000			118.929	0.059		0.0	0.0				36.5	0.0
16.001			118.887	0.059		0.0	0.0				40.8	0.0
	0.00		118.572	0.105		0.0	0.0				11.8	
16.002	0.00					0.0	0.0	C	.0	0.17	12.2	0.0
	0.00	7.29	110.5/1	0.105								
16.002 16.003			118.570	0.156		0.0	0.0	c	.0	1.15	248.8	0.0

Woods Hardw											Page	4
15-17 Goldi	ngton	Road										
Bedford											2	~
MK40 3NH											- Mio	
Date 18/03/	2015 1	2:29		Dea	signed	by	a.tew	1				
File SW Tre	nchard	prop	osed 1.	Ch	ecked	by					Dra	Ш
Micro Drain	age			Net	twork	2014	.1.1					
		Net	work D	esign)	Table	for	SW Pr	oposed	1			
PN	Lengt	Fall	Slope	I.Area	7 2	в	ase	k	HVD	DIA	Auto	
	(m)	(m)	(1:X)		(mins)							
		0 0.030 9 0.060		0.000	0.00			0.600	0		-	
17.002	23.50	9 0.060	391.0	0.000	0.00		0.0	0.600	0	323	· 🗗	
1.007	37.75	4 0.097	389.2	0.000	0.00		0.0	0.600	0	825	n 🖻	
											100	
				0.030				0.600		225		
				0.024				0.600		225		
				0.008				0.600		225	· · ·	
				0.006				0.600			-	
10.004		0.000		v. v. 1	0.00		0.0	0.000	0	500		
19.000	31.80	0.110	289.1	0.019	5.00		0.0	0.600	0	100	ð (
18 005	31.43	0 0 030	1047.7	0.021	0.00		0.0	0.600	0	300	. 4	
				0.000				0.600		100		
18.007	4.69	0.052	90.2	0.000	0.00		0.0	0.600	0	100		
18.008	13.63	3 0.058	235.1	0.051	0.00		0.0	0.600	0	100		
18.009	17.44	1 0.070	249.2	0.000	0.00		0.0	0.600	0	100	D 🗗	
1.008	19.04	4 0.020	952.2	0.000	0.00		0.0	0.600	\mathbf{V}	40	6 0	
20.000	12.42	5 0.039	318.6	0.070	5.00		0.0	0.600	0	100	. 4	
			N	etwork	Result	ts Ta	able					
PN Ra	ain 1	.c. 1	US/IL 1	I.Area	ΣBa	se	Foul	Add Flo	ow V	el	Cap	F
(mm	/hr) (m	nins)	(m)	(ha)	Flow (1/s)	(1/s)	(1/s)	(m	v/s)	(1/s)	(
17.001	0.00	5 02 1	19 420	0.156		0.0	0.0		.0 1	21	282.8	
				0.156		0.0					243.6	
1.007	0.00 1	1.27 1	18.297	2.501		0.0	0.0	0	.0 1	.50	801.2	
18.000	0.00	5.49 1	19.340	0.030		0.0	0.0	0	.0 1	.02	40.4	
		6.00 1		0.054		0.0			.0 0		36.4	
	0.00	6.74 1	19.020	0.062		0.0	0.0	0	.0 0	.90	35.8	
	0.00	7.27 1		0.068		0.0			.0 0		36.0	
18.002 18.003			18.615	0.080		0.0	0.0	0	.0 0	.91	64.4	
18.002 18.003		7.73 1				0.0	0.0	0	.0 0	.45	3.5	
18.002 18.003 18.004	0.00	6.18 1	18.840	0.019						40	22.0	
18.002 18.003 18.004 19.000	0.00 0.00	6.18 1				0.0	0.0	~			33.8	
18.002 18.003 18.004 19.000 18.005	0.00 0.00 0.00	6.18 1 8.83 1	18.530	0.120		0.0			.0 0		6 2	
18.002 18.003 18.004 19.000 18.005 18.006	0.00 0.00 0.00 0.00	6.18 1 8.83 1 9.18 1	18.530 18.500	0.120		0.0	0.0	0	.0 0	.79	6.2	
18.002 18.003 18.004 19.000 18.005 18.006 18.007	0.00 0.00 0.00 0.00 0.00	6.18 1 8.83 1	18.530 18.500 18.320	0.120 0.120 0.120			0.0	0		.79	6.2 6.4 3.9	
18.002 18.003 18.004 19.000 18.005 18.006 18.007 18.008	0.00 0.00 0.00 0.00 0.00 0.00	6.18 1 8.83 1 9.18 1 9.28 1	18.530 18.500 18.320 18.268	0.120		0.0	0.0	0 0 0	.0 0	.79	6.4	
18.002 18.003 18.004 19.000 18.005 18.006 18.007 18.008 18.009	0.00 0.00 0.00 0.00 0.00 0.00 0.00	6.18 1 8.83 1 9.18 1 9.28 1 9.74 1 0.34 1	18.530 18.500 18.320 18.268 18.210	0.120 0.120 0.120 0.171 0.171		0.0 0.0 0.0	0.0 0.0 0.0 0.0	0 0 0 0	.0 0. .0 0 .0 0	.79 .81 .50 .48	6.4 3.9 3.8	
18.002 18.003 18.004 19.000 18.005 18.006 18.007 18.008 18.009 1.008	0.00 0.00 0.00 0.00 0.00 0.00 0.00 1 0.00 1	6.18 1 8.83 1 9.18 1 9.28 1 9.74 1	18.530 18.500 18.320 18.268 18.210 17.700	0.120 0.120 0.120 0.171		0.0 0.0 0.0	0.0 0.0 0.0 0.0	0 0 0 0	.0 0. .0 0 .0 0	.79 .81 .50 .48	6.4 3.9 3.8 7493.7	

