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## 16871

## **Flood Risk Assessment Compliance**

For Camp Road, Upper Heyford Parcel D5a

December 2014

16871/B4





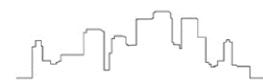


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#### 1.0 **Introduction**

- 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
(I/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.
- The final discharge from the parcel will be controlled using a hydro-brake vortex controller. 3.16
- Living roofs have been discounted as they are not in keeping with the strict urban planning 3.17 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 <u>Hydraulic Performance</u>

#### 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.
- 4.2 The Microdrainage model (refer to **Appendix D**) demonstrates that the proposed 1 in 100 year (plus climate change) discharge rate does not exceed 157.3 l/s at run 6.009.
- 4.3 The achieved discharge rate (69.6l/s) is significantly lower than the calculated allowable discharge.

#### Exceedance

4.4 During storms in excess of the designated storm, there is the potential for the storage structures and drainage system to be overwhelmed, leading to flooding. Indicative finished floor levels and external levels have been designed so that during these periods, flood water will be directed away from the proposed building entrances and into the roads and soft landscaping areas.

#### Pollution prevention

- 4.5 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.
- 4.6 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 development 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 A Microdrainage models have been created and demonstrates a significant betterment in discharge rates.

## **APPENDIX A**

## **Residential Parcel Plan**

## APPENDIX B

Proposed levels and drainage layouts

## APPENDIX C

Existing Microdrainage Calculations

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PN 1.00 1.00 2.00	<u>N</u> <b>PN</b> 1.000 1.001 2.000 2.001 1.002 <b>Ra:</b> (nm/ 0 0 1 0 0 0 1 0	Length (m) 35.951 26.411 14.225 22.148 10.321 in T. hr) (mi .00 \$ .00 \$	Minim Maxim Dept for lope <b>Fal:</b> (m) 0.62 0.21 0.22 0.19 0.10 <b>C.</b> (nns) 5.35 5.83 5.19 5.44	um Back um Back h for O Auto De for Opt E sign Ta (1:X) 9 57.2 5 122.8 5 63.2 8 111.9 4 99.2 US/IL (m) 120.021 119.392	drop Heid drop Heid drop Heid ptimisati sign only imisation Designed a able for able for a I.Area (ha) 2 0.031 3 0.056 2 0.090 0 0.200 2 0.100 Network E I.Area (ha) 0.031 0.081	yht (m) ght (m) ion (m) y (m/s) h (1:X) with Le T.E. (mins) 5.00 0.00 5.00 0.00 0.00 0.00 Resul A Σ B Flow	vel Sc <u>AST E</u> Ba Flow (1/s) 0.0 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.	ING 15 k (mm) 0.600 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000 0.00000000	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) 225 150 300 300 300 300 300 300 300 150 300 300 300 150 300 300 300 300 300 300 300 300 300 3	0.000 1.200 0.75 500 SWS Auto Desig 0 0 0 0 0 0 0 0 0 0 0 0 0	Flow (1/s) 0.0 0.0 0.0

Woods Har	dwick										Pa	ge O
15-17 Gol	dington	Road										
Bedford											4	~
MK40 3NH											5.4	inte
Date 23/1	2/2014	13:00	-	De	signe	d by	a.tev	v				
File SW T:	renchar	d exis	ting 2	2 Ch	ecked	by					U	aina
Micro Dra	inage			Ne	twork	2014	.1.1					
	Sac	0.000	50.50	1 T		1.1	15.7	20.	1.13			
	STOP	RM SEW	ER DES	IGN by	the M	odifi	ed Ra	ationa	al Me	thod		
	Des	ign C	riteria	a for S	W EAST	EXIS	STING	15.0	7.13	.SWS		
Time	Ci	U PAPT	ENTOTIN	C 15 07				CH PAC	PVT	OTTNO	15 07	12
Pipe	Sizes S	W EASI	EAISIIN					SW EAS.	L LAI	SIING	15.07	. 13
			Deturn		ainfal		1				2	
			Recurn	Period Site Lo			0500	225250	SP 5	0500		
				0	(1km)					-	0.023	
					(1km)						0.328	
					2 (1km) 3 (1km)						0.309	
					(1km) (1km)						0.292	
		14			(1km)						2.461	
	Maximum			ainfall antration							30	
	Hay Throug	+ Inte O		Sewage (1							0.000	
				Runoff							0.750	
	A			nate Char drop Heid							0.000	
				drop Heid							0.000	
1	Min Desig										1.200	
				sign only							0.75	
	Min	Slope :	for Opt:	imisation	i (1:X)						500	
			D	esigned w	with Le	vel Sc	ffits					
		rk Des	ign Ta	ble for	SW E	AST E	XIST	ING 18	5.07	13.5	WS	
	Networ							1	uvn	DTA		
P	N Lengt											
р				I.Area (ha)								
1.0	N Lengt (m)	(m)	(1:X) 9 57.2	(ha) 0.031	(mins) 5.00	Flow	(1/s) 0.0	(mm) 0.600	SECT	(mm) 225	Desig	
1.0	N Lengt (m)	(m)	(1:X) 9 57.2	(ha) 0.031	(mins) 5.00	Flow	(1/s) 0.0	(mm)	SECT	(mm) 225	Desig	
1.0	N Lengt (m)	(m) 0.62 1 0.21	(1:X) 9 57.2 5 122.8	(ha) 0.031 0.056	(mins) 5.00 0.00	Flow	(1/s) 0.0 0.0	(mm) 0.600 0.600	SECT C	(mm) 225 150	Desig	
1.( 1.( 2.(	N Lengt (m) 000 35.95 001 26.41	(m) 01 0.62 11 0.21 25 0.22	(1:X) 9 57.2 5 122.8 5 63.2	(ha) 0.031 0.056 0.090	(mins) 5.00 0.00 5.00	Flow	(1/s) 0.0 0.0 0.0	(mm) 0.600 0.600	SECT C	(mm) 225 150	Desig	
1.( 1.( 2.( 2.(	N Lengt (m) 000 35.95 001 26.41	(m) 51 0.62 11 0.21 25 0.22 18 0.19	(1:X) 9 57.2 5 122.8 5 63.2 8 111.9	(ha) 0.031 0.056 0.090 0.200	(mins) 5.00 0.00 5.00 0.00	Flow	(1/s) 0.0 0.0 0.0 0.0	(mm) 0.600 0.600 0.600 0.600	SECT C C C	(mm) 225 150 150 300	Desig	
1.( 1.( 2.( 2.(	N Lengt (m) 000 35.95 001 26.41 000 14.22 001 22.14	(m) 51 0.62 11 0.21 25 0.22 18 0.19	(1:X) 9 57.2 5 122.8 5 63.2 8 111.9 4 99.2	(ha) 0.031 0.056 0.090 0.200	(mins) 5.00 0.00 5.00 0.00 0.00	Flow	(1/s) 0.0 0.0 0.0 0.0 0.0	(mm) 0.600 0.600 0.600 0.600	SECT C C C	(mm) 225 150 150 300	Desig	
1.0 1.0 2.0 1.0	N Lengt (m) 000 35.95 001 26.41 000 14.22 001 22.14 002 10.32	(m) 1 0.62 1 0.21 25 0.22 18 0.19 21 0.10	(1:X) 9 57.2 5 122.8 5 63.2 8 111.9 4 99.2	(ha) 0.031 0.056 0.090 0.200 0.100 Network	(mins) 5.00 0.00 5.00 0.00 0.00 Resu	Flow its Ta	(1/s) 0.0 0.0 0.0 0.0 0.0 0.0	(mm) 0.600 0.600 0.600 0.600 0.600	SECT C C C C C C C C C C C C C C C C C C	(mm) 225 150 300 300	Desig d d d d d d d d d d d d d d d d d d d	'n
1.( 1.( 2.( 1.( PN	N Lengt (m) 000 35.95 001 26.41 000 14.22 001 22.14 002 10.32	(m) 01 0.62 11 0.21 0.22 0.19 0.10 11 0.10 T.C.	(1:X) 9 57.2 5 122.8 5 63.2 8 111.9 4 99.2 <u>1</u> US/IL	(ha) 0.031 0.056 0.090 0.200 0.100 Network E I.Area	(mins) 5.00 0.00 5.00 0.00 0.00 <u>Resu</u>	Flow Its Ta	(1/s) 0.0 0.0 0.0 0.0 0.0 0.0 able Foul	(mm) 0.600 0.600 0.600 0.600 0.600 Add F	SECT 0 0 0 0 0 0 0 0 0	(mm) 225 150 300 300 Vel	Desig d d d d d d d d d d d d d d d d d d d	Flow
1.( 1.0 2.( 2.0 1.0 ( 1.000	N Lengt (m) 000 35.95 001 26.41 000 14.22 001 22.14 002 10.32 Rain	(m) 51 0.62 11 0.21 25 0.22 28 0.19 21 0.10 T.C. mins) 5.35	(1:X) 9 57.2 5 122.8 5 63.2 8 111.9 4 99.2 <u>1</u> US/IL (m) 120.021	(ha) 0.031 0.056 0.090 0.200 0.100 Network E I.Area (ha) 0.033	(mins) 5.00 0.00 5.00 0.00 0.00 <u>Resu</u> <b>E</b> E Flow	Flow Its T: ase (1/s) 0.0	(1/s) 0.0 0.0 0.0 0.0 0.0 able Foul (1/s) 0.0	(mm) 0.600 0.600 0.600 0.600 0.600 0.600 Add F (1/:	SECT	(mm) 225 150 300 300 Vel (m/s) 1.73	Desig	m Flow (1/s) 0.0
1.( 1.0 2.( 1.0 <b>PN</b> ( 1.000 1.001	N Lengt (m) 000 35.95 001 26.41 000 14.22 001 22.14 002 10.32 Rain (mm/hr) (mm/hr) (m	(m) 51 0.62 51 0.21 55 0.22 58 0.19 51 0.10 T.C. mins) 5.35 5.83	(1:X) 9 57.2 5 122.8 5 63.2 8 111.9 4 99.2 1 US/IL (m) 120.021 119.392	(ha) 0.031 0.056 0.090 0.200 0.100 Network E I.Area (ha) 0.033 0.08	(mins) 5.00 0.00 5.00 0.00 0.00 <u>Resu</u> Flow	Flow its T: ase (1/s) 0.0 0.0	(1/s) 0.0 0.0 0.0 0.0 0.0 able Foul (1/s) 0.0 0.0	(mm) 0.600 0.600 0.600 0.600 0.600 0.600 Add F (1/:	SECT	(mm) 225 150 300 300 Vel (m/s) 1.73 0.91	Desig Cap (1/s)	Flow (1/s) 0.0 0.0
1.0 1.0 2.0 1.0 1.000 1.001 2.000	N Lengt (m) 000 35.95 001 26.41 000 14.22 001 22.14 002 10.32 Rain mm/hr) (1 0.00 0.00	(m) 61 0.62 11 0.21 25 0.22 28 0.19 21 0.10 T.C. mins) 5.35 1 5.83 1 5.19	(1:X) 9 57.2 5 122.8 5 63.2 8 111.9 4 99.2 	(ha) 0.031 0.056 0.090 0.200 0.100 Network E I.Ares (ha) 0.033 0.087	(mins) 5.00 0.00 5.00 0.00 0.00 <u>Resu</u> <b>Flow</b>	Flow its T: ase (1/s) 0.0 0.0	(1/s) 0.0 0.0 0.0 0.0 0.0 <u>able</u> Foul (1/s) 0.0 0.0	(mm) 0.600 0.600 0.600 0.600 0.600 Add F (1/)	SECT	(mm) 225 150 300 300 Vel (m/s) 1.73 0.91 1.27	Desig Cap (1/s)	Flow (1/s) 0.0 0.0
1.0 1.0 2.0 1.0 1.000 1.001 2.000 2.001	N Lengt (m) 000 35.95 001 26.41 000 14.22 001 22.14 002 10.32 Rain mm/hr) () 0.00 0.00	(m) 51 0.62 11 0.21 25 0.22 28 0.19 21 0.10 <b>T.C.</b> <b>mins</b> ) 5.35 5.83 5.19 5.44	(1:X) 9 57.2 5 122.8 5 63.2 8 111.9 4 99.2 <u>19.021</u> 119.392 119.600 119.225	(ha) 0.031 0.056 0.090 0.200 0.100 Network E I.Area (ha) 0.033 0.087 0.036 0.290	(mins) 5.00 0.00 5.00 0.00 0.00 Result Flow	Flow Its Ta ase (1/s) 0.0 0.0 0.0	(1/s) 0.0 0.0 0.0 0.0 able Foul (1/s) 0.0 0.0 0.0	(mm) 0.600 0.600 0.600 0.600 0.600 Add F (1/)	SECT	(mm) 225 150 300 300 (m/s) 1.73 0.91 1.27 1.49	Desig Cap (1/s) 68.9 16.0 22.4 105.0	Flow (1/s) 0.0 0.0 0.0

15-17 Bedfor MK40 3	d	ngton	Road									2	~
Date 2	3/12/	2014 1	3:00		De	signed	i by	a.tew	6		-		
File S	W Tre	nchard	exi	sting 2	Ch	ecked	by					D	ain
Micro	Drain	age			Ne	twork	2014	.1.1					
				-	1.1		-			1	15.16		
	1	Networ	k Des	sign Tab	ole for	SW E	AST E	XISTI	NG 15	.07.	13.S	WS	
	PN	Length	Fall	Slope	I.Area	T.E.	B	ase	k	HYD	DIA	Auto	
		(m)		(1:X)									
	3.000	20.687	0.09	7 213.3	0.363	5.00		0.0	0.600	0	375		
		20.000	0.00	7 94.8	0.000	5 00			0.000				
	4.000	30.900	0.52	/ 94.0	0.295	5.00		0.0	0.600	0	660		
	3.001	43.746	0.40	6 107.7	0.132	0.00		0.0	0.600	0	375	9	
	5.000	25.387	0.21	1 120.3	0.099	5.00		0.0	0.600	0	100		
												- T.	
				7 297.4 0 266.5					0.600			_	
					a contra							-	
	6.000	3.241	0.13	5 24.0	0.030	5.00		0.0	0.600	0	150	6	
1.1	1.003	5.982	0.01	7 351.9	0.000	0.00		0.0	0.600	0	525	6	
	1.004	8.188	0.01	8 454.9	0.000	0.00		0.0	0.600	0	525	<b>.</b>	
	7.000	8.461	0.04	2 201.5	0.159	5.00		0.0	0.600	0	225	6	
	7.001	38.682	0.24	0 161.2	0.000	0.00		0.0	0.600	0	225	9	
	7.002	7.950	0.00	1 7950.0	0.046	0.00		0.0	0.600	0	300	9	
	8.000	20.838	0.16	9 123.3	0.515	5.00		0.0	0.600	0	225	8	
				N	etwork	Resul	ts T	able					
DN	Ra	in T		US/IL	TAres	TR		Foul	Add F	low	Vel	Can	Flo
				(m)		Flow						-	
3.0	00	0.00	5.28	119.600	0.363		0.0	0.0	(	0.0	1.24	136.6	0.
4 0	0.0	0.00	5.20	119.980	0 203		0.0	0.0			1 74	52.4	0
3.0	01	0.00	5.80	119.503	0.788		0.0	0.0	0	0.0	1.75	192.7	0.
5.0	00	0.00	5.60	119.583	0.099	é.	0.0	0.0	(	0.0	0.70	5.5	0.
3.0	03	0.00	6.47	119.097 118.990	0.887			0.0				115.5	
6.0	00	0.00	5.03	119.257	0.030	)	0.0	0.0	(	0.0	2.06	36.5	0.
1.0	03	0.00	6.55	118.917	1.423		0.0	0.0		0.0	1.19	257.2	0.
1.0	04	0.00	6.69	118.365	1.423		0.0	0.0	(	0.0	1.04	225.9	0.
7.0	00	0.00	5.15	118.929	0.159		0.0	0.0		0.0	0.92	36.5	0
				118.887					ć				
				118.572					(				
8.0	00	0.00	5.30	119.471	0.515		0.0	0.0	(	0.0	1.18	46.8	0.

