

6. CONCLUSIONS AND RECOMMENDATIONS

6.1. CONTAMINATED LAND ASSESSMENT

Human Health	The Tier I assessment identified a single exceedance for asbestos. Loose chrysotile fibres were identified in the granular Made Ground in TP104 at <0.001 %. No visual signs of ACM were encountered during the ground investigation; it is therefore likely that only trace fibres are present. Impacted soils should be managed according to the asbestos risk mitigation conceptual site model. The installation of a suitable cover system in all landscaping and public open space will remove any potential for direct exposure to impacted soils. The specific design and installation process for the appropriate cover systems should be defined within a site remediation and enabling works strategy. Chemical analysis of the natural granular deposits has identified these soils to be acceptable for use as subsoil within the proposed landscaped areas; however, further chemical validation samples will be required to confirm this. There are no suitable sources of topsoil available on the site. Further post-demolition investigations are required to confirm the findings of this initial assessment as and when full and unrestricted access is available.
Controlled Waters	Leachate and groundwater analysis has identified exceedances of the EQS for chromium, copper, mercury, trichloromethane and pH. Historically, the site has been occupied by a Cotton Finishing Works, Copper Roller Works and Mills which are potential sources of mobile contamination. However, the initial soil analysis has not identified a risk to controlled waters. The site is underlain by shallow sandstone bedrock which is classified as a principal aquifer. However, the majority of the identified inorganic compounds are of low solubility. The sensitivity of the principal aquifer in the bedrock is reduced given the closest potable groundwater abstraction is located 507 m north. Trichloromethane has been recorded above the limit of detection in all three groundwater samples from the rotary boreholes which have monitoring wells set within the sandstone bedrock. All other VOCs are less than the limit of detection. It is unlikely that this relates to residual contamination from the former works and mills located on site as these land uses were historical and the compounds would have degraded. It is considered possible that this compound may have migrated from commercial sites further afield. The site is topographically lower than the land to the east, therefore it is likely that groundwater will flow towards the site and towards the River Irwell. The results of the groundwater analysis indicate a higher concentration of trichloromethane at RBH101 in the north east as opposed to RBH105 located in the south west.



Controlled Waters	The site is encapsulated in hardstanding, therefore infiltration will be limited. An additional round of groundwater sampling and surface water analysis is recommended to further assess the risk to controlled waters. The results will be issued in an addendum report.
Ground Gas	Characteristic Situation 1 (pending completion of gas monitoring).
Potable Water	This will need to be confirmed following the completion of a UKWIR risk assessment. Post-remediation and enabling works ground conditions may be different from those identified during this site investigation. Current indications suggest that PE pipe may be suitable.

6.2. GEOTECHNICAL ASSESSMENT

The natural SAND (weathered bedrock) has been assessed as being very dense with a net allowable bearing pressure (ABP) in the order of 504 kN/m² at circa 1 m bgl.

The underlying SANDSTONE has a net ABP of 403-505 kN/m² between 1.00 m and 9.00 m bgl.

Given the significant obstructions, prior to the construction of any foundation solution, a programme of remediation and enabling works will be required to remove existing foundation and slab structures and re-engineer the site to provide suitable development platform levels.

The Made Ground is not considered a suitable target founding stratum.

In respect of the proposed development, E3P consider it feasible to construct the proposed residential apartment blocks utilising piled foundations set within the underlying sandstone bedrock. The final foundation solution will be dependent on the structural loadings, elevation and should be designed by a suitably qualified structural engineer with detailed designs from a specialist piling contractor.

Post demolition boreholes are required to further inform the foundation and sub-structure design.

END OF REPORT



APPENDIX I

LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between E3P and the client as indicated in Section 1.3.
2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed it is correct. No attempt has been made to verify the information.
3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.
4. During the site walkover, reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover, no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.
5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.
6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials, this is for indicative purposes only and do not constitute or replace full and proper surveys.
8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
9. E3P cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by E3P is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by E3P in this connection without their explicit written agreement there to by E3P.
10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.



