PROPOSED DEVELOPMENT, ON LAND AT VICTORIA TERRACE, MELLOR BROOK, Nr PRESTON.

DRAINAGE STRATEGY REPORT HAMILTON TECHNICAL SERVICES 1 CHILTERN AVE, EUXTON, CHORLEY, PR7 6NU

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Document Control Sheet

Proposed Development, to provide 3 New Dwellings, on land at Victoria Terrace, Mellor Brook, Nr Preston.

Drainage Strategy Report

Job C0886	Date 29 th March 2019	lssue 1	Сору
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Contents

- 1.0 Introduction
- 2.0 Description of existing site
- 3.0 Proposals for Development
- 4.0 Construction Method Statement
- 5.0 Maintenance
- 6.0 Conclusions

Figures and Plans

Appendices

1. Introduction

- 1.1. Hamilton Technical Services have been commissioned through Partington & Associates Ltd., to act on behalf of the developer MFH Projects (Harrison), to prepare a Foul and Surface Water Drainage Strategy Report, in support of a development scheme, to provide three new dwellings and associated access and landscaping.
- 1.2. The site comprises an area of land adjacent to Victoria Terrace, Mellor Brook, Nr Preston. The location of the site is illustrated in **Figure 1** appended to this report.
- 1.3. The national grid reference for the site is 364153E, 431079N.
- 1.4. It is understood that permission is being sought to develop the site to provide three detached dwellings with access and landscaping areas. A proposed site layout plan is attached as Figure 2 of this report.

2. Description of the existing site.

- 2.1. The site is located on the west side of Victoria Terrace, south of its junction with Mellor Brow. The site is bounded to the north, east and on all sides by mainly residential properties with a mix of some commercial properties.
- 2.2. The site is presently occupied by grassed open space, with some existing trees and a small watercourse exiting its northern edge.
- 2.3. The site has been considered as a green field site. As such the existing green field run-off rates would be very low and much less than 5.0 l/s.
- 2.4. The site is covered by a thin layer of topsoil overlying clay strata to depth and is considered to be unsuitable for the use of soak-aways to disperse surface water run-off.

3. Proposals for Development

- 3.1. The redevelopment of the site will consist of the construction of three detached dwellings with driveways and garden areas and will be constructed with access taken from Mellor Brow. The scheme will include the de-culverting of approximately 60.0 meters of the existing culvert passing through the site and replacing this with a new open channel section of the watercourse.
- 3.2. The site is, as described in 2.4 above, unsuitable for soak-away employment. Further if soakaways were introduced on a steep site such as this, water could flow across the surface of the clay sub-strata and emerge as springs, leading to destabilisation of the sloping ground across the site.
- 3.3. An existing culverted watercourse that flows along the eastern side of the site will have its flow diverted into a new open section of watercourse passing from south to north through the new development as indicated on the drainage layout. The open watercourse will have sides constructed in stone with a sloping landscaped bank to either side, blending into the general site wide landscaping.
- 3.4. The existing culverted section through the site will be fully surveyed by CCTC cameras to ascertain the location of any existing pipework connections along the length of culvert that is to be abandoned. Any connections found will have their pipework extended to connect to the new open watercourse, to allow any existing surface water to continue flowing into the new open section, preserving existing rights of drainage.
- 3.5. Surface water run-off will be collected in new surface water drains that will discharge through a new outfall into the new open watercourse at the north end of the site. Foul run-off will be collected in a new system of foul drains and will flow northwards to discharge into the existing public sewer in Mellor Brow. A plan of the new drainage layout is attached as **Figure 3** along with a SW catchment plan attached as **Figure 4** of this report.
- 3.6. The new site surface water drainage will be restricted to a maximum discharge rate of 5.0 l/s prior to being discharged to the watercourse. Flows will be controlled by a Hydro-brake unit installed in the last surface water manhole and all required attenuation will be provided within a new attenuation tank sited within the surface drainage immediately prior to entering the Hydro-brake chamber.

3.7. A series of storm simulation calculations have been completed to demonstrate the operation of the proposed surface water drainage system. These calculations show that no exceedance flows will be created during storms of 1 in 2 Yr to 1 in 100 Yr return periods and with a climate change allowance of 35% included in calculations. A copy of a selection of the simulation calculations is attached as **Appendix 1** of this report.

4. Construction Method Statement

- 4.1. Excavation for the new open channel will be commenced at the downstream end of the new watercourse length.
- 4.2. The existing turf will be removed from the working area and stored for re-use at the final landscaping stage of the new works.
- 4.3. All remaining excavated material will be retained and stored on site temporarily to be used to infill behind the new sidewalls of the open section of watercourse and to contour and landscape the bank areas of the new works, prior to reintroduction of the stored turf and topsoil.
- 4.4. The sides of the new watercourse will be constructed using local stone built up as shown on the construction detail drawing attached to this report as **Figure 5**.
- 4.5. On completion of the open channel construction the upstream end of the existing culvert will be sealed off by continuing the sidewall construction across the end of the existing culvert, thus diverting flows along the new section of the watercourse.
- 4.6. Any existing connection into the abandoned length of culvert will then be extended into the new open channel.
- 4.7. On completion of any necessary connection extensions the downstream end of the abandoned length of culvert will be sealed by completing the construction of the channel sidewall across the existing outlet apron.
- 4.8. The existing retained materials will then be used to infill around the new sidewalls and to contour the bank areas to blend in with the remaining site levels.
- 4.9. Retained topsoil and turfs will be re-laid to complete the new landscaping of the bank areas. Any additional excavated materials will be used as part of the general site landscape works.

5. Maintenance of Site Including Sustainable Assets

5.1 The developed estate will remain privately owned and managed. On completion of the development works a suitably qualified management company will be employed and will carry out the future inspection, maintenance and repair of the road and car park surfaces and the foul and surface water drainage systems.

5.2 These works will be carried out as part of the annual maintenance programme and will be funded from annual maintenance fees charged by the management company.

5.3 The foul drainage and surface water drainage including the sustainable elements of the systems will be inspected at six monthly intervals and any accumulated silt and debris will be removed to an off-site tip. Any necessary maintenance or repairs will be carried out by the management company.

5.4 The open channel will be inspected annually in spring and any necessary maintenance or repair works will be completed as soon as they are identified.

6. Conclusions

Based on the above details and proposals it will be possible to design, construct and install the proposed works in a sustainable manner that will not increase any flood risk and that will prevent the occurrence of flooding on or out-with the development site.

Figures;

Figure 1 – Site Location Plan Figure 2 – Proposed Site Layout Plan Figure 3 – Proposed Drainage Layout Figure 4 – Proposed SW Catchments Plan Figure 5 – Proposed Construction Details

Appendix 1 – SW Simulation Calculations



revisions: A 02.10.12 - site boundary updated B: 15.02.16 - site boundary updated

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Victoria Terrace, Mellor Brook, Preston.

Appendix 1

SW Drainage System, Simulation Calculations.

Hamilton Technical Services		Page 1
1 Chiltern Ave	Leehand, Mellor Brook	
Euxton	SW Simulation Calcs	4
Chorley PR7 6NU	1 in 30 Yr Storms + CC	Mirro
Date 29.03.2019	Designed by Geoff Hamilton	
File NEW MELLOR SW.MDX	Checked by	Drainage
Micro Drainage	Network 2014.1	
Time	Area Diagram for Storm	
	Time Area Time Area mins) (ha) (mins) (ha)	
	0-4 0.089 4-8 0.004	
Total	Area Contributing (ha) = 0.093	
Tot	al Pipe Volume (m³) = 0.624	
Free Flow:	ing Outfall Details for Storm	
Outfall Outfa Pipe Number Nam	all C. Level I. Level Min D,L e (m) (m) I. Level (mm) ((m)	W mm)
1.003 wATERCO	DURSE 93.750 92.950 92.950 1200	0
Simul	ation Criteria for Storm	
Hot Start (m. Hot Start Level Manhole Headloss Coeff (Glo	ctor 1.000 Additional Flow - % of Total ins) 0 MADD Factor * 10m³/ha Sto (mm) 0 Run Time (n bal) 0.500 Output Interval (n	Flow 35.000 prage 2.000 mins) 1440 mins) 1
	drographs 0 Number of Storage Structures Controls 1 Number of Time/Area Diagrams Controls 0	
Synt	thetic Rainfall Details	
Rainfall Model Return Period (years) Region M5-60 (mm) Ratio R	FSR Profile Type 30 Cv (Summer) England and Wales Cv (Winter) 18.800 Storm Duration (mins) 0.306	0.750 0.840

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l Chiltern	Ave					Leeha	nd, M	lello	or Bi	cook					
Euxton						SW Si	mulat	ion	Cald	CS				L	
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Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0

Hamilton Technical Services		Page 3
1 Chiltern Ave	Leehand, Mellor Brook	
Euxton	SW Simulation Calcs	L.
Chorley PR7 6NU	1 in 30 Yr Storms + CC	Micco
Date 29.03.2019	Designed by Geoff Hamilton	
File NEW MELLOR SW.MDX	Checked by	Diamaye
Micro Drainage	Network 2014.1	

Storage Structures for Storm

Cellular Storage Manhole: 4, DS/PN: 1.003

Invert Level (m) 93.000 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000

Depth	(m)	Area	(m²)	Inf.	Area	(m²)	Depth	(m)	Area	(m²)	Inf.	Area	(m²)

0.000	25.0	0.0	1.000	25.0	0.0
0.500	25.0	0.0	1.001	0.0	0.0

Hamilton Technical Services		Page 4
1 Chiltern Ave	Leehand, Mellor Brook	
Euxton	SW Simulation Calcs	L.
Chorley PR7 6NU	1 in 30 Yr Storms + CC	Micco
Date 29.03.2019	Designed by Geoff Hamilton	Drainage
File NEW MELLOR SW.MDX	Checked by	Diamacje
Micro Drainage	Network 2014.1	

