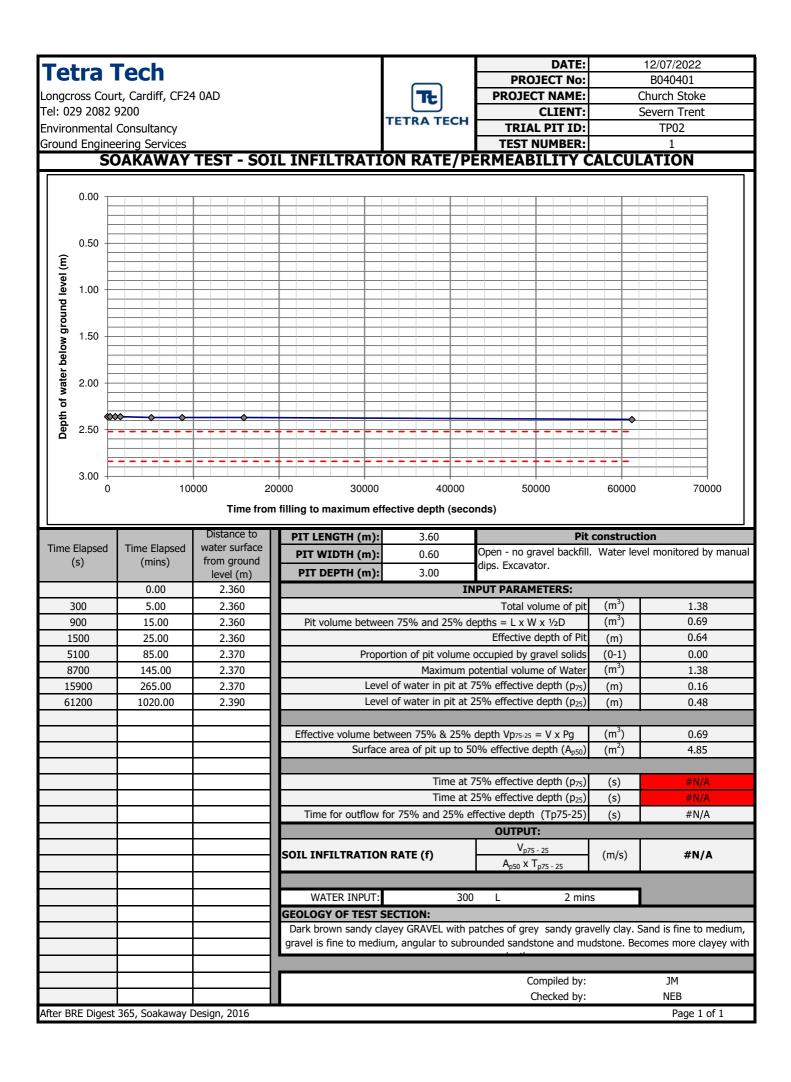
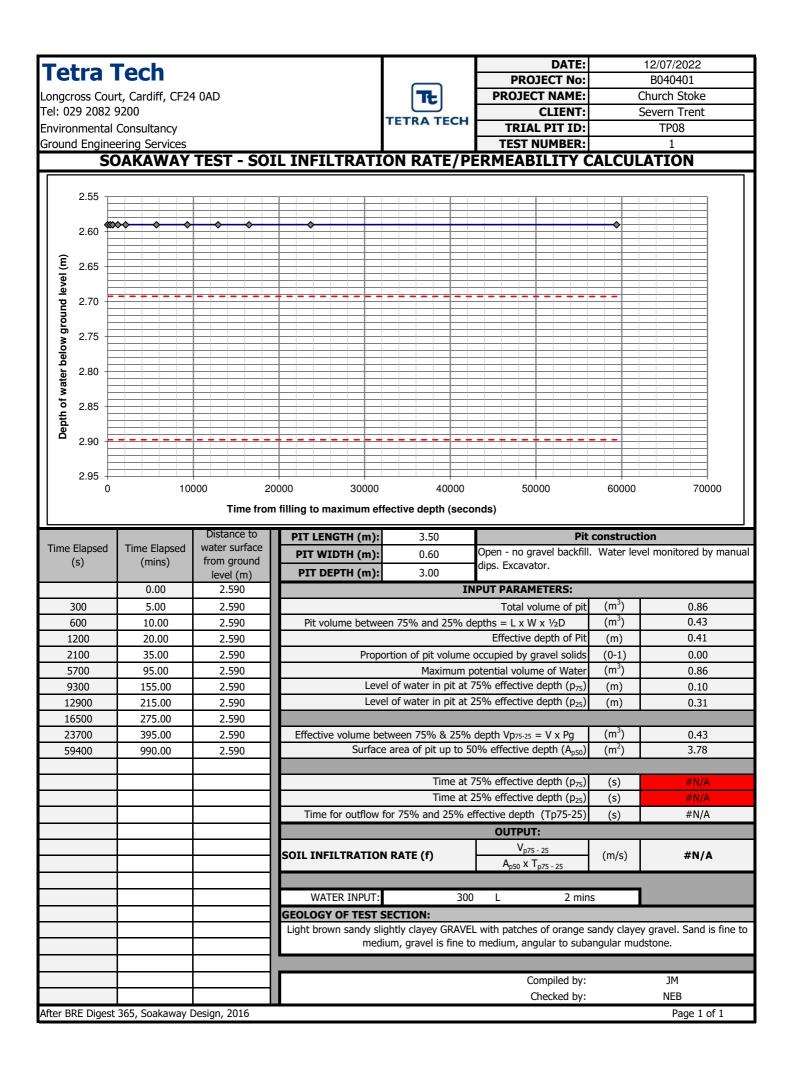
Appendix B Infiltration Testing Results

