



2255-Ducie St, Manchester

Drainage Strategy
& Maintenance Document

Rev: P01 Date:17.12.2021

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. A Ground Investigation reports the exploratory holes encountered Made Ground (to a maximum depth of 3.05m) overlying superficial deposits of Devensian Till comprising firm to very stiff CLAY, If this is deemed not to be sufficient then soak away tests will be carried out to demonstrate infiltration rates are poor. However, we would suggest points thus far would validate that an infiltration drainage solution would not viable.

The site has been assessed for the viability of a surface water connection to an existing local watercourse. The site has no surrounding watercourse and therefore will not be assessed any further.

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.

It is therefore determined that drainage connections from the proposed development should be routed to the existing combined water public sewer networks surrounding the development site. A S106 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:

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The main sewerage for the development will remain private with space foul and surface water connections 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. United Utilities and the Lead Local Flood Authority are to be consulted to agree an assumed surface water discharge rate of 5.0l/s into the combined water sewer network.

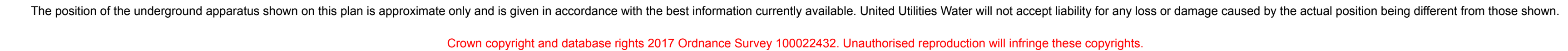
The surface water sewer system has been designed in accordance with Sewers for Adoption 6th Edition and therefore includes the design for attenuation of flows for up to a 1 in 100 year + 30% climate change storm events without flooding. The outflow to the public sewer will be controlled by a hydrobrake device manhole. Attenuation has been provided in the form of cellular storage. This attenuates up to and including the 1 in 100 year + 30% CC return period for a site impermeable area of 546m². 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 to be agreed with united utilities that the foul drainage will discharge with an assumed free discharge to the existing combined sewer with in Lomax 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 Packaged Pump Manhole Chamber/Rising Main	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.

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All point assets follow the standard colour convention:

red	- combined	blue	- surface water
brown	- foul	purple	- overflow

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

FO Foul
SW Surface Water
CO Combined
OV Overflow

CI	Circular	TR	Trapezoidal
EG	Egg	AR	Arch
OV	Oval	BA	Barrel
FT	Flat Top	HO	HorseShoe
RE	Rectangular	UN	Unspecified
SQ	Square		

AC	Asbestos Cement
BR	Brick
PE	Polyethylene
RP	Reinforced Plastic Matrix
CO	Concrete
CSB	Concrete Segment Bolted
CSU	Concrete Segment Unbolted
CC	Concrete Box Culverted
PSC	Plastic / Steel Composite
GRC	Glass Reinforced Plastic
DI	Ductile Iron
PVC	Polyvinyl Chloride
CI	Cast Iron
SI	Spun Iron
ST	Steel
VC	Vitrified Clay
PP	Polypropylene
PF	Pitch Fibre
MAC	Masonry, Coursed
MAR	Masonry, Random
U	Unspecified

Address or Site Reference:

51-53 DUCIE STREET,
MANCHESTER,
M1 2JQ

Scale: 1:1250 **Date:** 30/11/2021

Sheet: 1 of 1

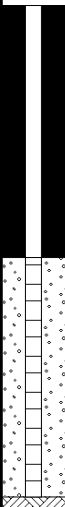
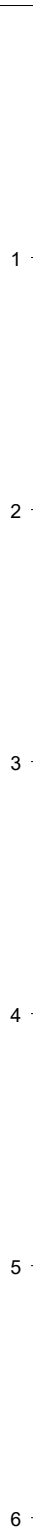
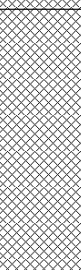
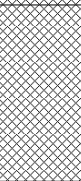
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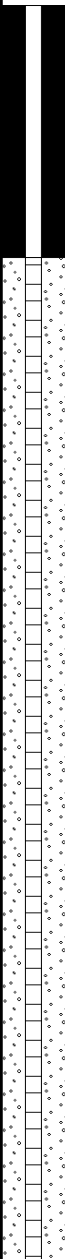
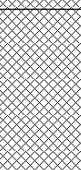
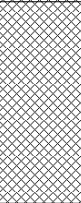
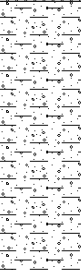
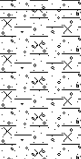
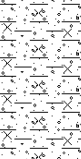


