

100 Halsey Street

Contamination Site Management Plan

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Prepared for: NZCRE 100 Halsey Limited

Prepared by: Tonkin & Taylor Ltd

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1 Introduction

Tonkin & Taylor Ltd (T+T) has been engaged by NZCRE 100 Halsey Limited (NZCRE) to prepare this Contamination Site Management Plan (CSMP) to outline procedures for NZCRE's appointed contractor to follow during the proposed development at 100 Halsey Street, Wynard Quarter (hereafter referred to as "the site"). The site location is presented in Figure 1.1.

The project site located at 100 Halsey Street occupies a prominent central block within the Wynyard Quarter precinct, with key frontages to Amey Daldy Park and the Daldy Street Linear Park. Over the past decade, the surrounding area has undergone a significant transformation, with high-quality developments establishing elevated expectations and performance benchmarks across the precinct.

This CSMP has been prepared to provide technical support for the substantive application under the Fast-track Approvals Act 2024 (FTAA). It has been prepared prior to confirming the construction methodology for development. Due to site access constraints, we have been unable to fully complete intrusive site investigations.

This CSMP outlines preliminary controls based on the T+T 2026 Preliminary and Detailed Site Investigation (PSI/DSI) Report[1]. The controls will need to be confirmed after intrusive investigations are complete and prior to construction. As such, a revised CSMP or addendum to the CSMP may be required prior to works commencement, if significant changes or amendments are required.

This CSMP report has been prepared in accordance with our proposal[2] dated 19 June 2026 and variation dated 20 August 2026.

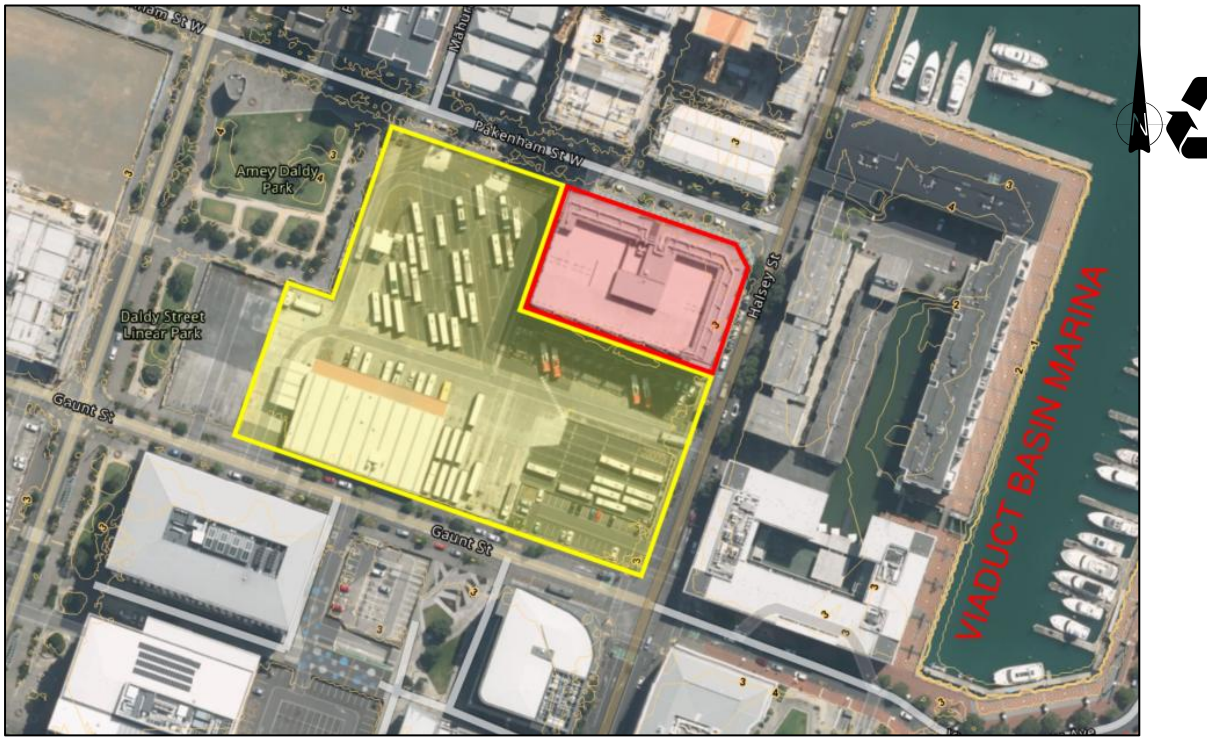


Figure 1.1 Site location. Development area shown in yellow. Existing structure shown in red (Travelodge), which is outside of the scope of this assessment. (Source: Auckland Council GIS).

[1] T+T, October 2026, Preliminary and Detailed Site Investigation – 100 Halsey Street, Auckland Central. Prepared for LT McGuinness Ltd. Reference: 1101803.

[2] T+T, 19 June 2026. *"Variation Order -100 Halsey Street – Substantive Application –Civil, Natural Hazards, and Geotechnical, Contaminated Land services"*, Job number 1101937.1000.

1.1 Site identification

The site is located at 100 Halsey Street, Auckland Central, within the Wynyard Precinct (formerly known as the Western Reclamation) and is within Quarter 2 where retail, high density residential and commercial/office activities are permitted. The site is currently utilised as a bus depot by Kinetic Group (Kinetic). In the late 2010s, the northeastern portion of the site was redeveloped as a Travelodge hotel, Wynyard carpark, offices for NZ Bus (now Kinetic) and retail.

Further site identification details are provided in Table 1.1.

Table 1.1: Site description

Street Address	100 Halsey Street, Auckland Central, 1010
Legal description	SECT 2 SO 526051, Lot 2 DP 80054
Zoning	Business – City Centre Zone
Area (m^2)	17,142
Site owner	Viaduct Harbour Holdings Limited (landowner) NZCRE 100 Halsey Limited (leaseholder)
Current use	Kinetic city bus depot, Wynyard Car Park and retail

1.2 Background and proposed development

The proposed development seeks to deliver a high-quality mixed-use commercial precinct of five buildings comprising premium office accommodation, retail and food and beverage uses, integrated amenities and end-of-trip facilities, together with the supporting infrastructure, building services and car parking required to service the development.

Building 2 is proposed as a purpose-built data centre. The building will accommodate the specialist plant, infrastructure and servicing requirements associated with the data centre use, while also incorporating centralised infrastructure to support the wider development

Basements will be constructed beneath B2, B3, and B4/B5.

The masterplan comprises five buildings arranged around a central mid-block plaza, bounded by Gaunt Street, Halsey Street, Pakenham Street and Daldy Street/Amey Daldy Park. Refer Figure 1.2 below for the proposed development diagram.

- Building 1 - Commercial Office Building corner Halsey Street and Gaunt Street.
- Building 2 - Data Centre, sited centrally between B1 and existing Travelodge.
- Buildings 3A/3B - Commercial Office buildings fronting Amey Daldy Park.
- Building 4 - Commercial Office on Gaunt Street.
- Building 5 - Commercial Office on Gaunt Street between Building 4 and VHHL site.

Construction will be delivered in stages, with Buildings 1 and 2 prioritised to commence as soon as practicable, followed by Building 3 and then Buildings 4 and 5. NZ Bus will progressively vacate the site in line with the construction staging, consolidating its operations into a smaller portion of the site as each stage proceeds.

NZCRE initially intends to develop the southeastern portion of the site adjoining Halsey Street, within the proposed footprints of Buildings 1 and 2. Based on the Peddlethorp drawings dated 23 September 2026, the development area for Buildings 1 and 2 is approximately 4,300 m². The proposed development plans are provided in Appendix A and Figure 1.2.

This CSMP shall be implemented for the soil disturbance activities for the proposed development and is the primary document for management of contamination at the site. The contamination conditions at the site are described in Section 3.



Figure 1.2: Proposed development plan showing location of basements (received from Peddlethorp on 22/10/2026).

1.3 Objectives of this CSMP

The objectives of this CSMP are to:

- Provide procedures to manage potential ground contamination effects on human health and the environment during ground disturbance activities associated with the proposed site development works.
- Outline pre-works site investigations to support site development.
- Meet the requirements for proposed conditions of resource consents for ground disturbance works under the NESCS[3] and AUP[4].

This CSMP provides a framework for managing contamination hazards on-site by identifying potential hazards and proposing mitigation measures relevant to the known site conditions at the time of writing. This CSMP provides information and options to manage Health and Safety (H&S) and environmental protection, but is not intended to relieve the controller of the place of work of either their responsibility for their workers, contractors and the public or their responsibility for protection of the environment.

Works relating to the demolition of above ground structures are outside the scope of this CSMP.

[3] Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.
[4] Auckland Unitary Plan operative in Part, 15 November 2016.

1.4 Regulatory compliance

This CSMP has been prepared in general accordance with Ministry for the Environment (MfE) Contamination Land Management Guidelines (CLMG) No.1 "*Reporting on Contaminated Sites in New Zealand"* (revised 2021). Sampling procedures provided in the plan generally comply with the MfE CLMG No.5 "*Site Investigation and Analysis of Soils"* (revised 2021).

This plan considers the requirements of the Health and Safety at Work (Asbestos) Regulations (HSWAR) (2016), the WorkSafe NZ *Approved Code of Practice (ACOP): Management and Removal of Asbestos* (September 2016) and the *New Zealand Guidelines for Assessing and Managing Asbestos in Soil* (BRANZ Ltd, October 2024).

The persons preparing this CSMP are suitably qualified and experienced practitioners (SQEP) as required by the NESCS and defined in the NESCS Soil Users' Guide[5].

[5] Ministry for the Environment. 2012. Users' Guide: National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.

2 CSMP administration and control

This CSMP provides a framework for managing contamination hazards on-site by identifying potential hazards and suggesting mitigation measures. It provides information and recommendations to augment this process but is not intended to relieve the person conducting business or undertaking (PCBU) of either their responsibility for the health and safety of their workers, contractors and the public or its responsibility for the protection of the environment.

The provisions of this CSMP are mandatory for all persons (employees, contractors and sub-contractors) involved in undertaking any of the proposed ground disturbance works (earthworks, trenching, etc.).

2.1 Roles and responsibilities

The proposed roles and responsibilities under this CSMP are provided in Table 2.1.

Table 2.1: Organisational involvement

Company/organisation	Roles and responsibilities
NZCRE 100 Halsey Limited	Leaseholder: responsible for ensuring compliance with consent conditions, including the requirements of the CSMP and ensuring a Contaminated Land Specialist (CLS) is retained during the works.
Project Manager	The client appointed Project Manager and the client representative on-site. Responsible for ensuring compliance with the consent conditions, including the requirements of this CSMP and ensuring a CLS is retained during applicable work as the client representative.
Main Contractor (Contractor).	Responsible for implementation of CSMP during earthworks, including monitoring compliance of all Sub-contractors with the requirements for the CSMP.
Any subcontractor (s) undertaking soil disturbance work.	Responsible for undertaking works applicable to their craft in accordance with the requirements of this CSMP.
Contaminated Land Specialist (CLS)	Responsible for provision of ground contamination advice during the works and validation reporting, including additional soil testing. The CLS will be required to undertake site inspections during excavation to verify the requirements of this CSMP and applicable resource consent conditions are met. The CLS shall be a SQEP as required by the NESCS and defined in the NESCS Soil Users' Guide.
Competent person	A competent person must meet the requirements of the HSWAR 2016. This can be the CLS. A person who has the knowledge, experience, skills and qualifications to carry out a particular task e.g. air monitoring during works, assessment of classification and appropriate controls for the activity, undertaking removal of asbestos or asbestos impacted soils.
Licensed Asbestos Removalist	Must be licensed in accordance with Regulation 56 of the HSWAR 2016. Responsible for: • Preparation of asbestos removal control plan (ARCP). • WorkSafe notification for asbestos works. • Oversight of disturbance works.

Company/organisation	Roles and responsibilities
Auckland Council (Regulatory)	Monitoring and compliance of consent conditions.

2.2 Distribution

A copy of the final approved CSMP shall be kept on-site at all times during construction activities. It is the responsibility of NZCRE and/or their nominated project management company to distribute the plan to the Contractor appointed to carry out the work. It is the responsibility of NZCRE's nominated Contractor to distribute the CSMP to any other sub-contractors or parties carrying out earthworks.

2.3 Review and update

This CSMP is a live document. Statutory requirements, operating procedures or site conditions may vary and may require that this plan be amended or updated. Any variations to the CSMP proposed by the Contractor must be approved by NZCRE and the CLS prior to works commencing or the variation being implemented if works have already commenced. If the changes are substantive, they may need to be approved by Council prior to implementation.

It is the responsibility of the appointed Contractor to distribute any changes to the plan to the relevant parties involved in the construction works and update the site copy.

