S1358/230117/WB/JG

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Checked by: Bill Bailey



<u>Phase 2 – Catalyst, Bicester</u> Technical Note – LLFA / CDC Drainage Response

Introduction

This technical note has been produced as an addendum to Application No: 22/03677/DISC relating to discharge of Condition 40 (SW Drainage). This condition has been partially discharged for Phase 1 which is now complete. Phase 2 (Units 5-9) is the next and final phase of development for this application. Please find below Bailey Johnson Hayes responses to consultee comments received to date.

LLFA Comments Responses

1. Provide pipe numbering on the drainage plan which should read in line with the calculations produced.

Drawings No. S1358-PH2-04B, 06B, 08B and 10B have been updated to provide MircoDrainage calculation pipe numbers and lengths as requested. Please note all pipe number can be found on drawing no. S1358-DD02 Rev C which is appended to the Catalyst Bicester SW Drainage calculations package revision 3.

2. Provide SuDS construction details drawings.

New Drawings No. S1358-PH2-17A, 18, 19, 20, 21, 22 & S1358-PH1-23 are now submitted to provide full details of the Attenuation Basin 2, Petrol Interceptors 3-5, Permeable Paving, Hydro-brake outlet manhole, headwalls, culverts and ditches.

3. Provide consent to discharge to the existing watercourse.

Application submitted to Tony Brummell at Cherwell District Council for approval of headwalls, culvert and re-graded outfall ditch to the Langford Brook.

4. Confirm the capacity of the ditch to take the proposed loads without posing flood risk to the neighbouring sites.

Please find attached Ditch Capacity Calculations to confirm ditches are OK.

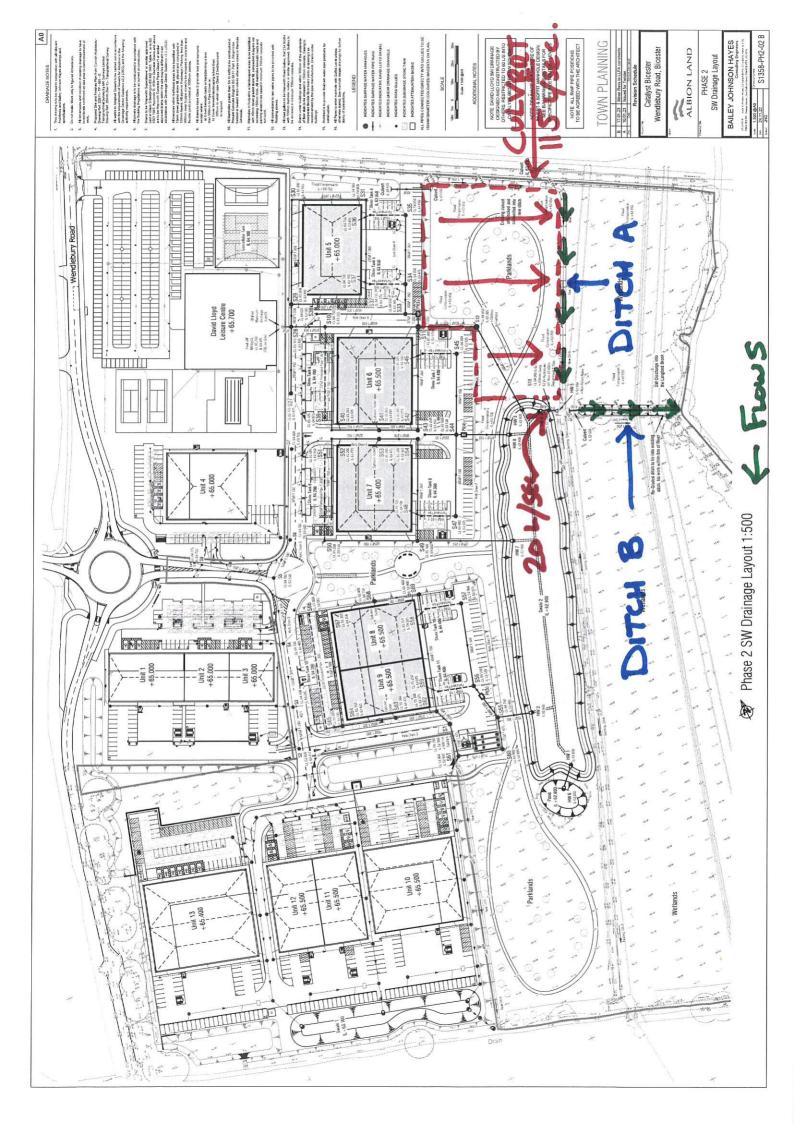
5. Provide flood exceedance plan with flood arrows demonstrating that all surface water will be kept away from structures and within the site boundary.

