Freedom of Information Disclosure Log Publication Coversheet

The following information is provided pursuant to section 28 of the *Freedom of Information Act 2016*.

Application Details	
Ref. No.	CRAFOI 2026 - 001
Date of Application	9 January 2026
Date of Decision	17 March 2026
Processing time (in working days)	45
Fees	Waived
Decision on Access	Partial Release
Information Requested (summary)	Information and internal communications specific to Block 24 Section 65 from July 2023 to the present.

Publication Details		
Original application	☑ Published	☐ N/A
Decision notice	☑ Published	☐ N/A
Documents and schedule	☑ Published	☐ N/A
Decision made by Ombudsman	N/A	
Additional information identified by Ombudsman	N/A	
Decision made by ACAT	N/A	
Additional information identified by ACAT	N/A	

From:	CMTEDD FOI
To:	iCBR FOI
Cc:	CED, FOI; CMTEDD FOI
Subject:	RE: iCBRFOI2526/40 - full transfer/partial transfer with CED request [FW: Freedom of Information request, CITY Block 24 Section 65 (from 1 July 2023)
Date:	Friday, 9 January 2026 3:55:15 PM
Attachments:	image001.png

OFFICIAL

Hi Kirstie

CRA have advised they will have some information within scope of this request, therefore CMTEDD FOI accepts shared partial transfer with CED as of today.

Kind regards

Sue

CMTEDD Freedom Of Information Team
Phone: 02 6207 7754 | Email: CMTEDDFOI@act.gov.au
Corporate | **Chief Minister, Treasury and Economic Development Directorate** | **ACT Government**
Level 1, 220 London Circuit, Canberra ACT 2601 | GPO Box 158 Canberra ACT 2601 | act.gov.au

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From: Ball, Kirstie <Kirstie.Ball@act.gov.au> **On Behalf Of** iCBR FOI
Sent: Friday, 9 January 2026 10:54 AM
To: CMTEDD FOI <CMTEDDFOI@act.gov.au>
Cc: iCBR FOI <iCBR.FOI@act.gov.au>; CED, FOI <CEDFOI@act.gov.au>
Subject: FW: iCBRFOI2526/40 - full transfer/partial transfer with CED request [FW: Freedom of Information request, CITY Block 24 Section 65 (from 1 July 2023)

OFFICIAL

Hi team,

Apologies for the oversight I have discovered I should send this to you as well

To note:

- This request has also been sent to CED who are discussing with their business area (CCd for awareness).

Action requested:

- Could you please advise if you accept the full transfer, or shared partial transfer with CED as iCBR hold no applicable information.

Scope of request:

I request access to all documents, records, correspondence, reports, briefings, studies, assessments, and internal communications relating specifically to Block 24 Section 65 from 1 July 2023 to the present.
This request includes, but is not limited to:

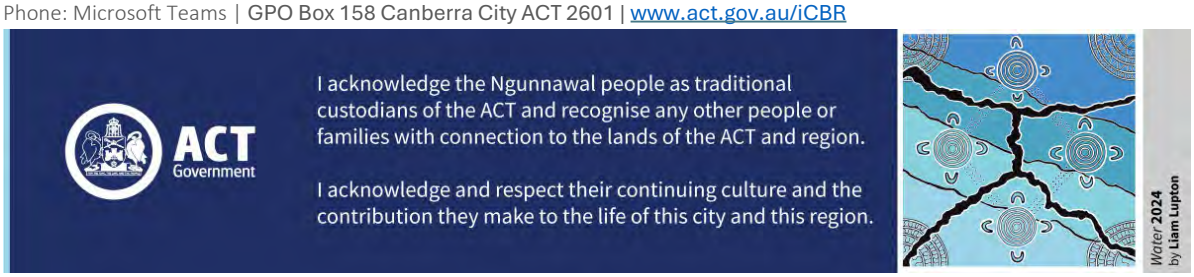
- *Any work undertaken by or for the ACT Government concerning future land use, development options, or strategic planning for Block 24 Section 65*
- *Briefings, advice, or correspondence involving the City Renewal Authority, Environment, Planning and Sustainable Development Directorate, or the Office of the Chief Minister that reference Block 24 Section 65*
- *Any material prepared in anticipation of, or contributing to, the proposed City South East Master Plan insofar as it relates to Block 24 Section 65*

If any documents are withheld or partially redacted, I request that reasons be provided in accordance with the Act.
I am happy to receive the documents electronically.

Thank you in advance,

Kirstie

Kirstie Ball
A/g Assistant Director Reporting and FOI | Corporate Services
Chief Operating Office | People Engagement Operations and Group
Infrastructure Canberra (iCBR) | ACT Government
Phone: Microsoft Teams | GPO Box 158 Canberra City ACT 2601 | www.act.gov.au/iCBR



***Making flexible work** - If you receive an email from me outside of normal business hours, please know that I am sending my email during my work hours.*
***Please don't feel pressure to read or reply until during your work hours**.*

From: Ball, Kirstie <Kirstie.Ball@act.gov.au> **On Behalf Of** iCBR FOI
Sent: Tuesday, 6 January 2026 2:18 PM
To: CED, FOI <CEDFOI@act.gov.au>
Cc: iCBR FOI <iCBR.FOI@act.gov.au>
Subject: FW: iCBRFOI2526/40 - full transfer request [FW: Freedom of Information request, CITY Block 24 Section 65 (from 1 July 2023)

OFFICIAL

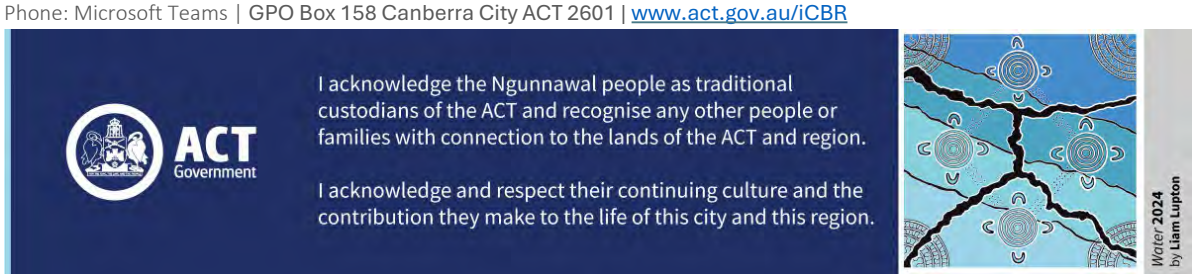
Hi team,

Just following up on the below full transfer request?

> *I request access to all documents, records, correspondence, reports, briefings, studies, assessments, and internal communications relating specifically to Block 24 Section 65 from 1 July 2023 to the present.*
> *This request includes, but is not limited to:*
>
> - *Any work undertaken by or for the ACT Government concerning future land use, development options, or strategic planning for Block 24 Section 65*
> - *Briefings, advice, or correspondence involving the City Renewal Authority, Environment, Planning and Sustainable Development Directorate, or the Office of the Chief Minister that reference Block 24 Section 65*
> - *Any material prepared in anticipation of, or contributing to, the proposed City South East Master Plan insofar as it relates to Block 24 Section 65*
>
> *If any documents are withheld or partially redacted, I request that reasons be provided in accordance with the Act.*
> *I am happy to receive the documents electronically.*

Thank you in advance,

Kirstie
Kirstie Ball
A/g Assistant Director Reporting and FOI | Corporate Services
Chief Operating Office | People Engagement Operations and Group
Infrastructure Canberra (iCBR) | ACT Government
Phone: Microsoft Teams | GPO Box 158 Canberra City ACT 2601 | www.act.gov.au/iCBR



Making flexible work *- If you receive an email from me outside of normal business hours, please know that I am sending my email during my work hours.*
Please don't feel pressure to read or reply until during your work hours.

From: Ball, Kirstie <Kirstie.Ball@act.gov.au> **On Behalf Of** iCBR FOI
Sent: Thursday, 18 December 2025 4:16 PM
To: CED, FOI <CEDFOI@act.gov.au>
Cc: iCBR FOI <iCBR.FOI@act.gov.au>
Subject: iCBRFOI2526/40 - full transfer request [FW: Freedom of Information request, CITY Block 24 Section 65 (from 1 July 2023)
Importance: High

OFFICIAL

Hi team,

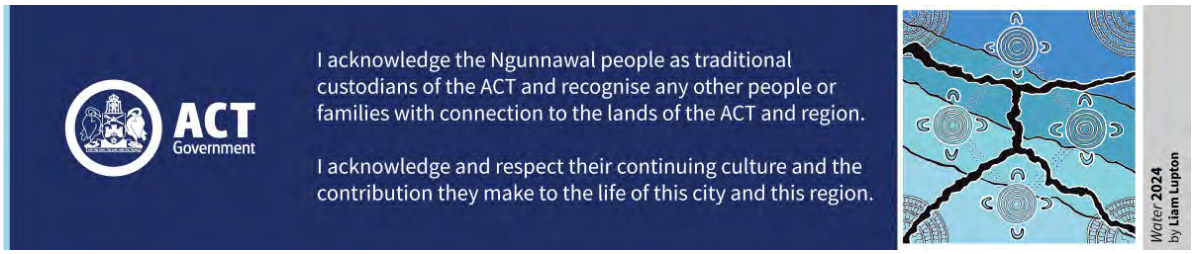
Could you please review the below request and advise if CED accept full transfer?

I have also found a previous release if useful Disclosure Log

Thanks in advance,

Kirstie

Kirstie Ball
A/g Assistant Director Reporting and FOI | Corporate Services
Chief Operating Office | People Engagement Operations and Group
Infrastructure Canberra (iCBR) | ACT Government
Phone: Microsoft Teams | GPO Box 158 Canberra City ACT 2601 | www.act.gov.au/iCBR



***Making flexible work** - If you receive an email from me outside of normal business hours, please know that I am sending my email during my work hours.*
Please don't feel pressure to read or reply until during your work hours.

From: [redacted]
Sent: Thursday, 18 December 2025 3:45 PM
To: iCBR FOI <iCBR.FOI@act.gov.au>
Subject: Freedom of Information request, CITY Block 24 Section 65 (from 1 July 2023)
Importance: High

Dear FOI Coordinator,

I am writing to make a formal request under the Freedom of Information Act 2016 (ACT).

I request access to all documents, records, correspondence, reports, briefings, studies, assessments, and internal communications relating specifically to Block 24 Section 65 from 1 July 2023 to the present.

This request includes, but is not limited to:

- Any work undertaken by or for the ACT Government concerning future land use, development options, or strategic planning for Block 24 Section 65
- Briefings, advice, or correspondence involving the City Renewal Authority, Environment, Planning and Sustainable Development Directorate, or the Office of the Chief Minister that reference Block 24 Section 65
- Any material prepared in anticipation of, or contributing to, the proposed City South East Master Plan insofar as it relates to Block 24 Section 65

If any documents are withheld or partially redacted, I request that reasons be provided in accordance with the Act.

I am happy to receive the documents electronically.

Thank you for your assistance. I look forward to your response within the statutory timeframe.

Yours sincerely,

Our ref: CRAFOI 2026-001
[CMTEDDFOI 2026-010]

City Renewal Authority|
ACT Government
ABN 40 746 096 162
T 02 6205 1878
CityRenewal@act.gov.au

Nara Centre
Ground Floor
3 Constitution Avenue
Canberra City

GPO Box 158
Canberra City
ACT 2601

CityRenewalCBR.com.au
@CityRenewalCBR

FREEDOM OF INFORMATION REQUEST – NOTICE OF DECISION

I refer to your application under section 30 of the *Freedom of Information Act 2016* (the Act), received by the City Renewal Authority (CRA) on 9 January 2026 when the Chief Minister, Treasury, and Economic Development Directorate (CMTEDD) accepted a partial transfer of your request from Infrastructure Canberra (iCBR).

Specifically, you have sought access to the following information:

> *I request access to all documents, records, correspondence, reports, briefings, studies, assessments, and internal communications relating specifically to Block 24 Section 65 [Canberra Central CITY Section 65 Block 24] from 1 July 2023 to the present [9 January 2026].*
>
> *This request includes, but is not limited to:*
>
> • *Any work undertaken by or for the ACT Government concerning future land use, development options, or strategic planning for Block 24 Section 65*
>
> • *Briefings, advice, or correspondence involving the City Renewal Authority, Environment, Planning and Sustainable Development Directorate, or the Office of the Chief Minister that reference Block 24 Section 65*
>
> • *Any material prepared in anticipation of, or contributing to, the proposed City South East Master Plan insofar as it relates to Block 24 Section 65*
>
> *If any documents are withheld or partially redacted, I request that reasons be provided in accordance with the Act.*
>
> *I am happy to receive the documents electronically.*

On 16 January 2026, you were advised that CMTEDD accepted a full transfer of this request.

On 28 January 2026, you responded to a clarification request seeking to narrow the scope of your request. The **revised scope** of your request is as follows:

> *I request access to all documents, records, correspondence, reports, briefings, studies, assessments, and internal communications relating specifically to Block 24 Section 65*

[Canberra Central CITY Section 65 Block 24] from 1 July 2023 to the present [9 January 2026].

This request includes, but is not limited to:

- *Any work undertaken by or for the ACT Government concerning future land use, development options, or strategic planning for Block 24 Section 65*
- *Briefings, advice, or correspondence involving the City Renewal Authority, Environment, Planning and Sustainable Development Directorate, or the Office of the Chief Minister that reference Block 24 Section 65*
- *Any material prepared in anticipation of, or contributing to, the proposed City South East Master Plan insofar as it relates to Block 24 Section 65*
- *If any documents are withheld or partially redacted, I request that reasons be provided in accordance with the Act.*

I am happy to receive the documents electronically.

To assist with narrowing the scope, I am happy to exclude any unsolicited proposals. The search can be limited to:

- *Correspondence between government employees, and*
- *Correspondence between a government employee and a contractor formally engaged to perform work in relation to this block of land.*

I am also content to receive only the latest version of any document (finalised or draft as at the date of the request), and to limit the scope to the substantive products of work, assessments, or planning activity convened by the City Renewal Authority (CRA) on behalf of the Territory. This would exclude supporting administrative and process documents such as internal governance, finance, procurement, meeting notes, and similar material.

For clarity, I also confirm that I am only seeking documents and correspondence created after 1 July 2023 and relating specifically to Block 24 Section 65.

Authority

I am an Information Officer appointed by the CRA under section 18 of the Act to deal with access applications made under Part 5 of the Act.

Timeframes

In accordance with section 40 of the Act, CRA is required to provide a decision on your access application within 30 days.

As this matter required third party consultation, the decision due date was extended by 15 working days, in accordance with section 40(2) of the Act.

Therefore, a decision is due by **17 March 2026.**

Decision on access

Searches of CRA have identified ten documents within the scope of your request.

I have decided to grant **full access** to one document.

I have decided to grant **partial access** to two documents.

I have decided to **refuse access** to seven documents.

Searches of CMTEDD records have identified that it does not hold information within scope of your request, and the records located in scope of this request are the documents held by the CRA.

The records identified as relevant to your application are listed in the schedule enclosed at **Attachment A**. This provides a description of each document that falls within the scope of your request and the access decision for each of those documents.

Release of documents

The information being released to you is provided at **Attachment B**.

Statement of Reasons

In accordance with section 54(2) of the Act a statement of reasons outlining my decisions is below. In reaching my access decisions, I have taken the following into account:

- the Act
- the information that falls within the scope of your request
- third party consultation
- information that is publicly available
- *Human Rights Act 2004*
- ACT Ombudsman Freedom of Information Guidelines, Volume 4.

As a decision maker, I am required to determine whether the information within scope is in the public interest to release. To make this decision, I am required to:

- assess whether the information would be contrary to public interest to disclose as per **Schedule 1** of the Act.
- perform the public interest test as set out in section 17 of the Act by balancing the factors favouring disclosure and factors favouring nondisclosure in **Schedule 2** of the Act.

Outside Scope

Information within your requested scope contains information that is 'outside scope', or out of scope, of your request where it does not relate to Block 24 Section 25, and this material has been redacted. Where there are full pages that are marked for redaction for this reason, these out of scope pages have been removed from documents 1, 2 and 3.

Where the only reason for redaction within a document is out of scope information, such as document 3, this is taken to be a full release. This is in line with the ACT Ombudsman Freedom of Information Guidelines.

Exemptions claimed

Schedule 1: Information taken to be contrary to the public interest.

My reasons for deciding not to grant access to the identified documents and components of these documents are as follows:

- *Section 1.2 - Information subject to legal professional privilege.*

Document 4 contains information that has been identified as being within the scope of your request that is fully composed of information that is considered to be contrary to the public interest information under section 1.2 of Schedule 1 of the Act as it is information that is deemed privileged under Legal Professional Privilege. The document is a legal advice document. This information can only be released if the parties involved agree to waive that privilege. The parties have not waived privilege, and I have refused access to this document.

- *Section 1.6 - Cabinet Information.*

Document 10 is entirely composed of information that is considered to be contrary to the public interest under section 1.6 of Schedule 1 of the Act as it is Cabinet information. Under section 1.6 of Schedule 1 of the Act, Cabinet information is exempt from release. The purpose of this exemption is to maintain the confidentiality of the cabinet process and to uphold the principle of collective ministerial responsibility. This exemption was discussed in *Commonwealth v Northern Land Council* [1993] HCA 24; (1993) 176 CLR 604 (21 April 1993). Paragraph 6 of the decision, states that:

- *… it has never been doubted that it is in the public interest that the deliberations of Cabinet should remain confidential in order that the members of Cabinet may exchange differing views and at the same time maintain the principle of collective responsibility for any decision which may be made.*

The document that you have requested falls within section 1.6 of the Act as it is information that has been commissioned by the Cabinet to guide it in its decision making and to assist it in its deliberations. It is therefore exempt from release under the Act.

I find that this document was prepared with the intention of being considered by Cabinet and is therefore exempt from release.

Public Interest Test

The Act has a presumption in favour of disclosure. As a decision maker I am required to decide where, on balance, public interest lies. As part of this process, I must consider factors favouring disclosure and nondisclosure and not consider certain factors under section 17(3) of the Act.

In *Hogan v Hinch* (2011) 243 CLR 506, [31] French CJ stated that when 'used in a statute, the term [public interest] derives its content from "the subject matter and the scope and purpose" of the enactment in which it appears'. Section 17(1) of the Act sets out the test, to be applied to determine whether disclosure of information would be contrary to the public interest. These factors are found in subsection 17(2) and Schedule 2 of the Act.

Schedule 2: Factors to be considered when deciding the public interest.

Taking into consideration the information contained in the documents found to be within the scope of your request, I have identified that the following public interest factors are relevant to determine if release of the information contained within these documents is within the 'public interest'.

Factors favouring disclosure (Section 2.1)

- *Section 2.1(a)(i) - promote open discussion of public affairs and enhance the government's accountability.*
- *Section 2.1(a)(ii) - contribute to positive and informed debate on important issues or matters of public interest.*
- *Section 2.1(a)(viii) – reveal the reason for a government decision and any background or contextual information that informed the decision.*

Disclosure of the requested information will promote open discussion of public affairs and enhance the government's accountability and contribute to positive and informed debate on important issues or matters of public interest.

I am satisfied that these factors favouring disclosure carry some weight. However, these factors are to be balanced against the factors favouring nondisclosure.

