chris eyres designs

Chartered Architects

c.n.eyres r.i.b.a

Viceroy House
13 Southbrook Terrace
Bradford BD7 1AD
tel: (01274) 723325
fax: (01274) 735107
email: chris@chriseyresdesigns.com
web: www.chriseyresdesigns.com

3rd December 2013
Our Ref:- IR / D / 2019

Andrew Burton
Senior Planning Officer (Outer Area Team)
Development Management
Barnsley Metropolitan Borough Council
Development Services
PO Box 604
Barnsley
S70 9FE

Dear Andrew.

Re:- Hill Croft, Cawthorne Lane, Darton, Barnsley – Isabella Ramsbottom – Drainage Proposals

REVISED

With regard to the above we are writing to put forward our revised proposals for the drainage so they can be considered under discharging the drainage condition on our clients application. These revisions have been arrived at from discussions with Derek Bell within your drainage/highways dept and we understand have now addressed all issues raised.

Foul Water:
Our proposal is to pump the foul water up Cawthorne Lane to connect to the Yorkshire Water foul sewer at the top. This is shown on the attached drawings.
The location of the foul pumping station has been moved so that it is no longer in the vicinity of the surface-water storage proposals.

Surface Water:
General:
We have employed the services of ARP Associates in Leeds who are environmental engineers and have over 20 years of experience in the field as well as possessing all the latest calculation software. They have provided advice, recommendations and calculations based upon their software results, considerable experience and industry standard practice.

Our proposal is to put the site surface water through a silt trap to remove debris and silt, then to collect this in a large attenuation chamber (within existing redundant swimming pool) and then gravity-feed this to a brick-built manhole in the highways verge, to then gravity-feed into the nearby highways drain. The purpose of the attenuation chamber is to ensure the existing highways drain is not surcharged.

Outlet From Pool:

The outlet from the pool has been requested by Highways at 5litres/second/hectare, but this results in an outlet size of only 22mm ARP Associates have noted that this is just not practical or feasible as this small size of outlet will block on a regular basis which could then result in flooding.

ARP Associates have noted that a discharge rate more practical would be a 5litres/sec which results in a 93mm pipe, which from other sources we have seen to be considered as self-cleaning. Not only will this ensure free-flow and avoid blockages, but ARP have noted that there is additional justification for such a size based upon the fact the 5litres/sec is a greenfield run-off rate and that the current existing surface water drainage is simply discharged direct onto the floor from the roofs and hardstanding areas. This existing run-off at present is already running down the contours of the hillside and discharging into the highways drain along the road (the ground conditions are such that very little if-any of this water will be percolating into the soil). As such we are proposing the outlet to be 93mm diameter.

It is of note that the surface area we are draining is 570m2 which over 350m2 of which is existing impermeable area. The remainder of which, while grassed, is of such ground conditions to be not soaking water.

Pool Storage Amount:

The attached drawing shows we are proposing to raise the level of the pool-base in order to provide an attenuation chamber of 44.5m3.

ARP Associates calculations sheets (attached) show that for a 93mm diameter outlet, we would only need 15.5m3 of attenuation volume.

ARP Associates further calculations also show that with the impractical 22mm diameter outlet, the storage volume needed is still only 40m3

As we are proposing 44.5m3 this is vastly in excess of any of the worst case figures and is this not only good practice but indicates the willingness of our client to ensure the installed scheme is to an extremely high standard with extremely large safety margins.

ARP Associates calculations have been carried out on the basis of the worst-case 100 year return storm (which also includes an additional 30% for climate change).

Gravity Feed Method:

Because we have raised the base of the pool in our proposals, we feel a gravity-feed method is possible to the highways drain.

Our contractor has calculated levels from the ground level at the pool, to the ground level at the bottom corner of our site. This difference is 750mm.

If we assume that the highways drain is 700mm below ground level (and likely it is much more) this gives us a drop from pool-ground to highways drain of 1450mm.

If we then take the outlet of the pool at 1m deep, this means the level difference between pool-outlet and highways drain is 450mm.

The course of the drain on our attached plan runs 35m linear and so at 1:80 falls (standard for surface water) the drop we need is only 438mm which is less than the available 450mm so the fall is achieveable.

Obviously, should the highways drain be found to be deeper, then this gives us an increased safety marging within which to obtain our drainage falls.

Enclosures:

We enclose the following documents with our proposal:

Klargester Foul Pumping Station PDF document

Our Drawing	-	Site Layout Showing Drained Area
Our Drawing	-	Site Layout Showing Drainage Outfall Connections
Our Drawing	-	Swimming Pool Attenuation Details
ARP Associates	-	Professional calculations & rainwater assessment

Conclusion:

We feel the above (and attached) information illustrates we have met all comments and criteria for the scheme proposal and thus look forward to your decision. After spending considerable time on this matter, at this stage, each individual day delay in receiving an approval is adding an additional day to the delays on-site which in turn is preventing our client, Isabella, from occupying her new home, which in-turn may have a detrimental affect to her condition. As such we hope you understand our urgency when we request all speed available in responding to our proposal.