'etra	Tech				DATE:		12/07/2022
					PROJECT No:		B040401
	ourt, Cardiff, CF2	4 0AD		TE	PROJECT NAME:		Church Stoke
: 029 208			-	TETRA TECH	CLIENT:	9	Severn Trent
	al Consultancy				TRIAL PIT ID:		TP01
	neering Services				TEST NUMBER:		1
	SOAKAWAY	TEST - SO1	<u>IL INFILTRATIO</u>	ON RATE/P	ERMEABILITY (	CALCUL	ATION
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<b><sup>1</sup></b> 1.20							
epti							
<b>ق</b> <sub>1.40</sub>			<u>+</u>				
1.60							
	0 10	000 20	30000 30000	40000	50000	60000	70000
		Time from	n filling to maximum effe	ective depth (seco	onds)		
			n filling to maximum effe	ective depth (seco	-		
imo Elanco	d Time Elanced	Distance to	PIT LENGTH (m):	active depth (seco	Pit	construct	
-		Distance to water surface			Pit Open - no gravel backfill		
ime Elapsed (s)	d Time Elapsed (mins)	Distance to	PIT LENGTH (m):	3.40	Pit		
-		Distance to water surface from ground	PIT LENGTH (m): PIT WIDTH (m):	3.40 0.60 1.50	Pit Open - no gravel backfill		
•	(mins)	Distance to water surface from ground level (m)	PIT LENGTH (m): PIT WIDTH (m):	3.40 0.60 1.50	Pit Open - no gravel backfill dips. Excavator.	I. Water lev (m <sup>3</sup> )	
(s) 300 900	(mins) 0.00 5.00 15.00	Distance to water surface from ground level (m) 1.020 1.020 1.020	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m):	3.40 0.60 1.50	Pit Open - no gravel backfill dips. Excavator. IPUT PARAMETERS: Total volume of pit epths = L x W x ½D	(m <sup>3</sup> ) (m <sup>3</sup> )	el monitored by ma 0.98 0.49
(s) 300	(mins) 0.00 5.00	Distance to water surface from ground level (m) 1.020 1.020	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m):	3.40 0.60 1.50	Pit Open - no gravel backfill dips. Excavator. IPUT PARAMETERS: Total volume of pit	(m <sup>3</sup> ) (m <sup>3</sup> )	el monitored by ma
(s) 300 900	(mins) 0.00 5.00 15.00	Distance to water surface from ground level (m) 1.020 1.020 1.020	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee	3.40 0.60 1.50 IN n 75% and 25% do	Pit Open - no gravel backfill dips. Excavator. IPUT PARAMETERS: Total volume of pit epths = L x W x ½D	(m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1)	el monitored by ma 0.98 0.49
(s) 300 900 1500	(mins) 0.00 5.00 15.00 25.00	Distance to water surface from ground level (m) 1.020 1.020 1.020 1.030	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee	3.40 0.60 1.50 IN n 75% and 25% do rtion of pit volume Maximum p	Pit Open - no gravel backfill dips. Excavator. IPUT PARAMETERS: Total volume of pit epths = L x W x ½D Effective depth of Pit occupied by gravel solids iotential volume of Water	. Water lev (m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1) (m <sup>3</sup> )	el monitored by ma 0.98 0.49 0.48
(s) 300 900 1500 5100	(mins) 0.00 5.00 15.00 25.00 85.00	Distance to water surface from ground level (m) 1.020 1.020 1.020 1.030 1.030	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee Propor	3.40 0.60 1.50 IN n 75% and 25% do rtion of pit volume Maximum p of water in pit at 7	Pit Open - no gravel backfill dips. Excavator. IPUT PARAMETERS: Total volume of pit epths = L x W x ½D Effective depth of Pit occupied by gravel solids otential volume of Water 75% effective depth (p <sub>75</sub> )	. Water lev (m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1) (m <sup>3</sup> ) (m)	el monitored by ma 0.98 0.49 0.48 0.00
(s) 300 900 1500 5100 8700	(mins) 0.00 5.00 15.00 25.00 85.00 145.00	Distance to water surface from ground level (m) 1.020 1.020 1.020 1.030 1.030 1.030	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee Propor	3.40 0.60 1.50 IN n 75% and 25% do rtion of pit volume Maximum p of water in pit at 7	Pit Open - no gravel backfill dips. Excavator. IPUT PARAMETERS: Total volume of pit epths = L x W x ½D Effective depth of Pit occupied by gravel solids iotential volume of Water	. Water lev (m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1) (m <sup>3</sup> ) (m)	el monitored by ma 0.98 0.49 0.48 0.00 0.98
(s) 300 900 1500 5100 8700 15900	(mins) 0.00 5.00 15.00 25.00 85.00 145.00 265.00	Distance to water surface from ground level (m) 1.020 1.020 1.020 1.030 1.030 1.030 1.030	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee Propor Level Level	3.40 0.60 1.50 IN 75% and 25% de rtion of pit volume Maximum p of water in pit at 2 of water in pit at 2	Pit Open - no gravel backfill dips. Excavator. IPUT PARAMETERS: Total volume of pit epths = L x W x ½D Effective depth of Pit occupied by gravel solids otential volume of Water 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>25</sub> )	. Water lev (m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1) (m <sup>3</sup> ) (m) (m)	el monitored by ma 0.98 0.49 0.48 0.00 0.98 0.12
(s) 300 900 1500 5100 8700 15900	(mins) 0.00 5.00 15.00 25.00 85.00 145.00 265.00	Distance to water surface from ground level (m) 1.020 1.020 1.020 1.030 1.030 1.030 1.030	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee Propor Level Level Level Effective volume betw	3.40 0.60 1.50 IN rtion of pit volume Maximum p of water in pit at 2 of water in pit at 2 ween 75% & 25%	Pit Open - no gravel backfill dips. Excavator. IPUT PARAMETERS: Total volume of pit epths = L x W x ½D Effective depth of Pit occupied by gravel solids otential volume of Water 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>25</sub> ) depth Vp <sub>75-25</sub> = V x Pg	. Water lev (m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1) (m <sup>3</sup> ) (m) (m) (m)	el monitored by ma 0.98 0.49 0.48 0.00 0.98 0.12 0.36 0.49
(s) 300 900 1500 5100 8700 15900	(mins) 0.00 5.00 15.00 25.00 85.00 145.00 265.00	Distance to water surface from ground level (m) 1.020 1.020 1.020 1.030 1.030 1.030 1.030	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee Propor Level Level Level Effective volume betw	3.40 0.60 1.50 IN 75% and 25% de rtion of pit volume Maximum p of water in pit at 2 of water in pit at 2 ween 75% & 25%	Pit Open - no gravel backfill dips. Excavator. IPUT PARAMETERS: Total volume of pit epths = L x W x ½D Effective depth of Pit occupied by gravel solids otential volume of Water 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>25</sub> )	. Water lev (m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1) (m <sup>3</sup> ) (m) (m)	el monitored by ma 0.98 0.49 0.48 0.00 0.98 0.12 0.36
(s) 300 900 1500 5100 8700 15900	(mins) 0.00 5.00 15.00 25.00 85.00 145.00 265.00	Distance to water surface from ground level (m) 1.020 1.020 1.020 1.030 1.030 1.030 1.030	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee Propor Level Level Level Effective volume betw	3.40 0.60 1.50 IN n 75% and 25% do rtion of pit volume Maximum p l of water in pit at 7 l of water in pit at 5 ween 75% & 25%	Pit Open - no gravel backfill dips. Excavator. IPUT PARAMETERS: Total volume of pit epths = L x W x ½D Effective depth of Pit occupied by gravel solids iotential volume of Water 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>25</sub> ) depth Vp <sub>75-25</sub> = V x Pg 0% effective depth (A <sub>p50</sub> )	. Water lev (m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1) (m <sup>3</sup> ) (m) (m) (m <sup>3</sup> ) (m <sup>2</sup> )	el monitored by ma 0.98 0.49 0.48 0.00 0.98 0.12 0.36 0.49 3.96