1.0 EXECUTIVE SUMMARY

Appointment	A site investigation has been commissioned by BDI Structural Solution Ltd, on behalf of Urbano Red Ltd (the 'Client') to examine ground conditions for the proposed residential development to the north of Ducie Street, Manchester.
The Investigation	The investigation comprised 4no. cable percussive boreholes and 6no. window sample boreholes, in situ testing, laboratory geotechnical and contamination testing. A Preliminary Explosive Ordnance Risk Assessment was also conducted prior to the site investigation.
The Site	The site is in Manchester, approximately 1km to the east of Manchester Central Shopping District, at approximate National Grid Reference SJ 85016 98259. The site is underlain by Superficial Deposits of Devensian Till (boulder clay), and the bedrock geology comprises the Chester Formation (sandstone).
Site History	The site has been developed since 1848 and has had multiple phases of recorded development. Historically, terraced houses occupied the north of the site, whilst a machine factory and brewery occupied the south of the site. The terraced houses on the northeast of the site were demolished by 1922. A hotel covered the east of the site, and the machine factory became a brush works by 1932. The remaining terraced houses were demolished by 1953 and the hotel converted into a factory by 1985. All the buildings on site were demolished by 2010 and the area became utilised as a car park to present day.
UXO Risk	The Explosive Ordnance poses a low risk to the proposed site investigation works. However, the planned piling works expose the project to a potential UXO encounter. Therefore, a Stage 2 Detailed Explosive Ordnance Risk Assessment is recommended prior to development.
Ground Conditions Encountered	The exploratory holes encountered Made Ground (to a maximum depth of 3.05m) overlying superficial deposits of Devensian Till comprising firm to very stiff CLAY (to a maximum depth of 16.40m). Beneath which were granular deposits comprising medium dense to very dense SAND (to a maximum depth of 21.0m), and dense to very dense SAND & GRAVEL (to a maximum depth of 21.45m). Groundwater was encountered during the field work at 3.50m (WS2). Subsequent monitoring in the standpipes encountered groundwater at depths between 3.15m-3.30m bgl (WS2) and 1.95m and 3.90m bgl (WS4).
Geotechnical Assessment	Foundation options for the proposed residential development are piles taken down to depth to a suitable founding stratum such as the stiff to very stiff Devensian Till Deposits (boulder clay). Evidence of soil desiccation was observed in seven clay samples. Pavement Design – preliminary design value = 1% Made Ground. Design Sulphate Class = DS-1 ACEC Site Classification = AC-1s
Contamination Assessment	Risk from contamination to groundworkers during development – Low to Moderate Chemical exceedance in Lead in 1no. soil sample (WS1). Risk from soil contamination to future residential end users – Low due to removal of impacted soils beneath the proposed building. Soil Waste Assessment: 7no. samples tested – 1no. Hazardous and 6no. Non-Hazardous. Asbestos was encountered as bundles of chrysotile fibres in 2no. samples. Asbestos quantified to be between 0.002% (WS2) and 0.003% (CP2). An Asbestos Management Plan will need to be prepared for the site.
Ground Gas Assessment	Based on the gas monitoring results the site can be classified as Gas Regime A and protection measures are therefore not needed.
<i>This sheet is intended to provide a summary only of the report. It does not provide a definitive engineering analysis for the purposes of costing or construction and is subject to the limitation of the agreed brief.</i>	

