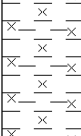
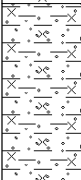
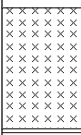




Plate 5 – Ground conditions encountered in TP10.

APPENDIX D – Exploratory Logs

Exploratory Logs

 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA Tel: 01306 646510 www.leapenvironmental.com				Trial Pit Log				Trialpit No TP1 Sheet 1 of 1		
Project Name: Woodfords, Shipley Road,, Southwater				Project No. LP2826		Co-ords: 515632 - 125044 Level:		Date 27/01/2022		
Location: Woodfords, Shipley Road,, Southwater, West Sussex						Dimensions (m):		Scale 1:25		
Client: Reside Developments						Depth 3.00		Logged ADC		
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
	Depth	Type	Results							
	0.10	ES	HVP=112	0.25			Grass over greyish brown silty clayey TOPSOIL with rootlets.			1
	0.35	ES					Firm light orangish mottled grey slightly silty CLAY.			
	0.70	D								
	1.00	D								
	1.60	D	HVP=205	1.50		Very stiff brown mottled dark brown thinly laminated CLAY.			2	
	2.30	D								
	2.70	D								
				3.00		End of pit at 3.00 m			3	
									4	
									5	
Remarks: Trial pit remained dry and stable and was backfilled with arisings on completion.										
Stability: Stable										





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Trial Pit Log

Trialpit No

TP2

Sheet 1 of 1

Project Name: Woodfords, Shipley Road,, Southwater

Project No.
LP2826

Co-ords: 515622 - 125087

Level:

Date

27/01/2022

Location: Woodfords, Shipley Road,, Southwater, West Sussex

Dimensions
(m):

Depth
2.70

Scale
1:25

Logged
ADC

Client: Reside Developments

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.15	ES		0.20			Grass over dark brown silty clayey TOPSOIL with occasional wood fragments.	
	0.40	ES					Stiff light orange brown mottled grey silty CLAY with occasional roots.	
	0.80	D	HVP=105				Hand Pen at 0.6m = 190kPa	
							Hand Pen at 1m = 170kPa	1
			HVP=205	1.20			Stiff to very stiff light grey mottled orange thinly laminated silty CLAY with rare fine angular gravel of extremely weak mudstone and occasional roots.	
							Hand Pen at 1.4m = 260kPa	
							Relic shear surfaces noted at 1.4m bgl.	
	1.80	D		1.60			Friable brown laminated desiccated silty CLAY with rootlets.	
	2.10	D		2.00			Very weak thickly laminated brown to dark brown occasionally light grey silty MUDSTONE with frequent bivalve fossils. Recovered as fine to coarse tabular gravel.	2
				2.20			Very weak brown to orangish brown occasionally ironstained thinly laminated clayey SILTSTONE.	
	2.60	D		2.70			End of pit at 2.70 m	3
								4
								5

Remarks: Trial pit was terminated at 2.7m due t slow progress through weak siltstone. The excavation remained dry and stable and was backfilled with arisings on completion.

Stability: Stable

AGS

 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA Tel: 01306 646510 www.leapenvironmental.com				Trial Pit Log Trialpit No TP3 Sheet 1 of 1					
Project Name: Woodfords, Shipley Road,, Southwater				Project No. LP2826		Co-ords: 515654 - 125101 Level:		Date 27/01/2022	
Location: Woodfords, Shipley Road,, Southwater, West Sussex						Dimensions (m):		Scale 1:25	
Client: Reside Developments						Depth 3.00		Logged ADC	
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
	0.10	ES		0.20			Grass over brown locally mottled orange and grey clayey TOPSOIL with rootlets.		
	0.30	ES					Firm becoming stiff mottled orange and grey silty CLAY with roots.		
	1.00	D					HVP=168 Hand Pen at 0.9m = 200kPa		
	1.30	D					Extremely weak thinly laminated dark grey and dark orange silty MUDSTONE.		
	1.50	D	HVP=195	1.35		Stiff friable laminated orange brown and light grey silty CLAY.			
						Off white to grey shelly mudstone bed noted at 1.75m Too friable for hand pen			
	2.30	D				Very weak thinly laminated grey and dark reddish brown silty MUDSTONE recovered as tabular gravel.			
	2.90	D				Extremely weak light bluish grey thinly laminated silty MUDSTONE.			
				3.00		End of pit at 3.00 m			
	Remarks: Trial pit remained dry and stable and was backfilled with arisings on completion.								
Stability: Stable 									



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Trial Pit Log

Trialpit No

TP4

Sheet 1 of 1

Project Name: Woodfords, Shipley Road,, Southwater

Project No.
LP2826

Co-ords: 515725 - 125082

Level:

Date

27/01/2022

Location: Woodfords, Shipley Road,, Southwater, West Sussex

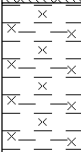
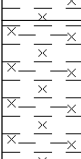
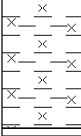
Dimensions
(m):

Depth
2.90

Scale
1:25

Logged
ADC

Client: Reside Developments

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.15	ES		0.20			Grass over grey brown mottled orange clayey TOPSOIL with rootlets.	
	0.25	ES					Firm to stiff light orange brown and grey silty CLAY.	
	0.80	D	HVP=184	0.95			Hand Pen at 0.7m = 190kPa	
				1.20			Stiff dark grey and orange brown silty CLAY. Hand Pen at 1m = 220kPa	1
			HVP=166				Stiff friable brown mottled grey laminated silty CLAY.	
	1.90	D					Hand Pen at 1.7m exceeds 400kPa	2
	2.40	D		2.30			Very weak brown and grey ironstained dark brown thinly laminated silty MUDSTONE with occasional bands of bluish grey mudstone.	
				2.90			End of pit at 2.90 m	3
								4
								5

Remarks: Trial pit remained dry and stable and was backfilled with arisings on completion.

Stability: Stable

AGS

 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA Tel: 01306 646510 www.leapenvironmental.com				Trial Pit Log Trialpit No TP5 Sheet 1 of 1											
Project Name: Woodfords, Shipley Road,, Southwater		Project No. LP2826		Co-ords: 515687 - 125064 Level:		Date 27/01/2022									
Location: Woodfords, Shipley Road,, Southwater, West Sussex				Dimensions (m):		Scale 1:25									
Client: Reside Developments				Depth 3.20		Logged ADC									
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description								
	Depth	Type	Results												
	0.15	ES	HVP=100	0.20		 Grass over brown to greyish brown silty clayey TOPSOIL with rootlets.	1								
	0.60	D		0.85	 Firm mottled light grey, light orange and dark orange silty CLAY.	Relic shear surface at 0.5m bgl. Hand Pen at 0.6m = 220kPa									
								1.00	D	1.10	 Stiff dark grey and dark orange silty CLAY. Hand Pen at 0.9m = 210kPa				
												1.50	D	1.80	 Firm to stiff light orange brown and light grey silty CLAY with frequent dark ironstaining in places. Hand Pen at 1.4m = 190kPa
	2.90	D	HVP=205	3.20		 Extremely weak to very weak thinly laminated blue grey and light brown silty MUDSTONE.	3								
	End of pit at 3.20 m							4							
								5							
	Remarks: Trial pit remained dry and stable and was backfilled with arisings on completion.														
	Stability: Stable														



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Trial Pit Log

Trialpit No

TP6

Sheet 1 of 1

Project Name: Woodfords, Shipley Road,, Southwater

Project No.
LP2826

Co-ords: 515771 - 125074

Level:

Date

28/01/2022

Location: Woodfords, Shipley Road,, Southwater, West Sussex

Dimensions
(m):

Depth
2.80

Scale

1:25

Logged
ADC

Client: Reside Developments

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	ES	HVP=157	0.20			Grass over brown silty clayey TOPSOIL with rootlets.	1
	0.25	ES					Stiff light orange and grey silty CLAY.	
	0.60	D					<u>Hand Pen at 0.5m = 210kPa</u>	
								
								
								
								
								
								
								
	1.40	D		1.40		Very stiff dark brown and dark grey silty CLAY with occasional medium to coarse tabular siltstone gravel and frequent roots.	2	
	2.40	B		1.80		Very weak to weak orange to orange brown thinly laminated SILTSTONE with occasional roots recovered as medium to coarse tabular gravel.		
				2.80		End of pit at 2.80 m		
							3	
							4	
							5	

Remarks: Trial pit remained dry and stable and was backfilled with arisings on completion.

