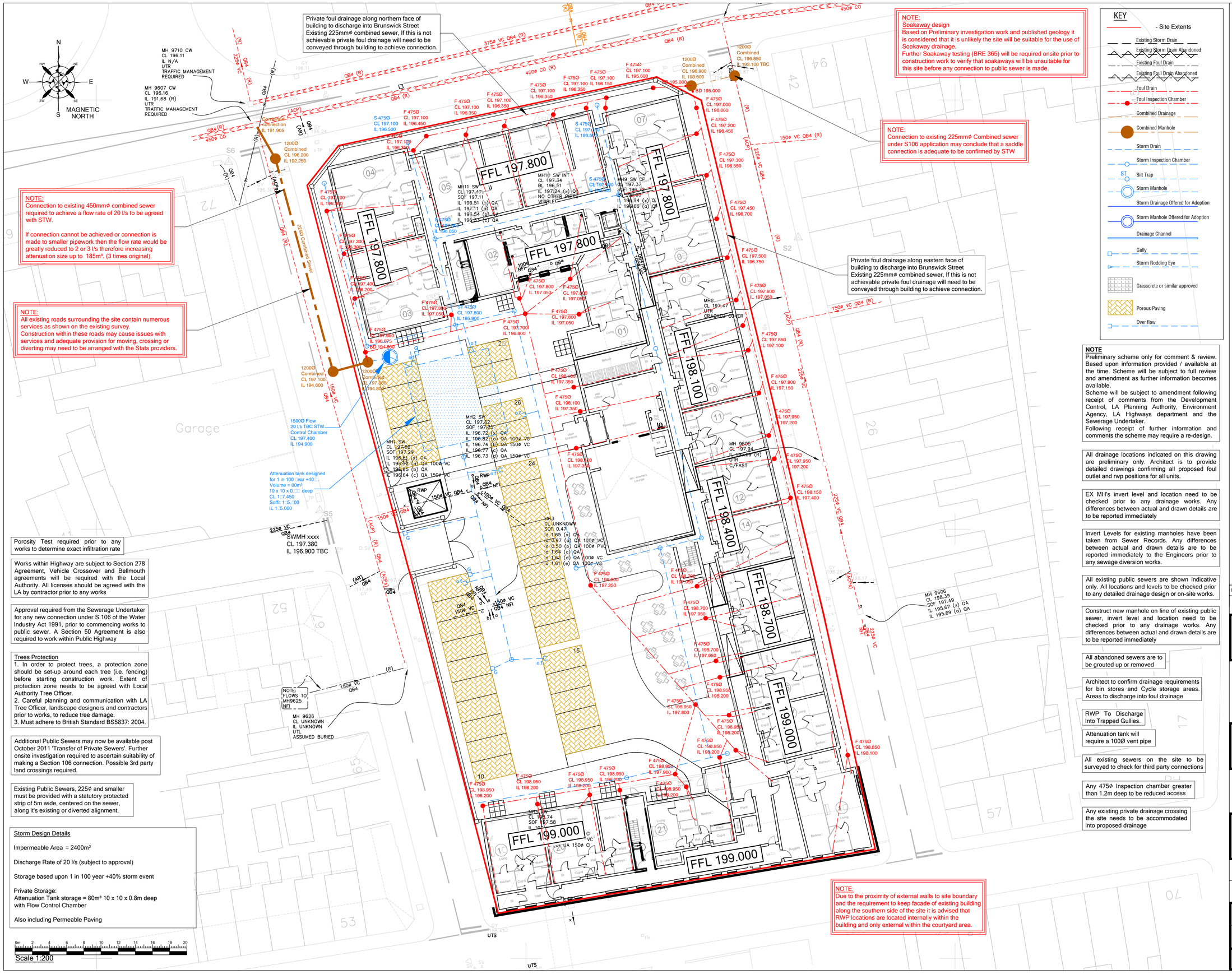
Appendix A7

CCTV Report (to follow)