MK40 3NH Date 23/12/2					signed	-				-	- Mic	tro inagi
File SW Tren		exist	ing 2.								Gre	m is sj
Micro Draina	age			Net	work :	2014	.1.1					
N	letwork	Desi	gn Tab	le for	SW EA	ST E	XISTI	NG 15.	07.1	3.51	WS	
PN	Length (m)			I.Area (ha)							Auto Design	
8.001	45.406	0.311	146.0	0.120	0.00		0.0	0.600	o	225	. <del>6</del>	
				0.135				0.600			-	
8.003	14,461	0.152	95.1	0.100	0.00		0.0	0.600	0	225	0	
7.003	7.429	0.001	7429.0	0.000	0.00		0.0	0.600	0	300	<b>0</b>	
9,000	56.396	0.150	376.0	0.156	5.00		0.0	0.600	0	525	8	
9.001	8.750	0.030	291.7	0.000	0.00		0.0	0.600	0	525	. 4	
9.002	23.509	0.060	391.8	0.000	0.00		0.0	0.600	0	525	<b>.</b>	
1.005	37.754	0.097	389.2	0.000	0.00		0.0	0.600	0	825	6	
10,000	13 622	0.050	225 1	0.063	5 00		0.0	0.600		100	e de	
				0.000				0.600				
1.000	10.044	0.000	050.0	0.000	0.00			0 000				
1.006	19.044	0.020	932.2	0.000	0.00		0.0	0.000	V	40	•	
				0.070							-	
11.001	9.076	0.010	907.6	0.006	0.00		0.0	0.600	0	100	e e	
12.000	8.298	0.065	127.7	0.006	5.00		0.0	0.600	0	150	8	
			N	etwork	Result	is la	able					
				I.Area (ha)								
8.001 0	0.00 e	.00 11	9.302	0.635				0.				
8.002 0 8.003 0							0.0		0 1		49.3	0.0
8.005	0.00 0	.40 11	0./30	0.010		0.0	0.0	0.		. 54	33.5	0.0
7.003 0	0.00 7	.29 11	8.571	1.075		0.0	0.0	0.	0 0	.17	12.2	0.0
9.000 0	0.00 5	. 82 11	8.570	0.156		0.0	0.0	0.	.0 1	.15	248.8	0.0
9.001 0				0.156			0.0				282.8	
9.002 0	0.00 6	.28 11	8.390	0.156		0.0	0.0	0.	.0 1	.13	243.6	0.0
1.005 0	0.00 7	.71 11	8.297	2.654		0.0	0.0	0.	.0 1	.50	801.2	0.0
10.000	0.00 5	. 46 11	8.268	0.063		0.0	0.0	0.	0 0	.50	3.9	0.0
10.001 0	0.00 6	.06 11	8.210	0.063		0.0	0.0	0.	0 0	.48	3.8	0.0
1.006 0	0.00 7	.88 11	7.700	2.717		0.0	0.0	0.	0 1	.91	7493.7	0.0
11.000	0.00 5	. 49 11	8,143	0.070		0.0	0.0	0	0 0	.43	3.3	0.0
			8.104	0.076		0.0			0 0		1.9	
12.000	0.00 5	.16 11	8.017	0.006		0.0	0.0	0.	.0 0	.89	15.7	0.0

Woods Hardw	ick							Page	₽ 3
15-17 Goldi	ngton Road								
Bedford								4	4
MK40 3NH				1				Mit	
Date 23/12/	2014 13:00		Designe	d by a	a.tew			and the second second	inac
File SW Tre	A REAL PROPERTY OF A REAL PROPERTY OF A	ting 2		-				Dire	minn
Micro Drain	age		Network	2014.	.1.1			_	
1	Network Des	ign Table	for SW E	AST E	XISTIN	3 15.07	.13.S	WS	
PN	Length Fall	1 Slope I.A.	ea T.E.	Ba	se	k HY	DIA	Auto	
	(m) (m)	(1:X) (ha	a) (mins)	Flow	(1/s) (	mm) SEC	T (mm)	Design	n
1.00	7 31.260 0.03	5 893.1 0.0	0.00		0.0 0	. 600 \	/ 40	ő	
13.000	0 33.909 0.09	6 353.2 0.1	107 5.00		0.0 0	. 600	o 100	#	
1,008	8 4.365 0.00	5 873.0 0.0	0.00		0.0 0	. 600 \	/ 40	Ô	
		Netwo	ork Resu	lts Ta	able				
	in T.C.								
	/hr) (mins)								
	0.00 8.14 1								
	0.00 6.40 1								
1.008	0.00 8.18 1	17.645 2.	906	0.0	0.0	0.0	1.99	7828.5	0.0
Free	Flowing Ou	tfall Deta	ils for	SW EA	ST EXIS	STING 1	5.07.	13.SWS	5
	Out fall	Outfall C	Level T	Level	Min	D, L	W		
	Pipe Numbe		(m)	(m)		el (mm)			
					(m)				
	1.0	08	0.000	117.640	0.0	00 0	0		
	Simulation	Criteria i	or SW E	AST EX	ISTING	15.07	13.SV	VS	
	Volumetric Ru	noff Coeff (	0.840 Ac	dition	al Flow	- % of	Total H	Flow 0.	000
		ion Factor 1		MADD					
		tart (mins)		Den D		Inlet Co			
Manhole	Handlage Coof	Level (mm)	500	per P	erson pe		ime (mi		60
Foul S	lewage per hec	tare (1/s) (	0.000		Outpu	ut Inter	val (mi	ins)	1
		nput Hydrogr							
		Online Cont Offline Cont							
		Synthet	ic Rainf	=11 D	otails				
				D.	C CGTTD				
		Rainfall Mode Period (years					FEH 100		
	and the set of the	Site Locatio		00 225	250 SP 3				
		C (1kr			- 201	-0.			
		D1 (1kr	n)				328		
		D2 (1kr					309		
		D3 (1kr E (1kr					264 292		
		- ,	· · · ·						
		©1982-	2014 XP	Solut	ions	_			
		©1982-	-2014 XP	Solut	ions				

Woods Hardwick		Page 4
15-17 Goldington Road		6
Bedford		Ly
MK40 3NH		Mirro
Date 23/12/2014 13:00	Designed by a.tew	Micro Drainage
File SW Trenchard existin		bidinoge
Micro Drainage	Network 2014.1.1	
	Synthetic Rainfall Details	
	F (1km) 2.461	
	Summer Storms No Winter Storms Yes	
	Cv (Summer) 0.750	
	Cv (Winter) 0.840	
	Storm Duration (mins) 15	

Woods Har	iwick			3				P	age 5
15-17 Gol	dington	Road						C	
Bedford									1.0.1
MK40 3NH				1					the C
Date 23/1	2/2014 1	3:00		Designe	d by	a.tew			NICIO
			2 2						Irainad
File SW T: Micro Dra		existi	iy 2	Network		1.1			
MICIO DIA.	maye			NELWOIN	X 2014	.1.1		_	_
Summary (	of Criti	cal Resu	lts by	Maximum 15.07.1		(Rank	1) for SW	EAST	EXISTI
			Si	mulation	Criter:	ia			
							% of Tota		
		Hot Start			MAD		10m3/ha S		
Manhol		Start Lev			w ner l		ilet Coeffi Day (1/pe		
	Sewage p				in pur .	ternon per	- nal (r) he		0.000
						6 CL	-		
							Structure ea Diagram		
							me Control		
				etic Rainf	fall De	tails			
		Rainfal				-	FEH		
				GB 450500	225250	SP 50500			
			C (1km) 1 (1km)				-0.023		
			2 (1km)				0.309		
			3 (1km)				0.264		
			E (1km)				0.292		
			F (1km)				2.461		
			Summer)				0.750		
		CV (	Winter)				0.840		
	Margin f	or Flood	Risk Warr	ing (mm)				300.0	
			Analysis	Timestep	2.5 Se	cond Incr	ement (Ext	ended)	
				'S Status				ON	
				/D Status				ON	
			Inerti	la Status				ON	
		Pro	file(s)			s	ummer and	Vinter	
	Du			15, 30, 60	0, 120,		, 480, 960		
		eriod(s)						100	
	C1	imate Cha	nge (%)					0	
		Return	Climate	First	x	First Y	First	Z O/F	Lvl
PN	Storm	Period	Change	Surchan	rge	Flood	Overfl	ow Act.	Exc.
1,000	) 15 Winte	er 100	0%						
	15 Winte			100/15 St	ummer 1	.00/15 Sum	mer		5
	15 Winte					00/15 Sum			4
	15 Winte					00/15 Sun			3
	15 Winte					00/15 Sun			4
	) 15 Winte ) 15 Winte					00/15 Sum			5
	15 Winte					.00/15 Sum			2
	15 Winte					00/15 Sum			9
	15 Winte					00/15 Sum			1
	3 15 Winte			100/15 St					
	) 15 Winte			100/15 St					
1.003	3 15 Winte			100/15 St					
	15 Winte	er 100	0.8	100/15 St	A POPPO AL ANT				

Woods Hardw	ick							Pa	ge 6
15-17 Goldi	ngton H	load		1					
Bedford								4	~
MK40 3NH				1. Same 1.				N/	licro
Date 23/12/	2014 13	3:00		Designe	d by a.	tew			icro
File SW Tre	nchard	existing	1 2	Checked	by			U	rainago
Micro Drain			1.0000	Network	-	.1			-
				and the second		-			-
Summary of	Critic	al Resul	ts by I	Maximum	Level (	Rank 1	) for	SW EAST H	EXISTING
				15.07.13	. SWS				
	-			First 1		first Y		rst Z O/F	
PN	Storm	Period	Change	Surchar	je –	Flood	Ove	rflow Act.	Exc.
7.000	15 Winte	r 100	08	100/15 Sur	mer 100/	15 Summ	er		4
7.001	15 Winte	r 100		100/15 Sur		15 Summ	er		2
				100/15 Sur					
8.000	30 Winte	r 100 r 100	08	100/15 Sur 100/15 Sur	mer 100/	15 Summ	er		11 6
8,002	15 Winte	r 100	08	100/15 Sur 100/15 Sur					3
		r 100				a ar and a			
7.003	15 Winte	r 100	0%	100/15 Sur	mer				
9.000	15 Winte	r 100 r 100	0%	100/115 0					
		r 100 r 100		100/15 Sur 100/15 Sur					
		r 100	08	100/15 50	awer L				
		r 100	08.	100/15 Sur	mer 100/	15 Summ	er		8
10.001	15 Winte	r 100		100/15 Sur	mer				
1.006	15 Winte	r 100	80						
		r 100 r 100				15 Summ	er		8
		r 100		100/15 Sur					
			08						
		r 100		100/15 Sur	mer 100/	15 Summ	er		10
1.008	15 Winte	r 100	\$0						
		Water		Floode	d		Pipe		
	US/M	H Level	Surch'	ed Volume	Flow /	O'flow	Flow		
P	N Nam	e (m)	Depth (	(m) (m <sup>3</sup> )	Cap.	(1/s)	(1/s)	Status	
1	000 075	9 120.134	-0.1	12 0.00	0 0.28	0.0	18.0	OK	
		1 120.088		46 11.05			24.7		
		2 120.544	0.7	94 6.98	0 1.89	0.0	38.9	FLOOD	
2.	001 121	1 120.237		12 6.54	7 1.21	0.0	112.4	FLOOD	
2	000 Fv N	H 120.731			1 0 95	0.0	109.3		
		7 120.812					78.8		
з.	001 076	0 120.673	0.7	95 0.44	9 1.05	0.0	185.5	FLOOD	
		3 120.412							
		2 120.257						FLOOD	
		H 119.902						SURCHARGED FLOOD RISK	
		6 119.624						FLOOD RISK	
1.	004 F	T 119.109	0.2	19 0.00	0 2.81	0.0	357.5	SURCHARGED	
		15 120.106			0 2.04			FLOOD	
7.	001 074	6 119.952	0.8	40 0.14	5 1.53	0.0	59.3	FLOOD	
8	000 071	1 120.165	<u>0</u> .4	69 123.95	2 1.20	0.0	50.8	FLOOD	
		2 120.113		86 35.47				FLOOD	
		3 120.190		74 6.28				FLOOD	
		6 120.074		0.00				FLOOD RISK	
		H 119.385		14 0.00				SURCHARGED	
9.		8 119.095 5 118.987		00 0.00			82.8	OK	
0	001 076								

Woods Ha											Page 7
15-17 Go	ldingt	on Ro	ad								5
Bedford											L.
MK40 3NH											Micro
Date 23/	12/201	4 13:	00		De	signed	by a.t	iew			
File SW	Trench	ard e	xisting	2	Ch	ecked 1	v				Drainago
Micro Dr	ainage				Ne	twork 2	2014.1.	.1			
		-			-			-	-	-	
Summary	of Cr	itica	l Resul	ts by	Max	cimum Lo	evel (	Rank 1	) for	SW EAS	T EXISTING
					15.	07.13.	SWS				
			2.4								
		-	Water Level			Flooded		01.61.000	Pipe		
	DN		(m)								
	PR	Maune	(m)	Depen	(m)	(m.)	cap.	(1/5)	(1/5)	Scacu	
	9.002	Ex MH	118.948	0.	033	0.000	0.42	0.0	82.8	SURCHAR	GED
	1.005	0769	118.911	-0.	211	0.000	0.91	0.0	574.6		OK
			118.907								OOD
			118.611								OK
	11.000	1267	118.238 118.561	0.	318	12.673	2.32	0.0	7.3	FL	OOD
	11,001	1288	118,441	0.	237	0.000	3,58	0.0	9.2	FLOOD R	ISK
	12.000	1287	118.207	0.	040	0.000	0.25	0.0	3.5	SURCHAR	
			118.204								OK
			118,450								OOD OK
	1.000	preen	110,111	-0.	114	0.000	W.+/	0.0	201.0		OIL
						14 XP 5					

