

Rochdale Road, Controlled Waters Assessment, Technical Note

Date: April 2023

Client Name: McGoff Construction Limited

Document Reference: WIE19453-100-TN-6.1.5-CWaters

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS EN ISO 45001:2018)

Issue	Prepared by	Checked & Approved by
	Name: Ugne Ankenaite Position: Consultant	Name: Rachael Tempest Position: Associate Director
	Signature: 	Signature: 

1. Boulder Clay Assessment - Controlled Waters

1.1 Introduction

The following Technical Note, authored by Waterman Infrastructure & Environment Limited ('Waterman'), aims to present additional geotechnical and hydrogeological assessment relating to the potential for vertical migration within the Glacial Till (Boulder Clay) underlying the Site at Rochdale Road, Manchester (hereafter named "Site").

The Technical Note will firstly set out the baseline geological and hydrogeological conditions of the site. A summary of the additional groundwater monitoring and sampling data, along with an assessment of the potential impacts of the proposed basement and underground parking on the bedrock aquifer at the Site.

This Technical Note builds upon reports prepared previously for the Site by Waterman and the data of additional groundwater monitoring. The following reports should therefore be read in conjunction with this Technical Note:

- WIE. Generic Quantitative Risk Assessment – Rochdale Road, Manchester. Ref. WIE19453-100-R-2.3.1-GQRA, dated January 2023; and,
- WIE. Foundation Works Risk Assessment – Rochdale Road, Manchester. Ref. WEI19453-100-R-4-1-2-FWRA.

1.2 Proposed Development

The Proposed Development is defined as:

‘The Erection of a part 11, part 13 storey building to form residential apartments (Use Class C3a) together with the erection of two blocks of 3 storey duplexes (Use Class C3a) to form 237 residential homes in total with associated commercial floor (Use Class E) (132 sqm), basement car parking, landscaping and public realm, and associated engineering and infrastructure works following demolition of existing buildings and structures’.

The consented development Drawings are presented within Enclosure 1.

1.3 Background

E3P Limited undertook the initial desk-based review of the Site in December 2018 (ref: 12-922-R1). Waterman then undertook ground investigation works between 26th October and 19th November 2022 (reported in January 2023). The scope of investigation undertaken at the Site by Waterman comprised cable percussive, rotary and window sample boreholes, trial pits together with handpits, gas and groundwater monitoring and laboratory analysis of soil and groundwater.

Based on the GI and environmental monitoring findings Waterman prepared Remediation Strategy and Foundation Works Risk Assessment for the proposed redevelopment at the Site.

1.4 Objectives

This technical note aims to directly address the Environment Agency concerns raised during the meeting undertaken in March 2023 following their review of the documents above. The main objectives of the technical note are:

- Provide more detail regarding the proposed underground parking and how deep the structure would extend into the existing Made Ground and Boulder Clay (if at all);
- To assess the potential that hydrocarbon contamination identified at the Site may be originating from the off-site historical Petrol Filling Station (PFS);
- To demonstrate the implications of the underground parking to the thickness of underlying Boulder Clay and how it will impact the migration risk to the underlying sandstone Aquifer;
- To present the additional data of groundwater monitoring and sampling; and
- To provide further assessment of the potential for vertical migration of perched water within the Boulder Clay into the underlying bedrock aquifer;

1.5 Limitations and Constrains

No boreholes were advanced in the northern boundary of the Site due to the presence of an existing open tunnel network and potential underground voids associated with the former use of the Site as a gas works. Therefore, two boreholes were advanced off-site to the north (BH106 and BH107). It should be noted that the topographic level of the adjacent site is approximately 5m lower than the subject Site. The below ground voids and below ground walls are presented in the drawing in Enclosure 1 (ref. 23C002-WSL-SI-XX-DR-S-96000).

The information contained in this technical note is based on a review of available information, consultation with the regulatory authorities and observations made on site.

2. Proposed Car Park Basement Interaction with Geology

The proposed development has a basement car park, located centrally at the Site. The basement excavation is likely to extend to approximately 4.5m bgl. In addition, the site levels at the east are likely to be reduced by 1m to allow the Site to align with external ground levels. An additional 500mm is likely to be excavated associated with the basement construction.

The following Drawings present the construction drawings for the basement car parking, included in Enclosure 1 & 2:

- Waterman Drawing Ref. 23C002-WSL-SI-XX-DR-S-96103/P03 – Existing Site Long Section Sheet 3, dated 24th February 2023;
- Waterman /drawing Ref. Refs. 23C002-WSL-SI-XX-DR-S-96102/P03 – Existing Site Long Section Sheet 2, dated 24th February 2023;
- Waterman Drawing Ref. 23C002-WSL-SI-XX-DR-S-96101/P03 – Existing Site Long Section Sheet 1, dated 24th February 2023;
- Ref. Jon Matthews Drawing Ref. 136/JMA/MP/LG-P-A-022199. Dated 13th August 2021.

