DRAINAGE STRATEGY REPORT

PROPOSED TEMPORARY CAR PARK
NO 1 CITY ROAD EAST
MANCHESTER
M15 4PN

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Client: Car Park Securities Ltd
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Revision	Date	Reason
0	Oct 2025	Original for planning.

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Contents.

1 Introduction. 3
1.1 Purpose of Assessment. 3
1.2 LLFA Consultation. 3
1.3 LPA Planning. 3
1.4 Other references. 3
2 Site Proposals. 3
2.1 Existing Site Plan. 3
2.2 Proposed (Temporary) Site Plan. 3
2.3 Derivation of Data, Surveys and Models. 4
2.3.1 Topography. 4
2.3.2 Geology. 4
2.3.3 Drainage Surveys. 4
2.3.4 Sewer Undertaker Records. 4
2.3.5 BGS Borehole Records. 4
2.3.6 NX Consulting, NX406 Phase 1 & Phase 2 Geoenvironmental Assessment Report for No 1 City Road East, Manchester, M15 4PN. 4
3 Drainage Strategy. 5
3.1 Existing Site rainfall & drainage systems. 5
3.2 Rainfall Climate Change Impacts. 5
3.3 Proposed Surface Water Drainage. 5
3.3.1 Infiltration. 5
3.3.2 Watercourse. 6
3.3.3 SW Sewer. 6
3.3.4 Combined Sewer. 6
3.4 Proposed Foul Water Drainage. 6
3.5 Adoption. 6
3.6 Maintenance. 6
4 Conclusion & Residual risks. 6
4.1 Drainage. 6
5 Appendix. 8
5.1 Microdrainage Permeable Car Park Calculation. 8
5.2 Photographs. 12

1 Introduction.

1.1 Purpose of Assessment.

The primary purpose of this report is to identify drainage strategy for a temporary planning permission.

The proposal is for a city centre car park.

The Site will be assessed in accordance with the national drainage hierarchy for surface water disposal & exceedance characteristics, also considering the proposed end adopters and their requirements.

Regarding Site assessment, this report will appraise the existing and local drainage infrastructure, assess the suitability of the proposed development, giving recommendations for drainage design & management, specifically for approval of the LLFA/EA/sewerage undertakers, as applicable.

Drainage from new developments is to be designed to follow the national drainage hierarchy for surface water discharge to the following networks in order of preference:

- infiltration.
- Watercourse.
- surface water sewer.
- combined sewer.

If required, flow rates (existing & proposed) are to be estimated for approval using the following methodology:

- Development should aim to deliver greenfield runoff on greenfield sites up to a 100yr rainfall event, considering climate change.
- Development should aim for a minimum reduction in surface water runoff rates of 50% for Brownfield sites on a 1yr rainfall event.
- Development should be designed so that there is no flooding to the development in a 30yr event, and so that there is no property flooding in a 100yr event considering climate change.

1.2 LLFA Consultation.

No consultations at the time of writing.

1.3 LPA Planning.

Planning have requested the following:

> "We require details on site drainage, including soakaways. You should provide a plan showing drainage channel and a section drawing for the land levels."

1.4 Other references.

The planning portal was searched and a full site investigation/report was undertaken for the former site owners in 2023.

Report ref: NX Consulting, NX406 Phase 1 & Phase 2 Geoenvironmental Assessment Report for No 1 City Road East, Manchester, M15 4PN.

The report was undertaken on the site for a previous planning application but remains relevant to the assessment.

2 Site Proposals.

2.1 Existing Site Plan.

The site previously comprised and office building and car park which was demolished c2023.

Prior to current development for a car park, the site comprised a hardcore surface with no structures.

The site area is approximately 5500sqm.

2.2 Proposed (Temporary) Site Plan.

To prepare the surface for a temporary use as a car park, the existing hard-core base was compacted and all metal & deleterious debris removed.

Approximately 400 tonnes of recycled road tarmac plannings were then evenly spread and consolidated using a 20-tonne roller, producing a relatively smooth, compact and largely dust-free surface suitable for both vehicle and pedestrian use.