Woods												Page	9 5
15-17	Goldin	gton F	load										
Bedfor	d											4	~
MK40 3	NH											Mic	
Date 1	8/03/2	015 12	:29		De	signed	i by	a.tew	2				
File S	W Tren	chard	propo	sed 1	Ch	ecked	bv					Dra	
Micro			1 1			twork		.1.1					
		3-											
			Net	work I	Design	Table	for	SW Pr	opose	d			
	PN	Length		_	I.Area			ase	k			Auto	
		(m)	(m)	(1:X)	(ha)	(mins)	Flow	(1/s)	(mm)	SECT	(mm)	Design	1
	20.001	9.076	0.010	907.6	0.006	0.00		0.0	0.600	0	100	#	
												-	
	21.000	8.298	0.065	127.7	0.006	5.00		0.0	0.600	0	150	•	
	1 000	31 260	0.025	802 1	0.000	0.00		0.0	0.600	11	40		
	1.009	51.200	0.035	093.1	0.000	0.00		0.0	0.000	V	40	Ó	
	22.000	13.020	0.150	86.8	0.031	5.00		0.0	0.600	0	150	8	
					0.064				0.600			9	
					0.006				0.600				
	22.003	21.0//	0.100	210.0	0.040	0.00		0.0	0.000	0	500	£	
	23.000	17.082	0.400	42.7	0.014	5.00		0.0	0.600	0	150	Ô	
	24.000	19.030	0.896	21.2	0.024	5.00		0.0	0.600	0	150	6	
	24.000	19.050	0.050	21.2	0.024	5.00							
	25.000	19.276	0.428	45.0	0.025	5.00		0.0	0.600	0	150	Ō	
	26.000	17.832	0.120	148.6	0.006	5.00		0.0	0.600	0	150	Ô	
	23.001	17.712	0.195	90.8	0.072	0.00		0.0	0.600	0	100	8	
	22.004	23.954	0.100	239.5	0.006	0.00		0.0	0.600	0	300	8	
				N	etwork	Resul	ts Ta	able					
PN	D- i							P1				0	E1
PN		hr) (mi		(m)	(ha)				Add Fl			Cap (1/s)	Flo
	(1111)			()	(114)		(1/5)	(1/5)	(1/ 5	, (.		(1/5/	(-/
20.0	01 0	.00 6	.10 11	8.104	0.076		0.0	0.0	0	0.0	0.25	1.9	0
21.0	00 0	.00 5	.16 11	8.017	0.006		0.0	0.0		0.0	0.89	15.7	0
					0.000			0.0					-
1.0	09 0	.00 11	.70 11	7.680	2.754		0.0	0.0	C	0.0	1.97	7739.1	0
22.0	00 0	.00 5	.20 11	0.00	0.031		0.0	0.0		0.0	1.08	19.1	0
22.0			.80 11		0.095		0.0	0.0			1.28	51.0	0
22.0			.33 11		0.101		0.0	0.0			1.05	74.4	0
22.0	03 0	.00 6	.82 11	8.005	0.147		0.0	0.0	0	0.0	0.94	66.5	0
23.0	00 0	.00 5	.18 11	8.850	0.014		0.0	0.0	0	0.0	1.54	27.3	0
24.0	00 0	.00 5	.14 11	9.346	0.024		0.0	0.0	C	0.0	2.20	38.8	0
25.0	00 0	.00 5	.21 11	8.878	0.025		0.0	0.0	c	0.0	1.50	26.6	0
26.0	00 0	.00 5	.36 11	8.420	0.006		0.0	0.0	C	0.0	0.82	14.5	0
26.0			75 11	8.300	0.141		0.0	0.0	c	0.0	0.81	6.3	0
28.0	01 0	.00 5	. / 3 11	0.300									-
100000000			. 22 11				0.0	0.0		0.0		71.5	0

Woods	Hardwi	ck										Page	9.6
		ngton R	oad		1							rug.	
Bedfor		2										4	
MK40 3												NB	~~
Date 1	8/03/2	2015 12	:29		De	esigned	i by	a.tew					cio
File S	W Tren	chard	propo	sed 1		-	-					Ufa	ainage
	Draina		FF-			etwork		.1.1					
			Net	work I	Design	Table	for	SW Pr	opose	d			
						100000							
	PN	-		-		T.E.		ase				Auto	
		(m)	(m)	(1:X)	(ha)	(mins)	Flow	(1/s)	(mm)	SECT	(mm)	Design	n
	27.000	31.870	0.295	108.0	0.019	5.00		0.0	0.600	0	150		
	22,005	11.380	0.045	252.9	0.049	0.00		0.0	0.600	0	300	f	
		22.760							0.600				
	1.010	4.365	0.005	873.0	0.000	0.00		0.0	0.600	V	40	8	
				N	etwork	Resul	ts T	able					
PN	Ra	in T.	c. U	S/IL 1	I.Are	аΣВ	ase	Foul	Add F	low	Vel	Cap	Flow
	(mm/	hr) (mi	ns)	(m)	(ha)	Flow	(1/s)	(1/s)	(1/s) (m∕s)	(1/s)	(1/s)
27.0	00 00	.00 5	.55 11	8.250	0.01	9	0.0	0.0		0.0	0.97	17.1	0.0
22.0	0.5	.00 7	41 11	7.805	0.36	2	0.0	0.0			0.00	69.6	0.0
		.00 7						0.0			0.98		
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Woods Hardwick		Page 7
15-17 Goldington Road		
Bedford		L.