Stability: Stable

AGS

Trial Pit Log

Trialpit No

TP7

Sheet 1 of 1

Project Name: Woodfords, Shipley Road,, Southwater

Project No.
LP2826

Co-ords: 515734 - 125041

Level:

Date _____

28/01/2022

Location: Woodfords, Shipley Road,, Southwater, West Sussex

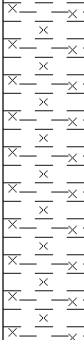
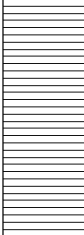
Dimensions
(m):

Depth
3.00

Scale
1:25

Logged
ADC

Client: Reside Developments

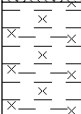
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	ES	HVP=189	0.25		Grass over brown to greyish brown slightly silty clayey TOPSOIL with rootlets.	
	0.35	ES					Firm to stiff orange brown and grey slightly silty CLAY with occasional roots.
							Hand Pen at 0.6m = 180kPa
	0.90	D				HVP=190	1.40
	1.90	D		2.20		Interbedded extremely weak to very weak bluish grey MUDSTONE and dark orange brown silty MUDSTONE.	
				Becomes very weak to weak below 2.8m			
2.50	D		3.00		End of pit at 3.00 m		

Remarks:	Trial pit remained dry and stable and was backfilled with arisings on completion.
----------	---

Stability: Stable

AGS

 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA Tel: 01306 646510 www.leapenvironmental.com				Trial Pit Log				Trialpit No TP8 Sheet 1 of 1	
Project Name: Woodfords, Shipley Road,, Southwater				Project No. LP2826		Co-ords: 515684 - 125014 Level:		Date 28/01/2022	
Location: Woodfords, Shipley Road,, Southwater, West Sussex						Dimensions (m):		Scale 1:25	
Client: Reside Developments						Depth 3.00		Logged ADC	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	ES		0.30			Grass over greyish brown occasionally mottled orange silty clayey TOPSOIL with abundant rootlets.	
	0.35	ES					Stiff orange and light grey silty CLAY.	
	1.10	D	HVP=167	1.40			Hand Pen at 0.7m = 200kPa	1
							Relic shear surface at 0.8m bgl	
	1.60	D	HVP=166	2.10			Hand Pen at 1.1m = 220kPa	2
							Extremely weak dark brown and light grey thinly laminated MUDSTONE.	
	2.20	D		2.70			Very stiff blue grey silty CLAY with bands of extremely weak laminated blue grey mudstone.	3
							Hand Pen at 2.2m exceeds 400kPa	
	2.80	D		3.00			Very weak to weak thinly laminated blue grey and orange brown silty MUDSTONE recovered as tabular gravel.	4
							End of pit at 3.00 m	
								5

Remarks: Trial pit remained dry and stable and was backfilled with arisings on completion.

Stability: Stable



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Project Name: Woodfords, Shipley Road,, Southwater				Project No. LP2826		Co-ords: 515644 - 124950 Level:		Date 27/01/2022	
Location: Woodfords, Shipley Road,, Southwater, West Sussex						Dimensions (m):		Scale 1:25	
Client: Reside Developments						Depth 2.90		Logged ADC	

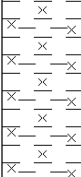
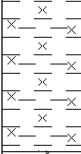
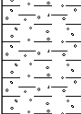
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	ES	HVP=143	0.25		Grass over brown mottled brick red and black silty clayey TOPSOIL with rare fine brick and charcoal fragments.	1	
	0.40	ES						Stiff light orange brown and grey silty CLAY with rare fine ironstone gravel.
	0.80	D						<i>Hand Pen at 0.8m = 200kPa</i>
								<i>Becomes thinly laminated below 1.25m</i>
	1.50	D	HVP=193	1.40		Stiff friable brown mottled grey gravelly silty CLAY. Gravel is fine to medium sub-angular mudstone and ironstone.	2	
				1.70		<i>Hand Pen at 1.65m = 240kPa</i> Extremely weak to very weak grey and orange thinly laminated MUDSTONE.		
	2.00	D				<i>Frequent light grey silt partings and bivalve fossils at 2.2m bgl.</i>	3	
	2.20	D						
						Weak brown to orange brown silty MUDSTONE recovered as coarse tabular gravel.	4	
	2.80	D						
			2.90			End of pit at 2.90 m	5	

Remarks: Trial pit remained dry and stable and was backfilled with arisings on completion.

Stability: Stable



 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA Tel: 01306 646510 www.leapenvironmental.com				Trial Pit Log				Trialpit No TP10 Sheet 1 of 1	
Project Name: Woodfords, Shipley Road,, Southwater				Project No. LP2826		Co-ords: 515615 - 124926 Level:		Date 27/01/2022	
Location: Woodfords, Shipley Road,, Southwater, West Sussex						Dimensions (m): Depth 2.70		Scale 1:25 Logged ADC	
Client: Reside Developments									

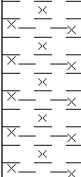
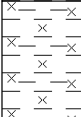
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	ES	HVP=170	0.20			Grass over brown silty clayey TOPSOIL with rootlets and rare fine brick.	1
	0.30	ES					Stiff grey mottled orange silty CLAY with roots.	
	0.90	D					Hand Pen at 0.8m = 240kPa	
			HVP=196	1.30			Stiff friable brown silty slightly gravelly CLAY. Gravel is fine to medium sub-angular and tabular mudstone and ironstone.	2
							Hand Pen at 1.5m = 330kPa	
	1.90	D		1.70			Extremely weak to very weak blue grey mottled orange brown thinly laminated slightly silty MUDSTONE.	3
	2.60	D					Very weak mottled brown, dark brown and grey thinly laminated SILTSTONE recovered as coarse tabular gravel.	
							End of pit at 2.70 m	
				2.70				4
								5

Remarks: Trial pit was terminated at 2.7m bgl due to no further progress through weak mudstone. The excavation remained dry and stable and was backfilled with arisings on completion.

Stability: Stable



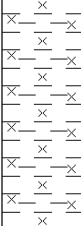
 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA Tel: 01306 646510 www.leapenvironmental.com				Trial Pit Log				Trialpit No TP11 Sheet 1 of 1	
Project Name: Woodfords, Shipley Road,, Southwater				Project No. LP2826		Co-ords: 515574 - 124939 Level:		Date 28/01/2022	
Location: Woodfords, Shipley Road,, Southwater, West Sussex						Dimensions (m): Depth 2.90		Scale 1:25 Logged ADC	
Client: Reside Developments									

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.15	ES		0.20		 Grass over brown silty clayey TOPSOIL with occasional fine brick gravel and abundant rootlets.		
						 Stiff brown to orange brown and brownish grey slightly silty CLAY with occasional rootlets.		
	1.00	D	HVP=190	1.10		 Hand Pen at 0.8m = 250kPa	1	
	1.50	D	HVP=248	1.50		 Very stiff friable brown to dark brown mottled grey thinly laminated silty CLAY with occasional fine to medium siltstone gravel.		
	1.80	D				 Extremely weak to very weak grey mottled orange brown thinly laminated silty MUDSTONE recovered as tabular gravel. Hand Pen at 1.5m exceeds 400kPa	2	
						 interbedded with bands of siltstone below 2.1m bgl.		
	2.80	D		2.90		 End of pit at 2.90 m	3	
							4	
							5	

Remarks: Trial pit remained dry and stable and was backfilled with arisings on completion.

