



2288-Fernhill Traveler's Site, Bury

Drainage Strategy
& Maintenance Document

Rev: P02 Date: 26.01.2022

1. Assessment of Drainage Options

The site is to be assessed for the suitability of infiltration type surfacewater drainage systems in accordance with BRE Digest 365; however, if it is found that the subsoils are not permeable the site would then be assessed for a connection to a local watercourse. As per the borehole logs and remediation document it is notable that the majority of made ground is comprised of clay with fragments of natural stone, based on this as well as contamination on site we believe infiltration not to be feasible on this basis.

The site has been assessed for the viability of a surface water connection to an existing local watercourse. A culverted watercourse has been noted 200m south of the site boundary, however, due to the impact such a dig would cause to the surrounding 3rd party landowners we believe the nature of the site would not justify an outfall connection to the identified watercourse as to be confirmed by the Local Planning and Lead Local Flood auth

The site is brownfield and therefore is surrounded with a positive sewer network. Copies of the United Utilities sewer records have been obtained and verified on site as generally accurate. Existing manholes are to be lifted to check pipe diameters, depths, and routes. According to the records the surrounding sewers are combined water sewers.

By way of a CCTV survey, it has been confirmed an onsite combined sewer provides an outfall solution to the off-site existing sewers. It is therefore determined that drainage connections from the proposed development should be routed to the existing combined water private sewer network surrounding within the development site. A S106 Part 1 application will be undertaken according to the Water Industry Act to United Utilities for sewer connections.

2. Drainage proposals

Details of the proposed drainage are shown on the following drawings:

2288-SCE-00-00-DR-C-0001-P02-Drainage_Strategy

The main sewerage for the development will remain private with space foul and surface water to combine on site before connecting to the existing public sewer near the site. This therefore ensures that the main sewerage infrastructure shall be owned and maintained by the client or management company.

In accordance with the hierarchy of drainage options within the National Planning Practice Guidance, both discharge to ground via infiltration and discharge to a waterbody should be discounted prior to consideration of discharging surface water to the public sewer system. Evidence provided to be reviewed by lead flood authority and United Utilities in order to demonstrate how these have been discounted.

Once evidence is sufficient as outlined above, United Utilities will consider a connection to the 450mm diameter public combined sewer within Every Street located East of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 5L/s.

The surface water sewer system has been designed in accordance with Sewers for Adoption 6th Edition and therefore includes the design for attenuation of flows for up to a 1 in 100 year + 40% climate change storm events without flooding. The outflow to the public sewer will be controlled by a hydrobrake device manhole. Attenuation has been provided in the form of cellular storage. This attenuates up to and including the 1 in 100 year + 40% CC return period for a site impermeable area of 3900m². The hydrobrake has been designed to restrict surface water flows to a discharge rate of 5.0L/s. details of the hydrobrake can be found in the Micro drainage calculations and hydro-international details.

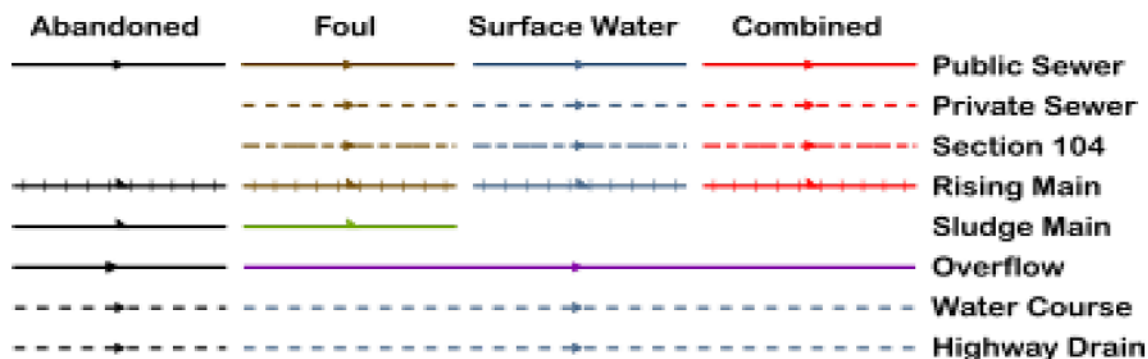
It is agreed with United Utilities by way of a predevelopment enquiry that the foul drainage will discharge with a free discharge to the existing combined sewer within Every St.

A proposed maintenance plan shown in Table 1 breaks down the maintenance responsibility and regimes of the other various assets.

Table 1: Proposed Maintenance (in accordance with best practice and CIRIA C753 – The SuDS Manual).