## APPENDIX D

Proposed Microdrainage Calculations

	100	lck										Pa	ge O
15-17 0	Coldin	ngton	Road	_									
Bedford	i											4	4
MK40 3N	IH	and a second	-		11.0	in the second		1.00				M	icro
Date 23	3/12/2	2014 1	3:02		De	signed	l by	a.tew	1			ň	aina
File SV	I Trer	nchard	i prop	osed 1	Ch	ecked	by					D	<u>an ic</u>
Micro I	)raina	ige			Ne	twork	2014	.1.1					
		STOR	M SEW	ER DES	IGN by	the Mo	airi	ed Ra	ationa	at M	etnoc	1	
		Desi	ign Cr	iteria	for SI	W EAST	EXIS	STING	15.0	7.13	.SWS		
			1.14						6.2.9.				
P	ipe Si	zes SW	EAST	EXISTIN	G 15.07.	13 Manh	ole S	izes 3	SW EAS	r exi	STING	15.07	.13
					FEH R	ainfall	Mode	1					
				Return	Period (						1. 11 Tot	2	
						cation (1km)	GB 45	0500	225250	SP :		25250	
						(1km)						0.328	
						(1km)						0.309	
						(1km) (1km)						0.264	
						(1km)						2.461	
					infall (							Ó	
	Ma	ximum 1	Time of		tration wage (1							30	
			Vol		Runoff							0.750	
		Ac			ate Chan							0	
					rop Heig							0.000	
			Margari mar										
	Min	Design	Maximu n Depth									1.200	
			n Depth	for Op	timisati ign only	on (m)							
		Min Vel	n Depth 1 for A	h for Op Auto Des	timisati	on (m) (m/s)						1.200	
		Min Vel	n Depth 1 for A	n for Op Auto Des For Opti	timisati sign only	on (m) (m/s) (1:X)	rel Sc	ffits				1.200	
		Min Vel	n Depth 1 for A	n for Op Auto Des For Opti	otimisati sign only misation	on (m) (m/s) (1:X)	7el Sc	fits				1.200	
	1	Min Vel Min S	n Depth 1 for A Slope f	n for Op Auto Des For Opti De	otimisati sign only misation	on (m) (m/s) (1:X) with Lev				5.07		1.200 0.75 500	
	1	Min Vel Min S Networ	n Depth 1 for A Slope f <u>k Des</u>	n for Op Auto Des For Opti De ign Ta	otimisati sign only misation ssigned v	on (m) (m/s) (1:X) with Lev SW EA	AST E	XIST		1	.13.5	1.200 0.75 500	
	<u>N</u>	Min Vel Min S Networ	h Depth 1 for A Slope f <u>k Des</u> h Fall	n for Op Auto Des for Opti De ign Ta Slope	otimisati sign only misation esigned w ble for	on (m) (m/s) (1:X) with Lev SW EA T.E.	AST E Ba	XIST	ING 1	HYD	.13.5 DIA	1.200 0.75 500 SWS Auto	
	<u>N</u> PN	Min Vel Min S Networ Length (m)	h Depth 1 for A Slope f k Des h Fall (m)	n for Op Auto Des For Opti De ign Ta Slope (1:X)	timisati sign only misation esigned w ble for I.Area	on (m) (m/s) (1:X) with Lev SW EA T.E. (mins)	AST E Ba Flow	se (1/s)	ING 1	HYD	.13.5 DIA	1.200 0.75 500 SWS Auto Desig	
	<u>N</u> PN 1.000 1.001	Min Vel Min S Networ Length (m) 35.955 26.411	h Depth 1 for A Slope f k Des h Fall (m) 1 0.629 1 0.215	ign Ta slope (1:X) 57.2 51	timisati tign only misation esigned w ble for I.Area (ha) 0.031 0.056	on (m) (m/s) (1:X) SW EA T.E. (mins) 5.00 0.00	AST E Ba Flow	se (1/s) 0.0 0.0	ING 19 k (mm) 0.600 0.600	HYD	.13.5 DIA [ (mm)	1.200 0.75 500 SWS Auto Desig	
	<u>N</u> PN 1.000 1.001	Min Vel Min S Networ Length (m) 35.955 26.411	h Depth 1 for A Slope f k Des h Fall (m) 1 0.629 1 0.215	ign Ta slope (1:X) 57.2 51	timisati tign only misation esigned v ble for I.Area (ha) 0.031	on (m) (m/s) (1:X) SW EA T.E. (mins) 5.00 0.00	AST E Ba Flow	se (1/s) 0.0 0.0	ING 1 k (mm) 0.600	HYD	.13.5 DIA [ (mm) 225	1.200 0.75 500 SWS Auto Desig	
	<u>N</u> PN 1.000 1.001 1.002	Min Vel Min S Networ Length (m) 35.955 26.411 10.323	h Depth 1 for A Slope f k Des h Fall (m) 1 0.622 1 0.104	ign Ta Slope (1:X) 5 57.2 5 122.8 4 99.2	timisati tign only misation esigned w ble for I.Area (ha) 0.031 0.056	on (m) (m/s) (1:X) with Lev SW EA T.E. (mins) 5.00 0.00 0.00	AST E Ba Flow	xist (1/s) 0.0 0.0 0.0	ING 1 k (mm) 0.600 0.600 0.600	HYD	.13.5 DIA (mm) 225 150 300	1.200 0.75 500 SWS Auto Desig	
	<u>N</u> PN 1.000 1.001 1.002 2.000	Min Vel Min S Networ Lengtl (m) 35.955 26.411 10.325 20.68	h Depth 1 for A Slope f <b>k Des</b> <b>h Fall</b> (m) 1 0.622 1 0.212 1 0.104 7 0.097	a for Op Auto Des For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 4 99.2 7 213.3	ble for <b>I.Area</b> (ha) 0.031 0.056 0.100 0.363	on (m) (m/s) (1:X) (ith Lev SW EA T.E. (mins) 5.00 0.00 0.00 5.00	AST E Ba Flow	se (1/s) 0.0 0.0 0.0 0.0	k (mm) 0.600 0.600 0.600 0.600	HYD SECT	.13.5 DIA r (nm) 5 225 5 150 5 300 5 375	1.200 0.75 500 SWS Auto Desig	
	<u>N</u> PN 1.000 1.001 1.002 2.000	Min Vel Min S Networ Lengtl (m) 35.955 26.411 10.325 20.68	h Depth 1 for A Slope f <b>k Des</b> <b>h Fall</b> (m) 1 0.622 1 0.212 1 0.104 7 0.097	a for Op Auto Des For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 4 99.2 7 213.3	ble for 1.Area (ha) 0.031 0.100	on (m) (m/s) (1:X) (ith Lev SW EA T.E. (mins) 5.00 0.00 0.00 5.00	AST E Ba Flow	se (1/s) 0.0 0.0 0.0 0.0	k (mm) 0.600 0.600 0.600 0.600	HYD SECT	.13.5 DIA r (nm) 5 225 5 150 5 300 5 375	1.200 0.75 500 SWS Auto Desig	
	<u>N</u> PN 1.000 1.001 1.002 2.000	Min Vel Min S Networ Lengtl (m) 35.955 26.411 10.325 20.68	h Depth 1 for A Slope f <b>k Des</b> <b>h Fall</b> (m) 1 0.622 1 0.212 1 0.104 7 0.097	a for Op Auto Des For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 4 99.2 7 213.3 7 94.8	ble for <b>I.Area</b> (ha) 0.031 0.056 0.100 0.363	on (m) (m/s) (1:X) (ith Lev SW EA T.E. (mins) 5.00 0.00 5.00 5.00	AST E Ba Flow	xisti (l/s) 0.0 0.0 0.0 0.0 0.0	k (mm) 0.600 0.600 0.600 0.600	HYD SECT	.13.5 DIA r (nm) 5 225 5 150 5 300 5 375	1.200 0.75 500 SWS Auto Desig	
	<u>N</u> PN 1.000 1.001 1.002 2.000 3.000 Ra	Min Vel Min S Networ Lengtl (m) 35.955 26.411 10.323 20.68 30.988 30.988	h Depth 1 for A Slope f k Des h Fall (m) 1 0.625 1 0.104 7 0.097 8 0.327 N.C.	n for Op Auto Des For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 4 99.2 7 213.3 7 94.8 <u>N</u> US/IL	timisati tign only misation esigned v ble for I.Area (ha) 0.031 0.056 0.100 0.363 0.293 Network Σ I.Area	on (m) (m/s) (1:X) with Lev SW EA T.E. (mins) 5.00 0.00 5.00 5.00 5.00 2.00 5.00 2.00 2.00 5.00 2.00 5.00 2.00 5.00 2.00 5.00 5.00 2.00 5.00	AST E Ba Flow	x IST (1/s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 Foul	ING 1: k (mm) 0.600 0.600 0.600 0.600 0.600	HYD SECT	.13.5 DIA (mm) 2255 150 300 375 225 Vel	1.200 0.75 500 SWS Auto Desig	Flow
PN	<u>N</u> PN 1.000 1.001 1.002 2.000 3.000 Ra (mm/	Min Vel Min S letwor Lengtl (m) 35.955 26.411 10.325 20.68 30.988 30.988 in T hr) (m	h Depth 1 for A Slope f k Des h Fall (m) 1 0.625 1 0.215 1 0.104 7 0.097 8 0.327 8 0.327 .C. tins)	a for Op Auto Des For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 4 99.2 7 213.3 7 94.8 <u>1</u> US/IL (m)	timisati ign only misation esigned v ble for I.Area (ha) 0.031 0.056 0.100 0.363 0.293 Vetwork E I.Area (ha)	on (m) (m/s) (1:X) (ith Lev SW EA T.E. (mins) 5.00 0.00 5.00 5.00 Result Γ Ba Flow (	AST E Ba Flow ts Ta ase (1/s)	x IST (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 c c c c c c c c c c c c c c c c c c c	.13.5 DIA (mm) 225 150 300 375 225 Vel (m/s)	1.200 0.75 500 SWS Auto Desig	Flow (1/s)
<b>PN</b> 1.00	<u>N</u> <b>PN</b> 1.000 1.001 1.002 2.000 3.000 <b>Ra</b> (mm/ 0 0	Min Vel Min S Networ Lengtl (m) 35.955 26.411 10.325 20.68 30.988 30.988 in T 'hr) (m	h Depth 1 for A Slope f k Des h Fall (m) 1 0.629 1 0.219 1 0.104 7 0.097 8 0.327 c.C. hins) 5.35 1	a for Op Auto Des For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 4 99.2 7 213.3 7 94.8 <u>1</u> US/IL (m) 20.021	timisati bign only misation esigned v ble for I.Area (ha) 0.031 0.056 0.100 0.363 0.293 Network E I.Area (ha) 0.031 0.293	on (m) (m/s) (1:X) with Lev SW EA T.E. (mins) 5.00 0.00 5.00 5.00 5.00 5.00 Flow (	AST E Ba Flow ts T: ase (1/s) 0.0	x IST: (1/s) 0.0 0.0 0.0 0.0 0.0 0.0 6 Foul (1/s) 0.0	k (mm) 0.600 0.600 0.600 0.600 0.600 0.600	HYD SECT	.13.5 DIA (mm) 2255 150 300 375 225 Vel (m/s) 1.73	1.200 0.75 500 SWS Auto Desig	Flow (1/s)
<b>PN</b> 1.00	<u>N</u> <b>PN</b> 1.000 1.001 1.002 2.000 3.000 <b>Ra.</b> (mm/ 0 0 1 0	Min Vel Min S Networ Lengtl (m) 35.95: 26.411 10.32: 20.68 30.988 30.988 in T (hr) (m)	h Depth 1 for A Slope f k Des h Fall (m) 1 0.629 1 0.215 1 0.104 7 0.097 8 0.327 8 0.327 5.35 1 5.35 1 5.83 1	n for Op Auto Des For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 4 99.2 7 213.3 7 94.8 <u>1</u> US/IL (m) 20.021 19.392	timisati ign only misation esigned v ble for I.Area (ha) 0.031 0.056 0.100 0.363 0.293 Vetwork E I.Area (ha)	on (m) (m/s) (1:X) with Lev SW EA T.E. (mins) 5.00 0.00 5.00	AST E Ba Flow ts Ta ase (1/s) 0.0 0.0	x IST (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 Add F (1/	HYD SEC! ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	.13.5 DIA r (nm) 0 225 0 150 0 300 0 375 0 225 vel (m/s) 1.73 0.91	1.200 0.75 500 SWS Auto Desig	Flow (1/s) 0.0
PN 1.00 1.00 1.00	<u>N</u> <b>PN</b> 1.000 1.001 1.002 2.000 3.000 <b>Ra.</b> (mm/ 0 0 2 0	Min Vel Min S Min S Lengtl (m) 35.955 26.41 10.323 20.68 30.988 in T (hr) (m) 0.00 0.00	n Depth 1 for A Slope f k Des h Fall (m) 1 0.629 1 0.215 1 0.104 7 0.097 8 0.327 8 0.327 5.35 1 5.35 1 5.35 1 5.94 1	n for Op Auto Des For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 4 99.2 7 213.3 7 94.8 <u>N</u> US/IL (m) 20.021 19.392 19.027	timisati tign only misation esigned v ble for I.Area (ha) 0.031 0.056 0.100 0.363 0.293 Network E I.Area (ha) 0.031 0.056 0.100 0.363 0.293	on (m) (m/s) (1:X) with Lev SW EA T.E. (mins) 5.00 0.00 5.00 5.00 5.00 Result Flow (	AST E Ba Flow ts T: (1/s) 0.0 0.0	x IST se (1/s) 0.0 0.0 0.0 0.0 0.0 able Foul (1/s) 0.0 0.0 0.0	ING 1: k (mm) 0.600 0.600 0.600 0.600 Add F (1/)	HYD SEC7 ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	.13.5 DIA (mm) 0 225 150 0 300 0 375 0 225 Vel (m/s) 1.73 0.91 1.58	1.200 0.75 500 SWS Auto Desig	Flow (1/s) 0.( 0.( 0.(
PN 1.00 1.00 1.00	<u>N</u> <b>PN</b> 1.000 1.001 1.002 2.000 3.000 <b>Ra.</b> (mm/ 0 0 2 0	Min Vel Min S Min S Lengtl (m) 35.955 26.41 10.323 20.68 30.988 in T (hr) (m) 0.00 0.00	n Depth 1 for A Slope f k Des h Fall (m) 1 0.629 1 0.215 1 0.104 7 0.097 8 0.327 8 0.327 5.35 1 5.35 1 5.35 1 5.94 1	n for Op Auto Des For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 4 99.2 7 213.3 7 94.8 <u>N</u> US/IL (m) 20.021 19.392 19.027	ble for i.Area (ha) 0.031 0.056 0.100 0.363 0.293 Network E I.Area (ha) 0.031 0.293	on (m) (m/s) (1:X) with Lev SW EA T.E. (mins) 5.00 0.00 5.00 5.00 5.00 Result Flow (	AST E Ba Flow ts T: (1/s) 0.0 0.0	x IST se (1/s) 0.0 0.0 0.0 0.0 0.0 able Foul (1/s) 0.0 0.0 0.0	ING 1: k (mm) 0.600 0.600 0.600 0.600 Add F (1/)	HYD SEC7 ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	.13.5 DIA (mm) 0 225 150 0 300 0 375 0 225 Vel (m/s) 1.73 0.91 1.58	1.200 0.75 500 SWS Auto Desig	Flow (1/s) 0.( 0.( 0.(
PN 1.00 1.00 1.00 2.00	<u>N</u> PN 1.000 1.001 1.002 2.000 3.000 Ra (mm/ 0 0 1 0 2 0 0 0	Min Vel Min S Min S Lengtl (m) 35.955 26.411 10.325 20.68 30.988 in T hr) (m 0.00 0.00 0.00	h Depth 1 for A Slope f k Des h Fall (m) 1 0.625 1 0.215 1 0.104 7 0.097 8 0.327 8 0.327 5.35 1 5.83 1 5.28 1	a for Op Auto Des For Opti De ign Ta Slope (1:X) 9 57.2 5 122.8 4 99.2 7 213.3 7 94.8 <u>1</u> 20.021 (m) 20.021 19.007 19.600	timisati tign only misation esigned v ble for I.Area (ha) 0.031 0.056 0.100 0.363 0.293 Network E I.Area (ha) 0.031 0.056 0.100 0.363 0.293	on (m) (m/s) (1:X) (ith Lev SW EA T.E. (mins) 5.00 0.00 5.00 5.00 5.00 8.00 5.00 5.00	AST E Ba Flow ts T: (1/s) 0.0 0.0 0.0 0.0	xisti se (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	ING 11 k (mm) 0.600 0.600 0.600 0.600 Add F (1/)	HYD SEC ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	.13.5 DIA (mm) 225 150 300 375 225 Vel (m/s) 1.73 0.91 1.58 1.24	1.200 0.75 500 SWS Auto Desig 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Flow (1/s) 0.0 0.0 0.0