Stability: Stable



 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA Tel: 01306 646510 www.leapenvironmental.com				Trial Pit Log				Trialpit No TP12 Sheet 1 of 1		
Project Name: Woodfords, Shipley Road,, Southwater				Project No. LP2826		Co-ords: 515542 - 124937 Level:		Date 28/01/2022		
Location: Woodfords, Shipley Road,, Southwater, West Sussex						Dimensions (m):		Scale 1:25		
Client: Reside Developments						Depth 2.80		Logged ADC		
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
	Depth	Type	Results							
	0.10	ES	HVP=170	0.20			Grass over greyish brown mottled orange silty clayey TOPSOIL with abundant rootlets and rare fine brick.			
	0.30	ES						Stiff mottled orange brown and grey slightly silty CLAY with roots and rootlets.		
	0.90	D						Hand Pen at 0.9m = 190kPa		
	1.05							Weak grey brown to grey thinly bedded SILTSTONE recovered as tabular gravel.		
	1.20		Stiff friable orange brown and light grey thinly laminated silty CLAY with thin extremely weak mudstone bands.							
	1.50	D	HVP=186							
	2.10	D				Becomes blue grey below 2.0m bgl.				
	2.70	D		2.80		Extremely weak to very weak orange and blue grey thinly laminated silty MUDSTONE.				
	End of pit at 2.80 m									
	1 2 3 4 5									
Remarks: Trial pit remained dry and stable and was backfilled with arisings on completion.										
Stability: Stable 										



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Trial Pit Log

Trialpit No

TP13

Sheet 1 of 1

Project Name: Woodfords, Shipley Road,, Southwater

Project No.
LP2826

Co-ords: 515538 - 124906

Level:

Date

28/01/2022

Location: Woodfords, Shipley Road,, Southwater, West Sussex

Dimensions
(m):

Depth
3.00

Scale

1:25

Logged
ADC

Client: Reside Developments

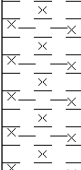
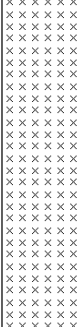
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.15	ES	HVP=168	0.20			Grass over brown mottled orange silty clayey TOPSOIL with abundant rootlets.	
	0.25	ES					Stiff light orangish brown, brown and grey mottled silty CLAY with rare fine subangular to subrounded ironstone gravel.	
	0.70	D		0.90			Stiff mottled dark grey and dark orange silty CLAY with occasional roots.	1
	1.00	D					Stiff friable brown mottled dark grey desiccated silty CLAY with rootlets.	
	1.40	D					Very weak brown mottled dark brown and light grey thinly laminated MUDSTONE.	2
	2.10	D		2.00			Interbedded very weak to weak brown to light brown mottled dark brown thinly laminated silty MUDSTONE and SILTSTONE.	
	2.70	B		2.40				
				3.00				
							End of pit at 3.00 m	3
								4
								5

Remarks: Trial pit remained dry and stable and was backfilled with arisings on completion.

Stability: Stable

AGS

 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA Tel: 01306 646510 www.leapenvironmental.com				Trial Pit Log				Trialpit No TP14 Sheet 1 of 1	
Project Name: Woodfords, Shipley Road,, Southwater				Project No. LP2826		Co-ords: 515578 - 124896 Level:		Date 27/01/2022	
Location: Woodfords, Shipley Road,, Southwater, West Sussex						Dimensions (m):		Scale 1:25	
Client: Reside Developments						Depth 2.90		Logged ADC	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	ES		0.20		 Grass over brown silty clayey TOPSOIL with rootlets and rare fine brick.		
	0.40	ES				 Firm to stiff light brown, orange brown and grey mottled slightly silty CLAY.		
	1.10	D	HVP=160	1.80		 Hand Pen at 0.8m = 140kPa	1	
			HVP=132			 Hand Pen at 1.4m = 220kPa		
	2.00	D		2.90		 Very weak to weak grey and brown laminated SILTSTONE recovered as tabular gravel.	2	
	2.80	D				End of pit at 2.90 m	3	
							4	
							5	

Remarks: Trial pit remained dry and stable and was backfilled with arisings on completion.

Stability: Stable



Trial Pit Log

Trialpit No

Bund2

Sheet 1 of 1

Project Name: Woodfords, Shipley Road,, Southwater

Project No.
LP2826

Co-ords:	-
Level:	

Date
08/01/2022

Location: Woodfords, Shipley Road,, Southwater, West Sussex

Dimensions
(m):

Scale
1:25

Client: Reside Developments

Depth
0.35

Logged
ADC

[illegible]

Remarks:	Excavation was backfilled on completion.
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Stability: Stable

AGS

APPENDIX E – Geotechnical Field Test Results

Geotechnical Field Test Results

Dynamic Cone CBR Test

Nr Blows	S Blows	Penetration mm	S Pen. mm
0	0	50	50
1	1	50	100
1	2	50	150
1	3	50	200
2	5	50	250
1	6	50	300
1	7	50	350
1	8	50	400
1	9	50	450
1	10	50	500
1	11	50	550
1	12	50	600
1	13	50	650
2	15	50	700
1	16	50	750
2	18	50	800
2	20	50	850
2	22	50	900

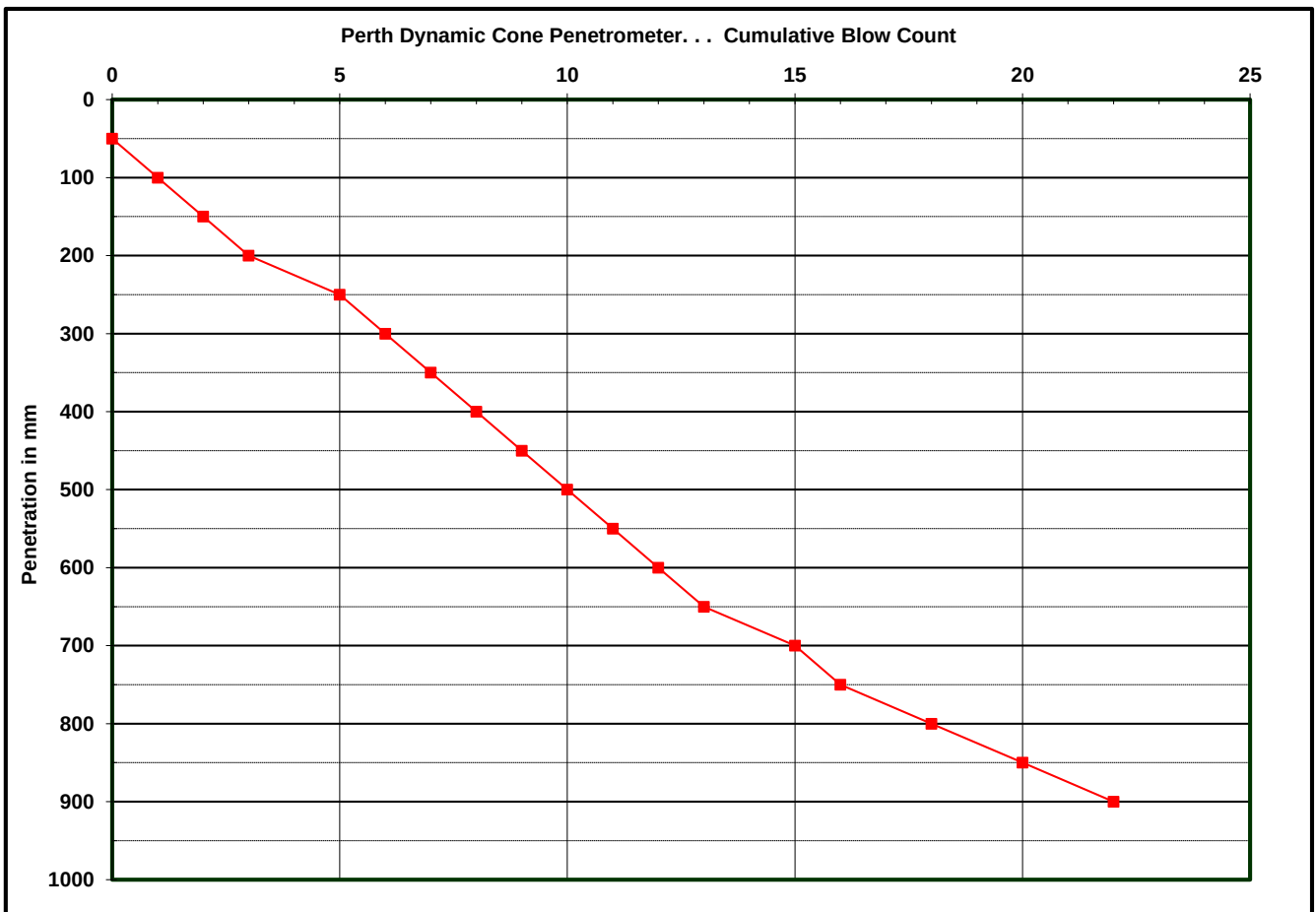
Woodfords, Shipley Road, Southwater Test Reference: - DCP1