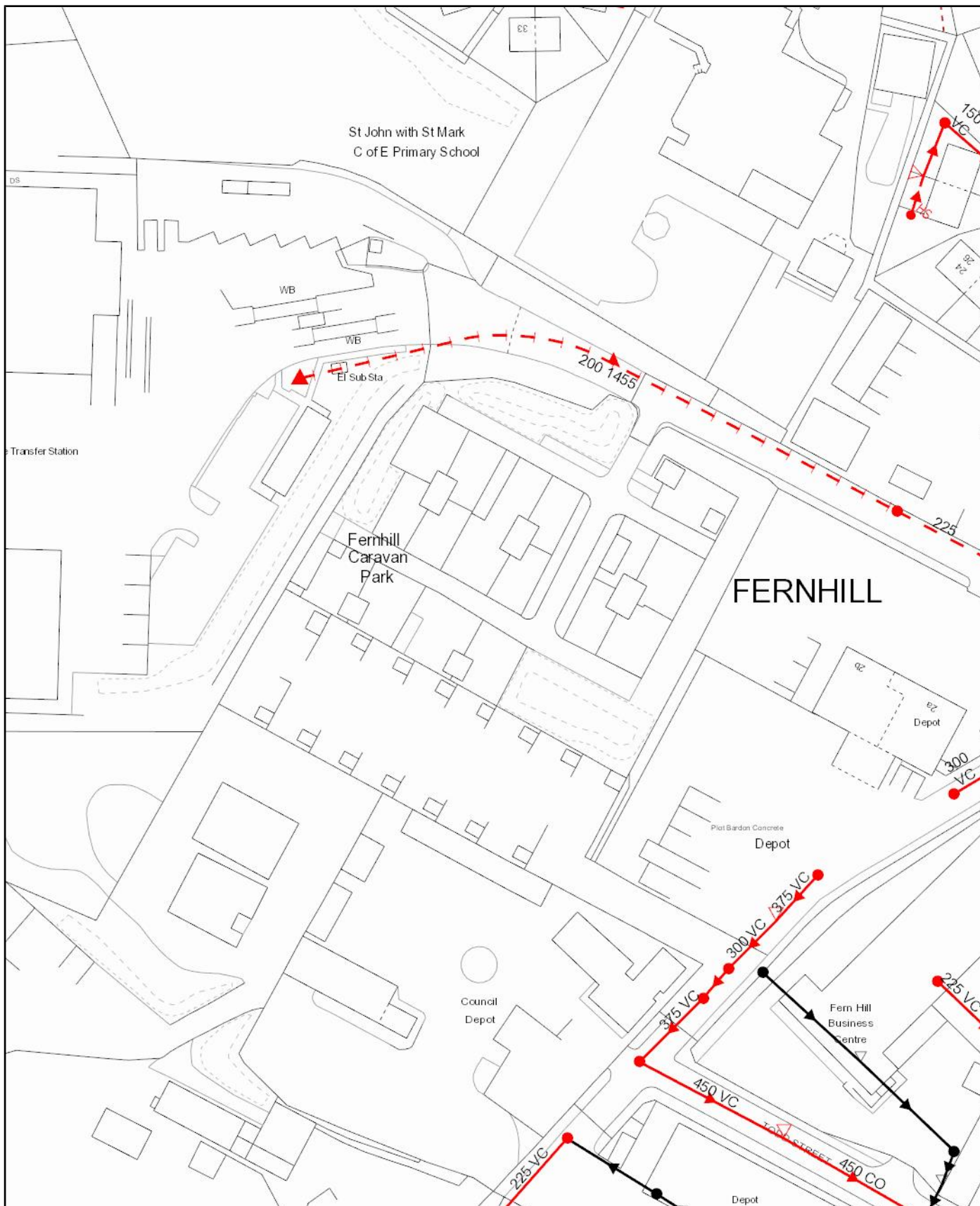
Drainage Asset	Responsible Organisation	Maintenance Work	Frequency
Pipework / Manholes	Private Ownership / Management Company	Inspect pipe work and clear blockages	Annually or after severe storms.
		Inspect manholes and clear blockages	
		Repair any defects in network	
Private Hydro brake Manhole Chamber	Management Company	Inspect structure and remove any debris/litter on structure	Six monthly or after severe storms.
Catchpits prior to attenuation	Management Company	Inspect structure and remove any debris/litter on structure	Three monthly or after severe storms.
Cellular Storage	Management Company	Inspect structure and remove any debris/litter on structure	Annually or after severe storms.

