

Planning Inspectorate Reference: EN010151

Change Request Environmental Statement Addendum Appendix 10.1 Attenuation Calcula-

tions

Document Reference: 10.10

December 2025



IT:	PROJECT: Beacon Fen Energy Park	JOB NO.: ST19595	CALC. REF. NO.:			
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Calcu	ılation: Required Attenuation - C	onstruction Phase (Submitted Work Plar	1)			
Causeway 'Flow' Attenuation	on Volume Estimate					
Rainfall Methodology	FSR v	Calculations assume no infi	Itration as a 'worst case'			
Rainfall Events	Singular v	scenario	Worst case			
FSR Region	England & Wales v	Discharge rates based on 1.	44 I/s/ha QBAR rate			
M5-60 (mm)	20.000					
Ratio-R	0.400					
Summer CV ✓	0.750					
Winter CV	0.840					
Work No. 4A						
Storage Estimate		Storage Estimate				
Return Period (years)	30	Return Period (years)	00			
Climate Change (%)	35	Climate Change (%)	10			
Impermeable Area (ha)	0.690	Impermeable Area (ha)	0.690			
Peak Discharge (I/s)	0.990	Peak Discharge (I/s)	0.990			
Infiltration Coefficient (m/hr) (leave blank if no infiltration)	0.00000	Infiltration Coefficient (m/hr) (leave blank if no infiltration)	0.0000			
Required Storage (m³)	Calc	Required Storage (m³)	Calc			
from	428		589			
to	486	_	647			
Average: 457m3		Average: 618m3				
Work No. 5A, 5B, 5C						
Storage Estimate		Storage Estimate				
Return Period (years)	30	Return Period (years)	100			
Climate Change (%)	35	Climate Change (%)	40			
Impermeable Area (ha)	2.940	Impermeable Area (ha)	2.940			
Peak Discharge (I/s)	4.230	Peak Discharge (I/s)	4.230			
Infiltration Coefficient (m/hr) (leave blank if no infiltration)		Infiltration Coefficient (m/hr) (leave blank if no infiltration)				
Required Storage (m³)	Calc	Required Storage (m³)	Calc			
from	1821	from	2508			
to	2069	to	2758			
Average: 1,945m3		Average: 2,633m3				

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	Beacon Fen Energy Parl	K ST19595	PAGE: OF
Calc	ulation: Required Attenuation - 0	Construction Phase (Submitted Work F	Plan)
Causeway 'Flow' Attenuation	on Volume Estimate	Work No. 5D	
		WOLK INO. 3D	Calculations assume n
Rainfall Methodology	FSR V		infiltration as a 'worst
Rainfall Events	Singular >		case' scenario
FSR Region	England & Wales V		Discharge rates based
M5-60 (mm)	20.000		on 1.44 l/s/ha QBAR
Ratio-R	0.400		rate
Summer CV ✓	0.750		
Winter CV ✓	0.840		
Work No. 5D			
WOIR NO. 3D			
Storage Estimate		Storage Estimate	
Return Period (years)	30	Return Period (years)	100
Climate Change (%)	35	Climate Change (%)	40
Impermeable Area (ha)	1.670	Impermeable Area (ha)	1.670
Peak Discharge (I/s)	2.400	Peak Discharge (I/s)	2.400
Infiltration Coefficient (m/hr)		Infiltration Coefficient (m/hr)	
(leave blank if no infiltration)		(leave blank if no infiltration)	
Required Storage (m³)	Calc	Required Storage (m³)	Calc
from	1035	from	1425
to	1175	to	1567
Average 1 105m2		Avaraga, 1.216m2	
Average: 1,105m3		Average: 1,316m3	
Existing Substation			
Storage Estimate		Storage Estimate	
Return Period (years)	30	Return Period (years)	100
Climate Change (%)	35	Climate Change (%)	40
Impermeable Area (ha)	7.430	Impermeable Area (ha)	7.430
Peak Discharge (I/s)	10.700	Peak Discharge (I/s)	10.700
		Infiltration Coefficient (m/hr)	0.00000
Infiltration Coefficient (m/hr) (leave blank if no infiltration)	0.00000	(leave blank if no infiltration)	0.0000
Required Storage (m³)	Calc	Required Storage (m³)	Calc
from	4601	from	6336
to	5229	to	6971
Average: 4,915m3		Average: 6,654m3	

on Fen Energy Park	JOB NO.: ST19595	CALC. F	REF. NO.:			
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uired Attenuation - Co	onstruction Phase (Change Reque	st)				
Estimate \	Work No. 5D					
~		Calcul	lations assum	ie no		
~			ation as a 'wo			
Wales V		scena	rio			
	19/1000047	Disch	arge rates ba	sed o		
		500	/s/ha QBAR r			
	Storage Estimate	100				
	Return Period (years)	100				
	Climate Change (%)	45	45			
	Impermeable Area (ha)	5.410				
	Peak Discharge (I/s)	7.790				
	Infiltration Coefficient (m/hr) (leave blank if no infiltration)					
	Required Storage (m³)					
			Calc			
	from					
	to	5264		4		
	Average: 5,033m3					
	Storage Estimate					
	Return Period (years)	100				
	Climate Change (%)	40				
	Impermeable Area (ha)	2.160		=		
	Peak Discharge (I/s)	3.110		=		
	Infiltration Coefficient (m/hr					
	(leave blank if no infiltration					
	Required Storage (m³)	Cal	С			
	fron	n 1842				
	t	2027				
	Average: 1,935m3					
			to 2027	to 2027		