Appendix A8

Foul/Surface Water Strategy



GENERAL NOTES

1.1. THIS DRAWING IS COPYRIGHT AND SHO□LD NOT BE REPRODU□CED IN WHOLE OR PART WITHO□T THE WRITTEN CONSENT OF PATRICK PARSONS LTD.
1.2 DO NOT SCALE FROM THIS DRAWING.
1.3. LOCATIONS OF ALL EXISTING SERVICES ON-SITE TO BE CONFIRMED □ PROVIDED TO THE ENGINEER PRIOR TO COMMENCEMENT OF WORKS.
1.4. THIS DRAWING IS TO BE READ IN CONJ□NCTION WITH ALL RELEVANT PATRICK PARSONS LTD DRAWINGS □ SPECIFICATIONS.

1. Due to a change in legislation on 1st October 2011, there could be formally private sewers which have transferred over to the responsibility of the Sewerage Undertaker. If such sewers are located on site during construction works, please contact Stewart and Harris so that a Section 185 Agreement can be prepared to divert these sewers.
2. The survey information used in the preparation of this drawing is not warranted. The contractor shall check all dimensions and levels on site.
3. This drawing must be read in conjunction with the site investigation report. Before work commences contractor should consult the engineer and the SI report regarding any contamination issues. All necessary health and Safety measures to be taken.
4. Before work commences, the contractor shall liaise with all Statutory Authorities to determine the exact location of all apparatus and take all precautions deemed necessary to locate, protect and where necessary divert such equipment.
5. This drawing is subject to approval by Local Authority, Building Control, Sewerage Undertaker and the Environment Agency. Any works undertaken prior to the granting of these approvals is carried out at at risk to others.
6. Should any surplus excavated material require disposal off site, it should be taken to a suitably licensed landfill site.
7. The contractor shall check all dimensions and levels on site.
8. Setting out to be confirmed by the Architect.
9. Prior to commencing work on the drainage, all existing drains, sewers manholes and outfalls to remain shall be located, identified and a CCTV condition survey carried out. Where necessary, protection to the existing drainage infrastructure shall be provided.
10. All existing sewers and manholes abandoned due to the proposed works are to be either removed, and suitably backfilled or grouted up.
11. All external drainage works shall be constructed in accordance with civil engineering specification for the water industry and Sewers for Adoption 6th Edition for adoptable drainage, for private drainage in accordance with the Building regulations Part H and BS EN 752.
12. All existing drainage levels, diameters & locations need to be checked on site prior to any drainage works, and any discrepancies need to be reported back to the Engineer.
13. Cover levels for manholes are approximate only and should be adjusted to match surrounding levels.
14. All manhole and drainage covers shall comply with BS.EN124. Manhole covers within block paved area and buildings shall be recessed. Cover strengths to be:- Class E600 in areas of heavy loading. Class D400 in heavy trafficked areas (roads, services yards). Class C250 Lightly trafficked areas (car parks). Class B125 in landscape and non trafficked areas (min. 100mm dp frame).
15. Drainage pipes 100mm Ø unless stated otherwise.
16. Pipes to be :- Vitrified clay to BS EN 295 or Concrete to BS 5911 or UPVC pipes to BS EN 1452 or Thermoplastic Structured wall pipes complying with WIS 4-35-01. BSI kitemarked. Class 8kN/m² nominal short term ring stiffness.
17. All pipes to be laid with soffits level, unless noted otherwise.
18. Where cover to pipes is less than 1200mm under carriageway - concrete bed and surround or concrete protection slab is required.
19. All pipes beneath buildings to be B&S in concrete. Where cover is less than 300mm the concrete is to be cast integrally with the floor slab.
20. Pipes Penetrating Walls. An opening is to be formed through walls to give pipes at least 50mm clearance all round. Brickwork over shall be supported by a lintel. Opening to be masked each side with rigid sheet material. Pipes embedded in walls shall have joints formed within 150mm of either wall face. Adjacent rocker pipes of max 600mm length with flexible joints shall continue the pipework.
21. Pipe runs near Buildings. If a trench is within 1m of a building it shall be filled with concrete up to the lowest level of the adjacent foundation. If a trench is greater than 1m from a building the trench shall be filled with concrete up to a level below the building equal to the distance from the building less 150mm.
22. Ventilation shall be provided at the head of the foul drainage runs.
23. For setting out of svp and rwp, see architects layout.
24. Threshold drainage is required where levels fall towards a building entrance. Architect to confirm if not required.
25. Yard Gully positions are indicative, should be adjusted on site to suit levels.
26. All gully positions to suit low points and to be trapped.
27. Road gullies shall be trapped 450Ø x 900mm deep with Class D 400 frame and grating to BS EN 124.
28. Drainage channel detailed design to be undertaken by manufactures. Alternative channels may be used, subject to Engineers approval.
29. All concrete to drainage, manholes bases, surrounds etc to be in accordance with the BRE special digest 1 - Concrete in aggressive ground. Refer to site investigation report for sulphate requirements.
30. All manholes, pipe trenches etc. to be backfilled with imported granular fill to Class 6F1-6F5 (Capping material) to (SHW) Table 6/1 & compacted in accordance with Table 6/4.
31. All pipelines shall be tested both before and after backfilling, using either air test or water test, in accordance with BS EN 1610.
32. Demarcation manholes and lateral drains need to be constructed in accordance with the Water UK/WRc "Sewers For Adoption 6th Edition".
33. All works to sewers/ manholes being offered for adoption or on existing public sewers should be in accordance with "Sewers for Adoption 6th Edition" and the Adopting Water Authority's recommendations
34. Requirement for Land Drains to be assessed on site by the Site Manager