(s) 300 900 1500 5100 8700 15900	(mins) 0.00 5.00 15.00 25.00 85.00 145.00 265.00	Distance to water surface from ground level (m) 1.020 1.020 1.020 1.030 1.030 1.030 1.030	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee Propor Level Level Level Effective volume betw	3.40 0.60 1.50 IN n 75% and 25% do rtion of pit volume Maximum pit at 7 of water in pit at 7 of water in pit at 7 of water in pit at 7 dof water in pit at 7 dof water in pit at 7 mean 75% & 25% area of pit up to 50 Time at 7	Pit Open - no gravel backfill dips. Excavator. IPUT PARAMETERS: Total volume of pit epths = L x W x $\frac{1}{2}$ D Effective depth of Pit occupied by gravel solids iotential volume of Water 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>25</sub> ) depth Vp <sub>75-25</sub> = V x Pg 0% effective depth (A <sub>p50</sub> ) 75% effective depth (p <sub>75</sub> )	. Water lev (m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1) (m <sup>3</sup> ) (m) (m) (m) (m <sup>3</sup> ) (m <sup>2</sup> )	el monitored by ma 0.98 0.49 0.48 0.00 0.98 0.12 0.36 0.49 3.96 #N/A
300 900 1500 5100 8700 15900	(mins) 0.00 5.00 15.00 25.00 85.00 145.00 265.00	Distance to water surface from ground level (m) 1.020 1.020 1.020 1.030 1.030 1.030 1.030	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee Propor Level Level Level Effective volume betwee Surface	3.40 0.60 1.50 IN n 75% and 25% de rtion of pit volume Maximum p l of water in pit at 2 l of water in pit at 2 d of water in pit at 2 ween 75% & 25% area of pit up to 50 Time at 2 Time at 2	Pit Open - no gravel backfill dips. Excavator. IPUT PARAMETERS: Total volume of pit epths = L x W x ½D Effective depth of Pit occupied by gravel solids otential volume of Water 75% effective depth (p <sub>75</sub> ) 25% effective depth (A <sub>p50</sub> ) depth Vp <sub>75-25</sub> = V x Pg 0% effective depth (A <sub>p50</sub> ) 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>75</sub> )	. Water lev (m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1) (m <sup>3</sup> ) (m) (m) (m) (m) (m <sup>3</sup> ) (m <sup>2</sup> ) (s) (s)	el monitored by ma 0.98 0.49 0.48 0.00 0.98 0.12 0.36 0.49 3.96 #N/A #N/A
(s) 300 900 1500 5100 8700 15900	(mins) 0.00 5.00 15.00 25.00 85.00 145.00 265.00	Distance to water surface from ground level (m) 1.020 1.020 1.020 1.030 1.030 1.030 1.030	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee Propor Level Level Level Effective volume betwee Surface	3.40 0.60 1.50 IN n 75% and 25% de rtion of pit volume Maximum p l of water in pit at 2 l of water in pit at 2 d of water in pit at 2 ween 75% & 25% area of pit up to 50 Time at 2 Time at 2	Pit Open - no gravel backfill dips. Excavator. IPUT PARAMETERS: Total volume of pit epths = L x W x ½D Effective depth of Pit occupied by gravel solids otential volume of Water 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>25</sub> ) depth Vp <sub>75-25</sub> = V x Pg 0% effective depth (A <sub>p50</sub> ) 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>25</sub> ) ffective depth (Tp75-25)	. Water lev (m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1) (m <sup>3</sup> ) (m) (m) (m) (m) (m <sup>3</sup> ) (m <sup>2</sup> ) (s) (s)	el monitored by ma 0.98 0.49 0.48 0.00 0.98 0.12 0.36 0.49 3.96 #N/A
(s) 300 900 1500 5100 8700 15900	(mins) 0.00 5.00 15.00 25.00 85.00 145.00 265.00	Distance to water surface from ground level (m) 1.020 1.020 1.020 1.030 1.030 1.030 1.030	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee Propor Level Level Level Effective volume betwee Surface	3.40 0.60 1.50 IN n 75% and 25% de rtion of pit volume Maximum p l of water in pit at 2 l of water in pit at 2 d of water in pit at 2 ween 75% & 25% area of pit up to 50 Time at 2 Time at 2	Pit Open - no gravel backfill dips. Excavator. IPUT PARAMETERS: Total volume of pit epths = L x W x ½D Effective depth of Pit occupied by gravel solids otential volume of Water 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>25</sub> ) depth Vp <sub>75-25</sub> = V x Pg 0% effective depth (A <sub>p50</sub> ) 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>25</sub> ) ffective depth (Tp75-25) OUTPUT:	. Water lev (m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1) (m <sup>3</sup> ) (m) (m) (m) (m) (m <sup>3</sup> ) (m <sup>2</sup> ) (s) (s)	el monitored by ma 0.98 0.49 0.48 0.00 0.98 0.12 0.36 0.49 3.96 #N/A #N/A
(s) 300 900 1500 5100 8700 15900	(mins) 0.00 5.00 15.00 25.00 85.00 145.00 265.00	Distance to water surface from ground level (m) 1.020 1.020 1.020 1.030 1.030 1.030 1.030	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee Propor Level Level Level Effective volume bett Surface Time for outflow for	3.40 0.60 1.50 IN n 75% and 25% de rtion of pit volume Maximum p l of water in pit at 2 l of water in pit at 2 d of water in pit at 2 ween 75% & 25% area of pit up to 50 Time at 2 or 75% and 25% e	Pit Open - no gravel backfill dips. Excavator. IPUT PARAMETERS: Total volume of pit epths = L x W x $\frac{1}{2D}$ Effective depth of Pit occupied by gravel solids iotential volume of Water 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>25</sub> ) depth Vp <sub>75-25</sub> = V x Pg 0% effective depth (A <sub>p50</sub> ) 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>25</sub> ) gravel depth (p <sub>75</sub> ) 25% effective depth (p <sub>25</sub> ) 25% effective depth (p <sub>25</sub> ) ffective depth (Tp75-25) OUTPUT: V <sub>p75-25</sub>	. Water lev (m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1) (m <sup>3</sup> ) (m) (m) (m) (m) (m <sup>3</sup> ) (s) (s) (s) (s)	el monitored by ma 0.98 0.49 0.48 0.00 0.98 0.12 0.36 0.49 3.96 #N/A #N/A #N/A
(s) 300 900 1500 5100 8700 15900	(mins) 0.00 5.00 15.00 25.00 85.00 145.00 265.00	Distance to water surface from ground level (m) 1.020 1.020 1.020 1.030 1.030 1.030 1.030	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee Propor Level Level Level Effective volume betwee Surface	3.40 0.60 1.50 IN n 75% and 25% de rtion of pit volume Maximum p l of water in pit at 2 l of water in pit at 2 d of water in pit at 2 ween 75% & 25% area of pit up to 50 Time at 2 or 75% and 25% e	Pit Open - no gravel backfill dips. Excavator. IPUT PARAMETERS: Total volume of pit epths = L x W x ½D Effective depth of Pit occupied by gravel solids otential volume of Water 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>25</sub> ) depth Vp <sub>75-25</sub> = V x Pg 0% effective depth (A <sub>p50</sub> ) 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>25</sub> ) ffective depth (Tp75-25) OUTPUT:	. Water lev (m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1) (m <sup>3</sup> ) (m) (m) (m) (m) (m <sup>3</sup> ) (m <sup>2</sup> ) (s) (s)	el monitored by ma 0.98 0.49 0.48 0.00 0.98 0.12 0.36 0.49 3.96 #N/A #N/A
