

# GEOTECHNICAL DESKTOP STUDY

Client – Captag Investments Pty Ltd

Project Title – 15a, 15b Moseley Street & 25-31 Donald Street, Carlingford

Project Type – Proposed Multi-Use Development

Project No. – GR25162-1A

Date Issued – 3/12/2025

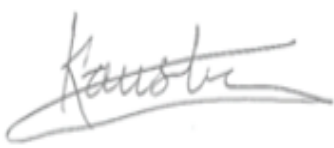
Description of Services – Geotechnical Desktop Study

## Document Control

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**Report No:** GR25162-1A

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## 1. Introduction

### 1.1 Background

CEC Geotechnical Pty Ltd was engaged by the client to conduct a geotechnical desktop study at **15a, 15b Moseley Street & 25-31 Donald Street, Carlingford** to develop a preliminary understanding of the site conditions as part of a formal response to the Department of Planning Housing and Infrastructure regarding State Significant Development (SSD-83870463).

### 1.2 Provided Information

- A set of Architectural Drawings including site plans, floor plans, prepared by CAPIO, revision D 12/02/2025.
- Survey Plan prepared Ramsay Surveyors Pty Ltd Ref 9338, issue date: 21/04/2023.
- Geotechnical Investigation Report prepared by CEC Geotechnical, Job No. GR25162, Date: 06/06/2025
- Geotechnical Investigation Report prepared by JK Geotechnics, Job No. 33910SNrpt, Date: 16/04/2025
- Geotechnical Investigation and Slope Risk Assessment Report prepared by Morrow, Job No. P2914\_01 rev3, Date: 21/10/2023
- Geotechnical Investigation Report prepared by JK Geotechnics, Job No. 37031MrptRev2, Date: 29/04/2025

### 1.3 Proposed Development

Based on the information provided by the client, the proposed development comprises the construction of two multistorey residential buildings (Building A and Building B).

Building B will consist of a seven-storey residential structure supported by three basement levels. The development will also include an integrated childcare centre and a shared residential communal open space to be utilised jointly with Building A.

Building A will involve the construction of a nine-storey residential building supported by a single basement level, together with associated landscape works.

The lowest proposed basement level has a Finished Floor Level (FFL) of 98.75, resulting in a maximum excavation depth of approximately 13.3 m. Localised deeper excavations will be required for lift shafts, building footings, and various service pits and trenches.

### 1.4 Objectives

The objective of this report include:

- Site Description
- Potential Subsurface & Hydrogeological conditions
- Potential Salinity and Acid Sulphate
- General Recommendations

### 1.5 Scope of Works

A desktop assessment was undertaken as an initial phase of the geotechnical investigation. This process involved the review and analysis of existing information and publicly available data sources to identify the likely geological, geotechnical, and environmental characteristics of the site.

- The findings of this assessment provide context for planning further site investigations and identifying potential geotechnical risks or constraints associated with the proposed development.
- Desktop Study including a review of existing previous geotechnical reports, architectural drawings, survey, geology and topography of the site and neighbouring properties.
- Review hydrological data for water table characteristics
- Examination of the site-specific potential Salinity Region and Acid Sulphate Soils Classification
- Interpretation of potential subsurface conditions for the existing site based on available borehole data in close proximity to the site (i.e. NSW Water Data set of Groundwater boreholes, adjacent geotechnical investigation records, etc.)

## 1.6 Constraints

The desktop assessment provides a preliminary understanding of the site's geological and geotechnical context based on existing and publicly available data sources. While useful for identifying potential risks and guiding the scope of further investigations, this assessment is inherently limited by the absence of site-specific fieldwork or laboratory testing. The data reviewed may be regional in nature, outdated, or of insufficient resolution to accurately reflect local subsurface conditions. As such, critical features such as soil variability, groundwater conditions, contamination, or the presence of fill material cannot be confirmed. Consequently, the findings of this desktop study should be considered indicative only and must be validated through intrusive geotechnical investigations to support detailed design and development planning.

If a more detailed geotechnical investigation regarding soil reactivity is available, it should be provided to CEC Geotechnical Pty Ltd. In addition, any details related to the site's history should be supplied. If the site conditions change from those of the original investigation, the findings of this report may be void.