Rev.	A□end□ents	Date	B□

Revisions

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Client: McCarthy & Stone

Project: Portland Mills, Buxton Road, Leek

Drawing: Drainage La□out

Scales	1:200	At original si□e	A1
Drawn	DGW	Checked	GV
Date	03.02.17		

Status: Co-ordinated Design

Drawing No. B16332-202 Rev.

McCarthy & Stone Drawing No. MI-2416-03-DE-002 -

Appendix A9

Surface Water Calculations

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	98.666	0.666	20.0	53.3	O K
30 min Summer	98.810	0.810	20.0	64.8	O K
60 min Summer	98.869	0.869	20.0	69.5	O K
120 min Summer	98.831	0.831	20.0	66.5	O K
180 min Summer	98.744	0.744	20.0	59.6	O K
240 min Summer	98.632	0.632	20.0	50.6	O K
360 min Summer	98.445	0.445	20.0	35.6	O K
480 min Summer	98.319	0.319	20.0	25.6	O K
600 min Summer	98.243	0.243	19.6	19.4	O K
720 min Summer	98.203	0.203	19.0	16.3	O K
960 min Summer	98.171	0.171	15.8	13.7	O K
1440 min Summer	98.139	0.139	11.8	11.1	O K
2160 min Summer	98.114	0.114	8.6	9.2	O K
2880 min Summer	98.100	0.100	6.9	8.0	O K
4320 min Summer	98.084	0.084	5.1	6.7	O K
5760 min Summer	98.074	0.074	4.0	5.9	O K
7200 min Summer	98.067	0.067	3.4	5.4	O K
8640 min Summer	98.062	0.062	2.9	5.0	O K
10080 min Summer	98.058	0.058	2.6	4.7	O K
15 min Winter	98.763	0.763	20.0	61.0	O K
30 min Winter	98.926	0.926	20.0	74.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	117.566	0.0	66.0	16
30 min Summer	79.051	0.0	88.8	29
60 min Summer	50.812	0.0	114.3	46
120 min Summer	31.606	0.0	142.2	80
180 min Summer	23.620	0.0	159.4	116
240 min Summer	19.088	0.0	171.8	146
360 min Summer	14.022	0.0	189.3	206
480 min Summer	11.272	0.0	202.9	262
600 min Summer	9.508	0.0	213.9	316
720 min Summer	8.270	0.0	223.2	370
960 min Summer	6.629	0.0	238.6	490
1440 min Summer	4.845	0.0	261.6	734
2160 min Summer	3.534	0.0	286.2	1100
2880 min Summer	2.821	0.0	304.7	1468
4320 min Summer	2.050	0.0	332.1	2192
5760 min Summer	1.633	0.0	352.6	2936
7200 min Summer	1.367	0.0	369.2	3640
8640 min Summer	1.182	0.0	383.1	4344
10080 min Summer	1.046	0.0	395.4	5136
15 min Winter	117.566	0.0	74.0	17
30 min Winter	79.051	0.0	99.5	30