Factors favouring nondisclosure (Section 2.2)

- *Section 2.2(a)(ii) - prejudice the protection of an individual's right to privacy or any other right under the Human Rights Act 2004.*
- *Section 2.2(a)(xi) - prejudice trade secrets, business affairs or research of an agency or person.*
- *Section 2.2(a)(xvi) - prejudice a deliberative process of government.*

I have placed significant weight on the factors identified above.

Where information is personal information of a third party, I have redacted such information under schedule 2, section 2.2(a)(ii), such as names, email addresses where the information is not already publicly available. In making my decision I have taken into consideration third party consultation, including responses received.

I have also considered the impact of disclosing information that relates to business affairs. In the case of Re Mangan and The Treasury [2005] AATA 898 upheld the term 'business affairs' to be interpreted as meaning 'the totality of the money-making affairs of an organisation or undertaking as distinct from its private or internal affairs'. Schedule 2 section 2.2(a)(xi) allows for government information to be withheld from release if disclosure of the information could reasonably be expected to prejudice the trade secrets, business affairs or research of an agency or person.

In particular, the documents within scope include PowerPoint presentations, reports, including and scientific/geotechnical reports, that contained information about the operation of the Territory's business affairs including research, as it relates to Block 24 Section 65.

I have decided to release some information that I find to be factual in nature, such as information related to soil sample testing, and enquiries related to whether the site is contaminated. The documents in within scope of the request contain information that could be subject to interpretation as giving some insight into the Territory's possible intentions at the site. Releasing the documents could give rise to inferences or speculation about the

Territory's future intentions, thereby effecting price changes and or market valuations for the site that would not otherwise occur.

Businesses undertaking development activities in the ACT may expect that any sensitive business information they provide to the Government will be held in confidence. However, businesses that provide information to government do so with the knowledge that government held information may be subject to an access application made under Freedom of Information legislation. Those who do business with government must also recognise that governments have to balance the commercial interests of businesses with the principles of openness and transparency, and that the weight of the public interest in protecting business information will depend on a variety of factors, including how commercially sensitive the information is, its age, its current relevance and the extent to which it has entered the public domain.

Some of the information contained in the reports related to soil sample testing on the block were obtained under a contract with the Territory with a supplier, and that contract contains clauses related to confidentiality and non-disclosure of Territory information. Accordingly, I find that the information collected is considered confidential where final decisions have not yet been made, and I have redacted such information within the documents.

As stated in Public Transport Association of Canberra Inc and Transport Canberra and City Services [2025] ACTOFOI 4 (4 April 2025), at [75], 'A deliberative process involves the weighing up or evaluation of arguments or considerations related to a process that is being undertaken within government to consider whether and how to make or implement a decision' [citing Re JE Waterford and Department of Treasury (No 2) [1984] AATA 67 (14 March 1984) at [58]].

For the deliberative process factor to apply, the information must also be reasonably expected to prejudice such a process – i.e. some sort of harm to the deliberations could occur if the information was disclosed.

Documents within scope includes information that is not publicly known, and there have not been final decisions on information within the documents. As the deliberative process is ongoing, release could affect the ability of the government to consider and finalise the relevant plans.

Having applied the test outlined in section 17 of the Act and deciding that release of personal information contained in the documents is not in the public interest to release, I have chosen to redact this specific information in accordance with section 50(2). Noting the pro-disclosure intent of the Act, I am satisfied that redacting only the information that I believe is not in the public interest to release will ensure that the intent of the Act is met.

Additional information

Some information is published on the ACT Contracts register, which can be found here:

Contract - CLD36195

Charges

Processing charges are applicable for this request because the total number of pages to be released to you exceeds the charging threshold of 50 pages. However, the charges have been waived.

Online publishing – Disclosure Log

Under section 28 of the Act, the CRA maintains an online record of access applications called a disclosure log.

Your original access application and my decision will be published on the disclosure log. Your personal contact details will not be published.

Ombudsman Review

My decision on your access request is a reviewable decision as identified in Schedule 3 of the Act. You have the right to seek Ombudsman review of this outcome under section 73 of the Act within 20 working days from the day that my decision is provided to you, or a longer period allowed by the Ombudsman.

We recommend using this form *Applying for an Ombudsman Review* to ensure you provide all of the required information. Alternatively, you may write to the Ombudsman at:

The ACT Ombudsman
GPO Box 442
CANBERRA ACT 2601

Via email: actfoi@ombudsman.gov.au

ACT Civil and Administrative Tribunal (ACAT) Review

Under section 84 of the Act, if a decision is made under section 82(1) on an Ombudsman review, you may apply to the ACAT for review of the Ombudsman decision. Further information may be obtained from the ACAT at:

ACT Civil and Administrative Tribunal
GPO Box 370
Canberra City ACT 2601
Telephone: (02) 6207 1740
http://www.acat.act.gov.au/

Should you have any queries in relation to your request please contact the CMTEDD FOI Team by telephone on 6207 7754 or email CMTEDDFOI@act.gov.au.

Yours sincerely

Jan Horley

Information Officer
City Renewal Authority

16 March 2026

ACT Government | CITY RENEWAL AUTHORITY

FREEDOM OF INFORMATION REQUEST SCHEDULE

WHAT ARE THE PARAMETERS OF THE REQUEST	Reference No.
Revised scope: *.. all documents, records, correspondence, reports, briefings, studies, assessments, and internal communications relating specifically to Block 24 Section 65 from 1 July 2023 to the present [9 January 2026].* *This request includes, but is not limited to:* • *Any work undertaken by or for the ACT Government concerning future land use, development options, or strategic planning for Block 24 Section 65* • *Briefings, advice, or correspondence involving the City Renewal Authority, Environment, Planning and Sustainable Development Directorate, or the Office of the Chief Minister that reference Block 24 Section 65* • *Any material prepared in anticipation of, or contributing to, the proposed City South East Master Plan insofar as it relates to Block 24 Section 65* *exclude any unsolicited proposals. The search can be limited to:* • *Correspondence between government employees, and* • *Correspondence between a government employee and a contractor formally engaged to perform work in relation to this block of land.* *... only the latest version of any document (finalised or draft as at the date of the request), and to limit the scope to the substantive products of work, assessments, or planning activity convened by the City Renewal Authority (CRA) on behalf of the Territory. This would exclude supporting administrative and process documents such as internal governance, finance, procurement, meeting notes, and similar material.* *For clarity, I also confirm that I am only seeking documents and correspondence created after 1 July 2023 and relating specifically to Block 24 Section 65.*	**CRAFOI 2026-010** **[CMTEDDFOI 2026-010]**

Ref No	Page number	Description	Date	Status	Reason for Exemption	Online Release Status
Binder 1 – Due Diligence Documents						
1	1-272	*1.JC1593_Site 1 ESSR.01 Issue#2* - Environmental Site Suitability Report	14/03/2025	Partial	Outside scope Sch 2, s 2.2(a)(ii)	Yes
2	273-597	Geotech - 754-CBRGE334891_R02_final_#2	28/02/2025	Partial	Outside scope Sch 2, s 2.2(a)(ii) Sch 2, s 2.2(a)(xi) Sch 2, s 2.2(a)(xvi)	Yes
Binder 2 – Glebe Park Planning 2024-2025						
3	1-43	PowerPoint presentation - 250205_City East Review_v02	05/02/2025	Full	Outside scope	Yes

Binder 3 – Glebe Park Planning 2024-2025 - Non-release						
4	1-12	2024.06.17 Advice - Block 24 Section 65 City	17/06/2024	Refused	Sch 1, s 1.2	No
5	13-30	PowerPoint presentation - 20250210_Section 65 Revision City South East Project Review	05/02/2025	Refused	Sch 2, s 2.2(a)(xi) Sch 2, s 2.2(a)(xvi)	No
6	31-50	PowerPoint presentation - 20250321_Section 65_Planning_Options_v09	18/02/2025	Refused	Sch 2, s 2.2(a)(xi) Sch 2, s 2.2(a)(xvi)	No
7	51-56	PowerPoint Presentation - Section 65 Development Update_Final copy	14/04/2025	Refused	Sch 2, s 2.2(a)(xi) Sch 2, s 2.2(a)(xvi)	No
8	57-66	PowerPoint Presentation - _FINAL- S65 Master Planning	29/05/2025	Refused	Sch 2, s 2.2(a)(xi) Sch 2, s 2.2(a)(xvi)	No
9	67-114	CRA Planning Report S65 City 20250610 – Report by third party	May 2025	Refused	Outside scope Sch 2, s 2.2(a)(xi) Sch 2, s 2.2(a)(xvi)	No
Binder 4 – Portfolio Land Development Program and ILRP - Non-release						
10	1-118	City Renewal Authority - Portfolio Land Development Plan (Final)	16/04/2025	Refused	Sch 1, s 1.6 (Cabinet)	No
Total No of Docs						
10						

APPENDIX C: GOVERNMENT SEARCHES

Mitchell Cunningham

From: John OBrien
Sent: Tuesday, May 28, 2024 10:06 AM
To: Kurt Lockwood
Subject: FW: Contaminated Land Search - Application, 46HTTLDT, John O'Brien [SEC=UNCLASSIFIED, DLM=Sensitive: Personal]

John O'Brien
ACT Manager
Principal Environmental Consultant

Agon Environmental
Sch 2.2(a)(ii)
john.obrien@agonenviro.com.au

From: Jennings, RussellC <RussellC.Jennings@act.gov.au>
Sent: Monday, October 30, 2023 4:07 PM
To: John OBrien <john.obrien@agonenviro.com.au>
Cc: Contaminated Sites <ContaminatedSites@act.gov.au>
Subject: RE: Contaminated Land Search - Application, 46HTTLDT, John O'Brien [SEC=UNCLASSIFIED, DLM=Sensitive: Personal]

OFFICIAL

Dear Mr O'Brien

RE: CONTAMINATED LAND SEARCH

Thank you for your search form request of 16/10/2023 enquiring about:

outside scope

Block 24 Section 65 City Canberra Central

outside scope

Records held by the Environment Protection Authority (EPA) for the above block(s) indicate the following:

outside scope

CANBERRA CENTRAL CITY SECTION 65 BLOCK 24

The block is not recorded on the EPA's contaminated sites management database or geographic information system.

Aerial photographs indicate that part of the block is occupied by a car park. Whilst there is no recorded information on potential site contamination, car parks have been associated with potential site contamination due to the placement of uncontrolled fill during the establishment of the site.

The ACT EPA Contaminated Sites Environment Protection Policy 2017 lists landfilling as an activity associated with land contamination which may pose a risk to human health and the environment.

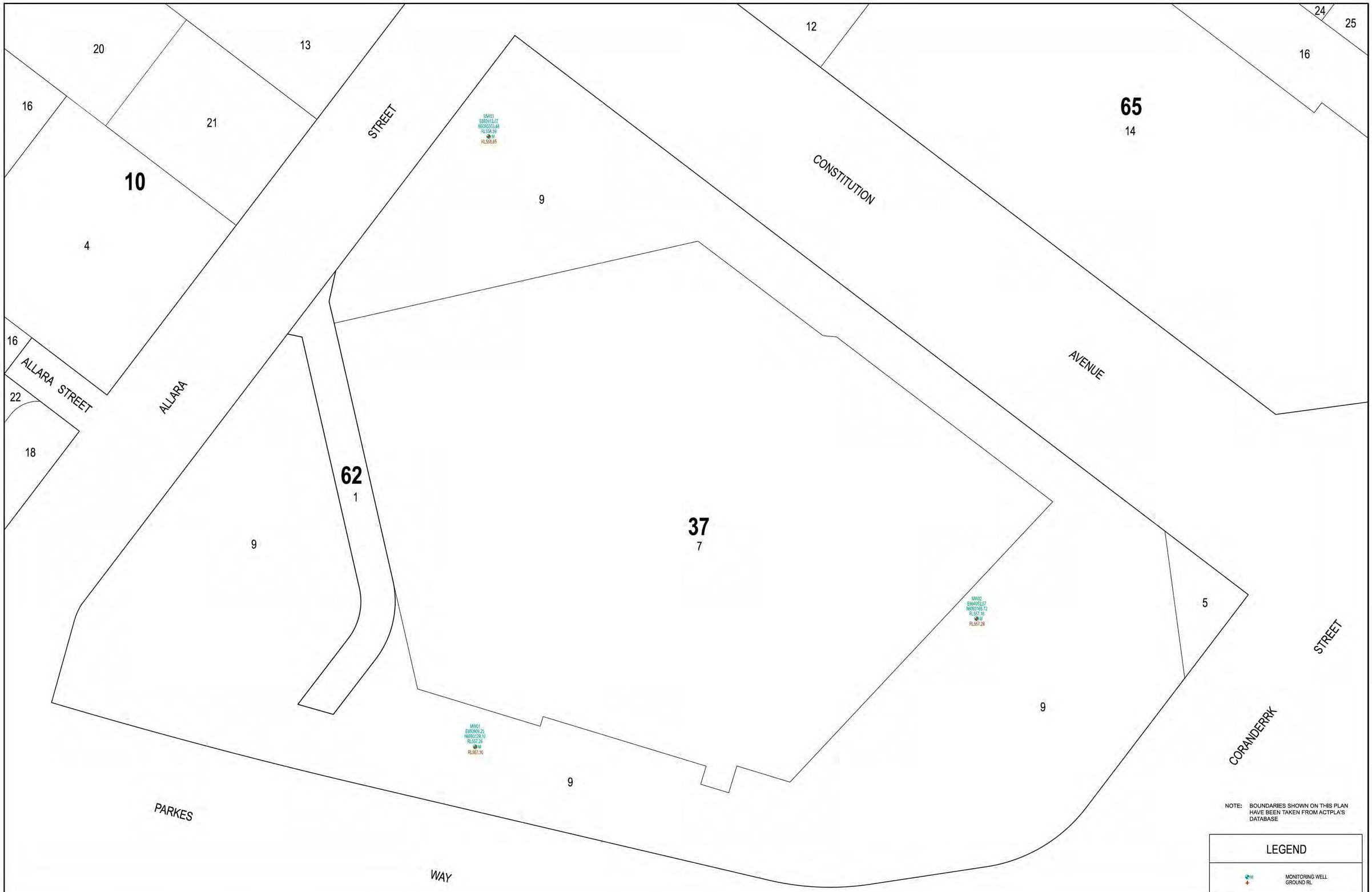
The EPA has not issued any orders of assessment or remediation under sections 91C (1) or 91D (1) respectively, environment protection orders under sections 125 (2) or (3), requested an audit under section 76 (2) or received an audit notification under section 76A (1) of the Environment Protection Act 1997 (the Act) over the site and as a result the site is not recorded on the Register of contaminated sites under section 21A of the Act.

The information detailed above only relates to records held by the EPA and may not represent the actual condition of the site.

At present the EPA has no information on contamination of the above block(s) other than as detailed above. However, this does not absolutely rule out the possibility of contamination and should not be interpreted as a warranty that there is no contamination.

I appreciate that this does not absolutely rule out the existence of contamination of the soils. If you or your clients wish to be completely sure you, or they, should arrange to conduct independent tests.

outside scope



NOTE: BOUNDARIES SHOWN ON THIS PLAN HAVE BEEN TAKEN FROM ACTPLA'S DATABASE

LEGEND

M MONITORING WELL
GROUND RL

Amendments		
No.	Description	Date
A	ORIGINAL SURVEY	23-10-2024

Surveyed by: ACT SURVEY PTY LTD
Date: OCTOBER 2024 Proj No. 2024102301
Drawn by: CUYEE DESIGN

ACT SURVEY PTY LTD
LAND & ENGINEERING SURVEYORS

GDA2020 NORTH

Designed by TJ
Drawn by CD
Checked by TJ
Approved by

PROJECT
DETAIL SURVEY
CIVIC POOL MONITORING WELLS
BLOCK 9 SECTION 37
CITY

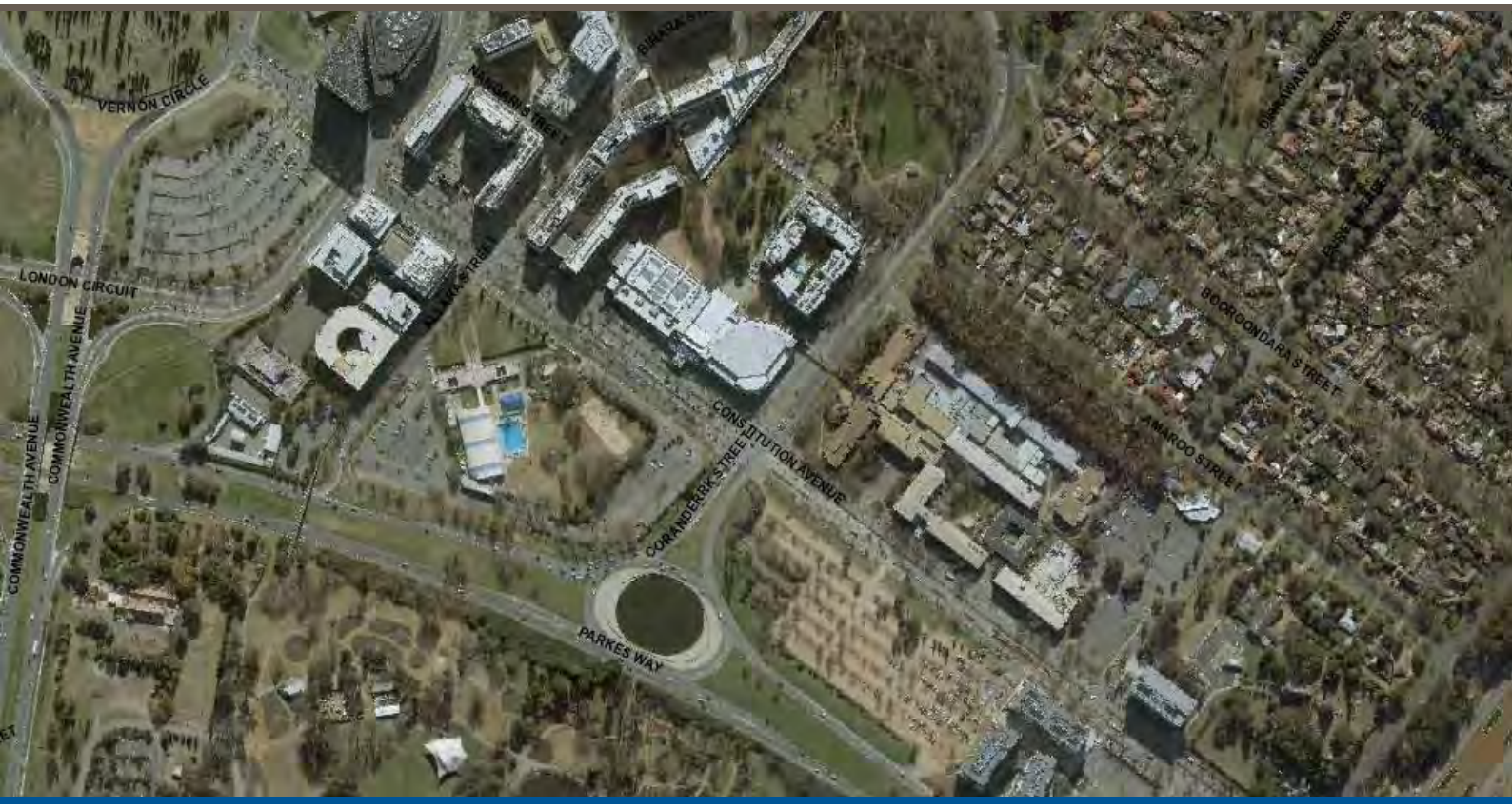
Drawing Title
DETAIL SURVEY
VER A

Scale 1:500
Drg No. 2024102301-A
Sheet No. 1 OF 1

Geotechnical Investigation Services for the City Renewal Authority

Stage 2 Geotechnical Investigation Report

City Renewal Authority



Reference: 754-CBRGE334891-R02

28 February 2025

GEOTECHNICAL INVESTIGATION SERVICES FOR THE CITY RENEWAL AUTHORITY

Stage 2 Geotechnical Investigation Report

Report reference number: 754-CBRGE334891-R02
28 February 2025

PREPARED FOR

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QUALITY INFORMATION

Revision history

Revision	Description	Date	Author	Reviewer	Approver
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V1	FINAL	28 Feb 2025			

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V0	1	PDF	City Renewal Authority – J. Pooley	20 Dec 2024
V1	1	PDF	City Renewal Authority – J. Pooley	28 Feb 2025

CONTENTS

outside scope

LIST OF TABLES

outside scope

outside scope

APPENDICES

ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
AHD	Australian Height Datum
ARR	Average Risk Rating
ASS	Acid Sulfate Soils
CBR	California Bearing Ratio
Coffey	Tetra Tech Coffey Pty Ltd
DCP	Dynamic Cone Penetrometer
Ha	Hectare
HGL	Hydrogeological Landscape
m BGL	Metres Below Ground Level
XWM	Extremely Weathered Material
XW	Extremely Weathered
HW	Highly weathered
MW	Moderately weathered
SW	Slightly weathered
Fr	Fresh
PASS	Potential Acid Sulfate Soils
ppm	Parts per million
PSD	Particle Size Distribution
SMDD	Standard Maximum Dry Density
SOMC	Standard Optimum Moisture Content
SPT	Standard Penetration Tests
CRA	City Renewal Authority

1. INTRODUCTION

City Renewal Authority (CRA) engaged Tetra Tech Coffey Pty Ltd (Tetra Tech) to undertake Geotechnical Investigation Services for the six (6) nominated sites across the City South East precinct. The site location plan and site layout plan are presented in Figure 1 and Figure 2, Appendix B. The work was commissioned by the CRA and was carried out in general accordance with our fee proposal (Ref: 754-CBRGE334891-P01, dated 10 October 2023).