Summary of Results for 15 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 200.0 DVD Status OFF Analysis Timestep Fine Inertia Status OFF DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	95.057	-0.093	0.000	0.31	0.0	11.8	OK
1.001	2	94.306	-0.044	0.000	0.84	0.0	26.6	OK
1.002	3	93.667	0.417	0.000	1.86	0.0	36.8	SURCHARGED
1.003	4	93.525	0.375	0.000	0.35	0.0	4.9	SURCHARGED

Hamilton Technical Services			Page 1
1 Chiltern Ave	Leeha	and, Mellor Brook	5
Euxton	SW S:	imulation Calcs	L'
Chorley PR7 6NU	l in	30 Yr Storms + CC	Micco
Date 29.03.2019	Desig	gned by Geoff Hamilton	
File NEW MELLOR SW.MDX	Check	ced by	Drainage
Micro Drainage	Netwo	ork 2014.1	·
	Area Dia	gram for Storm	
	ime Area ins) (ha)		
	0-4 0.089		
Total Ar	rea Contri	buting (ha) = 0.093	
Tota	l Pipe Vol	ume $(m^3) = 0.624$	
Free Flowir	ng Outfa	ll Details for Storm	
Outfall Outfal Pipe Number Name		vel I. Level Min D,L W (m) I. Level (mm) (mm (m))
1.003 wATERCOU	RSE 93.	750 92.950 92.950 1200	0
Simula	tion Cri	teria for Storm	
Volumetric Runoff Coe Areal Reduction Fact Hot Start (min Hot Start Level (m Manhole Headloss Coeff (Globa	or 1.000 (s) 0 (m) 0	Additional Flow - % of Total Fl	Low 35.000 age 2.000 as) 1440
	Controls 1	Number of Storage Structures ? Number of Time/Area Diagrams (
Synth	netic Ra	infall Details	
Rainfall Model Return Period (years) Region Er M5-60 (mm) Ratio R).750).840

		al S	ervic	es									Pa	age 2	
l Chiltern	Ave					Leeha	nd, M	lello	or Bi	cook					
Euxton						SW Si	mulat	ion	Cald	CS				L	
Chorley P	R7 6NU	Г				1 in	30 Yr	Sto	orms	+ CC			N	licro	
Date 29.03	.2019				1	Desig	ned k	by Ge	eoff	Hami	lton				
File NEW M		Check	ed by	7						rain	ay				
Aicro Drai	nage					Netwo	rk 20)14.1	1						
			(Onli	ine (Contro	ols f	or S	torm	<u>l</u>					
Hydro	o-Brake	e Opt	:imum@	B Ma	anhol	.e: 4	, DS/	PN:	1.00	3, Vo	olume	e (m ³):	1.2	
							ence MI)-SHE	-0105	-5000-					
					-	Head low (1					1.	.000 5.0			
				Des	-	lush-F				Ca	alcula				
						Object	ive M	4inim	ise uj	pstrea	n stor	age			
				_		eter (· /					105			
	Mini	imum ()	utlet			Level	. ,				93.	.000 150			
			ed Man	-							1	130 L200			
Control	Points		Head	(m)	Flow	(1/s)		Cont	rol P	oints		Head	(m)	Flow	(1/s
Design Point	(Calcul	lated)	1	000		5.0				Kick-	Flo®	0	.636		4.
bebigii i oine		n-Flo™					Mean	Flow	over						4.
The hydrold Hydro-Brake Hydro-Brake invalidated	e Optimu e Optimu d	um® as um® be	s speci e utili	fied sed	d. Sh then	ould a these	another storag	r type ge rou	e of d uting	controi calcui	l devi latior	.ce ot ns wil	ther ll be	than e	a
Hydro-Brake Hydro-Brake invalidated Depth (m)	e Optimu e Optimu d Flow (um® as um® be (1/s)	s speci e utili Depth	fied sed (m)	d. Sh then Flow	ould a these (l/s)	nother storag	type ge rou (m)	e of d uting	calcui	l devi latior Deptl	.ce ot ns wi: n (m)	ther ll be Flo	than e w (1/s	a 5)
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100	e Optimu e Optimu d Flow (um® as um® be (1/s) 3.6	s speci e utili Depth 1.	fied sed (m) 200	d. Sh then Flow	ould a these (1/s) 5.4	Depth	(m)	e of d uting Flow	controi calcui (1/s) 8.3	l devi latior Deptl	.ce ot ns wi n (m) 7.000	ther ll be Flo	than • • (1/: 12	a 5) . 4
Hydro-Brake Hydro-Brake invalidated Depth (m)	e Optimu e Optimu d Flow ()	um® as um® be (1/s)	s speci e utili Depth 1. 1.	fied sed (m)	d. Sh then Flow	ould a these (l/s)	Depth 3	type ge rou (m)	e of d uting Flow	calcui	l devi latior Deptl	.ce ot ns wi: n (m)	ther ll be Flo	than e w (1/s	a 5) . 4 . 8
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200	e Optimu e Optimu d Flow ())	um® as um® be (1/s) 3.6 4.8	<pre>b speci b utili Depth 1. 1. 1.</pre>	fiec sed (m) 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8	Depth 3 3 4 4	(m) (000 .500 .500 .500	e of d uting Flow	(1/s) (1/s) 8.3 8.9 9.5 10.1	Deptl	.ce ot ns wi n (m) 7.000 7.500	ther ll be Flo	than • • (1/: 12 12	a 5) .4 .8 .2
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500	e Optimu e Optimu d Flow ()))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7	<pre>b speci b utili Depth 1. 1. 1. 1. 2.</pre>	fiec sed (m) 200 400 600 800 000	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9	Depth 3 4 4 5	(m) .000 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (l/s) 8.3 8.9 9.5 10.1 10.6</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600	e Optimu e Optimu d Flow ())))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3	<pre>s speci utili Depth 1. 1. 1. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2	Depth 3 4 4 5 5	(m) .000 .500 .500 .500 .500 .500 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500	ther ll be Flo	than w (1/: 12 12 13 13	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0

Hamilton Technical Services		Page 3
1 Chiltern Ave	Leehand, Mellor Brook	
Euxton	SW Simulation Calcs	L.
Chorley PR7 6NU	1 in 30 Yr Storms + CC	Micco
Date 29.03.2019	Designed by Geoff Hamilton	
File NEW MELLOR SW.MDX	Checked by	Diamaye
Micro Drainage	Network 2014.1	

Storage Structures for Storm

Cellular Storage Manhole: 4, DS/PN: 1.003

Invert Level (m) 93.000 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000

Depth	(m)	Area	(m²)	Inf.	Area	(m²)	Depth	(m)	Area	(m²)	Inf.	Area	(m²)

0.000	25.0	0.0	1.000	25.0	0.0
0.500	25.0	0.0	1.001	0.0	0.0

	Page 4
Leehand, Mellor Brook	
SW Simulation Calcs	L.
1 in 30 Yr Storms + CC	Micco
Designed by Geoff Hamilton	
Checked by	Diamacje
Network 2014.1	
	SW Simulation Calcs 1 in 30 Yr Storms + CC Designed by Geoff Hamilton Checked by

Summary of Results for 30 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 200.0 DVD Status OFF Analysis Timestep Fine Inertia Status OFF DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	95.050	-0.100	0.000	0.24	0.0	9.2	OK
1.001	2	94.289	-0.061	0.000	0.66	0.0	20.7	OK
1.002	3	93.660	0.410	0.000	1.46	0.0	29.0	SURCHARGED
1.003	4	93.653	0.503	0.000	0.35	0.0	4.9	SURCHARGED

Hamilton Technical Services			Page 1
1 Chiltern Ave	Leeh	and, Mellor Brook	
Euxton	SW S	imulation Calcs	L'
Chorley PR7 6NU	l in	30 Yr Storms + CC	Micro
Date 29.03.2019	Desi	gned by Geoff Hamilton	
File NEW MELLOR SW.MDX	Chec	ked by	Drainage
Micro Drainage	Netw	ork 2014.1	
Time	Area Dia	agram for Storm	
	ime Area ins) (ha)		
	0-4 0.089	9 4-8 0.004	
Total A	rea Contri	buting (ha) = 0.093	
Tota	l Pipe Vol	ume $(m^3) = 0.624$	
Free Flowin	ng Outfa	ll Details for Storm	
Outfall Outfal Pipe Number Name		vel I. Level Min D,L W (m) I. Level (mm) (mm) (m))
1.003 wATERCOU	JRSE 93.	750 92.950 92.950 1200	C
Simula	tion Cri	teria for Storm	
Volumetric Runoff Coe Areal Reduction Fact Hot Start (min Hot Start Level (r Manhole Headloss Coeff (Globa	tor 1.000 ns) 0 nm) 0	Additional Flow - % of Total Fl	ow 35.000 ge 2.000 s) 1440
	Controls 1	Number of Storage Structures 1 Number of Time/Area Diagrams (
Syntl	netic Ra	infall Details	
Rainfall Model Return Period (years) Region En M5-60 (mm) Ratio R).750).840