We look forward to your consideration

Yours sincerely

Alex Moisan – Chris Eyres Designs

A R P A S S O C I A T E S
CHARTERED CONSULTING ENGINEERS

Head Office:
5/6 Northwest Business Park
Servia Hill
Leeds
LS6 2QH

Tel. 0113 2458498
Fax 0113 2443864
E-mail: leeds@arpassociates.co.uk
www.arpassociates.co.uk

Mr A Moisan
Chris Eyres Designs
Viceroy House
13 Southbrook Terrace
Bradford
BD7 1AD

BY E-MAIL

Our Ref: F1/800/276/ARPmjs

19th November 2013

-- Dear Alex

Isabella Ramsbottom
Hillcroft, Cawthorne Lane, Darton

Further to our recent telephone conversation, and receipt of your e-mail correspondence for the Ramsbottoms Pool Attenuation requirements for the above site, we are pleased to attach calculations for the attenuation requirement for the above site. These are based as follows:-

1. Using the information you have provided in your e-mail and assuming that the swimming pool is 1m deep, as shown on your drawing, and 57m² in area with a discharge rate of 0.29l/s, the swimming pool can accommodate a 1 in 100 year storm plus 30% allowance for climate change. However, the orifice of the hydrobrake control is only 22mm in diameter and this will result in regular blockage and potential overflow of the attenuation. The calculations are attached on pages 1 - 4.

2. You have not indicated the reason for the limited discharge at 0.29l/s, other than the 5l/s/ha, which is normally the greenfield run-off rate. If there is existing impermeable area which is being taken up, there may be a justification for a larger discharge rate and it is usual to look to a 5l/s discharge rate to achieve a reasonable size orifice on the hydrobrake. We have, therefore, also undertaken a review of the attenuation requirements for a 5l/s discharge. This gives an orifice of 93mm which would be sufficient for self-maintenance and little chance of blockage and, in these circumstances, you would only require 15.5m³, which would reduce the size of the swimming pool considerably. The calculations are attached on pages 5 - 8.

We hope that the above is satisfactory, and can confirm that our services have been carried out in accordance with the Conditions of Engagement of the Association for Consultancy and Engineering, Agreement 2 : Advise and Report, 2009. Our invoice of £150 plus VAT for this service will be issued to Paul S Withey Associates at the end of the month, with payment requested within 14 days from the date of the invoice.

ARP ASSOCIATES

To comply with the requirements of our Professional Indemnity Insurers, the following Clauses are included within our Appointment:-

> Nothing in this Contract confers or purports to confer on any third party, any benefit or any right to enforce any term of this Contract.
>
> Our Appointment does not include any liability in the event of any act of war or terrorism or any action in controlling, preventing or suppressing any warlike operations, or any injury arising from such action. The appointment also excludes any liability for any injury or damage from any fungus or spore, and any substance, vapour or gas arising from any fungus or spore.

If you require any further services, please do not hesitate to contact us at your convenience.