This Stage 2 Geotechnical Investigation Report was based on the observation, field testing, and laboratory analytical results of soil / rock core samples collected from intrusive investigation of five[1] (5) nominated sites as follows:

outside scope

- Site 3 – Glebe Park

outside scope

The purpose of this Stage 2 Geotechnical Investigation was to provide a broad understanding of ground conditions across the nominated sites Sch 2 s 2.2(a)(xi), Sch 2 s 2.2(a)(xvi) .

1.1 PROJECT BACKGROUND

The CRA requires geotechnical investigation services at six (6) nominated sites across the City South East precinct. The Geotechnical Investigation would require review of existing documentation and geotechnical assessment of the sites Sch 2 s 2.2(a)(xi), Sch 2 s 2.2(a)(xvi)

The Canberra City South East Precinct covers a number of leased blocks and Sections and publicly held unleased land or roadways. Site details for each nominated site are presented in the following Sections. A site layout plan for the nominated sites (total 6) is presented in Figure 2, Appendix B.

1.2 OBJECTIVES

Sch 2 s 2.2(a)(xi), Sch 2 s 2.2(a)(xvi)

outside scope

Sch 2 s 2.2(a)(xi), Sch 2 s 2.2(a)(xvi)

1.3 SCOPE OF WORKS

To meet the above objectives, Tetra Tech completed the following scope of work:

- Ground investigation at the nominated site as follows:

outside scope

    - Site 3 – Glebe Park including:
        -

outside scope

        - Standard Penetration Tests (SPT) at the selected borehole locations.
        - Sampling and laboratory testing.
- Preparation of this Geotechnical Investigation Report, with data from the field investigation, laboratory test results, and geotechnical recommendations present individually for each nominated site in the following subsections.

3. SITE 3 – GLEBE PARK

3.1 INVESTIGATION METHODOLOGY

3.1.1 Site Walkover and Service Location

Prior to the commencement of drilling works, a Tetra Tech representatives attended the site on 29 August 2024, with a representative from Agon Environmental Pty Ltd (Agon) to undertake a site walkover to:

- Observe features of environmental and geotechnical significance across the site
- Confirm borehole locations and site access.
- Check the selected borehole locations for site safety concerns.
- A professional service location sub-contractor (Commence Communication Pty Ltd) was engaged for the duration of site walkover to undertake underground service clearance for the selected borehole locations. Selected site photographs from the walkover and drilling works are shown in Appendix E2.

3.1.2 Intrusive Investigation

A drilling subcontractor (GE Drilling Pty Ltd) was engaged to attend the site on 30 August 2024, to drill a total of 4 boreholes across Site 3 – Glebe Park. The boreholes were advanced using a Hanjin D&B 8D track-mounted drilling rig.

A Tetra Tech engineer was onsite for the duration of the drilling works to observe borehole excavation, log the boreholes, monitor field testing and collect samples for geotechnical laboratory testing.

Boreholes were drilled at the following proposed locations within Site 3, also shown in Appendix B2, Figure 1:

- 4 auger boreholes, to a depth of 25m bgl, or prior TC-bit refusal, whichever occurred first.

Subsurface conditions were logged in accordance with Australian Standard *AS1726:2017 Geotechnical Site investigations*, as shown on borehole logs included in Appendix C2. A summary of the encountered subsurface conditions is presented in Section 3.3.1.

SPT testing was undertaken at the selected borehole locations, with SPT results presented in the borehole logs in Appendix C2. Disturbed soil samples and rock core samples were collected for geotechnical testing, with geotechnical laboratory results presented in Appendix D2.

On completion of drilling, all boreholes were backfilled with remaining soil cuttings and the surface reinstated to match surrounds.

3.1.3 Laboratory Testing

Selected soil and rock samples were submitted to Coffey Testing and Eurofins NATA-accredited laboratories for a range of geotechnical tests, including the following tests summarised in Table 3-1. Laboratory reports are included in Appendix D2.

Table 3-1 - Summary of geotechnical laboratory testing undertaken

Test	Quantity
Atterberg Limits	2
Particle Size Distribution	2
Shrink-Swell Index	1

Test	Quantity
Soil Aggressivity (pH, Conductivity, Sulfate, Chloride)	3
Natural Moisture Content	3
California Bearing Ratio (4-day / std. compaction)	1

3.2 SITE INFORMATION

3.2.1 Site Identification

Site identification details are summarised in Table 3-2, below.

Table 3-2 - Site identification summary

Suburb	City
Block	24
Section	65
Total Area m^2	12,334
Land Custodian	City Renewal Authority
Existing Use	Open Space – Glebe Park
Land Use Zone	CZ6 – Leisure and Accommodation
Territory Plan – Overlay Zone	S Special requirements under NCP
Proposed re-Development	Sch 2.2(a)(xvi), Sch 2.2(a)(xi)

3.2.2 Site Description and Observations

The site is currently use as part of the Glebe Park which generally open space landscape area. The small middle portion of the site is sealed carpark. The site topography is flat, with an average elevation of about 558m AHD.

3.2.3 Regional Geology and Soil

The Canberra (8727) 1:100,000 Geological Sheet indicates the site is underlain by the Canberra Group, which comprising mudstone, siltstone, minor sandstone, limestone, hornfels, dacitic ignimbrite volcaniclastics, minor agglomerate and lithic tuff.

The Central *Canberra 1:10 000 engineering geology series* shows that the site is likely underlain by siltstone, mudstone, very deeply weathered in the City East Fault Zone.

The Michelago (Jenkins 1993) 1:100,000 Soil Landscape sheet indicates that Site 3 is underlain by Williamsdale Soil Landscape which comprising moderately deep, moderately well-drained yellow chromosols (yellow podzolic soils) on red and brown Kandosols (red and yellow earths) on upper rises and fan elements. Moderately to very deep, poorly to imperfectly drained Sodosols (solodic soils and solodized solonetz soils) on lower rises and fan elements.

3.2.4 Regional Hydrogeology

Regional map showed the nearest surface water body to be the Molonglo River located approximately 500m south from Site 3; and as a result, the inferred groundwater flow direction was estimated to be to the south, towards the Molonglo River.

A groundwater bore search from the ACT active map (ACT Mapi) did not indicate any registered groundwater bores within 1km radius of the project sites. However, review of previous investigations (Coffey 2006) indicated that shallow groundwater was encountered at various locations during intrusive investigation fieldworks with approximate depths between 2m and 6m bgl.

3.2.5 Acid Sulfate Soils

Acid Sulfate Soil risk maps available on NSW Government's ESPADE viewer indicates that the site has not been assessed for the probability of acid sulfate soils (ASS) or potential acid sulfate soils (PASS). No record for ASS or PASS could be found for the areas surrounding the site. According to the LotSearch report for the site and referenced from the Altas of Australian Acid Sulfate Soil compiled by CSIRO indicated that there is a low probability of ASS or PASS occurring at the site.

3.3 RESULTS OF INVESTIGATION

3.3.1 Subsurface Conditions

Table 3-3 below provides a summary of the inferred geotechnical units observed across the site. The depth to the base of each unit is summarised in Table 3-4. Further details are provided in the Engineering Borehole Logs and accompanying explanation sheets, included as Appendix C2.

In summary, subsurface conditions typically comprised shallow topsoil at boreholes across the site, underlain by alluvial / residual soil (typically silty clay, sandy clay, clay and sand with some gravel), underlain by weathered bedrock (siltstone, pyroclastic rock, and trace quartz) to the limited of the investigation depths. Some fill / reworked material was encountered at one borehole location (BH25) to the depth of 2.2m bgl, comprising gravelly silty clay, sandy silty clay, and gravel.

Table 3-3 – Inferred geotechnical model

Unit	Material	Description
1a	Topsoil	Sandy SILT, dark brown, fine to medium grained sand, trace fine grained sub-rounded gravel.
1b	Fill	Gravelly Silty CLAY, Sandy CLAY, CLAY, SAND, Sandy Silty CLAY, GRAVEL, brown, fine to coarse grained sand, low to medium plasticity, fine to medium grained sub-angular / sub-rounded gravel.
2	Alluvial soil	Sandy CLAY, SAND, brown to dark brown, low plasticity, fine to medium grained sand.
3	Residual soil and Extremely weathered material	Gravelly SILT, Gravelly Sandy SILT, brown, fine grained sub-angular / sub-rounded gravel.
4a	Extremely to highly weathered bedrock	SILTSTONE, Pyroclastic rock, brown to grey brown, pale brown, trace quartz, very low to low strength.
4b	Highly to moderately weathered bedrock	SILTSTONE, brown to pale brown, medium to high strength.

Table 3-4 - Summary of depths to inferred geotechnical units

Borehole	Depth to base of unit (m bgl)					
	1a – Topsoil	1b – Fill	2 – Alluvium	3 –Residual soil and extremely weathered material	4a – Extremely weathered to highly weathered bedrock	4b – highly weathered to moderately weathered bedrock
BH23	0.2	NE	2.2	NE	>4.03	NE
BH24	0.2	NE	2.3	4.8	NE	>5.55
BH25	0.1	2.2	3.3	NE	>5.5	NE
BH26	0.2	NE	1.9	2.6	8.2	>8.59

Note: 1) NE: Not encountered

3.3.2 Groundwater

Groundwater inflow was observed at BH24 and BH25 at 4.8m bgl and 2.7m bgl, respectively during auger drilling on 30 August 2024. It should be noted that groundwater may fluctuate in response to variations in rainfall, temperature and other climatic factors.

3.3.3 In-situ Testing Results

Standard Penetration Test (SPT) were undertaken in soils at approximately 1.5m interval to assess soil strength. Refusal SPT was terminated as at >15 blows/100mm penetration in weathered bedrock.

Within alluvial and residual soil, SPT ranged between approximately 5 and 25 blows/300mm penetration with a median value of 17.

3.3.4 Laboratory Results

Laboratory testing results are summarised in the following sub-sections. The testing certificates are included in Appendix D2.

3.3.4.1 Atterberg Limits

Laboratory results for Atterberg Limits testing are summarised in Table 3-5, below.

Table 3-5 - Summary of Atterberg Limits test results

Location	Sample Depth (m)	Material Description	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Linear Shrinkage (%)
BH24	0.7 – 1.0	Alluvial soil – Sandy CLAY to Clay	41	17	24	11
BH26	0.6 – 1.0	Alluvial soil – Silty CLAY	31	19	12	5.5

Laboratory results for Atterberg Limits testing results for Sandy Clay and Silty CLAY samples indicated low to intermediate plasticity soil.

3.3.4.2 Particle Size Distribution

Particle Size Distribution (PSD) testing was undertaken on material sampled from BH1 and BH9 with results summarised below in Table 3-6 and Table 3-7, below and present in Appendix D2.

Table 3-6 - Summary of particle size distribution test results

Location	Sample Depth (m bgl)	Material Description	Sieve (mm)	Passing (%)
BH24	1.1 – 1.6	Unit 1b Alluvial soil – Sandy Gravelly CLAY	13.2	100
			9.5	98
			6.7	97
			4.75	94
			2.36	87
			1.18	78
			0.6	70
			0.425	66
			0.3	61
			0.15	54
			0.075	48
BH25	2.8 – 3.0	Unit 2 Alluvial soil – SAND	19.0	100
			13.2	97
			9.5	94
			6.7	91
			4.75	89
			2.36	84
			1.18	77
			0.6	63
			0.425	53
			0.3	41
			0.15	30
			0.075	25

Table 3-7 - Summary of particle size distribution testing results

Borehole	Material	Fine (%)	Sand (%)	Gravel (%)
BH24	Alluvial soil	48	39	13
BH25	Alluvial soil	25	59	16

3.3.4.3 Shrink-Swell Index

Shrink-swell testing was undertaken on 1 sample collected from Unit 2, with laboratory results summarised in Table 3-8, with laboratory report present in Appendix D2.

Table 3-8 – Summary of shrink-swell test results

Borehole	Sample Depth (m)	Material Description	Moisture (%)	Shrink on drying (E_{SH}%)	Swell on saturation (E_{SW}%)	Shrink-swell index (%)
BH23	0.6 – 1.0	Unit 1b Alluvial soil - Sandy CLAY	17.0	1.5	0.0	0.9

3.3.4.4 Aggressivity and Moisture Content

Three samples were tested for pH, sulfate, chloride and electrical conductivity (soil aggressivity tests) and moisture content by Eurofins laboratory. Aggressivity test results are summarised in Table 3-9, below.

Table 3-9 - Summary of soil aggressivity test results

Borehole	Sample Depth (m)	Moisture Content (%)	pH (pH Units)	Conductivity (µS/cm)	Resistivity* (Ohm.cm)	Chloride (ppm)	Sulfate (ppm)
BH23	0.2 – 0.5	14	7.8	23	430,000	<10	14
BH24	1.0 – 1.45	12	8.4	71	140,000	<10	44
BH25	2.5 – 2.95	19	8.3	69	150,000	20	19

The results of Soil Aggressivity testing were assessed using Australian Standard *AS2159-2009 Piling – Design and Installation*. For the soils tested, chemical test results are consistent with an exposure classification of "Mild" for buried concrete and "non-aggressive" for buried steel structures.

3.3.4.5 California Bearing Ratio

California Bearing Ratio (CBR) testing was undertaken on a remoulded sample collected from borehole BH24, comprising Unit 2 (Alluvial soil - Silty CLAY). The sample was compacted to a target 95% Modified Maximum Dry Density and 100% Modified Optimum Moisture Content, soaked for four days with a surcharge load of 4.5kg.

A summary of CBR test results is presented in Table 3-10, below.

Table 3-10 - Summary of California Bearing Ratio (CBR) test results

Borehole	Sample Depth (m)	Moisture Content (%)	MOMC (%)	MMDD (T/m^3)	CBR at 2.5mm (%)	Swell (%)
BH24	1.1 – 1.6	11.7	12.0	1.90	6	2.5

Note to Table 2-10: **MOMC**: Modified Optimum Moisture Content, **MMDD**: Modified Maximum Dry Density

3.4 DISCUSSION AND RECOMMENDATIONS

3.4.1 General

Sch 2 s 2.2(a)(xi), Sch 2 s 2.2(a)(xvi)

Sch 2 s 2.2(a)(xi), Sch 2 s 2.2(a)(xvi)

3.4.2 Earthworks

Sch 2 s 2.2(a)(xi), Sch 2 s 2.2(a)(xvi)

3.4.2.1 Excavatability

Based on the ground conditions interpreted from the boreholes, it is expected that excavations in fill, natural soil, and extremely weathered rock (Unit 1 to unit 4a) can generally be excavated using large excavator.

For the Unit 4b – highly to moderately weathered bedrock with higher strength, tyne rippers on heavy dozers, and rock breaker/rock hammer will generally be required for the excavation of rock units.

In cut areas, rock is likely to be exposed over significant areas with areas of soil in sporadic and/or transition zones. The presence of rock will impede typical subgrade preparation as set out below. Detailed rippability analysis is beyond the scope of this report.

3.4.3 Subgrade Preparation

Following excavation to design levels, subgrade preparation should be undertaken for proposed development areas (including for pavements and dam wall construction areas). Subgrade preparation should include:

- All areas of proposed pavement construction should be stripped to remove all existing structures, vegetation, topsoil, existing fill, or other potentially deleterious material. Additional stripping may be required in any areas if poor subgrade conditions are encountered.
- Prior to the placement of engineered fill, the exposed subgrade should be proof rolled (a minimum 10 tonne static roller) to identify any area that may cause excessive ground deformation. The identified areas should be excavated and backfilled per Section 3.4.4 with approved materials.
- The prepared subgrade should be protected to maintain moisture content as far as practicable.
- Site preparation should include provision of drainage, erosion control and sedimentation control measures as required.

Trafficability in silty and clayey materials for wheeled vehicles can be difficult during and following rainfall.

3.4.4 Engineered Fill Compaction

Engineered fill compaction for hardstand construction, pavement or support of structure foundations should comply with the following requirements:

- Fill material should be placed in layers of thickness appropriate for the compaction equipment being used and moisture conditioned to 90 to 100% of SOMC (Standard Optimum Moisture Content) at the time of compaction
- Engineered fill should be compacted to achieve a minimum dry density ratio of 98% SMDD (Standard Maximum Dry Density, for cohesive soils), or a minimum density index of 75% (cohesionless soils) and moisture conditioned.
- Fill should be placed in layers appropriate for the plant being used on site and in general accordance with *AS3798-2007 Guidelines on Earthworks for Commercial and Residential Developments*.
- Geotechnical inspection and testing of earthworks should be conducted under Level 1 geotechnical inspections and testing as defined in AS3798-2007.

3.4.5 Reuse of Site-Won Material

Excavated soils from Unit 3 and 4a are expected to be suitable for reuse in landscaping and as general backfill, providing the material is at near optimum moisture content and well compacted. The same material could potentially be used as engineered fill, subject to the recommendations in Section 3.4.4above.

The excavated materials from Rock Unit 4b are expected to be suitable for reuse provided material can be broken down to particle size less than 200mm and blended with the excavated soil unit materials.

Unit 1a, 1b, and 2 are not considered to be suitable for reuse as general backfill, however Unit 1a (topsoil), the soil component in Unit 1b and Unit 2 may be used in general landscaping works across the site (if suitable from a contamination perspective).

