Douglas PARTNERS

GROUNDED EXPERTISE

Report on Sampling and Analysis Quality Plan

Proposed Mixed Use Development

138 Maroubra Road, Maroubra

Prepared for Maroubra Property Developments Pty Ltd

Project 20854.03

11 June 2025

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Document History

Details

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Status	Prepared by	Reviewed by	Date issued
Revision 0	Johann Chalache	John Russell	27 August 2024
Revision 1	Phi Quoc Huy Tran	Paul Gorman	11 June 2025

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Revision 0	Leigh Manser – Maroubra Property Developments Pty Ltd
Revision 1	Leigh Manser – Maroubra Property Developments Pty Ltd

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

Signature	Date
Author p.p.	11 June 2025
Reviewer	11 June 2025

FS604853

Douglas Partners acknowledges Australia's First Peoples as the Traditional Owners of the Land and Sea on which we operate. We pay our respects to Elders past and present and to all Aboriginal and Torres Strait Islander peoples across the many communities in which we live, visit and work. We recognise and respect their ongoing cultural and spiritual connection to Country.

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Report on Sampling and Analysis Quality Plan
Proposed Mixed Use Development
138 Maroubra Road, Maroubra

1. Introduction

This sampling and analysis quality plan (SAQP) has been prepared by Douglas Partners Pty Ltd (Douglas) to set out the recommended scope of works for the detailed site investigation (DSI) required at 138 Maroubra Road, Maroubra (herein referred to as 'the site'). The investigation was commissioned by email dated 30 July 2023 from Leigh Manser of Maroubra Property Developments Pty Ltd and was undertaken in accordance with Douglas' proposal 20854.02.P.001.Rev0 dated 10 June 2025.

It is understood that the requirement for the DSI was reported in the amended Statement of Facts and Contentions (SOFAC), and that this SAQP may be used to inform the consent authority of proposed investigation works responsive to the requirements of the *Resilience and Hazards* SEPP.

The objective of this SAQP is to outline the recommended scope of works for the DSI and to obtain data which can be used to assess the contamination status at the site. The results of the DSI will be evaluated against published criteria to assess the suitability of the site for the proposed development (from a contamination perspective).

The proposed development is an eight-storey building containing:

- A single carpark basement, using the current basement level with the following modifications:
  - Overall basement is proposed to have 150mm depth removed from the underside of the slab; and
  - The northern section of the basement will have 750mm removed from the underside of the slab.
- Ground level retail / utilities rooms;
- Level 1 mixed-use parking and residential units;
- The remaining levels containing residential units; and
- Rooftop communal garden and plant room.

It is noted that the DSI will be undertaken prior to demolition of the existing building which presents certain access constraints. As such, the scope has been devised accordingly.

This report must be read in conjunction with all appendices including the notes provided in Appendix B.

2. SEARs Declaration: Mixed-use development with in-fill affordable housing at 138 Maroubra Road, Maroubra

Declaration		
Name	Phi Quoc Huy Tran	
Qualification	BSc Environmental earth science and ecology, licensed asbestos assessor	
	The undersigned declares that this Sampling Analysis Quality Plan (SAQP) has been prepared in response to the following SEARs requirements issued for the Project on 10/06/2025 for SSD-81426710.	
SEARs item no.	SEARs Requirements	Relevant section of this Report
13.02	**Contamination and Remediation** In accordance with Chapter 4 of the State Environmental Planning Policy (Resilience and Hazards) 2021, assess and quantify any soil and groundwater contamination and demonstrate that the site is suitable (or will be suitable, after remediation) for the development.	This report in its entirety, developing a scope to address the condition through a detailed site investigation.
Signed		
Dated		

3. Site identification

Site address	138 Maroubra Road, Maroubra
Legal description	Lots 1 and 2, Deposited Plan 506844
Area	1500 m^2
Zoning	Zone E2 – Commercial Centre
Local Council Area	Randwick City Council
Current use	Commercial building with basement
Surrounding uses	North – Piccadilly Place followed by mixed use apartments East – Mixed use apartments South – Maroubra Road, followed by residential and commercial / retail West – Maroubra Police Station, followed by Bruce Bennetts Place and mixed-use apartments

The site boundary is shown on Figure 1, below, and Drawing 1, Appendix A.