3 Site history and contamination conditions

A summary of the site, including details of the overall site history and contamination risks are provided below. For further detail, the reader is referred to the T+T 2026 PSI/DSI.

3.1 Site setting and condition

The site is located within Quarter 2 of the Western Reclamation where retail, high density residential and commercial/office activities are permitted. The Wynyard Quarter comprises an area of land progressively reclaimed from the Waitemata Harbour. The southern section of the reclamation (including the site) was reclaimed by the Auckland Harbour Board, between 1905 and 1917, principally using material dredged from the harbour. However, the reclamation is also thought to include sandstone from the cliffs adjoining Beaumont Street and more variable fill, including demolition debris, timbers and gasworks, incinerator and other process related wastes, particularly within the upper 1 m to 2 m.

Wynyard Quarter was initially utilised by the timber trade, and then in the 1930s it started to be used for bulk petro-chemical storage. A number of pollution incidents are reported to have resulted from the petro-chemical storage activities, however, the biggest single event is reported to be the loss, in July 1986, of between 800,000 L and 1,400,000 L of Jet A1 fuel from the base of a tank operated by Shell at the Block III site, which occupied the property at the corner of Pakenham Street West, Beaumont Street and Madden Street, 200 m to the west/northwest of the site. T+T note that the former Shell Block III site is cross/downgradient of groundwater flow from the site.

The site is located to the south of the adjacent Mason Brothers Building. The property to the immediate west of the Mason Brothers Building was used by Mobil from 1927 to approximately 2006 mainly for bulk diesel storage (former Mobil Pakenham Street Site) and has since been redeveloped for commercial use as have much of the surrounding properties.

Following its reclamation the site was used by Auckland Regional Holdings as a tram depot and by the Acetone Illuminating and Welding Company. The site is currently utilised as a bus depot by Kinetic Group (Kinetic). In the late 2010s, the northeastern portion of the site was redeveloped as a Travelodge hotel, Wynyard carpark, offices for NZ Bus (now Kinetic) and retail.

3.2 Ground contamination conditions

The site has been used as a transport depot since at least the 1940s and is located on reclaimed land. Potential HAIL activities were undertaken at the site over its history, including the demolition of buildings that may have contained asbestos containing material (ACM) building products and/or lead based paints, placement of potentially contaminated fill, workshop maintenance activities, underground storage tanks (UST) and above ground storage tanks (AST) containing fuel. Key site features identified in the 2026 PSI/DSI are presented on Figure Appendix B.1.

Contamination [6] [7] and geotechnical investigations [8] [9] [10] have been undertaken across the site since December 2002 including borehole drilling, soil sampling and water quality measurements. A DSI was completed by Babbage to support the development of the Travelodge (adjacent northeast refer Figure 1.2). The investigations included soil sampling in the footprint of the Travelodge development as well as in what is now the B1 and B2 development area, and groundwater sampling from three groundwater wells located across the site.

Additional soil investigation was undertaken by T+T within the B1 and B2 development area in May 2026 as part of a supplementary DSI to increase the sampling density in that area. Investigation locations undertaken across the wider siter area (B3, 4 & 5), and within the B1 and B2 development area are shown on Figure 3.1.

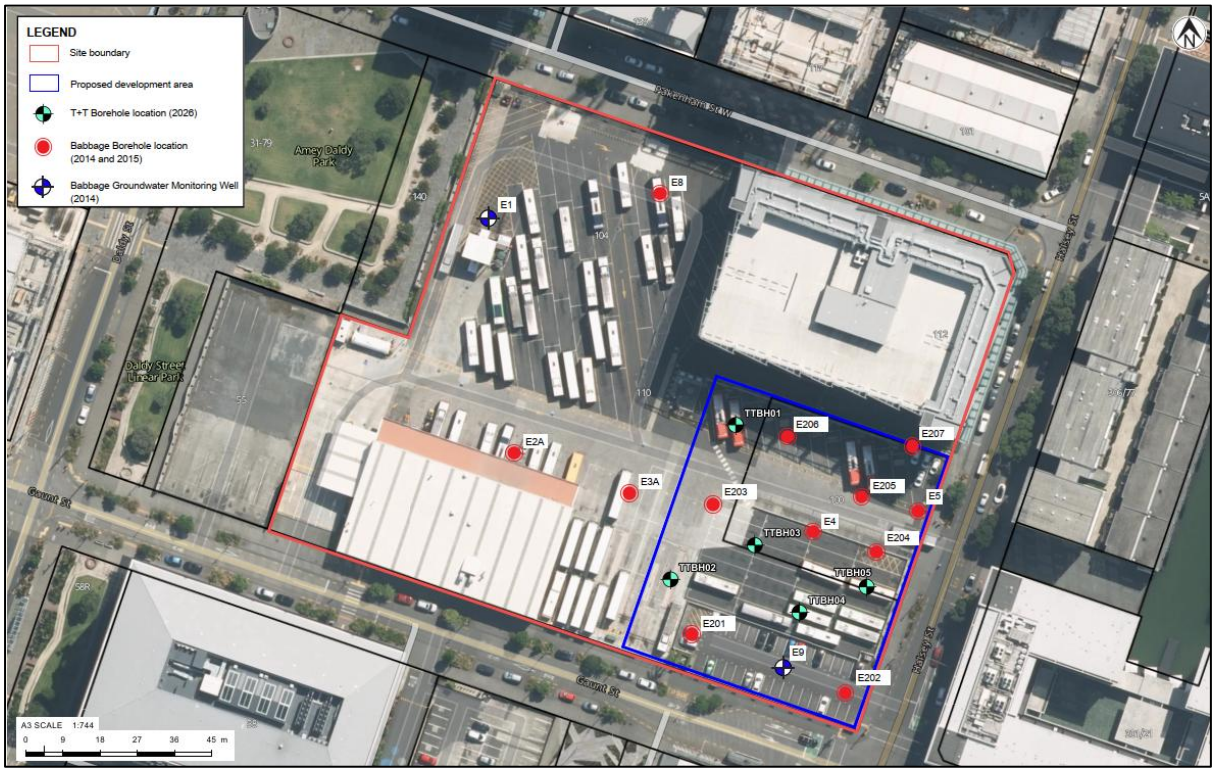


Figure 3.1: Investigation locations. (Source T+T 2026 PSI/DSI).

3.2.1 Soil condition

Investigations undertaken by Babbage and T+T have identified localised soil contamination associated primarily with fill materials. Contaminants include metals, asbestos, cyanide and polycyclic aromatic hydrocarbons (PAHs). A summary table of the results for the site compared against the assessment criteria is presented in Appendix C. The investigaiton results are summarised as follows:

[6] Babbage, 21 August 2015, 100 Halsey Street Redevelopment, Detailed Site Investigation, prepared for Infratil Infrastructure Property Limited. Job No: 51987. Report reference: BDOC0014152496.
[7] Babbage, 19 May 2017, 100 Halsey Street Redevelopment, Detailed Site Investigation, prepared for Infratil Infrastructure Property Limited. Job No: 51987. Report reference: BDOC0014152496.
[8] T+T, June 2002, Geotechnical and Environmental Assessment – Proposed multi-level apartment building, Freemans Bay, Auckland. Report prepared for Viaduct Harbour Holdings Ltd. Job No: 19949.
[9] T+T, November 2014, Geotechnical and Contaminated Land Assessment – 100 Halsey Street, Wynyard Quarter. Prepared for Viaduct Harbour Holdings Ltd. Job No: 30579.
[10] T+T, May 2026, 100 Halsey Street – Buildings B1 & B2 – Geotechnical Desktop Assessment. Prepared for LT McGuinness Ltd. Report reference: 1101803-GEO-RPT-101.

- Lead exceeded the NESCS commercial/industrial land-use criterion at TTBH03, E204 and E4, with concentrations ranging from 4,200 mg/kg to 6,800 mg/kg. All other metal and cyanide results complied with the applicable NESCS human health criteria.
- Asbestos was detected in three of the 19 samples analysed. TTBH05 contained asbestos fines and friable asbestos (AF and FA) at 0.150% w/w, exceeding the Asbestos in Soil criterion of 0.001% w/w. The other asbestos detections were below the applicable guideline value.
- Concentrations of copper, lead, mercury, nickel and zinc exceeded the Auckland Unitary Plan permitted activity (AUP PA) criteria at multiple locations and depths. Benzo[a]pyrene (BaP) equivalent concentrations also exceeded the AUP PA criterion at TTBH03 and E207. Benzene, toluene, ethylbenzene, xylene (BTEX), total petroleum hydrocarbons (TPH), other volatile organic compounds (VOC) and semi-volatile organic compounds (SVOC) were below the applicable criteria or laboratory limits of reporting (LoR).
- Total cyanide at TTBH05 and E205 exceeded the adopted environmental criterion of 8 mg/kg for free cyanide. Comparison of total cyanide against this criterion is conservative, as total cyanide includes species that may not be bioavailable. Free cyanide was not analysed. The laboratory LoR for the 2026 investigation was also above the adopted criterion; therefore, additional exceedances may not have been identified.
- Hydrocarbon odours were observed in fill soils sampled during the 2014/2015 Babbage investigation, and the 2026 T+T investigation. Field PID screening of soil samples during the 2026 T+T investigation indicated volatile ionisable compound concentrations ranging from 0 ppm to 68.3 ppm.
- Investigations undertaken by Babbage in the remainder of the development area identified fill materials containing construction debris, with widespread heavy metal and PAH contamination exceeding the NESCS and AUP permitted activity criteria, including localised hotspots of arsenic, copper, lead and BaP equivalent. Elevated cyanide concentrations were also identified at well E9, while asbestos and ACM were not detected.

Previous investigations at the neighbouring Travelodge site to the north identified contamination within reclamation fill associated with gasworks waste, hydrocarbons, asbestos, cyanide, heavy metals, and PAHs. Reported contaminant concentrations posed an unacceptable risk to human health and required remediation[11], including excavation and off-site disposal of contaminated soil, followed by validation testing[12] to confirm remediation outcomes.

3.2.2 Groundwater condition

Historical groundwater monitoring at well E9 within the B1 and B2 development area identified total cyanide concentrations above the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018) Guidelines trigger levels value for 80% marine ecosystem. TPH and BTEX were below laboratory LoR. Cyanide is therefore the principal groundwater contaminant identified by the available dataset.

Historical groundwater monitoring at well E1, located within the remainder of the development area, identified nickel as the only analyte detected above the laboratory LoR. No other contaminants of concern were identified, and there was no evidence of elevated hydrocarbon or trace metal concentrations in groundwater at this location.

[11] Babbage, 18 May 2017, 100 Halsey Street Redevelopment, Remedial Action Plan, prepared for Infratil Infrastructure Property Limited. Job No: 51987. Report reference: BDOC0014543818.
[12] Babbage, 1 July 2019, 100 Halsey Street Redevelopment, Site Validation Report, prepared for Infratil Infrastructure Property Limited. Job No: 51987. Report reference: BDOC0014543818.

A summary table of the results for the site compared against the assessment criteria is presented in Appendix B.

3.3 Contamination risk

The principal human health risk is expected to be to site workers who may be exposed to contaminated reclamation fill and groundwater, if present, during earthworks. Given the site's location within a densely developed central Auckland environment, there is also potential for adverse effects on adjacent receptors, including nearby residents, the general public, and the environment, if contamination is not appropriately managed.

Investigations in the B1 and B2 development area have identified concentrations of metals, asbestos and PAH in fill material above human health and AUP PA criteria.

A DSI has not been undertaken for the remainder of the development area, as the staged development programme identifies the B1 and B2 building areas as the initial earthworks stage. Further investigation and DSI assessment of the remaining development area will be undertaken as required to support subsequent stages of development. Based on the available soil data from the Babbage investigations, contamination is anticipated to be present more broadly across the site, with elevated concentrations of heavy metal and PAH within fill materials, with concentrations exceeding the NESCS and AUP PA criteria, including localised hotspots of arsenic, copper, lead and BaP equivalent.

The T+T 2026 PSI/DSI has identified potentially contaminating activities in the remainder of the development area, including, but not limited to, fuel storage and the current workshop. There is potential for these activities to have contaminated soil and potentially also groundwater. Further soil investigation will be required to assess the presence and extent of contamination before site re-development (refer Section 4). In addition, the basements for the proposed development are anticipated to intersect groundwater, which is indicated by historical investigations to be impacted with cyanide.

Based on the current available soil and groundwater investigation results, the risk of vapour intrusion is considered low and a vapour barrier is not indicated to be required for the proposed development, including the proposed basements. Additional groundwater sampling is proposed as part of pre-works testing to assess potential risks from groundwater, including vapour intrusion risk from volatile contaminants (if found to be present) (refer Section 4 for pre-works testing).

The principal contaminants of concern identified by the existing site investigations and from site activities include:

- Heavy metals.
- SVOC including PAH.
- VOC.
- TPH.
- Asbestos.
- Cyanide.