Job Nr LP2826
0

Date 28-Jan-22

CBR VALUE CALCULATIONS

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
100	650	1	13	45.8	5.3	3.2	3.2
650	900	13	22	27.8	9.0	6.1	6.1
			0				
			0				
			0				
			0				
			0				



Tested by	ADC	Checked		Approved	
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Site: Woodfords, Shipley Road, Southwater

Client: Reside Developments

Date: 28/01/2022

Job No: LP2826

Test No: DCP1

Dynamic Cone CBR Test

Nr Blows	S Blows	Penetration mm	S Pen. mm
0	0	50	50
1	1	50	100
1	2	50	150
1	3	50	200
0	3	50	250
1	4	50	300
2	6	50	350
1	7	50	400
1	8	50	450
1	9	50	500
1	10	50	550
1	11	50	600
1	12	50	650
2	14	50	700
1	15	50	750
2	17	50	800
2	19	50	850
3	22	50	900

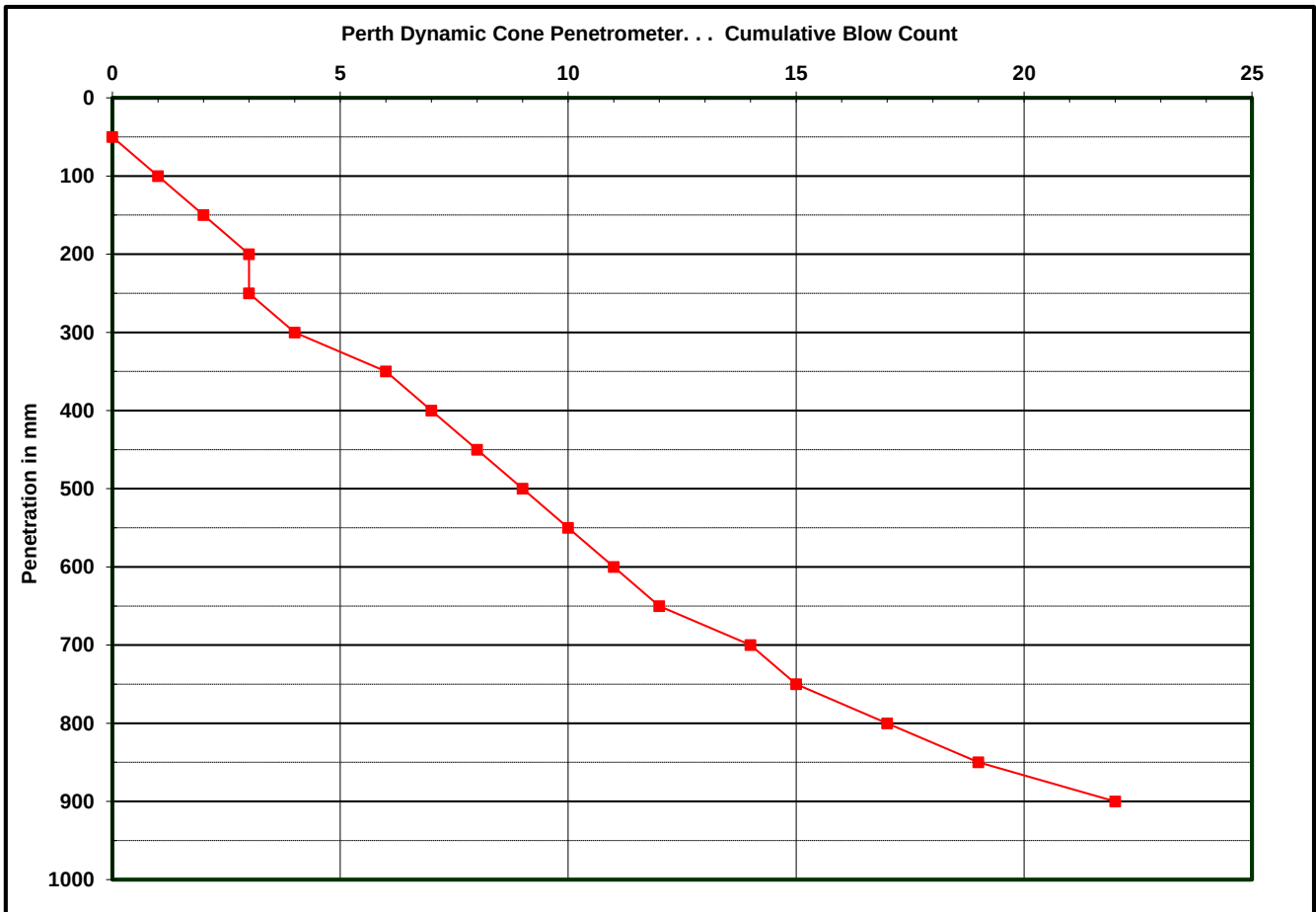
Woodfords, Shipley Road, Southwater Test Reference: - DCP2

Job Nr LP2826
0

Date 28-Jan-22

CBR VALUE CALCULATIONS

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
100	200	1	3	50.0	4.8	2.9	2.9
200	350	3	6	50.0	4.8	2.9	2.9
350	650	6	12	50.0	4.8	2.9	2.9
650	900	12	22	25.0	10.1	7.0	7.0
			0				
			0				
			0				



Tested by	ADC	Checked		Approved	
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Site: Woodfords, Shipley Road, Southwater

Client: Reside Developments

Date: 28/01/2022

Job No: LP2826

Test No: DCP2

Dynamic Cone CBR Test

Nr Blows	S Blows	Penetration mm	S Pen. mm
0	0	50	50
0	0	50	100
0	0	50	150
0	0	50	200
1	1	50	250
0	1	50	300
1	2	50	350
1	3	50	400
1	4	50	450
1	5	50	500
1	6	50	550
1	7	50	600
1	8	50	650
1	9	50	700
1	10	50	750
2	12	50	800
1	13	50	850
1	14	50	900