 EARTH ENVIRONMENTAL & GEOTECHNICAL Earth Environmental & Geotechnical Ltd Houldsworth Mill Business & Arts Centre Houldsworth Street Stockport SK5 6DA					Borehole Log			Borehole No. WS1 Sheet 1 of 1		
Project Name: Ducie Street					Project No. A4210		Co-ords: 385007.00 - 398259.00		Hole Type WS	
Location: Manchester					Level: 0.00		Scale 1:30			
Client: Urbano Red Limited					Dates: 03/08/2021 - 03/08/2021		Logged By SM			
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					0.15	-0.15		TARMACADAM (MADE GROUND).		
		0.60	ES					Dark brown very gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of concrete, red brick, sandstone and limestone. High cobble content of subangular brick and concrete. Rare glass fragments and metal nails (MADE GROUND).		
		1.20		N=7 (2,2/2,1,1,3)	1.20	-1.20		Reddish brown SAND & GRAVEL with high cobble content of subangular red brick. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of concrete, red brick, sandstone and limestone (MADE GROUND).		
		1.80	D	N=50 (25 for 10mm/50 for 10mm) N=50 (25 for 0mm/50 for 0mm)	1.90	-1.90		Light brownish grey CONCRETE (MADE GROUND).		
		2.00			2.00	-2.00		Borehole terminated in concrete. End of borehole at 2.00 m		
Remarks Location scanned with CAT prior to excavation. Hand dug pit excavated to 1.2m. Monitoring installation: 1m Plain, 0.95m slotted.										

 EARTH ENVIRONMENTAL & GEOTECHNICAL Earth Environmental & Geotechnical Ltd Houldsworth Mill Business & Arts Centre Houldsworth Street Stockport SK5 6DA					Borehole Log			Borehole No. WS2 Sheet 1 of 1			
Project Name: Ducie Street					Project No. A4210		Co-ords: 385014.00 - 398254.00		Hole Type WS		
Location: Manchester					Level: 0.00		Scale 1:30		Logged By SM		
Client: Urbano Red Limited					Dates: 03/08/2021 - 03/08/2021						

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.15	-0.15		TARMACADAM (MADE GROUND).	
								Dark brown clayey sandy subangular to subrounded GRAVEL of red brick, concrete, limestone and sandstone. High cobble content of subangular concrete and brick. Rare glass and metal fragments (MADE GROUND).	
							Occasional clay lenses at 0.80-1.0m bgl		
		1.20		N=6 (3,2/1,1,1,3)	1.10	-1.10		Firm brown slightly sandy gravelly CLAY. Gravel is angular to subangular fine to coarse of red brick, concrete, limestone and sandstone. Rare glass and metal fragments (MADE GROUND).	1
		2.00		N=14 (2,2/3,3,4,4)	1.90	-1.90		Brown sandy slightly gravelly CLAY. Gravel is rounded to subrounded fine to medium of sandstone and mudstone. Occasional sand lenses. Sand is fine to medium.	2
		2.50	D						
	3.00		N=30 (5,7/5,8,8,9)	3.00	-3.00		Stiff greyish brown silty sandy slightly gravelly CLAY. Gravel is rounded to subrounded fine to medium of sandstone and mudstone. Sand is fine to medium.	3	
	4.00		N=40 (8,8/10,10,10,10)			    	HP = 96kPa HP = 96kPa Lithology becoming very stiff at 4.0m bgl. HP = 96kPa HP = 120kPa	4	
	5.00		N=38 (5,6/8,10,10,10)	5.00	-5.00	End of borehole at 5.00 m			5
									6

Remarks
 Location scanned with CAT prior to excavation.
 Hand dug pit excavated to 1.2m.
 Monitoring installation: 1m Plain, 4m slotted.

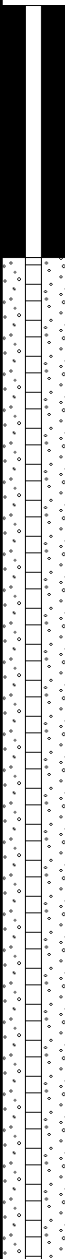
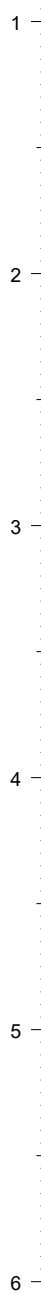