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	98.986	0.986	20.0	78.9	O K
120 min Winter	98.912	0.912	20.0	72.9	O K
180 min Winter	98.773	0.773	20.0	61.8	O K
240 min Winter	98.593	0.593	20.0	47.4	O K
360 min Winter	98.328	0.328	20.0	26.3	O K
480 min Winter	98.208	0.208	19.2	16.6	O K
600 min Winter	98.178	0.178	16.5	14.3	O K
720 min Winter	98.160	0.160	14.5	12.8	O K
960 min Winter	98.138	0.138	11.7	11.0	O K
1440 min Winter	98.114	0.114	8.6	9.1	O K
2160 min Winter	98.095	0.095	6.2	7.6	O K
2880 min Winter	98.084	0.084	5.0	6.7	O K
4320 min Winter	98.070	0.070	3.6	5.6	O K
5760 min Winter	98.062	0.062	2.9	5.0	O K
7200 min Winter	98.057	0.057	2.4	4.5	O K
8640 min Winter	98.053	0.053	2.1	4.2	O K
10080 min Winter	98.049	0.049	1.9	3.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	50.812	0.0	128.0	48
120 min Winter	31.606	0.0	159.3	86
180 min Winter	23.620	0.0	178.5	124
240 min Winter	19.088	0.0	192.4	156
360 min Winter	14.022	0.0	212.0	210
480 min Winter	11.272	0.0	227.2	256
600 min Winter	9.508	0.0	239.6	312
720 min Winter	8.270	0.0	250.0	370
960 min Winter	6.629	0.0	267.2	490
1440 min Winter	4.845	0.0	293.0	736
2160 min Winter	3.534	0.0	320.5	1100
2880 min Winter	2.821	0.0	341.2	1448
4320 min Winter	2.050	0.0	371.9	2160
5760 min Winter	1.633	0.0	395.0	2880
7200 min Winter	1.367	0.0	413.5	3600
8640 min Winter	1.182	0.0	429.0	4352
10080 min Winter	1.046	0.0	442.8	5128

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.351	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.300

Time (mins) From:	To:	Area (ha)
0	4	0.300

Model Details

Storage is Online Cover Level (m) 100.000

Tank or Pond Structure

Invert Level (m) 98.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	80.0	1.400	0.0	2.800	0.0	4.200	0.0
0.200	80.0	1.600	0.0	3.000	0.0	4.400	0.0
0.400	80.0	1.800	0.0	3.200	0.0	4.600	0.0
0.600	80.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	80.0	2.200	0.0	3.600	0.0	5.000	0.0
1.000	80.0	2.400	0.0	3.800	0.0		
1.001	0.0	2.600	0.0	4.000	0.0		

Hydro-Brake Optimum® Outflow Control

Unit Reference	MD-SHE-0199-2000-1000-2000
Design Head (m)	1.000
Design Flow (l/s)	20.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	199
Invert Level (m)	98.000
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	20.0
Flush-Flo™	0.340	20.0
Kick-Flo®	0.721	17.1
Mean Flow over Head Range	-	16.8

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.9	1.200	21.8	3.000	33.8	7.000	51.0
0.200	18.7	1.400	23.5	3.500	36.4	7.500	52.7
0.300	19.9	1.600	25.0	4.000	38.9	8.000	54.4
0.400	19.9	1.800	26.5	4.500	41.1	8.500	56.0
0.500	19.5	2.000	27.8	5.000	43.3	9.000	57.6
0.600	19.0	2.200	29.1	5.500	45.3	9.500	59.1
0.800	18.0	2.400	30.4	6.000	47.3		
1.000	20.0	2.600	31.6	6.500	49.2		

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