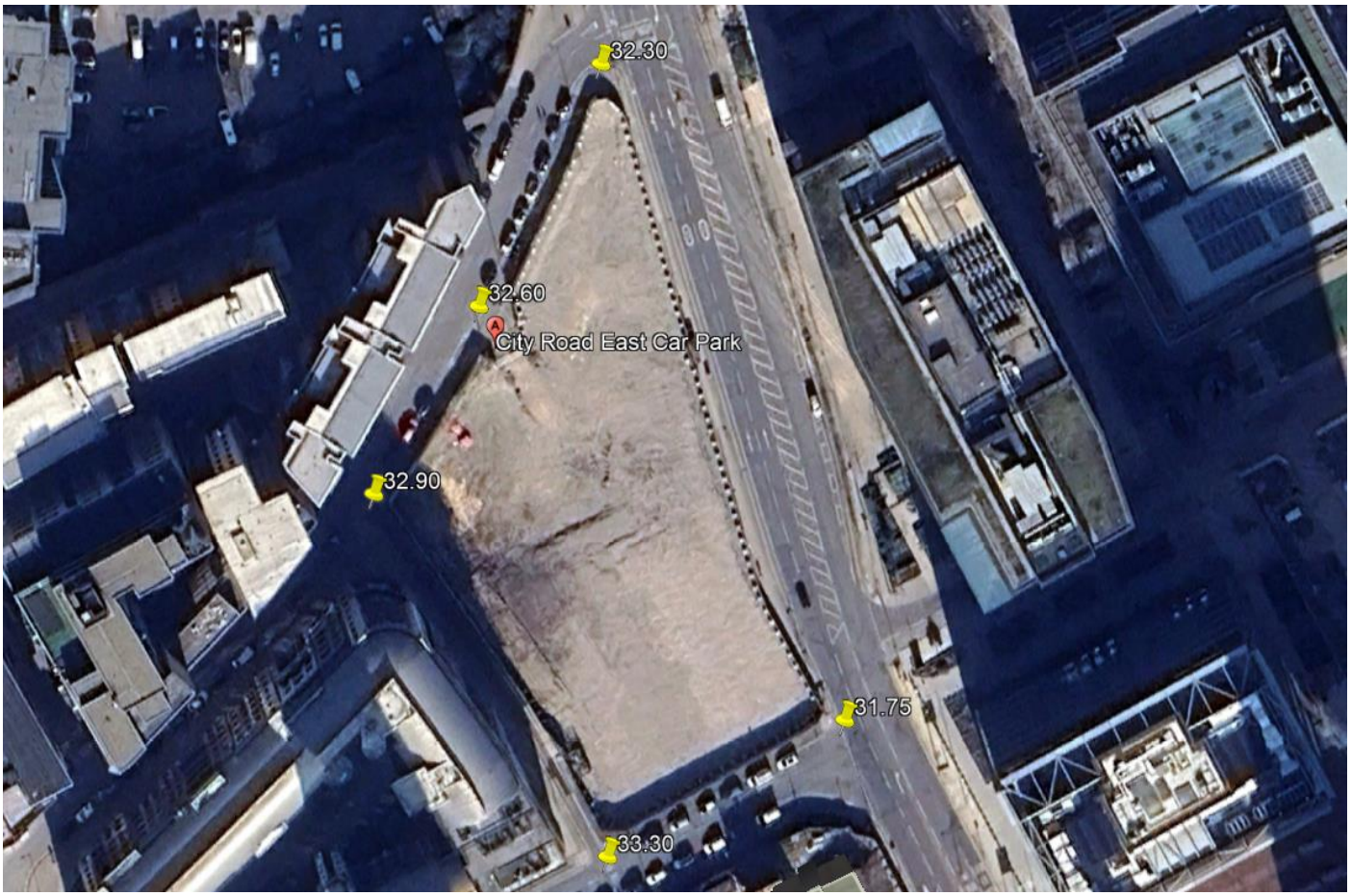
The surface make up is approximately 100mm of road planings on top of a generally granular made ground.