MK40 3NH		Micro
Date 18/03/2015 12:29	Designed by a.tew	Micro Drainage
File SW Trenchard proposed 1	Checked by	brainage
Micro Drainage	Network 2014.1.1	
Synthet	Network 2014.1.1 ic Rainfall Details D1 (1km) 0.328 D2 (1km) 0.309 D3 (1km) 0.264 E (1km) 0.292 F (1km) 2.461 Summer Storms No Winter Storms Yes Cv (Summer) 0.750 Cv (Winter) 0.840 Duration (mins) 15	
@1982-	-2014 XP Solutions	

IS-17 Coldington Road Bedford Designed by a.tew Designed by a.tew Directed by Date 18/03/2015 12:29 File SW Trenchard proposed 1 Checked by Designed by a.tew Designed by a.tew Directed by Micro Drainage Network 2014.1.1 Online Controls for SW Proposed Environmentation Environmentation Metwork 2014.1.1 Design Head (m) 1.600 Hydro-Brake@ Type Md6 SW Only Invert Level (m) 118.900 Design Head (m) 1.600 Hydro-Brake@ Type Md6 SW Only Invert Level (m) 118.900 Design Head (m) 1.600 Hydro-Brake@ Type Md6 SW Only Invert Level (m) 118.900 Design Head (m) 1.600 Hydro-Brake@ Type Md6 SW Only Invert Level (m) 118.900 Online Control selected, the form Flow (1/s) Depth (m) Flow (1/s) Depth (m) Flow (1/s) Online Control selected, excessive flows may result.	Bedford MK40 3NH Designed by a.tew Checked by Designed by a.tew	Bedford MK40 3NH Designed by a.tew Checked by Designed by	Bedford MK40 3NH Designed by a.tew Micro Date 18/03/2015 12:29 Designed by a.tew Checked by Directed by Micro Drainage Network 2014.1.1 Online Controls for SW Proposed Micro Mydro-Brake@ Manhole: 15 (D5a), DS/PN: 6.009, Volume (m³): 6.1 Design Head (m) 1.600 Hydro-Brake@ Type Md6 SW Only Invert Level (m) 118.900 Depth (m) Flow (1/s) 92.0 Diameter (mm) 337 Depth (m) Flow (1/s) 12.6 Online Controls for SW Proposed 0.100 10.8 0.200 Diameter (mm) 337 Depth (m) Flow (1/s) 12.6 Operth (m) Flow (1/s) 12.6 0.100 10.8 0.200 93.2 3.000 112.6 7.000 171.4 0.500 90.9 0.500 91.6 0.500 92.2 0.500 121.3 0.500 121.3 0.500 92.9 0.500 137.5 0.500 144.9 0.500 92.2 0.500 144.9 0.500 199.3 <	Bedford MK40 3NH Designed by a.tew Checked by Micro Diamage File SW Trenchard proposed 1 Designed by a.tew Checked by Designed by a.tew Checked by Designed by a.tew Micro Drainage Network 2014.1.1 Design Head (m) Network 2014.1.1 Designed by a.tew Checked by Micro Drainage Metwork 2014.1.1 Design Head (m) 1.600 Hydro-Brake@ Type Md6 SW Only Invert Level (m) 118.900 Design Flow (1/s) 92.0 Depth (m) Flow (1/s) Pepth (m) Flow (1/s) Depth (m) Flow (1/s) Depth (m) Flow (1/s) Depth (m) Flow (1/s) 0.100 10.8 1.200 93.2 3.000 112.6 7.000 171.4 0.200 31.7 1.400 91.5 3.500 121.3 7.500 177.4 0.300 55.2 1.600 91.6 4.000 129.6 8.000 183.3 0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.500 199.7 </th <th>Bedford MK40 3NH Designed by a.tew Micro Drainage Date 18/03/2015 12:29 Designed by a.tew Checked by Directed by Micro Drainage Network 2014.1.1 Design Head (m) 1.600 Hydro-Brake@ Type Md6 SW Only Invert Level (m) 118.900 Design Head (m) 1.600 Hydro-Brake@ Type Md6 SW Only Invert Level (m) 118.900 Depth (m) Flow (1/s) The flow (1/s) 0.100 10.8 1.200 93.2 3.000 112.6 7.000 171.4 0.300 55.2 1.600 91.6 4.000 129.6 8.000 183.3 0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 155.2 9.500 199.7 0.800 99.3 2.400 102.0 6.000 158.7 199.7</th> <th>Woods Ha</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>Page 8</th>	Bedford MK40 3NH Designed by a.tew Micro Drainage Date 18/03/2015 12:29 Designed by a.tew Checked by Directed by Micro Drainage Network 2014.1.1 Design Head (m) 1.600 Hydro-Brake@ Type Md6 SW Only Invert Level (m) 118.900 Design Head (m) 1.600 Hydro-Brake@ Type Md6 SW Only Invert Level (m) 118.900 Depth (m) Flow (1/s) The flow (1/s) 0.100 10.8 1.200 93.2 3.000 112.6 7.000 171.4 0.300 55.2 1.600 91.6 4.000 129.6 8.000 183.3 0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 155.2 9.500 199.7 0.800 99.3 2.400 102.0 6.000 158.7 199.7	Woods Ha							Page 8
MK40 3NH Date 18/03/2015 12:29 Designed by a.tew Checked by Micro Micro Micro Drainage Designed by a.tew Checked by Micro Micro Micro Micro Drainage Micro Micro Drainage Micro Micro Drainage Micro Micro Design Micro Micro Drainage Micro Micro Design Micro Micro Drainage Micro Design Micro Design Micro Design Micro Micro Drainage Micro Design Micro Micro Micro Design Micro Micro Design Micro Design Micro Micro Design Micro Micro Design Micro	MK40 3NH Date 18/03/2015 12:29 Designed by a.tew Checked by Micro Micro Micro Micro Drainage Designed by a.tew Checked by Micro Micro Micro Micro Drainage Micro Micro Drainage Micro Micro Design Micro Micro Drainage Micro Design Micro Micro Drainage Micro Design Micro Micro Drainage Micro Design Micro Design Micro Micro Design Micro Drainage Micro Design Micro Design Micro Micro Micro Design Micro Design Micro Design Micro Micro Design Micro Mi	MK40 3NH Date 18/03/2015 12:29 Designed by a.tew Checked by Micro Micro Micro Drainage Designed by a.tew Checked by Micro Micro Micro Drainage Micro Micro Micro Drainage Micro Micro Micro Micro Micro Drainage Micro Micr	MK40 3NH Date 18/03/2015 12:29 Designed by a.tew Micro Micro File SW Trenchard proposed 1 Checked by Checked by Dianage Designed by a.tew Dianage	MK40 3NH Date 18/03/2015 12:29 Designed by a.tew Micro Micro File SW Trenchard proposed 1 Checked by Checked by Dianage Designed by a.tew Dianage	MK40 3NH Date 18/03/2015 12:29 Designed by a.tew Micro File SW Trenchard proposed 1 Checked by Checked by Checked by Micro Drainage Network 2014.1.1 Online Controls for SW Proposed Micro Micro Brake@ Manhole: 15 (D5a), DS/PN: 6.009, Volume (m³): 6.1 Design Head (m) 1.600 Hydro-Brake@ Type Md6 SW Only Invert Level (m) 118.900 Depth (m) Flow (1/s) Pepth (m) Flow (1/s) Depth (m) Flow (1/s) Depth (m) Flow (1/s) Depth (m) Flow (1/s) 0.100 10.8 1.200 93.2 3.000 112.6 7.000 171.4 0.200 31.7 1.400 91.5 3.500 121.3 7.500 177.4 0.300 55.2 1.600 93.1 4.500 137.5 8.500 183.3 0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500	15-17 Go	oldington Roa	ad					6
