NEW DWELLING

CHURCH LANE

WHELDRAKE

YORK

DRAINAGE REPORT

1. INTRODUCTION

This drainage report has been prepared to accompany a drainage design for a new dwelling on Church Lane, Wheldrake, York.

The report outlines the drainage scheme and shows that a viable foul and surface water drainage system can be provided to the proposed development that meets current standards.

The report should be read with drawing YH427/DD/1, Drainage Design.

2. PRE-DEVELOPMENT SITE

The pre-development site is a garden area of an existing house. The garden area has an existing garage and lean-to building to the existing dwelling.

There is an existing combined drain on site, which discharges into Church Lane and, presumably, to the public sewer. The existing combined drain takes surface water from the existing dwelling and the garage and lean-to building.

3. FOUL DRAINAGE

The foul drainage from the development will be drained to the existing combined manhole at the front of the development. The levels on site are such that a gravity connection is possible.

The foul system will be separate to the surface water system.

4. SURFACE WATER

The building regulations require that surface water is disposed of through a specific hierarchy of:- by infiltration, to watercourse or to sewer in that order.

There are no watercourses present. In addition, there is very limited space on site to allow the use of soakaways for infiltration. As such, it is not practical to install soakaways, even if the ground proved suitable. Therefore, it is recommended that the surface water system is also connected to the combined manhole at the front of the development.

5. SURFACE WATER DESIGN

The existing garage and lean-to building amount to 58 square metres. Using the usually accepted discharge rate of 140l/s/hectare, the existing discharge rate for the site is 0.8l/s. However, this is a very small discharge rate. For this site a more practical discharge rate of 2l/s will be used, which is also generally accepted by the local authority.

The surface water discharge from site to sewer will be limited to 2l/s. As such, some attenuation on site will be required. To determine the attenuation requirements, the microdrainage program has been used with the following parameters.

Impermeable Area 120 sq m
Storm 1 in 100 year plus 30 % climate change (all durations)
M5-60 = 19
Ratio r = 0.4

The microdrainage calculations show that an attenuation system of 2.1 cu m is sufficient. The calculations are appended to the end of this report.

To reduce flows to 2l/s, a Hydrobrake chamber will be used. The attenuation will be provided by a geo-cellular system under the driveway.

6. CONCLUSIONS

- The surface water and foul systems on and off site will have separate systems.
- Foul flows will be discharged to the combined manhole at the front of the site.
- The surface water from this development can be managed successfully providing a scheme that has no flooding in the 1 in 100 year plus climate change storm.
- The scheme discharges to the surface water sewer at a reduced rate of 2.0l/s.
- A hydrobrake will limit flows to 2.0l/s.

- The required 2.1 cu m of attenuation will be provided by a geo-cellular system.

Report by

Hugh Morris BSc CEng MICE

Dated 27/05/2015

APPENDIX

MICRODRAINAGE CALCULATIONS

1 IN 100 YEAR PLUS 30% CLIMATE CHANGE

HYDROBRAKE DETAILS

MICRODRAINAGE CALCULATIONS

Survey and Site Services		Page 1
10 The Green York YO26 5LR	CHURCH LANE WHELDRAKE	
Date 27-05-2016 File STORAGE CALC.SRCX	Designed by HM Checked by	
XP Solutions	Source Control 2015.1	