EARTH ENVIRONMENTAL & GEOTECHNICAL

 EARTH ENVIRONMENTAL & GEOTECHNICAL Earth Environmental & Geotechnical Ltd Houldsworth Mill Business & Arts Centre Houldsworth Street Stockport SK5 6DA					Borehole Log			Borehole No. WS3 Sheet 1 of 1			
Project Name: Ducie Street					Project No. A4210		Co-ords: 385017.00 - 398247.00		Hole Type WS		
Location: Manchester					Level: 0.00		Scale 1:30		Logged By SM		
Client: Urbano Red Limited					Dates: 03/08/2021 - 03/08/2021						
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
X					0.15	-0.15	X	TARMACADAM (MADE GROUND).	1 2 3 4 5 6		
		0.30	ES					Dark brown slightly silty SAND & GRAVEL. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of red brick, concrete, sandstone, limestone, occasional glass fragments. High cobble content of subangular red brick and concrete (MADE GROUND).			
					0.50	-0.50		<i>Borehole terminated on concrete slab.</i> End of borehole at 0.50 m			
Remarks Location scanned with CAT prior to excavation. Hand dug pit excavated to 1.2m. No monitoring installation, hole backfilled with arisings.										 EARTH ENVIRONMENTAL & GEOTECHNICAL	

 EARTH ENVIRONMENTAL & GEOTECHNICAL Earth Environmental & Geotechnical Ltd Houldsworth Mill Business & Arts Centre Houldsworth Street Stockport SK5 6DA					Borehole Log			Borehole No. WS3A Sheet 1 of 1		
Project Name: Ducie Street					Project No. A4210		Co-ords: 385018.00 - 398245.00		Hole Type WS	
Location: Manchester					Level: 0.00		Scale 1:30		Logged By SM	
Client: Urbano Red Limited					Dates: 03/08/2021 - 03/08/2021					
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					0.15	-0.15		TARMACADAM (MADE GROUND).	1 2 3 4 5 6	
					0.37	-0.37		Reddish brown slightly silty SAND & GRAVEL. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of red brick, slate, concrete, and sandstone. Rare metal fragments and plastic bags. High cobble content of subangular red brick and concrete (MADE GROUND). <i>Borehole terminated on concrete slab.</i> End of borehole at 0.37 m		
Remarks Location scanned with CAT prior to excavation. Hand dug pit excavated to 1.2m. No monitoring installation, hole backfilled with arisings.										

 EARTH ENVIRONMENTAL & GEOTECHNICAL Earth Environmental & Geotechnical Ltd Houldsworth Mill Business & Arts Centre Houldsworth Street Stockport SK5 6DA					Borehole Log			Borehole No. WS3B Sheet 1 of 1		
Project Name: Ducie Street					Project No. A4210		Co-ords: 385022.00 - 398253.00		Hole Type WS	
Location: Manchester					Level: 0.00		Scale 1:30			
Client: Urbano Red Limited					Dates: 03/08/2021 - 03/08/2021		Logged By SM			
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.20	ES		0.15	-0.15		TARMACADAM (MADE GROUND).	1 2 3 4 5 6	
					0.50	-0.50		Dark brown very gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of concrete, red brick, sandstone and limestone. High cobble content of subangular brick and concrete. Rare glass fragments and metal nails (MADE GROUND).		
					0.73	-0.73		Dark brown clayey sandy subangular to subrounded GRAVEL of red brick, concrete, limestone and sandstone. High cobble content of subangular concrete and brick. Rare glass and metal fragments (MADE GROUND). <i>Borehole terminated on suspected concrete slab.</i> End of borehole at 0.73 m		
Remarks Location scanned with CAT prior to excavation. Hand dug pit excavated to 1.2m. No monitoring installation, hole backfilled with arisings.										