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0.200 31.7 1.400 91.5 3.500 121.3 7.500 177.4 0.300 55.2 1.600 91.6 4.000 129.6 8.000 183.3 0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 152.0 9.500 199.7 0.800 99.3 2.400 102.0 6.500 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.200 31.7 1.400 91.5 3.500 121.3 7.500 177.4 0.300 55.2 1.600 91.6 4.000 129.6 8.000 183.3 0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 152.0 9.500 199.7 0.800 99.3 2.400 102.0 6.500 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.200 31.7 1.400 91.5 3.500 121.3 7.500 177.4 0.300 55.2 1.600 91.6 4.000 129.6 8.000 183.3 0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 152.0 9.500 199.7 0.800 99.3 2.400 102.0 6.500 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.200 31.7 1.400 91.5 3.500 121.3 7.500 177.4 0.300 55.2 1.600 91.6 4.000 129.6 8.000 183.3 0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 152.0 9.500 199.7 0.800 99.3 2.400 102.0 6.500 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.200 31.7 1.400 91.5 3.500 121.3 7.500 177.4 0.300 55.2 1.600 91.6 4.000 129.6 8.000 183.3 0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 152.0 9.500 199.7 0.800 99.3 2.400 102.0 6.500 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.200 31.7 1.400 91.5 3.500 121.3 7.500 177.4 0.300 55.2 1.600 91.6 4.000 129.6 8.000 183.3 0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 152.0 9.500 199.7 0.800 99.3 2.400 102.0 6.500 158.7 1.000 96.6 2.600 105.5 6.500 165.2	Depth	(m) Flow (1/s)	Depth (m) Flo	w (l/s)	Depth (m) Fl	low (l/s)	Depth (m)	Flow (1/s)
0.300 55.2 1.600 91.6 4.000 129.6 8.000 183.3 0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 152.0 9.500 199.7 0.800 99.3 2.400 102.0 6.000 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.300 55.2 1.600 91.6 4.000 129.6 8.000 183.3 0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 152.0 9.500 199.7 0.800 99.3 2.400 102.0 6.000 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.300 55.2 1.600 91.6 4.000 129.6 8.000 183.3 0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 152.0 9.500 199.7 0.800 99.3 2.400 102.0 6.000 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.300 55.2 1.600 91.6 4.000 129.6 8.000 183.3 0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 152.0 9.500 199.7 0.800 99.3 2.400 102.0 6.000 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.300 55.2 1.600 91.6 4.000 129.6 8.000 183.3 0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 152.0 9.500 199.7 0.800 99.3 2.400 102.0 6.000 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.300 55.2 1.600 91.6 4.000 129.6 8.000 183.3 0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 152.0 9.500 199.7 0.800 99.3 2.400 102.0 6.000 158.7 1.000 96.6 2.600 105.5 6.500 165.2								
0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 152.0 9.500 199.7 0.800 99.3 2.400 102.0 6.000 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 152.0 9.500 199.7 0.800 99.3 2.400 102.0 6.000 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 152.0 9.500 199.7 0.800 99.3 2.400 102.0 6.000 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 152.0 9.500 199.7 0.800 99.3 2.400 102.0 6.000 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 152.0 9.500 199.7 0.800 99.3 2.400 102.0 6.000 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.400 76.1 1.800 93.1 4.500 137.5 8.500 188.9 0.500 90.9 2.000 95.6 5.000 144.9 9.000 194.4 0.600 97.3 2.200 98.6 5.500 152.0 9.500 199.7 0.800 99.3 2.400 102.0 6.000 158.7 1.000 96.6 2.600 105.5 6.500 165.2								
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0.800 99.3 2.400 102.0 6.000 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.800 99.3 2.400 102.0 6.000 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.800 99.3 2.400 102.0 6.000 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.800 99.3 2.400 102.0 6.000 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.800 99.3 2.400 102.0 6.000 158.7 1.000 96.6 2.600 105.5 6.500 165.2	0.800 99.3 2.400 102.0 6.000 158.7 1.000 96.6 2.600 105.5 6.500 165.2								
1.000 96.6 2.600 105.5 6.500 165.2	1.000 96.6 2.600 105.5 6.500 165.2	1.000 96.6 2.600 105.5 6.500 165.2	1.000 96.6 2.600 105.5 6.500 165.2	1.000 96.6 2.600 105.5 6.500 165.2	1.000 96.6 2.600 105.5 6.500 165.2	0.	.600 97.3	2.200	98.6	5.500	152.0	9.500	199.7
								ialised control	selected	d, excessive	e flows ma	ay result.	