Woods	Hardwi	ick		100									Pag	je 1
	Goldin	ngtor	n Re	oad									F	
edfor													2	1 m
MK40 3 Date 2	3/12/2	2014	13:	:02		De	signe	d by	a.tew	i				icro
					osed 1	Ch							U	ainage
Micro	Draina	age				Ne	twork	2014	.1.1					
		Inter	w.F	Doet	on To	ble for	SWE	ACT F	VICTI	INC 15	07	13.5	WC.	
	-	ie c n c	11.12	Deal	rgii ra	Die Tot	on a	ADI D	ALDI	ing it				
	PN	Leng (m)			-	I.Area (ha)			se (1/e)		100	1.1.1.1	Auto	
		(11)		(m)	(1.4)	(na)	(mano)	1104	(1) 01	(main)	0001	(man)	Desty	
	2.001	43.7	46 (	0.406	107.7	0.132	0.00		0.0	0.600	0	375		
	4,000	25.3	87 (	0.211	120.3	0.099	5.00		0.0	0.600		100	r de la comercia de l	
						0.000				0.600		375	-	
	5,000	3.2	41 (	0.135	24.0	0.030	5.00		0.0	0.600		150	6	
						0.000								
													2	
						0.067				0.600				
							5.00							
	8.000	8.4	59 (	0.180	47.0	0.012	5.00		0.0	0.600	c	100	ð	
	6.002	20.6	09 (	0.050	412.2	0.046	0.00		0.0	0.600	c	450	æ	
	9.000	9.3	21 (	0.120	77.7	0.020	5.00		0.0	0.600	0	100	•	
					1	Network	Resul	Its Ta	able					
					<del>.</del>									
PI		in (hr)				Σ I.Area (ha)	E B Flow						-	
						1.1				17	·		1	
2.0	01 (	00.0	5.	80 1	19.503	0.788		0.0	0.0		0.0	1.75	192.7	0.0
4.0	00 0	0.00	5.	60 1	19.583	0.099		0.0	0.0		0.0	0.70	5.5	0.0
2.0	02 (	0.00	6	31 1	19,097	0.88		0.0	0.0		0.0	1.05	115 5	0.0
						0.916			0.0					0.0
5.0	00 0	0.00	5.	03 1	19.257	0.030	r.	0.0	0.0		0.0	2.06	36.5	0.0
1.0	03 0	0.00	6.	55 1	18.917	1.133		0.0	0.0		0.0	1.19	257.2	0.0
6.0		0.00			19.850 19.450	0.06		0.0	0.0				17.5 237.6	0.0
7.0	00 0	0.00	5.	11 1	19.710	0.058		0.0	0.0		0.0	1.33	23.5	0.0
8.0		0.00			19.790	0.012		0.0	0.0			1.13		
6.0	02 (	0.00	5.	91 1	19.260	0.226		0.0	0.0		0.0	1.00	158.3	0.0
9.0	00 0	0.00	5.	18 1	19.680	0.020	)	0.0	0.0		0.0	0.87	6.9	0.0

15-17 Gold Bedford MK40 3NH	lington	Road									Z	r.
Date 23/12	2/2014	13:02		De	signed	i by	a.tew			_	- Mi	
File SW Tr			osed 1		ecked						Dre	ninaq
Micro Drai		I I		A REAL PROPERTY AND	work		.1.1					
						2000			_		-	
	Netwo	rk Desi	lgn Ta	ble for	SW E	AST E	XISTI	NG 15	.07.	13.SI	WS	
PI	N Leng (m			I.Area (ha)			15e (1/s)	k (mm)			Auto Design	n
10.0	000 8.5	00 0.06	5 130.8	0.027	5.00		0.0	0.600	0	150		
10.0	001 17.4	64 0.08	5 205.5	0.025	0.00		0.0	0.600	0	225		
				0.008				0.600		450	-	
6.0	004 44.7	07 0.11	0 406.4	0.072	0.00		0.0	0.600	o	450	Ð	
11.0	000 20.7	94 0.41	50.7	0.043	5.00		0.0	0.600	0	100	#	
12.0	000 13.0	00 0.41	0 31.7	0.034	5.00		0.0	0.600	0	100	£	
				0.017				0.600			-	
1/23				0.069				0.600		300		
				0.020				0.600		100	-	
				0.145				0.600			-	
15.0	000 4.1	16 0.35	5 11.6	0.057	5.00		0.0	0.600	o	100	6	
			1	Network	Resul	ts Ta	able					
PN	Rain	T.C.	115/TL	Σ I.Area	FF	lase	Foul	Add F	low	Vel	Cap	Flow
	mm/hr)		(m)	(ha)			(1/s)				(1/s)	
10.000	0.00	5.16 1	19.660	0.027		0.0	0.0		0.0	0.88	15.5	0.0
10.001	0.00	5.48 1	19.520	0.052	1	0.0	0.0		0.0	0.91	36.1	0.0
				0.306		0.0					176.9	
6.004											159.4	
11.000	0.00	5.32 1	19.830	0.043		0.0	0.0		0.0	1.08	8.5	0.0
12.000	0.00	5.16 1	19.830	0.034	1	0.0	0.0		0.0	1.38	10.8	0.0
6.005				0.472		0.0						0.0
6.006	0.00		19.030			0.0					172.2	0.0
	0.00	5.80 1	20.080	0.048	F	0.0	0.0		0.0	1.13	80.1	0.0
13.000	0.00	5.09 1	20.500	0.020		0.0	0.0		0.0	1.75	13.8	0.0
13.000 14.000	0.00			0 212	£	0.0					144.1	0.0
14.000 13.001	0.00	6.29 1									144.1	0.0
14.000 13.001 13.002	0.00	6.49 1	19.520	0.241		0.0						
14.000 13.001	0.00	6.49 1	19.520			0.0					17.9	