 EARTH ENVIRONMENTAL & GEOTECHNICAL Earth Environmental & Geotechnical Ltd Houldsworth Mill Business & Arts Centre Houldsworth Street Stockport SK5 6DA					Borehole Log			Borehole No. WS4 Sheet 1 of 1		
Project Name: Ducie Street					Project No. A4210		Co-ords: 385021.00 - 398259.00		Hole Type WS	
Location: Manchester					Level: 0.00		Scale 1:30		Logged By SM	
Client: Urbano Red Limited					Dates: 03/08/2021 - 03/08/2021					

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					0.15	-0.15		TARMACADAM (MADE GROUND).		
					0.30	-0.30				Dark brown slightly silty SAND & GRAVEL. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of red brick, concrete, sandstone, limestone, slag, and tarmac. High cobble content of subangular red brick and concrete (MADE GROUND).
										
		0.80	ES							
		1.20								
				N=9 (2,1/1,1,3,4)						
		2.00	D		1.90	-1.90		Firm to stiff brown sandy slightly gravelly CLAY. Gravel is rounded to subrounded fine to medium of sandstone and mudstone. Occasional sand lenses. Sand is fine to medium.		2
		2.00		N=15 (2,3/3,4,4,4)						
		3.00		N=28 (4,4/6,7,7,8)	3.00	-3.00		Stiff greyish brown silty sandy slightly gravelly CLAY. Gravel is rounded to subrounded fine to medium of sandstone and mudstone. Sand is fine to medium.		3
	3.50	D								
	4.00		N=22 (4,4/5,5,6,6)							
	5.00		N=35 (4,5/8,8,9,10)	5.00	-5.00		End of borehole at 5.00 m	5		
								6		

Remarks
 Location scanned with CAT prior to excavation.
 Hand dug pit excavated to 1.2m.
 Monitoring installation: 1m Plain, 4m slotted.


EARTH ENVIRONMENTAL & GEOTECHNICAL

 EARTH ENVIRONMENTAL & GEOTECHNICAL Earth Environmental & Geotechnical Ltd Houldsworth Mill Business & Arts Centre Houldsworth Street Stockport SK5 6DA					Borehole Log			Borehole No. CP1 Sheet 1 of 5		
Project Name: Ducie Street					Project No. A4210		Co-ords: 385013.00 - 398264.00		Hole Type CP	
Location: Manchester					Level:		Scale 1:25		Logged By LG	
Client: Urbano Red Limited					Dates: 02/08/2021 - 03/08/2021					

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.15		TARMACADAM (MADE GROUND).		
		0.40	ES				Dark grey SAND & GRAVEL. Sand is fine to coarse. Gravel is angular fine to coarse brick, concrete and slag. High cobble content of brick and concrete (MADE GROUND).		
		1.00	ES				<i>Lithology becomes slightly clayey.</i>	1	
		1.50		N=14 (1,2/3,3,3,5)				2	
					2.10		Light brown and light grey slightly sandy gravelly COBBLES. Sand is fine to coarse. Gravel is fine to coarse angular concrete. Medium boulder content of concrete (MADE GROUND).		
		3.00 - 3.45	U		2.90 3.00		CONCRETE (MADE GROUND).	3	
		4.50		N=18 (2,3/4,4,5,5)			Stiff brown slightly silty slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to medium sandstone.	4	
							<i>HP = 215kPa</i>	5	
Continued on next sheet									

Remarks
 Location scanned with CAT prior to excavation.
 Hand dug pit excavated to 1.2m.
 No monitoring installation, hole backfilled with arisings.


EARTH ENVIRONMENTAL & GEOTECHNICAL

 EARTH ENVIRONMENTAL & GEOTECHNICAL Earth Environmental & Geotechnical Ltd Houldsworth Mill Business & Arts Centre Houldsworth Street Stockport SK5 6DA					Borehole Log				Borehole No. CP1 Sheet 2 of 5	
Project Name: Ducie Street					Project No. A4210		Co-ords: 385013.00 - 398264.00		Hole Type CP	
Location: Manchester					Level:		Scale 1:25		Logged By LG	
Client: Urbano Red Limited					Dates: 02/08/2021 - 03/08/2021					
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		6.00 - 6.45	U						6	
		7.50 7.50 - 7.95	D	N=24 (4,4/5,6,6,7)					7	
		9.00		N=23 (4,5/5,6,6,6)					8	
									9	
									10	
Continued on next sheet										
Remarks Location scanned with CAT prior to excavation. Hand dug pit excavated to 1.2m. No monitoring installation, hole backfilled with arisings.										