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								ialised control	selected	i, excessive	e flows ma	ay result.	
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Woods Hardwick				Page 9
15–17 Goldington Road				6
Bedford				12
MK40 3NH				Micco
Date 18/03/2015 12:29	Desid	ned by	a.tew	Desinge
File SW Trenchard proposed 1	Check	ted by		Digitig
Micro Drainage		ork 2014	4.1.1	
Storage Str	ucture	es for	SW Proposed	
Porous Car Park Ma	anhole	: PP (I	5a), DS/PN: 6.000	
Infiltration Coefficient Base	(m/hr)	0.00000	Width (m)	
Membrane Percolation (mm/hr)	1000	Length (m)	25.0
Max Percolation	(1/s)	71.5	Slope (1:X)	300.0
Safety	ractor	0.30	Slope (1:X) Depression Storage (mm) Evaporation (mm/day)	3
Invert Lev	el (m)	120.000	Cap Volume Depth (m)	0.000
	(m)	120.000	cap forance puper (m)	0.000
Porous Car Park Ma	anhole	: PP (I	D5a), DS/PN: 7.000	
Infiltration Coefficient Base	(m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (
Max Percolation	(1/s)	50.0	Slope (1:X)	300.0
Safety	Factor	2.0	Depression Storage (mm)	5
Po	rosity	0.30	Evaporation (mm/day) Cap Volume Depth (m)	3
Invert Lev	el (m)	119.850	Cap Volume Depth (m)	0.000
Porous Car Park Ma	anhole	: PP (I	5a), DS/PN: 8.000	
Infiltration Coefficient Base	(m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (
Max Percolation	(1/s)	18.8	Slope (1:X)	300.0
Safety	Factor	2.0	Depression Storage (mm)	5
			Evaporation (mm/day)	
Invert Lev	el (m)	120.150	Cap Volume Depth (m)	0.000
Porous Car Park Ma	anhole	: PP (I	5a), DS/PN: 9.000	
Infiltration Coefficient Base	(m/hr)	0.00000	Width (m)	6.0
Membrane Percolation (
Max Percolation				
Safety	Factor	2.0	Depression Storage (mm)	5
Po	rosity	0.30	Evaporation (mm/day) Cap Volume Depth (m)	3
Invert Lev	el (m)	120.000	Cap Volume Depth (m)	0.000
Porous Car Park Ma	nhole	: PP (D	5a), DS/PN: 10.000	
Infiltration Coefficient Base	(m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (Length (m)	
Max Percolation			Slope (1:X)	
Safety	Factor		Depression Storage (mm)	
Po	rosity	0.30	Evaporation (mm/day)	3
Invert Lev	el (m)	120.000	Cap Volume Depth (m)	0.000
Porous Car Park Ma	nhole	: PP (D	5a), DS/PN: 11.000	
Infiltration Coefficient Base	(m/br	1 0.0000	0 Max Percolation (1/a)	68.4
Membrane Percolation				

Woods Hardwick	Page 10
15-17 Goldington Road	
Bedford	Ly m
MK40 3NH	Mirro
Date 18/03/2015 12:29 Designed by a.tew	Drainage
File SW Trenchard proposed 1 Checked by	biainage
Micro Drainage Network 2014.1.1	
Denne Gen Denk Merkeler DD (DC-) DD (DN: 11.0	0.0
Porous Car Park Manhole: PP (D5a), DS/PN: 11.0	00
Porosity 0.30 Slope (1:X) 300.	0
Invert Level (m) 120.150 Depression Storage (mm)	5
	3
Length (m) 28.0 Cap Volume Depth (m) 0.00	0
Porous Car Park Manhole: PP (D5a), DS/PN: 12.0	00
	h (m) 10.7
	h (m) 27.0
Max Percolation (1/s) 80.3 Slope Safety Factor 2.0 Depression Storage	(1:X) 300.0 (mm) 5
Porosity 0.30 Evaporation (mm	
Invert Level (m) 120.220 Cap Volume Dept	h (m) 0.000
Dereve Car Dark Markele, DD (DEa) DC (DN, 14.0	0.0
Porous Car Park Manhole: PP (D5a), DS/PN: 14.0	00
	h (m) 5.0
	h (m) 18.0
Max Percolation (1/s) 25.0 Slope Safety Factor 2.0 Depression Storage	(1:X) 300.0 (mm) 5
Porosity 0.30 Evaporation (mm	(day) 3
Invert Level (m) 120.700 Cap Volume Dept	
Percus Car Park Manhole: DD (DEa) DC (DN: 15.0	0.0
Porous Car Park Manhole: PP (D5a), DS/PN: 15.0	00
Infiltration Coefficient Base (m/hr) 0.00000 Widt	h (m) 13.1
	h (m) 32.0
Max Percolation (1/s) 116.4 Slope Safety Factor 2.0 Depression Storage	(1:X) 300.0 (mm) 5
Porosity 0.30 Evaporation (mm	