To demonstrate how the basement interacts with the recorded geology at the Site a series of geological cross sections have been produced which firstly display the recorded geology at the Site as encountered in the recent ground investigation and as recorded in the exploratory hole logs.

Geological Cross Sections E (W-E) and C (NW-SW) in Enclosure 3 shows that the surface of boulder clay is encountered from 6.7m to 6.8m bgl extending to a depth of 19.2m and 20.2m bgl (a thickness of between 12.5m and 13.4m).

The proposed basement has been overlaid onto the Cross Sections, which shows at its proposed location the proposed basement will be extended to between 4.2m and 4.5m bgl. The extent of the basement does not reduce the thickness of the underlying Boulder Clay.

The Cross Sections demonstrate that the proposed basement excavation does not affect the thickness of this Boulder Clay barrier layer therefore no new preferential pathways of vertical migration will be introduced as a result of the development. The risk to the underlying aquifer is considered to be low.

3. Off-Site Petrol Filling Station (PFS)

The Environment Agency raised concerns that the elevated TPH concentrations within the groundwater may be originating from the neighbouring historical Petrol Filling Station (PFS) situated off-site to the east of the Site.

The exploratory holes advanced at the east of the Site during the ground investigation recorded the surface of the Boulder Clay (WS101) at 0.9m bgl depth proven to 3.40m bgl. The geology in this area of the Site is demonstrated in geological cross section A (NW-SE) in Enclosure 3.

The direction of groundwater migration was determined as to the north and north-east at the Site therefore the impact of the off-site PFS on this subject site is likely to be limited firstly on direction of groundwater migration.

Secondly the ground conditions at the west of the Site recorded Boulder Clay from 0.9m bgl with voids recorded further to the north-east. The description of the Boulder Clay in WS101 was soft to firm brown sandy gravelly clay with no groundwater encountered. Indicating limited potential for the migration of water.

The Boulder Clay would act as a low permeability barrier preventing potential lateral migration from the off-site PFS. Therefore, it is considered unlikely that the off-site PFS is impacting the Site.

2No. additional rounds of groundwater monitoring and sampling were undertaken at the Site with laboratory results presented in Enclosure 4 and discussed in Section 4. The concentrations of TPH and BTEX contaminants were recorded below the laboratory detection limits during the 2nd round undertaken on 30th March 2023 with elevated TPH and benzene concentrations recorded during the 3rd round undertaken on 5th April 2023. The EPH interpretation suggests the elevated concentrations are associated with dissolved phase aromatics.

No elevated concentrations of TPH or BTEX were recorded at BH102 which is located at the closest proximity to the off-site historical PFS.

It is considered unlikely that the off-site PFS is impacting the ground conditions at the Site. The PFS is discounted from the Site conceptual model.

It should also be noted that the off-site PFS is not part of this Site and is owned by a third party. In the event that contaminants are migrating onto this Site, the cost benefit of remediating the migrating contaminants would not be feasible. Responsibility for remediation of this contamination would fall to the third party owners of the adjacent Site and not our Client.

4. Additional Groundwater Sampling

Groundwater Level Monitoring

Following the discussions with the Environment Agency an additional 2 rounds of groundwater monitoring were undertaken at the Site on 30th March and 5th April 2023. The groundwater level monitoring results from the previous monitoring and the additional monitoring visits are presented in Table 2 overleaf.

Monitoring well BH103 was lost prior to the additional monitoring visits during archaeological exploratory excavations at the Site and access to borehole BH105 was obstructed by a stockpiled material during round 2.

The groundwater level monitoring indicates that there is limited groundwater recorded during the monitoring rounds at the Site. Deep piezometers were installed in the underlying sandstone in borehole BH101 at depth from 22m to 36m bgl and borehole BH102 at depth from 32m to 35.5m bgl. The piezometers were dry during all rounds.

The water recorded at the Site is limited in its extent and is considered to be collected perched water on top of the Glacial Till (Boulder Clay) within the Made Ground.