The principal risks posed by the contamination are summarised below:

1 Potential risk to on-site worker human health from direct skin contact and ingestion of contaminated soil or groundwater during ground-breaking, excavation, trenching or other intrusive works.

2 Potential risk to human health from inhalation (of dust) and ingestion and contact with airborne dust and/or vapour during excavation works.

3 Potential risk to the environment associated with:

a Uncontrolled discharges of contaminated surface water or groundwater.

b Inappropriate handling or disposal of contaminated soils or waters.

Exposure to ground contamination hazards during ground disturbance will be controlled by a combination of requirements including dust control, erosion and stormwater control, good hygiene practices, decontamination procedures, and wearing appropriate personal protective equipment (PPE). These control measures are detailed in the following sections.

Some contaminated soil is expected to be removed during the redevelopment works as a result of the proposed basement constructions. The development plans indicate that the site will have sealed ground surfaces with no exposed soil. When the development of the site is complete, the presence of residual contamination is not expected to present an unacceptable risk to human health or the environment for ongoing commercial/industrial use.

4 Pre-works testing

The development area is currently occupied by the operational Kinetic city bus depot, which has constrained intrusive investigation across much of the site. Consequently, pre-works testing is proposed to be undertaken following demolition of the site structures.

Asbestos testing completed to date for the B1 and B2 development area indicates that further sampling is required to confirm appropriate health and safety controls for soil disturbance works. This information will also support classification and disposal of spoil at suitable waste management facilities.

A DSI has not yet been completed for the wider development area (B3 to B5), and only limited site investigation information is available. Further site investigations are therefore proposed following demolition of the existing structures and site surfaces. A DSI report will be prepared once the wider intrusive investigations are complete and provided to NZCRE and Auckland Council alongside an updated CSMP. The DSI may also be completed in stages depending on the staging of the development.

Contamination sampling and revision of the CSMP controls will be undertaken by NZCRE's project appointed CLS. The sampling programme is outlined below.

4.1 Sampling rationale

A combination of targeted and systematic soil sampling is proposed as shown in the pre-works investigation plan included in Appendix D and rationale indicated in Table 4.1. The number of sample locations for the targeted areas may vary based on post-demolition field observations and MfE guidance, and will be determined by the CLS.

Groundwater investigation is also proposed to collect current groundwater data for the site. There are understood to be three existing wells at the site (E9, BH201 and BH202), as shown in Figure Appendix D.1 . Additional monitoring or additional groundwater well installation may be required based on the findings of the future investigations.

The current development plans include a basement beneath building B3 in the northern portion of the site. A groundwater monitoring well (E1) was previously installed by Babbage along the north-western site boundary; however, it has not been located during recent site works. Given the proposed basement excavation and the proximity of this area to the former Mobil Pakenham Street site, it is recommended that a replacement groundwater monitoring well be installed as part of the pre-construction investigation programme to enable assessment of groundwater conditions within the B3 development area.

Table 4.1: Proposed detailed site investigation methodology and rationale

Sample locations (suggested but not limited too)	Media	Comments
B1 and B2 development area		
Systematic: 6 No across the B1 and B2 development area (based on a 19 x 19 m grid).	Reclamation fill and/or underlying natural soils.	• Sampling will comprise testing of soil from across the development area following demolition of building structures and site surfaces. The CLS will develop the sampling plan taking into account asbestos removal works and the available earthworks plans.

Sample locations (suggested but not limited too)	Media	Comments
Wider site area		
Targeted areas: • AST • USTs • Workshop • Transformers • Bus wash • Former workshop **Systematic:** 11 No across the remainder of the site (based on a 30 x 30 m grid).	Reclamation fill and/or underlying natural soils.	• The number of samples in the target areas will be based on a pre-demolition inspection by the CLS. UST and AST removal procedures are set out in Section 4.2.3. • Collection of samples at near-surface, 0.5 m below ground level, 1 m bgl and 1 m thereafter unless signs of contamination are encountered to support disposal and final construction CSMP controls. • Target depth for investigations will be at least 1 m into natural soils or a minimum of 4 m below surface (depending on depth of the basements). • Sample analysis to be undertaken in accordance with Section 4.2.1. • Grid-based sampling is also proposed to characterise conditions across the wider site.
	Groundwater	• Monitoring to be undertaken in accordance with Section 4.2.2.

4.2 Sampling methodology

4.2.1 Soil sampling

Soil samples for chemical testing shall be collected in general accordance with the MfE CLMG No.5:

- Materials encountered shall be logged in accordance with the NZ Geotechnical Society *"Guidelines for the classification and field description of soils and rocks for engineering purposes"*.
- Freshly gloved hands shall be used to collect soil samples into laboratory supplied containers.

Soil samples are to be field screened for VOC with a photo-ionisation detector (PID).

Samples for asbestos testing shall be collected in general accordance with the methods for semi-quantitative analysis of asbestos in the soil as set out in the Asbestos in Soil Guidelines as follows:

- Inspect soil for potential ACM fragments. Collect all suspected ACM into a zip-lock plastic bag.
- Collect a 500 mL sample of the soil using a freshly gloved hand or trowel.

Any equipment used to collect the samples shall be decontaminated between sample locations using clean water and Decon 90 (a phosphate-free detergent).

Samples for chemical analysis shall be shipped in chilled conditions to an International Accreditation New Zealand (IANZ)-accredited laboratory under chain of custody documentation.

Systematic soil samples collected from the wider site shall be analysed for metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), SVOC, TPH, VOC, asbestos (semi-quantitative analysis in accordance with NZ Asbestos in Soil Guidelines) and cyanide. The laboratory schedule for targeted samples will vary based on the contamination source and will be confirmed by the CLS. Appropriate collection and analysis of duplicate samples shall be undertaken and as directed by the CLS.

Systematic soil samples collected from across the B1 and B2 development area will be analysed for asbestos (semi-quantitative analysis in accordance with NZ Asbestos in Soil Guidelines) only.

4.2.2 Groundwater sampling

The following summarises the groundwater sampling programme and procedures to be completed:

- Complete two rounds of groundwater quality monitoring from the two installed wells from the geotechnical investigation and existing well E9 to characterise contaminant concentrations and to assess potential disposal/discharge options.
- If a basement is to be installed beneath B3, complete two rounds of sampling for the new well (to be installed) in that area.
- VOC readings from the headspace of the wells should be taken using a PID following opening of the well.
- The water level should be recorded for each well, prior to sampling using a calibrated interface probe.
- Wells should be purged prior to groundwater sampling. Groundwater sampling shall be undertaken using low-flow techniques.
- Groundwater samples shall be undertaken once water quality field parameters have stabilised and at least 2 L of water has been purged.
- Collection of field parameters shall be undertaken during purging. An appropriate device should be calibrated prior to use in the field, and the following parameters should be recorded: conductivity, temperature, oxygen reductive potential (ORP), and pH. Stabilised field parameters shall be recorded prior to sampling.
- Descriptions of the visual and olfactory characteristics of the groundwater should be recorded each time a measurement is made and include details such as elapsed time, volume purged, colour, turbidity, odour, sheen etc.
- Groundwater should be collected directly or with a laboratory field filter kit (where appropriate, for metals analysis) into laboratory prepared preserved and unpreserved sample containers; and
- The water samples shall be labelled and dated and placed in a chilled container for transport to the laboratory.

Any equipment used to collect the samples shall be decontaminated between sample locations using clean water and Decon 90 (a phosphate-free detergent).

Samples for chemical analysis shall be shipped in chilled conditions to an IANZ-accredited laboratory under chain of custody documentation.

Groundwater samples shall be analysed for dissolved metals (arsenic, cadmium, chromium, copper, lead, nickel and zinc), PAH (screen), VOC (screen), TPH, cyanide and pH. Appropriate collection and analysis of QA/QC samples shall be undertaken and as directed by the CLS.

The two monitoring rounds will be undertaken at least four weeks apart.

4.2.3 UST and AST removal

The programme for decommissioning of the petroleum storage systems at the site is not yet confirmed. We anticipate ASTs will be removed as part of demolition, and USTs may be removed during the demolition stage or during bulk earthworks.

The Contractor shall remove the USTs and ASTs using the following procedures:

<u>The Contractor shall:</u>

- Notify Council of the discovery as soon as practicable, as a minimum before removal of the UST/AST begins.

- Ensure that the removal works are undertaken in accordance with this CSMP and the relevant guidelines, regulations and Council requirements, including but not limited to:
  - Code of Practice for the Design, Installation and Operation of Underground Petroleum Storage Systems. The Occupational Safety and Health Service, Department of Labour, Wellington, 1992.
  - Hazardous Substances and New Organisms Act; and
  - MfE Contaminated Land Management Guidelines, in particular the current edition of *Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealan*d.
- Liaise with the CLS so that inspection and validation testing of the works is completed.

The CLS shall:

- Observe the removal of the tank including taking photographs and looking for evidence of breaches in the system.
- Collect soil samples from appropriate locations beneath the infrastructure including, fill points, filling or dispensing lines and beneath storage tanks/areas in accordance with the MfE Contaminated Land Management Guidelines.
- Schedule the soil samples for laboratory analyses for contaminants of concern relevant to the UST, such as TPH, BTEX and/or PAHs.
- Review the laboratory results against the assessment criteria and provide preliminary conclusions as to the status of remaining soils at the site and the need for any further excavation (if any).
- Collate the necessary information, in accordance with the MfE Contaminated Land Management Guidelines, for inclusion in the pre-works investigation report or the Site Validation Report (depending on the timing of the tank removals).

4.3 Data evaluation

Soil and groundwater sample results shall be assessed against the following evaluation criteria and the proposed re-development land use:

- For human health:
  - The NESCS Soil contaminant standards (SCS) for commercial/industrial land use.
  - Human health soil guideline values presented in the Asbestos in Soil Guidelines.
- For discharged to the environment:
  - AUP – Standard E30.6.1.4 PA soil acceptance criteria.
  - Background Concentrations of Inorganic Elements in Soils in the Auckland Region Technical Publication No. 153 (Non -volcanic Background Concentrations)[13].
- For soil disposal:
  - The AUP PA criteria can be used as a proxy for typical managed fill acceptance criteria to account for variability in acceptance criteria between managed fill facilities. T+T note that there is no AUP PA criterion for asbestos in soil, and asbestos in soil acceptance also varies between managed fill facilities. Should the Contractor advise they have a preferred managed fill facility, the criteria can be included in the screening.
- For groundwater:

[13] Auckland Regional Council, 2001, Background Concentrations of Inorganic Elements in Soils in the Auckland Region Technical Publication No. 153

  - ANZG 2018 Guidelines: Marine water quality guidelines for 80% protection level as per the controlled activity rules in the AUP (the ANZG are the updated version of the ANZECC 2000 Guidelines [14] to which the AUP refers.)
- For consideration of discharge to trade waste systems:
  - Watercare Services Limited, July 2019, Trade waste characteristics and substances control.

4.4 Reporting

The CSMP shall be updated following:

- The pre-works testing conducted in the B1 and B2 development area.
- The pre-works DSI for the remainder of the development area.

The procedures outlined in Sections 5, 6 and Appendix E are proposed on a precautionary basis given the current site data, and may change as a result of the pre-works investigations.

[14] Australian & New Zealand Guidelines for Fresh and Marine Water Quality (2000).

5 Health and safety procedures

The Contractor shall prepare and implement a risk assessment in compliance with the Health and Safety at Work Act 2015 and other applicable legislation, regulations, codes, and guidelines. This is likely to comprise a Job Safety Analysis (JSA) or similar document. The Contractor's assessment shall also cover measures related to the presence of potentially contaminated material.

As described in Section 4, further investigations are required prior to disturbance. The procedures within this section are proposed on a precautionary basis and reflect good practice for reducing exposure risks to the extent practicable. As noted, these procedures will be further updated upon completion of the pre-works investigation.

5.1 Protective equipment

The wearing of the following PPE will be mandatory for all personnel involved in ground disturbance activities where the potential for direct contact (including accidental contact) with soil exists:

- Full-length clothing.
- Impermeable gloves, for example, nitrile, polyvinyl alcohol or viton. However, the resistance of the gloves to the contaminants likely to be encountered on-site should be confirmed prior to use.

Generally, these requirements are expected to be limited to personnel undertaking manual handling/excavation activities which may place them in direct contact with potentially contaminated materials. Personnel who are operating machinery, such as excavators and trucks, and are therefore unlikely to come into direct contact with contaminated materials are exempt from these requirements while they are operating the equipment.

Additional requirements such as safety glasses, dust masks, disposable coveralls etc. may be required depending on the results of additional soil sampling or more significant soil conditions (refer Appendix E). The conditions under which the need for additional requirements will be triggered shall be identified in the project health and safety plan or by communication from NZCRE or their appointed client representative in conjunction with the CLS and the contractor.