NHAO 3NH         Designed by a.tew         Micro Drainage           Pile SW Trenchard proposed 1         Network 2014.1.1         Micro Drainage         Network 2014.1.1           Network Design Table for SW EAST EXISTING 15.07.13.SWS         PN         Length Fall Slope I.Area T.E. Base k HTO DIA Acto (m) (m) (1:0) (ha) (min) Flow (1/s) (mm) SECT (mm) Design           13.003 26.568 0.000 291.9 0.022 0.00         0.0 0.600 c 450 13.005 44.703 0.205 313.4 0.071 0.00 0.0 0.600 c 450 13.005 44.703 0.205 313.4 0.071 0.00 0.0 0.600 c 450 6.000 8.116 0.015 541.1 0.000 0.00 0.0 0.600 c 450 6.000 8.116 0.015 541.1 0.000 0.00 0.0 0.00 0.600 c 450 6.000 8.116 0.015 541.1 0.000 0.00 0.0 0.0 0.600 c 450 6.011 11.2300 0.044 279.5 0.000 0.00 0.0 0.0 0.00 0.00 0.00 0.	Woods Hard 15-17 Gold Bedford		Road									5	
Date 39/12/2014 13:02         Designed by a.tew         Drining           Micro Drainage         Network 2014.1.1         Intervent design Table for SW EAST EXISTING 15.07.13.SWS           PN         Length Fall Slope I.Area T.E. Base k HTD DIA Auto (m) (m) (1:X) (ha) (mins) Plov (l/s) (mm) SECT (mm) Design           13.003 26.268 0.090 291.9 0.022 0.00 0.0 0.000 0.450 (mm) SECT (mm) Design         13.004 21.846 0.070 312.1 0.086 0.00 0.0 0.000 0.450 (mm) SECT (mm) Design           13.004 21.846 0.070 312.1 0.086 0.001 0.00 0.00 0.600 o 450 (mm) SECT (mm) Design         0.000 0.000 0.000 0.00 0.000 0.00 (mm) SECT (mm) Design           13.006 10.487 0.030 349.6 0.052 0.000 0.00 0.00 0.000 0.600 o 450 (mm) SECT (mm) Design         0.000 8.116 (0.015 541.1) 0.000 0.000 0.00 0.00 0.600 o 450 (mm) SECT (mm) Design           1.004 1.833 0.020 403.5 0.000 0.000 0.00 0.00 0.00 0.600 o 450 (mm) SECT (mm) Design         0.001 1.808 0.015 541.7 0.017 (mo) 0.00 0.000 0.00 0.00 0.00 0.00 (mm) SECT (mm) Design           1.004 1.833 0.010 183.3 0.000 0.000 0.00 0.00 0.00 0.600 o 525 (mm) SECT (mm) Design         0.001 1.808 0.025 489.6 0.000 0.000 0.00 0.00 0.00 0.00 0.00	MK40 3NH		-								_	- Mi	rm.
Nature Drainage         Network 2014.1.1           Network Design Table for SW EAST EXISTING 15.07.13.SWS           PN         Length Fall Slope I.Area T.E.         Base k         HTO DIA Auto (m) DESign           13.003 26.268 0.090 291.9 0.022 0.00         0.0 0.600 0 450 g         13.004 21.846 0.070 312.1 0.086 0.00         0.0 0.600 0 450 g           13.004 21.846 0.070 312.1 0.086 0.000 0.0 0.00 0.600 0 450 g         13.005 64.703 0.205 315.6 0.071 0.000 0.00 0.00 0.600 0 450 g         6.007 0.00 0.00 0.400 0 600 0 450 g           13.005 10.487 0.003 349.6 0.052 0.000 0.00 0.00 0.600 0 450 g         6.007 0.01 18.00 0.044 279.5 0.000 0.000 0.00 0.00 0.600 0 450 g         6.001 11.2.300 0.044 279.5 0.000 0.000 0.00 0.00 0.600 0 525 g           1.004 1.833 0.010 183.3 0.000 0.000 0.00 0.0 0.0600 0 525 g         1.005 12.240 0.025 489.6 0.000 0.00 0.00 0.00 0.00 0.600 0 525 g         1.006 1.90 0.011 485.0 0.044 279.5 0.004 0.000 0.00 0.00 0.00 0.600 0 525 g           16.001 38.652 0.240 161.2 0.040 0.046 0.00 0.0 0.0 0.00 0.00 0.00					1 m m	-	-	a.tew					
Network Design Table for SW EAST EXISTING 15.07.13.SWS           PN Length Fall Slope I.Area T.E. Base k HTD DIA Auto (m) (m) (1:X) (ha) (mins) Flow (1/s) (mm) SECT (mm) Design           13.003 26.268 0.090 291.9 0.022 0.00         0.0 0.600 o         450 13.004 21.946 0.070 312.1 0.066 0.000         0.0 0.600 o         450 13.005 64.703 0.205 315.6 0.071 0.000         0.0 0.600 o         450 13.005 64.703 0.205 315.6 0.071 0.000         0.0 0.600 o         450 13.006 10.487 0.303 380.6 0.052 0.000         0.0 0.600 o         450 6 0.008 8.116 0.015 541.1 0.000         0.00 0.00 0.600 o         450 6 0.001 8.116 0.015 541.1 0.000 0.000         0.00 0.600 o         450 6 0.01 1.808 0.200 403.5 0.000 0.000         0.00 0.600 o         525 6 0.001 1.808 0.202 403.5 0.000 0.000         0.00 0.600 o         525 7 0.005 0.224 40.60.2 0.000 0.000 0.000 0.000 0.000         525 7 0.005 0.224 00.025 400.60 0.000 0.000 0.000 0.000 0.000         525 7 0.005 0.224 00.025 400.60 0.000 0	File SW Tr	enchar	d prop	osed 1.	Che	cked b	y	0.00				DI	amoge
PN         Length         Fail         Slope         LArea         T.E.         Base         k         HTD         DIA         Auto           13.003         26.266         0.000         0.012         0.000         0.00         0.600         0.450         0           13.004         21.846         0.070         312.1         0.026         0.00         0.00         0.600         0.450         0           13.006         64.703         0.025         315.6         0.071         0.00         0.00         0.600         0.450         0           6.007         22.963         0.055         417.5         0.037         0.00         0.00         0.600         0.450         0           6.007         80.708         80.208         0.005         411         0.000         0.00         0.00         0.600         450         0           6.010         11.808         0.031         380.9         0.000         0.00         0.00         0.600         525         0           1.004         1.833         0.010         183.3         0.000         0.00         0.000         0.225         0           1.004         1.833         0.021         80.00	Micro Drai	nage			Net	work 2	014.	1.1				1	
PN         Length         Fail         Slope         LArea         T.E.         Base         k         HTD         DIA         Auto           13.003         26.266         0.000         0.012         0.000         0.00         0.600         0.450         0           13.004         21.846         0.070         312.1         0.026         0.00         0.00         0.600         0.450         0           13.006         64.703         0.025         315.6         0.071         0.00         0.00         0.600         0.450         0           6.007         22.963         0.055         417.5         0.037         0.00         0.00         0.600         0.450         0           6.007         80.708         80.208         0.005         411         0.000         0.00         0.00         0.600         450         0           6.010         11.808         0.031         380.9         0.000         0.00         0.00         0.600         525         0           1.004         1.833         0.010         183.3         0.000         0.00         0.000         0.225         0           1.004         1.833         0.021         80.00					a ar							11	
(m)         (m)         (1:X)         (m)         (min)         Flow (1/s)         (m)         SECT         (m)         Design           13.003         26.268         0.000         231.9         0.022         0.00         0.0         0.600         0         450         m           13.004         21.846         0.070         312.1         0.086         0.000         0.0         0.600         0         450         m           13.005         64.703         0.205         31.5.6         0.071         0.00         0.00         0.00         0.600         0         450         m           6.007         22.963         0.055         417.5         0.037         0.00         0.00         0.600         0         450         m           6.007         80.708         0.015         83.3         0.000         0.00         0.00         0.600         0         450         m           1.004         1.833         0.101         183.3         0.000         0.00         0.00         0.600         0         225         m           1.004         8.640         0.042         201.5         0.059         5.00         0.00         0.600         525		Netwo	rk Des	ign Tab	le for	SW EAS	ST E	XISTI	NG 15.	07.1	13.SI	NS	
(m)         (m)         (1:X)         (m)         (min)         Flow (1/s)         (m)         SECT         (m)         Design           13.003         26.268         0.000         231.9         0.022         0.00         0.0         0.600         0         450         m           13.004         21.846         0.070         312.1         0.086         0.000         0.0         0.600         0         450         m           13.005         64.703         0.205         31.5.6         0.071         0.00         0.00         0.00         0.600         0         450         m           6.007         22.963         0.055         417.5         0.037         0.00         0.00         0.600         0         450         m           6.007         80.708         0.015         83.3         0.000         0.00         0.00         0.600         0         450         m           1.004         1.833         0.101         183.3         0.000         0.00         0.00         0.600         0         225         m           1.004         8.640         0.042         201.5         0.059         5.00         0.00         0.600         525	DN	Leng	th Fall	Slone	T Area	TR	R		×	HYD	DTA	Ant	
13.004       21.846       0.070       312.11       0.0866       0.000       0.0       0.600       0       450         13.005       64.703       0.205       315.6       0.071       0.00       0.00       0.600       0       450         13.006       10.487       0.030       343.6       0.052       0.00       0.0       0.600       0       450         6.007       22.963       0.055       417.5       0.037       0.00       0.00       0.600       0       450         6.008       8.116       0.015       541.1       0.000       0.00       0.00       0.600       0       450         6.010       11.808       0.020       403.5       0.000       0.00       0.00       0.600       525       5         1.004       1.833       0.000       1.000       0.600       525       5       5         1.005       8.461       0.042       20.50       0.000       0.00       0.600       525       5         16.000       8.461       0.044       5.00       0.00       0.600       525       5         16.002       7.950       0.001       7429.0       0.000       0.00													
13.004       21.846       0.070       312.11       0.0866       0.000       0.0       0.600       0       450         13.005       64.703       0.205       315.6       0.071       0.00       0.00       0.600       0       450         13.006       10.487       0.030       343.6       0.052       0.00       0.0       0.600       0       450         6.007       22.963       0.055       417.5       0.037       0.00       0.00       0.600       0       450         6.008       8.116       0.015       541.1       0.000       0.00       0.00       0.600       0       450         6.010       11.808       0.020       403.5       0.000       0.00       0.00       0.600       525       5         1.004       1.833       0.000       1.000       0.600       525       5       5         1.005       8.461       0.042       20.50       0.000       0.00       0.600       525       5         16.000       8.461       0.044       5.00       0.00       0.600       525       5         16.002       7.950       0.001       7429.0       0.000       0.00													
13.004       21.846       0.070       312.11       0.0866       0.000       0.0       0.600       0       450         13.005       64.703       0.205       315.6       0.071       0.00       0.00       0.600       0       450         13.006       10.487       0.030       343.6       0.052       0.00       0.0       0.600       0       450         6.007       22.963       0.055       417.5       0.037       0.00       0.00       0.600       0       450         6.008       8.116       0.015       541.1       0.000       0.00       0.00       0.600       0       450         6.010       11.808       0.020       403.5       0.000       0.00       0.00       0.600       525       5         1.004       1.833       0.000       1.000       0.600       525       5       5         1.005       8.461       0.042       20.50       0.000       0.00       0.600       525       5         16.000       8.461       0.044       5.00       0.00       0.600       525       5         16.002       7.950       0.001       7429.0       0.000       0.00	13.0	03 26.2	68 0.09	0 291.9	0.022	0.00		0.0	0.600	0	450		
13.005 64.703 0.205 315.6 0.071 0.00       0.0 0.000 c 450       c 450         13.006 10.487 0.030 349.6 0.052 0.00       0.0 0.000 c 450       c 450         6.007 22.963 0.055 417.5 0.037 0.00       0.0 0.00 c 600       c 450         6.009 80.708 0.200 403.5 0.000 0.00       0.0 0.600       c 600         6.011 11.808 0.031 380.9 0.000       0.00       0.00 0.600       c 450         6.011 12.300 0.044 279.5 0.000       0.00       0.0 0.600       c 450         1.004 1.833 0.010 183.3 0.000 0.00       0.0 0.600       c 525       c         1.005 8.10 0.018 455.0 0.000       0.00       0.0 0.600       c 525       c         16.001 38.682 0.240 161.2 0.000       0.00       0.0 0.600       c 225       c         16.002 7.990 0.017 1950.0 0.046 0.00       0.0 0.600       c 225       c         17.000 56.396 0.150 376.0 0.156 5.00       0.0 0.600       c 525       c         13.003 0.00 6.861 119.365       0.322       0.0       0.0       0.600       525       c         13.004 0.00 7.18 119.255       0.406       0.00       0.00       0.00       1.18 188.4       0.0         13.003 0.00 6.861 119.365       0.322       0.0       0.0       1.16 18 184.4       0.0         13.005       0.00 8.24 119.205												-	1
13.006 10.487 0.030 349.6 0.052 0.00       0.0 0.600 o 450         6.007 22.963 0.055 417.5 0.037 0.00       0.00 0.600 o 450         6.008 8.116 0.015 541.1 0.000 0.00       0.0 0.600 o 450         6.009 80.708 0.200 403.5 0.000 0.00       0.0 0.600 o 450         6.010 11.200 0.044 279.5 0.000 0.00       0.0 0.600 o 450         1.004 1.833 0.010 183.3 0.000 0.00       0.0 0.600 o 525         1.005 12.240 0.028 449.6 0.000 0.00       0.0 0.600 o 525         1.006 8.190 0.018 455.0 0.000 0.00       0.0 0.600 o 525         16.001 38.682 0.240 161.2 0.000 0.00       0.0 0.600 o 525         16.001 38.682 0.240 161.2 0.000 0.00       0.0 0.600 o 525         16.003 7.429 0.001 7429.0 0.004 40.00       0.0 0.600 o 525         17.000 56.396 0.150 376.0 0.156 5.00       0.0 0.600 o 525         13.003 0.00 6.86 119.365 0.320       0.00 0.00 0.00       0.50         13.003 0.00 6.86 119.365 0.320       0.0 0.00 0.00       0.0 1.15 182.2 0.0         13.004 0.00 7.18 119.275 0.407       0.0 0.0 0.0 0.0       0.0 1.18 188.4 0.0         13.004 0.00 8.42 118.970 1.107 0.0 0.0 0.0 0.0 1.18 188.4 0.0       0.00 0.12 1.15 1.22 0.0         13.006 0.00 8.42 119.275 0.477 0.0 0.0 0.0 0.0 1.18 182.2 0.0       0.0         13.006 0.00 8.46 119.915 1.107 0.0 0.0 0.0 0.0 1.04 148.11 0.0       0.0 0.0 0.0 0.0 1.04 1.418.11 0.0         13.006 0.00 8.46 118.970 1.10	13.0	05 64.7	03 0.20	5 315.6	0.071	0.00							
6.008       8.116       0.015       541.1       0.000       0.00       0.0       0.600       0       6500       6450       6         6.009       80.708       0.200       40.31       380.9       0.000       0.00       0.0       0.600       0       450       6         6.011       12.300       0.044       279.5       0.000       0.00       0.0       0.600       0       450       6         1.005       12.240       0.025       489.6       0.000       0.00       0.0       0.600       0       525       6         1.006       8.160       0.018       455.0       0.000       0.00       0.0       0.600       0       525       6         16.001       38.62       0.240       161.2       0.000       0.00       0.0       0.600       0       225       6         16.003       7.429       0.010795.0       0.046       0.00       0.0       0.600       0       225       6         Network Results Table         PN       Rain       T.C.       US/IL       E IArea       Z Base       Foul       Add Flow       Vel       Cap       Flow <td< td=""><td>13.0</td><td>06 10.4</td><td>87 0.03</td><td>0 349.6</td><td>0.052</td><td>0.00</td><td></td><td>0.0</td><td>0.600</td><td>0</td><td>450</td><td></td><td>&lt;</td></td<>	13.0	06 10.4	87 0.03	0 349.6	0.052	0.00		0.0	0.600	0	450		<
6.008       8.116       0.015       541.1       0.000       0.00       0.0       0.600       0       6500       6450       6         6.009       80.708       0.200       40.31       380.9       0.000       0.00       0.0       0.600       0       450       6         6.011       12.300       0.044       279.5       0.000       0.00       0.0       0.600       0       450       6         1.005       12.240       0.025       489.6       0.000       0.00       0.0       0.600       0       525       6         1.006       8.160       0.018       455.0       0.000       0.00       0.0       0.600       0       525       6         16.001       38.62       0.240       161.2       0.000       0.00       0.0       0.600       0       225       6         16.003       7.429       0.010795.0       0.046       0.00       0.0       0.600       0       225       6         Network Results Table         PN       Rain       T.C.       US/IL       E IArea       Z Base       Foul       Add Flow       Vel       Cap       Flow <td< td=""><td>6.0</td><td>07 22 0</td><td>63 0 05</td><td>5 417 5</td><td>0.037</td><td>0.00</td><td></td><td>0.0</td><td>0 600</td><td>~</td><td>450</td><td></td><td></td></td<>	6.0	07 22 0	63 0 05	5 417 5	0.037	0.00		0.0	0 600	~	450		
6.009 80.708 0.200 403.5 0.000 0.00       0.00 0.00 0.00 0.00       0.00.600 0 450         6.010 11.823 00.044 279.5 0.000 0.00       0.0 0.600 0 450       0         1.004 1.833 0.010 183.3 0.000 0.00       0.00 0.600 0 525       0         1.005 12.240 0.025 489.6 0.000 0.00       0.0 0.600 0 525       0         1.006 8.190 0.018 455.0 0.000 0.00       0.0 0.600 0 525       0         16.001 38.682 0.240 161.2 0.000 0.00       0.0 0.600 0 300       0         16.001 38.682 0.240 161.2 0.000 0.00       0.0 0.600 0 300       0         16.003 7.429 0.001 7429.0 0.000 0.00       0.0 0.600 0 300       0         17.000 56.396 0.150 376.0 0.156 5.00       0.0 0.600 0 525       0         Network Results Table         Network Results Table         13.003 0.00 6.86 119.365 0.320 0.0 0.0 0.0 0.0 1.18 188.4 0.0         13.003 0.00 6.86 119.365 0.320 0.0 0.0 0.0 0.0 1.18 188.4 0.0       13.006 0.00 8.12 119.205 0.477 0.0 0.0 0.0 1.14 181.1 0.0         13.004 0.00 7.18 119.275 0.406       0.0 0.0 0.0 1.14 181.2.2 0.0       0.0         13.004 0.00 8.81 118.970 1.107 0.0 0.0 0.0 0.0 1.14 181.2.2 0.0       0.0       0.0 0.0 0.0 1.14 181.0         13.004 0.00 8.81 118.970 1.107 0.0 0.0 0.0 0.0 1.0 1.99 157.2 0.0       0.0 0.0 0.0 0.0 1.14 181.0       0.0         13.004 0.00 10.52 118.550 2.240 0.0 0.0 0.0 0.0 1.0 1.04 294.0 0.0													
6.010 11.808 0.031 380.9 0.000 0.00       0.00 0.00 0.00 0.00       0.0 0.600 0 450         1.004 1.833 0.010 183.3 0.000 0.00 0.00 0.0 0.600 0 525       1.005 12.240 0.025 489.6 0.000 0.00 0.0 0.600 0 525       1.005 12.240 0.025 489.6 0.000 0.00 0.0 0.600 0 525         1.006 8.190 0.018 455.0 0.000 0.00 0.00 0.0 0.600 0 525       1.006 8.190 0.018 455.0 0.000 0.00 0.0 0.600 0 525       1.006 138.682 0.240 161.2 0.000 0.00 0.0 0.600 0 225         16.001 38.682 0.240 161.2 0.000 0.00 0.00 0.00 0.600 0 300       16.003 7.429 0.001 7429.0 0.000 0.00 0.0 0.600 0 300       16.003 7.429 0.001 7429.0 0.000 0.00         17.000 56.396 0.150 376.0 0.156 5.00 0.0 0.660 0 525       5         Network Results Table         PN       Rain T.C. US/IL E I.Area E Base Foul Add Flow Vel Cap Flow (1/s) (1/													1.0
6.011 12.300 0.044 279.5 0.000 0.00       0.00 0.00 0.00 0.00       0.450 0       0.450 0         1.004 1.833 0.010 183.3 0.000 0.00       0.00 0.00 0.00 0.00 0.00       0.600 0       525 0         1.005 12.240 0.025 489.6 0.000 0.00       0.00 0.00 0.00 0.00 0.00       0.500 0       525 0         1.006 8.190 0.018 455.0 0.000 0.00       0.00 0.00 0.00 0.00       0.00 0.600 0       525 0         16.001 38.652 0.240 161.2 0.000 0.00 0.00 0.00 0.600 0       225 0       0         16.002 7.950 0.001 7950.0 0.046 0.00 0.00 0.00 0.600 0       300 0         17.000 56.396 0.150 376.0 0.156 5.00 0.0 0.00 0.600 0       525 0         Network Results Table         Network Results Table         13.003 0.00 6.86 119.365 0.320 0.0 0.0 0.0 0.0 1.18 188.4 0.0         13.004 0.00 7.18 119.275 0.406 0.0 0.0 0.0 1.15 182.2 0.0         13.004 0.00 8.28 119.000 0.529 0.0 0.0 0.0 0.0 1.18 188.4 0.0         13.006 0.00 8.28 119.000 0.529 0.0 0.0 0.0 0.0 1.08 172.0 0.0         6.007 0.00 8.67 118.970 1.107 0.0 0.0 0.0 0.0 1.08 172.0 0.0         6.008 0.00 8.80 118.915 1.107 0.0 0.0 0.0 0.0 1.04 294.0 0.0         6.009 0.00 10.14 118.900 1.107 0.0 0.0 0.0 1.04 164.7 0.0         6.009 0.00 10.12 118.550 2.240 0.0 0.0 0.0 0.0 1.04 164.7 0.0         6.001 0.00 10.52 118.550 2.240 0.0 0.0 0.0 0.0 1.04 255.9 0.0         1.004 0.00 10.52 118.550 2.240 0.0 0.0 0.0 0.0 1.04 255.9 0.0													
1.005       12.240       0.025       489.6       0.000       0.00       0.00       0.000       0       525       1         16.000       8.461       0.042       201.5       0.059       5.00       0.0       0.600       0       225       1         16.001       38.682       0.240       161.2       0.000       0.00       0.00       0.600       0       225       1         16.002       7.950       0.001       7429.0       0.000       0.00       0.00       0.600       0       300       1         17.000       56.396       0.150       376.0       0.156       5.00       0.0       0.600       0       525       1         Network Results Table         Ntwork Results Table         N       Rain       T.C.       US/IL       E I.Area       E Base       Foul       Add Flow       Vel       Cap       Flow         13.003       0.00       6.86       119.365       0.320       0.0       0.0       1.18       188.4       0.0         13.004       0.00       7.18       119.275       0.406       0.0       0.0       1.14       181.1       0.0													
1.005       12.240       0.025       489.6       0.000       0.00       0.00       0.000       0       525       1         16.000       8.461       0.042       201.5       0.059       5.00       0.0       0.600       0       225       1         16.001       38.682       0.240       161.2       0.000       0.00       0.00       0.600       0       225       1         16.002       7.950       0.001       7429.0       0.000       0.00       0.00       0.600       0       300       1         17.000       56.396       0.150       376.0       0.156       5.00       0.0       0.600       0       525       1         Network Results Table         Ntwork Results Table         N       Rain       T.C.       US/IL       E I.Area       E Base       Foul       Add Flow       Vel       Cap       Flow         13.003       0.00       6.86       119.365       0.320       0.0       0.0       1.18       188.4       0.0         13.004       0.00       7.18       119.275       0.406       0.0       0.0       1.14       181.1       0.0	1.0	0.4 1.9	22 0 01	0 192 2	0.000	0.00		0.0	0 600	-	5.25		
1.006       8.190       0.018       455.0       0.000       0.00       0.0       0.600       o       525       5         16.000       8.461       0.042       201.5       0.059       5.00       0.0       0.600       o       225       6         16.001       38.682       0.240       161.2       0.000       0.00       0.0       0.600       o       225       6         16.003       7.429       0.001       7950.0       0.046       0.00       0.0       0.600       o       300       6         17.000       56.396       0.150       376.0       0.156       5.00       0.0       0.600       o       525       6         Network Results Table         Network Results Table         N       Rain       T.C.       US/IL       E I.Area       E Base       Foul Add Flow       Vel       Cap       Flow         13.003       0.00       6.86       119.365       0.320       0.0       0.0       1.148       188.4       0.0         13.004       0.00       7.18       119.275       0.406       0.0       0.0       1.14       181.1       0.0 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>													
16.001       38.682       0.240       161.2       0.000       0.00       0.00       0.600       0       225       0         16.002       7.950       0.001       7950.0       0.046       0.00       0.0       0.600       0       300       0         16.003       7.429       0.001       7429.0       0.000       0.00       0.0       0.600       0       300       0         17.000       56.396       0.150       376.0       0.156       5.00       0.0       0.600       0       525       0         Network Results Table         N       Rain       T.C.       US/IL       E LArea       E Base       Foul       Add Flow       Vel       Cap       Flow         13.003       0.00       6.86       119.365       0.320       0.0       0.0       0.0       1.18       188.4       0.0         13.004       0.00       7.18       119.275       0.406       0.0       0.0       1.14       181.1       0.0         13.005       0.00       8.28       119.000       0.529       0.0       0.0       1.04       1.00       1.08       172.0       0.0         6.007<												-	
16.001       38.682       0.240       161.2       0.000       0.00       0.00       0.600       0       225       0         16.002       7.950       0.001       7950.0       0.046       0.00       0.0       0.600       0       300       0         16.003       7.429       0.001       7429.0       0.000       0.00       0.0       0.600       0       300       0         17.000       56.396       0.150       376.0       0.156       5.00       0.0       0.600       0       525       0         Network Results Table         N       Rain       T.C.       US/IL       E LArea       E Base       Foul       Add Flow       Vel       Cap       Flow         13.003       0.00       6.86       119.365       0.320       0.0       0.0       0.0       1.18       188.4       0.0         13.004       0.00       7.18       119.275       0.406       0.0       0.0       1.14       181.1       0.0         13.005       0.00       8.28       119.000       0.529       0.0       0.0       1.04       1.00       1.08       172.0       0.0         6.007<				- Land				- 100 -	(Colorado			- 62	
16.002       7.950       0.001       7950.0       0.046       0.00       0.0       0.600       0       300       0         16.003       7.429       0.001       7429.0       0.000       0.00       0.00       0.600       0       300       0         17.000       56.396       0.150       376.0       0.156       5.00       0.0       0.600       0       525       0         Network Results Table         PN Rain T.C. US/IL E I.Area E Base flow (1/s) (1/s) (1/s) (1/s) (1/s) (1/s) (1/s)         13.003       0.00       6.86       119.365       0.320       0.0       0.0       1.15       182.2       0.0         13.004       0.00       8.12       119.205       0.407       0.0       0.0       1.15       182.2       0.0         13.005       0.00       8.12       119.205       0.407       0.0       0.0       1.15       182.2       0.0         13.006       0.00       8.28       119.000       0.529       0.0       0.0       1.08       172.0       0.0         6.007       0.00       8.67       118.970       1.107       0.0       0.0       1.01       160.0       0.0 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>6</td></t<>													6
16.003       7.429       0.001       7429.0       0.000       0.00       0.0       0.600       0       300       1         17.000       56.396       0.150       376.0       0.156       5.00       0.0       0.600       0       525       1         Network Results Table         Network Results Table         N Rain (mm/hr) (mins) (m) (ha) Flow (l/s)         13.003       0.00       6.86       119.365       0.320       0.0       0.0       0.0       1.18       188.4       0.0         13.004       0.00       7.18       119.275       0.406       0.0       0.0       1.15       182.2       0.0         13.005       0.00       8.12       119.205       0.477       0.0       0.0       1.08       172.0       0.0         6.007       0.00       8.67       118.970       1.107       0.0       0.0       1.04       164.7       0.0         6.008       0.00       10.14       18.900       1.107       0.0       0.0       1.01       164.7       0.0         6.010       0.00       10.52       118.560       2.240       0.0       0.												-	
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Network Results Table           PN         Rain         T.C.         US/LI         E I.Area         E Base         Foul         Add Flow         Vel         Cap         Flow           13.003         0.00         6.86         119.365         0.320         0.0         0.0         0.0         1.15         182.2         0.0           13.004         0.00         7.18         119.275         0.406         0.0         0.0         1.15         182.2         0.0           13.005         0.00         8.12         119.205         0.477         0.0         0.0         1.08         172.0         0.0           13.006         0.00         8.67         118.970         1.107         0.0         0.0         0.09         1.57.2         0.0           6.007         0.00         8.67         118.900         1.107         0.0         0.0         1.04         294.0         0.0           6.008         0.00         8.80         118.915         1.107         0.0         0.0         1.04         294.0         0.0           6.010         0.00         10.55         118.669         1.107         0.0         0.0         1.01         1.04         1.04												•	
PNRain (mm/hr)T.C. (mins)US/IL (m) $\Sigma$ (ha)I.Area Flow (ha) $\Sigma$ Base Flow (l/s)Foul (l/s)Add Flow (l/s)Vel (m/s)Cap (l/s)Flow (l/s)13.0030.006.86119.3650.3200.00.00.01.18188.40.013.0040.007.18119.2750.4060.00.00.01.15182.20.013.0050.008.12119.2050.4770.00.00.01.14181.10.013.0060.008.28119.0000.5290.00.00.01.08172.00.06.0070.008.67118.9701.1070.00.00.01.04294.00.06.0080.008.80118.9151.1070.00.00.01.04294.00.06.0090.0010.14118.9001.1070.00.00.01.04164.70.06.0100.0010.33118.7001.1070.00.00.01.21192.60.01.0040.0010.52118.5502.2400.00.00.01.0425.90.01.0050.0010.72118.5402.2400.00.00.01.04225.90.01.0060.005.15118.9290.0590.00.00.01.0340.80.01.0060.00	17.0	00 56.3	96 0.15	0 376.0	0.156	5.00		0.0	0.600	0	525	ð	
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$\begin{array}{c c c c c c c c c c c c c c c c c c c $	PN	Rain	T.C.	US/IL	I. Area	Σ Ba	se	Foul	Add FI	ow	Vel	Cap	Flow
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$													10000
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	13,003	0.00	6.86	119.365	0.320		0.0	0.0		0.0	1.18	188.4	0.0
$\begin{array}{cccccccccccccccccccccccccccccccccccc$													
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6.008         0.00         8.80         118.915         1.107         0.0         0.0         1.04         294.0         0.0           6.009         0.00         10.14         118.900         1.107         0.0         0.0         1.01         160.0         0.0           6.010         0.00         10.33         118.700         1.107         0.0         0.0         1.01         160.0         0.0           6.011         0.00         10.50         118.669         1.107         0.0         0.0         1.04         164.7         0.0           1.004         0.00         10.52         118.550         2.240         0.0         0.0         1.01         121.77         0.0           1.005         0.00         10.72         118.540         2.240         0.0         0.0         1.01         217.7         0.0           1.006         0.00         10.85         118.515         2.240         0.0         0.0         1.01         217.7         0.0           1.006         0.00         10.85         118.515         2.240         0.0         0.0         1.04         225.9         0.0           16.000         0.00         5.15         118.929 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>0.0</td> <td>1.08</td> <td>172.0</td> <td></td>										0.0	1.08	172.0	
6.008         0.00         8.80         118.915         1.107         0.0         0.0         1.04         294.0         0.0           6.009         0.00         10.14         118.900         1.107         0.0         0.0         1.01         160.0         0.0           6.010         0.00         10.33         118.700         1.107         0.0         0.0         1.01         160.0         0.0           6.011         0.00         10.50         118.669         1.107         0.0         0.0         1.04         164.7         0.0           1.004         0.00         10.52         118.550         2.240         0.0         0.0         1.01         121.77         0.0           1.005         0.00         10.72         118.540         2.240         0.0         0.0         1.01         217.7         0.0           1.006         0.00         10.85         118.515         2.240         0.0         0.0         1.01         217.7         0.0           1.006         0.00         10.85         118.515         2.240         0.0         0.0         1.04         225.9         0.0           16.000         0.00         5.15         118.929 <td>6.007</td> <td>0.00</td> <td>8.67</td> <td>118 970</td> <td>1.107</td> <td></td> <td>0.0</td> <td>0.0</td> <td></td> <td></td> <td>0.99</td> <td>157.2</td> <td>0.0</td>	6.007	0.00	8.67	118 970	1.107		0.0	0.0			0.99	157.2	0.0
6.009         0.00         10.14         118.900         1.107         0.0         0.0         1.01         160.0         0.0           6.010         0.00         10.33         118.700         1.107         0.0         0.0         1.04         164.7         0.0           6.011         0.00         10.50         118.669         1.107         0.0         0.0         1.04         164.7         0.0           1.004         0.00         10.52         118.550         2.240         0.0         0.0         1.01         121         192.6         0.0           1.005         0.00         10.72         118.540         2.240         0.0         0.0         1.01         217.7         0.0           1.006         0.00         10.85         118.515         2.240         0.0         0.0         1.04         225.9         0.0           1.006         0.00         10.85         118.515         2.240         0.0         0.0         1.04         225.9         0.0           16.000         0.00         5.15         118.929         0.059         0.0         0.0         0.0         1.03         40.8         0.0           16.001         0.00													
6.010         0.00         10.33         118.700         1.107         0.0         0.0         0.0         1.04         164.7         0.0           6.011         0.00         10.50         118.669         1.107         0.0         0.0         0.0         1.21         192.6         0.0           1.004         0.00         10.52         118.550         2.240         0.0         0.0         1.01         1.21         192.6         0.0           1.005         0.00         10.72         118.540         2.240         0.0         0.0         1.01         217.7         0.0           1.006         0.00         10.85         118.515         2.240         0.0         0.0         1.04         225.9         0.0           1.006         0.00         10.85         118.515         2.240         0.0         0.0         0.0         1.04         225.9         0.0           16.000         0.00         5.15         118.929         0.059         0.0         0.0         0.0         0.92         36.5         0.0           16.001         0.00         5.78         118.887         0.059         0.0         0.0         0.0         0.17         11.8													
6.011       0.00       10.50       118.669       1.107       0.0       0.0       1.21       192.6       0.0         1.004       0.00       10.52       118.550       2.240       0.0       0.0       1.65       357.4       0.0         1.005       0.00       10.72       118.540       2.240       0.0       0.0       1.01       217.7       0.0         1.006       0.00       10.85       118.515       2.240       0.0       0.0       1.04       225.9       0.0         16.000       0.00       5.15       118.929       0.059       0.0       0.0       0.0       1.02       36.5       0.0         16.001       0.00       5.78       118.887       0.059       0.0       0.0       0.0       1.03       40.8       0.0         16.002       0.00       6.57       118.572       0.105       0.0       0.0       0.17       11.8       0.0         16.003       0.00       7.29       118.571       0.105       0.0       0.0       0.17       12.2       0.0	6.010	0.00	10.33	118.700	1.107					.0	1.04	164.7	0.0
1.005       0.00       10.72       118.540       2.240       0.0       0.0       1.01       217.7       0.0         1.006       0.00       10.85       118.515       2.240       0.0       0.0       1.04       225.9       0.0         16.000       0.00       5.15       118.929       0.059       0.0       0.0       0.0       0.92       36.5       0.0         16.001       0.00       5.78       118.887       0.059       0.0       0.0       0.0       1.03       40.8       0.0         16.002       0.00       6.57       118.572       0.105       0.0       0.0       0.0       1.11       11.8       0.0         16.003       0.00       7.29       118.571       0.105       0.0       0.0       0.0       0.17       11.8       0.0							0.0	0.0	C	0.0	1.21	192.6	0.0
1.005       0.00       10.72       118.540       2.240       0.0       0.0       1.01       217.7       0.0         1.006       0.00       10.85       118.515       2.240       0.0       0.0       1.04       225.9       0.0         16.000       0.00       5.15       118.929       0.059       0.0       0.0       0.0       0.92       36.5       0.0         16.001       0.00       5.78       118.887       0.059       0.0       0.0       0.0       1.03       40.8       0.0         16.002       0.00       6.57       118.572       0.105       0.0       0.0       0.0       1.11       11.8       0.0         16.003       0.00       7.29       118.571       0.105       0.0       0.0       0.0       0.17       11.8       0.0	1,004	0.00	10.52	118.550	2,240		0.0	0.0		0.0	1,65	357.4	0.0
1.006         0.00         10.85         118.515         2.240         0.0         0.0         1.04         225.9         0.0           16.000         0.00         5.15         118.929         0.059         0.0         0.0         0.92         36.5         0.0           16.001         0.00         5.78         118.887         0.059         0.0         0.0         1.03         40.8         0.0           16.002         0.00         6.57         118.572         0.105         0.0         0.0         0.17         11.8         0.0           16.003         0.00         7.29         118.571         0.105         0.0         0.0         0.17         12.2         0.0							0.0	0.0	0				and a log
16.0010.005.78118.8870.0590.00.00.01.0340.80.016.0020.006.57118.5720.1050.00.00.00.1711.80.016.0030.007.29118.5710.1050.00.00.00.1712.20.0													
16.0010.005.78118.8870.0590.00.00.01.0340.80.016.0020.006.57118.5720.1050.00.00.00.1711.80.016.0030.007.29118.5710.1050.00.00.00.1712.20.0	16 000	0.00	5 15	118 020	0 050		0.0	0.0		0	0 00	36 5	0.0
16.002         0.00         6.57         118.572         0.105         0.0         0.0         0.17         11.8         0.0           16.003         0.00         7.29         118.571         0.105         0.0         0.0         0.17         12.2         0.0													
16.003 0.00 7.29 118.571 0.105 0.0 0.0 0.0 0.17 12.2 0.0													
17.000 0.00 5.82 118.570 0.156 0.0 0.0 0.0 1.15 248.8 0.0													
a set	17,000	0.00	5.82	118.570	0.156		0.0	0.0		0.0	1.15	248.8	0.0
@1982-2014 XP Solutions				_			-			15			