Figure 1: Site location

4. Environmental setting

Regional topography	Regional topography appears to be variable, with a hill to the east and smaller crests to the north and west. Topography to the south and south-west falls gently towards Port Botany and Botany Bay.
Site topography	The site topography appears relatively flat and is approximately 26 m relative to Australian Height Datum (AHD).
Soil landscape	Reference to the Sydney 1:100 000 Soils Landscape Sheet indicates that the site is underlain by Tuggerah aeolian sand typically comprising deep podzols on dunes and podzol / humus podzol intergrades on swales. The site is also located on Botany Sands, which is an unconfined aquifer with large groundwater capacity and highly variable groundwater levels.
Geology	Reference to the Sydney 1:100 000 Geology Sheet indicates that the site is underlain by Quaternary sediments typically comprising medium to fine-grained marine sand with podsols.

Acid sulfate soils	Published acid sulfate soils (ASS) risk mapping indicates that the site is in an area that has an extremely low probability of occurrence.
Surface water	No surface water bodies are present on the site. Surface water flows are anticipated to be intercepted by local stormwater systems.
Groundwater	A search of the publicly available registered groundwater bore database indicated that there are four registered groundwater bores within 250 m of the site which were for domestic use, with recorded standing water levels at 4.8 (GW025730) and 10.7 m (GW108931) bgl. Based on the regional topography, groundwater bore data, and the inferred flow direction of nearby water courses, the anticipated flow direction of groundwater beneath the site is to the south or south-west, towards Botany Bay, the likely receiving surface water body for the groundwater flow path.

5. Conceptual site model

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM provides the framework for identifying how the site became contaminated and how potential receptors may be exposed to contamination either in the present or the future i.e. it enables an assessment of the potential source – pathway – receptor linkages (complete pathways).

Based on the previous investigation (Douglas, 2022), the following potential sources of contamination and associated contaminants of potential concern (CoPC) have been identified and summarised in Table 1.

Table 1: Summary of potential sources

Potential sources and associated CoPC
On-site sources
S1: Fill: Associated with levelling, demolition of former buildings on the site and potential burying of waste CoPC include metals, PFAS, TRH, BTEX, PAH, PCB, OCP, phenols and asbestos **S2:** Former buildings CoPC include asbestos, synthetic mineral fibres (SMF), lead (in paint) and PCB **S3:** Existing or removed USTs and associated pipework, bowsers and fire retardants CoPC include lead, TRH, BTEX, PAH, VOC, and PFAS **S4:** Transformer in south-west corner of the site CoPC include PCB

Potential sources and associated CoPC
On-site sources
Off-site sources
S5: Possible USTs and associated pipework, bowsers and fire retardants in adjacent police station CoPC include lead, TRH and BTEXN. **S6:** Dry cleaning businesses located west and east of the site CoPC include perchloroethylene (PCE) and associated daughter products

The following potential human and environmental receptors, along with relevant potential pathways, have been identified and summarised in Table 2.

Table 2: Summary of potential receptors and pathways

Potential human receptors
HR1: Construction and maintenance workers **HR2:** End users [residential / retail / commercial] **HR3:** Adjacent site users [residential, commercial and police station]
Potential environmental receptors
ER1: Surface water [Bunnerong Creek and two unnamed creeks, Botany Bay] **ER2:** Groundwater
Potential pathways to human receptors
HP1: Ingestion and dermal contact **HP2:** Inhalation of dust and/or vapours
Potential pathways to environmental receptors
EP1: Surface water run-off **EP2:** Leaching of contaminants and vertical migration into groundwater

Summary of potentially complete exposure pathways

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to human or environmental receptors from contamination sources on or in the vicinity of the site, via exposure pathways (potential complete pathways). The possible pathways between the above sources (S1 to S7) and receptors are provided in below Table 3.