Table 1: Groundwater Levels

Exploratory Hole	Ground Level (mAOD)	Groundwater Level (mAOD)							
		Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8
On-site Up Hydraulic Gradient		21/10/22	11/11/22	21/11/22	07/12/22	03/01/22	16/01/23	30/03/23	05/04/23
BH101 - MG	51.90	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
BH101-piezo	51.90	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
BH102-MG	51.30	45.65	45.77	45.87	45.69	45.98	46.19	45.758	45.855
BH102 - piezo	51.30	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
BH103 - MG	51.48	45.92	45.92	46.06	45.8	45.97	46.14	Lost	
BH104 - MG	51.41	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
BH105 - MG	51.30	45.98	46.16	46.27	46.08	46.14	46.32	Obstructed	46.105
On-site Down Hydraulic Gradient									
BH106	45.782	44.442	44.50	44.622	44.542	44.602	44.762	44.452	44.431
BH107	46.28	45.18	45.19	45.13	45.19	45.3	45.42	45.279	45.09

Groundwater Samples

Groundwater sampling was carried out during one monitoring visit following the completion of the ground investigation works and 2No. additional visits were undertaken on 30th March and 5th April 2023 to further characterise the groundwater underlying the site. The presence of hydrocarbon free product on the groundwater was investigated using a free phase dip-meter, which did not show evidence of a hydrocarbon sheen on the surface.

Groundwater samples were obtained from the monitoring wells following purging of three well volumes using submersible low flow pump. On-site testing of groundwater for temperature, pH, conductivity, and dissolved oxygen was undertaken. The collected water samples were then sealed into bottles with pre-measured fixatives where necessary, as supplied by the specialist laboratory, and transported in cool boxes to the testing laboratory.

The groundwater laboratory certificates are presented in Enclosure 4 and the recorded elevated concentrations when compared to EQS Values are shown in Table 3.

During the 2nd round of groundwater monitoring (30/03/23) only concentrations of fluoranthene were recorded above the EQS threshold values with other determinants recorded below the laboratory detection limits.

The groundwater samples obtained during the 3rd monitoring visit (05/04/23) recorded elevated concentrations of 2-4,Dimethyphenol, Naphthalene, Anthracene and Fluoranthene consistent with typical gas works contaminants. Elevated concentrations of Nickel were recorded in BH105.

There is no published EQS for TPH, however the elevated concentrations are included in the table below.

Slightly elevated concentrations of TPH were recorded at BH105 during the 3rd monitoring visit, which is consistent with the observations of hydrocarbons within the groundwater recorded during the drilling and the 1st monitoring round. Marginally greater concentrations of TPH were recorded during the first monitoring visit with greater concentrations recorded at BH105, reducing towards BH103 with no elevated TPH concentrations recorded in BH102.

Elevated concentrations of Benzene were recorded at BH105 only during the third monitoring visit.

Table 2: Significantly elevated concentrations in groundwater

Contaminant	Threshold Value (µg/l)	No. of Samples above EQS			Max. Concentration (µg/l)
		1 st Round 21/10/22	2 nd Round 30/03/23	3 rd Round 05/04/23	
Nickel	4	2 (BH103 & BH105)	0	1 (BH105)	25
2,4-Dimethylphenol	7.7	1 (BH105)	0	1 (BH105)	95
Naphthalene	2	1 (BH105)	0	1 (BH105)	62 (1 st Round)
Anthracene	0.1	2 (BH103 & BH105)	0	1 (BH105)	2.9 (2 nd Round)
Fluoranthene	0.00630	3 (BH102, BH103 & BH105)	1 (BH102)	1 (BH105)	20.6 (1 st Round)
2-Methylnaphthalene	2	1 (BH105)	0	0	25
Benzene	10	0	0	1 (BH105)	23.7 (3 rd round)
TPH Aliphatic EC6-EC8	N/A	0	0	1 (BH105)	21 (3 rd round)
TPH Aliphatic EC8-EC10	N/A	0	0	1 (BH105)	107, 12 (3 rd round)
TPH Aromatic EC5-EC7	N/A	0	0	1 (BH105)	24 (3 rd round)
TPH Aromatic EC8-EC10	N/A	0	0	1 (BH105)	80 (3 rd round)
TPH Aromatic EC10-EC12	N/A	1 (BH105)	0	1 (BH105)	245
TPH Aromatic EC12-EC16	N/A	2 (BH103 & BH105)	0	1 (BH105)	580
TPH Aromatic EC16-EC21	N/A	2 (BH103 & BH105)	0	1 (BH105)	410
TPH Aromatic EC21-EC35	N/A	2 (BH103 & BH105)	0	0	480

Boreholes BH106 and BH107

Due to the presence of an existing open tunnel network and potential underground voids, advancing boreholes towards the northern boundary was deemed unsafe from a Health and Safety perspective. To provide geotechnical properties of the ground two boreholes were advanced off-site to the north (BH106 and BH107).

The groundwater sample collected from BH106 did not record any concentrations of contaminants above the EQS threshold values.