3.4.6 Site Trafficability and Drainage

The site soils are expected to be problematic if exposed to heavy construction traffic, particularly when wet. Trafficking of the unprotected subgrade should be minimised (where possible) to avoid permanent deformation of the subgrade. A platform of granular material such as rock base or crushed concrete may be needed to support construction plant. Where heavy plant such as piling rigs, or mobile cranes are to traffic the site, specific analysis of working platform requirements will be required to assess working platform thickness.

Provision should be made for effective diversion and removal of surface water from the prepared subgrade. Access tracks, driveway areas and earthworks platforms should be designed with sufficient crossfall to prevent water from entering the subgrade. Subsoil drainage should be installed at subgrade level along both sides of constructed pavement and building structures to intercept subsurface flows.

3.4.7 Footing Systems

Details on the proposed structures and footing systems are unknow at this stage. However, the proposed developments may incorporate both shallow and/or piled footings in the project design. Based on the ground conditions encountered to date, both options are considered to be feasible, subject to design requirements (e.g. foundation loading), the location of the structure and the general nature of the structure.

General recommendations on footing systems are provided below. in any case, footing design should be undertaken by a suitably experienced structural designer, with input from a geotechnical engineer to confirm the suitability of the ground conditions for the proposed design.

3.4.7.1 Shallow Footings

Shallow footings are considered to be a feasible option for structures such as signage, amenities blocks, electrical control boxes or park benches, particularly where lateral strength is not critical to the structural design.

In general, shallow footings should be designed to penetrate into Unit 2, or Unit 3, or where greater bearing capacities are required, into Unit 4a. Units 1a and Unit 1b are not considered to be suitable founding materials for shallow footings, as these units are highly variable and may lead to excessive or differential settlements.

Shallow footing systems founded in stiff or better residual clay (Unit 3) may be proportioned for an allowable bearing pressure of 150 kPa. Shallow footing systems founded at least 0.3m into Unit 4a could be proportioned for a greater allowable bearing capacity of 400 kPa. The recommended bearing pressures are contingent upon inspection by a geotechnical engineer to confirm that a suitable founding stratum has been reached and foundation conditions are suitable for the design parameters. All footings for a single structure should be founded in strata with similar bearing and reactivity characteristics to reduce the potential for differential movements across material transitions.

AS 2870-*2011 - Residential Slabs and Footings* establishes performance requirements and 'deemed to comply' slab and footing designs for single dwelling houses based on typical site classifications. Although, the standard has primarily been developed for single dwelling houses, it may also be used for other forms of construction such as some light industrial, commercial and institutional buildings if they are similar to houses in size, loading and superstructure flexibility.

Preliminary calculations for a shrink-swell index of 0.9%, and a depth of soil moisture variation of 2.3m indicate potential characteristic ground surface movements within the range of a Class S site classification based on the current site condition. Area with greater than 0.4m of uncontrolled fill shall be considered as Class P sites and designed using engineering principles.

The above site classification is applicable for the site conditions present at the time of fieldwork and has not considered the effects of tree induced moisture changes. Consequently, the site classification and estimated characteristic surface movements will need to be reviewed in consideration of development in proximity to trees or any site works that may be undertaken subsequent to this report. The site classification should also be reviewed following the completion of earthworks during site development. Site works may include:

- Changes to the existing soil profile by cutting and filling.
- Landscaping, including trees removed from the general building area and those planted.
- Drainage and watering systems.

3.4.7.2 Piled Footings

Piled footings may be appropriate for structures such as pedestrian lighting, or other highly loaded structures. Piled footings (if used) for should be embedded into Unit 4a, or deeper into Units 4b, with the target strata dependent on the pile design requirements.

Preliminary geotechnical design parameters for cast in-situ bored piles are provided in Table 3-11 below. The depth to and quality of Units 4a and 4b varied in the boreholes at the site. As such, it is recommended that pile excavations are observed by a geotechnical practitioner to confirm the embedment depths of the piles to achieve design requirements. Furthermore, it is recommended that a minimum additional two (2) boreholes are drilled for highly load structures (where Unit 4a / 4b parameters are adopted). Higher bearing and shaft adhesion parameters may be possible, but the drilling of additional cored boreholes would be required to allow detailed strength testing to be completed.

Table 3-11 - Preliminary geotechnical pile design parameters for non-displacement piles

Unit	Ultimate End Bearing Pressure (MPa)	Elastic Modulus (vertical), E (MPa)	Ultimate Shaft Adhesion (kPa)
3 – Residual soil (very stiff / very dense soil) / extremely weathered material	2	70	90 (compression) 45 (tension)
4a – Extremely to highly weathered bedrock	5	175	200 (compression) 100 (tension)
4b – highly to moderately weathered bedrock	10	300	450 (compression) 225 (tension)

Notes to Table 3-11:

8. Ultimate values occur at large settlements (>5% of minimum pile diameter)
9. Serviceability pressure to cause settlement of <1% of minimum pile diameter
10. Consideration of shaft adhesion in Units 1 (1a and 1b), and 2 are not recommended in pile design since these units may experience shrink/swell movements, and on the assumption that piles would be founded in the weathered bedrock of the site.
11. A bored pile socket in Unit 3 and Unit 4 (4a and 4b) of minimum 1.5m, shall be adopted to make use of the end bearing parameters provided in Table 3-11.
12. The parameters in Table 3-11 assume that the pile base is clear of debris. If seepage occurs into the pile excavation, dewatering should be conducted prior to pouring concrete, or concrete should be placed using a tremie. For bored piles, the subsurface profile encountered during pile excavation should be observed by a geotechnical engineer to confirm the design assumptions.
13. Piles should be designed in accordance with AS2159 – 2009 and good engineering practice.
14. The piles will penetrate reactive soils and so may be affected by soil heave and shrinkage movements in service. Consideration should be given to potential loads and deflections induced in the piles.

For uplift loads the tabulated shaft adhesion values should be multiplied by 0.5 in addition to the application of appropriate geotechnical strength reduction factors. Uplift capacity of tension piles should also be checked for the inverted cone pull out mechanism.

For pile design the geotechnical strength reduction factor should be calculated in accordance with AS2159-2011. The φg value will depend on an Average Risk Rating (ARR) which considers various geotechnical uncertainties, foundation system redundancy, construction supervision, quantity, and type of pile testing.

Limit state design also requires assessment of the serviceability performance of the foundation system, including pile group interaction effects. The modulus values given in Table 3-11 can be used for preliminary assessment, though the accuracy of settlement prediction is dependent on construction methods as well as material stiffness, both of which can involve considerable uncertainty. Settlement predictions can have a large margin for error, and in some cases serviceability pile load testing should be completed when foundation settlement is critical to the structure's performance.

3.4.7.3 Soil Aggressivity (AS2159)

The results of Soil Aggressivity testing were assessed using Australia Standard *AS2159-2009 Piling – Design and Installation*. Chemical test results indicate an exposure classification of 'Mild' for buried concrete and "Non-Aggressive" for buried steel structures.

3.4.8 Pavement Construction

3.4.8.1 CBR Design Values

Laboratory CBR testing undertaken on Unit 1b (Fill – Silty CLAY) indicated 4-day soaked CBR value at 6% (assuming compaction to 95% MMDD). In-situ CBR values for uncompacted soil are expected to be lower. Furthermore, CBR values are expected to vary across the site, and across the inferred geotechnical units described in this report. As such, once the location / extent and design levels of pavement have been confirmed, further CBR testing could be undertaken to assist project design.

Alternatively, Austroads *Guide to Pavement Technology Part 2: Pavement Structural Design 2017 (AGPT02-17)* provides presumptive design CBR values for various subgrade types based on favourable (good construction and drainage) and unfavourable (poor construction and / or flood plain) conditions. For a standard silty soil, under favourable conditions a maximum design CBR of 4% is typically allowed, with a maximum of 2% if unfavourable conditions are present.

3.4.9 Unsupported Shallow Excavations

The following batter designs are recommended for unsupported exposed cuts and fills that are above the water table and are less than 3m in height. Temporary batters should not be in place for longer than two months. Table 3-12 below indicates the suggested long term and temporary batter design for each geotechnical unit.

It is important to note that the site is underlain by predominantly alluvial and residual soil underlain by shallow bedrock, which can be either dispersive over time when exposed to air and surface water. Therefore, all excavated batters within the site must be protected from erosion/disintegration using temporary and/or permanent measures as soon as practically possible following excavation.

Table 3-12 - Material units and batter designs

Geotechnical Unit	Maximum short-term batter slope (up to 2-month)	Maximum long-term batter slope
Engineered Fill per Section 3.4.4 (if encountered)	1.5H:1V	2H:1V
Units 2 –Alluvial soil firm to stiff / medium dense soils	2H:1V	2.5H:1V
Units 3 – Residual very stiff soil / extremely weathered materials	1.5H:1V	2H:1V
Unit 4a – Extremely to highly weathered rock	1H:1V	2H:1V

3.4.10 Retaining Walls

Where insufficient space is available for unsupported permanent slopes or open excavation, excavation support may be required. Table 3-13 presents recommended design parameters for the design of retaining walls where there is a level retained ground surface.

Retention structures should be design according to AS4678 (Australian Standard 4678, 2002). Drainage behind any retaining structures must be provided to the guidance of AS4678.

Table 3-13 - Recommended design parameters for soil retention system design

Unit	Bulk Density γ (kN/m3)	Long Term / Effective Stress Parameters		Earth Pressure Coefficients		
		Effective Friction Angle Φ' (degrees)	Effective Cohesion c' (kPa)	Active, Ka	At rest K_0	Passive Kp
Unit 2	20	25	0	0.4	0.5	2.5
Unit 3	21	25	10	0.4	0.5	2.5
Unit 4a	22	28	10	0.4	0.5	2.7

Note: The values for earth pressure coefficients assume flat backfill behind the retention structure. The uplift buoyant force needs to be considered in the retaining wall design if the ground water encountered.

3.4.11 Acid Sulfate Soils

Acid sulfate soil risk maps indicated a low risk of the occurrence of Acid Sulfate Soils or Potential Acid Sulfate Soils (ASS / PASS) at the site. Additionally, no visual or olfactory indicators of ASS / PASS were observed during fieldworks (such as blue-grey staining, waterlogged soils or sulfide odours).

The likelihood of ASS / PASS being present at the site, and posing an issue to the proposed development, is therefore considered to be low.

3.4.12 Earthquake Design Parameters (AS1170.4 – 2007)

Based on the investigation carried out to date, the subsoil can be classified as Class Be – rock site, in accordance with AS 1170.4 – 2007 Structural Design Actions, Part 4 – Earthquake Actions in Australia. A Hazard Factor (Z) of 0.08 is also recommended for the site.

IMPORTANT INFORMATION ABOUT YOUR TETRA TECH COFFEY REPORT

As a client of Tetra Tech Coffey you should know that site subsurface conditions cause more construction problems than any other factor. These notes have been prepared by Tetra Tech Coffey to help you interpret and understand the limitations of your report.

Your report is based on project specific criteria

Your report has been developed on the basis of your unique project specific requirements as understood by Tetra Tech Coffey and applies only to the site investigated. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed by scope-of-service limitations imposed by the client. Your report should not be used if there are any changes to the project without first asking Tetra Tech Coffey to assess how factors that changed subsequent to the date of the report affect the report's recommendations. Tetra Tech Coffey cannot accept responsibility for problems that may occur due to changed factors if they are not consulted.

Subsurface conditions can change

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult Tetra Tech Coffey to be advised how time may have impacted on the project.

Interpretation of factual data

Site assessment identifies actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from literature and external data source review, sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, owners should retain the services of Tetra Tech Coffey through the development stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Your report will only give preliminary recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Tetra Tech Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Tetra Tech Coffey cannot be held responsible for such misinterpretation.

Your report is prepared for specific purposes and persons

To avoid misuse of the information contained in your report it is recommended that you confer with Tetra Tech Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.

Interpretation by other design professionals

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Tetra Tech Coffey to work with other project design professionals who are affected by the report. Have Tetra Tech Coffey explain the report implications to design professionals affected by them and then review plans and specifications produced to see how they incorporate the report findings.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These logs etc. should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Geoenvironmental concerns are not at issue

Your report is not likely to relate any findings, conclusions, or recommendations about the potential for hazardous materials existing at the site unless specifically required to do so by the client. Specialist equipment, techniques, and personnel are used to perform a geoenvironmental assessment. Contamination can create major health, safety and environmental risks. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact Tetra Tech Coffey for information relating to geoenvironmental issues.

Rely on Tetra Tech Coffey for additional assistance

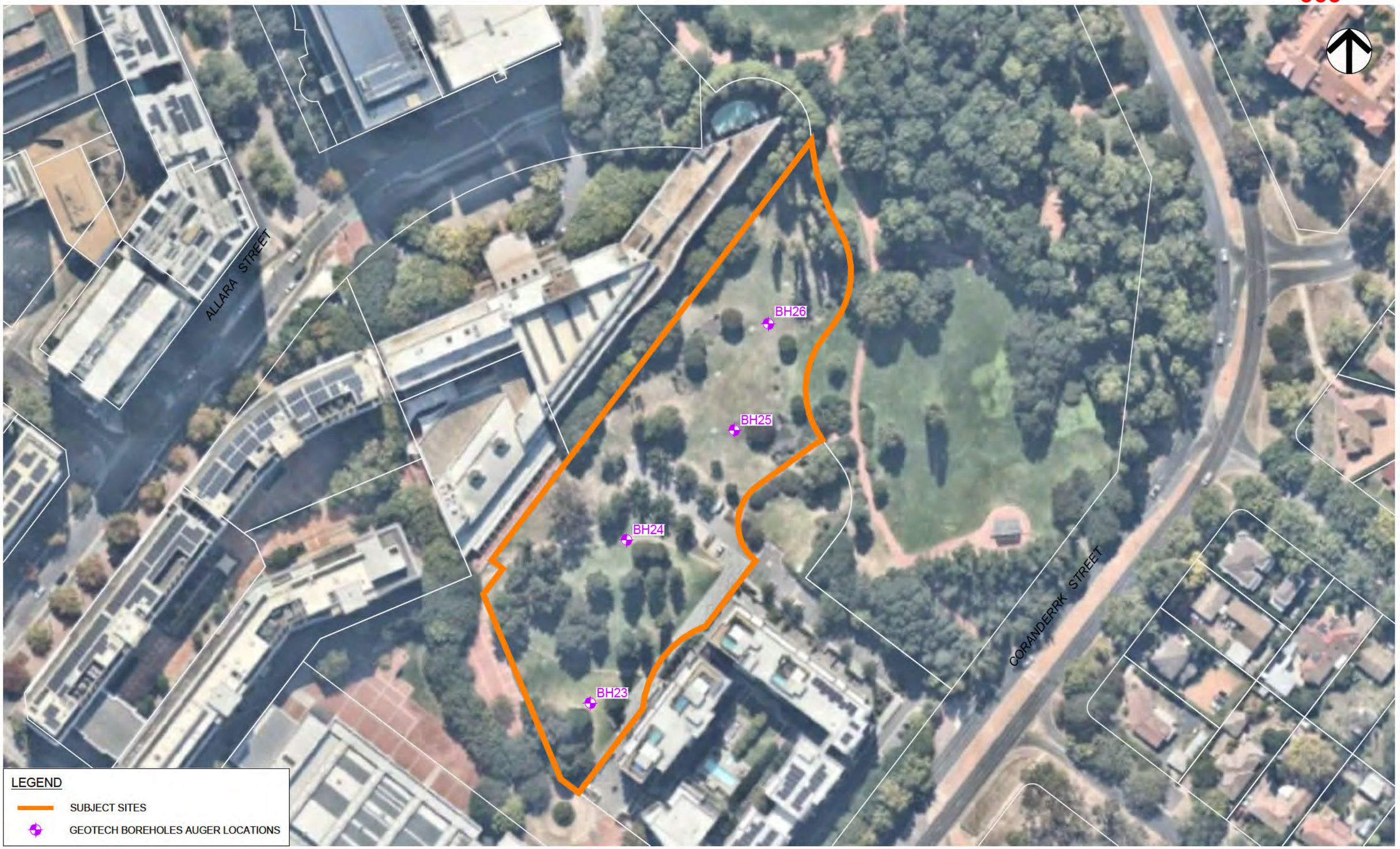
Tetra Tech Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction. It is common that not all approaches will be necessarily dealt with in your site assessment report due to concepts proposed at that time. As the project progresses through design towards construction, speak with Tetra Tech Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

Responsibility

Reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from Tetra Tech Coffey to other parties but are included to identify where Tetra Tech Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Tetra Tech Coffey closely and do not hesitate to ask any questions you may have.

B.2 : SITE 3 – GLEBE PARK

Figure 1 – Site 3 borehole location plan



revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	-	-	-

MAP PROJECTION: GDA2020 MGA ZONE 55

10 0 20 40 60

Scale (metres) 1:1250

drawn	TX / DR
approved	-
date	28-02-2025
scale	AS SHOWN
original size	A3

TETRA TECH COFFEY

client:	CITY RENEWAL AUTHORITY
project:	GEOTECHNICAL INVESTIGATION SERVICES: CITY SOUTH EAST PRECINCT CANBERRA, ACT
title:	SITE 3: GEOTECH BOREHOLE LOCATIONS
project no:	754-CBRGE334891-R02
figure no:	FIGURE 3
rev:	A

APPENDIX C: BOREHOLE LOGS

TETRA TECH COFFEY

SOIL DESCRIPTION EXPLANATION SHEET

DEFINITION:

In engineering terms soil includes every type of uncemented or partially cemented inorganic or organic material found in the ground. In practice, if the material can be remoulded or disaggregated by hand in its field condition or in water it is described as a soil. Other materials are described using rock description terms.

CLASSIFICATION SYMBOL & SOIL NAME

Soils are described in accordance with AS 1726:2017 as shown in the table on Sheet 2.

PARTICLE SIZE DEFINITIONS

Components	Subdivision	Size (mm)
Boulders Cobbles		>200 63 - 200
Gravel	Coarse Medium Fine	19 - 63 6.7 - 19 2.36 - 6.7
Sand	Coarse Medium Fine	0.6 - 2.36 0.210 - 0.6 0.075 - 0.21
Silt Clay		0.002 – 0.075 < 0.002

MOISTURE CONDITION

Coarse Grained Soil

Dry (D)	Non-cohesive and free-running
Moist (M)	Soil feels cool, darked in colour. Soil tends to stick together.
Wet (W)	As for moist, with free water forming when handled.

Fine Grained Soil

Moist, dry of plastic limit ($w<W_P$)	Hard and friable or powdery
Moist, near plastic limit ($w\approx W_P$)	Can be moulded at a moisture content approximately equal to the plastic limit.
Moist, wet of plastic limit ($w>W_P$)	Soils usually weakened and free water forms on hands when handling.
Wet, near liquid limit ($w\approx W_L$)	Near liquid limit.
Wet, wet of liquid limit ($w>W_L$)	Wet of liquid limit.

CONSISTENCY OF COHESIVE SOILS

Term (Abbreviation)	Indicative undrained shear strength s_u (kPa)	Field guide
Very Soft (VS)	<12	Soil exudes between fingers when squeezed in hand.
Soft (S)	12 – 25	Soil can be moulded by light finger pressure.
Firm (F)	25 – 50	Soil can be moulded by strong finger pressure.
Stiff (St)	50 – 100	Soil cannot be moulded by fingers.
Very Stiff (VSt)	100 – 200	Soil can be indented by thumb nail.
Hard (H)	>200	Soil can be indented with difficulty by thumb nail.
Friable (Fb)	–	Soil can be easily crumbled or broken into small pieces by hand.