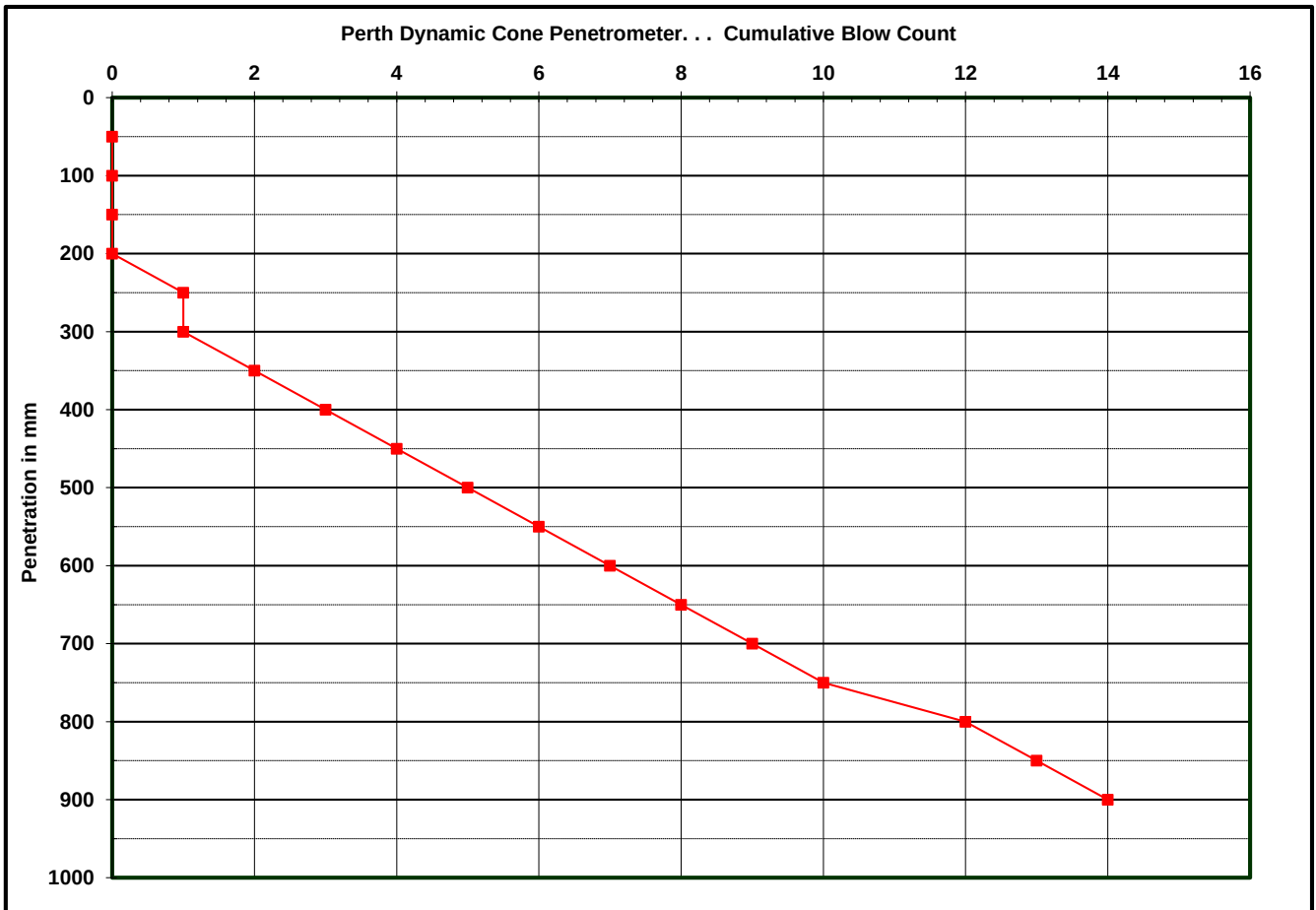
Woodfords, Shipley Road, Southwater Test Reference: - DCP3

Job Nr LP2826
0

Date 28-Jan-22

CBR VALUE CALCULATIONS

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
300	750	1	10	50.0	4.8	2.9	2.9
750	900	10	14	37.5	6.6	4.1	4.1
			0				
			0				
			0				
			0				
			0				



Tested by	ADC	Checked		Approved	
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Site: Woodfords, Shipley Road, Southwater

Client: Reside Developments

Date: 28/01/2022

Job No: LP2826

Test No: DCP3

Dynamic Cone CBR Test

Nr Blows	S Blows	Penetration mm	S Pen. mm
0	0	50	50
1	1	50	100
1	2	50	150
1	3	50	200
1	4	50	250
1	5	50	300
2	7	50	350
1	8	50	400
2	10	50	450
2	12	50	500
1	13	50	550
2	15	50	600
2	17	50	650
2	19	50	700
2	21	50	750
2	23	50	800
3	26	50	850
2	28	50	900

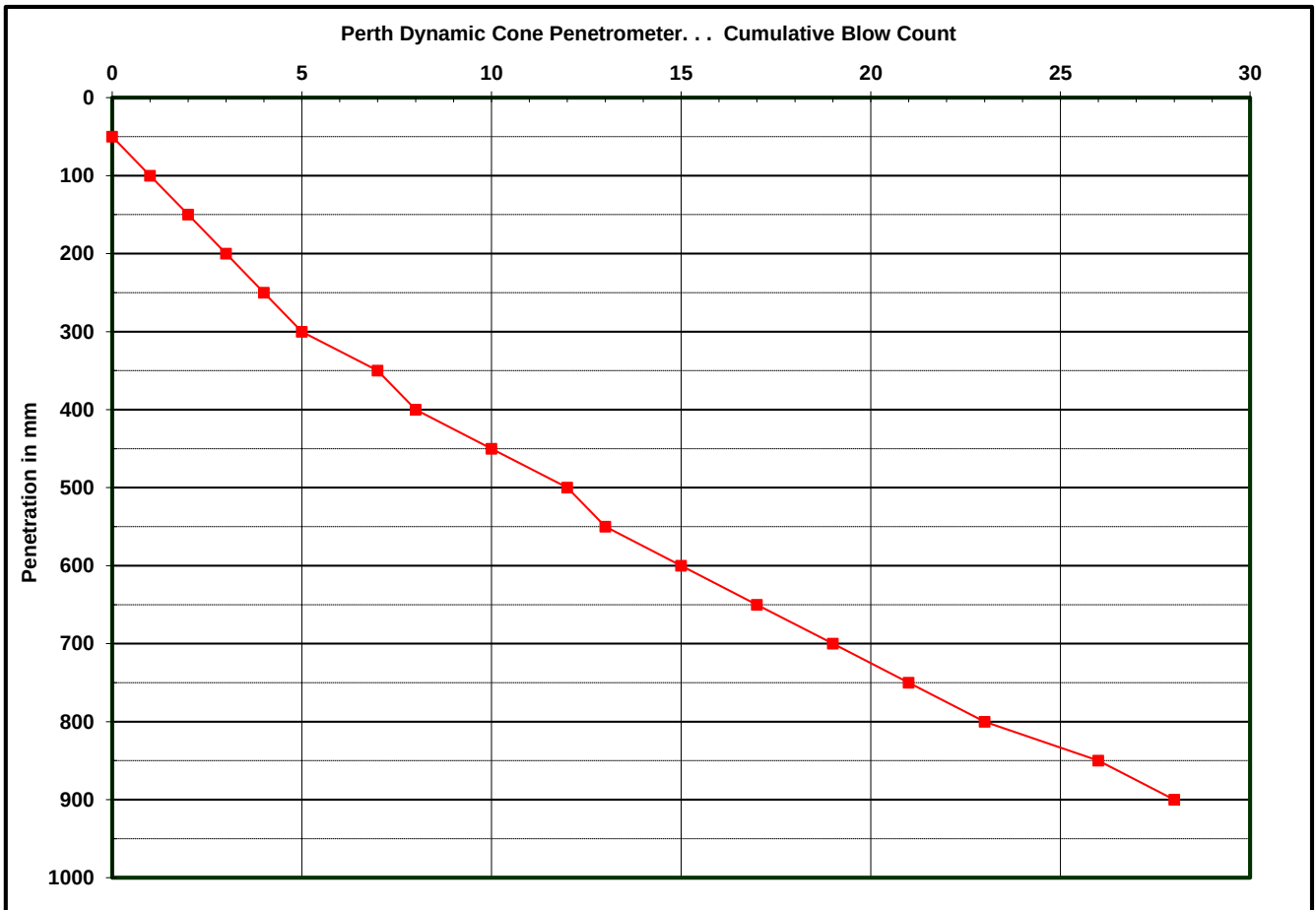
Woodfords, Shipley Road, Southwater Test Reference: - DCP4

Job Nr LP2826
0

Date 28-Jan-22

CBR VALUE CALCULATIONS

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
100	300	1	5	50.0	4.8	2.9	2.9
300	550	5	13	31.3	7.9	5.2	5.2
550	900	13	28	23.3	10.8	7.6	7.6
			0				
			0				
			0				
			0				



Tested by	ADC	Checked		Approved	
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Site: Woodfords, Shipley Road, Southwater

Client: Reside Developments

Date: 28/01/2022

Job No: LP2826

Test No: DCP4

Appendix D

RESIDE DEVELOPMENTS
Flood Risk Assessment and
Drainage Strategy
13TH SEPTEMBER 2021

Document Control Sheet

Flood Risk Assessment and Drainage Strategy

Woodfords, Shipley Road, Southwater

Reside Developments Limited

This document has been issued and amended as follows:

Date	Issue	Prepared by	Approved by
13/09/21	Draft	MH	NJ

Contents

1.0	Introduction	1
2.0	Site Description	2
3.0	Legislative and Policy Framework	4
4.0	Flood Risk	7
5.0	Drainage Strategy	9
6.0	SuDS Maintenance Regime	13
7.0	Foul Water Drainage	15
8.0	Summary and Conclusions	16

Appendices

A	Site Location Plan
B	Masterplan
C	Topographical Survey
D	BGS Borehole Records
E	Southern Water records
F	EA Product 4
G	Surface Water Flood Maps
H	QBar Calculations
I	MicroDrainage model results Catchment A
J	MicroDrainage model results Catchment B
K	Drainage Strategy
L	Exceedance Plan

1.0 Introduction

- 1.1 This Flood Risk Assessment (FRA) and Drainage Strategy has been prepared on behalf of Reside Developments in relation to development proposals at Woodfords, Shipley Road, Southwater, West Sussex.
- 1.2 The aim of this report is to satisfy the requirements of the Local Planning Authority, Lead Local Flood Authority (LLFA) and Environment Agency (EA) in relation to development and flood risk. Specific objectives of this FRA are to:
 - ▶ Assess the proposed development against the requirements of the National Planning Policy Framework (NPPF).
 - ▶ Assess whether the proposed development has taken appropriate consideration of the risk of flooding from all potential flood sources.
 - ▶ Detail how the proposed development will be safe with respect to flooding during its lifetime and will not increase the risk of flooding to other sites.
 - ▶ Produce a Drainage Strategy that will detail how the proposed development will not result in an increase in surface water that could cause flood risk to both the development and the neighbouring sites.
- 1.3 This report considers the requirements for carrying out an FRA as set out in the NPPF and has been prepared to comply with current EA and Flood Risk policy.

2.0 Site Description

Site Location and Description

- 2.1 The proposed 3.83-hectare (ha) development site is currently a combination of open field and an existing residential property. The site is bordered to the north by residential development and to the west, east and south by open fields. The centre of the site is at grid reference TQ 15625 25002. A site location plan can be found in [Appendix A](#). A site masterplan can be found in [Appendix B](#).

Topography

- 2.2 A topographical survey of the existing site was undertaken by Hook Survey Partnership in July 2019, which is provided in [Appendix C](#) of this report.
- 2.3 The topography demonstrates that the site has two catchments known as Catchment A and Catchment B as illustrated in Figure 2.1 below. Catchment A falls towards the ordinary watercourse which runs along the eastern site boundary with ground levels ranging from 50.56 metres Above Ordinance Datum (mAOD) to 43.62 mAOD. Catchment B fall towards the ordinary watercourse which runs along the southern site boundary with ground levels ranging from 50.12 mAOD to 43.26 mAOD.



Figure 2.1 Catchment boundaries

Geology

- 2.4 The British Geological Survey (BGS) online Geoindex Mapping indicates that the site is underlain by the Weald Clay Formation with no superficial deposits. Borehole records from the surrounding area have been obtained from the BGS online index, these can be found in **Appendix D**. These Borehole records support the findings of the BGS mapping. As the site is underlain by clay it is anticipated that infiltration techniques will not be viable on site. However, infiltration testing is recommended to confirm this at the detailed design stage

Existing Drainage Regime

- 2.5 Southern Water records can be found in **Appendix E** and show a 225mm surface water sewer running along Rascals Close, within the development to the north of the site. There is also a 150mm foul water sewer within Rascals Close to the north of the site.
- 2.6 The nearest main river is the River Adur located approximately 3km north of the site. However, there are a number of ordinary watercourses which run along the sites northern, eastern, and southern boundaries. The site currently drains into these existing watercourses.

3.0 Legislative and Policy Framework

Flood and Water Management Act

- 3.1 The Flood and Water Management Act 2010 (FWMA) received Royal Assent on 8th April 2010. The Act was introduced to enforce some of the key proposals set out within UK Government flood and water strategies along with UK Government's response to the Sir Michael Pitt's Review of the summer 2007 floods.
- 3.2 LLFA's including West Sussex County Council (WSCC) have a responsibility under the FWMA to develop, maintain, apply, and monitor the application of a strategy for local flood risk in their area. Local flood risk is defined as flood risk arising from surface run-off, groundwater, and ordinary watercourses (i.e. non main rivers). The EA plays a role in managing the watercourses designated as 'main rivers'.
- 3.3 Relevant to the site, the FWMA will encourage the uptake of SuDS by removing the automatic right to connect to sewers and providing for LLFA to adopt SuDS for new developments.
- 3.4 The development proposals will adhere to the Act through the provision of SuDS as a fundamental element of the surface water drainage system. Furthermore, the client is committed to work with the relevant stakeholders, such as the EA, WSCC (the lead local flood authority), in implementing the requirements of the FWMA where necessary.

National Planning Policy Framework

- 3.5 The NPPF and the PPG set out the Government's planning policies for England and how these are expected to be applied. This includes ensuring that flood risk is considered at all stages of the planning process, avoiding inappropriate development in areas at risk of flooding and directing development away from those areas where risks are highest.
- 3.6 A site-specific FRA is required for proposals of 1ha or greater in Flood Zone 1, all proposals for development in Flood Zones 2 and 3, or in an area within Flood Zone 1 which has critical drainage problems (as notified to the local planning authority by the EA). The FRA should identify and assess the risks of all forms of flooding to and from the development and demonstrate how these flood risks will be managed so that the development remains safe throughout its lifetime, taking climate change into account.

Local Planning Policy Requirements

- 3.7 Horsham District Planning Framework was produced in 2015. Policy 38 relates to Flood Risk and states;
 - ▶ Development proposals will follow a sequential approach to flood risk management, giving priority to development sites with the lowest risk of flooding and making required development safe without increasing flood risk elsewhere. Development proposals will:
 - a.) Take a sequential approach to ensure most vulnerable uses are placed in the lowest risk areas.
 - b.) Avoid the functional floodplain (Flood zone 3b) except for water-compatible uses and essential infrastructure.
 - c.) Only be acceptable in Flood Zone 2 and 3, following completion of a sequential test and exceptions test if necessary.
 - d.) Require a site-specific Flood Risk Assessments for all developments over 1 hectare in Flood Zone 1 and all proposals in Flood Zone 2 and 3.
 - ▶ Development proposals will comply with the tests and recommendations set out in the Horsham District Strategic Flood Risk Assessment (SFRA).

- ▶ Where there is the potential to increase flood risk, proposals must incorporate the use of sustainable drainage systems (SuDS) where technically feasible or incorporate water management measures which reduce the risk of flooding and ensure flood risk is not increased elsewhere.
- ▶ Consider the vulnerability and importance of local ecological resources such as water quality and biodiversity when determining the suitability of SuDS. New development should undertake more detailed assessments to consider the most appropriate SuDS methods for each site. Consideration should also be given to amenity value and green infrastructure.
- ▶ Utilise drainage techniques that mimic natural drainage patterns and manage surface water as close to its source as possible will be required where technically feasible.
- ▶ Be in accordance with the objective of the Water Framework Directive and accord with the findings of the Gatwick Sub Region Water Cycle Study in order to maintain water quality and water availability in rivers and wetlands and wastewater treatment requirements.

The Sequential and Exception Tests

- 3.8 The NPPF Sequential Test classifies proposed development into one of four Flood Zones, detailed in Table 3.1.

Flood Zone	Annual Probability of Flooding (%)	Corresponding Annual Chance of Flooding (1 in x)
✓ Low Probability	Fluvial <0.1% Tidal <0.1%	>1,000 >1,000
✓ Medium Probability	Fluvial 0.1 – 1.0% Tidal 0.1 – 0.5%	1,000 – 100 1,000 – 200
✓ a) High Probability	Fluvial >1.0% Tidal >0.5%	<100 <200
✓ b) The Functional Floodplain	Fluvial >5.0%* Tidal >5.0%* *Starting point for consideration. LPAs should identify Functional Floodplain, which should not be defined solely by rigid probability parameters.	<20 <20

Table 3.1 Flood Zones

- 3.9 The NPPF specifies that the suitability of all new development in relation to flood risk should be assessed by applying the Sequential Test to demonstrate that there are no reasonably available sites in areas with a lower probability of flooding that would be appropriate to the type of development proposed. The NPPF provides guidance on the compatibility of each land use classification in relation to each of the Flood Zones as summarised in Table 3.2.