Please find submitted S1358-DD05 Rev A. Note this was also appended to the Catalyst Bicester SW Drainage calculations package revision 3.

CDC Drainage Comments Responses

1. I have not been able to inspect the outfall between the proposed attenuation basin and the receiving watercourse, the Langford Brook, due to the area being securely fenced at the time of visit. The outfall must be in sufficiently good condition to freely pass the outfall discharges and maintained thereafter. The discharge to the Langford Brook will require a consent from the environment Agency.

Full details of outfall arrangements submitted to Cherwell District Council for approval of headwalls, culvert and re-graded outfall ditch to the Langford Brook. Note:- No works proposed within 8m of River so EA approval not required.



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The Maximum Velocity and Maximum Discharche ADE CALCUNTED Below USING MANNINGS FORMULA Assuming THE CHARAEL IS 75% Fill $V = R^3 \times S^{\frac{1}{2}} = 0.246^3 \times 0.005^{\frac{1}{2}} = 0.555 \text{ M/S}$ $R = A \times V = 0.6 \times 0.555 \times 0.75 = 2.50 \text{ J/S}$ $E \times PECTEO PEAK 1 - Hour Flows$ AREA TO BE SERVED ASSUMED FEH PANGAU INTENSITY = 82.6 mm/irr (1) DURATION = 1 Hour. COEFFICIENT OF RUNOFF (AVERAGE) = 0.5 (CONSERVATIVE) (C) $Q = CIA = 0.5 \times 6.0826 \times 20,000 = 0.23 \text{ m}^3/5 \text{ or } 230 \text{ J/S}$						YPILAL S	ECTION
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$V = \frac{R^{3}}{n} \times \frac{S^{2}}{S^{2}} = 0.246^{3} \times 0.005^{\frac{1}{2}} = 0.555 \text{ m/s}$ $Q = A \times V = 0.6 \times 0.555 \times 0.75 = 250 \text{ m/s}$ $E \times PECTEO PEAR I - Hour FLOWS$ $Apca to BE SERVED = 20,000 \text{ m}^{2} (A)$ $Assimed FEH PAINFAU INTENSITY = 82.6 \text{ mm/sr} (i)$ $Duratical = 1.4600\text{ m}$ $Coefficient of Pinceff (Automatic) = 0.5 (conservative) (c)$ $Q = CiA = 0.5 \times 0.0826 \times 20,000 = 0.23 \text{ m}^{3}/5 \text{ or } 230 \text{ m/s}$ $Coefficient of Conservative (c)$	THE WAXMANN VELOCITY	eno IVU	Activities	n erse	HADGE	- <u>AVX</u> - C/	Hamereo
$Q = A \times V = 0.6 \times 0.555 \times 0.75 = 2.50 \text{ ys}$ $E \times PECTEO PEAK 1 - Hour FLOWS$ Aprea to be Served $= 20,000 \text{ m}^2 (A)$ Assumed fell Painfrall Intensity = 82.6 mm/int (i) DURATION = 1.46000. (a) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c							
$Q = A \times V = 0.6 \times 0.555 \times 0.75 = 2.50 \text{ ys}$ $E \times PECTEO PEAK 1 - Hour FLOWS$ Aprea to be Served $= 20,000 \text{ m}^2 (A)$ Assumed fell Painfrall Intensity = 82.6 mm/int (i) DURATION = 1.46000. (a) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	$V = R^{3} \times S^{2} = 0$	246 3 ×	0 005	* =	<u> </u>	555 m/s	3
$Q = A \times V = 0.6 \times 0.555 \times 0.75 = 2.50 \text{ ys}$ $E \times PECTEO PEAK 1 - Hour FLOWS$ Aprea to be Served $= 20,000 \text{ m}^2 (A)$ Assumed fell Painfrall Intensity = 82.6 mm/int (i) DURATION = 1.46000. (a) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c		0.0	5				