RELATIVE DENSITY OF NON-COHESIVE SOILS

Term (Abbreviation)	Density index (%)
Very Loose (VL)	Less than 15
Loose (L)	15 – 35
Medium Dense (MD)	35 – 65
Dense (D)	65 – 85
Very Dense (VD)	Greater than 85

MINOR COMPONENTS

Term	Assessment Guide	Proportion of minor component in:
Trace	Presence just detectable by feel or eye, but soil properties little or no different to general properties of primary component.	Coarse grained soils: Fines - <5%, Accessory coarse fraction - <15% Fine grained soils: sand/gravel <15%
With	Presence easily detected by feel or eye, soil properties little different to general properties of primary component.	Coarse grained soils: Fines - 5 to 12%, Accessory coarse fraction – 15 to 30% Fine grained soils: sand/gravel 15 to 30%

SOIL STRUCTURE AND CEMENTATION

Zoning		Cementation	
Layer	Zone is continuous across exposure or sample.	Weakly cemented	Easily disaggregated by hand in air or water.
Lense	Discontinuous layer of different material, with lenticular shape.	Moderately cemented	Effort is required to disaggregate the soil by hand in air or water.
Pocket	Irregular inclusion of different material.		

GEOLOGICAL ORIGIN

Residual soil	Structure and fabric of parent rock not visible.
Extremely weathered material	Structure and/or fabric of parent rock is visible.
Alluvial soil	Deposited by streams and rivers.
Estuarine soil	Deposited in coastal estuaries, including sediments carried by inflowing rivers and streams, or tidal currents.
Marine soil	Deposited in a marine environment
Lacustrine soil	Deposited in freshwater lakes
Aeolian soil	Carried and deposited by wind
Colluvial soil	Deposited on slopes (transported downslope by gravity, with or without assistance of water).
Topsoil	Mantle of surface or near surface material, often defined by high levels of organic material.
Fill	Any material which has been placed by anthropogenic processes. Fill may be significantly more variable between tested locations than naturally occurring soils.

SOIL CLASSIFICATION INCLUDING IDENTIFICATION AND DESCRIPTION

FIELD IDENTIFICATION PROCEDURES (Excluding particles larger than 63 mm and basing fractions on estimated mass)							GROUP SYMBOL	SOIL NAME
COARSE GRAINED SOIL: More than 65% of materials less than 63 mm is larger than 0.075 mm	(About the smallest particle visible to the naked eye)	GRAVEL: More than half of coarse fraction is larger than 2.36 mm	CLEAN GRAVEL (Fines less than 5%)	Wide range in grain size and substantial amounts of all intermediate particle sizes, not enough fines to bind coarse grains, no dry strength.			GW	GRAVEL
				Predominantly one size or a range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength.			GP	GRAVEL
			GRAVEL with FINES (Fines greater than 12%)	'Dirty' materials with excess of non-plastic fines (for identification procedures see ML below).			GM	Silty GRAVEL
				'Dirty' materials with excess of plastic fines (for identification procedures see CL below).			GC	Clayey GRAVEL
		SAND: More than half of coarse fraction is smaller than 2.36	CLEAN SAND (Fines less than 5%)	Wide range in grain sizes and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength.			SW	SAND
				Predominantly one size or a range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength.			SP	SAND
			SAND with FINES (Fines greater than 12%)	'Dirty' materials with excess of non-plastic fines (for identification procedures see ML below).			SM	Silty SAND
				'Dirty' materials with excess of plastic fines (for identification procedures see CL below).			SC	Clayey SAND
FINE GRAINED SOIL: More than 35% of material less than 63 mm is smaller than 0.075 mm	(A 0.075 mm particle is about the smallest particle visible to the naked eye)		IDENTIFICATION PROCEDURES ON FRACTIONS <0.2 mm					
		SILT & CLAY: Liquid limit less	DRY STRENGTH	DILATANCY	TOUGHNESS			
			None to low	Slow to rapid	Low		ML	SILT
			Medium to high	None to slow	Medium		CL, CI	CLAY
			Low to medium	Slow	Low		OL	Organic SILT
		SILT & CLAY: Liquid limit	Low to medium	None to slow	Low to medium		MH	SILT
			High to very high	None	High		CH	CLAY
			Medium to high	None to very slow	Low to medium		OH	Organic CLAY
HIGHLY ORGANIC SOILS			Readily identified by colour, odour, spongy feel and frequently by fibrous texture.				PT	Peat

● Low plasticity – Liquid Limit W_L less than 35%. ● Medium plasticity –W_L between 35% and 50%. ● High plasticity – W_L greater than 50%.

COMMON DEFECTS IN SOIL

TERM	DEFINITION	DIAGRAM
Parting	A surface or crack across which the soil has little or no tensile strength. Parallel or sub parallel to layering (e g. bedding). May be open or closed.	
Fissure	A surface or crack across which the soil has little or no tensile strength but which is not parallel or sub parallel to layering. May be open or closed. May include desiccation cracks.	
Sheared Seam	Zone in clayey soil with roughly parallel near planar, curved or undulating boundaries containing closely spaced, smooth or slickensided, curved intersecting joints which divide the mass into lenticular or wedge shaped blocks.	
Sheared Surface	A near planar curved or undulating, smooth, polished or slickensided surface in clayey soil. The polished or slickensided surface indicates that movement (in many cases very little) has occurred along the defect	

TERM	DEFINITION	DIAGRAM
Softened Zone	A zone in clayey soil, usually adjacent to a defect in which the soil has a higher moisture content than elsewhere	
Tube	Tubular cavity. May occur singly or as one of a large number of separate or interconnected tubes. Walls often coated with clay or strengthened by denser packing of grains. May contain organic matter. Origins include root holes, animal burrows, tunnel erosion.	
Tube cast	An infilled tube. The infill may be uncemented or weakly cemented soil or have rock properties.	
Infilled Seam	Sheet or wall like body of soil substance or mass with roughly planar to irregular near parallel boundaries which cuts through a soil mass. Formed by infilling of open defects.	

TETRA TECH COFFEY

ROCK DESCRIPTION EXPLANATION SHEET

The descriptive terms used by Tetra Tech Coffey are given below. They are broadly consistent with Australian Standard AS1726:2017.

DEFINITIONS: Rock material, defect, structure and rock mass are defined as follows:

Rock material	In engineering terms rock material is any naturally occurring aggregate of minerals and/or organic materials that cannot be disaggregated by hand in air or water without prior soaking. Rock material is intact rock that is bounded by defects. Material which can be disaggregated or remoulded should be described as a soil.
Defect	Discontinuity, fracture, break or void in the material or materials across which there is little or no tensile strength.
Structure	Nature and configuration of the different defects within the rock mass and their relationship with each other.
Rock mass	It is the entirety of the system formed by all of the rock material and all of the defects. That is, it is a body of material which is not effectively homogeneous.

MATERIAL DESCRIPTIVE TERMS:

Rock name	Simple rock names are used rather than precise geological classification.
Particle size	Grain size terms for sandstone are:
Coarse grained	Mainly 0.6mm to 2mm
Medium grained	Mainly 0.2mm to 0.6mm
Fine grained	Mainly 0.06mm (just visible) to 0.2mm
Fabric	When grains show an alignment, a preferred orientation or a layering (e.g. bedding or lamination for sedimentary rocks, and foliation or cleavage for metamorphic rocks) the terms used are:
Massive	No layering or penetrative fabric.
Indistinct	Layering or fabric just visible. Little effect on strength properties.
Distinct	Layering or fabric is easily visible. Rock may break more easily parallel to the fabric.

CLASSIFICATION OF MATERIAL WEATHERING

Term	Abbreviation	Definition
Residual Soil	**RS**	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible. Soil has not been significantly transported.
Extremely Weathered	**XW**	Material is weathered to such an extent that it has soil properties, i.e. it either disaggregates or can be remoulded in water. Mass structure and material texture and fabric of original rock are still visible.
Highly Weathered[1]	**HW**	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching or may be decreased due to the deposition of weathering products in pores.
Moderately Weathered[1]	**MW**	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is no longer recognisable. Little or no change of strength from fresh rock.
Slightly Weathered	**SW**	Rock is partially discoloured with staining or bleaching adjacent to defects, but shows little or no change of strength from fresh rock.
Fresh	**FR**	Rock shows no sign of decomposition of individual minerals or colour changes.

Notes on Weathering:

1. The term 'Distinctly Weathered' (DW) may be used where it is not practicable (or it is judged that there is no advantage in making such a distinction) to distinguish between 'Highly Weathered' and 'Moderately Weathered'. 'Distinctly Weathered' is defined as follows: 'Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores'.
2. Where physical and chemical changes of the rock material are caused by hot gases or liquids at depth (process called alteration) the term 'altered' may be substituted for 'weathering' to give the abbreviations XA, HA, MA, SA and DA.

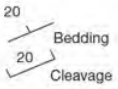
ROCK MATERIAL STRENGTH TERMS

Term (Abbreviation)	Guide to Strength: Point Load Strength Index, $I_{s(50)}$ (MPa)	Guide to Strength: Field Assessment
Very Low (VL)	0.03 - 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with a knife; too hard to cut a triaxial sample by hand; pieces up to 30mm thick can be broken by finger pressure.
Low (L)	0.1 - 0.3	Easily scored with a knife; indentations 1mm to 3mm show with firm bows of a pick point; has a dull sound under hammer. A piece of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium (M)	0.3 to 1.0	Readily scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.
High (H)	1 to 3	A piece of core 150mm long by 50mm diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
Very High (VH)	3 to 10	Hand specimen breaks after more than one blow; rock rings under hammer.
Extremely High (EH)	More than 10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

Notes on Rock Material Strength:

1. Material with strength less than 'Very Low' should be described using soil characteristics.
2. The method of measuring the $I_{s(50)}$ should be in accordance with AS 4133.4.2.
3. The rock strength should be determined perpendicular to any anisotropy in the rock. High strength anisotropic rocks may readily break parallel to the planar anisotropy.
4. Although AS1726:2017 provides a basis for rock strength terms based on Unconfined Compressive Strength (UCS), the ratio between UCS and $I_{s(50)}$ may vary from less than 10 to over 30 depending on the rock type and overall strength. The UCS/$I_{s(50)}$ strength ratio should be determined for each rock material.
5. The rock strength classification using $I_{s(50)}$ above should be considered indicative only. The rock strength classified in accordance with AS1726:2017 may be higher or lower if UCS results are available.

COMMON ROCK DEFECT TYPES

Term	Definition	Diagram	Map Symbol	Graphic Log (Note 1)
Parting	A surface or crack across which the rock has little or no tensile strength. Parallel or sub-parallel to layering (e.g. bedding) or a planar anisotropy in the rock material (e.g. cleavage). May be open or closed.			
Joint	A surface or crack with no apparent shear displacement and across which the rock has little or no tensile strength, but which is not parallel or sub-parallel to layering or to planar anisotropy in the rock material. May be open or closed.			
Sheared Zone/Seam (Note 3)	Zone of rock material with roughly parallel near planar, curved or undulating boundaries cut by closely spaced joints, sheared surfaces or other defects. Some of the defects are usually curved and intersect to divide the mass into lenticular or wedge shaped blocks.			
Sheared Surface (Note 3)	A near planar, curved or undulating surface which is usually smooth, polished or slickensided and which shows evidence of shear displacement.			
Crushed Seam (Note 3)	Seam of soil material with roughly parallel almost planar boundaries, composed of disoriented, usually angular fragments of the host rock material which may be more weathered than the host rock. The seam has soil properties.			
Infilled Seam	Seam of soil material usually with distinct roughly parallel boundaries formed by the migration of soil into an open cavity or joint, infilled seams up to 1mm thick may be described as veneer or coating on a joint surface.			
Extremely Weathered Seam	Seam of soil material, often with gradational boundaries. Formed by weathering of the rock material in place.			

Notes on Defects:

1. Usually borehole logs show the true dip of defects, and face sketches and sections show the apparent dip.
2. Partings and joints are not usually shown on the graphic log unless considered significant.
3. Sheared zones/seams, sheared surfaces and crushed seams are generally faults in geological terms.

DEFECT SHAPE TERMS

Planar	The defect does not vary in orientation
Curved	The defect has a gradual change in orientation
Undulating	The defect has a wavy surface
Stepped	The defect has one or more well defined steps
Irregular	The defect has many sharp changes of orientation

Note: The assessment of defect shape is partly influenced by the scale of the observation.

DEFECT ROUGHNESS TERMS

Very Rough	Many large surface irregularities (amplitude generally more than 1mm). Feels like, or coarser than very coarse sand paper.
Rough	Many small surface irregularities (amplitude generally less than 1mm). Feels like fine to coarse sand paper.
Smooth	Smooth to touch. Few or no surface irregularities.
Polished	Shiny smooth surface.
Slickensided	Grooved or striated surface, usually polished.

DEFECT COATING TERMS

Clean	No visible coating.
Stained	No visible coating but surfaces are discoloured.
Veneer	A visible coating of soil or mineral, too thin to measure; may be patchy.
Coating	A visible coating up to 1mm thick. Thicker soil material should be described using appropriate defect terms (e g. infilled seam). Thicker rock strength material should be described as a vein.

DIMENSION OF DEFECTS

Spacing, length, openness and thickness

The spacing, length, aperture (openness), and seam thickness should generally be described directly in millimetres or metres.

Block Shape

Where it is considered significant, block shape (e.g. tabular, prismatic, columnar) should be described using the terms in Table 23 of AS 1726:2017.

C.2 : SITE 3 – GLEBE PARK

TETRA TECH COFFEY

Engineering Log - Borehole

Borehole ID.	**BH23**
sheet:	1 of 1
project no.	**754-CBRGE334891**
date started:	**30 Aug 2024**
date completed:	**30 Aug 2024**
logged by:	[redacted]
checked by:	

client: ***City Renewal Authority (CRA)***

principal:

project: ***City South-East Precinct - Site 3 - Glen Park***

location: ***Glebe Park***

position: E: 694149; N: 6093368 (MGA94) | surface elevation: Not Specified | angle from horizontal: 90°

drill model: Hanjin D&B 8D, Track mounted | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristics, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	soil origin, structure and additional observations
AD N		Not Observed	D: BH23_0.2-0.5		0		ML	**TOPSOIL: Sandy SILT**: dark brown, fine to medium grained sand, trace fine grained sub-rounded gravel.	>Wp			**TOPSOIL**
							CL-CI	**Silty CLAY**: low to medium plasticity, dark brown, trace fine grained sand.	<Wp	F - St		**ALLUVIAL SOIL**
			D: BH23_0.6-1.0				CL	**Sandy CLAY**: low plasticity, brown to yellow brown, fine grained sand.				
			SPT 3, 4, 7 N*=11		1.0		CI	**CLAY**: medium plasticity, brown.		St - VSt		
					2.0		CL	**Gravelly Sandy CLAY**: low plasticity, brown, with red purple orange mottling, medium to coarse grained fine grained sub-angular gravel, trace quartz (recovered from pyroclastic rock).	<Wp			**EXTREMELY WEATHERED PYROCLASTIC ROCK**
			SPT 15, 15/120mm N*=R		3.0			**SILTSTONE**: recovered as Gravelly SILT: grey brown, moderately weathered, medium to high strength.				**MODERATELY WETHERED SILTSTONE**
			SPT 10/130mm N*=R		4.0			Borehole BH23 terminated at 4.03 m Refusal				
					5.0							
					6.0							
					7.0							

CDF_0_10_00.4_LIBRARY.GLB rev:CDF_0_10_00.4 2021-09-30 Log COF BOREHOLE: NON CORED 754-CBRGE334891 - SITE 3 - GLEN PARK.GPJ <<DrawingFile>> 28/02/2025 11:35

method
DT diatube
AD auger drilling*
AS auger screwing*
HA hand auger
W washbore
RR rock roller

* bit shown by suffix
e.g. AD/T
B blank bit
T TC bit
V V bit

support
M mud
C casing
N nil

penetration
no resistance ranging to refusal

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
B bulk disturbed sample
D disturbed sample
E environmental sample
SS split spoon sample
U## undisturbed sample ##mm diameter
HP hand penetrometer (kPa)
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
VS vane shear; peak/remouded (kPa)
R refusal
HB hammer bouncing

soil group symbol & material description
based on AS 1726:2017

moisture condition
D dry
M moist
W wet
Wp plastic limit
Wl liquid limit

consistency / relative density
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

TETRA TECH COFFEY

Engineering Log - Borehole

Borehole ID.	**BH24**
sheet:	1 of 1
project no.	**754-CBRGE334891**
client:	***City Renewal Authority (CRA)***
date started:	***30 Aug 2024***
principal:	
date completed:	***30 Aug 2024***
project:	***City South-East Precinct - Site 3 - Glen Park***
logged by:	[redacted]
location:	***Glebe Park***
checked by:	

position: E: 694170; N: 6093426 (MGA94) | surface elevation: Not Specified | angle from horizontal: 90°

drill model: Hanjin D&B 8D, Track mounted | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristics, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	soil origin, structure and additional observations
AD N			D: BH24_0.2-0.5				SM	**TOPSOIL: SILTY SAND**: fine to medium grained, brown, trace low plasticity clay.	M			**TOPSOIL**
							SM	**SILTY SAND**: fine to medium grained, brown, trace low plasticity clay.	D	L - MD		**ALLUVIAL SOIL**
							SC			MD		
			D: BH24_0.7-1.0				CI	**CLAYEY SAND**: fine to medium grained, brown, low plasticity clay.	<Wp	VSt - H		
			SPT 9, 11, 14 N*=25		1.0		CL	**Sandy CLAY TO CLAY**: medium plasticity, brown to dark brown, fine grained sand.		H		
			CBR: BH25_1.1-1.6					**Sandy Gravelly CLAY**: low plasticity, brown with some pale red mottling, fine grained sub-angular gravel, fine to medium grained sand.				
					2.0		CL-CI	**Sandy CLAY**: low to medium plasticity, red brown to orange brown.		VSt - Fb		**RESIDUAL SOIL**
			SPT 12, 15/20mm N*=R		3.0							
			SPT 9, 12, 15 N*=27		4.0							
		30/08/24			5.0			**SILTSTONE**: recovered as Gravelly SILT: pale brown, medium strength.				**HIGHLY TO MODERATELY WEATHERED SILTSTONE** becoming harder drilling
			SPT 10/50mm N*=R		6.0			Borehole BH24 terminated at 5.55 m Refusal				
					7.0							

CDF_0_10_00.4_LIBRARY.GLB rev:CDF_0_10_00.4 2021-09-30 Log COF BOREHOLE: NON CORED 754-CBRGE334891 - SITE 3 - GLEN PARK.GPJ <<DrawingFile>> 28/02/2025 11:35

method
DT diatube
AD auger drilling*
AS auger screwing*
HA hand auger
W washbore
RR rock roller
* bit shown by suffix
e.g. AD/T
B blank bit
T TC bit
V V bit

support
M mud
C casing
N nil

penetration
no resistance ranging to refusal

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
B bulk disturbed sample
D disturbed sample
E environmental sample
SS split spoon sample
U## undisturbed sample ##mm diameter
HP hand penetrometer (kPa)
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
VS vane shear; peak/remouded (kPa)
R refusal
HB hammer bouncing

soil group symbol & material description
based on AS 1726:2017

moisture condition
D dry
M moist
W wet
Wp plastic limit
Wl liquid limit

consistency / relative density
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