Table 3: Summary of potentially complete exposure pathways

Source and CoPC	Exposure pathway	Receptor	Risk management action
S1: Fill: metals, PFAS, TRH, BTEX, PAH, PCB, OCP, phenols and asbestos **S2:** Former buildings: asbestos, SMF, lead and PCB **S3:** Possible USTs on site: lead, TRH, BTEX, PAH, VOC and PFAS **S4:** Transformer: PCB	**HP1:** Ingestion and dermal contact **HP2:** Inhalation of dust and/or vapours	**HR1:** Construction and maintenance workers **HR2:** End users [residential / retail / commercial]	An intrusive investigation is recommended to assess possible contamination including testing of the soils, soil vapour and groundwater.
	HP2: Inhalation of dust and/or vapours	**HR3:** Adjacent site users [residential, commercial and police station]	
	EP1: Surface water run-off	**ER1:** Surface water	
	EP2: Leaching of contaminants and vertical migration into groundwater	**ER2:** Groundwater	
S5: Off-site USTs: lead, TRH, BTEXN **S6:** Off-site dry cleaners: PCE	**HP2:** Inhalation of vapours	**HR1:** Construction and maintenance workers **HR2:** End users [residential / retail / commercial]	

6. Site assessment criteria

The site assessment criteria (SAC) applied in the current investigation are informed by the CSM (Section 4) which identified human and environmental receptors to potential contamination on the site. Analytical results will be assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

The investigation and screening levels applied in the current investigation comprise levels adopted for a generic residential land use scenario (corresponding to land use category 'B').

7. Data quality objectives

The SAQP has been devised broadly in accordance with the seven-step data quality objectives (DQO) process which is provided in Appendix B, Schedule B2 of NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).

Table 4: Data quality objectives

Step	Summary
1: State the problem	The objective of the investigation is to assess the contamination status of the site with respect to the proposed land use. The report is being undertaken as the site is to be redeveloped. The requirements of the regulator, Randwick City Council, will also be considered by consulting their Development Control Plan (DCP), Local Environment Plan (LEP) and any other requirements based on our recent experience with Council on similar sites. A preliminary CSM is outlined in Section 4. The project team consists of experienced environmental engineers and scientists working in the roles of Project Principal, Project Reviewer, Project Manager and field staff.
2: Identify the decisions / goal of the study	The site history has identified possible contaminating previous uses which are identified in the CSM. The CSM identifies the associated CoPC and the likely impacted media. The site assessment criteria (SAC) for each of the CoPC discussed in Section 5. The decision is to establish whether or not the results fall below the SAC or whether or not the 95% upper confidence limit of the sample population falls below the SAC. On this basis, an assessment of the site's suitability from a contamination perspective will be derived and a decision made on whether (or not) further assessment and/or remediation will be required.
3: Identify the information inputs	Inputs will be the analytical results for the CoPC rom NATA accredited laboratories and methods, where possible. The SAC for each of the CoPC are discussed in Section 5. A photoionisation detector (PID) will be used on-site to screen soils for VOC. PID readings will be used to inform sample selection for laboratory analysis.
4: Define the study boundaries	The lateral boundaries of the investigation area are shown on Drawing 1, Appendix A. The vertical boundaries are to the extent of contamination impact.
5: Develop the analytical approach (or decision rule)	The decision rule is to compare all analytical results with the SAC (Appendix C, based on NEPC (2013)). Where guideline values are absent, other sources of guideline values accepted by NEPC (2013) shall be adopted where possible. Where a sample result exceeds the adopted criterion, a further site-specific assessment will be made as to the risk posed by the presence of that contaminant(s). Initial comparisons will be with individual results then, where required, summary statistics (including mean, standard deviation and 95% upper confidence limit (UCL) of the arithmetic mean (95% UCL)) to assess potential risks posed by the site contamination. Quality control results are to be assessed according to their relative percent difference (RPD) values. For field duplicates and laboratory results, RPD values should generally be below 30%; for field blanks, results should be at or less than the limits of reporting (NEPC, 2013).
6: Specify the performance or acceptance criteria	Baseline condition: Contaminants at the site and/or statistical analysis of data (in line with NEPC (2013)) exceed the human health and environmental SAC and pose a potentially unacceptable risk to receptors (null hypothesis).