Note: *Workers on contaminated sites can be subject to unusual stresses, for example, manual work while wearing dust masks or respirators, or exposure to elevated concentrations of contaminants. It would be prudent to check that personnel working under the requirements of this CSMP do not have any pre-existing conditions which might place them at risk as a result of such stresses.*

5.2 Decontamination and personal hygiene

Appropriate decontamination and personnel hygiene measures shall be implemented during ground disturbance activities to minimise health, safety and environmental risks and limit the migration of contaminants (from waste material, soil, water, equipment and PPE) around and outside the site.

The Contractor shall be responsible for developing and implementing a decontamination strategy appropriate to the nature of the works, contaminants of concern, and results of any additional site validation, delineation or environmental monitoring undertaken during the works.

As a minimum the decontamination strategy shall:

- Prevent the tracking or transfer of contaminated materials off-site.
- Provide suitable facilities for personnel hygiene and removal of contaminated soil, dust or other materials from equipment and PPE.

- Include procedures for management and disposal of contaminated consumables and waste materials.
- Ensure that plant, equipment and vehicles are inspected and cleaned as necessary before leaving work areas or the site.
- Include contingency measures for responding to direct contact with contaminated soil, groundwater or other potentially contaminated materials.

The contractor shall ensure that all personnel are informed of and comply with the site-specific decontamination and hygiene requirements. Eating, drinking and smoking shall only occur in designated areas following completion of any required decontamination procedures.

Where additional site investigation, validation or monitoring identifies contamination levels or exposure risks that differ from those anticipated, the decontamination measures shall be reviewed and modified as necessary to remain appropriate for the conditions encountered.

The work area shall be decontaminated at the completion of works within that area. This shall consist of removal of all soil and dust from the ground surface by sweeping, scraping and/or washing down as appropriate.

5.3 Asbestos management procedures

At present, limited asbestos in soil data are available to inform the required asbestos management and control measures for the site. Asbestos analysis was undertaken within the B1 and B2 development areas as part of the T+T 2026 investigation. Asbestos was detected in three soil samples, with one sample (TTBH05 1.0 m bgl) at a concentration that exceeded the Asbestos in Soil Guidelines Class B threshold of 0.01% w/w AF+FA. This result confirms the presence of asbestos contamination and indicates that appropriate asbestos management controls will be required during earthworks.

As such, **Class B asbestos controls** (summarised in Table 5.1) are set out as a precautionary basis for the B1 and B2 development area. This will be re-considered following the pre-works investigation. For the wider development area, controls are to be confirmed after the pre-works DSI. Should the asbestos in soil sampling indicate a re-rating of the controls after intrusive investigations, Table Appendix H.1 also provides the required controls that should be adopted.

Table 5.1: Class B asbestos controls.

Scenario/asbestos concentration	Class B works – non-friable >0.01% w/w AF+FA in soil >1% ACM
Additional documentation/ notification requirements	Asbestos removal control plan and WorkSafe notification for asbestos removal.
Oversight by a licensed removalist	Required.
Personal protective equipment	Disposable coveralls rated type 5, category 3, nitrile gloves, steel toe capped gumboots or safety footwear with disposable overshoes.
Respiratory protective equipment	Half-face P3 respirator with particulate filter.
Dust/asbestos fibre suppression	Water and polymer spray via localised points before and during works.
Air monitoring	Air monitoring not required but recommended given setting and to confirm that concentrations are below 0.01 f/ml.
Cleaning facilities	Dedicated cleaning area and foot wash.

Scenario/asbestos concentration	Class B works – non-friable >0.01% w/w AF+FA in soil >1% ACM
Vehicle (truck) protection	200 µm heavy-gauge polythene wrapped soil/lined trays and truck covered.
	HEPA filter system fitted for all occupied vehicles where friable ACM on-site (lagging, insulation, etc).
Vehicle Washing Facilities	Visual assessment plus swab (if friable) by an independent assessor or competent person or CLS following brush and or wash down.

5.3.1 Asbestos air monitoring

Asbestos air monitoring will be required under Class B works. The following procedure shall apply at a minimum:

- Air monitoring will be undertaken by the CLS, or a competent person, for the first three working days of the soil disturbance works, subject to weather conditions. If fibres are detected at levels > 0.01 fibre/mL, works shall cease until a review of asbestos management controls are undertaken and modified where necessary. Further controls will be implemented until results are < 0.01 fibre/mL. The review shall be undertaken jointly by a competent person, NZCRE and/or the designated client representative and the contractor. If fibres remain < 0.01 fibre/mL for the duration of the monitoring period, the CLS or a competent person may consider the reduction of the controls in conjunction with visual observations and/or soil sample results. All air monitoring results shall be reported in the validation report (refer to Section 7).
- Additional monitoring shall occur if there is a change in work method or significant change in conditions relative to the first three working days.
- A minimum of three air monitoring pumps shall be used, one upwind of the excavation and two downwind.
- Monitoring and establishment of the monitors shall be undertaken by the CLS, or by a competent person.
- Air monitoring cowls shall be analysed by a IANZ accredited laboratory.
- Air monitoring results shall be evaluated on receipt of the results by a competent person.

5.4 Volatile chemicals and explosive gases

Gas monitoring of explosive gases, carbon dioxide, carbon monoxide and oxygen shall be undertaken by the Contractor at above ground levels using a lower explosive limit (LEL) meter or similar during hours of operation for the duration of the in-ground works.

A PID fitted with a 10.6 eV lamp and calibrated against an isobutylene standard) shall be used by the Contractor to monitor ambient air in the work area (i.e. air in the breathing zone of workers) for total volatile ionisable vapours to provide real time screening and alarming for the potential cumulative mixture of volatile contaminants.

It should be noted that PIDs are not contaminant specific and will therefore detect all ionisable compounds that are present in the air space of the work area. This may result in false exceedances of the action level as a result of detection of compounds which are present at higher, although still safe concentrations, or the detection of compounds introduced by other activities undertaken within or adjacent to the work area (e.g. vehicle exhaust emissions). In these instances the use of NIOSH certified detector tubes, such as Gastec or Draeger colour diffusion tubes (passive and/or active), may be used to monitor exposures to specific contaminants.

In the event that the gas and contaminant vapours do not comply with the following limits, works in the area shall cease until such time the limits are met:

- Explosive gases: greater than 10% of the LEL unless hot work is carried out in which case the limit is 0% LEL.
- Carbon monoxide: 50 ppm [based on short-term 60 minute exposure period].
- Oxygen: less than 19.5% by volume under normal atmospheric pressure.
- Hydrogen sulfide: 5 ppm [New Zealand Workplace Exposure Standards (WES) time weighted average (TWA)].
- Petroleum hydrocarbons (using PID): 30 ppm. The WES TWA for petrol is 300 ppm. A tenfold safety factor has been applied to the WES TWA.

5.5 Identification of new hazards

The Contractor is responsible for reviewing any new work element and assessing whether there are any new associated hazards and whether these can be eliminated, isolated or minimised. The Contractor shall seek review by the project manager, who will seek CLS input if necessary. The Contractor shall then instruct all staff on the health and safety procedures associated with the new hazard.

6 Ground disturbance procedures

The following controls and procedures must be implemented to manage potential contamination during **all ground disturbance activities, including but not limited to:**

- Removal of site surfacing/capping material (paving materials, asphalt, concrete, building/basement ground slabs etc.).
- All excavation, ground disturbance or intrusive works including piling works.
- Temporary stockpiling of excavated materials.
- Loading of excavated materials and transportation of these materials off-site (soil and/or groundwater); and
- Disposal of soil materials and/or water, including dewatering.

Reference should also be made to the following sections:

- Health and safety procedures relating to contaminated soils are outlined in Section 5.
- Contingency procedures are outlined in Appendix E. These should be followed in the event of unexpected contamination discovery; and
- Validation procedures are outlined in Section 7.

A checklist is included in Appendix F to support the Contractor with CSMP implementation. An example agreement and acknowledgement sheet is attached in Appendix G.

All procedures employed by the Contractor shall comply with the relevant Council bylaws and conditions of any resource/building consent(s), including *Guidance Document 05: Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (June 2016)*.

Table 6.1: General earthworks/ground disturbance procedures

Earthworks practice	Contamination specific management
Site establishment.	• The site hazard board shall state that there is a risk from soil contamination on the site. • Aspects of this CSMP will be included in the contractors site induction so all staff are aware of contamination risks. • Fencing or barriers shall be placed to exclude entry by persons who have not been inducted. • Appropriate decontamination facilities shall be established (refer to Section 5.2 for further detail). • PPE shall be purchased and held on-site (refer to Section 5.1). • Prior to off-site disposal of soil, approval must be received from the disposal site. *Note: Sampling will potentially be required to inform disposal of underlying reclamation fill material. A conservative approach may be taken by disposal facilities until results are obtained, and this may result in higher disposal costs without soil analytical results.* • Sampling to be undertaken after site surfacing removal or from spoil generated during pile installation, as outlined in Section 5.3 and 5.5.
Health and Safety at Work (Asbestos) Regulations.	**Class B Contamination Controls** will be adopted initially until further soil sampling can be undertaken. The procedures are outlined in Section 5.3.
Decontamination.	Decontamination to be completed as per Section 5.2.

Earthworks practice	Contamination specific management
Dust and odour control for management of contaminated soil/soil disturbance.	To avoid mobilisation of contaminants in dust and/or odour the following controls and monitoring systems shall be put in place: • Maintain damp conditions using a water truck and/or water sprays in trafficked areas and within the excavation, sorting, filling and loading areas. • Dust controls shall comply with the applicable Council guidelines, regulations and other applicable legislation. • Dust and odour should be monitored by the contractor on a continuous basis and controls upgraded if necessary (for example increasing the number of watering points and/or frequency of watering). • If odour and/or dust discharges are occurring, then the contingency measures in Appendix E shall be followed. • Asbestos in air monitoring set out in Section 5.3.
Excavation and transport.	The Contractor shall ensure that: • Trucks shall be loaded directly, with soil stockpiles avoided where possible. As a minimum, trucks are to be covered when transporting spoil off the site. • Stockpiling of odorous materials is not permitted. • Where stockpiling of soil is necessary, stockpiles shall be: – Where required, stockpiles shall only be placed in an area where runoff can be controlled, clear of any flooding or ponding areas and at an adequate distance away from receptors. Alternatively appropriate sediment and erosion controls shall be constructed around the stockpiles (cut off drains, silt fences and silt socks) i.e. placed within areas where water and sediment discharges are controlled. – Placed on paved or impermeable surface(s) and with soil of similar contamination levels. Should contaminated soil be directly stockpiled on clean material, the surface soils of the underlying material may be required to be excavated and disposed of as contaminated material and/or validation testing. – Kept damp during works. – The stockpiles will be covered with geotextile or a polythene if not in use for more than 3 days to prevent rainfall induced erosion and dust. – Any stockpile that is inactive for longer than 1 week shall be stabilised (i.e. mulched). • The disposal documentation/weighbridge dockets for each load shall be collected and provided to the CLS one month after completion of works. • No on-carting of material shall be undertaken, once loaded into the trucks the material must be disposed of to a facility consented to receive the level of contamination present.
Spoil reuse.	The site redevelopment plans include the excavation of reclamation fill to accommodate basement levels across the site footprint. Spoil is not anticipated to be re-used, however, the data to date indicates soil can be re-used onsite with a hard cap (asphalt or concrete) or 0.2 m thick soft cap. Specific re-use considerations can be confirmed after the pre-works investigation. If spoil is to be considered for offsite re-use, further assessment of the material may be required by a CLS.
Spoil disposal.	• Disposal requirements for **the B1 and B2 development area** are as follows: – Fill materials up to approximately 2.0 m bgl: disposal to a licensed landfill facility. – Fill materials from below 2.0 m bgl: disposal to a managed fill facility.