 Earth Environmental & Geotechnical Ltd Houldsworth Mill Business & Arts Centre Houldsworth Street Stockport SK5 6DA					Borehole Log			Borehole No. CP1 Sheet 3 of 5		
Project Name: Ducie Street					Project No. A4210		Co-ords: 385013.00 - 398264.00		Hole Type CP	
Location: Manchester					Level:		Scale 1:25		Logged By LG	
Client: Urbano Red Limited					Dates: 02/08/2021 - 03/08/2021					
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		10.50 - 10.95	U					Lithology now contains occasional sand pockets.	11	
		12.00		N=21 (4,4/5,5,5,6)					HP = 180kPa	12
		13.50		N=43 (25 for 145mm/20,13,5,5)	13.50					13
		13.50 - 13.95	D						Soft to stiff brown very sandy CLAY. Abundant sand lenses.	14
		15.00		N=34 (5,6/7,8,9,10)				Continued on next sheet	15	
Remarks Location scanned with CAT prior to excavation. Hand dug pit excavated to 1.2m. No monitoring installation, hole backfilled with arisings.										 EARTH ENVIRONMENTAL & GEOTECHNICAL

 EARTH ENVIRONMENTAL & GEOTECHNICAL Earth Environmental & Geotechnical Ltd Houldsworth Mill Business & Arts Centre Houldsworth Street Stockport SK5 6DA					Borehole Log			Borehole No. CP1 Sheet 4 of 5		
Project Name: Ducie Street					Project No. A4210		Co-ords: 385013.00 - 398264.00		Hole Type CP	
Location: Manchester					Level:		Scale 1:25		Logged By LG	
Client: Urbano Red Limited					Dates: 02/08/2021 - 03/08/2021					
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		16.50		N=43 (25 for 145mm/20,13,5,5)	16.40			HP = 96kPa	16	
		16.50 - 16.95	D					Dense yellowish brown slightly silty gravelly SAND. Sand is fine to coarse. Gravel is subrounded to rounded fine to medium sandstone. Abundant clay lenses.	17	
		19.50		N=50 (25 for 145mm/50 for 180mm)				Lithology now additionally contains mudstone gravel.	18	
									19	
									20	
Continued on next sheet										
Remarks Location scanned with CAT prior to excavation. Hand dug pit excavated to 1.2m. No monitoring installation, hole backfilled with arisings.										

 EARTH ENVIRONMENTAL & GEOTECHNICAL Earth Environmental & Geotechnical Ltd Houldsworth Mill Business & Arts Centre Houldsworth Street Stockport SK5 6DA					Borehole Log			Borehole No. CP1 Sheet 5 of 5	
Project Name: Ducie Street				Project No. A4210		Co-ords: 385013.00 - 398264.00		Hole Type CP	
Location: Manchester				Level:		Scale 1:25		Logged By LG	
Client: Urbano Red Limited				Dates: 02/08/2021 - 03/08/2021					
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		21.00		N=50 (25 for 140mm/50 for 110mm)	21.00			Very dense orangish brown SAND & GRAVEL. Sand is fine to coarse. Gravel is rounded fine to coarse sandstone.	21
					21.45				End of borehole at 21.45 m
									22
									23
									24
									25
Remarks Location scanned with CAT prior to excavation. Hand dug pit excavated to 1.2m. No monitoring installation, hole backfilled with arisings.									 EARTH ENVIRONMENTAL & GEOTECHNICAL

 EARTH ENVIRONMENTAL & GEOTECHNICAL Earth Environmental & Geotechnical Ltd Houldsworth Mill Business & Arts Centre Houldsworth Street Stockport SK5 6DA					Borehole Log			Borehole No. CP2 Sheet 1 of 1			
Project Name: Ducie Street					Project No. A4210		Co-ords: 385023.00 - 398249.00		Hole Type CP		
Location: Manchester					Level:		Scale 1:25		Logged By SM		
Client: Urbano Red Limited					Dates: 03/08/2021 - 03/08/2021						