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

Half Drain Time : 11 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	12.059	0.309	0.0	2.0	2.0	1.8	O K
30 min Summer	12.072	0.322	0.0	2.0	2.0	1.8	O K
60 min Summer	12.032	0.282	0.0	2.0	2.0	1.6	O K
120 min Summer	11.909	0.159	0.0	2.0	2.0	0.9	O K
180 min Summer	11.824	0.074	0.0	2.0	2.0	0.4	O K
240 min Summer	11.789	0.039	0.0	1.9	1.9	0.2	O K
360 min Summer	11.768	0.018	0.0	1.4	1.4	0.1	O K
480 min Summer	11.758	0.008	0.0	1.2	1.2	0.0	O K
600 min Summer	11.752	0.002	0.0	1.0	1.0	0.0	O K
720 min Summer	11.750	0.000	0.0	0.9	0.9	0.0	O K
960 min Summer	11.750	0.000	0.0	0.7	0.7	0.0	O K
1440 min Summer	11.750	0.000	0.0	0.5	0.5	0.0	O K
2160 min Summer	11.750	0.000	0.0	0.4	0.4	0.0	O K
2880 min Summer	11.750	0.000	0.0	0.3	0.3	0.0	O K
4320 min Summer	11.750	0.000	0.0	0.2	0.2	0.0	O K
5760 min Summer	11.750	0.000	0.0	0.2	0.2	0.0	O K
7200 min Summer	11.750	0.000	0.0	0.1	0.1	0.0	O K
8640 min Summer	11.750	0.000	0.0	0.1	0.1	0.0	O K
10080 min Summer	11.750	0.000	0.0	0.1	0.1	0.0	O K
15 min Winter	12.111	0.361	0.0	2.0	2.0	2.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	121.269	0.0	3.2	14
30 min Summer	79.695	0.0	4.2	22
60 min Summer	49.937	0.0	5.3	40
120 min Summer	30.267	0.0	6.4	70
180 min Summer	22.297	0.0	7.0	98
240 min Summer	17.851	0.0	7.5	126
360 min Summer	12.957	0.0	8.2	184
480 min Summer	10.330	0.0	8.7	244
600 min Summer	8.659	0.0	9.1	304
720 min Summer	7.492	0.0	9.4	0
960 min Summer	5.959	0.0	10.0	0
1440 min Summer	4.309	0.0	10.9	0
2160 min Summer	3.110	0.0	11.8	0
2880 min Summer	2.466	0.0	12.4	0
4320 min Summer	1.775	0.0	13.4	0
5760 min Summer	1.405	0.0	14.2	0
7200 min Summer	1.171	0.0	14.7	0
8640 min Summer	1.008	0.0	15.2	0
10080 min Summer	0.889	0.0	15.7	0
15 min Winter	121.269	0.0	3.6	15

Survey and Site Services		Page 2
10 The Green York YO26 5LR	CHURCH LANE WHELDRAKE	Micro Drainage
Date 27-05-2016 File STORAGE CALC.SRCX	Designed by HM Checked by	
XP Solutions	Source Control 2015.1	

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	12.119	0.369	0.0	2.0	2.0	2.1	O K
60 min Winter	12.047	0.297	0.0	2.0	2.0	1.7	O K
120 min Winter	11.853	0.103	0.0	2.0	2.0	0.6	O K
180 min Winter	11.784	0.034	0.0	1.8	1.8	0.2	O K
240 min Winter	11.768	0.018	0.0	1.5	1.5	0.1	O K
360 min Winter	11.754	0.004	0.0	1.1	1.1	0.0	O K
480 min Winter	11.750	0.000	0.0	0.9	0.9	0.0	O K
600 min Winter	11.750	0.000	0.0	0.7	0.7	0.0	O K
720 min Winter	11.750	0.000	0.0	0.6	0.6	0.0	O K
960 min Winter	11.750	0.000	0.0	0.5	0.5	0.0	O K
1440 min Winter	11.750	0.000	0.0	0.4	0.4	0.0	O K
2160 min Winter	11.750	0.000	0.0	0.3	0.3	0.0	O K
2880 min Winter	11.750	0.000	0.0	0.2	0.2	0.0	O K
4320 min Winter	11.750	0.000	0.0	0.1	0.1	0.0	O K
5760 min Winter	11.750	0.000	0.0	0.1	0.1	0.0	O K
7200 min Winter	11.750	0.000	0.0	0.1	0.1	0.0	O K
8640 min Winter	11.750	0.000	0.0	0.1	0.1	0.0	O K
10080 min Winter	11.750	0.000	0.0	0.1	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	79.695	0.0	4.7	24
60 min Winter	49.937	0.0	5.9	42
120 min Winter	30.267	0.0	7.1	72
180 min Winter	22.297	0.0	7.9	96
240 min Winter	17.851	0.0	8.4	126
360 min Winter	12.957	0.0	9.1	186
480 min Winter	10.330	0.0	9.7	0
600 min Winter	8.659	0.0	10.2	0
720 min Winter	7.492	0.0	10.6	0
960 min Winter	5.959	0.0	11.2	0
1440 min Winter	4.309	0.0	12.2	0
2160 min Winter	3.110	0.0	13.2	0
2880 min Winter	2.466	0.0	13.9	0
4320 min Winter	1.775	0.0	15.0	0
5760 min Winter	1.405	0.0	15.9	0
7200 min Winter	1.171	0.0	16.5	0
8640 min Winter	1.008	0.0	17.1	0
10080 min Winter	0.889	0.0	17.6	0