Earthworks practice	Contamination specific management
	– Natural soil (marine sediments): was not encountered in previous investigations and has not been tested for off-site disposal acceptance. If natural soil is encountered, it is likely to be suitable for disposal at a cleanfill facility, however, testing may be required by the receiving facility. • **Disposal requirements for the wider site are to be confirmed via pre-works investigations**, as the depth and extent of fill are currently unknown. Based on the limited soil data available, fill materials encountered to approximately 2.2 m bgl would require disposal to a managed facility. • Deeper soil (the underlying natural soil) will likely be suitable for disposal as cleanfill; however, this may be subject to further contamination testing. This should be taken into consideration when engaging with disposal sites. • The disposal site operator must provide prior approval of its acceptance of the material before it is carted off-site. • Records (disposal dockets) to be kept as proof of disposal location(s). • All surplus soil must be disposed to a facility consented to receive the level of contamination.
Water discharges.	• Where possible clean water shall be diverted away from excavation areas by use of bunds, socks etc. • All stormwater which has come into contact with exposed soil during earthworks, and does not soak away, will be contained for either: – Soakage to ground through a soakage pit located on-site. Location and suitability of soakage will need to be considered with contractors to manage adverse effects on neighbouring properties. Should this option be utilised, the location to be provided in the final CSMP updated prior to construction and/or within the construction methodology. – If soakage cannot be maintained and off-site discharge is required, discharge to tradewaste/sewer under permit or through a tradewaste contractor will be required. – If discharge to stormwater system is required, the water shall be initially treated to remove sediment/solids. Validation of the discharge would be undertaken to establish it can meet the ANZG 80% marine criteria (following reasonable mixing) prior to discharge. See the stormwater quality monitoring section below for validation procedures. • If groundwater is encountered and requires disposal it shall be managed in accordance with the above procedures. Groundwater data to date (refer Section 3.3) indicates disposal to trade waste would be required.
Stormwater quality monitoring.	As the reclamation fill materials may contain contaminants that could affect surface water quality confirmation of the quality of any effluent generated from the site shall be confirmed prior to discharge. Proof of performance monitoring shall be conducted as follows: • All water is to either be contained on-site or collected for off-site disposal to an appropriately licensed facility during the proof of performance monitoring period. • Samples of effluent are to be collected by the CLS from the outlet of the stormwater treatment system on a daily basis for 3 consecutive days; • Following collection the samples shall be submitted to an IANZ accredited laboratory for analysis for TSS, cyanide, metals, SVOCs, and TPH. This suite may be altered following the pre-works investigation findings and Watercare trade waste requirements. • The CLS shall compare the averaged results to the ANZG for marine water at the level of protection of 80%of species.

Earthworks practice	Contamination specific management
	• If the average results obtained over the 3 day period comply with the respective ANZG criteria discharges to stormwater network can commence; OR • Where the average effluent concentrations do not comply with the above criteria the contingency measures defined in Section Appendix E shall be implemented. For discharges to the stormwater network ongoing monitoring shall be conducted as follows: • Samples of effluent are to be collected from the outlet of the stormwater treatment system on a weekly basis (provided discharges are occurring) during the period that excavation/ground disturbance works are being conducted. • Following collection the samples shall be submitted to an IANZ accredited laboratory for analysis for TSS, metals and PAHs. • The results shall be compared to the ANZG within 1 working day of receipt of the results from the laboratory. • If the effluent concentrations do not comply with the above criteria the contingency measures for defined in Appendix E shall be implemented immediately; and • For discharges being conducted under contingency measures ongoing monitoring shall be conducted in accordance with the applicable permit conditions, e.g. trade waste permit requirements.
Imported material.	• All soils imported to site must either be hardfill sourced direct from a consented quarry or meet with the following requirements: – Be crushed concrete sourced from a commercial recycler who can provide suitable testing information to show that the materials are free of asbestos; or – Be derived from a source, which is previously verified in accordance with the methods described in the NESCS, as being a piece of land to which the NESCS do not apply; or – Have been adequately investigated in accordance with MfE Contamination Land Management Guidelines No.5 – Site Investigation and Analysis of Soils (Revised 2021) by a CLS to meet the following: – For inorganic parameters: published background concentrations for Auckland non volcanic soils. – For organic parameters: cleanfill (Class 5) waste acceptance criteria[15]. Testing will depend on the potential contamination sources and may include metals, PAH, organochlorine pesticides (OCPs) and asbestos content. In all cases the testing information shall be provided to the CLS for approval prior to the materials being imported to site.
Contractor Required Monitoring.	• Daily monitoring shall be undertaken to note use of PPE and presence of unexpected contamination. Action shall be taken as required to notify the relevant parties and rectify any controls if monitoring identifies that it is needed. • Erosion and sediment controls should be monitored on a regular basis, including after periods of heavy rain. • Visual monitoring for dusts shall be carried out on a continuous basis.
Contingency measures.	Contingency measures are set out in Appendix E.

[15] WasteMinz, September 2023, Technical Guidelines for Disposal to Land Revision 3.1

7 Validation and completion reporting

Validation is the process of confirming the objectives of the works have been achieved, confirming works were undertaken according to agreed procedures and reporting on any incidents.

Validation of the site shall be conducted by the CLS. The validation programme recommended includes observation of the ground works and possible collection of soil samples to record the level of contamination (if any) remaining following excavation, prior to removal of underlying natural materials to cleanfill (if required).

7.1 Validation method

Validation sampling will be undertaken following tank removals (Section 4.2.3). Where this work is not completed prior to preparation of the DSI, the results will be reported in a SVR. Based on the information currently available, validation sampling is not anticipated within the B1/B2 development area. However, the requirement for validation sampling elsewhere within the development area will be assessed following completion of the DSI and will depend on the nature and extent of any contamination identified.

Where unexpected contamination conditions are encountered and remediated, the appointed CLS shall inspect the material and provide additional advice on the collection of any validation samples.

Validation sampling shall be undertaken by a suitably qualified CLS in accordance with the procedures described in Section 6.

7.2 Works observation

Observation visits shall be undertaken periodically by the CLS during the works to confirm that the works are being undertaken in accordance with this CSMP. The frequency of visits will depend on the staging of the project and what is encountered during the works.

As a minimum, the CLS will be onsite for the following activities during the works:

- To observe removal of ASTs, USTs and underground fuel pipework.
- To undertake soil sampling, as needed.
- To undertake water quality monitoring prior to discharge to trade waste or stormwater.
- To undertake periodic observations as the staged works progress.
- To observe conditions and provide guidance in relation to unexpected finds or application of contingency measures, as requested by the NZCRE 100 Halsey Limited and the Contractor.

7.3 Information required from the contractor

The following information is required from the Contractor for inclusion in project reporting:

- Confirmation that the works were undertaken in accordance with the CSMP or where variations were required details of those variations (note these are to be agreed as per Section 2.3).
- Copies of weighbridge summaries for the disposal destination for all contaminated materials.
- Clearance certificates from any licensed asbestos works (if applicable in case of unexpected finds).
- Documentation confirming the source, and where necessary testing, of any fill or soils imported during works.
- Records of visits by council representatives.

- Details of any complaints.
- Details of any health and safety incident related to the contamination and how they were resolved.
- Details of unexpected encounters/events and the action taken.

The Contractor shall provide the required information within one month of completion of the works to which the information relates.

7.4 Reporting

On completion of the soil disturbing works, a SVR shall be provided to Auckland Council incorporating the following:

- A summary of the works undertaken, including the location and dimensions of the excavations carried out, and the volume of soil excavated, including the quantities reused and disposed off-site.
- Confirmation that the soil disturbance works are complete.
- Confirmation that soil disturbance works were completed according to this CSMP and that there were no variations during the works; If there were variations the then the letter shall detail the nature of the variations and the measures taken to mitigate effects;
- Confirmation that there were no environmental incidents during the works. If there was an environmental incident, then the letter shall detail the nature of the incident and the measures taken to mitigate effects.
- Validation sampling results.
- Documentation confirming the source, and where necessary testing, of any fill or soils imported during works.
- Copies of laboratory report for and location of any soil contamination testing undertaken during the works.
- Confirmation of the disposal destination(s) of all spoil and the verification test results undertaken (where required) for disposal permitting.

The report shall comply with the MfE *Contaminated Land Management Guideline No. 1: Guidelines for Reporting on Contaminated Sites in New Zealand.*

If the asbestos management procedures are required to be implemented during the works additional clearance reporting to WorkSafe maybe necessary to comply with the Asbestos Regulations. Clearance reporting requirements shall be determined by the CLS, in consultation with an Independent Competent Person where necessary.

8 Applicability

We understand and agree that our client will submit this report as part of an application under the Fast-track Approvals Act 2024 and that an Expert Panel will use this report for the purpose of assessing that application. We understand and agree that this report will be used by the Expert Panel in undertaking its regulatory functions.

The requirements of this CSMP are mandatory for all persons (employees, contractor and sub-contractors) who will be involved in undertaking ground disturbance works on the site.

This CSMP provides a framework for managing contamination hazards on-site by identifying potential hazards and suggesting mitigation measures relevant to site conditions and works proposed at the time of writing. This CSMP provides information and recommendations to augment this process but is not intended to relieve the person conducting a business or undertaking (PCBU, previously referred to as the controller of the place of work) of either their responsibility for the health and safety of their workers, contractors and the public, or their responsibility for protection of the environment.

Any persons undertaking ground disturbance works on the site should develop a site-specific risk assessment (such as a job safety analysis (JSA), or similar) to complement this CSMP and to address other health and safety requirements that may be applicable to their particular works. The site-specific risk assessment should also be modified to address any specific health, safety or environmental issues that may arise during the works.

From time to time, statutory requirements, site ownership or occupation, operating procedures or site conditions may vary requiring that this plan be amended or updated.

The plan has been prepared on the basis of information available at the date of preparation nature and continuity of subsoil away from sample locations are inferred and it must be appreciated that actual conditions could vary from the assumed model.

This report has been prepared for the benefit of NZCRE with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement.

Tonkin & Taylor Ltd
Environmental and Engineering Consultants

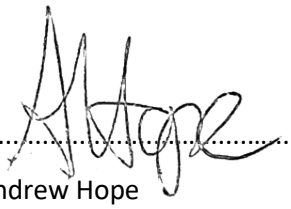
Report prepared by:



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Carmen Thornton
Contaminated Land Consultant

Authorised for Tonkin & Taylor Ltd by:



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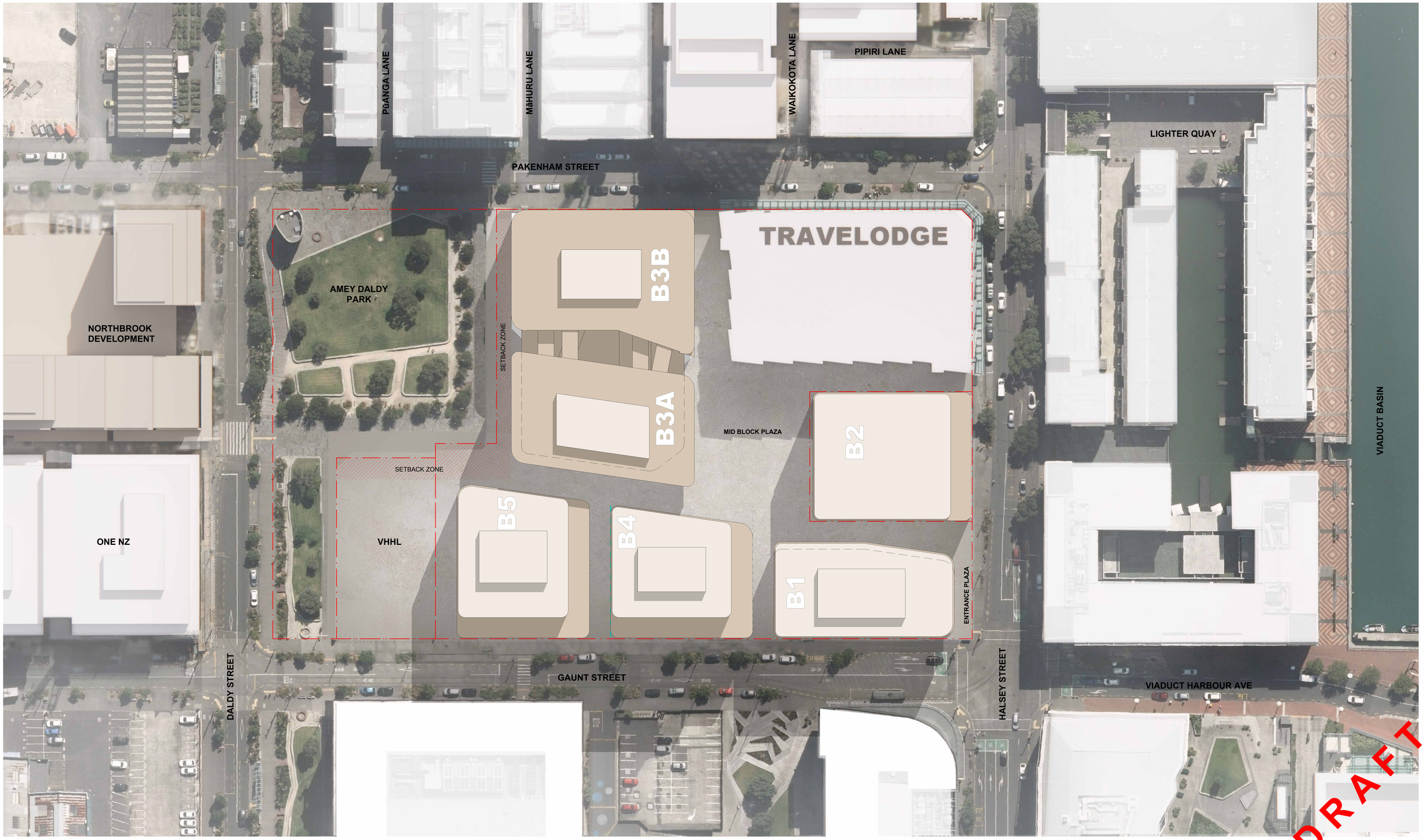
Andrew Hope
Project Director