Invert Level (m) 120.600 Cap Volume Dept	h (m) 0.000
Tark or Dord Markele, Dord (DEa) DC (DN, 6 00	0
Tank or Pond Manhole: Pond (D5a), DS/PN: 6.00	0
Invert Level (m) 118.915	
Depth (m) Area (m ²) Depth (m) Area (m ²)	
0.000 204.4 1.885 639.3	
Filter Drain Manhole: 5 (TC), DS/PN: 18.004	
Infiltration Coefficient Base (m/hr) 0.01000 Trench Len	gth (m) 17.0
	ter (m) 0.300
Safety Factor 1.0 Pipe Depth above Inv	
Porosity 0.30 Slop Invert Level (m) 118.425 Cap Volume De	e (1:X) 300.0
Trench Width (m) 2.0 Cap Infiltration De	
©1982-2014 XP Solutions	

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15-17 Goldington Road	
Bedford	m m
MK40 3NH M	icro
Date 18/03/2015 12:29 Designed by a.tew	ainage
File Sw Henchard proposed I Checked by	
Micro Drainage Network 2014.1.1	
Filter Drain Manhole: FD (TC), DS/PN: 19.000	
Infiltration Coefficient Base (m/hr) 0.00000 Trench Length (m) 3 Infiltration Coefficient Side (m/hr) 0.00000 Pipe Diameter (m) 0. Safety Factor 1.0 Pipe Depth above Invert (m) 0. Porosity 0.30 Slope (1:X) 30 Invert Level (m) 118.790 Cap Volume Depth (m) 0. Trench Width (m) 1.0 Cap Infiltration Depth (m) 0. Filter Drain Manhole: 7 (TC), DS/PN: 18.006	.000 00.0 .000
Filter blath Mandet, / (16), bb/rk. 10.000	
Infiltration Coefficient Base (m/hr) 0.01000 Trench Length (m) 2 Infiltration Coefficient Side (m/hr) 0.01000 Pipe Diameter (m) 0. Safety Factor 1.0 Pipe Depth above Invert (m) 0. Porosity 0.30 Slope (1:X) 90 Invert Level (m) 118.500 Cap Volume Depth (m) 0. Trench Width (m) 2.0 Cap Infiltration Depth (m) 0.	.000 00.0 .000
Filter Drain Manhole: 9 (TC), DS/PN: 18.008	
Infiltration Coefficient Base (m/hr) 0.01000 Trench Length (m) Infiltration Coefficient Side (m/hr) 0.01000 Pipe Diameter (m) 0. Safety Factor 1.0 Pipe Depth above Invert (m) 0. Porosity 0.30 Slope (1:X) 9 Invert Level (m) 118.268 Cap Volume Depth (m) 0. Trench Width (m) 10.0 Cap Infiltration Depth (m) 0.	.000 90.0 .000
Filter Drain Manhole: 16 (TC), DS/PN: 23.001	
Infiltration Coefficient Base (m/hr) 0.01000 Trench Length (m) 9 Infiltration Coefficient Side (m/hr) 0.01000 Pipe Diameter (m) 0. Safety Factor 1.0 Pipe Depth above Invert (m) 0. Porosity 0.30 Slope (1:X) 50 Invert Level (m) 118.200 Cap Volume Depth (m) 0. Trench Width (m) 2.9 Cap Infiltration Depth (m) 0.	.000 00.0 .000
Filter Drain Manhole: 19 (TC), DS/PN: 22.006	
Infiltration Coefficient Base (m/hr) 0.01000 Trench Length (m) 2 Infiltration Coefficient Side (m/hr) 0.01000 Pipe Diameter (m) 0. Safety Factor 1.0 Pipe Depth above Invert (m) 0. Porosity 0.30 Slope (1:X) 50 Invert Level (m) 117.760 Cap Volume Depth (m) 0. Trench Width (m) 1.0 Cap Infiltration Depth (m) 0.	.150 .000 00.0 .000
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Woods Hard	wick						Page
15-17 Gold	ington R	oad		1			<u> </u>
Bedford							4
MK40 3NH							Micc
Date 18/03	/2015 12	:29		Designed by	a.tew		- MICC
File SW Tre	enchard j	propose	d 1	Checked by			Drair
Micro Drai	nage			Network 201	4.1.1		
Summary	of Crit	ical Re	esults	by Maximum L	evel (Rank	1) for SW	Propos
			C.	imulation Crite	ria		
	Areal R	eduction		1.000 Additi		of Total Fi	low 0.00
				0 MA			
Manhole			clobal)	0 0.500 Flow per		t Coeffiecie av (1/per/da	
	Sewage per				rerbon par b	al (r/par/a	1, 0.00
	Number	of Input	Hydrogr	aphs 0 Number	of Storage Str	ructures 16	
	Number	r of Onl	ine Cont	rols 1 Number	of Time/Area I	Diagrams 0	
	Number	of Offl	ine Cont	rols 0 Number	of Real Time (Controls 0	
				etic Rainfall I			