CLIENT:	PROJECT:	JOB NO.:	CALC. REF. NO.:
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	Calculation: Required Attenua	tion - Construction Phase	
Causeway 'Flow' Attenuatio	n Volume Estimate		
Rainfall Methodology	FSR v	Calculations assume no ir	nfiltration as a 'worst case'
Rainfall Events	Singular	scenario	
FSR Region	England & Wales V	Discharge rates based on	1.44 l/s/ha QBAR rate
M5-60 (mm)	20.000		
Ratio-R	0.400		
Summer CV	0.750		
Winter CV	0.840		
Existing Substation			
Storage Estimate	St	orage Estimate	
Return Period (years)		turn Period (years)	100
Climate Change (%)	35CI	imate Change (%)	40
Impermeable Area (ha)	7.140 Im	permeable Area (ha)	7.140
Peak Discharge (I/s)	10.280 Pe	ak Discharge (I/s)	10.280
Infiltration Coefficient (m/hr) (leave blank if no infiltration)	- Int	iltration Coefficient (m/hr)	
Required Storage (m³)		ave blank if no infiltration)	
		equired Storage (m³)	Calc
	1422	from	6089
to 5	5025	to	6699
Average: 4,724m3	A	verage: 6,394m3	

Т:		PRO	OJECT		on Enor	av Dar	l,	JOB NO.: ST19595		CALC. REF. NO.:										
			ве	acon r	en Ener	gy Par	K			311	9595			PAG	E:			OF		
	Calc	ulatio	n: Rec	quired	Attenu	ation -	Opera	tional	Phase	(Subr	nitted '	Work I	Plan)							
auseway 'Flow' Atten	uatio	n Vo	olum	ne Es	timat	<u>e</u>														
Rainfall Methodology		FS	R			¢		Calc	ulatio	ons a	ssum	e no i	infilt	ratio	n as a	a 'wc	orst (rase'		
Rainfall Events		Sin	gular	P		v			nario	J113 u	JJuiii			latio			7130	case		
FSR Region		Eng	gland	8 W	ales	~		Disc	harge	e rate	es bas	ed or	า 1.4	14 I/s/	ha Q	BAR	rate	9		
M5-60 (mm)		20.0	000					Area	a 4A i	s rev	egeta	ted d	lurin	g ope	eratic	nal	phas	se		
Ratio-R		0.40	00																	
Summer CV	~	0.75	50												+	\vdash	_			
Winter CV	V	0.84	10																	
Work No. 5A, 5B ar	id 5C	;													+	++				
Storage Estimate							St	orage	Estir	mate										
Return Period (years)		30					Re	turn	Perio	d (yea	ars)		10	0						
Climate Change (%)		35					CI	Climate Change (%)			40									
Impermeable Area (ha)		2.20	0				lm	perm	eable	Area	(ha)		2.	200						
Peak Discharge (I/s)		3.17	0				Pe	ak Di	schai	rge (I	(s)		3.	170						
Infiltration Coefficient (m (leave blank if no infiltrat	/hr)										ient (r infiltra									
Required Storage (m³)	1011)		Calc				•		d Sto			ition)		Oal						
	rom	1362				_	-	quire	u Sto	nage	(111)	fram	10	Cal	C			_		
'	to	1548				=						from		64				=		
		1040											20	104	_	_	_	4		
Average: 1,455m3							Av	eraq	e: 1,9	970m	13									
Work No. 5D - exist	ina s	3000	SC 1	oad.																
WOIK NO. 5D - exist	ung a	acce	:55 1	Uau																
Storage Estimate							Sto	rage I	Estim	<u>ate</u>										
Return Period (years)		30					Reti	urn P	eriod	(year	s)		100]		
Climate Change (%)		35					Clin	nate 0	Chang	je (%))		40							
Impermeable Area (ha)		0.48	0				Imp	erme	able A	Area (ha)		0.48	0						
Peak Discharge (I/s)		0.69	0				Pea	k Dis	charg	e (I/s)		0.69	0						
Infiltration Coefficient (m (leave blank if no infiltrat											nt (m filtrati									
Required Storage (m³)			Calc				Req	uired	Stora	age (r	n³)			Calc						
f	rom	297					-				fr	om	409]		
	to	338					-					to	450							
·																				
				_			_						_							
Average:318m3							Av	erag	e: 43	0m3										