Elevated concentrations of contaminants similar to those recorded at the site were recorded in BH107.

It was concluded that the groundwater migrating to the north, and based on groundwater elevations, would be towards BH107. However, BH102 did not record elevated concentrations of contaminants, indicating that the concentrations recorded in borehole BH107 are likely to have a source on the adjacent site rather than sourced from this Rochdale Road site.

5. Ground Conditions

A summary of the Site soil and groundwater conditions as presented within the 2023 Waterman Generic Quantitative Risk Assessment report (Ref. WIE19453-100-R-2.3.1-GQRA) is provided below. The borehole location plan is presented in Enclosure 1.

5.1.1 Soil Profile

Table 3: Site Geology and Hydrogeology

Soil Type	Thickness (m)	EA Classification	Typical Description
Hardstanding (concrete and tarmac)	0.07 - 0.2	Not classified	Hardstanding covers 100% of the Site.
Made Ground (Granular)	0.9 – 7.8	Not classified, may locally contain shallow water	Encountered across the whole of the Site, generally comprising clayey sand with frequent gravels of mixed lithologies including brick, ash, clinker, glass, plastic, tarmac, wood and concrete.
Made Ground (Cohesive)	1.1	Not classified, may locally contain shallow water	Firm dark brown sandy gravelly clay. Recorded in east of the site (BH102)
Glacial Till (Boulder Clay)	12.6-19.2	Unproductive Strata	Firm to Stiff brown sandy gravelly clay to Firm brown very sandy gravelly friable clay with bands of Sand. Present across the whole Site overlying the Sandstone Bedrock.
Sand	1.3-2.8	Not classified	Sand bands of potentially weathered sandstone bedrock.

Soil Type	Thickness (m)	EA Classification	Typical Description
Sandstone Bedrock	From 15.0-26.0 (thickness unproven)	Principal Aquifer	awn sandstone residually weathered. Extremely weak to weak medium to coarse red brown Sandstone

5.1.2 Glacial Till (Boulder Clay)

The Glacial Till (Boulder Clay) thickness during the GI works was recorded between 13.0m and 19.2m between the Made Ground and the underlying Sandstone bedrock. Interbedded sand bands were recorded within the Glacial Till in BH101 (southeast corner of the site) from 20m bgl.

5.1.3 Groundwater

Limited groundwater was recorded during the drilling of the boreholes during the ground investigation.

Where the Glacial Till has been excavated at the Site, groundwater is encountered within the Made Ground contained above the Glacial Till surface and is likely to be perched and discontinuous across the Site. As evidenced by dry boreholes in the southeast of the site (BH101 and BH104). Groundwater levels recorded during the post works monitoring indicates the groundwater will migrate locally to the north-east from BH105 towards BH102.

It is considered that the Glacial Till recorded at the Site is a low permeability layer that will prevent the vertical migration of contamination from the Made Ground to the underlying Principal Aquifer. The Principal Aquifer in the GQRA report has therefore been discounted as a key receptor at the Site due to the significant thickness of Glacial Till.

5.1.4 Further Glacial Till (Boulder Clay) Assessment

Following the concerns raised by the Environment Agency during the meeting on 17th March 2023 associated with the potential of vertical migration from the impacted groundwater within the Made Ground to the deeper Sandstone Principal Aquifer, further assessment of the permeability of Glacial Till (Boulder Clay) was undertaken in order to provide the additional lines of evidence to indicate the risk of potential vertical migration at the Site.

A series of Cross Sections have firstly been prepared, which graphically demonstrate the thickness across the site. It is noted that interbedded sand bands within the Boulder Clay were recorded at borehole BH101 only from a depth of 20m bgl, with 16.9m of Boulder Clay above this.

Using the Particle Size Distribution (PSD) results from the ground investigation, an assessment of the hydraulic conductivity has been undertaken using the Hazen's Formula.

Cross Sections

A series of Geological Cross Sections representing the thickness of the clay across the Site together with the position of underground voids and the proposed basement parking are presented in Enclosure 3.

The maximum thickness of 19.2m of Glacial Till (Boulder Clay) was identified in BH101 located in the south-eastern corner of the site and the minimum thickness of 12.6m was encountered within BH105 located in the western portion of the site.

A substantial thickness of low permeability Glacial Till (Boulder Clay) is considered to exist at the Site, which will intercept the discontinuous impacted perched water identified within the Made Ground from moving downwards to the underlying Sandstone aquifer identified at depth beneath the Site. It should be noted that the proposed basement parking sits within the existing Made Ground at the Site, as shown on the Cross Sections in Enclosure 3, and the construction of the basement will not reduce the thickness of the underlying Glacial Till (Boulder Clay), hence the likelihood of vertical migration of contaminants within the perched groundwater remains low.