		Rainfal.		GB 450500 2252		FEH 250	
			C (1km)	GB 400000 2202.		023	
			1 (1km)			328	
			2 (1km) 3 (1km)			309 264	
			E (1km)			292	
			F (1km)		2.	461	
			Summer)			750	
		Cv (Winter)		0.	840	
	Margin for					300	
		1		Timestep 2.5 : TS Status	Second Increme		ON ON
				VD Status			ON
			Inert	ia Status			ON
		Pro	file(s)		Summ	er and Wint	er
	Dura			15, 30, 60, 12	0, 240, 360, 4	80, 960, 14	40
	Return Per	iod(s) ate Cha					00 30
	UT III	ace ona	ilge (s)				
PN	Storm		Climate Change		First Y Flood	First Z Overflow A	
	15 Winter						
	15 Winter			100/15 Summer	100/15 Summer	0	
	15 Summer 15 Winter			100/15 Summer 100/15 Summer	100/15 Summer		
	15 Winter			100/15 Summer			
	15 Winter			100/15 Summer			
	15 Winter 15 Summer			100/15 Summer 100/15 Summer			1
	15 Summer 15 Summer			100/15 Summer 100/15 Summer	100/15 Summer		
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Woods Hard				9 <u>7</u>		Page
15-17 Gold	ington R	bad				
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Micro Drai	nage			Network 201	4.1.1	
Summary	of Crit	ical Re	esults	by Maximum L	evel (Rank	1) for SW Prop
		-				
PN	Charme		Climate		First Y	First Z O/F I Overflow Act. E
PN	Storm	Period	Change	Surcharge	Flood	OVERIIOW ACC. E
6.002	15 Winter	100	+30%	100/15 Summer		
9.000	15 Winter	100		100/15 Summer		
10.000	15 Winter	100	+30%	100/15 Summer		
10.001	15 Winter	100	+30%	100/15 Summer 100/15 Summer		
6.003	15 Winter	100	+30%	100/15 Summer		
				100/15 Summer		
11.000	15 Winter	100	+30%	100/15 Summer		
12.000	15 Winter	100	+30%	100/15 Summer		
6.005	15 Winter	100	+30%	100/15 Summer 100/15 Summer		
6.006	15 Winter	100	+30%	100/15 Summer		
13.000	15 Winter	100	+30%	100/15 Summer 100/15 Summer		
				100/15 Summer		
				100/15 Summer		
13,002	15 Winter	100	+30%	100/15 Summer		
15,000	15 Winter	100	+30%	100/15 Summer		
13.003	15 Winter	100	+308	100/15 Summer 100/15 Summer		
13,004	15 Winter	100	+30%	100/15 Summer		
13.005	15 Winter	100	+30%	100/15 Summer 100/15 Summer		
	15 Winter			100/15 Summer		
				100/15 Summer		
6.008	60 Winter	100	+308	100/15 Summer		
6.010	30 Winter	100	+30%	100/15 Summer 100/15 Summer		
				100/15 Summer		
	60 Winter	100	+30%	100/15 Summer		
				100/15 Summer		
				100/15 Summer		
16.000	15 Winter	100	+30%	100/15 Summer		
16.002	15 Winter	100	+30%	100/15 Summer 100/15 Summer		
				100/15 Summer		
	15 Winter		+30%			
	15 Winter		+30%			
	15 Winter					
	15 Winter		+30%			
	15 Winter					
	15 Winter			100/15 Summer		
	15 Winter			100/15 Summer		
				100/15 Summer		
	30 Winter			100/15 Summer	100/30 Winter	-
				100/15 Summer	Loo, so wincel	
18.005	30 Winter	100	+30%	100/15 Summer		
	30 Winter			100/15 Summer		
				100/15 Summer		
	60 Winter			100/15 Summer	100/30 Winter	
				100/15 Summer		
	15 Winter					
	15 Winter			100/15 Summer	100/15 Summer	-
	15 Winter			100/15 Summer	- s ey a er transfiller i	
	15 Winter			100/10 Dummer		
	15 Winter					
1 0.00						

Woods Hard	wick	:									Pag	e 14
15-17 Gold	lingt	on Road	1			2						
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MK40 3NH												~m
	10.01	F 10.00				Dent					— Mi	CLO
Date 18/03/2015 12:29 File SW Trenchard proposed 1					Designed by a.tew						ainage	
					Checked by							
Micro Drai	nage	2				Netw	ork 201	4.1.1				
Cummore	, of	Critic	-1 D		t.c	by Max	cimum I	ovol (Dapk 1) for	SW Prop	ogod
Junnar	01	011010	11 10			by nar	CINGIN D	ever (Kalik 1	/ 101	54 Trop	oseu
			Return Clim				st X		st Y		Z O/F	
PN	St	orm Pe	riod	Cha	nge	Surc	harge	Fle	boo	Overf]	low Act. H	xc.