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Calc	culation: Required Attenuation - Oper	ational Phase (Submitted Work Plan	1)
Causeway 'Flow' Attenuation	on Volume Estimate		
Rainfall Methodology	FSR v	Calculations assume no inf	iltration as a 'worst case'
Rainfall Events	Singular	scenario Discharge rates based on 1	14 1/s/ha OBAP rate
FSR Region	England & Wales V	Discharge rates based on 1	.44 I/S/IIa QBANTate
M5-60 (mm)	20.000	Area 4A is revegetated dur	ing operational phase
Ratio-R	0.400		
Summer CV ✓	0.750		
Winter CV	0.840		
Eviation Cubatation			
Existing Substation			
Storage Estimate		Storage Estimate	
Return Period (years)		Return Period (years)	100
Climate Change (%)	1000	Climate Change (%)	40
Impermeable Area (ha)		Impermeable Area (ha)	7.430
Peak Discharge (I/s)		Peak Discharge (I/s)	10.700
Infiltration Coefficient (m/hr)		Infiltration Coefficient (m/hr)	0.00000
(leave blank if no infiltration)	0.0000	(leave blank if no infiltration)	
Required Storage (m³)	Calc	Required Storage (m³)	Calc
from	4601	from	6336
to	5229	to	6971
Average: 4,915m3		vores 6 654m2	
Average: 4,915m3	A	verage: 6,654m3	

IT:	PROJECT:	JOB NO.:	CALC. REF. NO.:				
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C	alculation: Required Attenuati	ion - Operational Phase (Change Request)					
Causeway 'Flow' Attenuation	on Volume Estimate	_					
Rainfall Methodology	FSR v	Calculations assume no inf	iltration as a 'worst case'				
Rainfall Events	Singular v	scenario					
FSR Region	England & Wales V	Discharge rates based on 1	.44 I/s/ha QBAR rate				
M5-60 (mm)	20.000	*(all surfacing removed wit	thin 4A area to south east				
Ratio-R	0.400	of substation)					
Summer CV	0.750	1					
Winter CV	0.840						
W. I N. 50 50							
Work No. 5A, 5B and p	aritai 50°						
Storage Estimate		Storage Estimate					
Return Period (years)	30	Return Period (years)	100				
Climate Change (%)	35	Climate Change (%)	40				
Impermeable Area (ha)	2.200	Impermeable Area (ha)	2.200				
Peak Discharge (I/s)	3.170	Peak Discharge (I/s)	3.170				
Infiltration Coefficient (m/hr)		Infiltration Coefficient (m/hr)					
(leave blank if no infiltration)		(leave blank if no infiltration)					
Required Storage (m³)	Calc	Required Storage (m³)	Calc				
from	1362	from	1876				
to	1548	to	2064				
Average: 1,455m3		Average: 1,970m3					
Average: 1,4551115		Average: 1,370m3					
Work No. 5D (existing a	aggregate compound	and access road retained - ot	her areas revegetated				
54							
Storage Estimate		Storage Estimate					
Return Period (years)	30	Return Period (years)	100				
Climate Change (%)	35	Climate Change (%)	0.770				
Impermeable Area (ha)	0.770	Impermeable Area (ha)					
Peak Discharge (I/s)	1.110	Peak Discharge (I/s)	1.110				
Infiltration Coefficient (m/hr) (leave blank if no infiltration)		Infiltration Coefficient (m/hr)					
Required Storage (m³)		(leave blank if no infiltration)					
	Calc	Required Storage (m³)	Calc				
from		from	657				
to	542	to	722				
Average: 510m3		Average: 690m3					

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Ca	alculation: Required Attenuation - Op	perational Phase (Change Request)				
Causeway 'Flow' Attenuation	un Valuma Estimata					
Causeway Flow Attelluation	ii voiuille Estilliate					
Rainfall Methodology	FSR 🗸	Calculations assume no infi	Itration as a 'worst case'			
Rainfall Events	Singular	scenario	441/ // ODAD 1			
FSR Region	England & Wales V	Discharge rates based on 1.	.44 I/s/na QBAR rate			
M5-60 (mm)	20.000					
Ratio-R	0.400					
Summer CV	0.750					
Winter CV	0.840					
Substation	Per reci Andrei					
Storage Estimate		Storage Estimate				
Return Period (years)		Return Period (years)	100			
Climate Change (%)	35	Climate Change (%)	40			
Impermeable Area (ha)	7.140	Impermeable Area (ha)	7.140			
Peak Discharge (I/s)	10.280	Peak Discharge (l/s)	10.280			
Infiltration Coefficient (m/hr) (leave blank if no infiltration)		Infiltration Coefficient (m/hr) (leave blank if no infiltration)				
Required Storage (m³)		Required Storage (m³)	0-1-			
from			Calc			
to		from	6089			
	3023	to	6699			
Average: 4,723m3	A	verage: 6,394m3				