Permeability Assessment

Hazens Formula

The hydraulic conductivity of the Glacial Till has been determined using both literature values and Hazen's calculations using the PSD data available for the Site.

The permeability of the clay has been calculated using the Hazen's Formula. The Hazen's Formula is defined as:

$$k = C \times (D_{10})^2$$

Where:

k is hydraulic conductivity [cm/sec]

C is Hazen's coefficient = 0.8 – 1.2 (typical = 1)

D_{10} is the 10 per cent particle size taken from the Particle Size Distribution (PSD) analysis [mm]

The PSD analysis, undertaken as part of the ground investigation, recorded that the Glacial Till (Boulder Clay) contains more than 10% clay, therefore, the maximum clay grain size value of 0.002m was used for D_{10} .

The Hazen's calculation gives a permeability of less than 4×10^{-8} m/s. As the 0.002m is the smallest sieve size in the PSD test, and all the test results indicate the material to include significantly greater than 10% clay, all the test results give the same permeability value and whereby the calculation is overestimating the permeability of the clay.

Literature Values

The hydraulic conductivities for clay as given in Domenico & Schwartz (1997) is between 1×10^{-11} m/s and 4.7×10^{-9} m/s.

The permeability of the clay is low (likely to be in the order of 1×10^{-11} m/s to 1×10^{-9} m/s based on site specific data and literature values) and the thickness significant (a minimum of 12.6m) and therefore the vertical migration of contaminants from the Made Ground to the deep Sandstone Principal Aquifer will be severely restricted.

6. Conclusions

The three concerns raised by the EA regarding the Glacial Till (Boulder Clay) and potential risk of vertical migration of contaminants have been discussed in this Technical Note.

The proposed development does not affect the thickness of Glacial Till (Boulder Clay) at the Site, due to the thickness of Made Ground currently present at the Site.

The presence of Glacial Till (Boulder Clay) at shallow depth at the eastern boundary of the Site is considered to provide a low permeability layer to migrating shallow groundwater.

The thickness of Glacial Till (Boulder Clay) recorded at the Site is between 12.6m and 19.2m, with localised sand bands only recorded in one location (BH101) at depths of greater than 20.0m bgl. No groundwater strikes were recorded during the drilling of the boreholes and the deep piezometers installed at the Site within the Sandstone have remained dry during the post works monitoring.

Calculating the hydraulic conductivity of the Glacial Till (Boulder Clay) using the PSD results and a review of literature values indicates a hydraulic conductivity of between 1×10^{-11} m/s to 1×10^{-9} m/s for the materials beneath the Site.

It is concluded that the risk of vertical migration of the limited perched groundwater is low at the Site and remains unaffected by the construction of the basement as part of the development

Enclosure 1

- General Arrangement Drawing PLANIT I.E (Ref. 2624-PLA-XX-XX-DR-L-0002/S1/P06)
- Borehole Location Plan (Ref. 19453-100-WIE-ZZ-XX-DR-V-80-001-P05)
- The existing site plan showing below ground voids and walls Ref. 23C002-WSL-SI-XX-DR-S-96000)
- Basement Level General Arrangement Plan (Ref: 136-MA-MP-LG-P-A-022199)

Enclosures

KEY:

- EXISTING BUILDINGS
- BELOW GROUND VOIDS (BASED ON HISTORIC GAS WORKS SITE PLAN)
- BELOW GROUND MASONRY WALLS (BASED ON HISTORIC GAS WORKS SITE PLAN)
- MASONRY BOUNDARY WALLS
- BRICKWORK CAPPING

This drawing should not be scaled. Dimensions to be verified on site.
Any discrepancies should be referred to the Engineer prior to work being put in hand.

GENERAL NOTES

- EXISTING SITE PLAN HAS BEEN BUILT BASED ON INFORMATION OBTAINED VIA TOPOGRAPHICAL & STRUCTURAL SURVEYS, INCLUDING HISTORICAL SITE INFORMATION REGARDING THE GAS WORKS. PARTY WALL AREAS 1, 3 AND 6 WERE INACCESSIBLE DURING THE SITE INSPECTIONS THEREFORE DETAILS MAY VARY FROM THAT INDICATED.
- BELOW GROUND OBSTRUCTIONS/ VOIDS EXTENTS ARE APPROXIMATED BASED ON BOTH LIMITED INTRUSIVE INVESTIGATION AND HISTORICAL DATA. FURTHER SITE INVESTIGATION IS RECOMMENDED TO ESTABLISH THE FULL EXTENTS OF BURIED OBSTRUCTIONS/ VOIDS WITHIN THE GROUND

