

**COMPLEX CHALLENGES ...
MADE SIMPLE**

Phase 3b Site Validation Report

Plot P1

for

Airport City Partnerships Ltd

December 2018

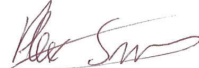
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CONSULTING ENGINEERS



Phase 3b Site Validation Report

**Plot P1 (former Texaco Petrol Filling Station)
Terminal 2, Manchester Airport**

DESCRIPTION		DATE	AUTHOR	REVIEWED BY	APPROVED BY
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RI	Update to include CBR testing results	27/02/19	Liam Daley 	Alex Smiles 	

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I.0 INTRODUCTION

I.1 Background

I.1.1 R^oC Consulting have been appointed by Airport City Partnerships Ltd to prepare a Phase 3b Site Validation Report relating to the proposed demolition and redevelopment of the Texaco Petrol Filling Station (the site). It is understood that the site, which is known within the wider Airport City masterplan as Plot P1, is to be developed for multiple storey hotel end uses (split between two buildings) in accordance with ICA Architects drawings provided within Appendix A.

I.1.2 The purpose of this Phase 3b Site Validation Report is to outline and provide evidence for implementation of the RoC Consulting Phase 3a Remediation Strategy dated March 2018 (report ref: AS/LD/3580 p3 R1) with respect to the clean-up and protection of site soils / controlled waters during the demolition and construction process. The objectives of this remediation validation report are as follows:

- Provide an overview to the findings of site investigation works completed to date across the site and any sources of contamination identified therein.
- Outline the remedial requirements carried out by demolition contractors with respect to the site's redevelopment.
- Provide detail on the site validation works enacted as part of the development process by RoC Consulting as evidence of the completion of remedial works.

I.1.3 This Phase 3a Remediation Strategy has been collated with reference to a number of site investigation and other relevant decommissioning information relating to the former T2 Texaco petrol filling station facility namely:

- 1) RoC Consulting Phase 2 Site Investigation report on Texaco T2, Manchester Airport dated December 2016 (ref: JB/AS/p2 2016).
- 2) Health & Safety File Document for T2 Petrol Station Closure, Manchester Airport dated July 2018.

I.1.4 It is recommended reference is made to the findings of the abovementioned reports when reviewing the current remediation strategy document.

I.2 Terms of Reference

I.2.1 The Phase 3b Site Validation Report was collated following receipt of an instruction from Mr Adam White of Airport City Partnerships Ltd.

I.5 Limitations of Study Assessment

- I.5.1 The comments made in this report are based on the data available at the time of its completion. Any unusual or conflicting evidence discovered during any future site works must be presented to R&C Consulting as soon as possible so that any implications may be considered.
- I.5.2 Additional information, changes in legislation or revised practices may necessitate re-interpretation of part or all of this report. Additionally, site redevelopment and/or a change in end use will require reinterpretation of the assessment.
- I.5.3 The accuracy of the data supplied by third parties should be considered in the context of any known site conditions for which R&C Consulting cannot be held liable.
- I.5.4 It should be noted that any subsequent revision of the proposed redevelopment or site boundary away from the above-mentioned drawing may result in the full or partial re-interpretation of this report and assessment.
- I.5.5 The report has been produced by R&C Consulting for the client solely for the purposes of a review of information for the above-mentioned site. It may not be used by any person for any other purpose other than that specified without the express written permission of R&C Consulting. Any liability arising out of its use by a third party for purposes not wholly connected with the above shall be the responsibility of that party who shall indemnify R&C Consulting against all claims, costs, damages and losses arising out of such use.

2.0 SITE SETTING & BACKGROUND INFORMATION

- 2.0.1 The following chapter provides an overview to most salient findings of our Phase 2 Site Investigation assessment. This information has been used to define the scope of remedial works required to support the sites development and it is recommended reference be made to these documents / plans when reviewing this report.
- 2.0.2 In addition to existing site investigation information a below ground utility survey was also commissioned by specialist contractors Survey Operations across the filling station. The purpose of this survey was to support the safe completion of site investigation field works and also establish the probable location of below ground utility and fuel supply related infrastructure.
- 2.0.3 A copy of the Survey Operation plans (ref: 161206/001) have been provided within Appendix A of the current report; it should be noted the information indicated on these drawings is considered approximate and any reliance placed within this context.
- 2.0.4 Following the closure of the Petrol Filling Station in April 2018 a program of decommissioning works was completed by R & M Developments Limited relating to the degassing and filling of below ground fuel storage tanks and demolition of structures associated with the petrol station, an overview to which is also provided within the below appraise.