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
			ES		0.15		TARMACADAM (MADE GROUND).	1	
				0.50		Reddish brown slightly silty SAND & GRAVEL. Gravel is angular to subangular fine to coarse of brick, slate, concrete, and sandstone. Occasional rebar. Sand is fine to coarse. High cobble content of subangular brick and concrete (MADE GROUND). CONCRETE (MADE GROUND).			
		0.80			0.85		Dark brown clayey sandy subangular to subrounded fine to coarse GRAVEL of red brick, concrete, limestone and sandstone. High cobble content of subangular red brick (MADE GROUND).		
		1.50			N=12 (2,3/3,2,3,4)				
					2.30		CONCRETE (MADE GROUND).	2	
				2.40		Borehole terminated on concrete slab. End of borehole at 2.40 m			
								3	
								4	
								5	

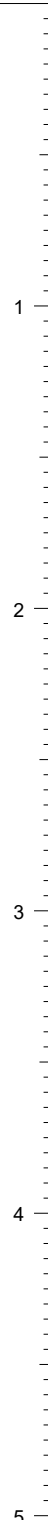
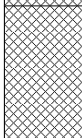
Remarks Location scanned with CAT prior to excavation. Hand dug pit excavated to 1.2m. No monitoring installation, hole backfilled with arisings.								 EARTH ENVIRONMENTAL & GEOTECHNICAL	
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Borehole Log

CP2A

Logged By
SM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.15			TARMACADAM (MADE GROUND).	
							Dark brown clayey sandy subangular to subrounded fine to coarse GRAVEL of red brick, concrete, limestone and sandstone. High cobble content of subangular red brick - possible brick wall (MADE GROUND).		
							CONCRETE (MADE GROUND). <i>Borehole terminated on concrete slab.</i> End of borehole at 0.70 m		
					0.60				
					0.70				

Location scanned with CAT prior to excavation.
Hand dug pit excavated to 1.2m.
No monitoring installation, hole backfilled with arisings.

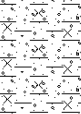
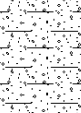
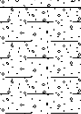


 EARTH ENVIRONMENTAL & GEOTECHNICAL Earth Environmental & Geotechnical Ltd Houldsworth Mill Business & Arts Centre Houldsworth Street Stockport SK5 6DA					Borehole Log			Borehole No. CP2B Sheet 1 of 4		
Project Name: Ducie Street					Project No. A4210		Co-ords: 385027.00 - 398254.00		Hole Type CP	
Location: Manchester					Level:		Scale 1:25		Logged By SM	
Client: Urbano Red Limited					Dates: 04/08/2021 - 05/08/2021					
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		1.50		N=8 (1,0/1,2,2,3)	0.15			TARMACADAM (MADE GROUND).	1	
					0.80			Dark brown slightly silty SAND & GRAVEL. Gravel is angular to subangular fine to coarse of tarmac, limestone, concrete, red brick and sandstone. Sand is fine to coarse (MADE GROUND).		
								Dark brown clayey sandy subangular to subrounded fine to coarse GRAVEL of red brick, concrete, limestone and sandstone. Medium cobble content of subangular red brick (MADE GROUND).		
								Brown sandy slightly gravelly CLAY. Gravel is rounded to subrounded fine to medium of sandstone, mudstone and rare brick. Occasional sand lenses. Sand is fine to medium (MADE GROUND).		
								Brown clayey sandy subangular to subrounded fine to coarse GRAVEL of red brick, concrete, limestone and sandstone. High cobble content of subangular red brick (MADE GROUND).		
		3.00		N=14 (2,2/3,3,4,4)	3.05			Firm greyish brown silty sandy slightly gravelly CLAY. Gravel is rounded to subrounded fine to medium of sandstone and mudstone. Sand is fine. <i>HSV = 75kPa</i>	3	
		4.50 - 4.95	U		4.50			Firm Brown sandy slightly gravelly CLAY. Gravel is rounded to subrounded fine to medium of sandstone and mudstone. Sand is fine to coarse.		
Continued on next sheet									5	
Remarks Location scanned with CAT prior to excavation. Hand dug pit excavated to 1.2m. No monitoring installation, hole backfilled with arisings.										