Flood Zone	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception test required	✓	✓
Zone 3a	Exception test required	✓	✗	Exception test required	✓
Zone 3b	Exception test required	✓	✓	✓	✓
Key: ✓ Development is appropriate ✗ Development should not be permitted					

Table 3.2 Flood Risk Vulnerability Classification

- 3.10 The proposed development site is located within an area designated as Flood Zone 1, having a less than 1 in 1000 chance per annum of flooding from rivers or seas. More vulnerable development (residential developments as per the proposals) is shown to be acceptable within this flood zone negating the need for a sequential or exception test.

Lead Local Flood Authority

- 3.11 As of April 2015, the LLFA became a statutory consultee on all major planning applications. The LLFA is required to assess planning applications in respect of surface water drainage and sustainable drainage systems. WSCC is the LLFA for Southwater and wider West Sussex areas.

Horsham District Council Strategic Flood Risk Assessment

- 3.12 The Horsham District Council Strategic Flood Risk Assessment (SFRA) has been prepared by Scott Wilson in 2010. The SFRA provides a useful source of information and evidence for a variety of stakeholders as part of the planning application process and when making decisions regarding the allocation of sites. The information within the SFRA should be used when putting together Flood Risk Assessments (FRAs) as part of planning applications.

Environment Agency Flood Map

- 3.13 As part of this FRA a 'Flood Product 4' data request was submitted to the EA. The 'Flood Product 4' provided confirmation of the sites flood zone classification, a detailed flood map, information about historical flooding incidents and EA model output data such as predicted fluvial flood water levels in the vicinity of the site. The response to this Flood Product data request is provided in **Appendix F**.
- 3.14 The EA Flood Map shows that the entirety of the site is located within Flood Zone 1 (less than 1 in 1000 annual probability of flooding from rivers or the sea).

4.0 Flood Risk

- 4.1 In this section a number of potential sources of flooding have been considered and the probability of any likely impacts assessed.

Flooding from Rivers and the Sea

- 4.2 The EA Flood Map shows that the whole of the site is located within Flood Zone 1 (less than 1 in 1000 annual probability of flooding from rivers or the sea).
- 4.3 The nearest watercourse to the site is the River Adur located approximately 3km north of the site. However there are a number of ordinary watercourses in close vicinity to the site running the northern, eastern, and southern boundaries.

It is therefore concluded that the site is at very low risk of flooding from rivers and the sea.

Groundwater Flooding

- 4.4 Groundwater flooding occurs when water originating in aquifers reaches the surface, typically as a result of high groundwater levels caused by prolonged rainfall. It has been identified using public data provided by the BGS that the site is underlain by the Weald Clay Formation with no superficial deposits. The SFRA states that the study area is not at risk of groundwater flooding and the SFRA has no record of the site or any area close to the site having flooded due to groundwater.

It is therefore concluded that the site is at very low risk of flooding from Groundwater.

Surface Water Flooding

- 4.5 Flooding from overland flow occurs when intense rainfall is unable to infiltrate into the ground or enter drainage systems resulting in localised flooding in low spots that provide no means of outfall.
- 4.6 The EA surface water flood map in **Appendix G** provides information concerning the risk of surface water flooding to the site. The Surface Water Flood Map shows the majority of the site is located in an area defined as 'very low' risk (outside of the modelled 1 in 1000 rainfall event) of surface water flooding. However, there is an area of the site defined as 'low' risk (between 1 in 1000 and 1 in 100 chance) and 'medium' risk (between 1 in 100 and 1 in 30 chance) of surface water flooding. The EA surface water flood maps show that surface water flood depths in these areas are between 0 to 300mm.
- 4.7 The mapping appears to show surface water entering the site from the field opposite to the east and Shipley Road. However, as the surface water modelling is quite coarse it does not appear to take account of the existing highway drainage ditch adjacent to the Shipley Road, which would intercept this overland flow and prevent it entering the site. In the unlikely event that water did enter the site, the water will be routed overland through the development using the existing road. Houses adjacent to the road will be set a minimum of 300mm above the external ground levels to prevent the properties from flooding.

It is therefore concluded that the site is between low to medium risk of flooding from surface water.

Flooding from Infrastructure Failure

In order to control and convey surface water runoff from impermeable surfaces in urban areas, underground surface water sewers or combined sewers (foul and surface water) are often utilised in urban areas. Pipes, culverts etc. have a finite capacity and therefore pose a risk of flooding due to the risk of siltation, blockage, or collapse.

- 4.8 Southern Water records show a 225mm surface water sewer running along Rascals Close to the north of the site. There is also a 150mm foul water sewer running along Rascals Close. The SFRA has no records of the site flooding due to infrastructure failure.

It is therefore concluded that the site is at low risk of flooding from infrastructure failure.

Flooding from Artificial sources

- 4.9 The EA provides a map showing the maximum potential flood extent, in the event that all reservoirs with a capacity of greater than 25,000 cubic metres were to fail and release the water they hold. The map shows that the site would not experience flooding in this scenario. There are no other significant artificial waterbodies in proximity of the site.

It is therefore concluded that the site is at low risk of flooding from artificial sources.

5.0 Drainage Strategy

Sustainable Drainage Overview & Hierarchy

- 5.1 Current planning policy and EA guidance requires developments to employ SuDS (Sustainable Drainage Systems) techniques wherever feasible. Careful design of SuDS features can ensure that the site surface water drainage closely reflects the natural hydrology and hydrogeology of the site.
- 5.2 SuDS will attenuate and treat surface water run-off quantities at the source (source control) in line with National Planning Policy Framework and EA policies.
- 5.3 This use of SuDS is needed to replicate the pre-developed Greenfield conditions so as not to increase flood risk to the site or surrounding sites by managing excess run-off at the source.
- 5.4 Source control systems treat water close to the point of collection, in features such as soakaways, permeable paving and dry swales.
- 5.5 The key benefits of SuDS are as follows:
 - ▶ Improving water quality over a conventional piped system by removing pollutants from diffuse pollutant sources (e.g. roads);
 - ▶ Improving amenity through the provision of open green space and wildlife habitat; and
 - ▶ Enabling a natural drainage regime which recharges groundwater (where possible).
- 5.6 SuDS provide a flexible approach to drainage, with a wide range of components from house soakaways to large-scale basins or ponds. The individual techniques should be used where possible in a management train which mimics the natural pre-development pattern of drainage. The Interim Code of Practice for SuDS sets out the hierarchy of techniques. These are:
 - ▶ Prevention – the use of good site design and housekeeping measures on individual sites to prevent runoff and pollution;
 - ▶ Source control – control of runoff at or very near its source (such as permeable paving or soakaways for individual houses);
 - ▶ Site control – management of water from several sub-catchments (including routing water from roofs and car parks to one large soakaway or infiltration basin for the whole site); and
 - ▶ Regional control – management of runoff from several sites, typically in a detention pond or wetland.

Greenfield Runoff Rates

- 5.7 The total area of the site is 3.83 ha. UKSUDS was used to calculate the QBar Greenfield runoff rate for the entire site showing a result of 20.87 l/s or 5.45 l/s/ha. UKSUDS QBar outputs can be found in **Appendix H**. Catchment A has a total area of 1.43ha and Catchment B has a total area of 2.40ha. Therefore, Catchment A has a Greenfield runoff rate of 7.79 l/s and Catchment B has a Greenfield runoff rate of 13.08 l/s.

Proposed Sustainable Drainage Strategy

- 5.8 The proposed development will have an increase in the amount of hardstanding areas on site from the new development and associated access roads. Therefore, without mitigation there will be an increase in surface water runoff from the site as a result of the development. A drainage strategy has been put in place so that the proposed development does not result in an increase in surface water run-off that could cause potential flood risk to both the development and the neighbouring sites.