2.1 Site Investigation Findings

- 2.1.1 The site comprises recently decommissioned petrol filling station (Texaco). Historical records and anecdotal evidence indicate that the site remained undeveloped as open fields (possibly agricultural) until 1993 when the site was developed for a petrol filling station.
- 2.1.2 Surface covering is split evenly between concrete hardstanding of the petrol station forecourt and a vegetated boundary. A Jet Washing facility and Car Wash are also noted on site to the northern and central extent respectively.
- 2.1.3 The sites eastern boundary is formed by the World Way access road, linking Terminal 2 with the M56. World Way rises from north to south along the length of the Eastern boundary on a vegetated embankment to a height circa 8m. Levels on and around the Petrol Filling station forecourt are approximately 69 to 71mAOD, rising to 77 to 78mAOD to the north eastern boundary.
- 2.1.4 Discussions with the former Petrol Filling Station manager indicated the operators were not aware of any historic leakages or loss of product from below ground storage tanks, or any remedial works to repair below ground fuel infrastructure.
- 2.1.5 The site's geology comprises of Devensian – Diamicton Till (Clay with sand bands) underlain by the Bollin Mudstone Member. The underlying cohesive geology is classified unproductive strata with the underlying Mudstone bedrock classed as a Secondary aquifer (B).

- 2.1.6 The nearest surface water feature is approximately 150m to the north east in the form of an unnamed channel or ditch. There are no named surface features with measurable flow rates or quality data within 500m of the site. The nearest active discharge consent is approximately 600m to the north west held by Manchester Airport PLC in relation to the discharge of treated sewage or effluent into the catchment of the River Bollin.
- 2.1.7 A program of ground investigation works were completed by RoC Consulting in 24th and the 26th of October 2016 to assess what (if any) impacts site operations have had on underlying soils and groundwater. The site investigation works comprised of the formation of x11 Window Sampler boreholes to depths of 4.0m and 5.0mbgl. Four ground water monitoring wells were installed within window sampler boreholes.
- 2.1.8 Made ground was reported at all exploratory hole locations in the area around the Petrol Filling station comprising of concrete, sub base gravel, reworked clay and demolition type material. In the areas away from the Petrol Filling station topsoil was reported at each borehole location comprising turf overlying fine to coarse light brown slightly clayey sand. In addition, evidence of a relic topsoil layer was noted at x3 locations comprising soft grey mottled brown sandy organic clay with occasional rootles and plant matter.
- 2.1.9 Alluvium was encountered at all locations, Fluvio-Glacial deposits were reported at the majority of borehole locations and glacial clay at most borehole locations. The weathered fraction of the underlying mudstone bedrock was encountered at a single borehole location.
- 2.1.10 Resting groundwater monitoring results (as revealed from borehole stand pipes) indicate a groundwater table within the fluvio-glacial deposits (sand) at depths ranging between 2.2 and 2.6mbgl. Groundwater ingress was encountered during the formation of all window sample boreholes at depths between 2.0m (WS106) and 4.3mbgl (WS110), with a mean depth of 3.04m. The groundwater table appears to be confined within the granular sand layer, sitting on top of low permeability clay and Mudstone bedrock. A single below ground obstruction was encountered in WS105 at 0.72mbgl in the form of concrete covering the base of the hand-pit.
- 2.1.11 Samples were collected for chemical testing/ geo-environmental laboratory analysis of soil / rock samples. Samples were obtained from both made ground and natural strata to assess the overall quality of underlying soils.
- 2.1.12 Chemical testing analysis indicated x2 slightly elevated PAH concentrations, x2 slightly elevated Mercury concentrations and no exceedances of Total Petroleum Hydrocarbons. Waste Acceptance Criteria results indicate that the material would be accepted at inert landfill disposal sites.
- 2.1.13 Sampling of demolition fill indicate x2 localised elevated concentrations of PAHs. Sampling of sub base gravel and reworked clay material indicate x2 slightly elevated concentrations of Mercury. No site wide contamination or contamination by hydrocarbons associated with historic / current petrol fuel filling operations have been identified by chemical testing results.