APPENDIX II

GLOSSARY

TERMS

ACM	Asbestos-containing material	MMP	Materials management plan
ADS	Acoustic design statement	ND	Not detected
AST	Above-ground storage tank	NDP	Nuclear density probe
BGS	British Geological Survey	NMP	Noise management plan
BSI	British Standards Institute	NPSE	Noise policy statement for England
BTEX	Benzene, toluene, ethylbenzene, xylenes	NR	Not recorded
CA	Coal Authority	PAH	Polycyclic aromatic hydrocarbon
CBR	California bearing ratio	PCB	Polychlorinated biphenyl
CIEH	Chartered Institute of Environmental Health	PI	Plasticity index
CIRIA	Construction Industry Research Association	PID	Photo ionisation detector
CLEA	Contaminated land exposure assessment	POS	Public open space
CML	Council of Mortgage Lenders	PPE	Personnel protective equipment
CoC	Contaminants of concern	ProPG	Professional practice guidance
CSM	Conceptual site model	QA	Quality assurance
DNAPL	Dense non-aqueous phase liquid (chlorinated solvents, PCB)	SGV	Soil guideline value
DWS	Drinking water standard	SPH	Separate-phase hydrocarbon
EA	Environment Agency	SPT	Standard penetration test
EQS	Environmental quality standard	SVOC	Semi-volatile organic compound
FFL	Finished floor level	TPH	Total and speciated petroleum hydrocarbon
GAC	General assessment criteria	TPH CWG	Total Petroleum Hydrocarbon (Criteria Working Group)
GL	Ground level	UKWIR	United Kingdom Water Infrastructure Risk