Wastewater Symbolology



All point assets follow the standard colour convention: **red** – combined **brown** - foul
blue – surface water **purple** - overflow

Manhole	Side Entry Manhole
Head of System	Outfall
Extent of Survey	Screen Chamber
Rodding Eye	Inspection Chamber
Inlet	Bifurcation Chamber
Discharge Point	Lamp Hole
Vortex	T Junction / Saddle
Penstock	Catchpit
Washout Chamber	Valve Chamber
Valve	Vent Column
Air Valve	Vortex Chamber
Non Return Valve	Penstock Chamber
Soakaway	Network Storage Tank
Gully	Sewer Overflow
Cascade	Ww Treatment Works
Flow Meter	Ww Pumping Station
Hatch Box	Septic Tank
Oil Interceptor	Control Kiosk
Summit	
Drop Shaft	Change of Characteristic
Orifice Plate	



Scale: 1:1250
Date: 05/11/2020

SEWER RECORDS



Address or Site Reference: 1 FERNHILL CARAVAN SITE EVERY STREET, BURY, BL9 5BE

Printed by: Property Searches

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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WINDOW SAMPLE LOG

Contract: Every Street, Bury			Client: Bury Council		Window Sample: BH01
Contract Ref: 11542	Start: 09.03.21 End: 09.03.21	Ground Level: ---	Co-ordinates: ---		Sheet: 1 of 1

Progress	Samples / Tests				Water Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results				
	0.15-0.20	1	ES	T+V+J		MADE GROUND: Black ASPHALT.	0.10	
	0.15-0.20	2	B			MADE GROUND: Greyish brown sandy slightly silty subangular to subrounded fine to coarse GRAVEL of limestone and sandstone.	0.25	
	0.30-0.40	3	ES	T+V+J			0.50	
	0.30-0.40	4	B					
	0.70-1.00	5	ES	T+V+J		MADE GROUND: Dark grey and black very gravelly clayey fine to coarse SAND with slight hydrocarbon odour. Gravel is subangular to subrounded fine to coarse sandstone and limestone and infrequent clinker and asphalt.	(0.60)	
	0.70-1.00	6	B				1.10	
	1.20-1.65	1	SPT	N=9		POSSIBLE MADE GROUND: Soft to firm light brown gravelly silty fine to coarse SAND. Gravel is subangular to subrounded fine to coarse sandstone.		
	1.20-2.00	1	U	114 blows 100% recovery				
	1.20-2.60	8	B			Soft to firm light brown slightly gravelly very sandy SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine sandstone and coal fragments.		
	1.30-1.50	7	ES	T+V+J				
1.20 - 2.00 (98mm dia) 100% rec	2.00-2.45	2	SPT	N=13			(2.20)	
	2.00-3.00	2	U	222 blows 100% recovery				
2.00 - 3.00 (98mm dia) 90% rec	3.00-3.45	3	SPT(c)	N=19		Light brown slightly gravelly silty fine to coarse SAND. Gravel is subangular to subrounded fine sandstone and coal fragments.	3.30	
	3.00-4.00	3	U	244 blows 100% recovery				
3.00 - 4.00 (98mm dia) 85% rec	4.00-4.45	4	SPT(c)	N=17		Soft to firm light brown slightly gravelly very sandy SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine sandstone and coal fragments.	(0.55)	
	4.00-5.00	4	U	261 blows 100% recovery			3.85	
4.00 - 5.00 (98mm dia) 80% rec	5.00-5.45	5	SPT(c)	N=21		Thinly laminated light brown slightly gravelly silty fine to coarse SAND. Gravel is subangular to subrounded fine to coarse sandstone and coal fragments.	(0.90)	
	5.00-6.00	5	U	270 blows 100% recovery			4.75	
5.00 - 6.00 (98mm dia) 100% rec	6.00-6.45	6	SPT(c)	N=20		Soft to firm light orangish brown slightly gravelly very sandy SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine sandstone and coal fragments.	(0.70)	
							5.45	
							(1.00)	
							6.45	
						Window sample hole terminated at 6.45 m depth.		