Report reviewed by: Natalie O'Rourke – Senior Contaminated Land Consultant, CEnvP SC

CAVE

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Appendix A Development plans



DRAFT

1 PROPOSED SITE PLAN
SCALE 1 : 500

0 25 50 m

Author Checker

north

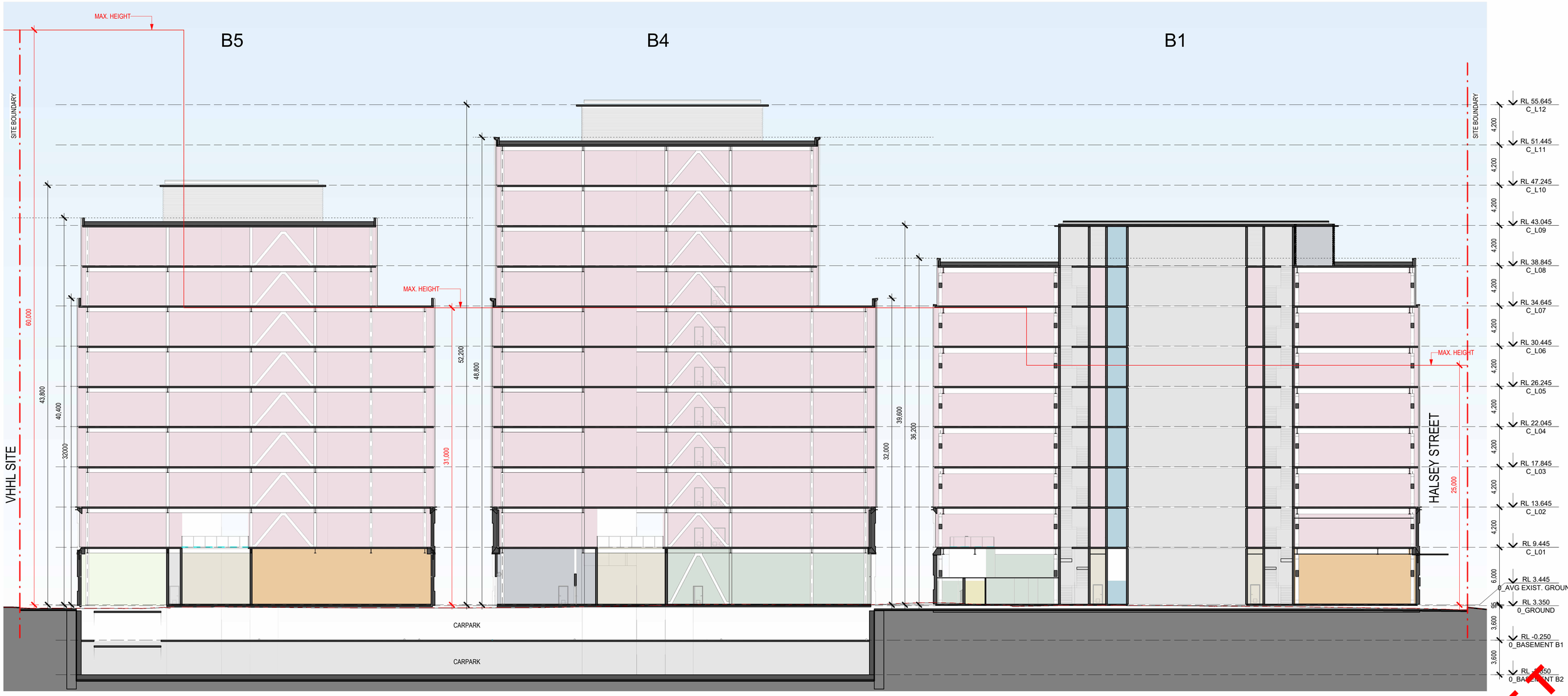
peddlethorp

PROPOSED SITE PLAN
100 HALSEY ST

SHEET NUMBER: 2153 - 1-100
REV:

Peddle Thorp Aitken Ltd
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ORIGINAL PRINT SIZE A1. DO NOT SCALE. CONTRACTOR MUST VERIFY DIMENSIONS ON SITE BEFORE COMMENCING ANY WORK. THIS DRAWING IS DERIVED FROM A BUILDING MODEL CREATED BY MULTIPLE AUTHORS AND IS PREPARED FOR AND ON BEHALF OF peddlethorp



1
1-101 SITE E-W SECTION
SCALE 1 : 200

RAISED FLOORS
RETAIL
LOBBY
OFFICE
TOILETS
END OF TRIP / BICYCLE
RISERS
CIRCULATION
SERVICES / REFUSE
LOADING DOCK

DRAFT

Author Checker

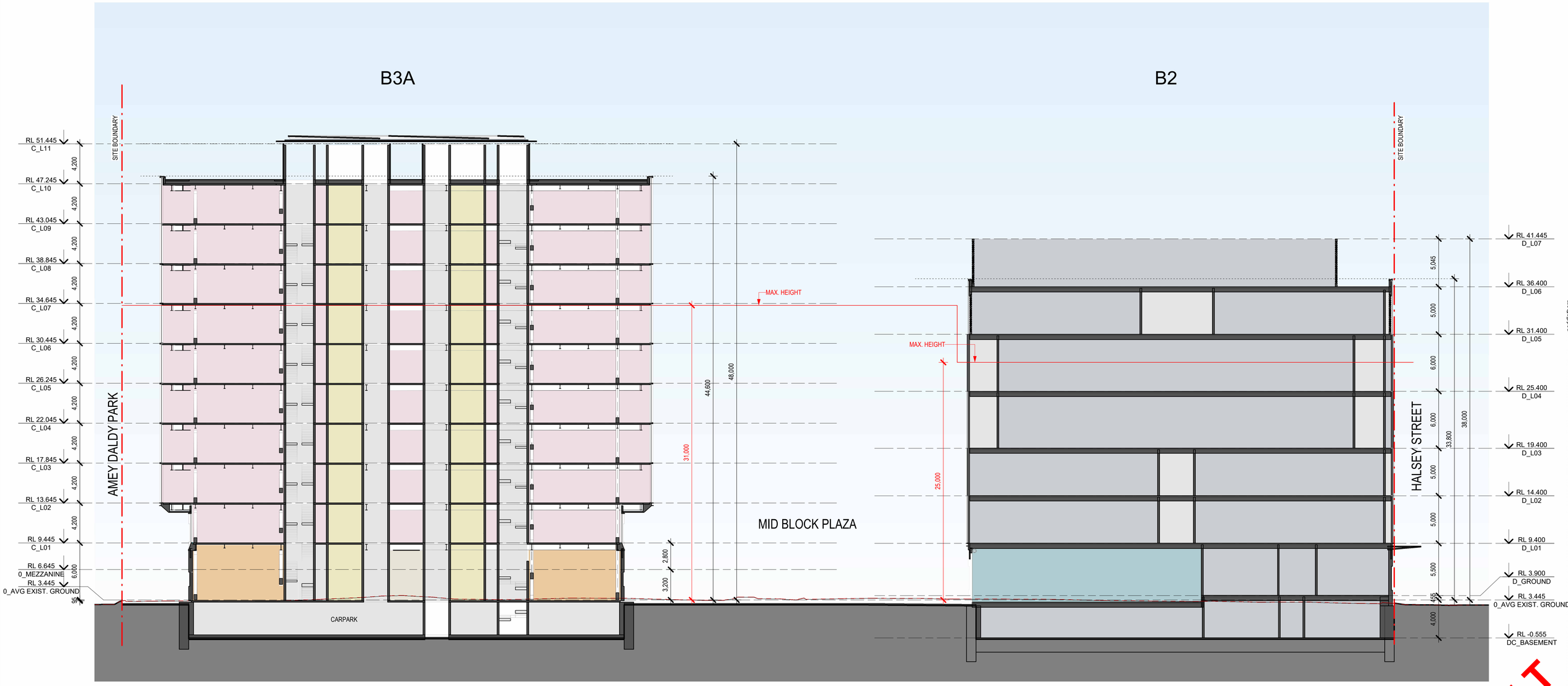
peddlethorp

SITE SECTIONS
100 HALSEY ST

SHEET NUMBER: 2153 - 1-320
REV:

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1 / 1-101 SITE E-W SECTION
SCALE 1 : 200

DRAFT

- RAISED FLOORS
- RETAIL
- LOBBY
- OFFICE
- TOILETS
- END OF TRIP / BICYCLE
- RISERS
- CIRCULATION
- SERVICES / REFUSE
- LOADING DOCK

Author Checker

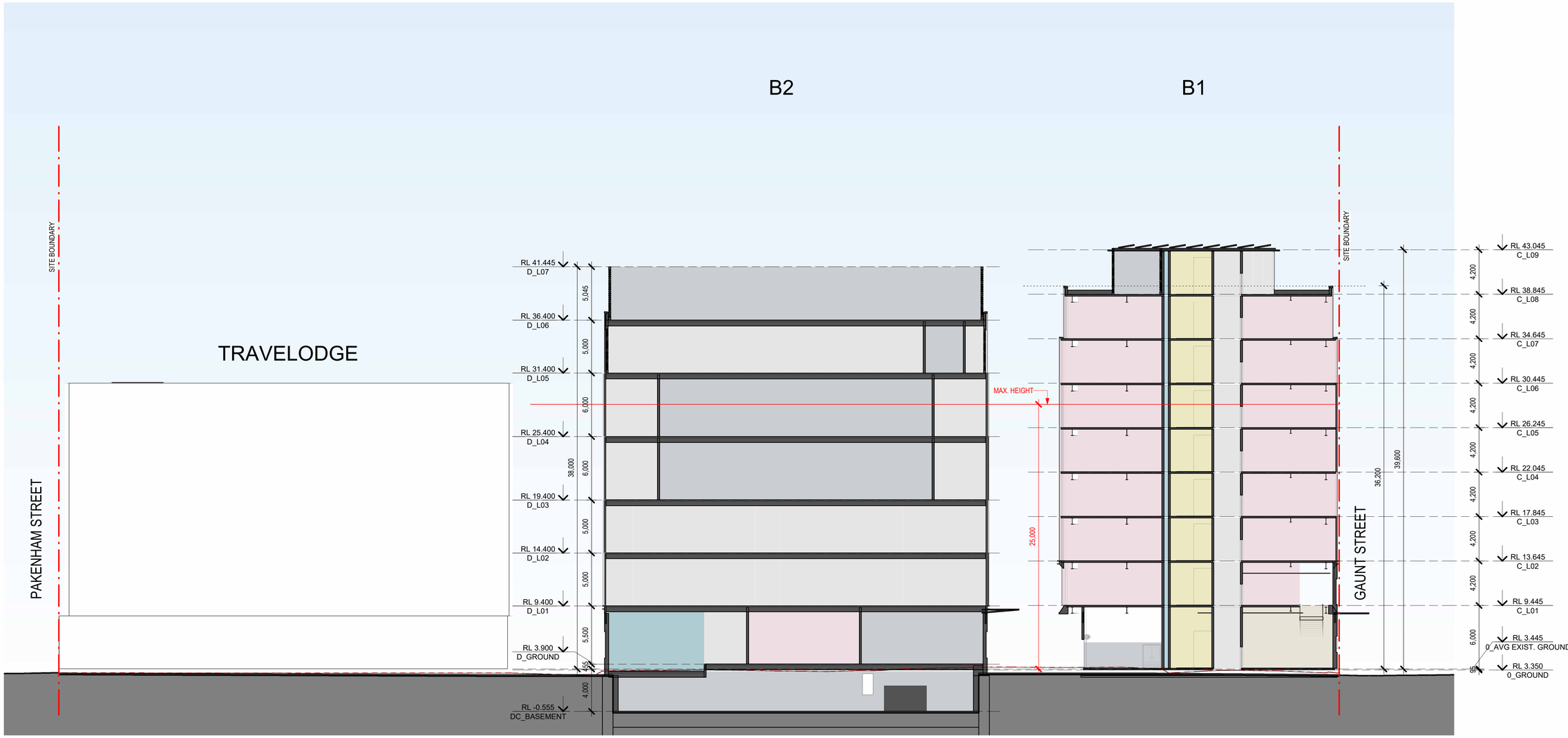
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SITE SECTIONS
100 HALSEY ST

SHEET NUMBER: 2153 - 1-321
REV:

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1 / 1-101 SITE N-S SECTION
SCALE 1 : 200