		al S	ervic	es									Pa	age 2	
l Chiltern	Ave					Leeha	nd, M	lello	or Bi	cook					
Euxton						SW Si	mulat	ion	Cald	CS				L	
Chorley P	R7 6NU	Г				1 in	30 Yr	Sto	orms	+ CC			N	licro	
Date 29.03	.2019				1	Designed by Geoff Hamilton									
File NEW M	ELLOR	SW.M	DX			Check	ed by	7						וווסו	ay
Aicro Drai	nage					Netwo	rk 20)14.1	1						
			(Onli	ine (Contro	ols f	or S	torm	<u>l</u>					
Hydro	o-Brake	e Opt	:imum@	B Ma	anhol	.e: 4	, DS/	PN:	1.00	3, Vo	olume	e (m ³):	1.2	
							ence MI)-SHE	-0105	-5000-					
					-	Head low (1					1.	.000 5.0			
				Des	-	lush-F				Ca	alcula				
						Object	ive M	4inim	ise uj	pstrea	n stor	age			
				_		eter (· /					105			
	Mini	imum ()	utlet			Level	. ,				93.	.000 150			
			ed Man	-							1	130 L200			
Control	Points		Head	(m)	Flow	(1/s)		Cont	rol P	oints		Head	(m)	Flow	(1/s
Design Point	(Calcul	lated)	1	000		5.0				Kick-	Flo®	0	.636		4.
bebigii i oine		n-Flo™					Mean	Flow	over						4.
The hydrold Hydro-Brake Hydro-Brake invalidated	e Optimu e Optimu d	um® as um® be	s speci e utili	fied sed	d. Sh then	ould a these	another storag	r type ge rou	e of d uting	controi calcui	l devi latior	.ce ot ns wil	ther ll be	than e	a
Hydro-Brake Hydro-Brake invalidated Depth (m)	e Optimu e Optimu d Flow (um® as um® be (1/s)	s speci e utili Depth	fied sed (m)	d. Sh then Flow	ould a these (l/s)	nother storag	type ge rou (m)	e of d uting	calcui	l devi latior Deptl	.ce ot ns wi: n (m)	ther ll be Flo	than e w (1/s	a 5)
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100	e Optimu e Optimu d Flow (um® as um® be (1/s) 3.6	s speci e utili Depth 1.	fied sed (m) 200	d. Sh then Flow	ould a these (1/s) 5.4	Depth	(m)	e of d uting Flow	controi calcui (1/s) 8.3	l devi latior Deptl	.ce ot ns wi n (m) 7.000	ther ll be Flo	than • • (1/: 12	a 5) . 4
Hydro-Brake Hydro-Brake invalidated Depth (m)	e Optimu e Optimu d Flow ()	um® as um® be (1/s)	s speci e utili Depth 1. 1.	fied sed (m)	d. Sh then Flow	ould a these (l/s)	Depth 3	type ge rou (m)	e of d uting Flow	calcui	l devi latior Deptl	.ce ot ns wi: n (m)	ther ll be Flo	than e w (1/s	a 5) . 4 . 8
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200	e Optimu e Optimu d Flow ())	um® as um® be (1/s) 3.6 4.8	<pre>b speci b utili Depth 1. 1. 1.</pre>	fiec sed (m) 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8	Depth 3 3 4 4	(m) (000 .500 .500 .500	e of d uting Flow	(1/s) 8.3 8.9 9.5 10.1	Deptl	.ce ot ns wi n (m) 7.000 7.500	ther ll be Flo	than • • (1/: 12 12	a 5) .4 .8 .2
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500	e Optimu e Optimu d Flow ()))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7	<pre>b speci b utili Depth 1. 1. 1. 1. 2.</pre>	fiec sed (m) 200 400 600 800 000	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9	Depth 3 4 4 5	(m) .000 .500 .500 .500 .000	e of d uting Flow	(1/s) (1/s) 8.3 8.9 9.5 10.1 10.6	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600	e Optimu e Optimu d Flow ())))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3	<pre>s speci utili Depth 1. 1. 1. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2	Depth 3 4 4 5 5	(m) .000 .500 .500 .500 .500 .500 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500	ther ll be Flo	than w (1/: 12 12 13 13	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimu e Optimu d Flow ()))))	(1/s) (1/s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .500 .500 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns will n (m) 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0

Hamilton Technical Services		Page 3
1 Chiltern Ave	Leehand, Mellor Brook	
Euxton	SW Simulation Calcs	L.
Chorley PR7 6NU	1 in 30 Yr Storms + CC	Micco
Date 29.03.2019	Designed by Geoff Hamilton	
File NEW MELLOR SW.MDX	Checked by	Diamaye
Micro Drainage	Network 2014.1	

Storage Structures for Storm

Cellular Storage Manhole: 4, DS/PN: 1.003

Invert Level (m) 93.000 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000

Depth	(m)	Area	(m²)	Inf.	Area	(m²)	Depth	(m)	Area	(m²)	Inf.	Area	(m²)

0.000	25.0	0.0	1.000	25.0	0.0
0.500	25.0	0.0	1.001	0.0	0.0

	Page 4
Leehand, Mellor Brook	
SW Simulation Calcs	L.
1 in 30 Yr Storms + CC	Micco
Designed by Geoff Hamilton	
Checked by	Diamacje
Network 2014.1	
	SW Simulation Calcs 1 in 30 Yr Storms + CC Designed by Geoff Hamilton Checked by

Summary of Results for 60 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 200.0 DVD Status OFF Analysis Timestep Fine Inertia Status OFF DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	95.041	-0.109	0.000	0.17	0.0	6.3	OK
1.001	2	94.270	-0.080	0.000	0.45	0.0	14.2	OK
1.002	3	93.713	0.463	0.000	1.01	0.0	20.0	SURCHARGED
1.003	4	93.705	0.555	0.000	0.35	0.0	4.9	SURCHARGED

		Page 1
1 Chiltern Ave	Leehand, Mellor Brook	5
Euxton	SW Simulation Calcs	14
Chorley PR7 6NU	1 in 100 Yr Storms + CC	Mirro
Date 29.03.2019	Designed by Geoff Hamilton	Drainage
File NEW MELLOR SW.MDX	Checked by	Diamage
Micro Drainage	Network 2014.1	
Time Are	ea Diagram for Storm	
Time (mins	Area Time Area) (ha) (mins) (ha)	
0-	4 0.089 4-8 0.004	
Total Area	Contributing (ha) = 0.093	
Total P	ipe Volume $(m^3) = 0.624$	
Free Flowing	Outfall Details for Storm	
Outfall Outfall Pipe Number Name	C. Level I. Level Min D,L W (m) (m) I. Level (mm) (mm) (m)	
1.003 wATERCOURSE	E 93.750 92.950 92.950 1200 0	
Simulatio	on Criteria for Storm	
Volumetric Runoff Coeff Areal Reduction Factor Hot Start (mins) Hot Start Level (mm) Manhole Headloss Coeff (Global)	1.000 Additional Flow - % of Total Flow 0 MADD Factor * 10m ³ /ha Storage 0 Run Time (mins)	a 35.000 e 2.000 1440
	raphs 0 Number of Storage Structures 1 trols 1 Number of Time/Area Diagrams 0 trols 0	
Synthet	cic Rainfall Details	
Rainfall Model Return Period (years) Region Engla M5-60 (mm) Ratio R	FSR Profile Type Wint 100 Cv (Summer) 0.7 and and Wales Cv (Winter) 0.8 18.800 Storm Duration (mins) 0.306	750

Hamilton Te	echnica	⊥ Se	ervic	es									Pa	age 2	
l Chiltern	Ave					Leeha	ind, M	Iello	or Bi	rook					
Euxton						SW Si	mulat	ion	Cald	CS			2		
Chorley PI	R7 6NU					1 in 100 Yr Storms + CC							Ν	lice	m
Date 29.03	.2019				1	Desig	ned k	y Ge	eoff	Hami	lton				
File NEW MI	ELLOR S'	W.MI	DX			Check	ed by	,						Irain	age
Micro Drain							ork 20		1						
) n l -	ine (ontr	ols f	or s	torm						
			<u>_</u>	/11 -		JUILL	015 1	OI S	COLI	-					
Hydro	-Brake	Opt	imum@	ð Ma	anhol	.e: 4	, DS/	PN:	1.00	3, Vo	lume	e (m ³	•):	1.2	
					Unit	Refere	ence MI)-SHE	-0105	-5000-3	1000-5	5000			
						Head					1	.000			
				Des	-	low (1				0	. 1 1 .	5.0			
						lush-F Object	cive M	linim	ise III		alcula m stor				
						eter (1111111	ise uj	95 CI Cu		105			
				Ir		Level	· /				93.	.000			
	Minim	um O	utlet i	Pipe	e Diam	eter ((mm)					150			
	Sug	gest	ed Man	hole	e Diam	eter ((mm)				-	L200			
Control	Points		Head	(m)	Flow	(l/s)		Cont	rol P	oints		Head	(m)	Flow	(1/s
Design Point	(Calcula	ted)	1.	000		5.0				Kick-	Flo®	0	.636		4.
	Flush-	Flo™	0.	295		4.9	Mean	Flow	over	Head F	lange		-		4.
Hydro-Brake Hydro-Brake invalidated	e Optimum e Optimum d	® as ® be	speci utili	fied sed	l. Sh then	ould a these	storag	r type ge roi	e of (uting	controi calcui	l devi latior	.ce of ns wil	cher ll be	than e	a
Hydro-Brake Hydro-Brake	e Optimum e Optimum d	® as ® be	speci utili	fied sed	l. Sh then	ould a these	another storag	r type ge roi	e of (uting	controi calcui	l devi latior	.ce of ns wil	cher ll be	than e	a
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100	e Optimum e Optimum d Flow (1,	® as ® be /s) 3.6	speci utili Depth 1.	fied sed (m) 200	d. Sh then Flow	ould a these (1/s) 5.4	Depth	.000	e of d uting Flow	controi calcui (1/s) 8.3	l devi latior Deptl	.ce of ns wi n (m) 7.000	ther ll be Flo	than • • (1/: 12	a 5) . 4
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200	e Optimum e Optimum d Flow (1	® as ® be /s) 3.6 4.8	speci utili Depth 1. 1.	fiec sed (m) 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8	Depth 3 3	(m) .000 .500	e of d uting Flow	controi calcui (1/s) 8.3 8.9	l devi latior Deptl	n (m)	ther ll be Flo	than • • (1/: 12 12	a 5) .4 .8
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300	e Optimum e Optimum d Flow (1	® as ® be /s) 3.6 4.8 4.9	speci utili Depth 1. 1.	fiec sed (m) 200 400 600	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2	Depth 3 3 4	(m) (m) .000 .500 .000	e of d uting Flow	(1/s) 8.3 8.9 9.5	l devi latior Deptl	.ce of ns wil n (m) 7.000 7.500 3.000	ther ll be Flo	than w (1/ 12 12 13	a 5) .4 .8 .2
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400	e Optimum e Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9</pre>	speci utili Depth 1. 1. 1.	fiec sed (m) 200 400 600 800	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5	Depth 3 3 4	(m) .000 .500 .500	e of d uting Flow	(1/s) 8.3 8.9 9.5 10.1	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500	ther ll be Flo	than w (1/: 12 12 13 13	a 5) .4 .8 .2 .6
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500	e Optimum e Optimum d Flow (1,	<pre>® as</pre>	speci utili Depth 1. 1. 1. 2.	fiec sed (m) 200 400 600 800 000	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9	Depth 3 4 4 5	(m) .000 .500 .500 .500 .000	e of d uting Flow	(1/s) (1/s) 8.3 8.9 9.5 10.1 10.6	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400	e Optimum 9 Optimum 1 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3</pre>	speci utili Depth 1. 1. 1. 2. 2.	fiec sed (m) 200 400 600 800 000 200	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2	Depth 3 4 4 5 5	(m) .000 .500 .500 .500 .500 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500	ther ll be Flo	than w (1/: 12 12 13 13	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600	e Optimum 9 Optimum 9 Flow (1	<pre>® as</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .000	e of d uting Flow	(1/s) (1/s) 8.3 8.9 9.5 10.1 10.6	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>speci utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>speci utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>speci utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>speci utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0