ods Har	dwick	1.1										Page	4
-17 Gol	dingto	on Ro	ad										
dford												4	~
40 3NH												Min	U
te 23/1	2/2014	1 13:	02		Dea	signed	by	a.tew				- MIC	
le SW T	rench:	ard p	ropo	sed 1.		ecked 1						Ula	inac
cro Dra		ard b	ropo	bed I.		work 1	+	1.1	_				
CIO DIA	Inage	-			nei	WOLK .	2014						
	Netv	ork	Desi	on Tab	le for	SW EA	ST E	XISTI	NG 15.	07.1	3.50	IS	
	neer	OL A	Dept	gii tab	Te Tot	on an	D1 1	nioi i		9711	3.0		
Pl	I Ler	oth I	Fall	Slope	I.Area	T.E.	в	ase	k	HYD	DIA	Auto	
		m)			(ha)		Flow	(1/s)	(mm)	SECT	(mm)	Design	1
					0.000				0.600			-	
17.0	002 23.	509 0	.060	391.8	0.000	0.00		0.0	0.600	0	525	<b>d</b>	
1.0	007 37.	754 0	.097	389.2	0.000	0.00		0.0	0.600	0	825	n	
										-		.,	
					0.030				0.600		225		
					0.024				0.600				
					0.008				0.600		225		
					0.006				0.600				
18.0	004 25.	000 0	.085	294.1	0.012	0.00		0.0	0.600	0	300	đ	
19.0	000 31	800 0	.110	289.1	0.019	5.00		0.0	0.600	0	100	6	
												-	
					0.021			0.0	0.600	0	300	<b>#</b>	
					0.000			0.0	0.600			0	
					0.000				0.600			-	
					0.051				0.600		100		
18.0	009 17.	441 0	.070	249.2	0.000	0.00		0.0	0.600	0	100	đ	
1.0	008 19.	044 0	.020	952.2	0.000	0.00		0.0	0.600	V	40	8	
20.0	000 12.	426 0	.039	318.6	0.070	5.00		0.0	0.600	0	100	ð	
				Ne	twork	Result	s Ta	able					
PN	Dete							P1				-	
	Rain			0.51 - 0	I.Area (ha)							Cap	Flow
	mm/ nr)	(mrns	5)	(m)	(na)	PION (	1/3)	(1/3)	(1/3)	(	(8)	(1/5)	(1/3)
17.001	0.00	5.9	93 11	8.420	0.156		0.0	0.0	0	.0 1	.31	282.8	0.0
17.002	0.00			8.390	0.156		0.0	0.0	0	0 1	.13	243.6	0.0
									4				
1.007	0.00	11.1	27 11	8.297	2.501		0.0	0.0	0	.0 1	.50	801.2	0.0
18,000	0.00	5.	49 11	9.340	0.030		0.0	0.0	0	0 1	.02	40.4	0.0
18.001	0.00			9.160	0.054		0.0				.91	36.4	
18.002	0.00			9.020	0.062		0.0				.90	35.8	0.0
18.003	0.00			8.830	0.068		0.0			0 0		36.0	0.0
18.004	0.00			8.615	0.080			0.0			.91	64.4	0.0
10.000		2		0.040					-				
19.000	0.00	6.1	18 11	8,840	0.019		0.0	0.0	0	0 0	.45	3.5	0.0
18.005	0.00	8.1	83 11	8.530	0.120		0.0	0.0	0	0 0	. 48	33.8	0.0
18.006					0.120			0.0			.79		0.0
18.007	0.00	9.1	28 11	8.320	0.120		0.0	0.0	0	0 0	.81	6.4	0.0
18.008	0.00			8.268	0.171		0.0	0.0			.50	3.9	0.0
18.009	0.00	10.3	34 11	8.210	0.171		0.0	0.0	0	0 0	.48	3.8	0.0
1.008	0.00	11.	44 11	7.700	2.672		0.0	0.0	0	0 1	.91	7493.7	0.0