2.2 Decommissioning Works

- 2.2.1 Following closure of the petrol filling station in April 2018 a program of decommissioning work was completed by contractors acting on behalf of Manchester Airport Group. These works entailed the degassing of below ground fuel storage tanks and their subsequent backfilling with foam.
- 2.2.2 Records provided by specialist tank decommissioning contractor Petrolcom Ltd indicate the petrol station contained 5 tanks further details of which are provided in Fig 2.0 below:

Tank Number	Grade	Safe Working Capacity (litres)
1	Diesel	26,458
2	Unleaded	39,687
3	Super Diesel	13,229
4	Diesel	26,458
5	Unleaded	26,458

- 2.2.3 Each tank was degassed and subsequently infilled with foam on or around the 13th to 16th June 2018. The decommissioning works do not appear to have extended to other below ground fuel filling infrastructure (e.g. below ground pipe runs, interceptors etc).

3.0 Remedial Requirements & Recommendations

3.0.1 A Phase 3a Remediation Strategy was produced detailing requirements for the remediation of the site and measures requiring validation. The objectives of the remediation strategy were:

- 1) The removal of above ground structures including the forecourt canopy and shop/payment kiosk.
- 2) Removal of existing foundations and other below ground structures should be grubbed out.
- 3) Removal of fuel filling pumps and other above ground lines and filling equipment.
- 4) Removal of the concrete slab and hardcore granular material
- 5) Removal of tanks and below ground fuel storage features, with subsequent soil verification sampling of material surrounding these features.
- 6) Management and re-use of site won material and subsequent backfilling of voids left by former underground features.
- 7) Recording of the extent of any below ground infrastructure as part of demolition / remediation works.

3.0.2 The above works were implemented in conjunction with wider site clearance works as part of the demolition contract.

3.1 Demolition Works

3.1.1 Specialist contractors R&M Developments were instructed by Manchester Airport Group to carry out demolition of the T2 Petrol Station development. These works included the following:

- 1) Construction of hoarding surrounding the site
- 2) Soft strip and demolition of kiosk canopy, car and jet wash
- 3) Removal of hardstanding including tarmac, block pavements, concrete, kerbs and edging
- 4) Removal and disposal of tanks, fuel lines, car wash and forecourt interceptors
- 5) Removal of foundations to all structures and tanks
- 6) Backfilling of excavations with crushed material and 6F2 imported fill
- 7) Site grading and finishing

3.1.2 The demolition works were completed between November and December 2018 with all surplus materials / arisings disposed of from site to a suitably licensed facility. Post remediation site levels had not been surveyed at the time of writing but were left roughly at or around those of the previous PFS site. Waste disposal and transfer notes and 6F2 certification has been provided within Appendix D.

3.1.3 The completion of demolition works in areas of potential ground contamination was subject to independent verification and validation by engineers from RoC Consulting (in accordance with the recommendations of our Phase 3a Remediation Strategy) further details of which are provided overleaf.