Drilling Progress and Water Observations						General Remarks									
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)										
09/03/21	09:40	0.00	0.00			1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Inspection pit hand dug to 1.20 m depth. 3. Water strike at 3.20 m depth. 4. Water strike at 4.50 m depth.									
09/03/21	12:35	6.00	6.00												
						All dimensions in metres		Scale:	1:38						
Method Used:	Tracked window sampling			Plant Used:	Archway Competitor		Drilled By:	CAPCSL		Logged By:	JSilverwood		Checked By:	AGS	

WINDOW SAMPLE LOG

Contract: Every Street, Bury			Client: Bury Council		Window Sample: BH03
Contract Ref: 11542	Start: 09.03.21	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 2	
	End: 09.03.21				

Progress	Samples / Tests				Water Backfill & Instru- mentation	Description of Strata	Depth (Thick- ness)	Material Graphic Legend
Window Run	Depth	No	Type	Results				
	0.00-0.15	1	ES			MADE GROUND: Grass onto very soft brown slightly sandy slightly gravelly CLAY with frequent rootlets. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse sandstone, quartzite and ceramic and brick fragments. (TOPSOIL)	0.20	
	0.30-0.50	2	ES				(0.40)	
	0.30-0.50	3	D				0.60	
	0.70-0.70	4	B			MADE GROUND: Soft to firm dark brown sandy gravelly CLAY with occasional rootlets and low cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse sandstone, quartzite, ceramic, brick, coal and concrete fragments. Cobbles are angular to subangular up to 150mm of sandstone flags.	0.80	
	0.70-0.70	5	ES				(0.75)	
	0.90-1.40	6	ES					
	0.90-1.40	7	B					
1.20 - 2.00 (98mm dia) 100% rec	1.20-1.65	1	SPT(c)	N=1 32 blows 100% recovery	1	MADE GROUND: Greyish brown sandy silty subangular to subrounded fine to coarse GRAVEL of limestone and sandstone. Sand is fine to coarse.	1.55	
	1.20-2.00	1	U				1.70	
	1.70-2.00	8	ES			MADE GROUND: Soft light orangish brown slightly gravelly sandy clayey SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse sandstone, coal and rare clinker.	2.00	
	1.70-2.00	9	D					
2.00 - 3.00 (98mm dia) 82% rec	2.00-2.45	2	SPT(c)	N=15 139 blows 100% recovery		Soft orangish brown mottled grey slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine sandstone and coal fragments.		
	2.00-3.00	2	U			Soft orangish brown slightly gravelly sandy clayey SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse sandstone and coal.		
	2.10-2.85	10	B			Soft to firm thinly laminated orangish brown slightly gravelly very sandy SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse sandstone and coal.	(2.75)	
3.00 - 4.00 (98mm dia) 90% rec	3.00-3.45	3	SPT(c)	N=17 210 blows 100% recovery	2	... between 2.35 m depth and 2.50 m depth, clayey SILT.		
	3.00-4.00	3	U			... at 2.90 m depth, thinly laminated		
4.00 - 5.00 (98mm dia) 90% rec	4.00-4.45	4	SPT(c)	N=15 237 blows 100% recovery	3		4.75	
	4.00-5.00	4	U					
5.00 - 6.00 (98mm dia) 85% rec	5.00-5.45	5	SPT(c)	N=20 291 blows 100% recovery		Soft to firm thinly laminated light brown slightly gravelly silty fine to coarse SAND. Gravel is subangular to subrounded fine to coarse sandstone and coal fragments.	(0.95)	
	5.00-6.00	5	U				5.70	
	6.00-6.45	6	SPT	N=15		Soft to firm thinly laminated orangish brown slightly gravelly very sandy SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse sandstone and coal.	(1.85)	

Drilling Progress and Water Observations						General Remarks			
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Inspection pit hand dug to 1.20 m depth. 3. Water strike at 1.50 m depth. 4. Water strike at 3.40 m depth. 5. Water strike at 4.50 m depth.			
09/03/21	13:10	0.00	0.00						
09/03/21	15:40	6.00	6.00						
						All dimensions in metres		Scale:	1:38
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	CAPCSL	Logged By:	JSilverwood
						Checked By:			



WINDOW SAMPLE LOG

Contract: Every Street, Bury		Client: Bury Council		Window Sample: BH03
Contract Ref: 11542	Start: 09.03.21 End: 09.03.21	Ground Level: ---	Co-ordinates: ---	Sheet: 2 of 2

Progress	Samples / Tests				Water	Backfill & Instru- mentation	Description of Strata	Depth (Thick ness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
							Soft to firm thinly laminated orangish brown slightly gravelly very sandy SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse sandstone and coal. <i>(stratum copied from 5.70m from previous sheet)</i>	7.55	
							Window sample hole terminated at 7.55 m depth.		

Drilling Progress and Water Observations						General Remarks						
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)							
						All dimensions in metres		Scale:	1:38			
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	CAPCSL		Logged By:	JSilverwood	Checked By:	