CONSTRUCTION SEQUENCING SHOULD PROCEED IN THE FOLLOWING DRAWING ORDER:

96000 - EXISTING SITE PLAN
96001 - ABOVE GROUND DEMOLITIONS PLAN
96003 - FUTURE EXPLORATORY WORKS PLAN
96006 - TEMPORARY WORKS PLAN
96004 - BELOW GROUND DEMOLITIONS PLAN
96002 - PILING PLATFORM PLAN

ABOVE DRAWINGS SHOULD BE READ IN CONJUNCTION WITH WSL DRAWING NUMBERS:

96100 - SITE SECTIONS KEYPLAN TOGETHER WITH:
96101 - LONG SECTIONS SHEET 1
96102 - LONG SECTIONS SHEET 2
96103 - LONG SECTIONS SHEET 3
96104 - LONG SECTIONS SHEET 4
96105 - LONG SECTIONS SHEET 5

96007 - PARTY WALL PLAN TOGETHER WITH:
21001 - PARTY WALL SECTIONS SHEET 1
21002 - PARTY WALL SECTIONS SHEET 2
21003 - PARTY WALL SECTIONS SHEET 3
21007 - PARTY WALL SECTIONS SHEET 4

96005 - NORTHERN BOUNDARY WALL PLAN TOGETHER WITH:
21004 - NORTHERN BOUNDARY WALL SECTIONS SHEET 1
21005 - NORTHERN BOUNDARY WALL SECTIONS SHEET 2

96010 - FOUNDATION OVERLAY PLAN
96011 - ALTERNATIVE PILECAP GA

P02	S2	17.03.22	APPROX DIMS ADDED TO EXISTING WALLS/VOIDS.	AH	JG
P01	S2	24.02.22	PRELIMINARY ISSUE AT STAGE 3	AH	AD
Status	Date	Description	By	CHK	

Amendments

Project
ROCHDALE ROAD, MANCHESTER

Title
EXISTING SITE PLAN

Client
McGOFF CONSTRUCTION



Trinity Court, 16 John Dalton Street Manchester M2 6HY
t+44 161 839 8392
mail@watermangroup.com www.watermangroup.com

Subsidiary
INFORMATION **S2**

Designed By
AD Checked By
AD Waterman Ref
STR17791

Drawn By
AS Date
NOV 2022 Scales @ A1
1:200@A1

Project - Originator - Volume - Level - Type - Role - Number

Revision
23C002-WSL-SI-XX-DR-S-96000 **P02**

UNDERLAY SHOWS APPROX POSITION OF FORMER GASWORKS BUILDINGS

EVIDENCE OF COLLAPSED / INFILLED VOID

EVIDENCE OF COLLAPSED / INFILLED VOID

LOW LEVEL PLINTH ONLY

BUILDING A
ARCHED WALL
CARRIED OUTSIDE

EXISTING
GARDEN WALL

POSSIBLE LEAN-TO
STRUCTURE, MAY TAKE
SUPPORT FROM BUILDING B
ALONG BOUNDARY

EXISTING ACCESS AND EGRESS
ONTO SITE

23C002-WSL-SI-XX-DR-S-96000

This drawing should not be scaled. Dimensions to be verified on site.
Any discrepancies should be referred to the Engineer prior to work being put in hand.

This drawing is the property of Waterman Infrastructure & Environment Limited, and the drawing is issued on the condition that it is not copied, reproduced, related or disclosed to any unauthorised person, either wholly or in part without the consent in writing of Waterman Infrastructure & Environment Limited
Pickfords Wharf, Clink Street, London SE1 5DG 1 020 7928 7888 1 03333 444 501

GENERAL NOTES

-  SITE BOUNDARY
-  WS101 WINDOW SAMPLE LOCATIONS
-  BH101 15-20M CABLE PERCUSSIVE BOREHOLES WITH FOLLOW ON 10M ROTARY CORING
-  TP111 TRIAL PITS TO ESTABLISH EXISTING FOUNDATION ARRANGEMENTS
-  HDP101 HAND DUG PIT LOCATIONS (POSITIONED ON SITE, NOT SURVEYED)
-  EXPLORATORY HOLE LOCATIONS WITHIN BUILDING WERE POSITIONED ONSITE, NOT SURVEYED

P05	SO	22.11.22	AS BUILT ISSUE	DC	RT
P04	SO	17.10.22	AS BUILT ISSUE	DC	RT
P03	SO	20.09.22	UPDATED TOPO	DC	RT
P02	SO	15.09.22	GI LOCATIONS UPDATED	MC	RT
P01	SO	09.09.22	PRELIMINARY ISSUE	MC	RT
Status	Date	Description		By	Chk

