

Our ref: SPM/Is/14009

6<sup>th</sup> October 2016

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For the attention of Francesca Sanders

Dear Francesca,

**RE: BOVERTON RESIDENTIAL DEVELOPMENT**

Many thanks for your email dated 28<sup>th</sup> September 2016 requesting further clarification on the SW drainage design strategy. As you are aware we were asked to amend the geometry of the basin very recently to accommodate some layout changes. The basin footprint reduced in plan area although we have since offset this by the introduction of additional porous surfacings within the main development.

We are aware that there are still concerns remaining on the double use of the basin as an infiltration structure/facility and useable amenity area. We have previously stated that perceived excessive water levels within the basin would only occur during the more extreme events when people are unlikely to be undertaking outdoor recreational activities. That aside, we have taken on board the concerns raised in our latest proposals (attached) which now includes for the provision of a buried (cellular) infiltration structure which effectively holds the water below ground whilst it is diffused.

The attached section and calculation illustrates the flood level for the 100 year event to be 300mm (standing water) although this will drain back into the tank within 2½ hours. Obviously, the ground will be saturated for a while until it dries naturally as per any other open space. There should be no ponding for the 1 and 30 year storm event other than naturally occurring depression storage.

On a secondary note, I have had another look at the trial pit information and the topsoil in the area has been described as 'clayey' in nature. We would recommend that the stripped topsoil is processed in some way after it has been removed (during construction of the basin) to improve its structure and I am sure that a landscape consultant could provide some advice here.

In terms of the frequency of standing water being encountered, this will be for storm events in excess of the 30 year event. That doesn't mean that it will only happen once every 30 years it means that there is a 1:30 (3.33%) chance of it happening in any one year.

Please note that the introduction of the attenuation infiltration structures below ground will require some additional soils testing at design depth for detailed design purposes.

We trust that this addresses your concerns and is sufficient to supplement/supersede our previous assessment which can be amended to reflect the above if necessary.

Yours sincerely

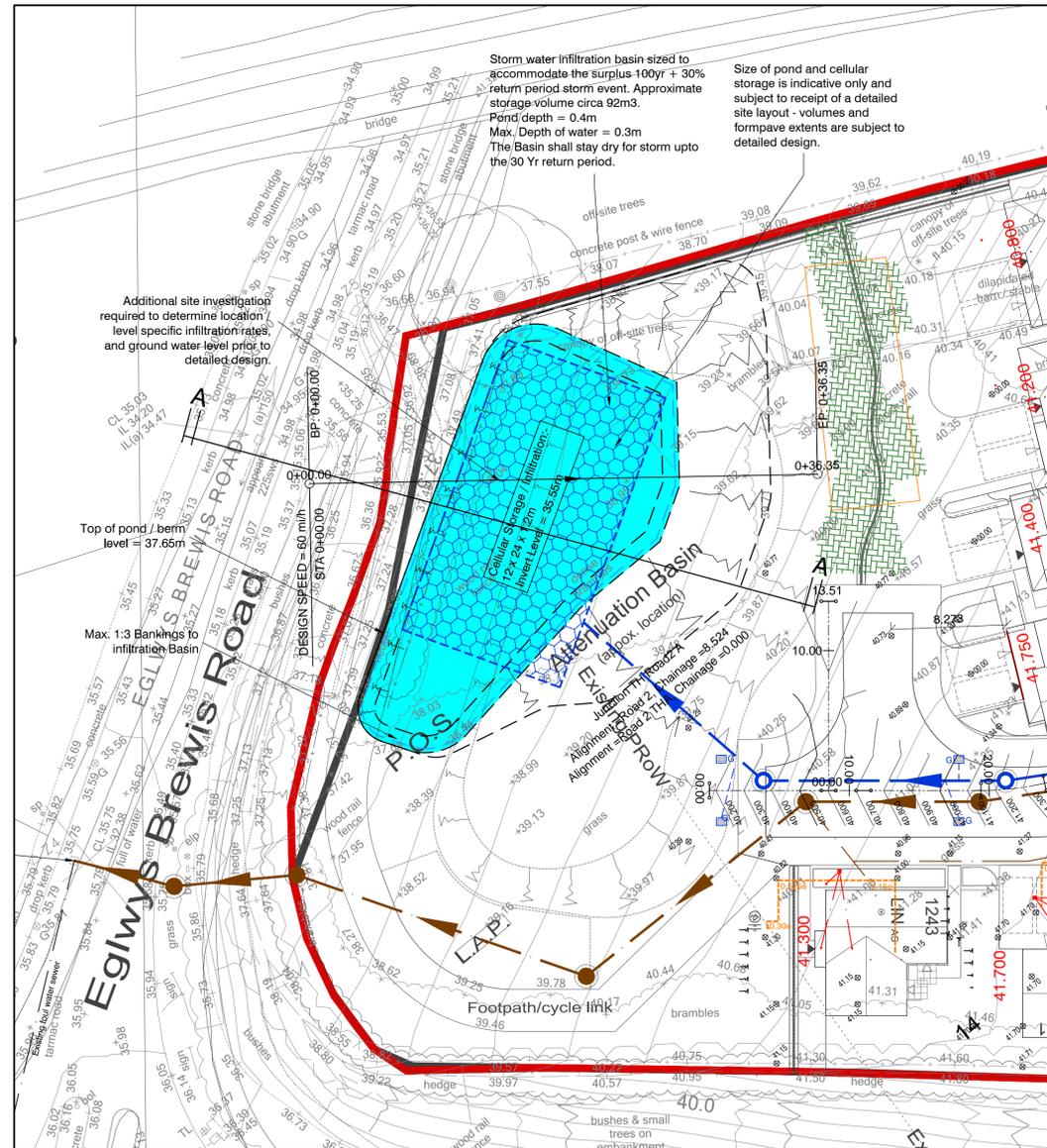
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**Steve McCarthy BEng(Hons) MSc CEng MICE MCIHT**