A small area at the entrance/exit areas have been fully tarmacked to minimise the risk of loose stones being carried onto the public highway.

2.3 Derivation of Data, Surveys and Models.

2.3.1 Topography.

A brief view of topography around the site is as follows (levels in maOD):



2.3.2 Geology.

BGS Maps record the superficial cover to be glaciaofluvial sand & gravels.

2.3.3 Drainage Surveys.

Not required for assessment.

2.3.4 Sewer Undertaker Records.

Not required for assessment.

2.3.5 BGS Borehole Records.

Not required for assessment.

2.3.6 NX Consulting, NX406 Phase 1 & Phase 2 Geoenvironmental Assessment Report for No 1 City Road East, Manchester, M15 4PN.

Refer to original report for all documentation.

Significant site investigations were taken over the site in order to understand the make-up of the geology summarised below:

Made ground.
Made ground was noted to maximum depths of up to 4.90m bgl, and an average thickness of approximately 2.50m.

The MADE GROUND was of general mixed lithology, predominantly comprising sand & gravel sized brick, sandstone, coal, concrete, slate, timber, ash and clinker, limestone & coal.

Rare and smaller depositional areas of both soft clayey sands/sandy clays, as well as loose sands were also noted.

Superficial deposits.
Superficial deposits typically comprised loose to medium glacial SAND & GRAVEL.

Beneath the glacial SAND & GRAVEL in all exploratory holes (and beneath the MADE GROUND in rare occasions where SAND & GRAVEL was not present), glacial TILL was present.

Weathered Bedrock.
HIGHLY WEATHERED SANDSTONE and WEATHERED SANDSTONE was noted between approximately 5.0m to 7.0mbgl.

Bedrock.
BEDROCK was noted in two locations at 6.00m bgl and 7.50m bgl.

Groundwater.
Groundwater was noted within MADE GROUND at approximately 3.5m deep. It was also noted at 3m in rare areas where more clayey material was noted and is considered perched in these areas.

Infiltration Testing.
Infiltration testing was undertaken as per BRE365 in the upper 2m of made ground, ref report excerpt below.

2No infiltration tests were undertaken and results were as follows:

- TP02 $3.58x10^{-5}$ m/s.
- TP05 $8.03x10^{-5}$ m/s.

7.5 Soakaway Drainage

Soakaway testing was undertaken within 2 locations broadly in accordance with BRE Digest No 365, to confirm the suitability of the Made Ground, Glacial Sand and Gravel, and Glacial Till. Results were consistent within both TP02 & TP05 as both soakaways succeeded to soakaway 50% of the effective storage volume. Within the granular Made Ground deposits, a preliminary infiltration rate in the region of 3.58E-05m/sec and 8.03E-05m/sec were recorded within TP02 & TP05, respectively.

NX406
September 2023
Phase 1 & Phase 2 Geoenvironmental Report for Land at No.1 City Road East, Manchester
Page | 47

3 Drainage Strategy.

3.1 Existing Site rainfall & drainage systems.

It is assumed all known drainage systems have been removed in the demolition process.

For the purposes of the assessment, the site is considered greenfield.

Currently all rainfall is considered to infiltrate into the site made ground which generally comprises a permeable granular MADE GROUND, on top of permeable superficial deposits.

3.2 Rainfall Climate Change Impacts.

Due to the temporary nature of the development type, climate change impacts will not affect the site.

3.3 Proposed Surface Water Drainage.

3.3.1 Infiltration.

The infiltration tests previously undertaken at the site show the ground is highly permeable.

If worst case figures are taken from the initial tests, the made ground permeability is $3.58x10^{-5}$ m/s or 0.126m/hr.

At this high rate of infiltration, the site is considered suitable for a temporary use as a car park with a permeable surface, which will comply with current SUDS guidance.

The surface make up is approximately 100mm of road planings on top of a generally granular made ground. The made ground is on average 2.5m deep offering significant underground storage capacity.

There is a small area of impermeable macadam at the car park entrance c250sqm, which drains onto the permeable site surface.