Amendments

Project

ROCHDALE ROAD

Title

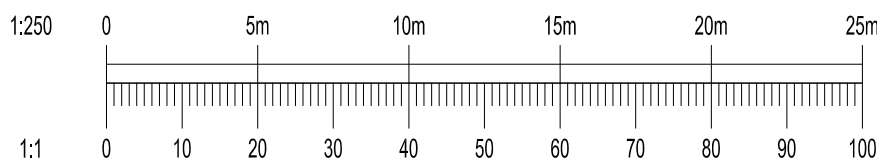
EXPLORATORY HOLE LOCATION PLAN

Client



6th Floor Trinity Court 16 John Dalton Street Manchester M2 6HY
t 0161 839 8392
mail@watermangroup.com www.watermangroup.com

Status					
AS BUILT					
Designed By	RT	Director	RT	Waterman Ref	WIE19453-100
Drawn By	MC	Date	NOVEMBER 2022	Scales @ A1	1:250
Project - Originator - Volume - Level - Type - Role - Number					Revision
19453-100-WIE-ZZ-XX-DR-V-80-001					P05





Notes:

PLAN KEY:

- 01

Car park (29 parking spaces)
- 02

Life safety room
- 03

Switch room
- 04

Tank room
- 05

Duplex coach house garage
- 06

Duplex coach houses (ground floor footprint above)
- 07

Vehicular entrance to basement
- 08

Automated roller shutter
- 09

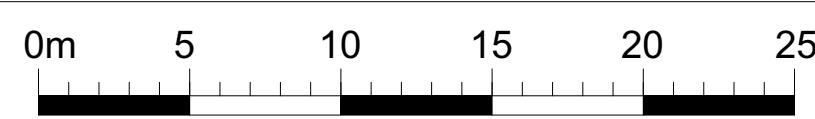
Ramp down to basement

Project Name: 87 Rochdale Road		Title: Basement Level General Arrangement Plan		Scale: 1:125 @ A1	
Drawn: JBe	Checked: MH	Status: Planning	Project: 136-JMA-MP-LG-P-A-022199	Drawing No: -	Rev: -
Details: 13/08/21 Issued for Planning					

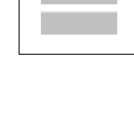
Jon Matthews Architects

4th Floor Centurion House, 129 Deansgate, Manchester, M3 3WR 0161 974 3690

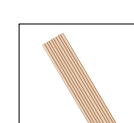
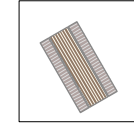
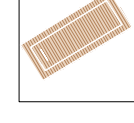
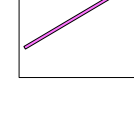
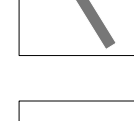
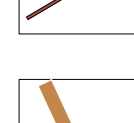
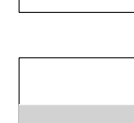
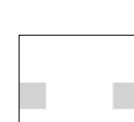
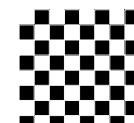
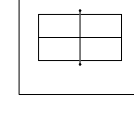
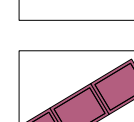
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Key

- **Mulbury Planning Application Boundary**
- **Natural Stone Paving Mix 1**
To public realm & shared community space
Type: Portuguese granite
Colour: TBC
Finish: TBC
Supplier: Hardscape or similar approved
Note: allow for galvanised 3x150mm exccell edge
- **Clay Paving Mix 2**
To match adjacent MCR site (H3 material) pedestrian areas throughout the site.
Type: Clay Paving
Colour: Various to complement architectural material palette
Finish: TBC
Supplier: Hardscape or similar approved
Note: allow for galvanised 3x150mm exccell edge
- **Clay Paving Mix 3**
To private garden space
Type: Neland Clay Paving
Colour: TBC
Finish: TBC
Supplier: Hardscape or similar approved
Note: allow for galvanised 3x150mm exccell edge
- **Green gap concrete paving**
To Residential spaces
Type: Concrete
Colour: TBC
Finish: TBC
Supplier: Hardscape or similar approved
Note: allow for galvanised 3x150mm exccell edge
- **Granite Planks**
To Residential spaces
Type: Portuguese granite
Colour: TBC
Finish: TBC
Supplier: Hardscape or similar approved
- **Natural Stone Paving**
To match approved MCR site Gould street highway paving
Size, colour finish, to MCC standard detail
Note: allow for 125x255mm kerb edge