TETRA TECH COFFEY

Engineering Log - Borehole

Borehole ID.	**BH25**
sheet:	1 of 1
project no.	**754-CBRGE334891**
date started:	**30 Aug 2024**
date completed:	**30 Aug 2024**
logged by:	
checked by:	

client: ***City Renewal Authority (CRA)***

principal:

project: ***City South-East Precinct - Site 3 - Glen Park***

location: ***Glebe Park***

position: E: 694202; N: 6093465 (MGA94) | surface elevation: Not Specified | angle from horizontal: 90°

drill model: Hanjin D&B 8D, Track mounted | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristics, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	soil origin, structure and additional observations
AD / N					0.0		ML	**TOPSOIL: Sandy SILT**: dark brown, some rootlets.	~Wp			**TOPSOIL**
							CL	**FILL: Gravelly Silty CLAY**: low plasticity, brown, fine to medium grained sub-angular gravel.	~Wp			**FILL**
			SPT 7, 8, 9 N*=17		1.0		CL	**FILL: Sandy Silty CLAY**: low plasticity, brown, some red orange mottling, medium to coarse grained sand, with some fine grained sub-rounded gravel.				
							GP	**FILL: GRAVEL**: medium grained, angular, grey.				
					2.0		CL	**FILL: Sandy CLAY**: low plasticity, brown, medium to coarse grained sand, with some fine to medium grained sub-angular gravel.				
			D: BH25_2.2-2.5				CL-CI		~Wp	F		**POSSIBLE ALLUVIAL SOIL**
			SPT 1, 3, 2 N*=5					**Sandy CLAY**: brown to dark brown, trace sub-rounded gravel.				
		30/08/24	D: BH25_2.8-3.0		3.0		SP	**SAND**: fine to medium grained, dark brown, trace low plasticity clay.	W	L		
								Gravelly Sandy SILT: brown, recovered from Siltstone.	<Wp	Fb		**EXTREMELY WEATHERED SILTSTONE**
			SPT 10/60mm N*=R		4.0			**SILTSTONE**: recovered as Gravelly Sandy SILT: red-brown, very low to low strength, highly weathered.				**HIGHLY WEATHERED SILTSTONE**
					5.0							
					6.0			Borehole BH25 terminated at 5.5 m Target depth				
					7.0							

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method
DT diatube
AD auger drilling*
AS auger screwing*
HA hand auger
W washbore
RR rock roller
* bit shown by suffix
e.g. AD/T
B blank bit
T TC bit
V V bit

support
M mud
C casing
N nil

penetration
no resistance ranging to refusal

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
B bulk disturbed sample
D disturbed sample
E environmental sample
SS split spoon sample
U## undisturbed sample ##mm diameter
HP hand penetrometer (kPa)
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
VS vane shear; peak/remouded (kPa)
R refusal
HB hammer bouncing

soil group symbol & material description
based on AS 1726:2017

moisture condition
D dry
M moist
W wet
Wp plastic limit
Wl liquid limit

consistency / relative density
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

TETRA TECH COFFEY

Engineering Log - Borehole

Borehole ID.	**BH26**
sheet:	1 of 2
project no.	**754-CBRGE334891**
date started:	**30 Aug 2024**
date completed:	**30 Aug 2024**
logged by:	
checked by:	

client: ***City Renewal Authority (CRA)***

principal:

project: ***City South-East Precinct - Site 3 - Glen Park***

location: ***Glebe Park***

position: E: 694218; N: 6093501 (MGA94) | surface elevation: Not Specified | angle from horizontal: 90°

drill model: Hanjin D&B 8D, Track mounted | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristics, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	soil origin, structure and additional observations
AD N		Not Observed	D: BH26_0.1-0.5				CL	**TOPSOIL: Sandy CLAY**: low plasticity, dark brown, some rootlets.	=Wp			**TOPSOIL**
							ML	**Sandy SILT**: dark brown.	=Wp	F		**ALLUVIAL SOIL**
			D: BH26_0.6-1.0				ML	**Clayey SILT**: brown.				
							CL	**Sandy CLAY**: low plasticity, fine to medium grained sand, with some fine grained sub-angular gravel.		F - St		
			SPT 7, 10, 13 N*=23		1.0		CI	**Silty CLAY**: medium plasticity, black.				
			D: BH26_1.5-2.0				CI	**Sandy CLAY**: medium plasticity, brown, with some fine grained sub-angular to sub-rounded gravel.	<Wp	VSt		
					2.0		ML	**Gravelly SILT**: brown, fine grained sub-angular to sub-rounded gravel.	<Wp	H - Fb		**RESIDUAL SOIL**
			SPT 13, 15/130mm N*=R		3.0			**Gravelly Sandy SILT**: brown, extremely weathered, low strength, recovered from Siltstone.		VSt - H		**EXTREMELY WEATHERED SILTSTONE**
			SPT 12, 15/110mm N*=R		4.0							
					5.0							
			SPT 9, 13, 16 N*=29		6.0							
								SILTSTONE: recovered as Gravelly SILT: brown, very low to low strength, highly weathered.				**HIGHLY WEATHERED SILTSTONE**
			SPT 15/10mm N*=R		7.0							

CDF_0_10_00.4 LIBRARY GLB rev:CDF_0_10_00.4 2021-09-30 Log COF BOREHOLE: NON CORED 754-CBRGE334891 - SITE 3 - GLEN PARK.GPJ <<DrawingFile>> 28/02/2025 11:35

method
DT diatube
AD auger drilling*
AS auger screwing*
HA hand auger
W washbore
RR rock roller

* bit shown by suffix
e.g. AD/T
B blank bit
T TC bit
V V bit

support
M mud
C casing
N nil

penetration
no resistance ranging to refusal

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
B bulk disturbed sample
D disturbed sample
E environmental sample
SS split spoon sample
U## undisturbed sample ##mm diameter
HP hand penetrometer (kPa)
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
VS vane shear; peak/remouded (kPa)
R refusal
HB hammer bouncing

soil group symbol & material description
based on AS 1726:2017

moisture condition
D dry
M moist
W wet
Wp plastic limit
Wl liquid limit

consistency / relative density
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

TETRA TECH COFFEY

Engineering Log - Borehole

Borehole ID.	**BH26**
sheet:	2 of 2
project no.	**754-CBRGE334891**
date started:	**30 Aug 2024**
date completed:	**30 Aug 2024**
logged by:	
checked by:	

client: ***City Renewal Authority (CRA)***

principal:

project: ***City South-East Precinct - Site 3 - Glen Park***

location: ***Glebe Park***

position: E: 694218; N: 6093501 (MGA94) | surface elevation: Not Specified | angle from horizontal: 90°

drill model: Hanjin D&B 8D, Track mounted | drilling fluid: | hole diameter : 100 mm

drilling information						material substance						
method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description **SOIL NAME**: plasticity or particle characteristics, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	soil origin, structure and additional observations
N		Not Observed	SPT 15/90mm N*=R					**SILTSTONE**: recovered as Gravelly SILT: brown, very low to low strength, highly weathered. *(continued)* 8.2 m: becoming harder drilling, grading into moderate weathered				**HIGHLY WEATHERED SILTSTONE** **MODERATELY WEATHERED SILTSTONE**
					9.0			Borehole BH26 terminated at 8.59 m Target depth				
					10.0							
					11.0							
					12.0							
					13.0							
					14.0							
					15.0							

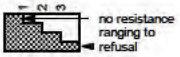
CDF_0_10_00.4_LIBRARY.GLB rev:CDF_0_10_00.4 2021-09-30 Log COF BOREHOLE: NON CORED 754-CBRGE334891 - SITE 3 - GLEN PARK.GPJ <<DrawingFile>> 28/02/2025 11:35

method
- DT diatube
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- RR rock roller

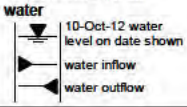
* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration



water



samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & material description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

APPENDIX D: LABORATORY RESULTS AND CHAIN OF CUSTODY

D.2 : SITE 3 – GLEBE PARK

Canberra Laboratory

Coffey Testing Pty Ltd
ABN 92 114 364 046
16 Mildura Street
Fyshwick ACT 2609

Phone: +61 2 8876 0550

Material Test Report

Report No: ASM:CANB24W01790
Issue No: 1

Client: Tetra Tech Coffey Pty Ltd (Canberra)
16 Mildura Street
Fyshwick ACT 2609

Principal:
Project No.: TESTCANB00562AA
Project Name: 754-CBRGE334891 - CRA City South East Precinct GI
Lot No.: Site 3 **TRN:**

NATA

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Sch 2 s 2.2(a)(ii)

ilac-MRA

Approved Signatory: [redacted]
(Laboratory Manager)
NATA Accredited Laboratory Number:431
Date of Issue: 25/10/2024

Material Details

Location	ACT		
Source	Insitu	**Sampled From**	
Description	Subgrade	**Specification**	AS Grading
Sampling Method	Submitted by client*		

Sample Details

Sample ID	CANB24S-03620	CANB24S-03621	CANB24S-03622	CANB24S-03623	CANB24S-03624	CANB24S-03625
Field Sample ID	00009	00010	00011	00012	00013	00014
Date Sampled	30/08/2024	30/08/2024	30/08/2024	30/08/2024	30/08/2024	30/08/2024
Date Submitted:	16/09/2024	16/09/2024	16/09/2024	16/09/2024	16/09/2024	16/09/2024
Sample Location:	Site 3	Site 3	Site 3	Site 3	Site 3	Site 3
	BH23	BH24	BH24	BH25	BH25	BH26
	0.6 - 1.0m	0.7 - 1.0m	1.1 - 1.6m	2.2 - 2.5m	2.8 - 3.0m	0.6 - 1.0m

Particle Size Distribution

Method:
AS 1289.3.6.1

Description:
Determination of the Particle Size Distribution of a Soil - Standard Method of Analysis by

Washed:
Sample Not Washed

Sieve Size	% Passing						Limits
300mm							
250mm							
200mm							
150mm							
125mm							
100mm							
75.0mm							
63.0mm							
53.0mm							
37.5mm							
26.5mm							
19.0mm						100	
13.2mm			100			97	
9.5mm			98			94	
6.7mm			97			91	
4.75mm			94			89	
2.36mm			87			84	
1.18mm			78			77	
600µm			70			63	
425µm			66			53	
300µm			61			41	
150µm			54			30	
75µm			48			25	

Other Test Results

Description	Method	Results				Limits
Moisture Content (%)	AS 1289.2.1.1	17.8		14.6	19.8	
Date Tested		23/09/2024		23/09/2024	23/09/2024	

Comments

*Results relate only to the items tested or sampled.

Canberra Laboratory

Coffey Testing Pty Ltd
ABN 92 114 364 046
16 Mildura Street
Fyshwick ACT 2609

Phone: +61 2 8876 0550

Material Test Report

Report No: ASM:CANB24W01790
Issue No: 1

Client: Tetra Tech Coffey Pty Ltd (Canberra)
16 Mildura Street
Fyshwick ACT 2609

Principal:
Project No.: TESTCANB00562AA
Project Name: 754-CBRGE334891 - CRA City South East Precinct GI
Lot No.: Site 3 **TRN:**

NATA

Accredited for compliance with ISO/IEC 17025 - Testing. NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates

Sch 2 s 2.2(a)(ii)

ilac-MRA

Approved Signatory: [redacted]
(Laboratory Manager)
NATA Accredited Laboratory Number:431
Date of Issue: 25/10/2024

Material Details

Location	ACT		
Source	Insitu	**Sampled From**	
Description	Subgrade	**Specification**	AS Grading
Sampling Method	Submitted by client*		

Sample Details

Sample ID	CANB24S-03620	CANB24S-03621	CANB24S-03622	CANB24S-03623	CANB24S-03624	CANB24S-03625
Field Sample ID	00009	00010	00011	00012	00013	00014
Date Sampled	30/08/2024	30/08/2024	30/08/2024	30/08/2024	30/08/2024	30/08/2024
Date Submitted:	16/09/2024	16/09/2024	16/09/2024	16/09/2024	16/09/2024	16/09/2024
Sample Location:	Site 3	Site 3	Site 3	Site 3	Site 3	Site 3
	BH23	BH24	BH24	BH25	BH25	BH26
	0.6 - 1.0m	0.7 - 1.0m	1.1 - 1.6m	2.2 - 2.5m	2.8 - 3.0m	0.6 - 1.0m

Other Test Results

Description	Method	Results	Limits
Sample History	AS 1289.1.1	Oven-Dried	Oven-Dried
Preparation	AS 1289.1.1	Dry Sieved	Dry Sieved
Linear Shrinkage (%)	AS 1289.3.4.1	11.0	5.5
Mould Length (mm)		254	254
Crumbling		No	No
Curling		Yes	No
Cracking		No	No
Liquid Limit (%)	AS 1289.3.1.2	41	31
Plastic Limit (%)	AS 1289.3.2.1	17	19
Plasticity Index (%)	AS 1289.3.3.1	24	12
Date Tested		30/09/2024	30/09/2024
Modified MDD (t/m³)	AS 1289.5.2.1	1.90	
Modified OMC (%)		12.0	
Retained Sieve (mm)		19	
Oversize Material (%)		0	
Curing Time (h)		120	
LL Method		Visual / Tactile	
Date Tested		30/09/2024	

Comments

*Results relate only to the items tested or sampled.

Canberra Laboratory

Coffey Testing Pty Ltd
ABN 92 114 364 046
16 Mildura Street
Fyshwick ACT 2609

Phone: +61 2 8876 0550

Material Test Report

Report No: ASM:CANB24W01790
Issue No: 1

Client: Tetra Tech Coffey Pty Ltd (Canberra)
16 Mildura Street
Fyshwick ACT 2609

Principal:
Project No.: TESTCANB00562AA
Project Name: 754-CBRGE334891 - CRA City South East Precinct GI
Lot No.: Site 3 **TRN:**

NATA

Accredited for compliance with ISO/IEC 17025 - Testing. NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates

Sch 2 s 22(a)(ii)

ilac-MRA

Approved Signatory: [redacted]
(Laboratory Manager)
NATA Accredited Laboratory Number:431
Date of Issue: 25/10/2024

Material Details

Location	ACT		
Source	Insitu	**Sampled From**	
Description	Subgrade	**Specification**	AS Grading
Sampling Method	Submitted by client*		

Sample Details

Sample ID	CANB24S-03620	CANB24S-03621	CANB24S-03622	CANB24S-03623	CANB24S-03624	CANB24S-03625
Field Sample ID	00009	00010	00011	00012	00013	00014
Date Sampled	30/08/2024	30/08/2024	30/08/2024	30/08/2024	30/08/2024	30/08/2024
Date Submitted:	16/09/2024	16/09/2024	16/09/2024	16/09/2024	16/09/2024	16/09/2024
Sample Location:	Site 3	Site 3	Site 3	Site 3	Site 3	Site 3
	BH23	BH24	BH24	BH25	BH25	BH26
	0.6 - 1.0m	0.7 - 1.0m	1.1 - 1.6m	2.2 - 2.5m	2.8 - 3.0m	0.6 - 1.0m

Other Test Results

Description	Method	Results	Limits
CBR at 2.5mm (%)	AS 1289.6.1.1	6	
Dry Density before Soaking (t/m³)		1.83	
Density Ratio before Soaking (%)		96.0	
Moisture Content before Soaking (%)		11.7	
Moisture Ratio before Soaking (%)		97.0	
Dry Density after Soaking (t/m³)		1.79	
Density Ratio after Soaking (%)		93.5	
Swell (%)		2.5	
Moisture Content of Top 30mm (%)		17.7	
Moisture Content of Remaining Depth (%)		16.9	
Compaction Hammer Used		Modified	
Surcharge Mass (kg)		4.50	
Period of Soaking (Days)		4	
Retained on 19 mm Sieve (%)		0	
CBR Moisture Content Method		AS 1289.2.1.1	
Sample Curing Time (h)		144	
Plasticity Method		Visual/Tactile	
Sample Moisture Content		AS 1289.2.1.1	
Date Tested		8/10/2024	

Comments

*Results relate only to the items tested or sampled.

Canberra Laboratory

Coffey Testing Pty Ltd
ABN 92 114 364 046
16 Mildura Street
Fyshwick ACT 2609

Phone: +61 2 8876 0550

Material Test Report

Report No: ASM:CANB24W01790
Issue No: 1

Client: Tetra Tech Coffey Pty Ltd (Canberra)
16 Mildura Street
Fyshwick ACT 2609

Principal:
Project No.: TESTCANB00562AA
Project Name: 754-CBRGE334891 - CRA City South East Precinct GI
Lot No.: Site 3 **TRN:**

Accredited for compliance with ISO/IEC 17025 - Testing. NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates

Sch 2 s 2.2(a)(ii)

Approved Signatory: [redacted]
(Laboratory Manager)
NATA Accredited Laboratory Number:431
Date of Issue: 25/10/2024

Material Details

Location	ACT		
Source	Insitu	**Sampled From**	
Description	Subgrade	**Specification**	AS Grading
Sampling Method	Submitted by client*		

Sample Details

Sample ID	CANB24S-03626
Field Sample ID	00015
Date Sampled	30/08/2024
Date Submitted:	16/09/2024
Sample Location:	Site 3
	BH26
	1.0 - 1.45m

Other Test Results

Description	Method	Results	Limits
Moisture Content (%)	AS 1289.2.1.1	15.7	
Date Tested		23/09/2024	

Comments

*Results relate only to the items tested or sampled.

Shrink-Swell Index Report

Client	Tetra Tech Coffey	**Source**	BH23_0.6-1.0m
Address	2/11 London Circuit, Canberra ACT 2601	**Sample Description**	Silty CLAY
Project	CRA City South East Precinct GI (754-CBRGE334891)	**Report No**	S100701-SS
Job No	S24520-1	**Lab No**	S100701

Test Procedure	In-House: Remoulded Shrink and Swell Test		
Sampling	Sampled by Client - results apply to the sample as received	**Date Sampled**	30/08/2024
Preparation	Prepared in accordance with the test method	**Date Tested**	25/10/2024

Sample Type	
Remoulded	
Swell Test	
Swell on Saturation(E_{SW})	0.0
Moisture Content Before Test (%)	17.0
Moisture Content After Test (%)	17.2
Shrink Test	
Shrinkage on Drying (E_{SH}%)	1.5
Estimated Inert Material Present (%)	0.0
Extent of Crumbling During Shrinkage	Mild
Extent of Cracking During Shrinkage	Mild
Moisture Content (%)	17.1
Shrink-Swell Index	
I_{ss} (percentage vertical strain per pF change in total suction)	**0.9**

Notes

This report is prepared to the in-house method, it is not NATA endorsed and the client has been advised that the result is not equivalent to one obtained using AS 1289.7.1.1.