Yours sincerely

A R Poyser

Enc

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

Half Drain Time : 1646 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	100.228	0.228	0.0	0.1	0.0	0.1	12.3	O K
30 min Summer	100.304	0.304	0.0	0.2	0.0	0.2	16.5	O K
60 min Summer	100.386	0.386	0.0	0.2	0.0	0.2	20.9	O K
120 min Summer	100.470	0.470	0.0	0.2	0.0	0.2	25.4	O K
180 min Summer	100.516	0.516	0.0	0.2	0.0	0.2	28.0	O K
240 min Summer	100.546	0.546	0.0	0.2	0.0	0.2	29.6	O K
360 min Summer	100.585	0.585	0.0	0.2	0.0	0.2	31.7	O K
480 min Summer	100.609	0.609	0.0	0.2	0.0	0.2	33.0	O K
600 min Summer	100.625	0.625	0.0	0.2	0.0	0.2	33.8	O K
720 min Summer	100.635	0.635	0.0	0.2	0.0	0.2	34.4	O K
960 min Summer	100.643	0.643	0.0	0.2	0.0	0.2	34.8	O K
1440 min Summer	100.641	0.641	0.0	0.2	0.0	0.2	34.7	O K
2160 min Summer	100.629	0.629	0.0	0.2	0.0	0.2	34.1	O K
2880 min Summer	100.612	0.612	0.0	0.2	0.0	0.2	33.1	O K
4320 min Summer	100.573	0.573	0.0	0.2	0.0	0.2	31.1	O K
5760 min Summer	100.537	0.537	0.0	0.2	0.0	0.2	29.1	O K
7200 min Summer	100.504	0.504	0.0	0.2	0.0	0.2	27.3	O K
8640 min Summer	100.474	0.474	0.0	0.2	0.0	0.2	25.7	O K
10080 min Summer	100.447	0.447	0.0	0.2	0.0	0.2	24.2	O K
15 min Winter	100.255	0.255	0.0	0.1	0.0	0.1	13.8	O K
30 min Winter	100.341	0.341	0.0	0.2	0.0	0.2	18.5	O K
60 min Winter	100.433	0.433	0.0	0.2	0.0	0.2	23.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	116.422	0.0	9.5	0.0	23
30 min Summer	78.043	0.0	10.6	0.0	38
60 min Summer	49.937	0.0	20.6	0.0	68
120 min Summer	30.868	0.0	23.3	0.0	128
180 min Summer	22.961	0.0	24.6	0.0	188
240 min Summer	18.485	0.0	25.6	0.0	246
360 min Summer	13.565	0.0	27.0	0.0	366
480 min Summer	10.890	0.0	28.0	0.0	486
600 min Summer	9.176	0.0	28.6	0.0	606
720 min Summer	7.974	0.0	29.1	0.0	726
960 min Summer	6.383	0.0	29.6	0.0	964
1440 min Summer	4.657	0.0	29.7	0.0	1242
2160 min Summer	3.390	0.0	50.8	0.0	1608
2880 min Summer	2.703	0.0	51.0	0.0	2020
4320 min Summer	1.961	0.0	50.1	0.0	2856
5760 min Summer	1.559	0.0	64.0	0.0	3680
7200 min Summer	1.305	0.0	66.9	0.0	4472
8640 min Summer	1.128	0.0	69.3	0.0	5280
10080 min Summer	0.998	0.0	71.4	0.0	6056
15 min Winter	116.422	0.0	9.8	0.0	23
30 min Winter	78.043	0.0	11.3	0.0	38
60 min Winter	49.937	0.0	22.3	0.0	68

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 Overflow (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
120 min Winter	100.528	0.528	0.0	0.2	0.0	0.2	28.6	O K
180 min Winter	100.581	0.581	0.0	0.2	0.0	0.2	31.4	O K
240 min Winter	100.615	0.615	0.0	0.2	0.0	0.2	33.3	O K
360 min Winter	100.660	0.660	0.0	0.2	0.0	0.2	35.7	O K
480 min Winter	100.689	0.689	0.0	0.2	0.0	0.2	37.3	O K
600 min Winter	100.709	0.709	0.0	0.2	0.0	0.2	38.4	Flood Risk
720 min Winter	100.722	0.722	0.0	0.2	0.0	0.2	39.1	Flood Risk
960 min Winter	100.736	0.736	0.0	0.2	0.0	0.2	39.9	Flood Risk
1440 min Winter	100.738	0.738	0.0	0.2	0.0	0.2	40.0	Flood Risk
2160 min Winter	100.721	0.721	0.0	0.2	0.0	0.2	39.1	Flood Risk
2880 min Winter	100.700	0.700	0.0	0.2	0.0	0.2	37.9	Flood Risk
4320 min Winter	100.647	0.647	0.0	0.2	0.0	0.2	35.0	O K
5760 min Winter	100.593	0.593	0.0	0.2	0.0	0.2	32.1	O K
7200 min Winter	100.545	0.545	0.0	0.2	0.0	0.2	29.5	O K
8640 min Winter	100.502	0.502	0.0	0.2	0.0	0.2	27.2	O K
10080 min Winter	100.463	0.463	0.0	0.2	0.0	0.2	25.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
120 min Winter	30.868	0.0	24.8	0.0	126
180 min Winter	22.961	0.0	26.4	0.0	184
240 min Winter	18.485	0.0	27.6	0.0	244
360 min Winter	13.565	0.0	29.1	0.0	360
480 min Winter	10.890	0.0	30.1	0.0	476
600 min Winter	9.176	0.0	30.8	0.0	592
720 min Winter	7.974	0.0	31.3	0.0	706
960 min Winter	6.383	0.0	31.8	0.0	930
1440 min Winter	4.657	0.0	31.7	0.0	1358
2160 min Winter	3.390	0.0	54.6	0.0	1692
2880 min Winter	2.703	0.0	55.3	0.0	2164
4320 min Winter	1.961	0.0	54.2	0.0	3072
5760 min Winter	1.559	0.0	71.6	0.0	3968
7200 min Winter	1.305	0.0	74.9	0.0	4824
8640 min Winter	1.128	0.0	77.6	0.0	5624
10080 min Winter	0.998	0.0	79.8	0.0	6456