Upon reviewing this information, it may be deemed that a more detailed geotechnical investigation is required.

## 2. Desktop Assessment

### 2.1 General Site Description

The site is situated within the City of Parramatta Local Government Area (LGA) and is legally identified as Lot 2 DP35555, Lot 35 DP536982, Lot 34 DP536982, Lot 32 DP536982 and Lot 33 DP536982. It encompasses a total area of approximately 5,948 m<sup>2</sup> and is bounded by Moseley Street to the north, Donald Street to the southwest, and residential properties to the east, west, and south, as illustrated in Figure 1.

A site inspection confirmed that the construction on site has commenced, with demolition works completed and excavation works to commence.

**Figure 1:** Site Location (15a, 15b Moseley Street & 25-31 Donald Street, Carlingford)

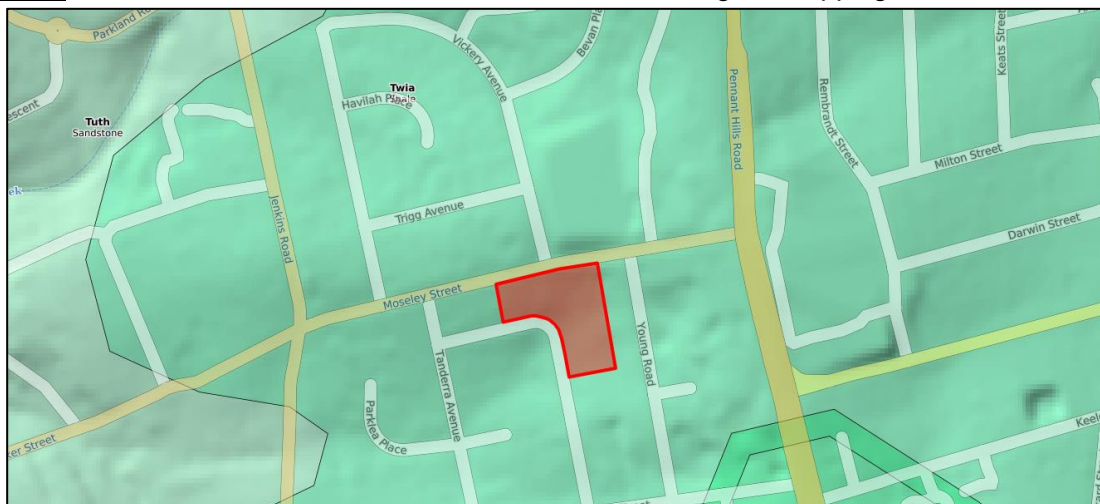


## 2.2 Geological Description

Based on the architectural drawings, it can be noted that the site is sloping from North to South, with an approximate slope of 5.9°.

The NSW Government MinView Portal, Seamless Geological Mapping indicates that the subject site is underlain by Wianamatta group, Ashfield Shale (**Twia**) which consists of black to light grey shale and laminate.

**Figure 2:** NSW Government MinView Portal, Seamless Geological Mapping



## 2.3 Subsurface Conditions and Potential Regional Hydrogeology

A Geotechnical Investigation Report prepared by CEC Geotechnical, Project No. GR25162 was previously conducted at 15a, 15b Moseley Street & 25-31 Donald Street, Carlingford, with an approximate thickness of the subsurface conditions as demonstrated in Table 1. In accordance with the drilling works and provided information, it is understood that the site consists of Silty CLAY,

underlain by SHALE. Additionally, groundwater was not encountered in any of the boreholes during the geotechnical investigation on 25 July 2025. Following completion of drilling, the boreholes were left to allow any potential groundwater to seep into the subsurface materials and stabilize. However, no groundwater seepage was observed during this period. A geotechnical engineer monitored the boreholes for one hour, confirming that no standing groundwater level was present at the site.