3.2 Validation Works

- 3.2.1 Validation works to provide evidence for the clean-up and protection of site soils and groundwater during the demolition works have been carried out by RoC Consulting. These works comprised the following:
- 1) Visual inspection of soils surrounding below ground fuel storage tanks and tank casing for any signs of fuel leakage.
 - 2) Sampling and chemical analysis of soils surrounding the below ground fuel tank and adjacent dispensing pumps.
 - 3) Provision of evidence for the suitable backfilling of voids,
 - 4) Provision of evidence for the disposal of material from site.
- 3.2.2 Site visits were completed by engineers from RoC at various stages during the tank removal process to inspect excavations for any evidence of historic leakage and obtain samples of materials being left in situ for confirmatory chemical testing. Black surface staining was noted in the upper portion of natural soils at location VAL07 however it was noted this did not extend to significant depths within the strata. Photographic evidence of this has been provided within Appendix B.
- 3.2.3 A total of 13 soil samples were taken in the areas surrounding pumps (VAL01 – VAL06) and from natural soils beneath the fuel tanks (VAL07 – VAL12). Drawing ES301 has been provided within Appendix A showing locations of soil samples with photographic records of tank removal works provided within Appendix B.
- 3.2.4 Chemical testing results are compared against C4SL and S4UL values under a suitable criteria for each determinant. A result in exceedance of a C4SL level may indicate the presence of contaminants within site soils and require further assessment.
- 3.2.5 For the purposes of this assessment we have assumed a “commercial” end use scenario when reviewing chemical testing data against C4SL / S4UL values; a “worst case” Soil Organic Matter content value of 1% has been assumed for the initial assessment.
- 3.2.6 Chemical testing of soil samples indicated no exceedances of screening criteria. Slightly elevated levels of TPHs were identified at a single location (VAL06) likely as a result of accidental spillages of hydrocarbon during use of fuel pumps. Full chemical testing data has been provided within Appendix C.
- 3.2.7 On removal of petrol filling station infrastructure, all excavations were backfilled and compacted with site won granular material arising from the demolition process (e.g. brick and concrete aggregate). The approximate extent of these excavations was surveyed by R&M Development on conclusion of works the results from which are indicated on Survey Operations drawing I8/D172/001 within Appendix A.
- 3.2.8 A total of 3 plate load tests were completed by R+M Developments once backfilling was completed, with one test contained within the footprint of the former interceptor and another 2 in the area of the tank excavation. The results gave a CBR value of 4.6% at all locations. The test report is presented in Appendix D.

4.0 CONCLUSIONS & RECOMMENDATIONS

- 4.0.1 It is considered that implementation of the Remediation Strategy throughout the demolition of the petrol filling station has been achieved as per the required specification. It is considered that risks to future human health and the local environment have not been impacted by the petrol filling station and subsequent demolition.
- 4.0.2 Site validation works confirmed the initial findings of the 2016 investigation that no significant spillage or leakage had occurred as a result of the previous petrol filling station operations.
- 4.0.3 Should any sources of contamination be identified during earthworks in the site's redevelopment, the material is to be sampled and submitted for chemical testing. Any contaminated soils encountered should be excavated and disposed of from site at a suitably licensed disposal facility. Any chemical testing should include provision for Waste Acceptance Criteria testing to determine disposal costs.
- 4.0.4 It is recommended copies of this validation report are provided to the Local Planning Authority to support the discharge of any contaminated land related planning conditions. In addition, copies of this report, as well as the previous Phase 2 Site Investigation and Phase 3a Remediation Strategy are provided to any prospective purchasers of the site as part of any due diligence works.



APPENDIX A - SITE PHOTOS AND DRAWINGS

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NOTE: The survey is plotted on a plane local grid. Orientation to national grid.

All levels relate to Ordnance Datum, achieved using the

OS National GPS network.

Survey Control Markers established for Mapping purposes only and should not be used for Construction without the written approval of Survey Operations Ltd.

Orange information must be verified with local authority records before use

NOTE: Sewer surveyed September 17/08 and added to Survey Operation drawing 17/08/ shown faulted