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)	19.000	Shortest Storm (mins)	15
Ratio R	0.356	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.057

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.000	4	8	0.057

Model Details

Storage is Online Cover Level (m) 101.000

Cellular Storage Structure

Invert Level (m) 100.000 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	57.0	0.0	1.300	0.0	0.0
0.100	57.0	0.0	1.400	0.0	0.0
0.200	57.0	0.0	1.500	0.0	0.0
0.300	57.0	0.0	1.600	0.0	0.0
0.400	57.0	0.0	1.700	0.0	0.0
0.500	57.0	0.0	1.800	0.0	0.0
0.600	57.0	0.0	1.900	0.0	0.0
0.700	57.0	0.0	2.000	0.0	0.0
0.800	57.0	0.0	2.100	0.0	0.0
0.900	57.0	0.0	2.200	0.0	0.0
1.000	57.0	0.0	2.300	0.0	0.0
1.100	0.0	0.0	2.400	0.0	0.0
1.200	0.0	0.0	2.500	0.0	0.0

Hydro-Brake® Outflow Control

Design Head (m) 1.000 Hydro-Brake® Type Md6 SW Only Invert Level (m) 100.000
Design Flow (l/s) 0.3 Diameter (mm) 22

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.1	1.200	0.3	3.000	0.5	7.000	0.7
0.200	0.1	1.400	0.3	3.500	0.5	7.500	0.8
0.300	0.2	1.600	0.3	4.000	0.6	8.000	0.8
0.400	0.2	1.800	0.4	4.500	0.6	8.500	0.8
0.500	0.2	2.000	0.4	5.000	0.6	9.000	0.8
0.600	0.2	2.200	0.4	5.500	0.6	9.500	0.9
0.800	0.2	2.400	0.4	6.000	0.7		
1.000	0.3	2.600	0.4	6.500	0.7		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 0.150 Invert Level (m) 101.000

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

Half Drain Time : 40 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Overflow (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	100.190	0.190	0.0	4.0	0.0	4.0	10.3	O K
30 min Summer	100.230	0.230	0.0	4.0	0.0	4.0	12.5	O K
60 min Summer	100.255	0.255	0.0	4.0	0.0	4.0	13.8	O K
120 min Summer	100.251	0.251	0.0	4.0	0.0	4.0	13.6	O K
180 min Summer	100.230	0.230	0.0	4.0	0.0	4.0	12.4	O K
240 min Summer	100.205	0.205	0.0	4.0	0.0	4.0	11.1	O K
360 min Summer	100.166	0.166	0.0	3.9	0.0	3.9	9.0	O K
480 min Summer	100.141	0.141	0.0	3.7	0.0	3.7	7.6	O K
600 min Summer	100.124	0.124	0.0	3.4	0.0	3.4	6.7	O K
720 min Summer	100.112	0.112	0.0	3.1	0.0	3.1	6.1	O K
960 min Summer	100.096	0.096	0.0	2.6	0.0	2.6	5.2	O K
1440 min Summer	100.078	0.078	0.0	2.0	0.0	2.0	4.2	O K
2160 min Summer	100.063	0.063	0.0	1.5	0.0	1.5	3.4	O K
2880 min Summer	100.054	0.054	0.0	1.2	0.0	1.2	2.9	O K
4320 min Summer	100.044	0.044	0.0	0.9	0.0	0.9	2.4	O K
5760 min Summer	100.038	0.038	0.0	0.7	0.0	0.7	2.1	O K
7200 min Summer	100.034	0.034	0.0	0.6	0.0	0.6	1.8	O K
8640 min Summer	100.031	0.031	0.0	0.5	0.0	0.5	1.7	O K
10080 min Summer	100.029	0.029	0.0	0.5	0.0	0.5	1.6	O K
15 min Winter	100.215	0.215	0.0	4.0	0.0	4.0	11.7	O K
30 min Winter	100.263	0.263	0.0	4.0	0.0	4.0	14.2	O K
60 min Winter	100.287	0.287	0.0	4.0	0.0	4.0	15.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	116.422	0.0	12.4	0.0	20
30 min Summer	78.043	0.0	16.7	0.0	31
60 min Summer	49.937	0.0	21.3	0.0	48
120 min Summer	30.868	0.0	26.4	0.0	82
180 min Summer	22.961	0.0	29.4	0.0	116
240 min Summer	18.485	0.0	31.6	0.0	148
360 min Summer	13.565	0.0	34.8	0.0	208
480 min Summer	10.890	0.0	37.2	0.0	266
600 min Summer	9.176	0.0	39.2	0.0	324
720 min Summer	7.974	0.0	40.9	0.0	384
960 min Summer	6.383	0.0	43.6	0.0	504
1440 min Summer	4.657	0.0	47.7	0.0	742
2160 min Summer	3.390	0.0	52.1	0.0	1108
2880 min Summer	2.703	0.0	55.4	0.0	1472
4320 min Summer	1.961	0.0	60.3	0.0	2208
5760 min Summer	1.559	0.0	64.0	0.0	2912
7200 min Summer	1.305	0.0	66.9	0.0	3672
8640 min Summer	1.128	0.0	69.4	0.0	4368
10080 min Summer	0.998	0.0	71.6	0.0	5136
15 min Winter	116.422	0.0	13.9	0.0	20
30 min Winter	78.043	0.0	18.7	0.0	33
60 min Winter	49.937	0.0	23.9	0.0	52