FURNITURE & STRUCTURES

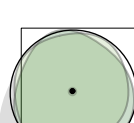
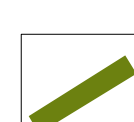
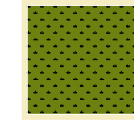
- **Seating Edge**
To Courtyards
Timber top corten frame
- **Picnic Table**
Timber top picnic table with powdercoated galvanised frame
- **Tiered Seating Feature**
Timber seating with integrated tree, details tbc
- **1.8m Rimini Galvanised Steel Fence**
details tbc
- **Retaining Structure**
Existing To Gould street & 87 Rochdale Road
- **1.1m Rimini Galvanised Steel Balustrade**
To private spaces, details tbc
- **Timber play feature**
To community shared spaces, details tbc
- **Proposed 1.1m wall with 500mm railing**
Brickwork finish to match building facade
- **1.5m Pillar Wall**
To courtyard edge
details tbc
- **Chess Board - Play**
To courtyard edge
- **Table tennis**
To courtyard edge
- **Planting Screen**
2.5m high Galvanised steel planting screen to courtyard
finish: tbc
- **Cycle Stands**
10no. Sheffield cycle stands to external spaces
- **Bin Store**
Controlled accessed 3 No. 1100L & 1no.240L bins to town house & duplex's

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- NOTES:
- Do not scale from this drawing.
 - Always work to noted dimensions.
 - All dimensions are in millimetres unless otherwise stated.
 - All setting out, levels and dimensions to be agreed on site.
 - The dimensions of all materials must be checked on site before being laid out.
 - This drawing must be read with the relevant specification clauses and detail drawings.
 - Order of construction and setting out to be agreed on site.

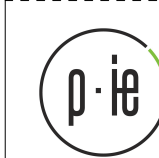
NOTE:
General Arrangement drawing to be read in conjunction with drawings:
2624-PLA-XX-XX-DR-L-1001
2624-PLA-XX-XX-DR-L-1002
2624-PLA-XX-XX-DR-L-2000
2624-PLA-XX-XX-DR-L-3000

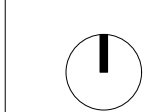
SOFTWORKS

- **Trees**
A combination of single & multi-stem trees. Refer to drawing 2426-PLA-XX-XX-DR-L-2000 for specification.
- **Clipped Instant Hedge**
To private garden boundaries
Size: 800mmW x 1200mmH approx.
Refer to drawing 2426-PLA-XX-XX-DR-L-2000 for specification.
- **Ornamental Shrub and Herbaceous Planting**
Biodiversity rich planting. Refer to drawing 2426-PLA-XX-XX-DR-L-2000 for specification.
- **Marginal Ornamental Planting**
To swales / rain gardens Refer to drawing 2426-PLA-XX-XX-DR-L-2000 for specification.
- **Lawn**
Medallion turf
Supplier: Rolawn or similar approved
- **Planting Bed**
450mm high timber planter, planting to residential community choice

S1-P06	06-12-21	Bin storage and boundary update	AS	KR
S1-P05	11-11-21	Updated boundary	AS	KR
S1-P04	01-09-21	Planning Issue	AS	KR
S1-P03	02-08-21	Draft Planning	AS	KR
S1-P02	20-07-21	For information	AS	KR
S1-P01	27-05-21	For coordination	AS	KR

Revision	Date	Description	Drawn	Apprvd.
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**Planit I.E. Limited**
E: info@planit-ie.com W: planit-ie.com
MANCHESTER
2 Back Grafton St., Altrincham, WA14 1DY
T: 0161 928 9281

**LEEDS**
No.1 Aire Street, Leeds Station, Leeds, LS1 4PR
T: 0113 824 6413
LIVERPOOL
Tempest 5.3, 12 Tithebarn Street, Liverpool, L2 2DT
T: 0151 363 1230
LONDON
Unit 6 Waterside, 44-48 Wharf Road, London, N1 7UX
T: 0207 253 5678
STANDISH
Standish Gatehouse, Stonehouse, Gloucestershire, GL10 3BZ
T: 0145 360 7080

Client **Portwood Development Ltd**

Project **87 Rochdale Road**

Drg Title **General Arrangement**

Created on	Created by	Approved by
02.08.21	AS	KR

Scale	Size	Workstage
1:250	A1	RIBA Stage 2

Drg No.	Suitability	Revision
2624-PLA-XX-XX-DR-L-0002	S1	P06

Enclosure 2

- Site Sections Key Plan (Ref. 23C002-WSL-SI-XX-DR-S-96000)
- Long Section Sheet 1
- Long Section Sheet 2
- Long Section Sheet 3
- Long Section Sheet 4
- Long Section Sheet 5

Enclosures