Hamilton Technical Services						
1 Chiltern Ave	Leehand, Mellor Brook					
Euxton	SW Simulation Calcs	L.				
Chorley PR7 6NU	1 in 100 Yr Storms + CC	Micco				
Date 29.03.2019	Designed by Geoff Hamilton					
File NEW MELLOR SW.MDX	Checked by	Diamaye				
Micro Drainage	Network 2014.1					

Storage Structures for Storm

Cellular Storage Manhole: 4, DS/PN: 1.003

Invert Level (m) 93.000 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area	(m²)	Depth	(m)	Area	(m²)	Inf. Area	(m²)
0.000 0.500				1. 1.			25.0 0.0		0.0

Hamilton Technical Services		Page 4
1 Chiltern Ave	Leehand, Mellor Brook	
Euxton	SW Simulation Calcs	L.
Chorley PR7 6NU	1 in 100 Yr Storms + CC	Micco
Date 29.03.2019	Designed by Geoff Hamilton	
File NEW MELLOR SW.MDX	Checked by	Diamaye
Micro Drainage	Network 2014.1	

Summary of Results for 15 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 200.0 DVD Status OFF Analysis Timestep Fine Inertia Status OFF DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	95.066	-0.084	0.000	0.40	0.0	15.3	OK
1.001	2	94.433	0.083	0.000	1.03	0.0	32.5	SURCHARGED
1.002	3	93.957	0.707	0.000	2.26	0.0	44.8	SURCHARGED
1.003	4	93.711	0.561	0.000	0.35	0.0	4.9	SURCHARGED

Hamilton Technical Services		Page 1
1 Chiltern Ave	Leehand, Mellor Brook	5
Euxton	SW Simulation Calcs	4
Chorley PR7 6NU	1 in 100 Yr Storms + CC	Micro
Date 29.03.2019	Designed by Geoff Hamilton	
File NEW MELLOR SW.MDX	Checked by	Drainage
Micro Drainage	Network 2014.1	·
Time Ar	rea Diagram for Storm	
Tim (min	e Area Time Area s) (ha) (mins) (ha)	
0.	-4 0.089 4-8 0.004	
Total Area	a Contributing (ha) = 0.093	
Total 1	Pipe Volume (m³) = 0.624	
Free Flowing	Outfall Details for Storm	
Outfall Outfall Pipe Number Name	C. Level I. Level Min D,L W (m) (m) I. Level (mm) (mm) (m)	
1.003 wATERCOURS	E 93.750 92.950 92.950 1200 0	
Simulati	on Criteria for Storm	
Volumetric Runoff Coeff Areal Reduction Factor Hot Start (mins) Hot Start Level (mm) Manhole Headloss Coeff (Global)	r 1.000 Additional Flow - % of Total Flo 0 MADD Factor * 10m³/ha Storag 0 Run Time (mins	w 35.000 e 2.000) 1440
	graphs 0 Number of Storage Structures 1 ntrols 1 Number of Time/Area Diagrams 0 ntrols 0	
Synthe	tic Rainfall Details	
Rainfall Model Return Period (years) Region Engl M5-60 (mm) Ratio R	FSR Profile Type Win 100 Cv (Summer) 0. land and Wales Cv (Winter) 0. 18.800 Storm Duration (mins) 0.306	750

Hamilton Te	echnica	⊥ Se	ervic	es									Pa	age 2	
l Chiltern	Ave					Leeha	ind, M	Iello	or Bi	rook					
Euxton						SW Si	mulat	ion	Cald	CS			2		
Chorley PI	R7 6NU					1 in 100 Yr Storms + CC							Ν	lice	m
Date 29.03	.2019				1	Desig	ned k	y Ge	eoff	Hami	lton				
File NEW MI	ELLOR S'	W.MI	DX			Check	ed by	,						Irain	age
Micro Drain							ork 20		1						
) n l -	ine (ontr	ols f	or s	torm						
			<u>_</u>	/11		JUILL	015 1	OI S	COLI	-					
Hydro	-Brake	Opt	imum@	ð Ma	anhol	.e: 4	, DS/	PN:	1.00	3, Vo	lume	e (m ³	•):	1.2	
					Unit	Refere	ence MI)-SHE	-0105	-5000-3	1000-5	5000			
						Head					1	.000			
				Des	-	low (1				0	. 1 1 .	5.0			
						lush-F Object	cive M	linim	ise III		alcula m stor				
						eter (1111111	ise uj	95 CI Cu		105			
				Ir		Level	. ,				93.	.000			
	Minim	um O	utlet i	Pipe	e Diam	eter ((mm)					150			
	Sug	gest	ed Man	hole	e Diam	eter ((mm)				-	L200			
Control	Points		Head	(m)	Flow	(l/s)		Cont	rol P	oints		Head	(m)	Flow	(1/s
Design Point	(Calcula	ted)	1.	000		5.0				Kick-	Flo®	0	.636		4.
	Flush-	Flo™	0.	295		4.9	Mean	Flow	over	Head F	lange		-		4.
Hydro-Brake Hydro-Brake invalidated	e Optimum e Optimum d	® as ® be	speci utili	fied sed	l. Sh then	ould a these	storag	r type ge roi	e of (uting	controi calcui	l devi latior	.ce of ns wil	cher ll be	than e	a
Hydro-Brake Hydro-Brake	e Optimum e Optimum d	® as ® be	speci utili	fied sed	l. Sh then	ould a these	another storag	r type ge roi	e of (uting	controi calcui	l devi latior	.ce of ns wil	cher ll be	than e	a
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100	e Optimum e Optimum d Flow (1,	® as ® be /s) 3.6	speci utili Depth 1.	fied sed (m) 200	d. Sh then Flow	ould a these (1/s) 5.4	Depth	.000	e of d uting Flow	controi calcui (1/s) 8.3	l devi latior Deptl	.ce of ns wi n (m) 7.000	ther ll be Flo	than • • (1/: 12	a 5) . 4
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200	e Optimum e Optimum d Flow (1	® as ® be /s) 3.6 4.8	speci utili Depth 1. 1.	fiec sed (m) 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8	Depth 3 3	(m) .000 .500	e of d uting Flow	controi calcui (1/s) 8.3 8.9	l devi latior Deptl	n (m)	ther ll be Flo	than • • (1/: 12 12	a 5) .4 .8
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300	e Optimum e Optimum d Flow (1	® as ® be /s) 3.6 4.8 4.9	speci utili Depth 1. 1.	fiec sed (m) 200 400 600	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2	Depth 3 3 4	(m) (m) .000 .500 .000	e of d uting Flow	(1/s) 8.3 8.9 9.5	l devi latior Deptl	.ce of ns wil n (m) 7.000 7.500 3.000	ther ll be Flo	than w (1/ 12 12 13	a 5) .4 .8 .2
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400	e Optimum e Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9</pre>	speci utili Depth 1. 1. 1.	fiec sed (m) 200 400 600 800	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5	Depth 3 3 4	(m) .000 .500 .500	e of d uting Flow	(1/s) 8.3 8.9 9.5 10.1	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500	ther ll be Flo	than w (1/: 12 12 13 13	a 5) .4 .8 .2 .6
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500	e Optimum e Optimum d Flow (1,	<pre>® as</pre>	speci utili Depth 1. 1. 1. 2.	fiec sed (m) 200 400 600 800 000	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9	Depth 3 4 4 5	(m) .000 .500 .500 .500 .000	e of d uting Flow	(1/s) (1/s) 8.3 8.9 9.5 10.1 10.6	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400	e Optimum 9 Optimum 1 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3</pre>	speci utili Depth 1. 1. 1. 2. 2.	fiec sed (m) 200 400 600 800 000 200	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2	Depth 3 4 4 5 5	(m) .000 .500 .500 .500 .500 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500	ther ll be Flo	than w (1/: 12 12 13 13	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600	e Optimum 9 Optimum 9 Flow (1	<pre>® as</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500 .000	e of d uting Flow	(1/s) (1/s) 8.3 8.9 9.5 10.1 10.6	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .2 .6 .0
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Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
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Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum 9 Optimum 9 Flow (1	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll be Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0

Hamilton Technical Services						
1 Chiltern Ave	Leehand, Mellor Brook					
Euxton	SW Simulation Calcs	L.				
Chorley PR7 6NU	1 in 100 Yr Storms + CC	Micco				
Date 29.03.2019	Designed by Geoff Hamilton					
File NEW MELLOR SW.MDX	Checked by	Diamaye				
Micro Drainage	Network 2014.1					