**Table 1:** Summary of Subsurface Conditions (Geotechnical Investigation Report prepared by CEC Geotechnical, Job No. GR25162, Date: 06/06/2025)

Unit	Description	Approximate Thickness (m)
Unit – 1: Topsoil	Silty CLAY CL-CI: soft, low to medium plasticity, grey brown	0.2
Unit – 2: Residual	Silty CLAY CH: medium plasticity, brown	0.4
Unit – 3: Residual	Silty CLAY CH: high plasticity, brown orange	0.6
Unit – 4: SHALE, Class V	SHALE: Distinctly weathered, very low strength	1.3
Unit – 5: SHALE, Class IV	SHALE: Highly weathered, low strength, brown grey	2.5

Similarly, a further Geotechnical Investigation and Slope Risk Assessment Report prepared by Morrow, Job No. P2914\_01 rev3 also observed that a regional groundwater table was not encountered within the proposed excavation depth. However, it should be anticipated that minor seepage may occur at the soil rock interface and within joints or bedding partings in the underlying bedrock. In shale bedrock, groundwater typically migrates downward toward local drainage lines or the regional water table, primarily along horizontal bedding planes and sub vertical joints. The permeability of the rock mass is therefore expected to be controlled by the presence and characteristics of joints, faults, and bedding plane.

An additional Geotechnical Investigation Report prepared by JK Geotechnics, Project No. 33910SNrpt was previously conducted at 16-24 Thallon Street & 27-29 Jenkins Road, Carlingford, with an approximate thickness of the subsurface conditions as demonstrated in Table 2. The site is located approximately 360m, South West from 15a, 15b Moseley St & 25-31 Donald St, Carlingford (as shown in Figure 3). The 1:100,000 geological map of Sydney indicates that the site (16-24 Thallon Street & 27-29 Jenkins Road, Carlingford) is underlain by Ashfield Shale of the Wianamatta Group and is located near the boundary with the underlying Hawkesbury Sandstone. As the geological formation is in close proximity of Hawkesbury Sandstone, the findings presented in the report demonstrate that the site consists of Silty CLAY, underlain by SANDSTONE, as shown below. All boreholes remained dry during auger drilling and upon completion of the drilling works. Approximately three weeks after standpipe installation, standing water was observed within the bedrock profile at depths of approximately 5.9-6.7 m (RL 84.6-87.6) below the existing ground surface. However, given the low permeability of both the soil and bedrock materials, it is considered likely that these water levels reflect localised seepage rather than a true representation of a regional groundwater table. Long term groundwater inflows are expected to be minor and can be effectively managed by directing them to a sump for periodic pumping and disposal to the stormwater system.

**Figure 3:** Aerial View of Site, Previous Geotechnical Investigations within its Vicinity



**Table 2:** Summary of Subsurface Conditions (Geotechnical Investigation Report prepared by JK Geotechnics, Job No. 33910SNrpt, Date: 16/04/2021)

Unit	Description	Approximate Thickness (m)
Unit – 1: Pavement	Concrete	0.08
Unit – 1: Fill	Silty CLAY CL-CI: soft, low to medium plasticity, grey brown	0.3
Unit – 2: Residual	Silty CLAY CH: medium plasticity, brown	0.4
Unit – 3: Residual	Silty CLAY CH: high plasticity, brown orange	0.7
Unit – 4: SANDSTONE, Class V	SANDSTONE: distinctly weathered, very low strength	1.5
Unit – 5: SANDSTONE, Class IV	SANDSTONE: Highly weathered, low strength, brown grey	2.6
Unit – 5: SANDSTONE, Class III	SANDSTONE: Moderately weathered, medium strength, brown grey	3.1
Unit – 5: SANDSTONE, Class II	SANDSTONE: Slightly weathered, medium to high strength, brown grey	5.0

A further Geotechnical Investigation Report prepared by JK Geotechnics, Project No. 37031YMrptRev2 was previously conducted at 10 James Street, Carlingford. The site is located approximately 610m, Southwest from 15a, 15b Moseley St & 25-31 Donald St, Carlingford (as shown in Figure 3). the findings presented in the report demonstrate that the site consists of Silty CLAY underlain by SHALE and SANDSTONE (as shown in Table 3).