A Microdrainage porous car park calculation was undertaken, up to the 100yr pluvial rainfall event. Considering the temporary & therefore short-term nature of the car park, an inclusion for climate change was not considered relevant.

The impermeable macadam area at the site entrance was accounted for in the Microdrainage calculation.

The results indicate the infiltration coefficient is suitable to infiltrate rainfall up to the 100yr pluvial event without surface water flooding.

Refer to calculation in Appendix.

3.3.2 Watercourse.

Not required.

3.3.3 SW Sewer.

Not required.

3.3.4 Combined Sewer.

Not required.

3.4 Proposed Foul Water Drainage.

Not required.

3.5 Adoption.

Not required.

3.6 Maintenance.

Not required.

4 Conclusion & Residual risks.

4.1 Drainage.

The site is considered suitable for infiltration SUDS via a permeable surface.

No flooding will occur on-site, and no offsite flooding will be caused by the development up to and including extreme rainfall events.

This report should be suitable for planning validation.

No drainage conditions are deemed necessary subject to LPA approval.

Signed……  .

D.S.Slattery BSc (Hons).

T J Booth Associates.

Authorised…  .

T J Booth BSc (Hons), C. Eng. C. Env. MICE.

T J Booth Associates.

5 Appendix.

5.1 Microdrainage Permeable Car Park Calculation.

T J Booth Associates		Page 1
104 Yorkshire St Rochdale Lancashire OL16 1JY	permeable car park hallmark developments city road east car park	Micro Drainage
Date oct 2025 File calc-tjba-hallmark-city rd E car park...	Designed By ds Checked By	
Micro Drainage	Source Control W.10.4	

Summary of Results for 100 year Return Period

Half Drain Time : 4 minutes

Storm Duration (mins)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m³)	Status
15 Summer	101.5	101.5	32.4553	0.0553	27.8	FLOOD RISK
30 Summer	108.0	108.0	32.4588	0.0588	31.8	FLOOD RISK
60 Summer	100.6	100.6	32.4548	0.0548	27.3	FLOOD RISK
120 Summer	78.6	78.6	32.4463	0.0463	19.7	FLOOD RISK
180 Summer	62.5	62.5	32.4413	0.0412	15.5	FLOOD RISK
240 Summer	51.0	51.0	32.4373	0.0372	13.0	FLOOD RISK
360 Summer	39.4	39.4	32.4328	0.0327	9.7	FLOOD RISK
480 Summer	31.4	31.4	32.4293	0.0292	7.9	FLOOD RISK
600 Summer	26.3	26.3	32.4268	0.0267	6.7	FLOOD RISK
720 Summer	23.4	23.4	32.4253	0.0252	5.8	FLOOD RISK
960 Summer	19.0	19.0	32.4228	0.0227	4.7	FLOOD RISK
1440 Summer	13.6	13.6	32.4193	0.0193	3.4	FLOOD RISK
2160 Summer	9.7	9.7	32.4163	0.0163	2.4	FLOOD RISK
2880 Summer	8.0	8.0	32.4148	0.0148	2.0	FLOOD RISK
4320 Summer	5.5	5.5	32.4123	0.0123	1.4	FLOOD RISK
5760 Summer	4.7	4.7	32.4113	0.0113	1.2	FLOOD RISK
7200 Summer	3.9	3.9	32.4103	0.0103	1.0	FLOOD RISK
8640 Summer	3.1	3.1	32.4093	0.0092	0.8	FLOOD RISK
10080 Summer	2.8	2.8	32.4088	0.0088	0.7	FLOOD RISK
15 Winter	108.0	108.0	32.4588	0.0588	31.7	FLOOD RISK
30 Winter	109.8	109.8	32.4598	0.0598	32.6	FLOOD RISK
60 Winter	94.2	94.2	32.4513	0.0513	24.3	FLOOD RISK
120 Winter	64.1	64.1	32.4418	0.0417	16.0	FLOOD RISK
180 Winter	48.3	48.3	32.4363	0.0362	12.2	FLOOD RISK