$\frac{\text{ExPECTED PEAK I-HOUR FLOWS}}{\text{AREA TO BE SERVED}} = 20,000 \text{ m}^2(A)$ $\frac{\text{AREA TO BE SERVED}}{\text{Assumed FEH PAWARM INTENSITY}} = 82.6 \text{ mm/hr (i)}$ $\frac{\text{DURATION}}{\text{DURATION}} = 1 \text{ HOUR}.$ $\frac{\text{COEFFICIENT OF PLANOFF (AUGMAGE)}}{\text{COEFFICIENT OF PLANOFF (AUGMAGE)}} = 0.5 (conservative) (c)$ $\frac{\text{Q}}{\text{Q}} = \text{CIA} = 0.5 \times 0.0826 \times 20,000 = 0.23 \text{ m}^3/5 \text{ or } 230 \text{ V/s}}{60 \times 60}$							
$\frac{\text{ExPECTED PEAK I-HOUR FLOWS}}{\text{AREA TO BE SERVED}} = 20,000 \text{ m}^2(A)$ $\frac{\text{AREA TO BE SERVED}}{\text{Assumed FEH PAWARW INTENSITY}} = 82.6 \text{ mm/hr (i)}$ $\frac{\text{DURATION}}{\text{DURATION}} = 1 \text{ HOUR}.$ $\frac{\text{COEFFICIENT OF PLANOFF (AUGMAGE)}}{\text{COEFFICIENT OF PLANOFF (AUGMAGE)}} = 0.5 (conservative) (c)$ $\frac{\text{Q} = \text{CIA} = 0.5 \times 0.0826 \times 20,000}{60 \times 60} = 0.23 \text{ m}^3/5 \text{ or } 230 \text{ VS}}$	$Q = A \times V = 0$	·6 × 0	.555 x	0.75	=	<u>250 1/4</u>	<u><u></u></u>
$\begin{array}{rcl} ATPER TO BE SERVED &= 20,000 \ m^2(A) \\ ASSUMED FEH PRIMARY INTENSITY &= 82.6 \ mm/inr(i) \\ DURATIONS &= 1.4600 \\ COEFFICIENT OF PUNOFF (AUFMAGE) &= 0.5 (CONSELVATIVE) (C) \\ Q &= CIA &= 0.5 \times 0.0826 \times 20,000 \\ &= 0.23 \ m^3/s \ or \ 230 \ V/s \\ &= 60 \times 60 \end{array}$						<u></u>	
$\begin{array}{l} Durations = 1 \ Hour.\\ Coefficient of Rinder (Augmage) = 0.5 (constructine) (c)\\ Q = CIA = 0.5 \times 0.0826 \times 20,000 = 0.23 \ m^{3}/s \ or \ 230 \ Vs \\ 60 \times 60 \qquad $	EXPECTED FEAK 1- HOUR	z thoms			i l		
$\begin{array}{l} Durations = 1 \ Hour.\\ Coefficient of Rinder (Augmage) = 0.5 (constructine) (c)\\ Q = CIA = 0.5 \times 0.0826 \times 20,000 = 0.23 \ m^{3}/s \ or \ 230 \ Vs \\ 60 \times 60 \qquad $	Acces on Res Sector				a .21	(1)	
$\begin{array}{l} Durations = 1 \ Hour.\\ Coefficient of Rinder (Automate) = 0.5 (constructine) (c)\\ Q = CIA = 0.5 \times 0.0826 \times 20,000 = 0.23 \ m^3/s \ or \ 230 \ Vs \\ 60 \times 60 \qquad $	Assumed fill Paulant 1	A ITE A SOT		2	and her	Ň	
$Q = CiA = 0.5 \times 6.6826 \times 20,000 = 0.23 \text{ m}^3/s \text{ or } 230 \text{ V/s} \\ 60 \times 60 \text{ (or)} < 250 \text{ V/s} \\ < 250 \text{ V/s} \\ < 0.60 \text{ (or)} $	Dipation = 1 Llouis	101000119			and the	9	* ************************************
$Q = CiA = 0.5 \times 6.6826 \times 20,000 = 0.23 \text{ m}^3/s \text{ or } 230 \text{ V/s} \\ 60 \times 60 \text{ (or)} < 250 \text{ V/s} \\ < 250 \text{ V/s} \\ < 0.60 \text{ (or)} $	COEFFICIENT OF PUNOFF	(AVEMAG	€) = (3.51	CONSERS	urme) (3
						-	
	$Q = CiA = 0.5 \times c$	0. 826 ×	20,00	<u>o</u> =	o·23	m³/s or	230 1/s
DITCH IS GARESTLY OK	6	0260			·	<u> </u>	250 / OK.
UTTEN IS GORE TRY OK							
			, 4	<u>r</u>	TCH 13	WRENT	Y ok