(s) 300 900 1500 5100 8700 15900	(mins) 0.00 5.00 15.00 25.00 85.00 145.00 265.00	Distance to water surface from ground level (m) 1.020 1.020 1.020 1.030 1.030 1.030 1.030	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee Propor Level Level Level Effective volume betw Surface Time for outflow for SOIL INFILTRATION	3.40 0.60 1.50 IN n 75% and 25% de rtion of pit volume Maximum p l of water in pit at 2 l of water in pit at 2 d of water in pit at 2 ween 75% & 25% area of pit up to 50 Time at 2 or 75% and 25% e	Pit Open - no gravel backfill dips. Excavator. IPUT PARAMETERS: Total volume of pit epths = L x W x $\frac{1}{2D}$ Effective depth of Pit occupied by gravel solids iotential volume of Water 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>25</sub> ) depth Vp <sub>75-25</sub> = V x Pg 0% effective depth (A <sub>p50</sub> ) 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>25</sub> ) gravel depth (p <sub>75</sub> ) 25% effective depth (p <sub>25</sub> ) 25% effective depth (p <sub>25</sub> ) ffective depth (Tp75-25) OUTPUT: V <sub>p75-25</sub>	. Water lev (m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1) (m <sup>3</sup> ) (m) (m) (m) (m) (m <sup>3</sup> ) (s) (s) (s) (s)	el monitored by ma 0.98 0.49 0.48 0.00 0.98 0.12 0.36 0.49 3.96 #N/A #N/A #N/A
(s) 300 900 1500 5100 8700 15900	(mins) 0.00 5.00 15.00 25.00 85.00 145.00 265.00	Distance to water surface from ground level (m) 1.020 1.020 1.020 1.030 1.030 1.030 1.030	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee Propor Level Level Level Effective volume bett Surface Time for outflow for	3.40 0.60 1.50 IN n 75% and 25% de rtion of pit volume Maximum p l of water in pit at 2 l of water in pit at 2 d of water in pit at 2 ween 75% & 25% area of pit up to 50 Time at 2 or 75% and 25% e	Pit Open - no gravel backfill dips. Excavator. IPUT PARAMETERS: Total volume of pit epths = L x W x $\frac{1}{2D}$ Effective depth of Pit occupied by gravel solids otential volume of Water 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>25</sub> ) depth Vp <sub>75-25</sub> = V x Pg 0% effective depth (A <sub>p50</sub> ) 75% effective depth (A <sub>p50</sub> ) 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>75</sub> -25) OUTPUT: V <sub>p75-25</sub> A <sub>p50</sub> x T <sub>p75-25</sub>	. Water lev (m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1) (m <sup>3</sup> ) (m) (m) (m) (m) (m) (s) (s) (s) (s) (s) (s) (s) (s) (s)	el monitored by ma 0.98 0.49 0.48 0.00 0.98 0.12 0.36 0.49 3.96 #N/A #N/A #N/A
(s) 300 900 1500 5100 8700 15900	(mins) 0.00 5.00 15.00 25.00 85.00 145.00 265.00	Distance to water surface from ground level (m) 1.020 1.020 1.020 1.030 1.030 1.030 1.030	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee Propor Level Level Effective volume betw Surface Soil INFILTRATION WATER INPUT: GEOLOGY OF TEST SU	3.40 0.60 1.50 IN IN IN IN IN IN IN IN IN IN	PitOpen - no gravel backfilldips. Excavator.IPUT PARAMETERS:Total volume of pitepths = L x W x $\frac{1}{2D}$ Effective depth of Pitoccupied by gravel solidsotential volume of Water75% effective depth ( $p_{75}$ )25% effective depth ( $p_{75}$ )UTPUT: $V_{p75-25}$ $A_{p50} \times T_{p75-25}$ L2 min	. Water lev (m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1) (m <sup>3</sup> ) (m) (m) (m) (m) (m) (s) (s) (s) (s) (s) (s) (s) (s) (s)	el monitored by ma 0.98 0.49 0.48 0.00 0.98 0.12 0.36 0.49 3.96 #N/A #N/A #N/A #N/A
(s) 300 900 1500 5100 8700 15900	(mins) 0.00 5.00 15.00 25.00 85.00 145.00 265.00	Distance to water surface from ground level (m) 1.020 1.020 1.020 1.030 1.030 1.030 1.030	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee Pit volume betwee Level Level Level Effective volume bett Surface Soil INFILTRATION WATER INPUT: GEOLOGY OF TEST SI Dark brown sandy slig	3.40 0.60 1.50 IN I	Pit Open - no gravel backfill dips. Excavator. IPUT PARAMETERS: Total volume of pit epths = L x W x $\frac{1}{2D}$ Effective depth of Pit occupied by gravel solids otential volume of Water 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>25</sub> ) depth Vp <sub>75-25</sub> = V x Pg 0% effective depth (A <sub>p50</sub> ) 75% effective depth (A <sub>p50</sub> ) 75% effective depth (p <sub>75</sub> ) 25% effective depth (p <sub>75</sub> -25) OUTPUT: V <sub>p75-25</sub> A <sub>p50</sub> x T <sub>p75-25</sub>	. Water lev (m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1) (m <sup>3</sup> ) (m) (m) (m) (m) (m) (m) (s) (s) (s) (s) (s) (s) (s) (s) (s) (s	el monitored by ma 0.98 0.49 0.48 0.00 0.98 0.12 0.36 0.49 3.96 #N/A #N/A #N/A #N/A
(s) 300 900 1500 5100 8700 15900	(mins) 0.00 5.00 15.00 25.00 85.00 145.00 265.00	Distance to water surface from ground level (m) 1.020 1.020 1.020 1.030 1.030 1.030 1.030	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee Pit volume betwee Level Level Level Effective volume bett Surface Soil INFILTRATION WATER INPUT: GEOLOGY OF TEST SI Dark brown sandy slig	3.40 0.60 1.50 IN I	Pit         Open - no gravel backfill         dips. Excavator.         IPUT PARAMETERS:         Total volume of pit         epths = L x W x ½D         Effective depth of Pit         occupied by gravel solids         otential volume of Water         75% effective depth ( $p_{75}$ )         25% effective depth ( $p_{75}$ )         0UTPUT: $V_{p75 - 25}$ $A_{p50} \times T_{p75 - 25}$ L       2 mir         . with patches of grey wittedium, angular to subrout	. Water lev (m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1) (m <sup>3</sup> ) (m) (m) (m) (m <sup>2</sup> ) (s) (s) (s) (s) (s) (s) (s) (s)	el monitored by ma 0.98 0.49 0.48 0.00 0.98 0.12 0.36 0.49 3.96 #N/A #N/A #N/A #N/A #N/A
(s) 300 900 1500 5100 8700 15900	(mins) 0.00 5.00 15.00 25.00 85.00 145.00 265.00	Distance to water surface from ground level (m) 1.020 1.020 1.020 1.030 1.030 1.030 1.030	PIT LENGTH (m): PIT WIDTH (m): PIT DEPTH (m): Pit volume betwee Pit volume betwee Level Level Level Effective volume bett Surface Soil INFILTRATION WATER INPUT: GEOLOGY OF TEST SI Dark brown sandy slig	3.40 0.60 1.50 IN I	PitOpen - no gravel backfilldips. Excavator.IPUT PARAMETERS:Total volume of pitepths = L x W x $\frac{1}{2D}$ Effective depth of Pitoccupied by gravel solidsootential volume of Water75% effective depth ( $p_{75}$ )25% effective depth ( $p_{25}$ )depth Vp75-25 = V x Pg0% effective depth ( $p_{75}$ )25% effective depth ( $p_{75}$ )0UTPUT: $V_{p75-25}$ $A_{p50} \times T_{p75-25}$ L2 mirwith patches of grey witt	. Water lev (m <sup>3</sup> ) (m <sup>3</sup> ) (m) (0-1) (m <sup>3</sup> ) (m) (m) (m) (m) (m) (s) (s) (s) (s) (s) (s) (s) (s) (s) (s	el monitored by ma 0.98 0.49 0.48 0.00 0.98 0.12 0.36 0.49 3.96 #N/A #N/A #N/A #N/A