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	82.56	12
30 Summer	54.32	20
60 Summer	34.16	36
120 Summer	20.83	64
180 Summer	15.43	94
240 Summer	12.41	126
360 Summer	9.07	184
480 Summer	7.23	246
600 Summer	6.06	308
720 Summer	5.24	364
960 Summer	4.17	486
1440 Summer	3.02	724
2160 Summer	2.19	1096
2880 Summer	1.73	1428
4320 Summer	1.25	2192
5760 Summer	0.99	2904
7200 Summer	0.83	3576
8640 Summer	0.71	4264
10080 Summer	0.63	5016
15 Winter	82.56	13
30 Winter	54.32	21
60 Winter	34.16	36
120 Winter	20.83	66
180 Winter	15.43	96

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T J Booth Associates		Page 2
104 Yorkshire St Rochdale Lancashire OL16 1JY	permeable car park hallmark developments city road east car park	
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Micro Drainage	Source Control W.10.4	

Summary of Results for 100 year Return Period

Storm Duration (mins)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m^3)	Status
240 Winter	39.4	39.4	32.4328	0.0327	9.8	FLOOD RISK
360 Winter	29.3	29.3	32.4283	0.0282	7.3	FLOOD RISK
480 Winter	23.4	23.4	32.4253	0.0252	5.8	FLOOD RISK
600 Winter	19.9	19.9	32.4233	0.0232	4.9	FLOOD RISK
720 Winter	17.4	17.4	32.4218	0.0217	4.3	FLOOD RISK
960 Winter	13.6	13.6	32.4193	0.0192	3.3	FLOOD RISK
1440 Winter	9.7	9.7	32.4163	0.0163	2.4	FLOOD RISK
2160 Winter	6.9	6.9	32.4138	0.0138	1.7	FLOOD RISK
2880 Winter	5.5	5.5	32.4123	0.0123	1.4	FLOOD RISK
4320 Winter	4.2	4.2	32.4108	0.0108	1.0	FLOOD RISK
5760 Winter	3.1	3.1	32.4093	0.0093	0.8	FLOOD RISK
7200 Winter	2.5	2.5	32.4083	0.0083	0.7	FLOOD RISK
8640 Winter	2.2	2.2	32.4078	0.0078	0.6	FLOOD RISK
10080 Winter	1.9	1.9	32.4073	0.0073	0.5	FLOOD RISK

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
240 Winter	12.41	126
360 Winter	9.07	186
480 Winter	7.23	244
600 Winter	6.06	306
720 Winter	5.24	368
960 Winter	4.17	480
1440 Winter	3.02	714
2160 Winter	2.19	1064
2880 Winter	1.73	1456
4320 Winter	1.25	2180
5760 Winter	0.99	2840
7200 Winter	0.83	3696
8640 Winter	0.71	4336
10080 Winter	0.63	5064

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T J Booth Associates		Page 3
104 Yorkshire St Rochdale Lancashire OL16 1JY	permeable car park hallmark developments city road east car park	
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Micro Drainage	Source Control W.10.4	

Rainfall Details

Region	ENG+WAL	Shortest Storm (mins)	15
Return Period (years)	100	Longest Storm (mins)	10080
M5-60 (mm)	17.000	Summer Storms	Yes
Ratio-R	0.400	Winter Storms	Yes
Cv (Summer)	0.750	Climate Change %	+0
Cv (Winter)	0.840		

Time / Area Diagram

Total Area (ha) = 0.550

Time from:	(mins) to:	Area (ha)
0	4	0.550

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T J Booth Associates		Page 4
104 Yorkshire St Rochdale Lancashire OL16 1JY	permeable car park hallmark developments city road east car park	
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Micro Drainage	Source Control W.10.4	