Storage Structures for Storm

Cellular Storage Manhole: 4, DS/PN: 1.003

Invert Level (m) 93.000 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area	(m²)	Depth	(m)	Area	(m²)	Inf. Area	(m²)
0.000 0.500				1. 1.			25.0 0.0		0.0

Hamilton Technical Services		Page 4
1 Chiltern Ave	Leehand, Mellor Brook	
Euxton	SW Simulation Calcs	L.
Chorley PR7 6NU	1 in 100 Yr Storms + CC	Micco
Date 29.03.2019	Designed by Geoff Hamilton	
File NEW MELLOR SW.MDX	Checked by	Diamacje
Micro Drainage	Network 2014.1	

Summary of Results for 30 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 200.0 DVD Status OFF Analysis Timestep Fine Inertia Status OFF DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	95.058	-0.092	0.000	0.32	0.0	12.0	OK
1.001	2	94.308	-0.042	0.000	0.86	0.0	27.0	OK
1.002	3	93.912	0.662	0.000	1.89	0.0	37.3	SURCHARGED
1.003	4	93.897	0.747	0.000	0.35	0.0	4.9	FLOOD RISK
1 Chiltern Ave Leehand, Mellor Brook Euxton SW Simulation Calcs Chorley PR7 6NU 1 in 100 Yr Storms + CC Date 29.03.2019 Designed by Geoff Hamilton File NEW MELLOR SW.MDX Checked by Micro Drainage Network 2014.1 Time Area Diagram for Storm Time Area (mins) (ha) 0-4 0.089 4-8 0.004 Total Area Contributing (ha) = 0.093 Total Pipe Volume (m³) = 0.624 Free Flowing Outfall Details for Storm Outfall Outfall C. Level I. Level Min D,L W Pipe Number Name (m) (m) I. Level (mm) (mm)	licro rainage							
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Chorley PR7 6NU 1 in 100 Yr Storms + CC Date 29.03.2019 Designed by Geoff Hamilton File NEW MELLOR SW.MDX Checked by Micro Drainage Network 2014.1 Time Area Diagram for Storm Micro Drainage Network 2014.1 Time Area (mins) (ha) 0-4 0.089 4-8 0.004 Total Area Contributing (ha) = 0.093 Total Pipe Volume (m³) = 0.624 Free Flowing Outfall Details for Storm Outfall Outfall C. Level I. Level Min D, L W	licro rainage							
Date 29.03.2019 Designed by Geoff Hamilton File NEW MELLOR SW.MDX Checked by Micro Drainage Network 2014.1 Time Area Diagram for Storm Time Area (mins) (ha) 0-4 0.089 4-8 0.004 Total Area Contributing (ha) = 0.093 Total Pipe Volume (m³) = 0.624 Free Flowing Outfall Details for Storm Outfall Outfall C. Level I. Level Min D, L W	licro rainage							
File NEW MELLOR SW.MDX Checked by Micro Drainage Network 2014.1 Time Area Diagram for Storm Time Area (mins) (ha) Time Area (mins) (ha) 0-4 0.089 4-8 0.004 Total Area Contributing (ha) = 0.093 Total Pipe Volume (m³) = 0.624 Free Flowing Outfall Details for Storm Outfall Outfall C. Level I. Level Min D, L W	rainage							
File NEW MELLOR SW.MDX Checked by Micro Drainage Network 2014.1 Time Area Diagram for Storm Time Area (mins) (ha) 0-4 0.089 4-8 0.004 Total Area Contributing (ha) = 0.093 Total Pipe Volume (m³) = 0.624 Free Flowing Outfall Details for Storm Outfall Outfall C. Level I. Level Min D, L W								
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<pre>(mins) (ha) (mins) (ha) 0-4 0.089 4-8 0.004 Total Area Contributing (ha) = 0.093 Total Pipe Volume (m³) = 0.624 <u>Free Flowing Outfall Details for Storm</u> Outfall Outfall C. Level I. Level Min D,L W</pre>								
Total Area Contributing (ha) = 0.093 Total Pipe Volume (m ³) = 0.624 <u>Free Flowing Outfall Details for Storm</u> Outfall Outfall C. Level I. Level Min D,L W								
Total Pipe Volume (m ³) = 0.624 <u>Free Flowing Outfall Details for Storm</u> Outfall Outfall C. Level I. Level Min D,L W								
Free Flowing Outfall Details for Storm Outfall Outfall C. Level I. Level Min D,L W								
Outfall Outfall C. Level I. Level Min D,L W								
(m)								
1.003 wATERCOURSE 93.750 92.950 92.950 1200 0								
Simulation Criteria for Storm								
Volumetric Runoff Coeff 0.840 Foul Sewage per hectare (1/s) 0.0 Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 35.0 Hot Start (mins) 0 MADD Factor * 10m ³ /ha Storage 2.0 Hot Start Level (mm) 0 Run Time (mins) 14 Manhole Headloss Coeff (Global) 0.500 Output Interval (mins)	.000							
Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 0								
Synthetic Rainfall Details								
Rainfall ModelFSRProfile Type WinterReturn Period (years)100Cv (Summer)0.750Region England and WalesCv (Winter)0.840M5-60 (mm)18.800 Storm Duration (mins)60Ratio R0.306								

Hamilton Te	echnica.	I Se	ervic	es									Pa	age 2	
l Chiltern	Ave]	Leeha	nd, M	lello	or Bi	rook					
Euxton						SW Si	mulat	ion	Cald	CS			ľ		
Chorley Pl	R7 6NU				-	l in	100 Y	'r St	corms	s + C	С		Ν	licco	m
Date 29.03	.2019				I	Desig	ned b	y Ge	eoff	Hami	lton				
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Aicro Drain	nage				1	Netwo	rk 20	14.1	1						
			<u>C</u>)nli	ine C	Contro	ols f	or S	torm	<u>l</u>					
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					Unit	Refere	ence MD	-SHE	-0105	-5000-:	1000-5	5000			
						Head						.000			
				Des	2	low (l						5.0			
						lush-F					alcula				
						-	ive M	linim	ise u	pstrea	n stoi	-			
				Tro		eter (Level	· ·				0.2	105 .000			
	Minim	11m ()	utlet 1				. ,				93.	150			
			ed Manl	-								130 L200			
Control	Points	-				(l/s)		Cont	rol P	oints		Head	(m)	Flow	(1/s
		1)											• •		• •
Design Point	(Calculat Flush-l					5.0	Mean 1	Flow	over	Kick-			.636		4.
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Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400	e Optimum e Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9</pre>	speci utili Depth 1. 1. 1.	fied sed (m) 200 400 600 800	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5	Depth 3 4 4	(m) .000 .500 .500	e of d uting Flow	(1/s) 8.3 8.9 9.5 10.1	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500	ther ll be Flo	than w (1/: 12 12 13 13	a 5) .4 .8 .2 .6
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300	e Optimum e Optimum d Flow (1,	® as ® be /s) 3.6 4.8 4.9	speci utili Depth 1. 1. 1. 2.	fied sed (m) 200 400 600 800 000	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9	Depth 3 3 4 4 5	(m) .000 .500	e of d uting Flow	(1/s) (1/s) 8.3 8.9 9.5 10.1 10.6	l devi latior Deptl	.ce of ns wil n (m) 7.000 7.500 3.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
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Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
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Hamilton Technical Services		Page 3
1 Chiltern Ave	Leehand, Mellor Brook	
Euxton	SW Simulation Calcs	L.
Chorley PR7 6NU	1 in 100 Yr Storms + CC	Micco
Date 29.03.2019	Designed by Geoff Hamilton	
File NEW MELLOR SW.MDX	Checked by	Diamaye
Micro Drainage	Network 2014.1	

Cellular Storage Manhole: 4, DS/PN: 1.003

Invert Level (m) 93.000 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area	(m²)	Depth	(m)	Area	(m²)	Inf. Area	(m²)
0.000 0.500				1. 1.			25.0 0.0		0.0

Hamilton Technical Services		Page 4
1 Chiltern Ave	Leehand, Mellor Brook	
Euxton	SW Simulation Calcs	L.
Chorley PR7 6NU	1 in 100 Yr Storms + CC	Micco
Date 29.03.2019	Designed by Geoff Hamilton	
File NEW MELLOR SW.MDX	Checked by	Diamacje
Micro Drainage	Network 2014.1	

Summary of Results for 60 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 200.0 DVD Status OFF Analysis Timestep Fine Inertia Status OFF DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)		Flow / Cap.	Overflow (1/s)	Pipe Flow (l/s)	Status
1.000	1	95.047	-0.103	0.000	0.22	0.0	8.3	OK
1.001	2	94.283	-0.067	0.000	0.59	0.0	18.6	OK
1.002	3	94.007	0.757	0.000	1.31	0.0	26.0	SURCHARGED
1.003	4	93.999	0.849	0.000	0.35	0.0	5.0	FLOOD RISK