'etra	a Tech				DATE:		12/07/2022
					PROJECT No:		B040401
	Court, Cardiff, CF2	24 0AD		TE	PROJECT NAME:		Church Stoke
	82 9200				CLIENT:	S	Severn Trent
vironme	ntal Consultancy			TETRA TECH	TRIAL PIT ID:		TP09
ound En	gineering Services				TEST NUMBER:		1
	SOAKAWAY	( TEST - SO	IL INFILTRATIO	DN RATE/P	ERMEABILITY C	CALCUL	ATION
2.3	5						
2.40	) <b>8000 - 0</b>		•			<b></b>	
2.4	j						
Ê							
) 2.50	)						
<b>j</b> 2.5	5		*				
n							
<b>2.</b> 60	)						
<u>8</u> 2.65	5						
<b>1</b> 2.70	)						
Depth of water below ground level (m) 2.5: 2.6: 2.6: 2.6: 2.6: 2.6: 2.6: 2.6: 2.6	'						
2.80	)						
2.85	,		*				
2.90	)						
	0 1	0000 20	0000 30000	40000	50000	60000	70000
		Time fron	n filling to maximum effe	ective depth (seco	onds)		
				• •			
ime Elaps	ed Time Elapsed	Distance to water surface	PIT LENGTH (m):	3.50		constructi	
(s)	(mins)	from ground	PIT WIDTH (m):	0.60	Open - no gravel backfill dips. Excavator.	. Water leve	el monitored by mai
()		level (m)	PIT DEPTH (m):	3.00	•		
	0.00	2.400		IN	IPUT PARAMETERS:		
300	5.00	2.410			Total volume of pit	(m³)	1.26
600	10.00	2.420	Pit volume between	n 75% and 25% de	epths = $L \times W \times \frac{1}{2}D$	(m <sup>3</sup> )	0.63
1200	20.00	2.420			Effective depth of Pit		0.60
2100	35.00	2.420	Propor	•	occupied by gravel solids	(0-1)	0.00
5700	95.00	2.420			otential volume of Water	(m <sup>3</sup> )	1.26
9300	155.00	2.420			75% effective depth $(p_{75})$	(m)	0.15
12900	215.00	2.420	Level	or water in pit at 2	25% effective depth (p <sub>25</sub> )	(m)	0.45
16500	275.00	2.420				(m <sup>3</sup> )	0.62
23700	395.00	2.420			depth Vp <sub>75-25</sub> = V x Pg D% effective depth ( $A_{p50}$ )	(m <sup>3</sup> ) (m <sup>2</sup> )	0.63 4.56
59400	990.00	2.420	SuildCe		(Ap50)	(11)	4.30
		┨────┨		Time at 7	75% effective depth (p <sub>75</sub> )	(s)	#N/A
		┨─────┨			25% effective depth $(p_{75})$	(s)	#N/A
		┥───┤	Time for outflow for		ffective depth (Tp75-25)	(s)	#N/A #N/A
					OUTPUT:	(3)	
		╂────┨			V <sub>p75 - 25</sub>		
			SOIL INFILTRATION	RATE (f)	A <sub>p50</sub> x T <sub>p75 - 25</sub>	(m/s)	#N/A
		┥───┤			rip50 A i p75 - 25		
		┼───┤	WATER INPUT:	300	L 2 min	s 1	
		1 I				<u> </u>	
			ICENI OCY OF TEET OF				aarea subangular t
			GEOLOGY OF TEST SE		d is fine to medium arour	al ic tine to r	
				ayey GRAVEL. San	d is fine to medium, grave Ibrounded mudstone.	el is fine to c	Joarse, subaligular i
				ayey GRAVEL. San	d is fine to medium, grave Ibrounded mudstone.	el is fine to c	
				ayey GRAVEL. San	ibrounded mudstone.	el is fine to c	
				ayey GRAVEL. San	brounded mudstone.	el is fine to c	ЈМ
	gest 365, Soakaway			ayey GRAVEL. San	ibrounded mudstone.	el is fine to c	