Technical Specification

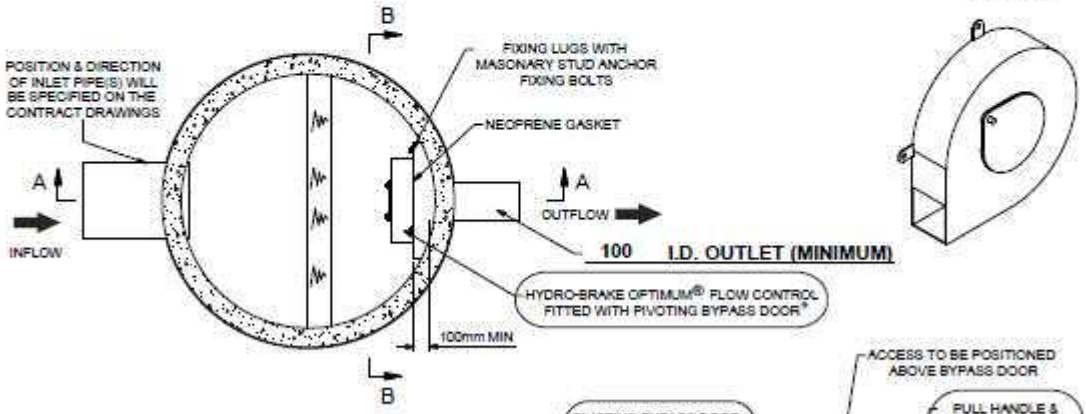
Control Point	Head (m)	Flow (l/s)
Primary Design	0.400	2.000
Flush-Flo™	0.124	1.996
Kick-Flo®	0.286	1.720
Mean Flow		1.668

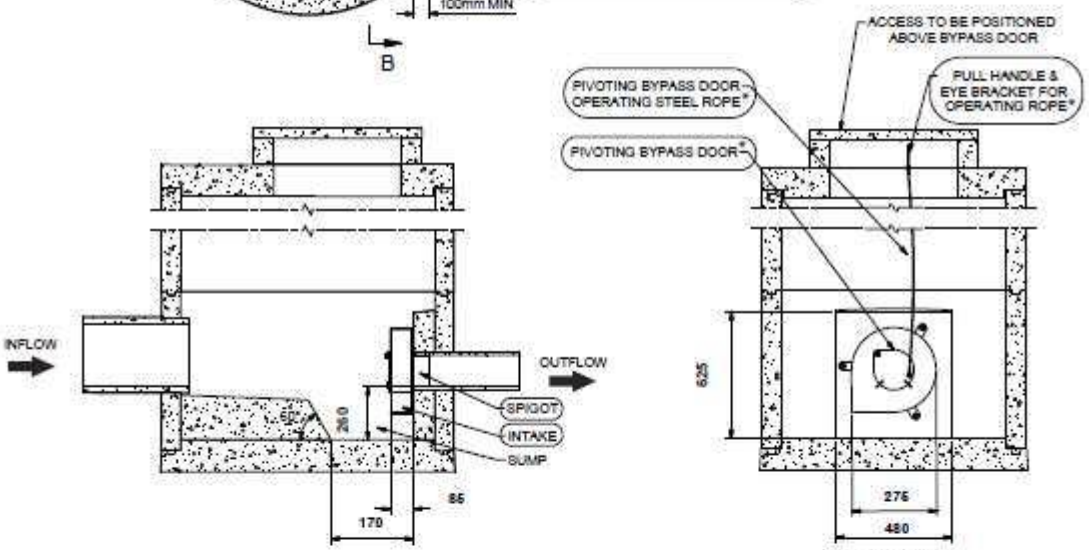
Hydro-Brake Optimum® Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting bypass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Bead blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Neoprene gasket to seal outlet

BBA

WRc APPROVED
PT/329/0412





SECTION A-A

SECTION B-B

IMPORTANT: (LIMIT OF HYDRO INTERNATIONAL SUPPLY)

THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE OPTIMUM® FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE !

The head/flow characteristics of this SHE-0078-2000-0400-2000 Hydro-Brake Optimum® Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro International

DATE	27/05/2016 16:16:47
SITE	Church Lane Wheldrake
DESIGNER	Hugh Morris
REF	1

SHE-0076-2000-0400-2000
Hydro-Brake Optimum®

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