Porous Car Park Details

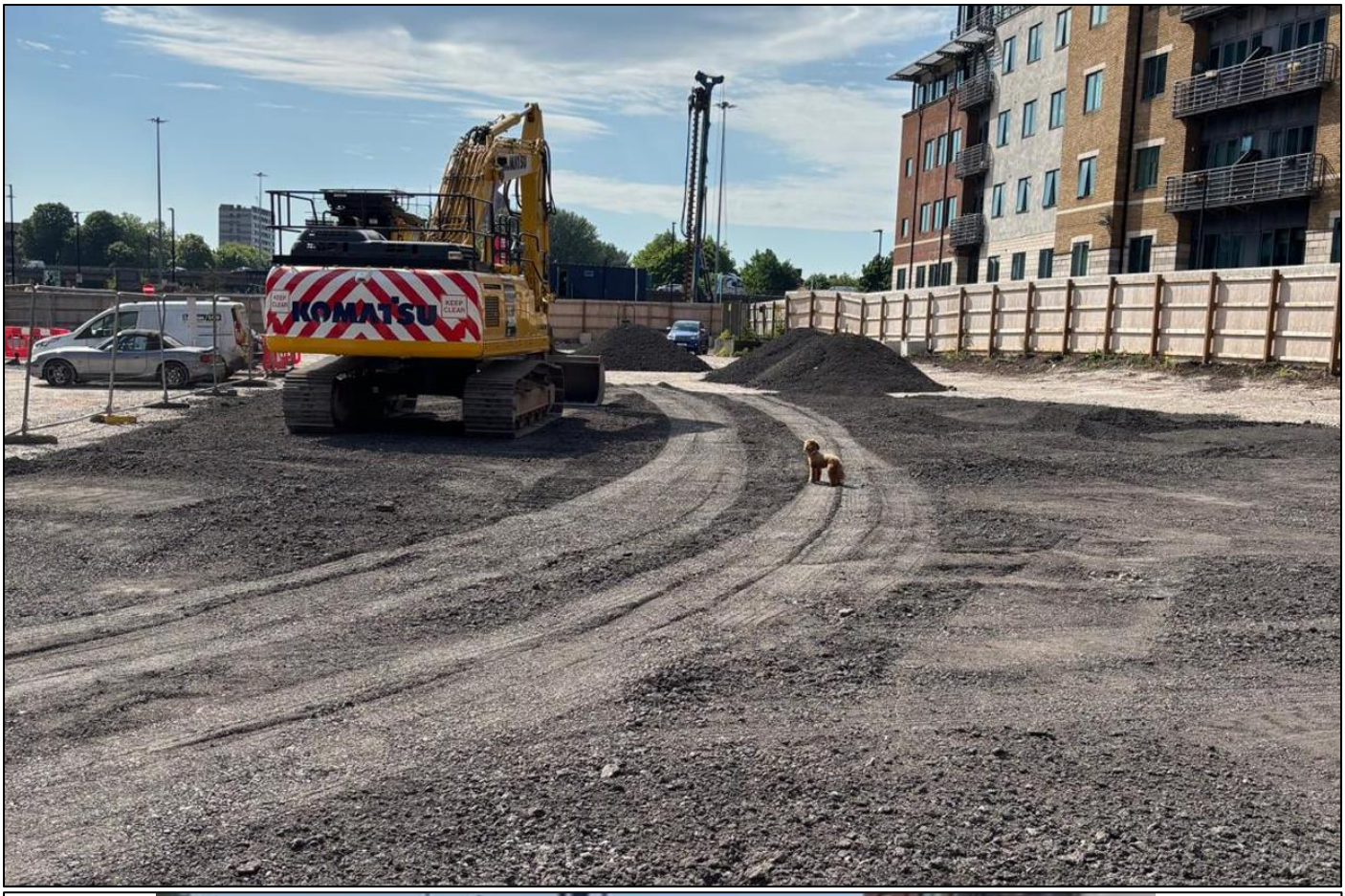
Infil Coef - Base (m/hr)	0.126000	Invert Level (m)	32.400
Membrane Percolation (mm/hr)	1000	Cover Level (m)	32.500
Safety Factor	1.0	Slope (1:x)	1000.0
Porosity	0.35	Max Percolation (l/s)	1458.3
Length (m)	100.0	Depression Storage (mm)	5
Width (m)	52.5	Evaporation (mm/day)	3

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5.2 Photographs.






KOMATSU