Sch 2.2(a)(ii)

Date: 4/11/2024

MACQUARIE GEOTECH

rie Geotechnical

14 Carter Street Lidcombe NSW 2141

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

TETRA TECH COFFEY

Consigning Office:	Canberra				
Report Results to:	Sch 2.2(a)(ii)	Mobile:	0429 226 345	Email:	Sch 2.2(a)(ii)
Invoices to:	Sch 2.2(a)(ii)	Phone:	0429 226 345	Email:	Sch 2.2(a)(ii)

Project No:	754-CBRGE334891	Task No:	Laboratory
Project Name:	CRA - City South East - Geotechnical Investi	Laboratory:	Eurofins
Sampler's Name:	Sch 2.2(a)(ii)	Project Manager:	Sch 2.2(a)(ii)
Quote number (if different to current quoted prices):			
Special Instructions:			

Lab Batch Ref	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	L1 - Aggressivity Suite - pH, EC, Cl, Resistivity, SO4	NOTES
	BH3_SPT_4.0-4.23	21/08/2024		SOIL	JAR	STD	X	
	BH5_1.7-2.0	22/08/2024					X	
	BH9_0.5-0.8	23/09/2024					X	
	BH10_0.4-0.7	3/09/2024					X	
	BH10_SPT_1.0-1.45	3/09/2024					X	
	BH13_1.5-1.8	3/09/2024					X	
	BH15_0.2-0.5	27/08/2024					X	
	BH14_1.2-1.5	27/08/2024					X	
	BH18_0.6-1.0	27/08/2024					X	
	BH25_SPT_2.5-2.95	30/08/2024					X	
	BH24_SPT_1.0-1.45	30/08/2024					X	
	BH23_0.2-0.5	30/08/2024					X	
	BH29_SPT_1.0-1.45	29/08/2024					X	
	BH30_4.5-5.0	29/08/2024					X	
	BH30_10.5-11.0	29/08/2024					X	

Analysis Request Section

RELINQUISHED BY			RECEIVED BY		
Name: Sch 2.2(a)(ii)	Date:	5/09/2024	Name: Sch 2 s 2.2(a)(xi)	Date:	6/9/24
Coffey	Time:		Company: Eurofins	Time:	5:23 PM.
Name:	Date:		Name:	Date:	
Company:	Time:		Company:	Time:	

Sample Receipt Advice: (Lab Use Only)

All Samples Recieved in Good Condition	☑
All Documentation is in Proper Order	☑
Samples Received Properly Chilled	☑ 2.9 °C
Lab. Ref/Batch No.	1137045

***Container Type & Preservation Codes:** P - Plastic, G- Glass Bottle, J - Glass Jar, V- Vial, Z - Ziplock bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative

5.7
6.7
6.0
6.1 − 3.2
= 2.9

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

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NATA# 2561
Site# 2554

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

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+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name: Tetra Tech Coffey Environment Pty Ltd ACT
Contact name: Sch 2.2(a)(ii)
Project name: CRA- CITY SOUTH EAST- GEOTECHNICAL INVESTIGATION
Project ID: 754-CBRGE334891
Turnaround time: 5 Day
Date/Time received Sep 6, 2024 5:23 PM
Eurofins reference 1137045

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 2.9 degrees Celsius.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Sch 2.2(a)(ii) **on phone : or by email:** Sch 2.2(a)(ii)

Results will be delivered electronically via email to Sch 2.2(a)(ii)

Note: A copy of these results will also be delivered to the general Tetra Tech Coffey Environment Pty Ltd ACT email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: Tetra Tech Coffey Environment Pty Ltd ACT
Address: 16 Mildura Street
Fyshwick
ACT 2609

Project Name: CRA- CITY SOUTH EAST- GEOTECHNICAL INVESTIGATION
Project ID: 754-CBRGE334891

Order No.:
Report #: 1137045
Phone: +61 2 6124 5600
Fax: +61 2 6260 7211

Received: Sep 6, 2024 5:23 PM
Due: Sep 13, 2024
Priority: 5 Day
Contact Name: Sch 2.2(a)(ii)

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						Aggressivity Soil Set	Moisture Set
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	BH3_SPT_0.4-4.23	Aug 21, 2024		Soil	R24-Se0019514	X	X
2	BH5_1.7-2.0	Aug 22, 2024		Soil	R24-Se0019515	X	X
3	BH9_0.5-0.8	Aug 23, 2024		Soil	R24-Se0019516	X	X
4	BH10_0.4-0.7	Sep 03, 2024		Soil	R24-Se0019517	X	X
5	BH10_SPT_1.0-1.45	Sep 03, 2024		Soil	R24-Se0019518	X	X
6	BH13_1.5-1.8	Sep 03, 2024		Soil	R24-Se0019519	X	X
7	BH15_0.2-0.5	Aug 27, 2024		Soil	R24-Se0019520	X	X
8	BH14_1.2-1.5	Aug 27, 2024		Soil	R24-Se0019521	X	X
9	BH18_0.6-1.0	Aug 27, 2024		Soil	R24-Se0019522	X	X
10	BH24_SPT_1.0-1.45	Aug 30, 2024		Soil	R24-Se0019523	X	X
11	BH23_0.2-0.5	Aug 30, 2024		Soil	R24-Se0019524	X	X
12	BH29_SPT_1.	Aug 29, 2024		Soil	R24-Se0019525	X	X

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

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Site# 2554

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Company Name: Tetra Tech Coffey Environment Pty Ltd ACT
Address: 16 Mildura Street
Fyshwick
ACT 2609

Project Name: CRA- CITY SOUTH EAST- GEOTECHNICAL INVESTIGATION
Project ID: 754-CBRGE334891

Order No.:
Report #: 1137045
Phone: +61 2 6124 5600
Fax: +61 2 6260 7211

Received: Sep 6, 2024 5:23 PM
Due: Sep 13, 2024
Priority: 5 Day
Contact Name: Sch 2.2(a)(ii)

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						Aggressivity Soil Set	Moisture Set
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
	0-1.45						
13	BH30_4.5-5.0	Aug 29, 2024		Soil	R24-Se0019526	X	X
14	BH30_10.5-11.0	Aug 29, 2024		Soil	R24-Se0019527	X	X
15	BH25_SPT_2.5-2.95	Aug 30, 2024		Soil	R24-Se0019528	X	X
Test Counts						15	15

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Tetra Tech Coffey Environment Pty Ltd ACT
16 Mildura Street
Fyshwick
ACT 2609

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: Sch 2.2(a)(ii)

Report **1137045-S**
Project name CRA- CITY SOUTH EAST- GEOTECHNICAL INVESTIGATION
Project ID 754-CBRGE334891
Received Date Sep 06, 2024

Client Sample ID			**BH3_SPT_0.4-4.23**	**BH5_1.7-2.0**	**BH9_0.5-0.8**	**BH10_0.4-0.7**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**R24-Se0019514**	**R24-Se0019515**	**R24-Se0019516**	**R24-Se0019517**
Date Sampled			**Aug 21, 2024**	**Aug 22, 2024**	**Aug 23, 2024**	**Sep 03, 2024**
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	55	18	< 10	12
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	51	180	< 10	58
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	8.4	9.6	8.2	8.6
Resistivity*	0.5	ohm.m	200	56	1000	170
Sulphate (as SO4)	10	mg/kg	11	120	< 10	32
Sample Properties						
% Moisture	1	%	14	21	15	18

Client Sample ID			**BH10_SPT_1.0-1.45**	**BH13_1.5-1.8**	**BH15_0.2-0.5**	**BH14_1.2-1.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**R24-Se0019518**	**R24-Se0019519**	**R24-Se0019520**	**R24-Se0019521**
Date Sampled			**Sep 03, 2024**	**Sep 03, 2024**	**Aug 27, 2024**	**Aug 27, 2024**
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	< 10	43	< 10	< 10
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	33	150	13	17
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	9.0	9.6	7.2	6.8
Resistivity*	0.5	ohm.m	300	68	780	580
Sulphate (as SO4)	10	mg/kg	18	40	< 10	< 10
Sample Properties						
% Moisture	1	%	15	7.0	14	7.1

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Client Sample ID			BH18_0.6-1.0	BH24_SPT_1.0-1.45	BH23_0.2-0.5	BH29_SPT_1.0-1.45
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			R24-Se0019522	R24-Se0019523	R24-Se0019524	R24-Se0019525
Date Sampled			Aug 27, 2024	Aug 30, 2024	Aug 30, 2024	Aug 29, 2024
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	< 10	< 10	< 10	< 10
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	33	71	23	44
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	8.2	8.4	7.8	9.2
Resistivity*	0.5	ohm.m	300	140	430	230
Sulphate (as SO4)	10	mg/kg	35	44	14	< 10
Sample Properties						
% Moisture	1	%	5.7	12	14	17

Client Sample ID			BH30_4.5-5.0	BH30_10.5-11.0	BH25_SPT_2.5-2.95
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			R24-Se0019526	R24-Se0019527	R24-Se0019528
Date Sampled			Aug 29, 2024	Aug 29, 2024	Aug 30, 2024
Test/Reference	LOR	Unit			
Chloride	10	mg/kg	< 10	20	< 10
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	75	69	18
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	9.0	8.3	8.4
Resistivity*	0.5	ohm.m	130	150	560
Sulphate (as SO4)	10	mg/kg	35	19	< 10
Sample Properties					
% Moisture	1	%	18	19	15

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Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Sydney	Sep 12, 2024	28 Days
- Method: LTM-INO-4270 Anions by Ion Chromatography			
Conductivity (1:5 aqueous extract at 25 °C as rec.)	Sydney	Sep 12, 2024	7 Days
- Method: LTM-INO-4030 Conductivity			
pH (1:5 Aqueous extract at 25 °C as rec.)	Sydney	Sep 12, 2024	7 Days
- Method: LTM-GEN-7090 pH by ISE			
Sulphate (as SO4)	Sydney	Sep 12, 2024	28 Days
- Method: In-house method LTM-INO-4270 Sulphate by Ion Chromatograph			
% Moisture	Sydney	Sep 09, 2024	14 Days
- Method: LTM-GEN-7080 Moisture			

Eurofins Environment Testing Australia Pty Ltd
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Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
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Company Name: Tetra Tech Coffey Environment Pty Ltd ACT
Address: 16 Mildura Street
Fyshwick
ACT 2609

Project Name: CRA- CITY SOUTH EAST- GEOTECHNICAL INVESTIGATION
Project ID: 754-CBRGE334891

Order No.:
Report #: 1137045
Phone: +61 2 6124 5600
Fax: +61 2 6260 7211

Received: Sep 6, 2024 5:23 PM
Due: Sep 13, 2024
Priority: 5 Day
Contact Name: Sch 2.2(a)(ii)

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						Aggressivity Soil Set	Moisture Set
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	BH3_SPT_0.4-4.23	Aug 21, 2024		Soil	R24-Se0019514	X	X
2	BH5_1.7-2.0	Aug 22, 2024		Soil	R24-Se0019515	X	X
3	BH9_0.5-0.8	Aug 23, 2024		Soil	R24-Se0019516	X	X
4	BH10_0.4-0.7	Sep 03, 2024		Soil	R24-Se0019517	X	X
5	BH10_SPT_1.0-1.45	Sep 03, 2024		Soil	R24-Se0019518	X	X
6	BH13_1.5-1.8	Sep 03, 2024		Soil	R24-Se0019519	X	X
7	BH15_0.2-0.5	Aug 27, 2024		Soil	R24-Se0019520	X	X
8	BH14_1.2-1.5	Aug 27, 2024		Soil	R24-Se0019521	X	X
9	BH18_0.6-1.0	Aug 27, 2024		Soil	R24-Se0019522	X	X
10	BH24_SPT_1.0-1.45	Aug 30, 2024		Soil	R24-Se0019523	X	X
11	BH23_0.2-0.5	Aug 30, 2024		Soil	R24-Se0019524	X	X
12	BH29_SPT_1.	Aug 29, 2024		Soil	R24-Se0019525	X	X

Eurofins Environment Testing Australia Pty Ltd
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Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

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ACT 2609

Project Name: CRA- CITY SOUTH EAST- GEOTECHNICAL INVESTIGATION
Project ID: 754-CBRGE334891

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Received: Sep 6, 2024 5:23 PM
Due: Sep 13, 2024
Priority: 5 Day
Contact Name: Sch 2.2(a)(ii)

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						Aggressivity Soil Set	Moisture Set
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
	0-1.45						
13	BH30_4.5-5.0	Aug 29, 2024		Soil	R24-Se0019526	X	X
14	BH30_10.5-11.0	Aug 29, 2024		Soil	R24-Se0019527	X	X
15	BH25_SPT_2.5-2.95	Aug 30, 2024		Soil	R24-Se0019528	X	X
Test Counts						15	15

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony Forming Unit	**Colour:** Pt-Co Units (CU)	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

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Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Chloride	mg/kg	< 10			10	Pass	
Sulphate (as SO4)	mg/kg	< 10			10	Pass	
Method Blank							
Conductivity (1:5 aqueous extract at 25 °C as rec.)	uS/cm	< 10			10	Pass	
Method Blank							
Chloride	mg/kg	< 10			10	Pass	
Sulphate (as SO4)	mg/kg	< 10			10	Pass	
Method Blank							
Conductivity (1:5 aqueous extract at 25 °C as rec.)	uS/cm	< 10			10	Pass	
LCS - % Recovery							
Chloride	%	115			70-130	Pass	
Sulphate (as SO4)	%	105			70-130	Pass	
LCS - % Recovery							
Conductivity (1:5 aqueous extract at 25 °C as rec.)	%	102			70-130	Pass	
Resistivity*	%	102			70-130	Pass	
LCS - % Recovery							
Conductivity (1:5 aqueous extract at 25 °C as rec.)	%	97			70-130	Pass	
Resistivity*	%	97			70-130	Pass	
LCS - % Recovery							
Chloride	%	111			70-130	Pass	
Sulphate (as SO4)	%	101			70-130	Pass	
LCS - % Recovery							
Conductivity (1:5 aqueous extract at 25 °C as rec.)	%	101			70-130	Pass	
Resistivity*	%	101			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Chloride	R24-Se0019528	CP	%	96			70-130	Pass	
Sulphate (as SO4)	R24-Se0019528	CP	%	98			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Chloride	R24-Se0019514	CP	mg/kg	55	62	12	30%	Pass	
Conductivity (1:5 aqueous extract at 25 °C as rec.)	R24-Se0019514	CP	uS/cm	51	56	9.0	30%	Pass	
pH (1:5 Aqueous extract at 25 °C as rec.)	R24-Se0019514	CP	pH Units	8.4	8.4	<1	30%	Pass	
Resistivity*	R24-Se0019514	CP	ohm.m	200	180	9.0	30%	Pass	
Sulphate (as SO4)	R24-Se0019514	CP	mg/kg	11	< 10	60	30%	Fail	Q15
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25 °C as rec.)	R24-Se0019522	CP	uS/cm	33	46	32	30%	Fail	Q15
pH (1:5 Aqueous extract at 25 °C as rec.)	R24-Se0019522	CP	pH Units	8.2	8.4	<1	30%	Pass	
Resistivity*	R24-Se0019522	CP	ohm.m	300	220	32	30%	Fail	Q15
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	R24-Se0019524	CP	%	14	13	<1	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
Chloride	R24-Se0019526	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Sulphate (as SO4)	R24-Se0019526	CP	mg/kg	35	34	1.0	30%	Pass	

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Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Sch 2.2(a)(ii)

Analytical Services Manager
Senior Analyst-Inorganic
Senior Analyst-Sample Properties
Senior Analyst-Inorganic

Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

APPENDIX E: SELECTED SITE PHOTOGRAPHS

E.2 : SITE 3 – GLEBE PARK

TETRA TECH COFFEY

APPENDIX E2 – SITE 3 SELECTED SITE PHOTOGRAPHS

Photo 1 – Drilling at BH23, looking towards north east.

Photo 2 – Drilling at BH24, looking towards south.

Photo 3 – Drilling at BH25, looking towards south west.

. **Photo 4** – Drilling at BH26, looking towards north west.

Photo 5 – SPT sample from BH23 at depth between 1.0 – 1.45m bgl.

Photo 6 – SPT sample from BH23 at depth between 2.5 – 2.77m bgl.

Photo 7 – SPT sample from BH23 at depth between 2.5 – 2.77m bgl.

Photo 8 – SPT sample from BH24 at depth between 1.0 – 1.45m bgl.

Photo 9 – SPT sample from BH24 at depth between 2.5 – 2.77m bgl

Photo 10 – SPT sample from BH24 at depth between 4.0 – 4.45m bgl

Photo 11 – SPT sample from BH26 at depth between 1.0 – 1.45m bgl.

Photo 12 – SPT sample from BH26 at depth between 2.5 – 2.78m bgl.

Photo 13 – SPT sample from BH26 at depth between 4.0 – 4.26m bgl.

Photo 14 – SPT sample from BH26 at depth between 5.5 – 5.95m bgl.

Photo 15 – SPT sample from BH26 at depth between 7.0 – 7.06m bgl.

ACT Government | CITY RENEWAL AUTHORITY

City East Project Review

Coordination Meeting

05 February 2025

Overview

Civic Structure Concept

Site legend

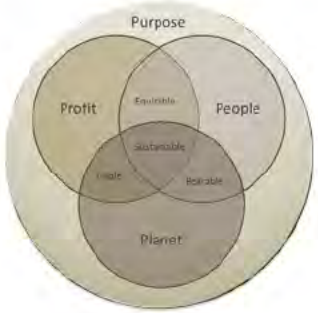
- Acton Waterfront neighbourhood
- Canberra Civic and Culture District
- Future UNSW Canberra City campus
- Site investigations and land release
- City Renewal Authority projects

Civic Structure Concept

Design-led, community focused...