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 Overflow (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
120 min Winter	100.271	0.271	0.0	4.0	0.0	4.0	14.7	O K
180 min Winter	100.234	0.234	0.0	4.0	0.0	4.0	12.7	O K
240 min Winter	100.197	0.197	0.0	4.0	0.0	4.0	10.7	O K
360 min Winter	100.146	0.146	0.0	3.7	0.0	3.7	7.9	O K
480 min Winter	100.120	0.120	0.0	3.3	0.0	3.3	6.5	O K
600 min Winter	100.104	0.104	0.0	2.9	0.0	2.9	5.7	O K
720 min Winter	100.094	0.094	0.0	2.6	0.0	2.6	5.1	O K
960 min Winter	100.079	0.079	0.0	2.1	0.0	2.1	4.3	O K
1440 min Winter	100.063	0.063	0.0	1.5	0.0	1.5	3.4	O K
2160 min Winter	100.051	0.051	0.0	1.1	0.0	1.1	2.8	O K
2880 min Winter	100.044	0.044	0.0	0.9	0.0	0.9	2.4	O K
4320 min Winter	100.036	0.036	0.0	0.7	0.0	0.7	1.9	O K
5760 min Winter	100.031	0.031	0.0	0.5	0.0	0.5	1.7	O K
7200 min Winter	100.028	0.028	0.0	0.4	0.0	0.4	1.5	O K
8640 min Winter	100.026	0.026	0.0	0.4	0.0	0.4	1.4	O K
10080 min Winter	100.024	0.024	0.0	0.3	0.0	0.3	1.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
120 min Winter	30.868	0.0	29.5	0.0	90
180 min Winter	22.961	0.0	33.0	0.0	124
240 min Winter	18.485	0.0	35.4	0.0	156
360 min Winter	13.565	0.0	38.9	0.0	212
480 min Winter	10.890	0.0	41.7	0.0	270
600 min Winter	9.176	0.0	43.9	0.0	330
720 min Winter	7.974	0.0	45.8	0.0	388
960 min Winter	6.383	0.0	48.9	0.0	506
1440 min Winter	4.657	0.0	53.5	0.0	752
2160 min Winter	3.390	0.0	58.4	0.0	1104
2880 min Winter	2.703	0.0	62.1	0.0	1464
4320 min Winter	1.961	0.0	67.6	0.0	2208
5760 min Winter	1.559	0.0	71.6	0.0	2920
7200 min Winter	1.305	0.0	74.9	0.0	3672
8640 min Winter	1.128	0.0	77.7	0.0	4400
10080 min Winter	0.998	0.0	80.2	0.0	5104

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)	19.000	Shortest Storm (mins)	15
Ratio R	0.356	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.057

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.057

Model Details

Storage is Online Cover Level (m) 101.000

Cellular Storage Structure

Invert Level (m) 100.000 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	57.0	0.0	1.300	0.0	0.0
0.100	57.0	0.0	1.400	0.0	0.0
0.200	57.0	0.0	1.500	0.0	0.0
0.300	57.0	0.0	1.600	0.0	0.0
0.400	57.0	0.0	1.700	0.0	0.0
0.500	57.0	0.0	1.800	0.0	0.0
0.600	57.0	0.0	1.900	0.0	0.0
0.700	57.0	0.0	2.000	0.0	0.0
0.800	57.0	0.0	2.100	0.0	0.0
0.900	57.0	0.0	2.200	0.0	0.0
1.000	57.0	0.0	2.300	0.0	0.0
1.100	0.0	0.0	2.400	0.0	0.0
1.200	0.0	0.0	2.500	0.0	0.0

Hydro-Brake® Outflow Control

Design Head (m) 1.000 Hydro-Brake® Type Md6 SW Only Invert Level (m) 100.000
Design Flow (l/s) 5.0 Diameter (mm) 93