1 Chiltern Ave Lechand, Mellor Brook Buxton SW Simulation Calcs Chorley PR7 6NU 1 in 100 Yr Storms + CC Date 29.03.2019 Designed by Geoff Hamilton File NEW MELLOR SW.MDX Checked by Micro Drainage Network 2014.1 Time Area (mine) (ha) 0 - 4 0.089 4-8 0.004 Time Area (mine) (ha) 0 - 4 0.089 4-8 0.004 Total Fipe Volume (n³) = 0.093 Total Fipe Volume (n³) = 0.093 Total Fipe Volume (n³) = 0.093 Designed by Geoff Hamilton (mine) (ha) Outfall Outfall Details for Storm Outfall Outfall C. Level I. Level Min p.L W Mice Control (mine) (mine) (mine) Outfall Outfall C. Level J. Level (mine) (mine) Outfall Outfall Potails for Storm Outfall Outfall C. Level Min p.L W Note Storm (mine) (mine) (mine) Outfall Outfall C. Level Mine p.L W Outfall Outfall C. Level Mine p.L W Outfall Outfall Potails Outfall Outfall Outfall Potais Number Out	Hamilton Technical Services		Page 1
Chorley PR7 6NU 1 in 100 Yr Storms + CC Date 29.03.2019 Designed by Geoff Hamilton Checked by File NEW MELLOR SW.MDX Network 2014.1 Time Area Diagram for Storm Time Area Diagram for Storm Time Area Diagram for Storm Time Area (mins) (ha) 0-4 0.089 4-8 0.004 Total Pipe Volume (m³) = 0.624 Free Flowing Outfall Details for Storm Outfall Outfall C. Level I. Level Min D,L W Pipe Number Name (m) (m) (m) (m) 1.000 Additional Flow - % of Total Flow 35.000 Areal Reduction Pactor 1.000 Additional Flow - % of Total Flow 35.000 Hot Start (mins) 0 MADD Pactor * 10m'/ha Storage 2.000 Hot Start Level (m) 0 Mabor of Input Hydrographs 0 Number of Storage Structures 1 Number of Input Hydrographs 0 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Synthetic Rainfall Details Not Synthetic Rainfall Details Number of Input Hydrogra	1 Chiltern Ave	Leehand, Mellor Brook	
Date 29.03.2019 File NEW MELLOR SW.MDX Micro Drainage Network 2014.1 Time Area Diagram for Storm Time Area Diagram for Storm Time Area Time Area (mins) (ha) 0-4 0.089 4-8 0.004 Total Area Contributing (ha) = 0.093 Total Pipe Volume (m ³) = 0.624 Free Flowing Outfall Details for Storm Outfall Outfall C. Level I. Level Min D,L W Pipe Number Name (m) (m) I. Level (mm) (mm) (m) 1.003 wATERCOURSE 93.750 92.950 92.950 1200 0 Simulation Criteria for Storm Volumetric Runoff Coeff 0.840 Foul Sewage per hectare (1/s) 0.000 Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 35.000 Hot Start (mins) 0 MADD Factor * 10m'/ha Storage 2.000 Hot Start (mins) 0 MADD Factor * 10m'/ha Storage 2.000 Hot Start (mins) 1440 Manhole Headloss Coeff (Global) 0.500 Output Interval (mins) 1 Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Synthetic Rainfall Details Rainfall Model FSR Profile Type Winter Return Period (years) 100 Cv (Winter) 0.750 Region England and Wales Cv (Winter) 0.840 M5-60 (mn) 18.800 Storm Duration (mins) 120	Euxton	SW Simulation Calcs	L'
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Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum o Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum o Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum o Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 200 400 600	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5 7.8	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500	e of duting	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0

Hamilton Technical Services		Page 3
1 Chiltern Ave	Leehand, Mellor Brook	
Euxton	SW Simulation Calcs	L.
Chorley PR7 6NU	1 in 100 Yr Storms + CC	Micco
Date 29.03.2019	Designed by Geoff Hamilton	
File NEW MELLOR SW.MDX	Checked by	Diamaye
Micro Drainage	Network 2014.1	

Cellular Storage Manhole: 4, DS/PN: 1.003

Invert Level (m) 93.000 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area	(m²)	Depth	(m)	Area	(m²)	Inf. Area	(m²)
0.000 0.500				1. 1.			25.0 0.0		0.0

Hamilton Technical Services		Page 4
1 Chiltern Ave	Leehand, Mellor Brook	
Euxton	SW Simulation Calcs	L.
Chorley PR7 6NU	1 in 100 Yr Storms + CC	Micco
Date 29.03.2019	Designed by Geoff Hamilton	Drainage
File NEW MELLOR SW.MDX	Checked by	Diamaye
Micro Drainage	Network 2014.1	

Summary of Results for 120 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 200.0 DVD Status OFF Analysis Timestep Fine Inertia Status OFF DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	95.037	-0.113	0.000	0.14	0.0	5.3	OK
1.001	2	94.264	-0.086	0.000	0.38	0.0	12.0	OK
1.002	3	94.003	0.753	0.000	0.86	0.0	16.9	SURCHARGED
1.003	4	93.995	0.845	0.000	0.35	0.0	5.0	FLOOD RISK

	T	Page 1
1 Chiltern Ave	Leehand, Mellor Brook	5
Euxton	SW Simulation Calcs	1 m
Chorley PR7 6NU	1 in 100 Yr Storms + CC	Mirco
Date 29.03.2019	Designed by Geoff Hamilton	Drainage
File NEW MELLOR SW.MDX	Checked by	Diamage
Micro Drainage	Network 2014.1	
Time Are	ea Diagram for Storm	
Time (mins	Area Time Area) (ha) (mins) (ha)	
0-	4 0.089 4-8 0.004	
Total Area	Contributing (ha) = 0.093	
Total P	ipe Volume $(m^3) = 0.624$	
Free Flowing	Outfall Details for Storm	
Outfall Outfall Pipe Number Name	C. Level I. Level Min D,L W (m) (m) I. Level (mm) (mm) (m)	
1.003 wATERCOURSE	E 93.750 92.950 92.950 1200 0	
Simulatio	on Criteria for Storm	
Volumetric Runoff Coeff Areal Reduction Factor Hot Start (mins) Hot Start Level (mm) Manhole Headloss Coeff (Global)	1.000 Additional Flow - % of Total Flow 0 MADD Factor * 10m ³ /ha Storage 0 Run Time (mins)	7 35.000 2.000 1440
	raphs 0 Number of Storage Structures 1 trols 1 Number of Time/Area Diagrams 0 trols 0	
Synthet	cic Rainfall Details	
Rainfall Model Return Period (years) Region Engla M5-60 (mm) Ratio R	FSR Profile Type Wint 100 Cv (Summer) 0.7 and and Wales Cv (Winter) 0.8 18.800 Storm Duration (mins) 2 0.306	750

Hamilton Te	echnica.	I Se	ervic	es									Pa	age 2	
l Chiltern	Ave]	Leeha	nd, M	lello	or Bi	rook					
Euxton						SW Si	mulat	ion	Cald	CS			ľ		
Chorley Pl	R7 6NU				-	l in	100 Y	'r St	corms	s + C	С		Ν	licco	m
Date 29.03	.2019				I	Desig	ned b	y Ge	eoff	Hami	lton				
Tile NEW M	ELLOR S	W.MI	DX		(Check	ed by	,						Irain	dIJĿ
Aicro Drain	nage				1	Netwo	rk 20	14.1	1						
			<u>C</u>)nli	ine C	Contro	ols f	or S	torm	<u>l</u>					
Hydro	-Brake	Opt	imum@	D Ma	anhol	.e: 4	, DS/1	PN:	1.00	3, Vo	olume	e (m ³	3):	1.2	
					Unit	Refere	ence MD	-SHE	-0105	-5000-:	1000-5	5000			
						Head						.000			
				Des	2	low (l						5.0			
						lush-F					alcula				
						-	ive M	linim	ise u	pstrea	n stoi	-			
				Tro		eter (Level	· ·				0.2	105 .000			
	Minim	11m ()	utlet 1				. ,				93.	150			
			ed Manl	-								130 L200			
Control	Points	-				(l/s)		Cont	rol P	oints		Head	(m)	Flow	(1/s
		1)											• •		• •
Design Point	(Calculat Flush-l					5.0	Mean 1	Flow	over	Kick-			.636		4.
The hydrold Hydro-Brake Hydro-Brake invalidated	e Optimum e Optimum d	® as ® be	speci: utili	fied sed	l. Sh then	ould a these	nother storag	type e roi	e of (uting	controi calcui	l devi latior	.ce of ns wil	ther ll be	than e	a
Hydro-Brake Hydro-Brake invalidated Depth (m)	e Optimum e Optimum d Flow (1,	® as ® be /s)	speci: utili: Depth	fied sed (m)	d. Sh then Flow	ould a these (l/s)	nother storag Depth	type rot (m)	e of (uting	calcui	l devi latior Deptl	nce of ns will n (m)	ther ll be Flo	than e w (1/s	a 5)
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100	e Optimum e Optimum d Flow (1,	® as ® be /s) 3.6	speci utili Depth 1.	fied sed (m) 200	d. Sh then Flow	ould a these (1/s) 5.4	Depth	(m)	e of d uting Flow	controi calcui (1/s) 8.3	l devi latior Deptl	.ce of ns wi n (m) 7.000	ther 11 be Flo	than • • (1/: 12	a 5) . 4
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200	e Optimum e Optimum d Flow (1,	® as ® be /s) 3.6 4.8	speci utili Depth 1. 1.	fied sed (m) 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8	Depth 3 3	(m) .000 .500	e of d uting Flow	controi calcui (1/s) 8.3 8.9	l devi latior Deptl	n (m)	ther ll be Flo	than • • (1/: 12 12	a 5) .4 .8
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300	e Optimum e Optimum d Flow (1,	® as ® be /s) 3.6 4.8 4.9	speci utili Depth 1. 1.	fied sed (m) 200 400 600	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2	Depth 3 3 4	(m) .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5</pre>	l devi latior Deptl	.ce of ns wil n (m) 7.000 7.500 3.000	ther ll be Flo	than w (1/ 12 12 13	a 5) .4 .8 .2
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400	e Optimum e Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9</pre>	speci utili Depth 1. 1. 1.	fied sed (m) 200 400 600 800	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5	Depth 3 4 4	(m) .000 .500 .500	e of d uting Flow	(1/s) 8.3 8.9 9.5 10.1	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500	ther ll be Flo	than w (1/: 12 12 13 13	a 5) .4 .8 .2 .6
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300	e Optimum e Optimum d Flow (1,	® as ® be /s) 3.6 4.8 4.9	speci utili Depth 1. 1. 1. 2.	fied sed (m) 200 400 600 800 000	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9	Depth 3 4 4 5	(m) .000 .500	e of d uting Flow	(1/s) (1/s) 8.3 8.9 9.5 10.1 10.6	l devi latior Deptl	.ce of ns wil n (m) 7.000 7.500 3.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500	e Optimum optimum d Flow (1,	<pre>® as</pre>	<pre>speci utili Depth 1. 1. 1. 2. 2.</pre>	fied sed (m) 200 400 600 800	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5	Depth 3 3 4 4 5 5	(m) .000 .500 .500 .500	e of d uting Flow	(1/s) 8.3 8.9 9.5 10.1	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum o Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum o Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum o Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
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Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum o Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum o Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum o Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum o Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum o Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum o Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum o Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum o Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
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Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum o Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum o Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum o Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 200 400 600	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5 7.8	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500	e of duting	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0