- Choreographing functional nodes/precincts
- Connected by active, pedestrian corridors
- Reinforcing connections between urban clusters
- Resilient Infrastructure
- Urban Housing/New Experiences
- Environmental Overlays

BALANCING COMPETING PRIORITIES FOR SHARED PURPOSE AND BENEFIT



Value Capture Strategy

- Leveraging Better Private Commercial Opportunities to improve Canberra's Public Realm

- Short-term value
  - Land Sale
  - PPP

- Long-term value
  - More Effective Infrastructure
  - More Resilient Infrastructure

  - Higher Economic Activity

City-Making Strategy

- Better Cultural Outcomes
- Better Environmental Performance

- Higher Quality Visitor Experience

- Supporting Canberra as a
- Great Destination

- New Urban Amenities
- Adaptive Reuse and Nature-Based Infrastructural Solutions

- Increased Housing Supply

Governance

- Better Social Outcomes
- Better Planning Outcomes
- Revenue streams

- Valuable Institutional Experience that can be replicated across the ACT

- Demonstrable success in delivering on community aspirations

PROFIT

PEOPLE & PLACE

PURPOSE

Section 65

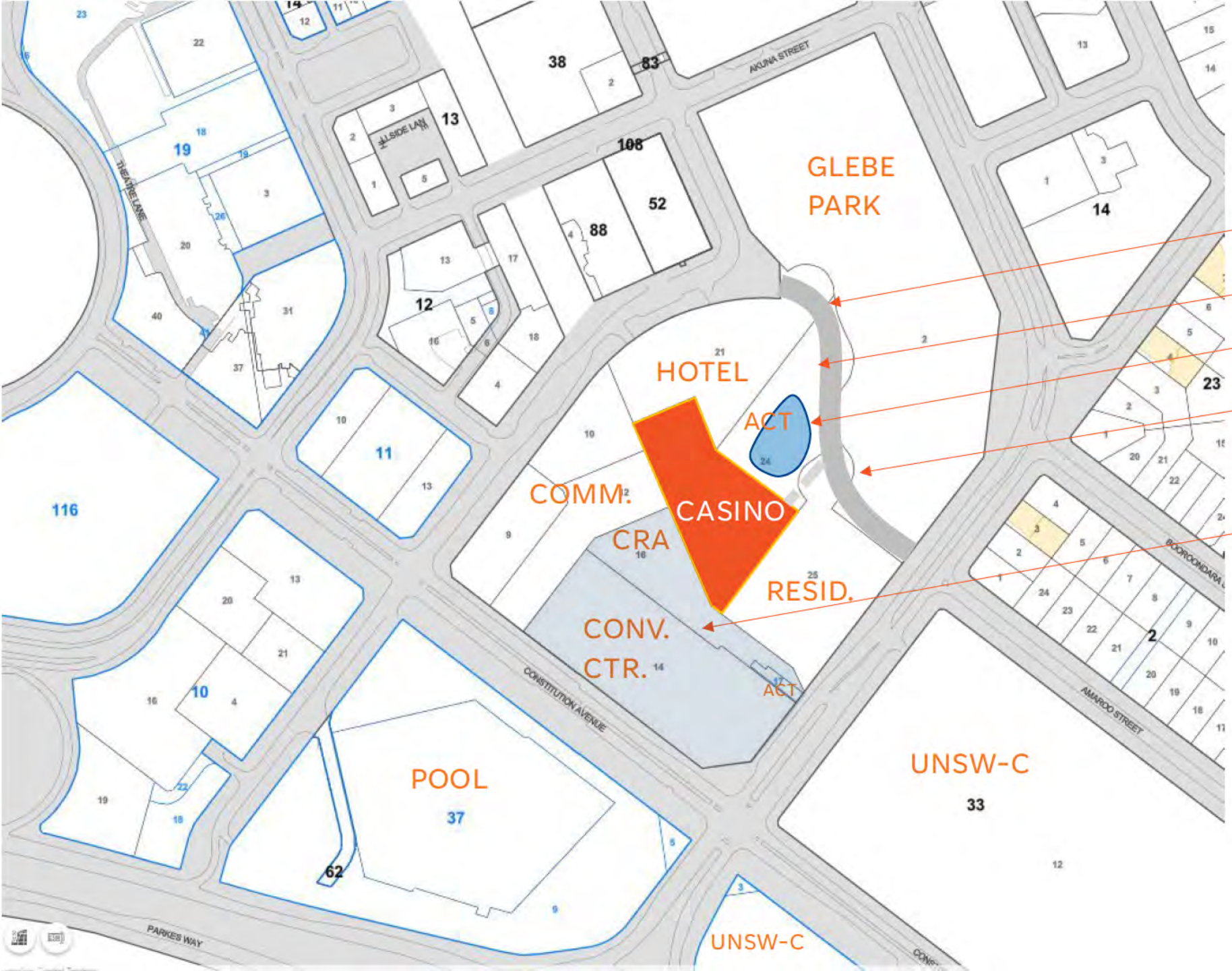
AERIAL VIEW
CITY SOUTHEAST

Context


Resources
AINSLIE PLACE
AKUNA STREET
BOOLEE STREET
COOYONG STREET
BUNDA STREET
LONDON CIRCUIT
CORANDERRK STREET
CURRONG STREET SOUTH
DIRRAWAN GARDENS
BOOROONDARA STREET
AMAROO STREET
EUREE STREET
CONSTITUTION AVENUE
ALLARA STREET
CANBERRA CENTRAL CITY Section 65 Block 24
65
38
13
88
52
12
14
28
23
26
24
11
10
2
0
50 m

Existing Conditions

Test Proposal



New Amaroo St.

Casino New Address

Water Feature

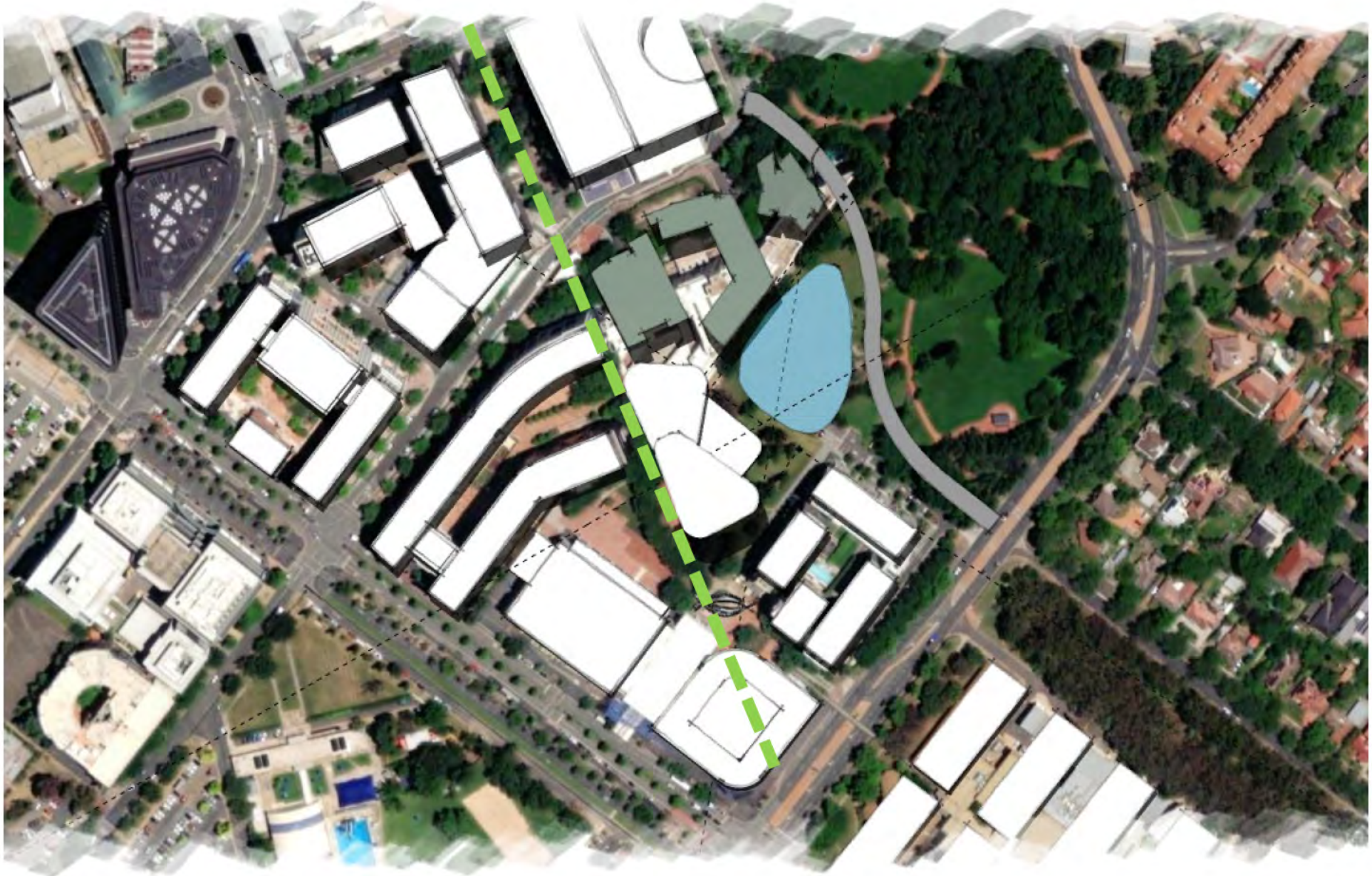
Lot lines to be rationalised

Consolidated Public Land for future use

Master Plan
Ground Plane

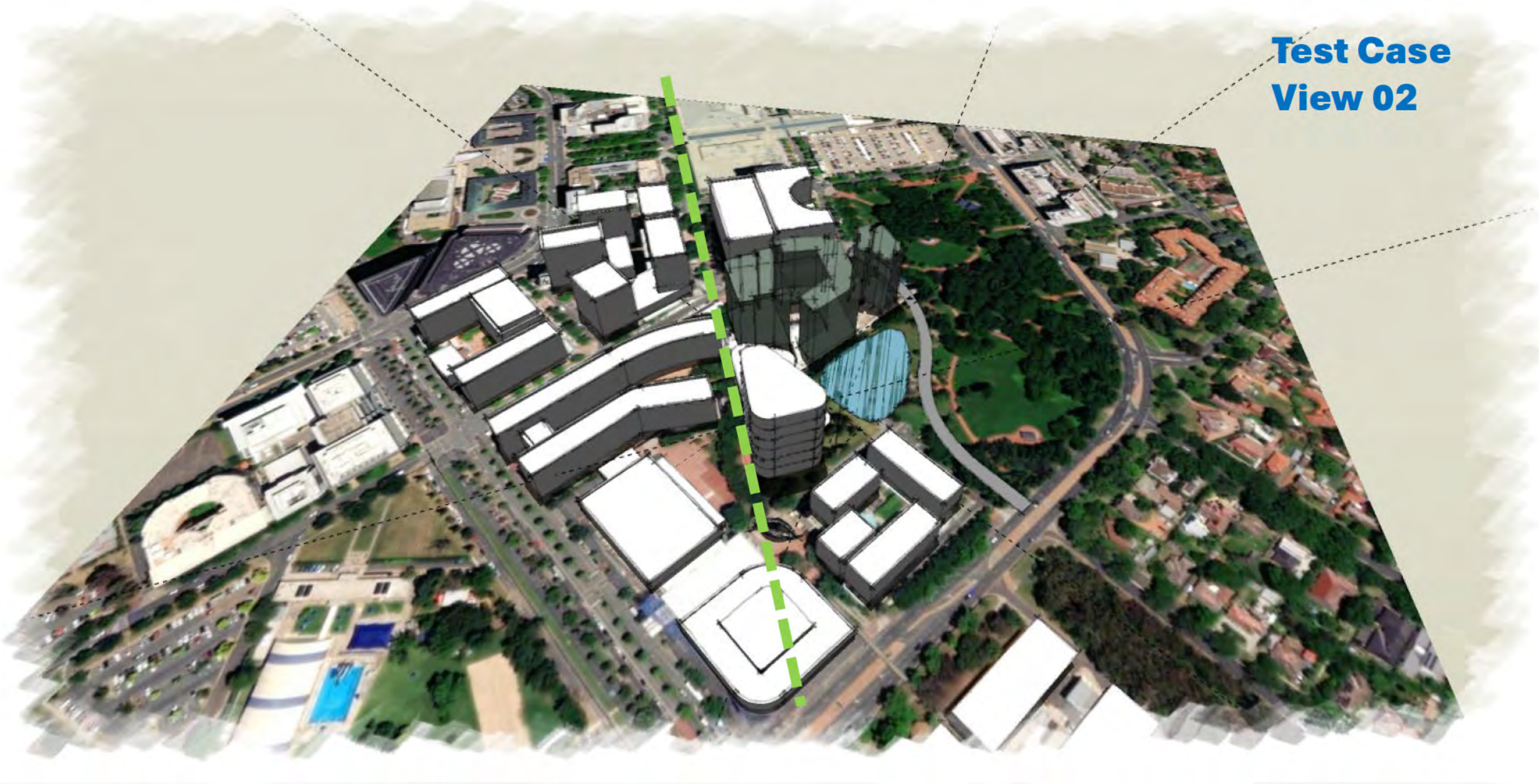
LEGEND

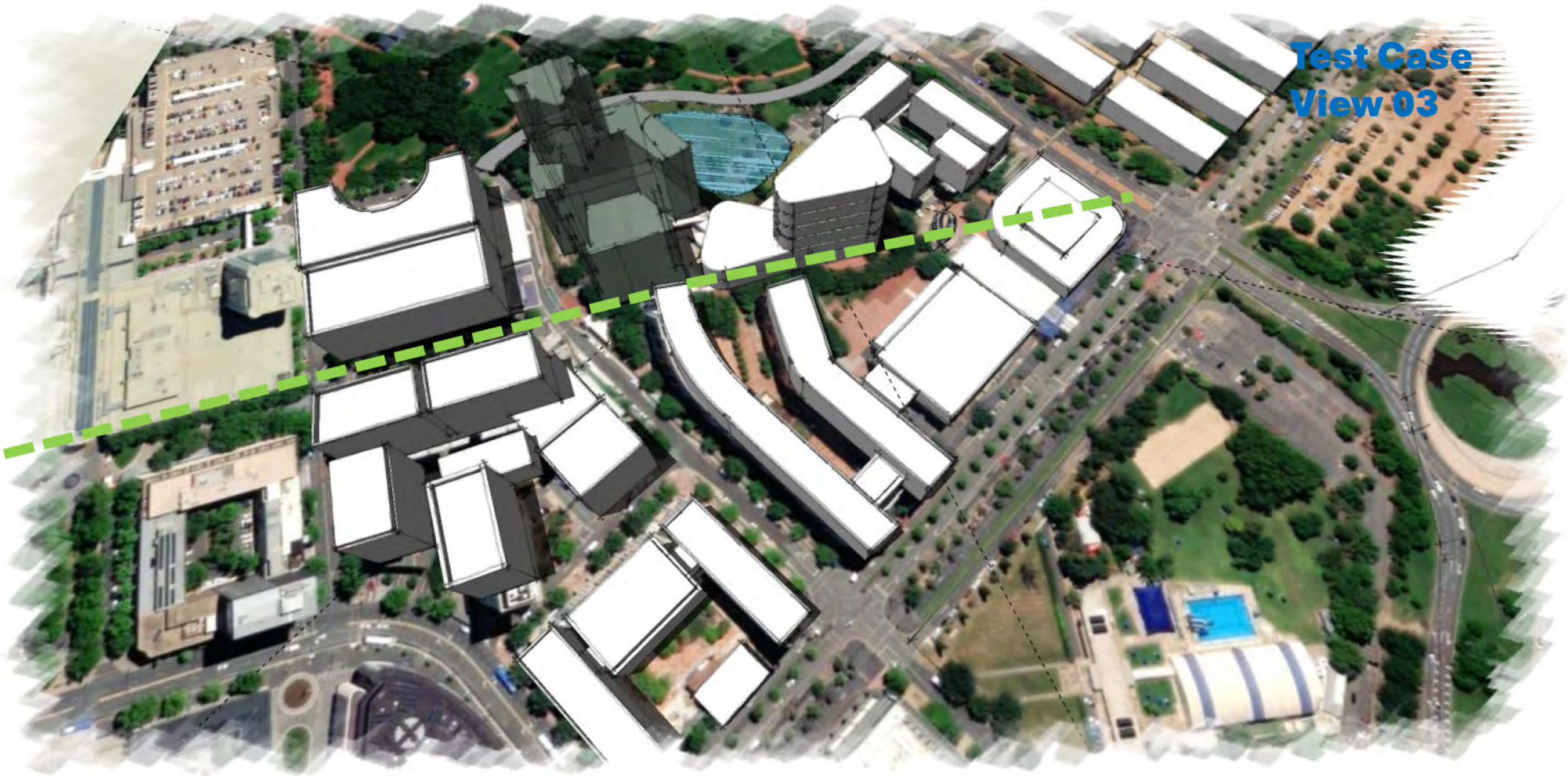
- 1a Block 16, Section 65- Canberra Casino
- 1b Block 21, Section 65- Crown Plaza
- Entry Points
- Servicing
- 1 Block 14, Section 65 – Possible Future Development
- 2 City Walk
- 3 Proposed City Walk Extension
- 4 Proposed Shared Way
- 5 TBC
- 6 Block 24, Section 65 South – Parkland with Basement parking
- 7 Glebe Park
- 8 City Walk Footbridge to UNSW
- 9 Block 12, Section 33 – UNSW Campus future Masterplan
- 10 Railway Easement – UNSW Masterplan
- 11 Block 25, Section 65- Glebe Park Apartments
- 12 Glebe Park Apartments right of way easement
- 13 Proposed Opportunity for existing access extension
- 15 Block 9/10/12, Section 65- Allara St Offices

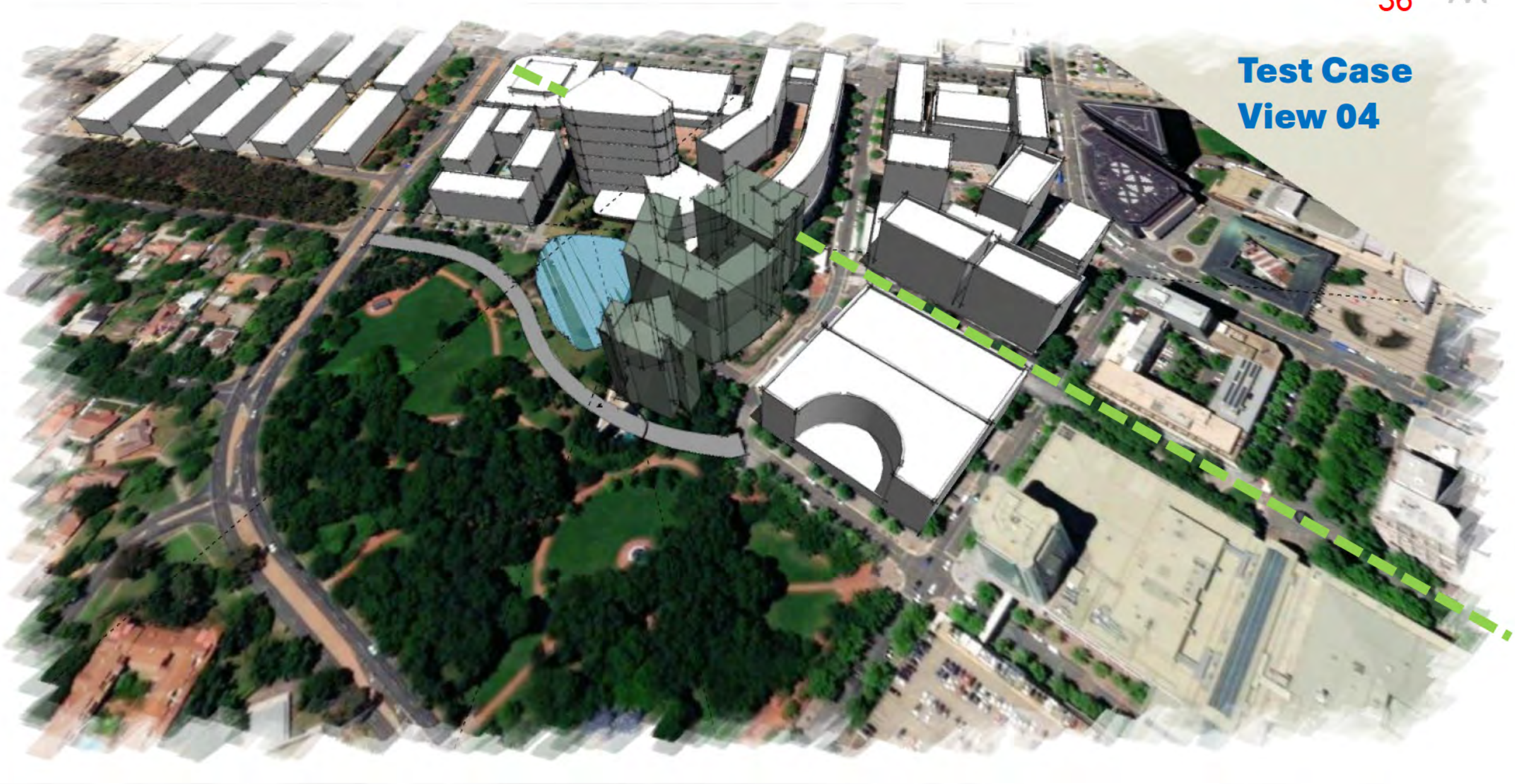


Test Case View 01

Test Case View 02




Test Case
View 03


Test Case
View 04


Test Case
View 05

Development Strategy

Clustering Strategy