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.4	3.000	8.5	7.000	13.1
0.200	4.0	1.400	5.8	3.500	9.2	7.500	13.5
0.300	3.8	1.600	6.2	4.000	9.9	8.000	14.0
0.400	3.7	1.800	6.6	4.500	10.5	8.500	14.4
0.500	3.7	2.000	7.0	5.000	11.0	9.000	14.8
0.600	3.9	2.200	7.3	5.500	11.6	9.500	15.2
0.800	4.4	2.400	7.6	6.000	12.1		
1.000	4.9	2.600	8.0	6.500	12.6		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 0.150 Invert Level (m) 101.000

Existing Yorkshire Water Foul Sewer

Existing Yorkshire Water Manhole Approx 1200mm deep

Form gravity feed branch connection

Form new highways–standard brick built manhole and cover

Surgery

Town Farm

Pipe in roadside trench, protected and backfilled 600mm deep

Swimming Pool

63mm MDPE flexible rising main in trench

Foul pumping chamber

EXISTING GARAGE

CAWTHORNE LANE

CAR PARKING AREA

UTILITY
BATHROOM
BEDROOM
KITCHEN
DINING AREA
LIVING ROOM
CONSERVATORY
CAR PORT
WHEELCHAIR STORE
CARER'S BATHROOM
CARER'S BEDROOM
CARER'S KITCHEN & STORAGE
ISABELLA'S BATHROOM
THERAPY ROOM
ISABELLA'S BEDROOM
BALCONY

Final catchment inspection chamber of all site foul drainage before entering pumping station

Highways standard/approved brick–built manhole within verge as per highways email dated 15th Nov

Final catchment inspection chamber of all site surface water drainage before entering silt trap

POOL

Assumed position of highways drain and gravity connection to be to highways approval