Hamilton Technical Services	Page 3	
1 Chiltern Ave	Leehand, Mellor Brook	
Euxton	SW Simulation Calcs	L.
Chorley PR7 6NU	1 in 100 Yr Storms + CC	Micco
Date 29.03.2019	Designed by Geoff Hamilton	
File NEW MELLOR SW.MDX	Checked by	Diamaye
Micro Drainage	Network 2014.1	

Cellular Storage Manhole: 4, DS/PN: 1.003

Invert Level (m) 93.000 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area	(m²)	Depth	(m)	Area	(m²)	Inf. Area	(m²)
0.000 0.500				1. 1.			25.0 0.0		0.0

Hamilton Technical Services		Page 4
1 Chiltern Ave	Leehand, Mellor Brook	
Euxton	SW Simulation Calcs	L.
Chorley PR7 6NU	1 in 100 Yr Storms + CC	Micco
Date 29.03.2019	Designed by Geoff Hamilton	
File NEW MELLOR SW.MDX	Checked by	Diamacje
Micro Drainage	Network 2014.1	

Summary of Results for 240 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 200.0 DVD Status OFF Analysis Timestep Fine Inertia Status OFF DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	95.029	-0.121	0.000	0.09	0.0	3.3	OK
1.001	2	94.249	-0.101	0.000	0.23	0.0	7.4	OK
1.002	3	93.818	0.568	0.000	0.53	0.0	10.5	SURCHARGED
1.003	4	93.810	0.660	0.000	0.35	0.0	4.9	FLOOD RISK

Hamilton Technical Services		Page 1
1 Chiltern Ave	Leehand, Mellor Brook	5
Euxton	SW Simulation Calcs	L'AL
Chorley PR7 6NU	1 in 100 Yr Storms + CC	Mirco
Date 29.03.2019	Designed by Geoff Hamilton	Drainade
File NEW MELLOR SW.MDX	Checked by	Diamacje
Micro Drainage	Network 2014.1	
Time Are	ea Diagram for Storm	
Time (mins	Area Time Area) (ha) (mins) (ha)	
0-	4 0.089 4-8 0.004	
Total Area	Contributing (ha) = 0.093	
Total P	ipe Volume (m³) = 0.624	
Free Flowing	Outfall Details for Storm	
Outfall Outfall Pipe Number Name	C. Level I. Level Min D,L W (m) (m) I. Level (mm) (mm) (m)	
1.003 wATERCOURSE	E 93.750 92.950 92.950 1200 0	
Simulati	on Criteria for Storm	
Volumetric Runoff Coeff Areal Reduction Factor Hot Start (mins) Hot Start Level (mm) Manhole Headloss Coeff (Global)	1.000 Additional Flow - % of Total Flo 0 MADD Factor * 10m ³ /ha Storag 0 Run Time (mins	w 35.000 e 2.000) 1440
	raphs 0 Number of Storage Structures 1 trols 1 Number of Time/Area Diagrams 0 trols 0	
Synthet	cic Rainfall Details	
Rainfall Model Return Period (years) Region Engl M5-60 (mm) Ratio R	and and Wales Cv (Winter) 0.	750

Hamilton Te	echnica.	I Se	ervic	es									Pa	age 2	
l Chiltern	Ave]	Leeha	nd, M	lello	or Bi	rook					
Euxton						SW Si	mulat	ion	Cald	CS			ľ		
Chorley Pl	R7 6NU				-	l in	100 Y	'r St	corms	s + C	С		Ν	licco	m
Date 29.03	.2019				I	Desig	ned b	y Ge	eoff	Hami	lton				
Tile NEW M	ELLOR S	W.MI	DX		(Check	ed by	,						Irain	dIJĿ
Aicro Drain	nage				1	Netwo	rk 20	14.1	1						
			<u>C</u>)nli	ine C	Contro	ols f	or S	torm	<u>l</u>					
Hydro	-Brake	Opt	imum@	D Ma	anhol	.e: 4	, DS/1	PN:	1.00	3, Vo	olume	e (m ³	3):	1.2	
					Unit	Refere	ence MD	-SHE	-0105	-5000-:	1000-5	5000			
						Head						.000			
				Des	2	low (l						5.0			
						lush-F					alcula				
						-	ive M	linim	ise u	pstrea	n stoi	-			
				Tro		eter (Level	· ·				0.2	105 .000			
	Minim	11m ()	utlet 1				. ,				93.	150			
			ed Manl	-								130 L200			
Control	Points	-				(l/s)		Cont	rol P	oints		Head	(m)	Flow	(1/s
		1)											• •		• •
Design Point	(Calculat Flush-l					5.0	Mean 1	Flow	over	Kick-			.636		4.
The hydrold Hydro-Brake Hydro-Brake invalidated	e Optimum e Optimum d	® as ® be	speci: utili	fied sed	l. Sh then	ould a these	nother storag	type e roi	e of (uting	controi calcui	l devi latior	.ce of ns wil	ther ll be	than e	a
Hydro-Brake Hydro-Brake invalidated Depth (m)	e Optimum e Optimum d Flow (1,	® as ® be /s)	speci: utili: Depth	fied sed (m)	d. Sh then Flow	ould a these (l/s)	nother storag Depth	type rot (m)	e of (uting	calcui	l devi latior Deptl	nce of ns will n (m)	ther ll be Flo	than e w (1/s	a 5)
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100	e Optimum e Optimum d Flow (1,	® as ® be /s) 3.6	speci utili Depth 1.	fied sed (m) 200	d. Sh then Flow	ould a these (1/s) 5.4	Depth	(m)	e of d uting Flow	controi calcui (1/s) 8.3	l devi latior Deptl	.ce of ns wi n (m) 7.000	ther 11 be Flo	than • • (1/: 12	a 5) . 4
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200	e Optimum e Optimum d Flow (1,	® as ® be /s) 3.6 4.8	speci utili Depth 1. 1.	fied sed (m) 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8	Depth 3 3	(m) .000 .500	e of d uting Flow	controi calcui (1/s) 8.3 8.9	l devi latior Deptl	n (m)	ther ll be Flo	than • • (1/: 12 12	a 5) .4 .8
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300	e Optimum e Optimum d Flow (1,	® as ® be /s) 3.6 4.8 4.9	speci utili Depth 1. 1.	fied sed (m) 200 400 600	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2	Depth	(m) .000 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5</pre>	l devi latior Deptl	.ce of ns wil n (m) 7.000 7.500 3.000	ther ll be Flo	than w (1/ 12 12 13	a 5) .4 .8 .2
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400	e Optimum e Optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9</pre>	speci utili Depth 1. 1. 1.	fied sed (m) 200 400 600 800	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5	Depth 3 4 4	(m) .000 .500 .500	e of d uting Flow	(1/s) 8.3 8.9 9.5 10.1	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500	ther ll be Flo	than w (1/: 12 12 13 13	a 5) .4 .8 .2 .6
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300	e Optimum optimum d Flow (1,	® as ® be /s) 3.6 4.8 4.9	speci utili Depth 1. 1. 1. 2.	fied sed (m) 200 400 600 800 000	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9	Depth 3 4 4 5	(m) .000 .500	e of d uting Flow	(1/s) (1/s) 8.3 8.9 9.5 10.1 10.6	l devi latior Deptl	.ce of ns wil n (m) 7.000 7.500 3.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500	e Optimum optimum d Flow (1,	<pre>® as</pre>	<pre>speci utili Depth 1. 1. 1. 2. 2.</pre>	fied sed (m) 200 400 600 800	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5	Depth 3 3 4 4 5 5	(m) .000 .500 .500 .500	e of d uting Flow	(1/s) 8.3 8.9 9.5 10.1	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .000 .500 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) . 4 . 8 . 2 . 6 . 0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
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Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum optimum d Flow (1,	<pre>® as ® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	speci utili Depth 1. 1. 1. 2. 2. 2.	fied sed (m) 200 400 600 200 400 600	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5 7.8	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500	e of duting	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0

Hamilton Technical Services	Page 3	
1 Chiltern Ave	Leehand, Mellor Brook	
Euxton	SW Simulation Calcs	L.
Chorley PR7 6NU	1 in 100 Yr Storms + CC	Micco
Date 29.03.2019	Designed by Geoff Hamilton	
File NEW MELLOR SW.MDX	Checked by	Diamaye
Micro Drainage	Network 2014.1	

Cellular Storage Manhole: 4, DS/PN: 1.003

Invert Level (m) 93.000 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area	(m²)	Depth	(m)	Area	(m²)	Inf. Area	(m²)
0.000 0.500				1. 1.			25.0 0.0		0.0

Hamilton Technical Services		Page 4
1 Chiltern Ave	Leehand, Mellor Brook	
Euxton	SW Simulation Calcs	L.
Chorley PR7 6NU	1 in 100 Yr Storms + CC	Micco
Date 29.03.2019	Designed by Geoff Hamilton	Drainage
File NEW MELLOR SW.MDX	Checked by	Diamaye
Micro Drainage	Network 2014.1	

Summary of Results for 400 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 200.0 DVD Status OFF Analysis Timestep Fine Inertia Status OFF DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	95.024	-0.126	0.000	0.06	0.0	2.3	OK
1.001	2	94.240	-0.110	0.000	0.16	0.0	5.1	OK
1.002	3	93.487	0.237	0.000	0.37	0.0	7.4	SURCHARGED
1.003	4	93.479	0.329	0.000	0.35	0.0	4.9	SURCHARGED