GSV	Gas screening value	UST	Underground storage tank
HCV	Health criteria value	VCC	Vibro-concrete column
ICSM	Initial conceptual site model	VOC	Volatile organic compound
LEL	Lower explosive limit	VRSC	Vibro-replacement stone columns
LMRL	Lower method reporting limit	VSC	Vibro-stone columns
LNAPL	Light non-aqueous phase liquid (petrol, diesel, kerosene)	WHO	World Health Organisation
MCV	Moisture condition value	WRAP	Waste and Resources Action Programme



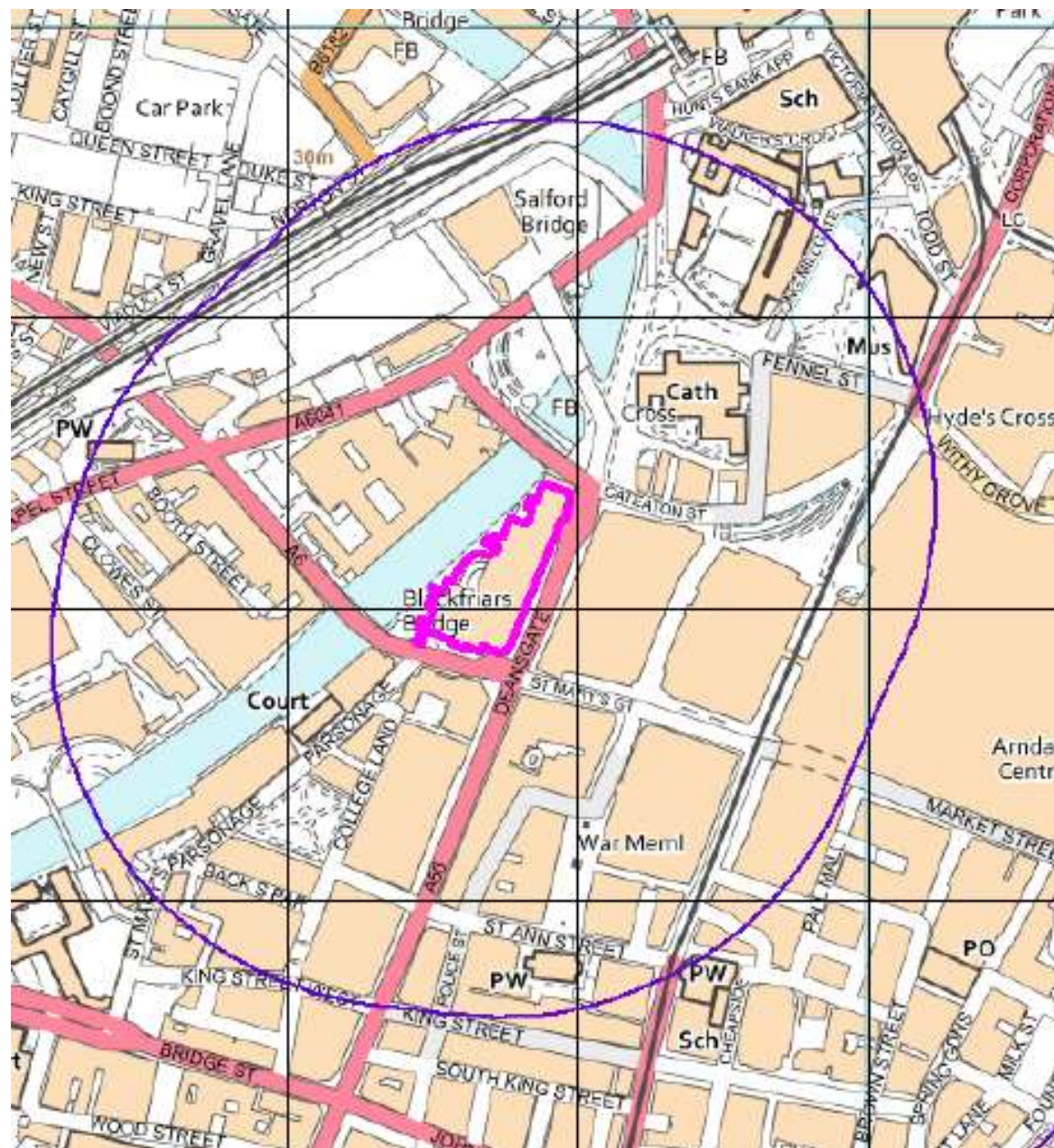
MIBK	Methyl isobutyl ketone	WTE	Water table elevation
m	Metres	ppm	Parts per million
km	Kilometres	mg/m³	Milligram per metre cubed
% v/v	Percent volume in air	m bgl bgl	Metres below ground level
mb	Millibars (atmospheric pressure)	m bcl	Metre below cover level
l/hr	Litres per hour	mAOD	Metres above ordnance datum (sea level)
µg/l	Micrograms per litre (parts per billion)	kN/m²	Kilonewtons per metre squared
ppb	Parts per billion	µm	Micrometre
mg/kg	Milligrams per kilogram (parts per million)	SSRT	Site Specific Remediation Target
PSD	Particle Size Distribution	DD	Dry Density
CL:AIRE	Contaminated Land: Applications in Real Environments	Mc	Moisture Content
ρ	Bulk Density	GPR	Ground Penetrating Radar
NDP	Nuclear Density Probe	FFL	Finished Floor Level
LEL	Lower Explosive Limit	UKWIR	UK Water Industry Research
CIRIA	Construction Industry Research and Information Association	LOD	Limit of Detection