Step	Summary
	Alternative condition: Contaminants at the site and statistical analysis of data (in line with NEPC (2013)) comply with the human health and environmental SAC and as such, do not pose a potentially unacceptable risk to receptors (alternative hypothesis). Unless conclusive information from the collected data is sufficient to reject the null hypothesis, it is assumed that the baseline condition is true. Uncertainty that may exist due to the above potential decision errors shall be mitigated as follows: • As well as a primary screening exercise, the use of the 95% UCL as per NEPC (2013) may be applied, i.e. 95% is the defined confidence level associated with the UCL on the geometric mean for contaminant data. The resultant 95% UCL shall subsequently be screened against the corresponding SAC. • The statistical assessment will only be able to be applied to certain data-sets, such as those obtained via systematic sampling. Identification of areas for targeted sampling will be via professional judgement and errors will not be able to have a probability assigned to them.
7: Optimise the design for obtaining data	As the purpose of the investigation is to assess the contamination status of the site, the sampling program is reliant on professional judgement to identify and sample the potentially affected areas.

8. Sampling and analysis plan

8.1 Soil

NSW EPA's *Sampling Design Guidelines* (NSW EPA, 2022) recommends a minimum of eight systematic grid-based sampling locations for a site of approximately 0.15 ha. It is noted that the DSI will be undertaken prior to demolition which presents certain access constraints. The eight proposed borehole locations are shown on Drawing 1, Appendix A:

- Six test locations (BH2 to BH7) within the footprint of the basement providing general coverage of the site. Given the access restrictions within the basement, these test locations will be undertaken using hand tools (hand auger) to a depth of approximately 1.0 m:
  - Soil sampling at approximate 1.0 m depth intervals (i.e. two per borehole) or upon sign of contamination).
- Two test locations (BH1 and BH8) will be undertaken at street level, where practicable. These boreholes will extend into the standing water table or to a maximum depth of approximately 10 m bgl:
  - Soil sampling at approximate 1.0 m depth intervals (or upon sign of contamination) to 1.0 m into natural material for contamination testing.
  - Soil sampling at approximate 1.0 m depth intervals from 3.0 m bgl to 10.0 m bgl (i.e. ~8 samples) for ASS screening.

The test locations are to be further informed (and moved / adjusted) based on site conditions and the results of service locating.

8.1.1 Soil sampling methodology

Soil sampling is carried out in accordance with Douglas' standard operating procedures. The general sampling and sample management procedures comprise:

- Collect soil samples directly from the solid flight auger / hand auger at the nominated sample depth;
- Place samples into laboratory-prepared glass jars with Teflon lined lids, capping immediately and minimising headspace within the sample jar;
- Place samples into laboratory-prepared containers (specific for PFAS), capping immediately and minimising headspace within the sample jar;
- Collect replicate samples in zip-lock bags for PID screening;
- Collect ~500 ml samples in zip-lock bags for fibrous asbestos and asbestos fines (FA and AF) analysis;
- Wear a new disposable nitrile glove for each sample point thereby minimising potential for cross-contamination;
- Collect 10% replicate samples for quality control (QC) purposes;
- Label sample containers with individual and unique identification details, including project number, sample location and sample depth (where applicable);
- Place samples into a cooled, insulated and sealed container for transport to the laboratory; and
- Use chain of custody documentation.

Reference is made to HEPA (2020) for requirements specific to PFAS.

8.1.2 PID screening

PID screening is carried out in accordance with Douglas' standard operating procedures. The general sampling and sample management procedures comprise:

- Calibrate the PID with isobutylene gas at 100 ppm and with fresh air prior to commencement of each successive day's field work;
- Allow the headspace in the PID zip-lock bag samples to equilibrate; and
- Screen using the PID.

8.2 Groundwater

Sampling from two groundwater wells will be undertaken (monitoring wells installed at BH1 and BH8).

8.2.1 Well installation / construction methodology

Based on the regional topography and nearby groundwater bore data, the depth to groundwater at the site is anticipated to be between 5 and 10 m bgl. BH1 and BH8 are proposed to be drilled to 10 m bgl and the screened section of each well will be 6.0 m to 10.0 m bgl.

Monitoring wells are constructed using class 18 uPVC machine slotted screen and blank sections with screw threaded joints. The screened section of each well is backfilled with a washed sand filter pack to approximately 0.5 m above the screened interval. Each well is completed with a hydrated bentonite plug of at least 1.0 m thick and then compacted drill cuttings / bentonite to the surface, finished with a cast iron road-box.