	Goldin	ngton R	load									Page	8 D
Bedfor MK40 3												2	r
Date 2	3/12/2	2014 13	:02		De	signed	l by	a.tew	07			MIC	
				sed 1	Ch	-						Uľa	ina
Micro			FF-			twork	-	.1.1				-	
142242			025 N		1					15	5.5	353	
	N	letwork	Desi	gn Tal	ole for	SW E	AST B	EXISTI	NG 15	.07.	13.S	WS	
	PN	Length (m)			I.Area (ha)			ase (1/s)	k (mm)		DIA (mm)		
	20.001	9.076	0.010	907.6	0.006	0.00		0.0	0.600	0	100	ø	
	21.000	8.298	0.065	127.7	0.006	5.00		0.0	0.600	0	150	•	
	1.009	31.260	0.035	893.1	0.000	0.00		0.0	0.600	N	40	6	
	22.000	13.020	0.150	86.8	0.031	5.00		0.0	0.600	0	150	8	
					0.064				0.600			<del>. 9</del>	
					0.006				0.600				
	22.003	27.677	0.100	276.8	0.046	0.00		0.0	0.600	0	300		
	23.000	17.082	0.400	42.7	0.014	5.00		0.0	0.600	0	150	ð	
	24.000	19.030	0.896	21.2	0.024	5.00		0.0	0.600	0	150	õ	
	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	6	
	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	3	
				N	letwork	Resul	ts T	able					
PN				1.00	Σ I.Area								Flow
	(mm/	hr) (mi	ns)	(m)	(ha)	Flow	(1/s)	(1/s)	(1/s	) (1	n/s)	(1/s)	(1/s
20.0	01 0	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	0.00 5	.16 11	8,017	0.006	2	0.0	0.0	C	0.0	0.89	15.7	0.1
1.0	09 0	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	0.00 5	.20 11	8.900	0.031		0.0	0.0	0	0.0	1.08	19.1	0.
22.0	01 0	0.00 5	.80 11	8.675	0.095		0.0	0.0	0	0.0	1.28	51.0	0.
22.0		0.00 6						0.0		0.0			
22.0	03 (	0.00 6	.82 11	8.005	0.147		0.0	0.0	C	0.0	0.94	66.5	0.
23.0	00 0	0.00 5	.18 11	8.850	0.014		0.0	0.0	C	0.0	1.54	27.3	0.0
24.0	00 0	0.00 5	.14 11	9.346	0.024	C .	0.0	0.0	c	0.0	2.20	38.8	0.
25.0	00 0	0.00 5	.21 11	8.878	0.025	6. F	0.0	0.0	C	.0	1.50	26.6	0.
26.0	00 0	0.00 5	.36 11	8.420	0.006		0.0	0.0	c	0.0	0.82	14.5	0.
23.0	01 0	0.00 5	.73 11	8.300	0.141		0.0	0.0	¢	.0 (	0.81	6.3	0.
22.0	04 0	0.00 7	.22 11	7.905	0.294		0.0	0.0	c	.0	1.01	71.5	0.

A 10 A 14 14	rdwi											Pag	e 6
15-17 Go.	Idin	gton R	oad									1	
Bedford												2	4
MK40 3NH								-	_			— Mi	cro
Date 23/						signed	-						ina
File SW 1			propo	sed 1			-						
Micro Dra	aina	ge	-	_	Ne	twork	2014	.1.1			_		
	N	etwork	Desi	gn Tak	ole for	SW EZ	AST E	XISTI	NG 15	.07.	13.S	WS	
	PN	Length	Fall	Slope	I.Area	T.E.	Ba	ase	k	HYD	DIA	Auto	
		(m)			(ha)								
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	<b>f</b>	
					0.027			0.0	0.600	0	225	6	
1	.010	4.365	0.005	873.0	0.000	0.00		0.0	0.600	V	40	8	
					etwork								
						100							
					E I.Area								
	(mm/)	nr) (mi	115)	(m)	(ha)	FIOW	(1/5)	(1/5)	(1/5	, (	mys)	(1/5)	(1/5)
27.000		00 E	22 11	0.050	0.010						0.07	47.4	
27.000													
22.005	0	.00 7	. 41 11	7.805	0.362		0.0	0.0		0.0	0.98	69.6	0.0
22.006	0	.00 7	.84 11	7.760	0.389		0.0	0.0		0.0	0.88	34.8	0.1
1.010	0	.00 11	.74 11	7.645	3.143	E.	0.0	0.0		0.0	1.99	7828.5	0.0
in.	-	Florie	d Out	fall .	lot at 1 -	for	-	CT DY	TOTTN	0 15	07	12 050	
FI	ree i	ETOMIU	y out	rart I	)etails	101 3	on EA	OI EA	19110	9 13	.07.	12.3%	-
					11 C. L								
		Pipe	Number	c Name	e (n	1)	(m)		evel ( n)	mm)	(mm)		
									1				
			1.010	)	0	.000 1	17.64	0 0	.000	0	0		
	5	Simulat	ion (	Criter	ia for	SW EA	ST E	XISTI	NG 15	07.1	13.50	IS	
	-					are are						<u></u>	
					eff 0.84								
		Areal R	eduction of Sta	on Fact	or 1.00	0	MADI	) Facto	Trlet	m <sup>3</sup> /ha	a Stor	ient 0	800
		Hot S	tart I	evel (r	ns) nm)	0 Flow	per I	Person	per Da	y (1)	/per/d	iay) 0.	000
		leadloss	Coeff	(Globa	al) 0.50	0			Ru	n Tir	ne (mi	ins)	60
For	ul Se	wage pe	r hect	are (1)	(s) 0.00	0		Out	put In	terva	al (mi	ins)	1
		Number	of Inp	ut Hyd	ographs	0 Numi	ber of	E Stora	age Str	uctu	res 1	6	
					Controls								
		Number	or Of	Tline (	Controls	0 Numl	per of	r Real	Time (	ontro	ols (	U	
		et tallierte e											
				Synt	hetic	Rainfa	all D	)etail	5				
			p:	100		Rainfa	<u>all D</u>	)etail	5	FI	EH		
				<u>Synt</u> sinfall eriod (;	Model	Rainfa	<u>all E</u>	)etail	5		EH 00		
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			urn Pe	ainfall eriod () Site Lo	Model years)					10	00 50		

Noods Hardwick		Page 7
15-17 Goldington Road		6
Bedford		Ly
K40 3NH		Micro
Date 23/12/2014 13:02	Designed by a.tew	Micro Drainage
File SW Trenchard proposed 1	Checked by	Biglingele
ficro Drainage	Network 2014.1.1	
Synthe	tic 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	
Storm	Duration (mins) 15	
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Woods Hardy	antes Des	4					Page 8
15-17 Goldi	ington Roa	a					2
Bedford							1 mm
MK40 3NH							Micro
Date 23/12/				ned by a.te	5W		Drainage
File SW Tre		oposed 1.					promitage
Micro Drain	lage	_	Netwo	rk 2014.1.1			
	Online	Controls	for SW E	AST EXISTIN	G 15.07	.13.SWS	
	_				_		
Hydr	o-Brake®	Manhole:	15 (D5a),	DS/PN: 6.0	009, Vol	Lume (m <sup>3</sup> )	: 6.1
	n Head (m) Flow (1/s)			mpe Md6 SW Onl mm) 33	ly Invert 37	Level (m)	118.900
Depth (m)	Flow (1/s)	Depth (m)	Flow (1/s)	Depth (m) F1	Low (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							
0.400		1.800			137.5		
0.500							
0.600					152.0		199.7
1.000					165.2		
	Pre-initi	alised cont	trol select	ed, excessive	flows ma	ay result.	
	Pre-initi	alised cont	trol select	ed, excessive	flows ma	ay result.	
	Pre-initi	alised cont	trol select	ed, excessive	flows ma	ay result.	
	Pre-initi	alised cont	trol select	ed, excessive	flows ma	ay result.	

Woods Hardwick			Page 9
15-17 Goldington Road			6
Bedford			Le.
MK40 3NH	1		Micco
Date 23/12/2014 13:02	Designed by	a.tew	WILLIU
File SW Trenchard proposed 1	Checked by		Drainac
Micro Drainage	Network 201		
inter o presidente			
Storage Structures f	or SW EAST E	XISTING 15.07.13.SWS	<u>e</u> -
Porous Car Park Ma	anhole: PP (I	05a), DS/PN: 6.000	
Infiltration Coefficient Base	(m/hr) 0.00000	Width (m)	10.3
Membrane Percolation (	mm/hr) 1000	Length (m)	25.0
Max Percolation	(1/s) 71.5	Slope (1:X)	300.0
Safety	Factor 2.0	Depression Storage (mm)	5
		Evaporation (mm/day)	
Invert Leve	ei (m) 120.000	Cap Volume Depth (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 Dercolation /	mm/hr) 1000	Length (m)	18.0
Max Percolation	(1/s) 50.0	Slope (1:X)	300.0
Dately	CAULUI 2.0	Debression Scorade (um)	
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	05a), DS/PN: 8.000	
Infiltration Coefficient Base	(m/hr) 0.00000	Width (m)	5.0
Membrane Percolation (			
Max Percolation		Slope (1:X)	
Safety	Factor 2.0	Depression Storage (mm)	5
Po	rosity 0.30	Evaporation (mm/day)	3
Invert Leve	el (m) 120.150	Cap Volume Depth (m)	0.000
Porous Car Park Ma	anhole: PP (I	05a), DS/PN: 9.000	
Infiltration Coefficient Base	(m/hr) 0.00000	Width (m)	6.0
Membrane Percolation (	mm/hr) 1000	Length (m)	18.0
Max Percolation	(1/s) 30.0	Slope (1:X) Depression Storage (mm)	300.0
Safety	Factor 2.0	Depression Storage (mm)	5
Po	rosity 0.30	Evaporation (mm/dav)	3
Invert Leve	ei (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 (			
Max Percolation			
		Depression Storage (mm)	
		Evaporation (mm/day)	
Invert Leve	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 Membrane Percolation			

Woods Hardwick		Page 10
15-17 Goldington Road		6
Bedford		Ly .
MK40 3NH		Micro
Date 23/12/2014 13:02	Designed by a.tew	Desirand
File SW Trenchard proposed 1	Checked by	Drainag
	Network 2014.1.1	
Porous Car Park Mar	nhole: PP (D5a), DS/PN: 11.000	
Porosity (		
	.150 Depression Storage (mm) 5	
	8.8 Evaporation (mm/day) 3 28.0 Cap Volume Depth (m) 0.000	
Bengen (m)	zato cap vorume bepch (m) 0.000	
Porous Car Park Mar	nhole: PP (D5a), DS/PN: 12.000	
Infiltration Coefficient Base (		
Membrane Percolation (m		27.0
Max Percolation	(1/s) 80.3 Slope (1:X)	300.0
Safety F	Factor 2.0 Depression Storage (mm)	5
Invert Leve	rosity 0.30 Evaporation (mm/day) al (m) 120.220 Cap Volume Depth (m)	0.000
	in (m) include in the include in (m)	
Porous Car Park Mar	nhole: PP (D5a), DS/PN: 14.000	
	Contraction of the second second	
Infiltration Coefficient Base (	(m/hr) 0.00000 Width (m)	5.0
Membrane Percolation (m		
Max Percolation	(1/s) 25.0 Slope (1:X) Factor 2.0 Depression Storage (mm)	
Invert Leve	rosity 0.30 Evaporation (mm/day) 21 (m) 120.700 Cap Volume Depth (m)	0.000
Porous Car Park Mar	nhole: PP (D5a), DS/PN: 15.000	
Infiltration Coefficient Base (	(m/hr) 0.00000 Width (m)	12.1
Membrane Percolation (m		
Max Percolation	(1/s) 116.4 Slope (1:X)	300.0
Safety F	Factor 2.0 Depression Storage (mm)	5
Por	rosity 0.30 Evaporation (mm/day)	3
Invert Leve	al (m) 120.600 Cap Volume Depth (m)	0.000
Tank or Rond Manhe	ole: Pond (D5a), DS/PN: 6.008	
rank or Fond Mainte	510. Long (554), 55/ER. 0.000	
Invert	t Level (m) 118.915	
and the second se		
Depth (m) Are	a (m <sup>2</sup> ) Depth (m) Area (m <sup>2</sup> )	
0.000	204.4 1.885 639.3	
Conserved to find the first		
Filter Drain Man	hole: 5 (TC), DS/PN: 18.004	
Infiltration Coefficient Base (m/	/hr) 0.01000 Trench Length (	m) 17.0
Infiltration Coefficient Side (m/		
Safety Fac	tor 1.0 Pipe Depth above Invert (	
Poros	sity 0.30 Slope (1:	X) 300.0
	(m) 118.425 Cap Volume Depth (	
Trench Width	(m) 2.0 Cap Infiltration Depth (	m) 0.000
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15-17	Goldington	n Road			
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Date	23/12/2014	13:02	Designed b	by a.tew	1000
File	SW Trenchar	rd proposed 1	Checked by	r	Dr
Micro	Drainage		Network 20	014.1.1	
1		Piltor Drain Man	bolo, ED (	TC) DC (DN: 10 000	
		riiter Drain Man	noie: PD (	TC), DS/PN: 19.000	
	Infiltration	Coefficient Base (m Coefficient Side (m	/hr) 0.00000	Trench Length (m Pipe Diameter (m	1) 3
	Int HILI GLION			Pipe Depth above Invert (m	1) 0.
		Poro	sity 0.30	Slope (1:) Cap Volume Depth (m	30
		Invert Level	(m) 118.790	Cap Volume Depth (m	1) 0.
		Trench Width	(m) 1.0	Cap Infiltration Depth (m	n) 0.
		Filter Drain Man	nhole: 7 (T	C), DS/PN: 18.006	
	Infiltration	Coefficient Base (m	/hr) 0.01000	Trench Length (m Pipe Diameter (m	1)
	Infiltration	Coefficient Side (m	/hr) 0.01000	Pipe Diameter (m	1) 0.
		Safety Fa	ctor 1.0	Pipe Depth above Invert (m	1) 0
		Poro	sity 0.30	Slope (1:) Cap Volume Depth (m	) 90
		Invert Level	(m) 118.500	Cap Volume Depth (m Cap Infiltration Depth (m	1 0
		irench width	(m) 2.0	cap infiltration pepth (n	1) 0.
		Filter Drain Man	nhole: 9 (T	C), DS/PN: 18.008	
	Infiltration	Coefficient Base (m	/hr) 0.01000	Trench Length (m	1)
	Infiltration	Coefficient Side (m			
		Datety ra	sity 0.30	Pipe Depth above Invert (m Slope (1:)	1) 0
		Invert Level	(m) 118,268	Cap Volume Depth (n	0 0
				Cap Infiltration Depth (m	
		Filter Drain Man	hole: 16 (	TC), DS/PN: 23.001	
	Infiltration	Coefficient Base (m	/hr) 0.01000	Trench Length (m Pipe Diameter (m	1) :
	Infiltration	Coefficient Side (m	/hr) 0.01000	Pipe Diameter (m	1) 0.
				Pipe Depth above Invert (m	
		Poro	sity 0.30	Slope (1:) Cap Volume Depth (m	) 50
		Trench Width	(m) 118.200 (m) 2.9	Cap Infiltration Depth (m	1) 0
				TC), DS/PN: 22.006	
	Infiltration	Coefficient Base (m	/hr) 0.01000	Trench Length (m	1) (
	Infiltration	Coefficient Side (m	/hr) 0.01000	Pipe Diameter (n	
		Safety Fa	ctor 1.0	Pipe Depth above Invert (m	1) 0.
		Poro	sity 0.30	Slope (1:)	() 50
		Invert Level	(m) 117.760	Cap Volume Depth (m	1) 0.
		Trench Width	(m) 1.0	Cap Infiltration Depth (n	1) 0.
		Invert Level Trench Width	(m) 1.0	Slope (1:) Cap Volume Depth (m Cap Infiltration Depth (m	1)
		©1982-	-2014 XP So	olutions	