DRAFT

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- RETAIL
- LOBBY
- OFFICE
- TOILETS
- END OF TRIP / BICYCLE
- RISERS
- CIRCULATION
- SERVICES / REFUSE
- LOADING DOCK

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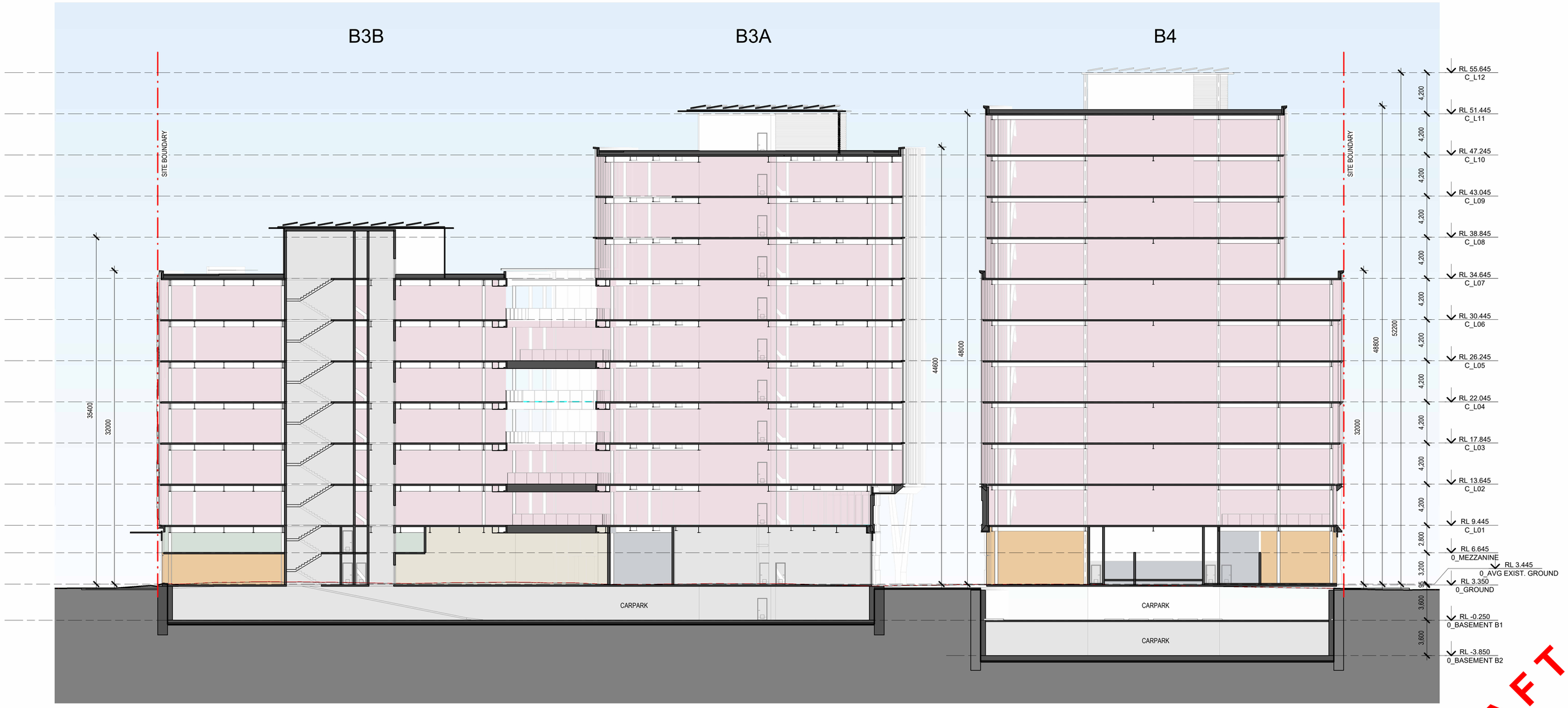
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1
1-101
SITE N-W SECTION
SCALE 1 : 200

RAISED FLOORS
RETAIL
LOBBY
OFFICE
TOILETS
END OF TRIP / BICYCLE
RISERS
CIRCULATION
SERVICES / REFUSE
LOADING DOCK

DRAFT

Author Checker

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SITE SECTIONS
100 HALSEY ST

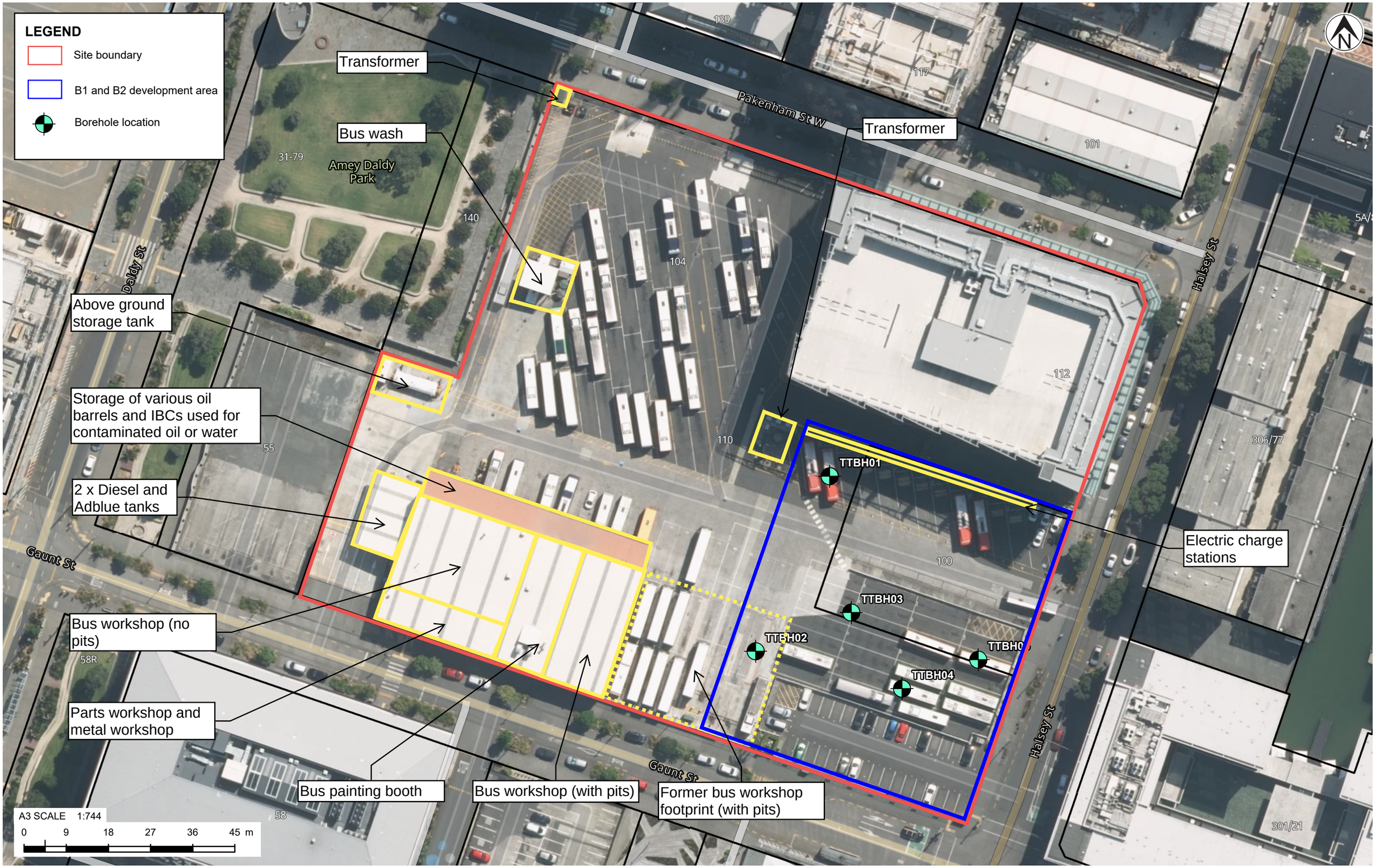
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Appendix B Figures

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Tonkin+Taylor

Exceptional thinking together www.tonkintaylor.co.nz

NOTES:

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LOCATION PLAN

			APPROVED	DATE
PROJECT No.	1101937.1000			
DESIGNED	CAVE	MAY.26		
DRAWN	-WEB-	MAY.26		
CHECKED				

CLIENT **NZ CRE 100 HALSEY LIMITED**

PROJECT **PRELIMINARY AND DETAILED SITE INVESTIGATION**

TITLE KEY SITE FEATURES

SCALE (A3) 1:744 FIG No. FIGURE APPENDIX B.1 REV 0

Appendix C Summary results tables

Table Appendix B.1: Summary of analytical results

Sample ID/Guidelines	Human Health	Discharge / Environmental	Disposal *		TTBH01			TTBH02			TTBH03		TTBH04			TTBH05			
Depth (m)					1.0	2.0	3.0	0.5	2.0	3.0	1.0	1.5	0.5	2.0	3.0	0.5	1.0	2.0	3.0
Soil type	NES Soil (Commercial/ Industrial) [1]	AUP Permitted Activity Criteria (Discharge) [8]	Background Auckland non-volcanic soils [11]	Maximum	CLAY			FILL, gravel	CLAY		Fill, gravel	CLAY	FILL, gravel			FILL, gravel	FILL, gravel	Fill, clay	Fill, clay
Sampled by					Tonkin + Taylor														
Date					6/05/2026			6/05/2026			6/05/2026		5/05/2026			6/05/2026			
Location					B1 and B2 Development Area														
Asbestos																			
Asbestos type	-	-	<LoR		Asbestos NOT detected	Asbestos NOT detected	Asbestos NOT detected	Asbestos NOT detected	Asbestos NOT detected	Asbestos NOT detected	Asbestos NOT detected	-	Asbestos NOT detected	Asbestos NOT detected	Chrysotile	Chrysotile	Chrysotile	Asbestos NOT detected	Asbestos NOT detected
Asbestos form	-	-	<LoR												Loose fibres	Loose fibres	ACM debris and Loose fibres		
Asbestos as ACM (w/w%)	0.05%[2]	-	<LoR												< 0.001	< 0.001	< 0.001		
Asbestos Fibres/Fine (w/w %)	0.001%[2]	-	<LoR												< 0.001	< 0.001	0.150		
Cyanide																			
Total Cyanide	>10,000[3]	8.0[9]	<LoR	74.0	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	74	< 15	-
Metals																			
Arsenic	70	100	12	66	36	6	9	< 2	2	10	34	8	2	7	6	< 2	16	4	-
Cadmium	1,300	7.5	0.65	21	0.38	< 0.10	< 0.10	< 0.10	0.12	< 0.10	1.39	0.41	0.16	0.5	0.13	< 0.10	2.1	< 0.10	-
Chromium	6,300	400	125	1,300	35	12	23	6	34	32	96	18	16	6	43	46	64	9	-
Copper	NL	325	45	2,600	660	9	10	29	42	13	890	133	44	79	60	64	260	17	-
Lead	3,300	250	65	6,800	1,260	17.4	17.5	< 0.4	5.8	22	5,100	760	27	650	159	13.6	1,950	11.7	-
Mercury	4,200	0.75	0.45	1	0.21	0.14	0.15	< 0.10	< 0.10	0.19	0.37	0.76	< 0.10	0.16	0.23	< 0.10	0.61	< 0.10	-
Nickel	6,000[4]	105	35	200	128	9	11	47	122	13	100	19	81	19	74	200	117	3	-
Zinc	NL[4]	400	180	5,100	800	43	54	21	60	72	2,600	1,320	49	340	150	61	1,000	32	-
Polycyclic Aromatic Hydrocarbons																			
Acenaphthene	-	-	<LoR	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.8	< 0.5	-
Acenaphthylene	-	-	<LoR	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.6	< 0.5	-
Anthracene	-	-	<LoR	3	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	3	< 0.5	-
Benzo[a]anthracene	-	-	<LoR	14	< 0.5	< 0.5	< 0.5	< 0.5	0.6	< 0.5	< 0.5	< 0.5	< 0.5	0.5	1.3	< 0.5	14.1	< 0.5	-
Benzo[a]pyrene (BAP)	-	-	<LoR	19	< 0.5	< 0.6	< 0.6	< 0.5	< 0.5	< 0.6	< 0.5	< 0.5	< 0.5	0.5	1.5	< 0.5	19.3	< 0.5	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	-	-	<LoR	16	< 0.5	< 0.6	< 0.6	< 0.5	0.5	< 0.6	< 0.5	< 0.5	< 0.5	< 0.5	1.4	< 0.5	16.3	< 0.5	-
Benzo[g,h,i]perylene	-	-	<LoR	16	< 0.5	< 0.6	< 0.6	< 0.5	< 0.5	< 0.6	< 0.5	< 0.5	< 0.5	< 0.5	1	< 0.5	15.8	< 0.5	-
Benzo[k]fluoranthene	-	-	<LoR	7	< 0.5	< 0.6	< 0.6	< 0.5	< 0.5	< 0.6	< 0.5	< 0.5	< 0.5	< 0.5	0.7	< 0.5	7.2	< 0.5	-
Chrysene	-	-	<LoR	14	< 0.5	< 0.5	< 0.5	< 0.5	0.6	< 0.5	< 0.5	< 0.5	< 0.5	0.5	1.3	< 0.5	13.9	< 0.5	-
Dibenzo[a,h]anthracene	-	-	<LoR	3	< 0.5	< 0.6	< 0.6	< 0.5	< 0.5	< 0.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	2.5	< 0.5	-
Fluoranthene	-	-	<LoR	29	< 0.5	< 0.5	< 0.5	< 0.5	1.9	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	3.3	< 0.5	29	< 0.5	-
Fluorene	-	-	<LoR	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-
Indeno(1,2,3-c,d)pyrene	-	-	<LoR	17	< 0.5	< 0.6	< 0.6	< 0.5	< 0.5	< 0.6	< 0.5	< 0.5	< 0.5	< 0.5	1.2	< 0.5	16.5	< 0.5	-
Naphthalene	210[5]	0.28[10]	<LoR	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-
Phenanthrene	-	-	<LoR	10	< 0.5	< 0.5	< 0.5	< 0.5	0.8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.2	< 0.5	9.5	< 0.5	-
Pyrene	NL[5]	7.9[10]	<LoR	32	< 0.5	< 0.5	< 0.5	< 0.5	1.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	3.5	< 0.5	32	< 0.5	-
BaP equivelant	35	20	<LoR	28	< 1.21	< 1.44	< 1.44	< 1.21	1.24	< 1.44	< 1.21	< 1.21	< 1.21	1.21	2.51	< 1.21	27.64	< 1.21	-
Total Petroleum Hydrocarbons																			
C7 - C9	5,200[6]	5,200[10]	<LoR	0	< 20	< 30	< 30	< 20	< 20	< 30	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	-
C10 - C14	7,800[6]	9,200[10]	<LoR	0	< 20	< 30	< 30	< 20	< 20	< 30	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	-
C15 - C36	NL[6]	NL[10]	<LoR	1,540	1,260	< 50	< 50	< 40	< 40	87	< 40	< 40	400	360	340	81	1,540	< 40	-
Total hydrocarbons (C7-C36)	-	-	<LoR	1,560	1,260	< 100	< 90	< 80	< 80	101	< 80	< 80	410	370	350	86	1,560	< 80	-
VOC																			
Tetrachloroethene (tetrachloroethylene)	390[12]	34[13]	-	10	0.3	< 0.4	< 0.4	< 0.3	< 0.3	0.6	0.7	< 0.3	< 0.3	0.7	0.4	10.4	4	< 0.3	-
Toluene	-	6	<LoR	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All other VOCs reported as less than laboratory detection [7]																			
Semi Volatile Organic Compounds (SVOC)																			
All SVOCs reported as less than laboratory detection [7]																			