Hamilton Technical Services		Page 1
1 Chiltern Ave	Leehand, Mellor Brook	5
Euxton	SW Simulation Calcs	L'
Chorley PR7 6NU	1 in 100 Yr Storms + CC	Micro
Date 29.03.2019	Designed by Geoff Hamilton	
File NEW MELLOR SW.MDX	Checked by	Drainage
Micro Drainage	Network 2014.1	·
Time Ar	rea Diagram for Storm	
Tim (min:	e Area Time Area s) (ha) (mins) (ha)	
0-	-4 0.089 4-8 0.004	
Total Area	a Contributing (ha) = 0.093	
Total H	Pipe Volume (m³) = 0.624	
Free Flowing	Outfall Details for Storm	
Outfall Outfall Pipe Number Name	C. Level I. Level Min D,L W (m) (m) I. Level (mm) (mm) (m)	
1.003 wATERCOURS	E 93.750 92.950 92.950 1200 0	
Simulati	on Criteria for Storm	
Volumetric Runoff Coeff Areal Reduction Factor Hot Start (mins) Hot Start Level (mm) Manhole Headloss Coeff (Global)	1.000 Additional Flow - % of Total Flo 0 MADD Factor * 10m³/ha Storad 0 Run Time (min:	ow 35.000 ge 2.000 s) 1440
	graphs 0 Number of Storage Structures 1 ntrols 1 Number of Time/Area Diagrams 0 ntrols 0	
Synthe	tic Rainfall Details	
Rainfall Model Return Period (years) Region Engl M5-60 (mm) Ratio R	land and Wales Cv (Winter) 0	.750

lamilton T	echnica	⊥ S	ervic	es									Pa	age 2	
Chiltern	Ave					Leeha	nd, M	lella	or Bi	rook					
Euxton					SW Simulation Calcs							ľ			
Chorley P	R7 6NU					l in	100 Y	'r St	torms	s + C	С		N	lice	m
ate 29.03	.2019				1	Desig	ned b	y Ge	eoff	Hami	lton]
'ile NEW M	ELLOR S	w.M	DX			Check	ed by	,						Irain	age
licro Drai							rk 20		1						
			()nl-	ine (ontr	ols f	or s	torm						
			<u> </u>	JII		JUILL	JIS I	01 5	COLI	<u>.</u>					
Hydro	-Brake	Opt	cimum	B Ma	anhol	.e: 4	, DS/1	PN:	1.00	3, Vo	lume	e (m ³	³):	1.2	
					Unit	Refere	ence MD	-SHE-	-0105	-5000-	1000-5	5000			
					-	Head					1	.000			
				Des	-	low (1				~		5.0			
						lush-F Object	ive M	linim	1 5 0 111		alcula m stor				
						eter (1111111	ise uj	pstrea		105			
				Ir		Level	· ·				93.	.000			
	Minim	ium O	utlet	Pipe	e Diam	eter (mm)					150			
	Sug	gest	ed Man	hole	e Diam	eter (mm)				-	L200			
Control	Points		Head	(m)	Flow	(l/s)		Cont	rol P	oints		Head	(m)	Flow	(1/s
Design Point						5.0					Flo®		.636		4.
	Flush-	Flo™	· 0.	295		4.9	Mean 1	Flow	over	Head F	lange		-		4.
The hydrold Hydro-Brake Hydro-Brake invalidated	e Optimum e Optimum	® as	s speci	fied	d. Sh	ould a	nother	type	e of d	contro	l devi	ce of	ther	than	
Hydro-Brake Hydro-Brake	e Optimum e Optimum d	® as ® be	s speci e utili	fied sed	d. Sh then	ould a these	nother storag	type e roi	e of (uting	controi calcui	l devi latior	.ce of ns wil	ther ll be	than e	a
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100	e Optimum e Optimum d Flow (1	® as ® be /s) 3.6	s speci e utili Depth 1.	fied sed (m) 200	d. Sh then Flow	ould a these (1/s) 5.4	Depth	(m) .000	e of d uting Flow	contro: calcu: (1/s) 8.3	l devi latior Deptl	.ce of ns wi n (m) 7.000	ther 11 be Flo	than • • (1/: 12	a 5) .4
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200	e Optimum e Optimum d Flow (1	® as ® be /s) 3.6 4.8	<pre>s speci e utili Depth 1. 1.</pre>	fiec sed (m) 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8	Depth 3 3	(m) .000 .500	e of d uting Flow	controi calcui (1/s) 8.3 8.9	l devi latior Deptl	n (m)	ther ll be Flo	than • • (1/: 12 12	a 5) .4 .8
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300	e Optimum e Optimum d Flow (1	(® as (® be /s) 3.6 4.8 4.9	<pre>s speci e utili Depth 1. 1.</pre>	fiec sed (m) 200 400 600	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2	Depth 3 3 4	(m) .000 .500	e of d uting Flow	control calcul (1/s) 8.3 8.9 9.5	l devi latior Deptl	.ce of ns wil n (m) 7.000 7.500 3.000	ther ll be Flo	than w (1/ 12 12 13	a 5) .4 .8 .2
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400	e Optimum e Optimum d Flow (1	(® as (® be /s) 3.6 4.8 4.9 4.9	<pre>s speci e utili Depth 1. 1. 1.</pre>	fied sed (m) 200 400 600 800	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5	Depth 3 4 4	(m) .000 .500 .500	e of d uting Flow	(1/s) 8.3 8.9 9.5 10.1	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500	ther ll be Flo	than w (1/: 12 12 13 13	a 5) .4 .8 .2 .6
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500	e Optimum e Optimum d Flow (1))	<pre>(® as (® be) /s) 3.6 4.8 4.9 4.9 4.9 4.7</pre>	<pre>b speci b utili Depth 1. 1. 1. 2.</pre>	fiec sed (m) 200 400 600 800 000	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9	Depth 3 3 4 4 5	(m) .000 .500 .500 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400	e Optimum e Optimum d Flow (1	(® as (® be /s) 3.6 4.8 4.9 4.9 4.7 4.3	<pre>s speci e utili Depth 1. 1. 1. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2	Depth 3 3 4 4 5 5	(m) .000 .500 .500 .000 .500 .500	e of d uting Flow	<pre>control calcul (l/s) 8.3 8.9 9.5 10.1 10.6 11.1</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500	ther ll bo Flo	than w (1/: 12 12 13 13	a 5) .4 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600	e Optimum e Optimum d Flow (1	<pre>(® as (® be) /s) 3.6 4.8 4.9 4.9 4.9 4.7</pre>	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9	Depth 3 3 4 4 5 5 6	(m) .000 .500 .500 .500	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum e Optimum d Flow (1	<pre>(® as (® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum e Optimum d Flow (1	<pre>(® as (® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum e Optimum d Flow (1	<pre>(® as (® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum e Optimum d Flow (1	<pre>(® as (® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum e Optimum d Flow (1	<pre>(® as (® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum e Optimum d Flow (1	<pre>(® as (® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum e Optimum d Flow (1	<pre>(® as (® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum e Optimum d Flow (1	<pre>(® as (® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum e Optimum d Flow (1	<pre>(® as (® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum e Optimum d Flow (1	<pre>(® as (® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum e Optimum d Flow (1	<pre>(® as (® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum e Optimum d Flow (1	<pre>(® as (® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum e Optimum d Flow (1	<pre>(® as (® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .8 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum e Optimum d Flow (1	<pre>(® as (® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum e Optimum d Flow (1	<pre>(® as (® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum e Optimum d Flow (1	<pre>(® as (® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .2 .6 .0
Hydro-Brake Hydro-Brake invalidated Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800	e Optimum e Optimum d Flow (1	<pre>(® as (® be /s) 3.6 4.8 4.9 4.9 4.7 4.3 4.5</pre>	<pre>s speci e utili Depth 1. 1. 1. 2. 2. 2.</pre>	fiec sed (m) 200 400 600 800 000 200 400	d. Sh then Flow	ould a these (1/s) 5.4 5.8 6.2 6.5 6.9 7.2 7.5	Depth 3 3 4 4 5 5 6	(m) .000 .500 .000 .500 .000 .500 .000	e of d uting Flow	<pre>control calcul (1/s) 8.3 8.9 9.5 10.1 10.6 11.1 11.5</pre>	l devi latior Deptl	.ce of ns wi 7.000 7.500 3.000 3.500 9.000	ther ll bo Flo	than w (1/: 12 12 13 13 14	a 5) .4 .2 .6 .0

Hamilton Technical Services		Page 3
1 Chiltern Ave	Leehand, Mellor Brook	
Euxton	SW Simulation Calcs	L.
Chorley PR7 6NU	1 in 100 Yr Storms + CC	Micco
Date 29.03.2019	Designed by Geoff Hamilton	
File NEW MELLOR SW.MDX	Checked by	Diamaye
Micro Drainage	Network 2014.1	

Cellular Storage Manhole: 4, DS/PN: 1.003

Invert Level (m) 93.000 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area	(m²)	Depth	(m)	Area	(m²)	Inf. Area	(m²)
0.000 0.500				1. 1.			25.0 0.0		0.0

Hamilton Technical Services		Page 4
1 Chiltern Ave	Leehand, Mellor Brook	
Euxton	SW Simulation Calcs	L.
Chorley PR7 6NU	1 in 100 Yr Storms + CC	Micco
Date 29.03.2019	Designed by Geoff Hamilton	Drainage
File NEW MELLOR SW.MDX	Checked by	Diamacje
Micro Drainage	Network 2014.1	

Summary of Results for 600 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 200.0 DVD Status OFF Analysis Timestep Fine Inertia Status OFF DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	95.020	-0.130	0.000	0.04	0.0	1.7	OK
1.001	2	94.234	-0.116	0.000	0.12	0.0	3.8	OK
1.002	3	93.231	-0.019	0.000	0.28	0.0	5.5	OK
1.003	4	93.223	0.073	0.000	0.35	0.0	4.9	SURCHARGED