Appendix C MicroDrainage Calculations

# **Greenfield Runoff Calculation**

Pell Frischmann		Page 1
5 Manchester Square		
London		
W1U 3PD		Micro
Date 03/10/2022 14:38	Designed by NStarkey	Micro Drainage
File	Checked by	Drainage
Innovyze	Source Control 2020.1	
1	bource concror roro.r	
ICP SUD	S Mean Annual Flood	
	Input	
Return Period (yea	rs) 100 Soil 0.450	
	ha) 1.000 Urban 0.000 mm) 919 Region Number Region 9	
	Results 1/s	
	QBAR Rural 6.0 QBAR Urban 6.0	
	2100 years 13.2	
	Q1 year 5.3 Q30 years 10.7	
	Q100 years 13.2	
	* 1	
©198	32-2020 Innovyze	

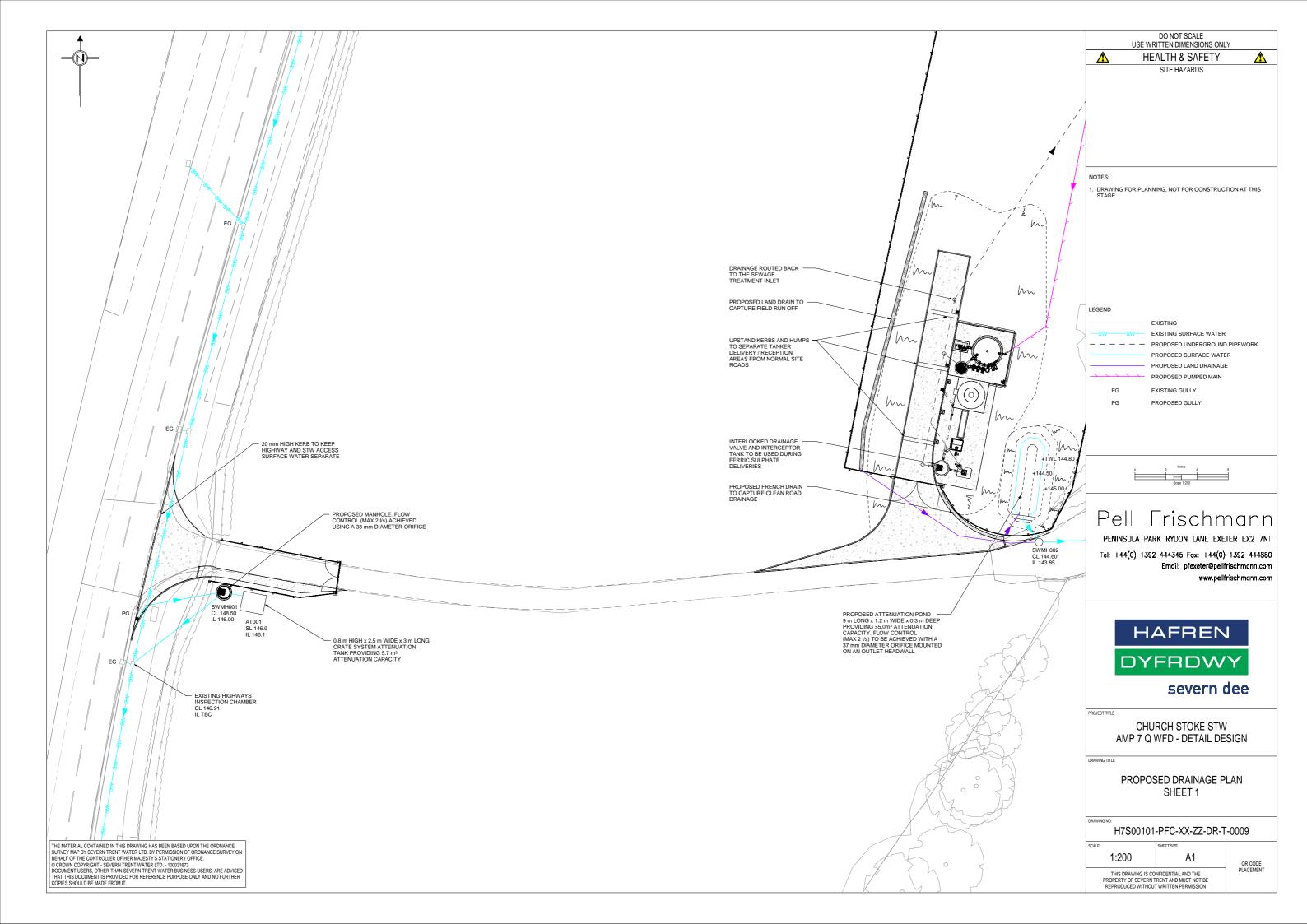
# **Dosing Plant Access Road Attenuation**

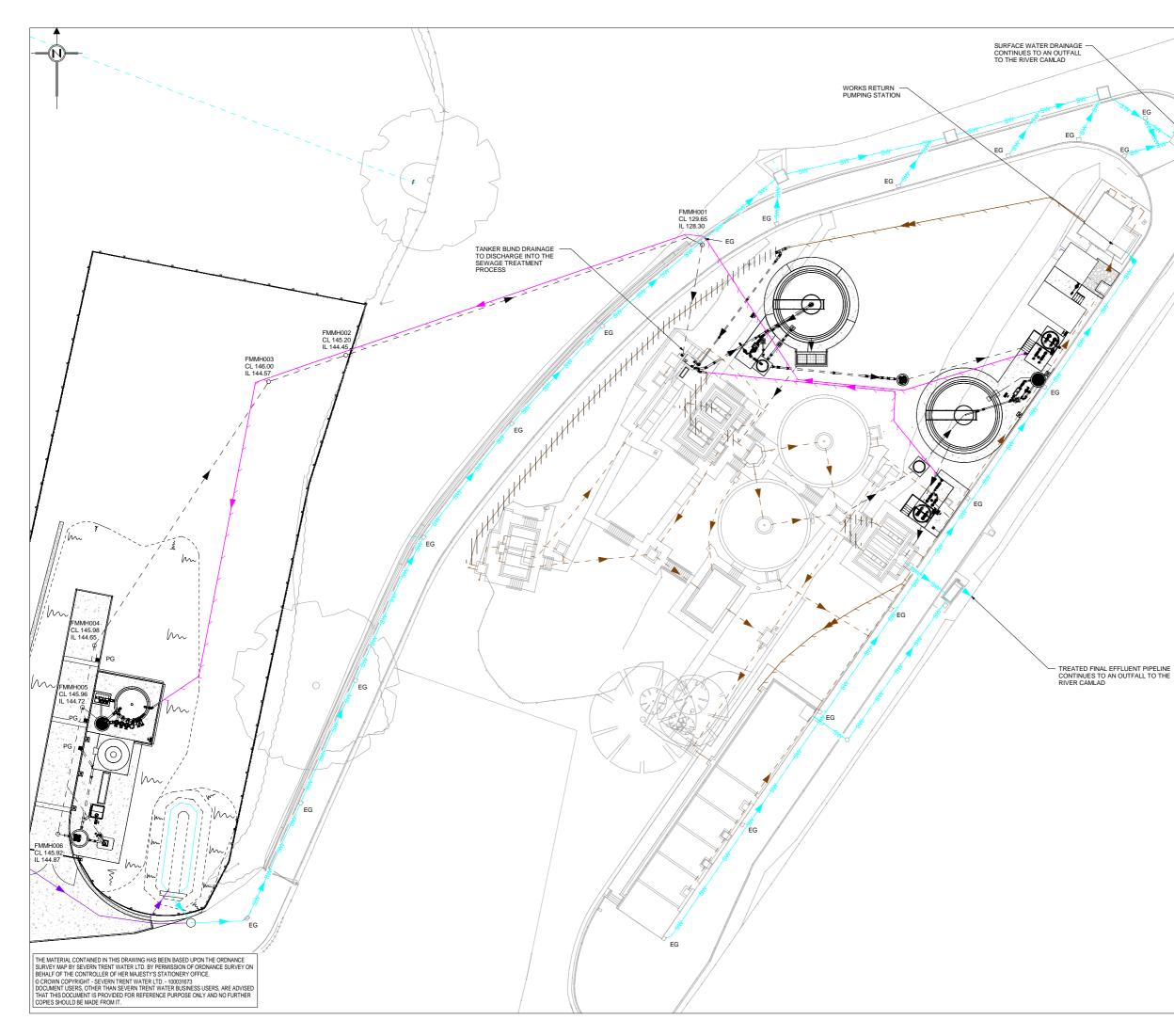
🖌 Quick Storage	Estimate
	Results
Micro Drainage	Global Variables require approximate storage of between 2.5 m <sup>3</sup> and 5.4 m <sup>3</sup> .
	These values are estimates only and should not be used for design purposes.
Variables	
Results	
Design	
Overview 2D	
Overview 3D	
Vt	
	Analyse OK Cancel Help
	Enter Maximum Allowable Discharge between 0.0 and 999999.0