pond

Silt trap

Gravity–feed drain 100mm diameter laid at 1:80 falls

Swimming pool attenuation tank and surface–water pump as per seperate drawing

1:200 scale at A1 paper

0 2 4 6 8 10
DRAWN SCALE 1:200

N

Falconer House

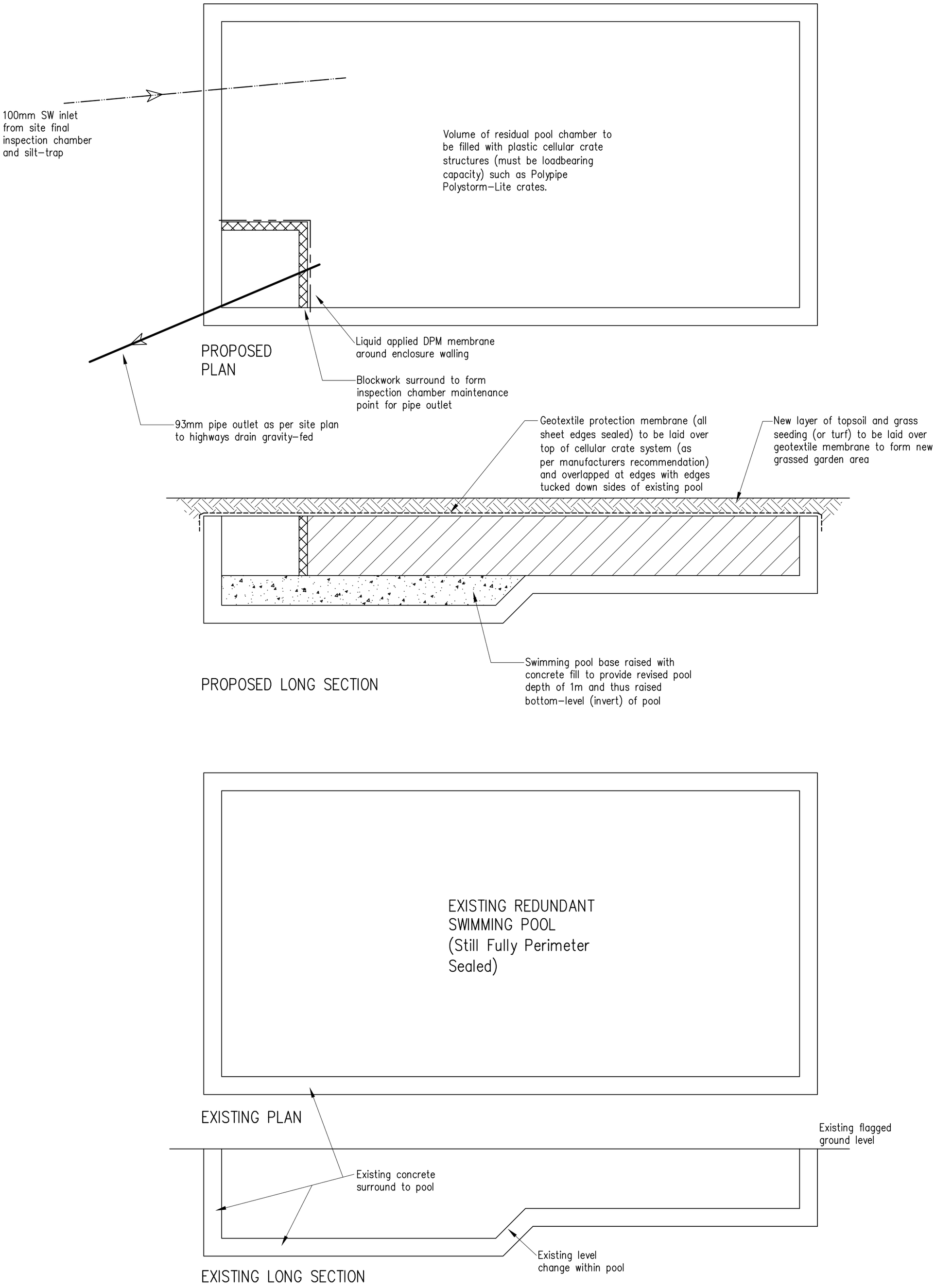
Revision C

Title
SITE PLAN – Drainage

Project
HILL CROFT
CAWTHORNE LANE
DARTON, BARNSLEY
S75 5EF

Client
ISABELLA RAMSBOTTOM

Scale	Drawn	Job No	
1:200@A1	de	2019	22



Revision C

Title
PROPOSED EXTENSION AND ALTERATIONS

Project
HILL CROFT
CAWTHORNE LANE
DARTON, BARNSLEY

Client
ISABELLA RAMSBOTTOM

0 0.5 1 1.5 2 2.5 3
DRAWN SCALE 1:50

P.S.Withey
Project Surveyors
tel., (01274) 739198
(01274) 739216
fax., (01274) 739201
73 Godwin Street, Bradford, BD1 2SH

Scale	Drawn	Job No	
1:50@a2	AJM	2019	20

Shaded area = approx
570m2 and includes
roof areas and external
hard surfaces for
surface water drainage

CAWTHORNE LANE

EXISTING GARAGE

CAR PARKING AREA

UTILITY

BATHROOM

BEDROOM

KITCHEN

DINING AREA

LIVING ROOM

CAR PORT

WHEELCHAIR STORE

CARER'S BATHROOM

CARER'S BEDROOM

CARER'S KITCHEN AND STORAGE

ISABELLA'S BATHROOM

ISABELLA'S BEDROOM

THERAPY ROOM

BALCONY

SWIMMING POOL

pond

N

0 2 4 6 8 10

DRAWN SCALE 1:200

P.S.Withey

Project Surveyors

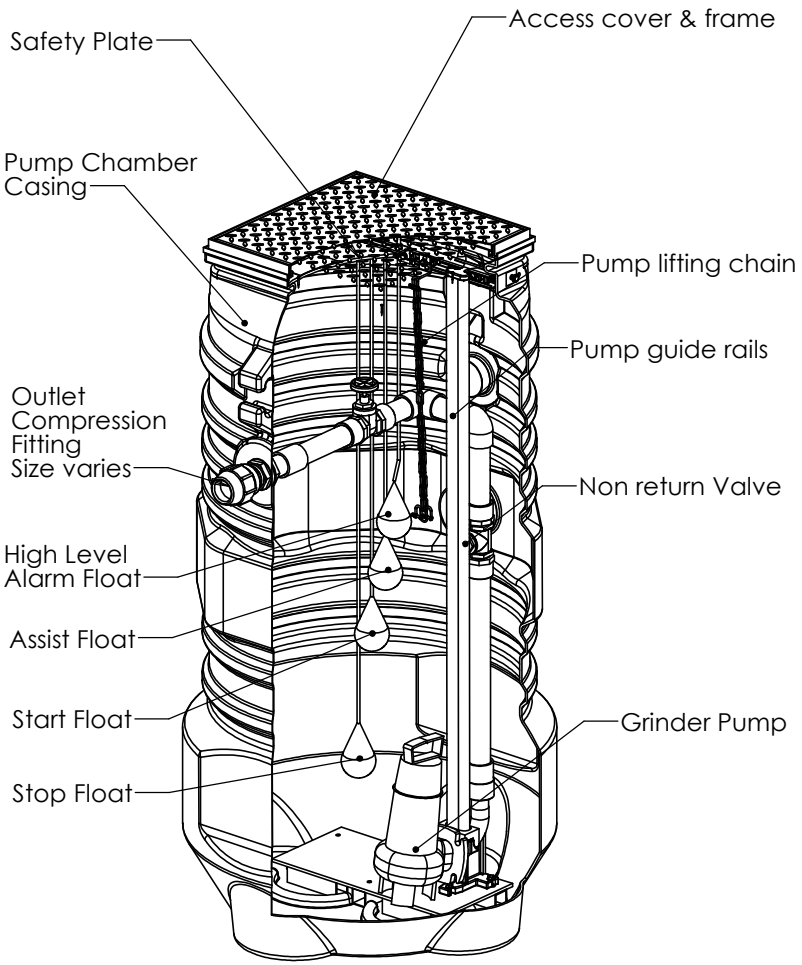
tel., (01274) 739198
(01274) 739216
fax., (01274) 739201
73 Godwin Street, Bradford, BD1 2SH