8.2.2 Groundwater sampling methodology

Groundwater monitoring wells are developed as soon as practicable following well installation. The purpose of well development is to remove sediments and/or drilling fluid introduced to the well during drilling and to facilitate connection of the monitoring well to the aquifer. The wells are developed by pumping / bailing to remove a minimum of five well volumes, or until dry.

Groundwater sampling is carried out in accordance with Douglas' standard operating procedures. Groundwater samples are collected using a positive displacement low flow bladder pump via the micro-purge (minimal drawdown) method. The method minimises aeration of the sample and disturbance to the water column thereby enhancing the quality of results for oxygen sensitive analytes. The sampling method is described as follows:

- Measure the static water level using an electronic interface probe and record the thickness of any LNAPL (if encountered);
- Decontaminate the interface probe and cable between monitoring wells by rinsing in a diluted Liquinox solution and then rinsing in demineralised water;
- Fit the pump with a well-dedicated bladder and tubing. Lower the pump into the well then clamp at a level estimated to be 1 m below the top of the water column (provided the depth of the pump is within the screened section) or to the approximate mid-point of the well screen;
- Set the pump at the lowest rate possible that could produce laminar flow to minimise drawdown of the water column;
- Measure physical parameters by continuously passing the purged water through a flow cell; and
- Following stabilisation of the field parameters, collect samples in laboratory-prepared bottles minimising headspace within the sample bottle and cap immediately.

8.3 Soil vapour assessment

Given the access restrictions within the basement, vapour sampling from two soil vapour pins (SV1 and SV2) within the basement will be undertaken.

8.3.1 Vapour pins installation / construction methodology

Vapour pin installation comprises the following steps:

- Drill a 38 mm pilot hole into the pavement to a depth of approximately 50 mm using a rotary hammer drill and masonry bit;
- Drill a second hole with a diameter of 16 mm to fully penetrate the pavement (approximately 150 mm);

- Insert a pre-fabricated stainless-steel vapour pin with a silicon sleeve (with an outer diameter approximately 20 mm) into the drilled hole and then drive into the pavement using a hammer. The silicon sleeve holds the pin in place. No glues, cements or other binding products are applied to the installation;
- Place a plastic cap on the inlet to the pin and screw a stainless-steel cap into place; and
- Allow the pins to sit for approximately 60 minutes to equilibrate to ambient conditions before purging.

8.3.2 Soil vapour sampling methodology

The soil vapour sampling is carried out in accordance with Douglas' standard operating procedures based on ASTM (2018) and current industry practice. The general sampling and sample management procedures comprise:

- Connect sample tubing directly to the vapour pin / vapour well outlet following removal of the stainless-steel cap and plastic cap;
- Collect the primary soil vapour sample to a Summa canister and the backup sample on carbon tubes. Attach Summa canisters directly to the sample point via disposable tubing. Collect the back-up sample using an air sampling pump, with the flow rate monitored using a rotameter and vacuum gauge;
- Perform shut in tests (minimum 30 seconds) following assembly of the sampling apparatus comprising:
    - Summa canister: Assemble the sample apparatus to the extent practical (i.e. connecting the Summa canister to the regulator), then open the canister valve to apply the vacuum (of between -29 mm Hg to -30 mm Hg) to the sampling train, while the regulator is still capped;
    - Carbon back-up tube: Assemble the sample train (fittings to attach to vapour well, carbon tube, vacuum gauge, rotameter and pump plus the associated tubing connecting the sample train) then clamp the sampling tube between the vapour port and carbon tube, activate the pump until a vacuum of 15 in Hg is achieved and then the sampling train is clamped at the pump;
- Purge the soil vapour well prior to sampling by removing one volume of air / vapour from the well (~500 ml);
- Introduce liquid isopropyl alcohol (IPA) into the sampling shroud to act as a tracer gas for leaks in the soil vapour well and/or the sampling train. All samples are analysed for IPA as part of the TO15 analysis;
- Take PID readings from the soil vapour well prior to and following application of the IPA tracer gas. Take a PID reading inside the shroud to provide a field indication of potential leaks;
- Measure general gas parameters from the soil vapour well, including methane, oxygen and carbon dioxide, on-site using a calibrated landfill gas analyser;
- Collect primary samples directly from the soil vapour port into 1 L Summa canisters with a flow regulator set by the analytical laboratory (approximately 100 ml/min). The regulators are supplied by the analytical laboratory and are decontaminated by the laboratory prior to shipment;
- Collect an intra-laboratory QC duplicate soil vapour sample;