HANDY REFERENCE: ABBREVIATIONS

Survey OPERATIONS

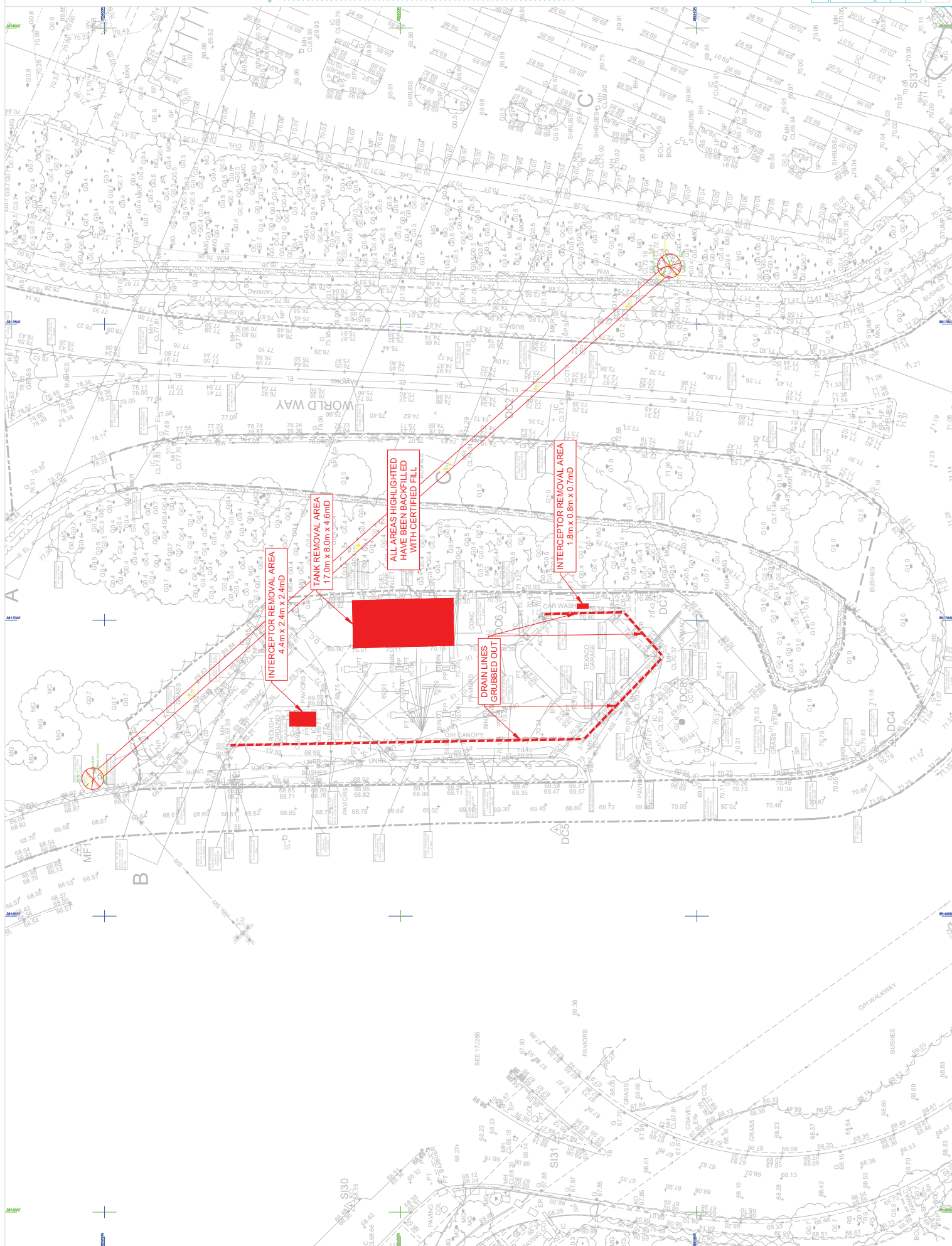
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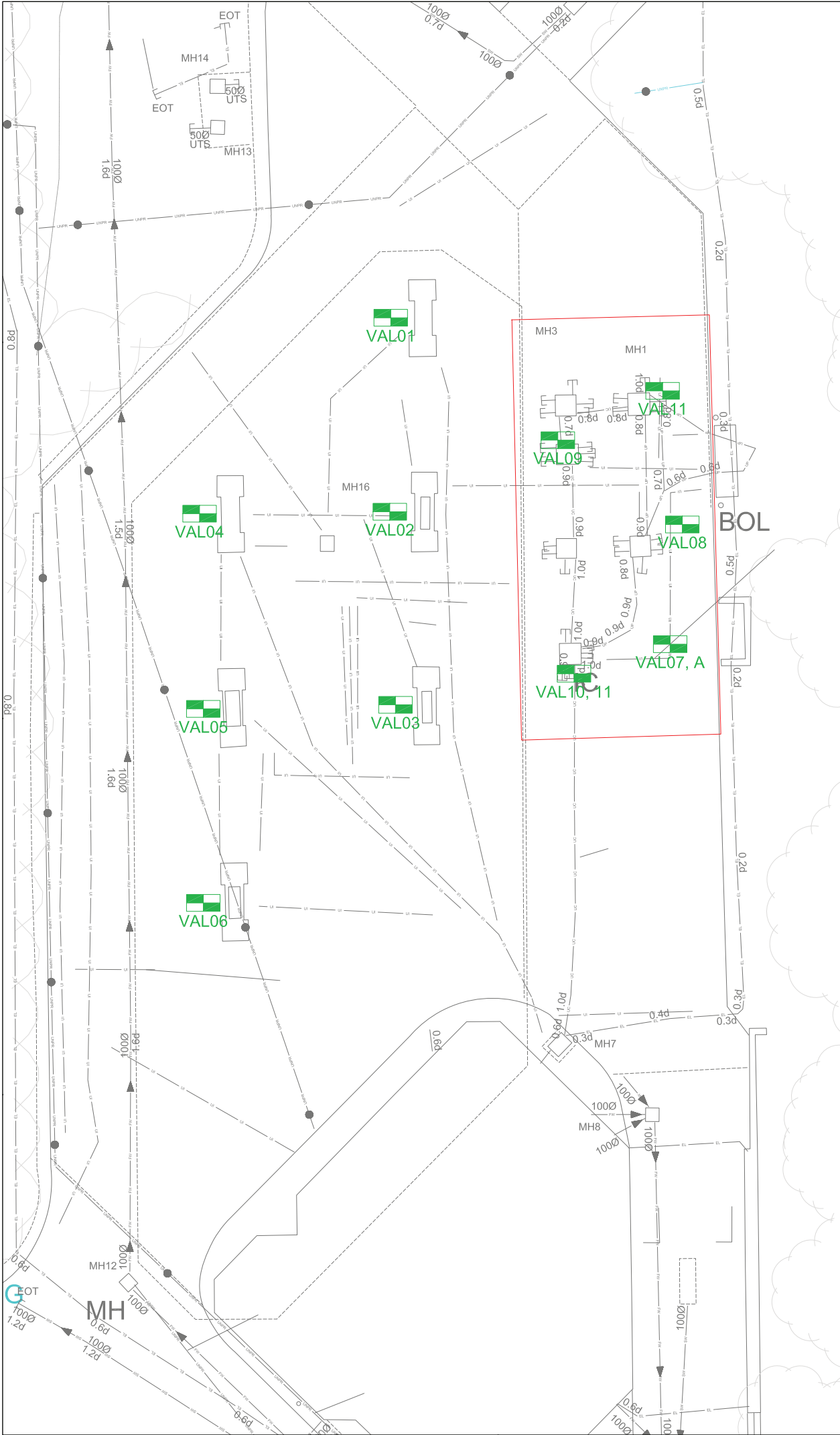
Client:

Project Title:
Confidential Space Survey of Land at:
Underground Beer Main Entry Point Pl.
Manchester Airport

	Schedule	Surveyor
Rollouts:	1:2000	SB/JJ
Date	SEP 18	JR
Job Number	180172	SO

Sheet Size & Top Number & Revision
A0 180172/001





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NOTES

KEY

- APPROX FUEL TANK EXCAVATION LOCATION
- SOIL SAMPLE LOCATION

DRAWING NOTES

- 1) UTILITY SURVEY TAKEN FROM SURVEY OPERATION REFERENCE 17L067
- 2) EXPLORATORY HOLE LOCATIONS SHOWN AT APPROXIMATE LOCATIONS ONLY
- 3) TANK EXCAVATION LOCATION TAKEN FROM SURVEY OPERATIONS DRAWING 180172/001
- 3) R9C CONSULTING ACCEPTS NO LIABILITY FOR ANY DAMAGE OR LOSS TO ANY PERSONS OR CONTRACTORS FROM THE USE OF THIS DRAWING

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CLIENT

AIRPORT CITY PARTNERSHIPS LTD

PROJECT TITLE

TEXACO GARAGE TERMINAL 2

DRAWING TITLE

SITE FEATURES & SOIL VALIDATION SAMPLE LOCATIONS

PROJECT No.	DRAWING No.	REV.
3580	ES301	S1

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