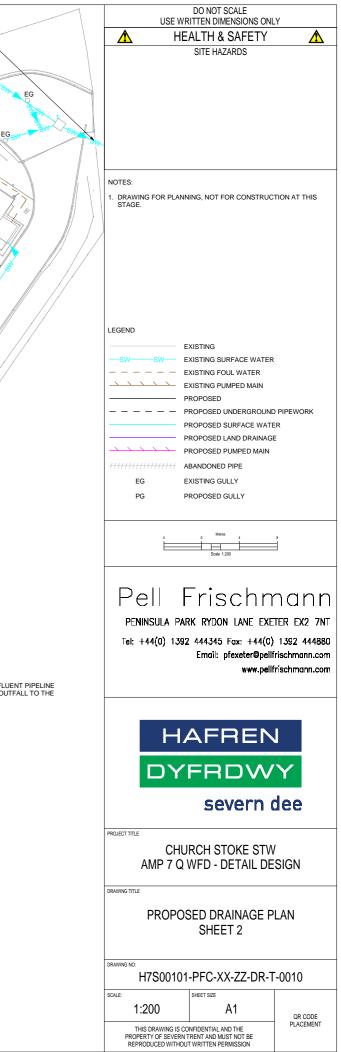
## Main Site Access Road Attenuation

🗸 Quick Storage	Estimate
	Results
Micro Drainage	Global Variables require approximate storage of between 5.0 m <sup>3</sup> and 9.7 m <sup>3</sup> .
	These values are estimates only and should not be used for design purposes.
Variables	
Results	
Design	
Overview 2D	
Overview 3D	
Vt	
	Analyse OK Cancel Help
	Select required Rainfall Model from the list

Appendix D Drainage Design







ell F	rischm	ann										Pag	re 1
Manc	hester	Squa	re										
ondon													
1U 3P	D											Mi	clo
	5/11/2				De	signed	by	NStar	ckey				ainag
'ile C	HURCH	STOKE	ROAD	.MDX	Che	ecked b	ру						
nnovy	ze				Net	twork 2	2020	.1					
		STORI	N SFW	FR DFSI	IGN by	the Mo	difi	iod Ra	ation	nal N	let hod	1	
		51010		ER DESI	LGN DY							<u> </u>	
				Networ	ck Desi	gn Tab	le f	Eor St	corm				
				_									
				« — Ir	ndicates	pipe ca	paci	.ty < f	Low				
PN	Length	Fall	Slope	I.Area	T.E.	Base		k	HYD		Sectio	on Type	Auto
	(m)	(m)	(1:X)			Flow (1			SECT	(mm)	Decer	on type	Design
1.000	11.430	0.100	114.3	0.023	5.00		0.0	0.600	0	100	Pipe/0	Conduit	•
2.000	4.344	0.000	0.0	0.000	5.00		0.0	0.600	0	100	Pipe/0	Conduit	•
1.001	16.907	0.100	169.1	0.000	0.00		0.0	0.600	0	100	Pipe/0	Conduit	•
3.000	2.242	0.000	0.0	0.015	5.00		0.0	0.600	0	100	Pipe/0	Conduit	•
	8.805				0.00			0.600	0			Conduit	
				N	etwork	Result	s T	able					
PN				•	Σ I.Area			Foul				Cap	Flow
	(mm/1	hr) (m	ins)	(m)	(ha)	Flow (	l/s)	(1/s)	(1	/s)	(m/s)	(1/s)	(1/s)
1.0	00 50	.00	5.27 <mark>1</mark>	46.420	0.023		0.0	0.0		0.0	0.72	5.6	3.1
2.0	00 50	.00	6.04 <mark>1</mark>	46.100	0.000		0.0	0.0		0.0	0.07	0.5	0.0
1.0	01 50	.00	6.52 <mark>1</mark>	46.100	0.023		0.0	0.0		0.0	0.59	4.6	3.1
	0.0 5.0	.00	5.54 <mark>1</mark>	44.300	0.015		0.0	0.0		0.0	0.07	0.5«	2.0
3.0	00 50	• • • •								0.0	3.21	25.2	2.0

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Pell Frischmann		Page 2
5 Manchester Square		
London		
W1U 3PD		Micro
Date 25/11/2022 16:54	Designed by NStarkey	Drainage
File CHURCH STOKE ROAD.MDX	Checked by	Diamage
Innovyze	Network 2020.1	

### Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
1	147.170	0.750	Open Manhole	1200	1.000	146.420	100				
2	148.500	2.400	Open Manhole	1200	2.000	146.100	100				
2	148.500	2.400	Open Manhole	1200	1.001	146.100	100	1.000	146.320	100	220
								2.000	146.100	100	
	146.900	0.900	Open Manhole	0		OUTFALL		1.001	146.000	100	
4	144.600	0.300	Open Manhole	1200	3.000	144.300	100				
5	145.000	0.700	Open Manhole	1200	3.001	144.300	100	3.000	144.300	100	
	143.512	0.712	Open Manhole	0		OUTFALL		3.001	142.800	100	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	327070.070	294654.884	327070.070	294654.884	Required	•
2	327085.696	294652.729	327085.696	294652.729	Required	
2	327081.385	294653.268	327081.385	294653.268	Required	
	327067.106	294644.216			No Entry	•••
4	327181.085	294663.987	327181.085	294663.987	Required	•
5	327183.325	294664.096	327183.325	294664.096	Required	
	327191.901	294666.091			No Entry	•

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Pell Frischm				ľ					Page 3
5 Manchester	Squa	re							
London									
W1U 3PD									Micro
Date 25/11/2	022 1	6 <b>:</b> 54			Designe	ed by N	Starkey		Drainage
File CHURCH	STOKE	ROAD.	MDX		Checked	l by			
Innovyze					Network	2020.	1		
			PII	PELINE	SCHEDUI	LES for	Storm		
				Ups	stream M	Manhole			
PN	-	Diam M (mm) Na		C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
1.000	0	100	1 1	47.170	146.420	0.650	Open Manhole		1200
2.000	0	100	2 1	48.500	146.100	2.300	Open Manhole		1200
1.001	0	100	2 1	48.500	146.100	2.300	Open Manhole		1200
3.000 3.001		100 100			144.300 144.300		Open Manhole Open Manhole		1200 1200
				Dowr	nstream	Manhol	e		
PN I	Length (m)	-			l I.Level (m)	L D.Dept (m)	h MH Connection	MH DIAM (mm	
1.000 1	11.430	114.3	2	148.500	0 146.320	2.08	0 Open Manhol	e	1200
2.000	4.344	0.0	2	148.500	0 146.100	2.30	0 Open Manhol	e	1200
1.001 1	16.907	169.1		146.900	0 146.000	0.80	0 Open Manhol	e	0
3.000 3.001			5				0 Open Manhol 2 Open Manhol		1200 0
		Free	Flo	owing (	Dutfall	Detail	s for Storm	<u>l</u>	
		utfall e Number		tfall C. ame	. Level I (m)	. Level (m)	Min D,L I. Level (mm (m)		
		1.003	1	1	L46.900	146.000	146.000	0 0	
		Free	Flo	owing (	Dutfall	Detail	s for Storm	1	
		utfall e Number		tfall C. ame	. Level I (m)	. Level (m)	Min D,I I. Level (mm (m)		
		3.002	1	1	143.512	142.800	143.000	0 0	