- Collect back-up samples directly onto carbon tubes using an SKC constant flow air-sampling pump, low flow adapter and rotameter to confirm the flow rate;
- Collect a shroud sample on a carbon tube to conduct analysis for IPA and determine the concentration of the tracer compound in the shroud;
- Collect the VOC sample from the sample point directly into the sorbent tube / canister so as not to pass through the pump, rotameter or tubing which has the potential to contaminate the samples (rotameter not required for canisters); and
- Label the sample canisters and tubes and record on chain of custody documentation. Complete field sampling sheets and transport samples to the laboratory in an appropriate sealed container.

8.4 **Analysis rationale**

The preliminary analysis rationale is outlined below. It is noted that this is subject to field observations and additional analysis may be undertaken.

Table 5: Analysis rationale

Media	Analytes
Soil (all locations)	Metals, TRH, BTEX, PAH, PCB, OPP, OCP, phenols, PFAS. Approximately 1.5 samples analysed per test location. AF / FA at one per location targeted to fill, and asbestos identification in material as required. ASS screening (BH1 and BH8), 1 sample per metre from 3.0 m to 10.0 m (i.e. 8 samples per borehole). SCr testing on up to 3 samples should screen results exceed relevant thresholds.
Groundwater (BH1 and BH8)	Metals, TRH, BTEX, PAH, PCB, OPP, OCP, phenols, VOC, PFAS. 1 sample per location.
Soil Vapour	Air-phase TO-15 VOC. 1 sample per location.

9. Quality assurance and quality control

Field quality assurance and quality control (QA / QC) testing will include the following:

- 10% sample intra-laboratory analysis; and
- Trip spike and trip blank samples (analysed for BTEX) (approximately one per batch of samples where volatile contaminants are CoPC).

10. Concluding statement

A DSI report will be prepared to assess the data in accordance with this SAQP. The report will be prepared with reference to the NSW EPA (2020) *Consultants Reporting on Contaminated Land* guidelines and will make a conclusion regarding the suitability of the site for the proposed development, the need for further investigations, and the need for remediation works (if required).

If considered necessary based on the findings of the DSI, a RAP may also be prepared.

11. References

Douglas. (2022). *Report on Preliminary Site (Contamination) Investigation, Proposed Mixed Use Development, 138 Maroubra Road, Maroubra*. Douglas ref: 20854.02.R.001.Rev1 dated 10 November 2022.

HEPA. (2020). *PFAS National Environmental Management Plan (NEMP).* Version 2.0: Heads of EPAs Australia and New Zealand and Australian Government Department of the Environment.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

NSW EPA. (2020). *Guidelines for Consultants Reporting on Contaminated Land*. Contaminated Land Guidelines: NSW Environment Protection Authority.

NSW EPA. (2022). *Contaminated Sites, Sampling Design Guidelines*. NSW Environment Protection Authority.

12. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for this project at 138 Maroubra Road, Maroubra in line with Douglas' proposal dated 10 June 2025 and acceptance received from Leigh Manser of Maroubra Property Developments Pty Ltd dated 23 August 2024. The work was carried out under Douglas' Engagement Terms. This report is provided for the exclusive use of Maroubra Property Developments Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after Douglas' field testing has been completed.

Douglas' advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by Douglas in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