APPENDIX III

DRAWINGS

DRAWING 14-261-001 – SITE LOCATION PLAN





Notes:				
P1	REVA	21.04.2021	LM	NS
Phase	Issue	Date	Drawn	Checked

Client:	Property Alliance Group Ltd
Job Title:	Renaissance Deansgate

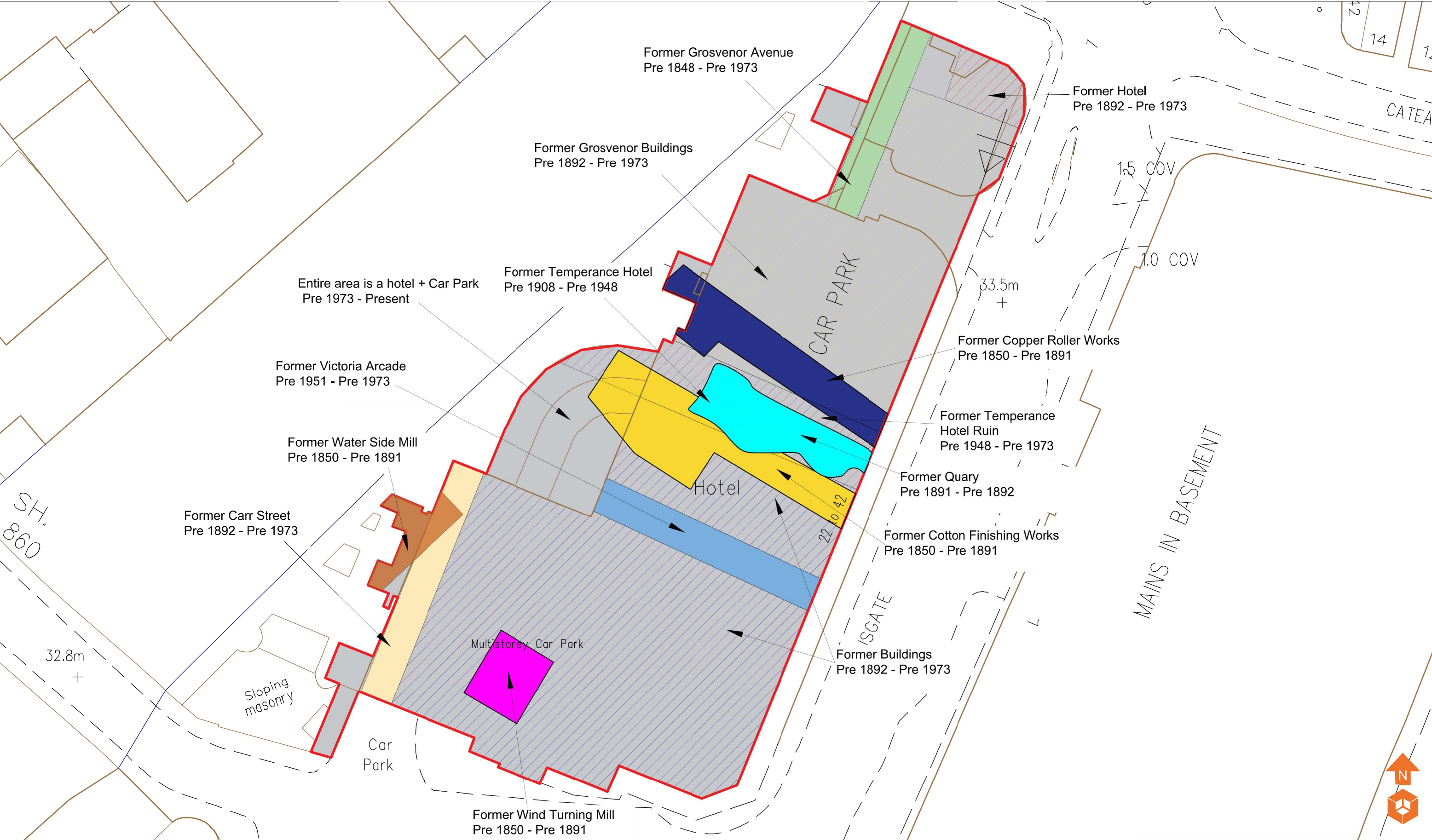
Job No:	14-261
Drawing No:	002

Date:	21.04.2021
Scale:	NTS
Drawing Title:	Proposed Development Plan



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Historical Features

- Former Buildings
- Former Carr Street
- Former Victoria Arcade
- Former Temperance Hotel
- Former Grosvenor Building
- Former Grosvenor Avenue
- Former Hotel
- Current Hotel and Car Park
- Former Quarry
- Former Wind Turning Mill
- Former Cotton Finishing Works
- Former Copper Roller Works
- Former Water Side Mill

Notes:

P1	REVB	13.05.2021	EB	NS
P1	REVA	28.07.2020	LM	EF
Phase	Issue	Date	Drawn	Checked

Client:

Property Alliance Group Ltd

Job No:

14-261

Drawing No:

003

Job Title:

Renaissance Deansgate

Date:

13.05.2021

Scale:

NTS

Drawing Title:

Historical Features Plan

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Site Features Multi-Storey Car Park Hotel Restaurant Staircases Car Park Ramp
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Notes:

P1

REVA

28.07.2020

LM

EF

Phase

Issue

Date

Drawn

Checked

Client:

Property Alliance Group Ltd

Job No:

14-261

Drawing No:

004

Job Title:

Renaissance Deansgate

Date:

28.07.2020

Scale:

NTS

Drawing Title:

Site Features Plan

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Location Symbols

	Approximate Core Through Wall Location
	Approximate Trial Pit Location
	Approximate Rotary Borehole Location with Install

Notes:				
P1	REVC	15.04.2021	HM	JC
P1	REVB	06.04.2021	CB	NS
P1	REVA	01.04.2021	CB	NS
Phase	Issue	Date	Drawn	Checked

Client:	Property Alliance Group Ltd
Job Title:	Renaissance Deansgate

Job No:	14-261
Drawing No:	005
Date:	15.04.2021
Scale:	NTS
Drawing Title:	Exploratory Hole Location Plan

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