 EARTH ENVIRONMENTAL & GEOTECHNICAL Earth Environmental & Geotechnical Ltd Houldsworth Mill Business & Arts Centre Houldsworth Street Stockport SK5 6DA					Borehole Log			Borehole No. CP2B Sheet 2 of 4		
Project Name: Ducie Street					Project No. A4210		Co-ords: 385027.00 - 398254.00		Hole Type CP	
Location: Manchester					Level:		Scale 1:25		Logged By SM	
Client: Urbano Red Limited					Dates: 04/08/2021 - 05/08/2021					
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		6.00		N=20 (3,4/5,4,5,6)				HSV = 111kPa	6	
		7.50 - 7.95	U					Lithology becoming stiff at 6.0m bgl.	7	
		9.00		N=22 (4,4/5,5,6,6)				HSV = 140kPa	9	
								Continued on next sheet	10	
Remarks Location scanned with CAT prior to excavation. Hand dug pit excavated to 1.2m. No monitoring installation, hole backfilled with arisings.										

 EARTH ENVIRONMENTAL & GEOTECHNICAL Earth Environmental & Geotechnical Ltd Houldsworth Mill Business & Arts Centre Houldsworth Street Stockport SK5 6DA					Borehole Log			Borehole No. CP2B Sheet 3 of 4		
Project Name: Ducie Street					Project No. A4210		Co-ords: 385027.00 - 398254.00		Hole Type CP	
Location: Manchester					Level:		Scale 1:25		Logged By SM	
Client: Urbano Red Limited					Dates: 04/08/2021 - 05/08/2021					
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		10.50 - 10.95	U					Occasional sand lenses at 10.0m bgl.	11	
		12.00 - 12.45	U						12	
		13.50 - 13.95	U					Grey subangular cobble of sandstone.	13	
								Occasional sand lenses at 14.0m bgl.	14	
		15.00		N=25 (6,6/6,7,6,6)	15.00			Continued on next sheet	15	
Remarks Location scanned with CAT prior to excavation. Hand dug pit excavated to 1.2m. No monitoring installation, hole backfilled with arisings.										 EARTH ENVIRONMENTAL & GEOTECHNICAL

 EARTH ENVIRONMENTAL & GEOTECHNICAL Earth Environmental & Geotechnical Ltd Houldsworth Mill Business & Arts Centre Houldsworth Street Stockport SK5 6DA					Borehole Log			Borehole No. CP2B Sheet 4 of 4		
Project Name: Ducie Street					Project No. A4210		Co-ords: 385027.00 - 398254.00		Hole Type CP	
Location: Manchester					Level:		Scale 1:25		Logged By SM	
Client: Urbano Red Limited					Dates: 04/08/2021 - 05/08/2021					

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		15.45 - 15.95	D				 Stiff greyish brown silty sandy slightly gravelly CLAY. Gravel is rounded to subrounded fine to medium of sandstone and mudstone. Sand is fine. <u>HSV = 116kPa</u>	16	
		16.50		N=27 (5,6/7,6,7,7)	17.20		 <u>HSV = 64kPa</u>	17	
		18.00		N=50 (25 for 145mm/50 for 275mm)	18.00			18	
		18.00 - 18.45	D				 Dense brown SAND & GRAVEL. Sand is fine to coarse. Gravel is rounded fine to coarse sandstone.	19	
		19.50		N=50 (25 for 50mm/50 for 50mm)	19.50		 Dense to very dense brown slightly clayey gravelly fine to coarse SAND. Gravel is rounded to subrounded fine to coarse of sandstone and mudstone.	20	
				19.95			End of borehole at 19.95 m		

Remarks
 Location scanned with CAT prior to excavation.
 Hand dug pit excavated to 1.2m.
 No monitoring installation, hole backfilled with arisings.


EARTH ENVIRONMENTAL & GEOTECHNICAL