22 000	15 W	linter	100		1205	100/15	Summer	100/15	Winter			1
		Vinter	100				Summer	100/15	wincer			1
		Vinter	100				Summer					
		linter					Summer					
23.000	15 W	Vinter	100		+30%							
		Vinter	100		+30%							
		Vinter										
		Vinter					Summer					
		Vinter Vinter					Summer					
		Vinter										
		linter						100/15	Summer			6
		Vinter					Summer					
1.010	15 W	Vinter	100		+30%							
			Wat				Flooded			Pipe		
		US/MH		rel			Volume				-	
PN		Name	(1	n)	Dept	th (m)	(m ³)	Cap.	(1/s)	(1/s)	Status	
1.0	00	0759	120.	171		-0.075	0.000	0.36	0.0	23.4	C	OK
1.0			120.				12.956			24.8	FLOO	
1.0			119.				0.000				FLOOD RIS	
2.0	00	Ex MH	120.	756		0.781	55.963	0.86	0.0	99.3	FLOO	DD
3.0			120.				65.075					
2.0			120.				5.773			193.9		
4.0			120.				27.010 0.019			11.3	FLOO	
2.0		Ex MH					0.000				SURCHARGE	
5.0			119.				0.000				FLOOD RIS	
1.0			119.				0.000				FLOOD RIS	
6.0	00	PP (D5a)	120.	241		0.241	0.000	1.49	0.0	23.4	SURCHARGE	D
6.0		1 (D5a)					0.000				SURCHARGE	
7.0		PP (D5a)					0.000				FLOOD RIS	
8.0		PP (D5a)					0.000				SURCHARGE	
6.0		2 (D5a)				0.517					SURCHARGE	
9.0		PP (D5a) PP (D5a)				0.381 0.407	0.000	1.36	0.0		SURCHARGE FLOOD RIS	
10.0		3 (D5a)				0.407	0.000	0.83			SURCHARGE	
6.0		4 (D5a)				0.554	0.000	0.74	0.0		SURCHARGE	
6.0		5 (D5a)				0.575	0.000	0.82			SURCHARGE	
11.0		PP (D5a)				0.377	0.000	1.26	0.0		SURCHARGE	
12.0		PP (D5a)				0.387	0.000	1.23			SURCHARGE	
6.0		6 (D5a)				0.640	0.000	1.21			SURCHARGE	
6.0		7 (D5a)				0.639	0.000	1.33			SURCHARGE	
13.0		8 (D5a)				0.876	0.000	0.42			FLOOD RIS	
14.0		PP (D5a) 9 (D5a)				0.292	0.000	1.08			SURCHARGE	
13.0		9 (D5a) 10 (D5a)				1.111	0.000	0.91			SURCHARGE	
15.0		PP (D5a)				0.570	0.000	1.42			SURCHARGE	
13.0		11 (D5a)				1.075	0.000	0.88			SURCHARGE	
10.0						1.072	0.000	1.29			SURCHARGE	

Woods Hardwi								Page 15
15-17 Goldin	igton Road							2
Bedford								1 mg
MK40 3NH								— Micro
Date 18/03/2	Desi	gned by	Drainad					
File SW Tren	Chec	ked by	Diamag					
Micro Draina	age		Netw	ork 201	4.1.1			•
Summary	of Critica	l Resul	lts bv Ma	ximum L	evel (Rank 1) for	SW Proposed
	US/MH	Water	Surch'ed	Flooded		O'flow	Flow	
PN	Name	(m)	Depth (m)			(1/s)		Status
13.005	12 (D5a)	120.676	1.021	0.000	1.36	0.0	228.6	SURCHARGED
13.006		120.245	0.795	0.000	2.29	0.0	257.7	SURCHARGED
6.007	14 (D5a)	120.027	0.607	0.000	3.46	0.0	449.7	SURCHARGED
6.008	Pond (D5a)	119.917	0.402	0.000	0.57	0.0	98.0	SURCHARGED
6.009	15 (D5a) 16 (D5a)	119.925	0.575	0.000	0.64	0.0	96.7	SURCHARGED
6.010	10 (DDa)	119.473	0.323	0.000	0.90	0.0	95.5	SURCHARGED
1.004	18 (D5a)	119.415	0.341	0.000	1.63	0.0	289.0	SURCHARGED SURCHARGED
1.005								SURCHARGED
1.006								SURCHARGED
16.000		119.455						SURCHARGED
16.001		119.353			1.11			SURCHARGED
16.002		119.049 118.951						SURCHARGED SURCHARGED
17.000			-0.204		0.51			
17.001			-0.102		0.52		93.5	
17.002			-0.090					
1.007	0769	118.777	-0.345	0.000	0.64	0.0	403.6	OK
18.000	1 (TC)	119.546	-0.019	0.000	0.58	0.0	21.9	OK
18.001	2 (TC)	119.491	0.106	0.000	1.06	0.0	35.8	SURCHARGED
18.002		119.351						SURCHARGED
18.003				0.000			29.8	SURCHARGED FLOOD
	FD (TC)			0.000				SURCHARGED
18.005								SURCHARGED
18.006								FLOOD RISK
18.007	8 (TC)	118.996	0.576	0.000	1.37	0.0	7.6	FLOOD RISK
18.008			0.533	3.195	2.26	0.0		
	1285 (TC)							FLOOD RISK
1.008			-0.806				410.0	
20.000 20.001		118.566		18.363				FLOOD FLOOD RISK
20.001		118.470		0.000			4.6	
1.009			-0.819					
22,000	10 (TC)	120.060	1.010	0.017	1.27	0.0	22.0	FLOOD
	11 (TC)	119.828	0.928	0.000	1.32	0.0	64.5	FLOOD RISK
	12 (TC)	119.002	0.547	0.000	1.00	0.0	67.8	FLOOD RISK
22.003								FLOOD RISK
23.000			-0.081					OK
	1191 (TC)							FLOOD RISK OK
25.000	1266 (TC) 15 (TC)					0.0		
23.001	16 (TC)	118.861	0,461	0.000	1.68	0.0	10.2	SURCHARGED FLOOD RISK
22.004	17 (TC)	118.638	0.433	0.000	1.48			FLOOD RISK
27.000		118.644	0.244	0.000	0.87			FLOOD RISK
22.005	18 (TC)	118.429	0.324	29.007	1.27	0.0	70.7	FLOOD
	19 (TC)							
1.010	Ditch	118.081	-0.835	0.000	0.14	0.0	460.6	OK

APPENDIX E

Flood routing