Woods Hard 15-17 Gold		heo		1			age 12
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MK40 3NH							y
	10011.10		_	Barris and Al			Micro
Date 23/12				Designed by	y a.tew		Draina
File SW Tr	enchard	propose	ed 1		1		andin is
Micro Drai	nage			Network 201	14.1.1		
Summarar o	f Critte	DI Poer	ite by	Maximum Lou	al (Papk 1)	for SW EAST	FYTST
Summary c	I GLILLG	ai Nest	iits by	15.07.13.SW		TOT SW EAST	EAIDI
					-		
				mulation Crite			15.0355
			(mins)			of Total Flow	
			el (mm)			.0m³/ha Storage t Coeffiecient	
Manhol			and the second se			ay (1/per/day)	
	Sewage pe					No. of the Ort of	
						and the state	
				aphs 0 Number rols 1 Number			
				rols 0 Number			
				etic Rainfall	Details	1000	
		Rainfal				FEH	
			C (1km)	GB 450500 2252		.023	
			1 (1km)			. 328	
			2 (1km)			. 309	
		D	3 (1km)			. 264	
			E (1km)			. 292	
			F (1km) Summer)			.461	
			Winter)			.840	
	Margin for				A. State State	300.0	
				Timestep 2.5 TS Status	Second Increme	ent (Extended) ON	
				VD Status		ON	
				ia Status		ON	
		Pro	file(s)		Sum	mer and Winter	
	Dura			15, 30, 60, 12		480, 960, 1440	
	Return Per					100	
	Clin	nate Cha	nge (%)			30	
	and the second		Climate			First Z O/F	
PN	Storm	Period	Change	Surcharge	Flood	Overflow Act	Exc.
	15 Winter						
	15 Winter			100/15 Summer	100/15 Summe:	E.	þ.
	15 Summer 15 Winter			100/15 Summer 100/15 Summer	100/15 5	-	6
	15 Winter 15 Winter			100/15 Summer 100/15 Summer			7
	15 Winter			100/15 Summer			3
	15 Winter			100/15 Summer			10
	15 Summer			100/15 Summer	100/15 Summe:	E	1
	15 Summer 15 Winter			100/15 Summer 100/15 Summer			
	15 Winter 15 Summer			100/15 Summer 100/15 Summer			
	15 Winter			100/15 Summer			
6.001	15 Winter	100		100/15 Summer			
7.000	15 Winter	100	+30%	100/15 Summer			
				and the second			
			©1982	-2014 XP Sol	utions		

Woods Hard	wick						Page
15-17 Gold	lington R	load					-
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Date 23/12	/2014 13	:02		Designed by	a.tew		Dre
File SW Tr	enchard	propose	d 1	Checked by			Die
Micro Drai	nage			Network 201	4.1.1		×
Summary o	f Critic	al Resu	ilts by	Maximum Leve	el (Rank 1)	for SW EA	ST EX
				15.07.13.SWS	3		
		Poturn	Climate	First X	First Y	First Z 0	
PN	Storm	Period				Overflow A	
	Scorm	rerrou	change	Surcharge	FICOU	OVELLION A	E.
8.000	15 Winter	100	+30%	100/15 Summer			
				100/15 Summer			
9.000	15 Winter	100	+30%	100/15 Summer			
10.000	15 Winter	100	+30%	100/15 Summer 100/15 Summer			
10.001	15 Winter	100	+30%	100/15 Summer			
6.003	15 Winter	100	+30%	100/15 Summer 100/15 Summer			
6.004	15 Winter	100	+30%	100/15 Summer			
11.000	15 Winter	100	+30%	100/15 Summer 100/15 Summer			
12.000	15 Winter	- 100	+308	100/15 Summer			
6.005	15 Winter	- 100	+30%	100/15 Summer			
13,000	15 Winter	100	+308	100/15 Summer 100/15 Summer			
14,000	15 Winter	- 100	+308	100/15 Summer			
				100/15 Summer			
				100/15 Summer			
15.000	15 Winter	100	+30%	100/15 Summer			
13.003	15 Winter	r 100	+30%	100/15 Summer			
13.004	15 Winter	100	+30%	100/15 Summer 100/15 Summer			
13.005	15 Winter	- 100	+30%	100/15 Summer			
				100/15 Summer			
6.007	15 Winter	100	+308	100/15 Summer			
6.008	60 Winter	100	+308	100/15 Summer			
6.009	30 Winter	100	+308	100/15 Summer 100/15 Summer			
6.011	30 Winter	100	+30%	100/15 Summer			
				100/15 Summer			
1.005	60 Winter	100	+30%	100/15 Summer			
1.006	60 Winter	100	+30%	100/15 Summer			
16.000	15 Winter	- 100	+30%	100/15 Summer			
16.001	15 Winter			100/15 Summer			
16.002	15 Winter	100	+30%	100/15 Summer			
	15 Winter			100/15 Summer			
	15 Winter						
	15 Winter 15 Winter		+308				
	15 Winter 15 Winter		+30%				
	15 Winter						
	15 Winter			100/15 Summer			
	15 Winter			100/15 Summer			
	30 Winter			100/15 Summer			
	30 Winter		+30&	100/15 Summer	100/30 Winter	r i	
	60 Winter			100/15 Summer			
	30 Winter			100/15 Summer			
	30 Winter			100/15 Summer			
	30 Winter			100/15 Summer			
				100/15 Summer	100/30 Winter	E')	
	60 Winter			100/15 Summer			
	15 Winter 15 Winter		+30%	100/15 Summer	100/15 Summer	-	
20.000	13 Wintel	100	+205	100/15 Summer	100/10 Summer		

	s Hard				_		-					Page	14
		ing	gton Ro	ad									
Bedf							_					12	t in
MK40 3NH												Micr	
Date 23/12/2014 13:02							Desig	gned by	and the second se	the second s			
File SW Trenchard proposed 1							Chec)	ced by	Digit	nage			
Micro Drainage							-	ork 201					
													-
Sum	mary of	f C	ritica	1 Res	ults	by	Maxim	um Leve	el (Ra	nk 1) 1	for SV	EAST EXI	STING
				0.000	10.00	1.1		.13.SWS					
							1000		1.00				
									First Y				
	PN		Storm	Perio	d Cha	ange	Surc	harge	Fl	boo	Overfl	low Act. Exc	
	21.000	15	Winter	10	0	+30%							
	1.009	15	Winter	10	0	+30%							
	22.000	15	Winter	10	0	\$0£+	100/15	Summer	100/15	Winter			1
	22.001	15	Winter	10	0	+30%	100/15	Summer Summer					
	22.002	15	Winter	10	0	+30%	100/15	Summer					
	22.003	15	Winter	10	0	+308	100/15	Summer					
			Winter										
			Winter				100/115	Summer					
								Summer					
								Summer					
								Summer					
								Summer	100/15	Summer			6
								Summer					
			Winter										
					ater	12		Flooded			Pipe		
	-		US/MH		evel			Volume					
	PN		Name		(m)	Dept	cn (m)	(m - )	Cap.	(1/5)	(1/s)	Status	
	1.00	00						0.000			23.4		
	1.00		07	61 12	0.090			12,956					
	1.00		0)	64 11	9.762							FLOOD RISK	
	2.00			MH 12				55.963		0.0			
	3.00			57 12				65.075					
	4.00			60 12				5.773 27.010					
	2.00			62 12				0.019					
	2.00			MH 11								SURCHARGED	
	5.00			67 11								FLOOD RISK	
	1.00			66 11				0.000				FLOOD RISK	
	6.00	00	PP (DS	a) 12	0.245		0,245	0.000	1,50	0.0	23.5	SURCHARGED	
	6.00							0.000				SURCHARGED	
	7.00							0.000				FLOOD RISK	
	8.00		PP (DS				0.352	0.000	0.99			SURCHARGED	
	6.00		2 (D5				0.528	0.000	0.50			SURCHARGED	
			PP (DS				0.385	0.000				SURCHARGED	
	10.00		PP (D5	a) 12 a) 12			0.414	0.000	1.27			FLOOD RISK SURCHARGED	
			4 (D5				0.564	0.000	0.83			SURCHARGED	
	6.00						0.586	0.000				SURCHARGED	
	11.00		PP (DS				0.378	0.000	1.27			SURCHARGED	
	12.00		PP (DS				0.387	0.000	1.23			SURCHARGED	
	6.00						0.651	0.000	1,23			SURCHARGED	
	6.00		7 (D5				0.650	0.000				SURCHARGED	
	13.00			ia) 12			0.917	0.000				FLOOD RISK	
		0.0	PP (DS	a) 12	0.898		0.298	0.000	1.09	0.0	13.9	SURCHARGED	
	14.00												
	14.00 13.00 13.00	01		a) 12	1.208		1.113	0.000	0.92			SURCHARGED SURCHARGED	

Woods Hardwi	ck							Page 15		
15-17 Goldin	gton Road	2								
Bedford	10 m 61 11							4		
MK40 3NH								M		
			-			_		Micro		
Date 23/12/2	014 13:02		Desi	gned by	Drainago					
File SW Tren	chard pro	posed 1	Chec	ked by				brainage		
Micro Draina	ge		Netw	ork 201	4.1.1					
								1		
Summary of	Critical I	Results	by Maxim	num Leve	1 (Rar	nk 1) i	for SV	EAST EXISTING		
			15.0	7.13.SWS	5					
Makan Manadad Mana										
	1000	Water		Flooded	1.		Pipe			
	US/MH	Level						al const		
PN	Name	(m)	Depth (m)	(m <sup>3</sup> )	Cap.	(1/s)	(1/s)	Status		
15.000	PP (D5a)	120.742	0.572	0.000	1.42	0.0	21.7	SURCHARGED		
13.003	11 (D5a)	120.924	1.109	0.000	0.90	0.0	142.7	SURCHARGED		
13.004	12a (D5a)	120.830		0.000				SURCHARGED		
	12 (D5a)							SURCHARGED		
	13 (D5a)							SURCHARGED		
6.007	14 (D5a)	120.039	0.619	0.000	3.49	0.0	453.6	SURCHARGED		
6.008	Pond (D5a)	119.918	0.403	0.000	0.57	0.0	97.5	SURCHARGED		
6.009	15 (D5a)	119.926	0.5/6	0.000	0.64	0.0	96.6	SURCHARGED SURCHARGED		
6.010	17 (D5a)	119.474	0.342	0.000	0.90	0.0	95.4	SURCHARGED		
	18 (D5a)							SURCHARGED		
	PI (D5a)			0.000				SURCHARGED		
	19 (D5a)			0.000				SURCHARGED		
16.000		119.455						SURCHARGED		
16.001	0746	119.353			1.11			SURCHARGED		
16.002		119.049						SURCHARGED		
16.003		118.951						SURCHARGED		
17.000			-0.204				114.9			
17.001			-0.102							
17.002			-0.090				91.2			
1.007		118.777	-0.345	0.000		0.0	403.6			
	2 (TC)			0.000				SURCHARGED		
10 000	2 (777)	110 351	0 100	0.000				SURCHARGED		
18,003	4 (TC) 5 (TC)	119.316	0,261	0.000				SURCHARGED		
18.004	5 (TC)	119.300	0.385	0.138						
	FD (TC)			0.000				SURCHARGED		
							41.2	SURCHARGED		
18.006	7 (TC)	119.285	0.685	0.000	1.27	0.0	7.5	FLOOD RISK		
18.007	8 (TC)	118.996						FLOOD RISK		
18.008	9 (TC)	118.901	0.533	3.195				FLOOD		
	1285 (TC)				2.30			FLOOD RISK		
								OK		
20.000		118.566		18.363		0.0				
20.001 21.000		118.470 118.138		0.000			4.6	FLOOD RISK OK		
1.009				0.000			408.8			
22,000				0.017						
	11 (TC)		0.928					FLOOD RISK		
	12 (TC)			0.000				FLOOD RISK		
	13 (TC)				1.46			FLOOD RISK		
23.000	14 (TC)	118,919	-0.081	0.000	0.43	0.0	10.8	OK		
24.000	1191 (TC)	119.422	-0.074	0.000		0.0	18.5	FLOOD RISK		
	1266 (TC)									
	15 (TC)			0.000		0.0		SURCHARGED		
23.001			0.461					FLOOD RISK		
22.004			0.433					FLOOD RISK		
27.000	RE (TC) 18 (TC)			0.000			14.2	FLOOD RISK FLOOD		
	1.00									

15-17 Bedfo	rd	ĸ ton Road								Page 16	-
File	23/12/20 SW Trenc			Chec			1			Micro Draina	
Micro	Drainag	e		Netv	ork 201	4.1.1					
Summ	ary of C	ritical l	Results	by Maxim	num Leve 7.13.SW		nk 1) f	or SV	EAS	T EXIST	ING
		US/MH	Water		Flooded		0' flow	Pipe			
	PN	Name		Depth (m)						tus	
	22.006 1.010	19 (TC) Ditch	118.389 118.081	0.404 -0.835	0.000	2.13 0.14	0.0 0.0	67.8 460.6	FLOOD	RISK OK	
-			61	982-2014	XP Sol	utions					