**Table 3:** Summary of Subsurface Conditions (Geotechnical Investigation Report prepared by JK Geotechnics, Job No. 37031YMrptRev2, Date: 29/04/2025)

Unit	Description	Approximate Thickness (m)
Unit – 1: Pavement	Concrete	0.08
Unit – 1: Fill	Silty CLAY CL-CI: low to medium plasticity, grey brown	0.2
Unit – 2: Residual	Silty CLAY CH: medium plasticity, brown	1.8
Unit – 4: SHALE	SHALE: dark grey	10
Unit – 5: SANDSTONE	SANDSTONE: brown grey	6

Groundwater was not encountered during auger drilling or upon completion of the auger boreholes. During coring, the introduction of water into the borehole limited the ability to obtain further meaningful groundwater level measurements. Groundwater levels were subsequently recorded within the standpipes ranging from 2.7-4.4m (RL 95-RL 97) below ground level. Furthermore, the groundwater levels measured before excavation indicated higher water tables than would be expected for the current excavation level of RL91 m, which remains dry. This condition is likely due to a drained basement located to the west that is lowering groundwater levels in the area. Some groundwater seepage should still be expected in the long term, mainly along the soil rock interface and through shale defects, particularly after rainfall. The excavation has been open for several years and has operated effectively as a drained system without adverse impacts. Any seepage during construction can be managed with standard sump-and-pump methods, and a drained basement is considered suitable for the site.

### 3. Conclusion

In accordance with the findings presented in the previous geotechnical, given the generally low permeability of both the soil and bedrock profiles, groundwater is not anticipated to be present within the basement excavation. Any seepage that does occur is anticipated to originate primarily along the soil rock interface and through discontinuities within the bedrock, such as joints and bedding planes. These inflows may temporarily increase following periods of heavy rainfall, however, they are expected to diminish as excavation progresses and the surrounding ground profile naturally drains.

Long term seepage is anticipated to be of limited volume and readily manageable through a conventional sump and pump system. This approach is suitable for both construction dewatering and ongoing control of groundwater beneath the basement slab.

It is recommended that seepage to be monitored throughout excavation by the site foreman and the geotechnical engineer to confirm that inflows remain within expected limits and that the designed drainage system is performing as intended.

## 4. Discussion and Recommendations

### 4.1 Sub-grade Preparation

- Fill should be compacted close to its optimum moisture content (+/- 2%) during compaction.
- The compaction method and equipment shall suit the filled material. The compaction of soil shall be tested by a NATA accredited laboratory and Geotechnical Inspection and Testing Authority (GITA) to ensure it meets the requirements of “AS 3798-2007 Guidelines on earthworks for commercial and residential developments”.
- Any organic materials (including topsoil) within the proposed building envelope are to be removed.
- The site should be proof rolled after an initial site scrape to unveil any soft spots. Any soft areas are to be removed and backfilled with compacted fill material as described in “AS 2870-2011”, cl 6.4.2.

## 5. Further Geotechnical Recommendations

CEC Geotechnical recommends and should be engaged at the following stages:

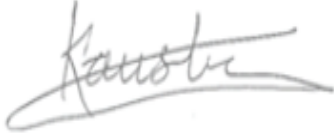
- Review of current site conditions and available groundwater information indicates no evidence at this time that anticipated groundwater intake will adversely affect the site or planned construction activities. Continued monitoring and evaluation during construction are recommended to confirm that groundwater conditions remain consistent with expectations
- Regular geotechnical inspections to be carried out to determine the seepage inflow throughout phases of excavation and piling
- If the proposed development is altered significantly from what has been assessed and described within this report.
- If the site conditions at the time of construction differ from those described in this report, then CEC Geotechnical shall be contacted. The owner/builder will be responsible for any fees associated with this additional work.

## 6. Limitations

This report and its associated recommendations have been prepared exclusively for our client who is named on the front page of this report and is the only intended entity to benefit from this report. CEC Geotechnical notes that reliance on the information provided in this report by any third party will be at their own risk. It should be noted that the analysis and conclusions made in this report may rely on works by other consultants and entities and hence, should these documents and investigations be incorrect, CEC Geotechnical must be made aware and the results of this report may be void.

For and on behalf of CEC Geotechnical Pty Ltd

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## References

- "AS 1726:2017" Geotechnical Site Investigations
- NSW Government MinView Portal, Seamless Geological Mapping
- NSW Central Resource for Sharing and Enabling Environmental Data in NSW (SEED)
- NSW Planning Portal - Environmental Planning Instrument for Acid Sulfate Soils