E A LL E Y J O H N S O N H A Y E S Bailey Johnson Hayes Suite 4, Phoenix House, 63 Campfield Road St Albans, Hertfordshire. AL4 5FL Tel: 01727 841172 Email: wb@bjh.co.uk	Project Catalyst Bicester, Wendlebury Rd, Bicest for Albion Land. Section Ditch Capacity Check	Checked	Sheet No. 2 of 2 Rev. Date Jan 2023 Date						
Web: www.bjh.co.uk		WB	Jan 2023						
Calculations									
			· · · · · · · · · · · · · · · · · · ·						
DITCH 'B' CHRACITY CHE NOTE: SEE ATTACHED C		in of Orth B							
DITCH PROAMETERS									
TOTAL LENGHTH OF ONT	4 = 46.5m								
INVERT LEVEL ATTOP OF	DTEM = 62.50 m F								
ADEA DOAMED BY DIT	-(2.268) = 1 m 200 $= 265 m^2 (1)$	AREA OF DITCH)							
Upstream FLOWS DPAIN			<u>50 - 300 1/s .</u>						
	= 230 4/5 (2	UITCH H J J							
CHANNEL CHARATERISTS		<u> </u>							
	HANNEL = 5. The	77-77	And the second						
AVERAGE BTM WIDTH OF C			13n						
CHANNEL DEDTH OVERAND	=1.3m		O.GM						
Side (S)	= 0.005 m/m	Max 175							
Ruburess Cofficient	(n) = 0.05 +	LEVEL ,							
* FAIRLY REGULAR SECTION	WITH SAME BUIS OF WATER								
CHIMMEL Fren CAPRE									
THE MAXIMUM VELOS BELGUN USING MARIN	and tonum Assur	NMAR DEPTH C	¥0.6m						
$V = R^3 \times S^{\frac{1}{2}} =$	0.320 × 0.005	= 0.66 m/s							
h	0.05		·						
$Q = A \times V =$	1.0 × 0.66	= 660 Us							
EXPECTED REAK 1 - Har	tious								
had the part									
AREA SERVED DIRECTLY TEH 1- Have RAWFINL ((11.0%. · · · · · · · · · · · · · · · · · · ·						
Departer	S=PTH = 82.6 mm/ = 1 Han	· · · · · · · · · · · · · · · · · · ·	·						
COFFFICIENT OF PUNOFF	= 0.3								
ADDITIONAL FLORIS	= SAY 300	Ys .							
$Q = Cin = \frac{0.3 \times 0.0526}{3600}$	<u> 265 + 300 ys = 18</u>	+ 300 = 318	L/S MAK						
		DETCH is curple	NTY OK V						