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Pell Frischmann		Page 4
5 Manchester Square		
London		
W1U 3PD		Mirro
Date 25/11/2022 16:54	Designed by NStarkey	Drainage
File CHURCH STOKE ROAD.MDX	Checked by	Diamade
Innovyze	Network 2020.1	

Online Controls for Storm

#### Orifice Manhole: 2, DS/PN: 1.001, Volume (m<sup>3</sup>): 2.8

Diameter (m) 0.032 Discharge Coefficient 0.600 Invert Level (m) 146.100

Orifice Manhole: 5, DS/PN: 3.001, Volume (m<sup>3</sup>): 0.8

Diameter (m) 0.037 Discharge Coefficient 0.600 Invert Level (m) 144.300

Pell Frischmann		Page 5
5 Manchester Square		
London		
W1U 3PD		Mirro
Date 25/11/2022 16:54	Designed by NStarkey	– Micro Drainage
File CHURCH STOKE ROAD.MDX	Checked by	Diamage
Innovyze	Network 2020.1	
Storage	Structures for Storm	
Tank or Pond	Manhole: 2, DS/PN: 2.000	
Inve:	rt Level (m) 146.100	
	epth (m) Area (m <sup>2</sup> ) Depth (m) Area (m <sup>2</sup> )	
	0.800 12.0 0.801 0.0	
	Manhole: 4, DS/PN: 3.000	
	rt Level (m) 144.300	
	rea (m <sup>2</sup> ) Depth (m) Area (m <sup>2</sup> )	
0.000	15.0 0.300 15.0	
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Pell Frisc	hmann							Page 6
5 Manchest	er Square							
London								
√1U 3PD								Micro
Date 25/11	/2022 16:5	4	De	signed by	NStarke	ev		
File CHURC	H STOKE RO	AD.MDX		necked by		-		Drainag
Innovyze				etwork 202	0 1			
innovyze			INC	CWOIR 202	0.1			
<u>1 year Ret</u>	urn Perio	d Summary		ritical Re or Storm	sults by	y Maxi	mum Level	L (Rank 1
	Hot Hot Star Headloss Co Sewage per h Number of	Start (min rt Level (r beff (Globa hectare (1, Input Hyd	tor 1.0 ns) nm) al) 0.5 /s) 0.0 lrograph	00 Flow per 00 s 0 Number	onal Flow DD Factor Person pe of Storag	* 10m <sup>3</sup> Inlet Co er Day e Struc	/ha Storage beffiecien (l/per/day tures 2	e 2.000 t 0.800
				s 2 Number s 0 Number			2	
		fall Model	Englar	id and Wales	Rati	er) 0.7	50	
	Margin fo		nalysis	ning (mm) 3 Timestep I IS Status	Fine Inert			
	Return Peric		ns) 15, rs)	30, 60, 120		0, 480,	and Winter 960, 1440 1, 30, 100 40, 40, 40	
US/MH PN Name	Storm	Return Cl. Period Ch		First (X) Surcharge	First (Y) Flood	) First Overi	(Z) Overf flow Act	
			-	-				
1.000 1		1		0/15 Summer				146.48
	120 Winter	1		1/30 Winter				146.21
1.001 2 3.000 4				1/15 Summer 0/15 Summer				146.24 144.36
3.000 4 3.001 5				0/15 Summer 0/15 Summer				144.36
	Surcharge	ed Flooded		н	alf Drain	Pine		
US/	-			Overflow	Time	Flow		Level
PN Nar	•	(m <sup>3</sup> )	Cap.	(1/s)	(mins)	(1/s)	Status	Exceeded
1.000	1 -0.03	37 0.000	0.71			3.7	OK	
2.000	2 0.01						SURCHARGED	
1.001	2 0.04		0.11				SURCHARGED	
3.000	4 -0.03		0.16				FLOOD RISK	
3.001	5 -0.03		0.03			0.6	OK	
			<u></u>	2020 Inno				

	~					
	er Square					
ondon						
1U 3PD						Micro
ate 25/11	/2022 16:54		Designed by	/ NStarkey		
'ile CHURC'	H STOKE ROAD	. MDX	Checked by			Drainag
nnovyze			Network 202	20 1		
11110 V y 2 C			NCCWOIK 202			
30 year Re	turn Period	Summary	of Critical R	esults by Ma	ximum Leve	l (Rank 1
			for Storm			
		c	Simulation Crite	oria		
	Areal Reduct		r 1.000 Additi		of Total Flo	w 0.000
	Hot St	art (mins)	) 0 MA	ADD Factor * 10	m³/ha Storage	e 2.000
	Hot Start				Coeffiecien	
	e Headloss Coef Sewage per hec		) 0.500 Flow per ) 0.000	Person per Da	y (l/per/day	) 0.000
	Number of T	ana tita alama	owerke O Number	of Champers Ch		
			ographs 0 Number ontrols 2 Number	-		
			ontrols 0 Number		2	
		Sunt	hetic Rainfall 1	Details		
	Rainfal	ll Model		R Ratio R	0.316	
			Ingland and Wales			
	M2-	-60 (mm)	18.400	) Cv (Winter)	0.840	
	Margin for	Flood Dial	k Manning (mm) 2			
	Margin ior					
	-		-	600.0 DVD S Fine Inertia S		
	-		lysis Timestep DTS Status	Fine Inertia S		
	-		lysis Timestep	Fine Inertia S		
		Anal	lysis Timestep DTS Status	Fine Inertia S ON	tatus OFF	
		Anal Profile(s)	lysis Timestep DTS Status	Fine Inertia S ON Summe	tatus OFF er and Winter	
		Anal Profile(s) (s) (mins)	lysis Timestep DTS Status 15, 30, 60, 12	Fine Inertia S ON Summe	tatus OFF er and Winter	1
	Duration Return Period(:	Anal Profile(s) (s) (mins)	lysis Timestep DTS Status 15, 30, 60, 12	Fine Inertia S ON Summe	tatus OFF er and Winter 30, 960, 1440	1
	Duration Return Period(:	Anal Profile(s) (s) (mins) s) (years)	lysis Timestep DTS Status 15, 30, 60, 12	Fine Inertia S ON Summe	tatus OFF er and Winter 30, 960, 1440 1, 30, 100	1
	Duration Return Period(: Climate (	Anal Profile(s) (s) (mins) s) (years) Change (%)	lysis Timestep DTS Status 15, 30, 60, 12	Fine Inertia S ON Summe 0, 240, 360, 48	tatus OFF er and Winter 30, 960, 1440 1, 30, 100 40, 40, 40	Water
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