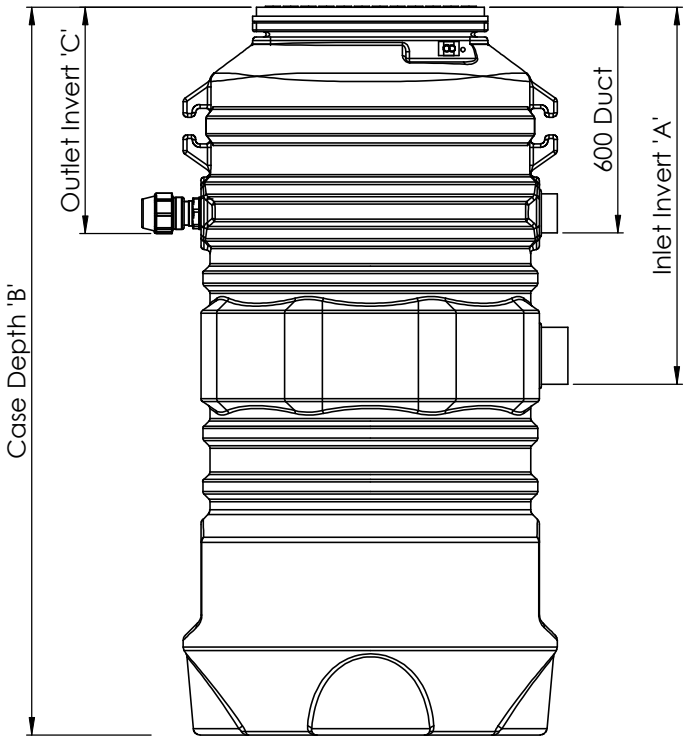
Title
SITE PLAN – Drainage Area

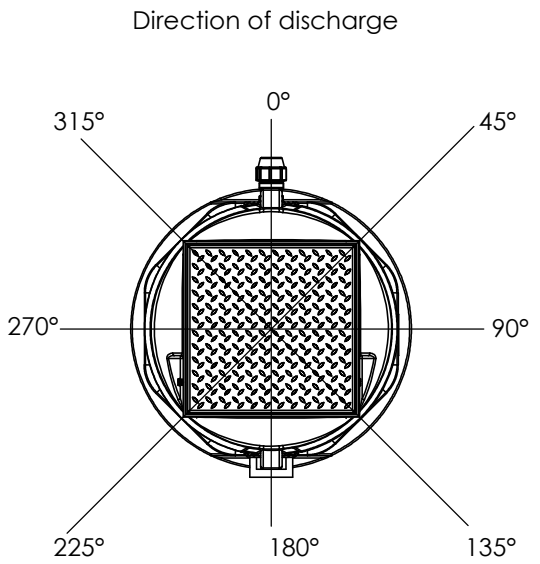
Project
HILL CROFT
CAWTHORNE LANE
DARTON, BARNSLEY
S75 5EF

Client
ISABELLA RAMSBOTTOM

Scale	Drawn	Job No	
1:200@a3	de	2019	21







Inlet Orientation
(Duct positioned @ 180 °)

Notes:
- Pumpwell delivered with pumps & floats not installed to avoid damage in transit.
- Pumps to be coupled to chains with shackles supplied in lifting chain which is connected to the unistrut assembly.
- Read operating and installation guidelines before installing.

Case Diameter	Outlet Invert 'C'	Case Depth 'B'		Inlet Invert 'A' - Standard		Inlet Size 'E'
		20 (2.0m)	25 (2.5m)	10 (1.0m)	15 (1.5m)	
10 (1.0m)	0.6m	●		●		110mm
			●		●	160mm

Please check with Kingspan Environmental that this drawing is the latest issue				
Issue	Date	Drawn by	Approved by	Description
01	18/02/10	S. Gill		Initial Release

Material : PE	Tolerance :	**Drawing : DS1064P**
Finish :	Thickness :	Page 1 of 1
Weight : Kgs	Surface Area :	Ø1.0 metre Single Grinder Pump Chamber

All dimensions in mm

Scale: Not to scale

Y:\engineering\Drawing Data\02 - Sales Drawings\DS\DS - 10\DS1064P