- 5.9 The site is currently defined as Greenfield and drains into the existing ordinary watercourses which run along the sites northern, eastern, and southern boundaries. There is also an existing land drain which crosses the centre of the site and runs from east to west and the land drain will remain in place. Any works to the existing ordinary watercourses will be subject to land drainage consents which will be submitted as part of the detailed design stage following planning permission.
- 5.10 The proposed impermeable area of the site has been calculated from Catchment A has an impermeable area of 7,000m² and Catchment B has an impermeable area of 7,461m².
- 5.11 Urban Creep can be described as future urban expansion within a development such as extensions to buildings and increased paved areas. These activities increase the impermeable area of a site and often sit outside of the development control process. Therefore, we have included a 10% increase in impermeable area on the development site to allow for urban creep. The proposed impermeable area of catchment A has been calculated as 0.70ha and therefore the estimated impermeable area due to urban creep = $0.70 \times 1.1 = 0.77\text{ha}$. The proposed impermeable area of catchment B has been calculated as 0.75ha and therefore the estimated impermeable area due to urban creep = $0.75 \times 1.1 = 0.83\text{ha}$.
- 5.12 Based on MicroDrainage source control calculations the approximate amount of attenuation storage required on Catchment A is between 471m³ and 659m³ based on a restriction of 3.82l/s (Qbar for 0.70ha of impermeable area) and for storm events up to 1 in 100-year plus 40% climate change. The model results can be found in full in [Appendix I](#). Based on MicroDrainage source control calculations the approximate amount of attenuation storage required on Catchment B is between 503m³ and 704m³ based on a restriction of 4.09l/s (Qbar for 0.75ha of impermeable area) and for storm events up to 1 in 100year plus 40% climate change. The model results can be found in full in [Appendix J](#).
- 5.13 In order to attenuate the additional surface water from the development in Catchment A it is proposed to have permeable paving with Permavoid beneath on some of the side roads and parking areas, cellular storage, and a wetland which will the discharge into the watercourse along the north-eastern site boundary at a restricted rate of 3.22l/s. In order to attenuate the additional surface water from the development in Catchment B it is proposed to have permeable paving on side roads and parking areas, swales, cellular storage, and a pond in the south-eastern corner of the site. Surface water will the discharge into the watercourse along the southern site boundary at a restricted rate of 3.8l/s. A drainage strategy can be found in full in [Appendix K](#) and a summary of the proposed SuDS features are shown in Table 5.1

SuDS feature	Storage Volume (m ³)
Catchment A – Permavoid permeable paving	403
Catchment A – Attenuation tank	52
Catchment A – Pond	169
Catchment A total storage volume 624m³	
Catchment B – Permeable paving	203
Catchment B – Attenuation tanks	99
Catchment B – Swale	144
Catchment B - Pond	198
Catchment B total storage volume 644m³	

Table 5.1 SuDS features

- 5.14 The proposed ditches that the surface water runoff will discharge into are located on the development site and not within third party land.

Exceedance Events

- 5.15 Exceedance events are those greater than the design rainfall event, i.e. greater than the 1-in-100-year rainfall event plus a 40% increase in climate change.

- 5.16 MicroDrainage Source Control Calculations have been used to identify the range of acceptable storage volumes to prevent flooding for the design rainfall event. For the purposes of this report, it is assumed that a low-level exceedance event may still be able to be discharged within the capacity of the system before significant flooding occurs.
- 5.17 It is imperative to check whether flooding would occur and, if so, whether it needs to be contained onsite. Exceedance flows should not ingress into any properties onsite and should not cause nuisance to any neighbouring sites or buildings.
- 5.18 As the site is divided into two catchment areas, any exceedance flows onsite would flow along the proposed road network within the proposed development, towards the wetland and pond areas within the northeastern and southeastern corner of the development site. It would be recommended to bound the proposed access roads and parking areas with precast concrete HB2 kerbs with a 125mm upstand where required to contain the exceedance flows below the top of kerbline.
- 5.19 An Exceedance Routing Plan for surface water dealing the proposed exceedance flows and storage areas within the development is found in **Appendix L**.

Surface Water Quality

- 5.20 The NPPF (Section 110) states that the development should not have a detrimental impact on the environment, including the water environment. The technical guidance to the NPPF provides further advice on the benefits of ensuring runoff quality is to an appropriate standard.
- 5.21 The CIRIA SuDS Manual C753 provides guidance on the treatment of surface water runoff. With regards to the proposed development site, Table 26.2 of the CIRIA SuDS Manual rates the pollution hazard from roof water runoff as 'very low'. The only requirement for roof water runoff is the removal of gross solids and sediments, which would be achieved using catchpits and silt traps upstream of any attenuation media, such as the cellular storage tanks.
- 5.22 With regards to the property driveways and access road, Table 26.2 of the CIRIA SuDS Manual C753 rates the pollution hazard from residential car parking and low traffic roads as 'low'. To mitigate a 'low' pollution hazard, the CIRIA SuDS Manual recommends using a Simple Index Approach, in line with Section 26.7.1. The Pollution Hazard Indices for the different land use classifications relating to the parking areas on the site is defined in further detail in Table 5.2 below:

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Individual Property Driveways, Residential Car Parks, Low Traffic Roads (e.g. Cul-de-sacs, Homezones and General Access Roads) and Non-Residential Car Parking with Infrequent Change (e.g. Schools, Offices) i.e. <300 Traffic Movements /Day	Low	0.5	0.4	0.4

Table 5.2 Excerpt from Table 26.2 of the CIRIA SuDS Manual

- 5.23 To deliver adequate pollution treatment and mitigation, the CIRIA SuDS Manual recommends using a SuDS component that has a total Pollution Mitigation Index (for each contaminant type) that equals or exceeds the Pollution Hazard Index (for each contaminant type).
- 5.24 Table 26.3 of the CIRIA SuDS Manual provides indicative SuDS Mitigation Indices for each SuDS type when discharging to surface water. Table 5.3 below, which is an excerpt from Table 26.3 of the CIRIA SuDS Manual, shows the Mitigation Indices for the SuDS features:

Type of Pollution Removal Component	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Concrete Block Permeable Paving	0.7	0.6	0.7
Swale	0.5	0.6	0.6
Detention Basin	0.5	0.5	0.5

Table 5.3 Pollution Mitigation Index

- 5.25 As Illustrated above, the Mitigation Indices for the proposed SuDS features exceed those of the Pollution Hazard Index figures for the identified site Pollution Hazard Level. This means that no further measures for pollution removal of SuDS elements are required to manage the pollution hazards onsite.

6.0 SuDS Maintenance Regime

- 6.1 This section describes the proposed management and schedules for the maintenance to reduce the risk of the proposed network flooding due to poor maintenance.

Piped Network Maintenance

- 6.2 The piped network shall be maintained by either Southern Water or an approved maintenance company in accordance with Sewers for Adoption (7th Ed.) and the manufacturers guidance.
- 6.3 This maintenance schedule should include clearing gullies, removing any large obstructions within the pipes and cleaning catchpits at regular intervals to ensure the correct operation of the sewer network.

Attenuation Storage Tanks and Pond Maintenance

- 6.4 The proposed SuDS features are to have a routine maintenance schedule that conforms to CIRIA SuDS Manual (C753) 2015 guidance. An approved maintenance company is to adhere to the maintenance schedule provided in Tables 6.1, 6.2 and 6.3 permeable paving, ponds, and swales of the CIRIA guidance in order to ensure the correct operation of the drainage.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface).	Once a year, after autumn leaf fall, or reduced frequency as required, based on site specific observations of clogging or manufacturer's recommendations - pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment.
Occasional Maintenance	Stabilise and mow contributing and adjacent areas.	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying.	As required - once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised within 50mm of the level of the paving.	As requires
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to structural performance or a hazard to users, and replace lost jointing material.	As required
	Rehabilitation of surface and upper substructure by remedial sweeping.	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for 3 months after installation.
	inspect for evidence of poor operation and/or weed growth - if required, take remedial action.	Three-monthly, 48h after large storms in first 6 months.
	Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually
	Monitor inspection chambers	Annually

Table 6.1 Operation and maintenance requirements for permeable paving