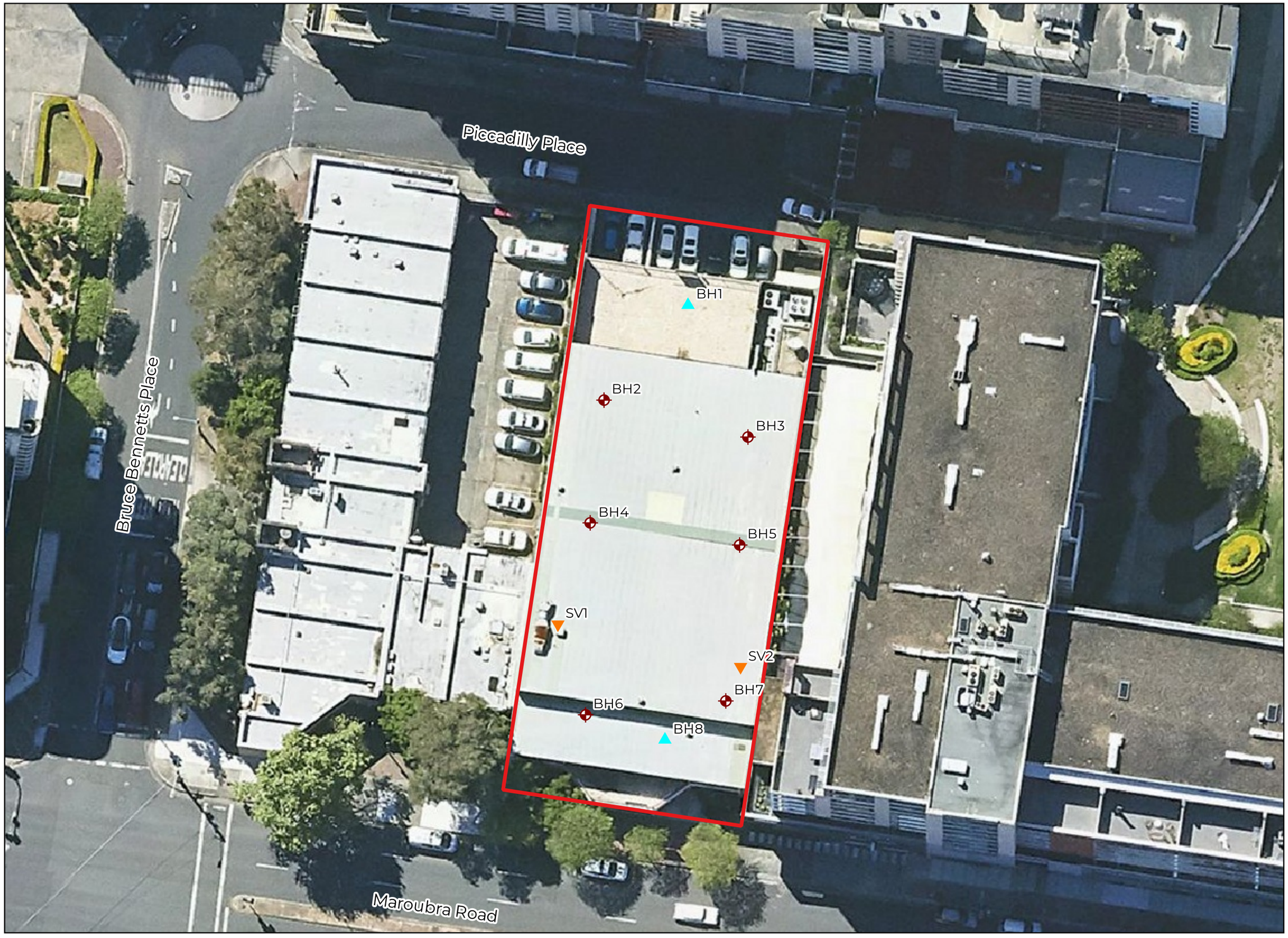
The assessment of atypical safety hazards arising from this advice is restricted to the environmental components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

Appendix A

Drawings



SITE LOCATION

LEGEND

- Site Boundary

Proposed Test Locations

- Hand Auger
- Monitoring Well
- Soil Vapour

NOTE:
1. Drawing projection in GDA2020 / MGA zone 56, adapted from aerial imagery from metromap dated August 2024

0 5 10 15 20 m

Douglas PARTNERS

CLIENT:	Maroubra Property Developments Pty Ltd	TITLE:	**Proposed Test Locations** **Proposed Mixed Development** **138 Maroubra Road, Maroubra NSW**
OFFICE: Sydney	DRAWN BY: JBC		
SCALE: 1:400 @A3	DATE: 10.January.2025		

PROJECT:	20854.03
DRAWING No:	1
REVISION:	0

Appendix B

About This Report

About this Report

November 2023

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

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About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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