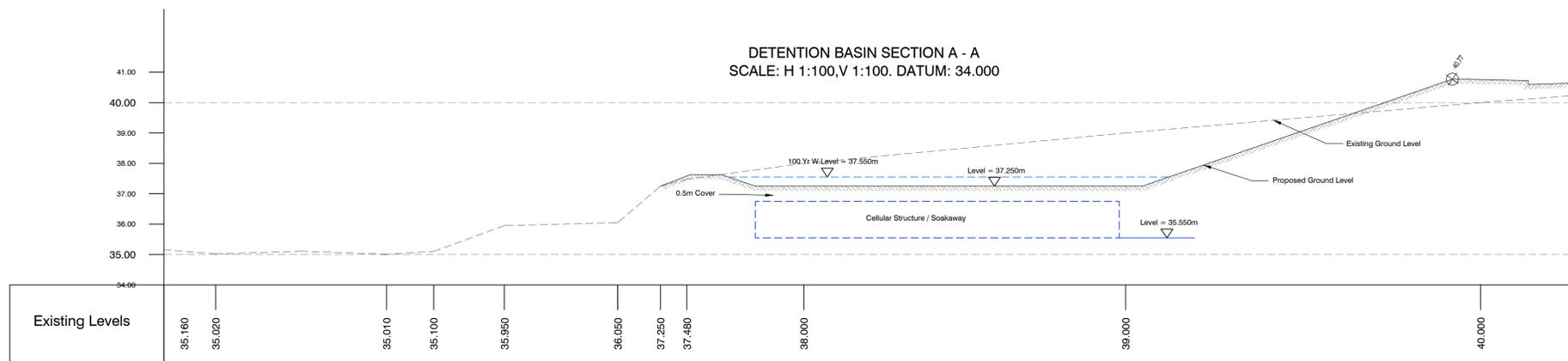
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Engineering Layout  
Scale 1:250

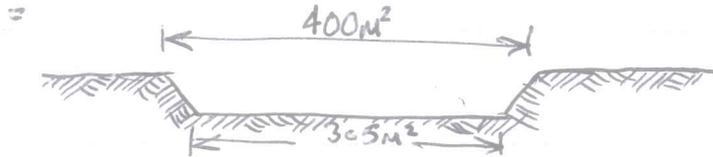
- DRAFT -



Rev	Date	Description	By
<small>Dimensions to be verified on site. This drawing should not be scaled. Use figured dimensions only. Any discrepancies should be referred to the Engineer prior to work being put in hand. This drawing is copyright.</small>			
		<b>QuadConsult Limited</b> Consulting Engineers <small>Engineers in Partnership</small> Columbus House, Village Way, Greenmeadow Springs, Cardiff CF15 7NE t 029 2077 9644 contactus@quadconsult.co.uk www.quadconsult.co.uk	
<small>Client</small>			
<small>Project</small>		<b>Land North of B4265, Boverton</b>	
<small>Title</small>		<b>Drainage Layout InfiltrationBasin</b>	
<small>Drawing Status</small>			
<b>PRELIMINARY</b>			
<small>Designed by</small>	<small>Drawn by</small>	<small>Checked by</small>	<small>Date</small>
RWP	RWP	SM	Oct '16
<small>Project No</small>	<small>Drawing No</small>	<small>Revision</small>	
14009	C/101	0	

Project BOVERTON INFILTRATION		Job Ref. 14009	
Section HALF / FULL DRAIN TIME		Sheet no./rev. 1 of	
Calc'd by JMM	Date 6/10/16	Chk'd by A. J. H.	Date 6/10/16
App'd by JMM	Date 6/10/16	App'd by JMM	Date 6/10/16

VOLUME OF WATER CONTAINED IN BASIN (100 YR + CC)



$$\frac{305 + 400}{2} \times 0.3 = 106.05 \text{ m}^3$$

Calculate infiltration disch through soil:  $Q$  ( $\text{m}^3/\text{s}$ )

$$i = 4.15 \times 10^{-5} \text{ m/s}$$

$$A = 305 \text{ m}^2$$

$$\therefore 305 \times 4.15 \times 10^{-5} = 0.0126 \text{ m}^3/\text{s}$$

$$Q = 0.0126 \text{ m}^3/\text{s}$$

Time to discharge  $106 \text{ m}^3$

$$0.0126 \times t = 106 \text{ m}^3$$

$$\therefore t = 8412 \text{ s}$$

$$\Rightarrow 140 \text{ mins}$$

$$\Rightarrow 2.33 \text{ hrs.}$$

$$T = 2.3 \text{ hrs.}$$

### SUMMARY

THE BASIN WILL DRAIN IN 2.3 hrs into the underlying attenuation/infiltration structure. (100 YR STORM EVENT)