Notes:

Red values indicate that results exceed NESCS criteria: Commercial/industrial

Underlined values indicate that results exceed AUP criteria

Bold values indicate that results exceed non-volcanic background levels for Auckland (default cleanfill disposal criteria)

All values are reported in mg/kg (ppm) unless otherwise stated.

<LoR = Below laboratory detection level

NL = Not limiting (i.e. >10,000 mg/kg)

ND = not detected

Grey values indicate the result is below the laboratory detection level

*Acceptance of material at the disposal location remains at the discretion of the receiving site.

1 - Ministry for the Environment (MfE), April 2012. Users Guide: National Environmental Standard for assessing and managing contaminants in soil to protect Human Health: Commercial/industrial (adopted as a conservative preliminary screening standard for construction works).

2 - BRANZ Ltd, October 2024. New Zealand Guidelines for Assessing and Managing Asbestos in Soil. Soil guideline values based on the weight of asbestos as either non-friable asbestos-containing material (ACM) or combined asbestos fines and/or fibres recovered from a given volume of soil (weight by weight [w/w] as a %).

3 - MfE, August 1997. Guidelines for Assessing and Managing Contaminated Gasworks Sites in New Zealand: Commercial/industrial, Cyanide (free).

4 - NEPM 2013. Guideline on the Investigation Levels for Soil and Groundwater: Commercial/industrial D.

5 - MfE, June 1999. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand. Tier 1 Soil acceptance criteria: residential use, sandy silt, <1 m.

6 - MfE, June 1999. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand. Tier 1 Soil acceptance criteria: Commercial/ industrial use, sandy silt, <1 m, inhalation pathway.

7 - All VOCs and SVOCs apart from those detailed in the the above table were reported as less than detection

8 - Auckland Unitary Plan: Operative in Part Version (AUP). Permitted Activity Soil Criteria Table E30.6.1.4.1 (unless otherwise stated).

9 - Canadian Council of Ministers of the Environment (CCME), March 1997. Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health: Commercial

10 - MfE, June 1999. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand - Groundwater Protection, sandy silt, contamination at <1 m, groundwater at 2 m depth.

11 - Auckland Regional Council (ARC), Technical Publication 153 - Background concentrations of Inorganic Elements in Soils from the Auckland Region. Non-volcanic.

12 - USEPA Regional Screening Level - Commercial/industrial soil.

13 - Canadian Council of Ministers of the Environment (CCME), March 1997. Recommened Canadian soil quality guideline for commercial or industrial land use

Table Appendix B.1: Summary of analytical results

Sample ID/Guidelines	Human Health	Discharge / Environmental	Disposal *		E4			E5				E9			E1 J2		E2A		E3A J1			E8A J1	
Depth (m)					0.5-0.6	1.0-1.1	3.0-3.1	0.7-0.8	1.0-1.1	1.8-1.9	2.7-2.8	0.2-0.3	1.0-1.1	2.6-2.7	0.7-0.8	1.9-2.0	1.6-1.7	2.1-2.2	0.7-0.8	1.4-1.5	2.1-2.2	0.7-0.8	1.6-1.7
Soil type	NES Soil (Commercial/ Industrial) [1]	AUP Permitted Activity Criteria (Discharge) [8]	Background Auckland non-volcanic soils [11]	Maximum	Fill, gravel	Fill, clay, silt	Fill, sand	Fill, gravel				Fill, gravel			Fill, sand		Fill, gravel	Fill, clay	Fill, clay	SAND	CLAY	Fill, clay	Fill, sand
Sampled by					Babbage										Babbage								
Date					17/04/2014										17/04/2014								
Location					B1 and B2 Development Area										Wider Development Area								
Asbestos																							
Asbestos type	-	-	<LoR		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos form	-	-	<LoR																				
Asbestos as ACM (w/w%)	0.05%[2]	-	<LoR																				
Asbestos Fibres/Fine (w/w %)	0.001%[2]	-	<LoR																				
Cyanide																							
Total Cyanide	>10,000[3]	8.0[9]	<LoR	74.0	0.41	< 0.10	< 0.10	0.5	0.35	0.39	0.11	< 0.10	< 0.10	0.82	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	12	< 0.10
Metals																							
Arsenic	70	100	12	66	66	9	6	21	9	4	3	< 2	13	23	6	5	4	8	5	11	8	9	5
Cadmium	1,300	7.5	0.65	21	21	0.45	0.19	0.68	0.31	0.15	< 0.10	< 0.10	< 0.10	0.29	< 0.10	< 0.10	< 0.10	< 0.10	0.1	0.1	0.12	0.17	< 0.10
Chromium	6,300	400	125	1,300	1,300	420	27	940	122	37	14	55	7	24	18	8	11	23	12	12	26	23	8
Copper	NL	325	45	2,600	2,600	51	24	1,610	780	250	22	55	19	39	48	10	31	13	38	15	13	40	8
Lead	3,300	250	65	6,800	6,800	57	48	520	300	133	9.4	4.2	13.3	55	66	21	57	23	49	45	25	166	15.7
Mercury	4,200	0.75	0.45	1	0.23	0.16	0.22	1.21	0.35	0.64	< 0.10	< 0.10	0.12	0.48	0.25	0.25	0.95	0.25	0.19	0.44	0.22	0.2	0.46
Nickel	6,000[4]	105	35	200	139	18	21	41	99	13	3	196	20	93	20	6	7	11	25	8	13	32	7
Zinc	NL[4]	400	180	5,100	5,100	350	165	800	280	192	21	44	95	1,070	162	47	96	69	129	72	78	134	36
Polycyclic Aromatic Hydrocarbons																							
Acenaphthene	-	-	<LoR	1	< 0.10	< 0.10	0.11	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.11	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	-	-	<LoR	1	< 0.10	< 0.10	< 0.10	< 0.10	0.19	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.11	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	-	-	<LoR	3	< 0.10	< 0.10	< 0.10	0.21	0.22	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.11	< 0.10	0.13	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	-	-	<LoR	14	0.19	0.11	0.21	1.23	1.11	0.22	< 0.10	< 0.10	< 0.10	< 0.10	0.11	0.16	0.35	0.23	0.28	0.64	0.26	0.44	0.25
Benzo[a]pyrene (BAP)	-	-	<LoR	19	0.23	< 0.2	0.18	0.93	1.13	0.19	< 0.16	< 0.12	< 0.14	< 0.16	< 0.14	0.17	0.43	0.3	0.31	0.62	0.3	0.47	0.27
Benzo[b]fluoranthene + Benzo[j]fluoranthene	-	-	<LoR	16	0.23	< 0.2	0.19	1.05	1.22	0.19	< 0.16	< 0.12	< 0.14	< 0.16	< 0.14	0.16	0.44	0.3	0.32	0.62	0.3	0.54	0.26
Benzo[g,h,i]perylene	-	-	<LoR	16	0.21	< 0.2	< 0.2	0.73	0.75	< 0.15	< 0.16	< 0.12	< 0.14	< 0.16	< 0.14	< 0.15	0.33	0.2	0.26	0.38	0.2	0.45	0.18
Benzo[k]fluoranthene	-	-	<LoR	7	< 0.2	< 0.2	< 0.2	0.37	0.45	< 0.15	< 0.16	< 0.12	< 0.14	< 0.16	< 0.14	< 0.15	0.16	< 0.3	< 0.15	0.24	< 0.2	0.2	< 0.14
Chrysene	-	-	<LoR	14	0.15	< 0.2	0.16	0.84	0.87	0.18	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.12	0.27	0.19	0.25	0.44	0.22	0.38	0.2
Dibenzo[a,h]anthracene	-	-	<LoR	3	< 0.10	< 0.10	< 0.10	0.21	0.17	< 0.15	< 0.16	< 0.12	< 0.14	< 0.16	< 0.14	< 0.15	< 0.16	< 0.3	< 0.15	< 0.16	< 0.2	< 0.18	< 0.14
Fluoranthene	-	-	<LoR	29	0.24	0.18	0.39	1.62	2.1	0.36	0.11	< 0.10	< 0.10	0.18	0.15	0.21	0.5	0.43	0.43	1.11	0.52	0.87	0.39
Fluorene	-	-	<LoR	0	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.11	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)pyrene	-	-	<LoR	17	0.16	< 0.2	< 0.2	0.49	0.55	< 0.15	< 0.16	< 0.12	< 0.14	< 0.16	< 0.14	< 0.15	0.24	< 0.3	0.19	0.29	< 0.2	0.38	0.15
Naphthalene	210[5]	0.28[10]	<LoR	0	< 0.2	< 0.10	0.26	< 0.10	0.21	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.11	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	-	-	<LoR	10	< 0.2	< 0.10	0.13	0.73	0.56	0.17	0.14	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.16	0.12	< 0.10	0.31	0.15	0.37	< 0.10
Pyrene	NL[5]	7.9[10]	<LoR	32	0.25	0.23	0.41	1.38	1.84	0.37	< 0.10	< 0.10	< 0.10	0.18	0.15	0.22	0.52	0.49	0.46	1.32	0.54	0.89	0.4
BaP equivelant	35	20	<LoR	28	0.55	0.44	0.65	2.88	3.57	0.62	0.32	< 0.26	< 0.26	0.39	0.34	0.44	1.05	0.82	0.84	1.91	0.91	1.49	0.74
Total Petroleum Hydrocarbons																							
C7 - C9	5,200[6]	5,200[10]	<LoR	0	< 8	< 12	< 10	< 8	< 9	< 9	< 10	< 8	< 9	< 9	< 9	< 10	< 9	< 14	< 9	< 10	< 13	< 11	< 9
C10 - C14	7,800[6]	9,200[10]	<LoR	0	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 30	< 20	< 20	< 30	< 30	< 20
C15 - C36	NL[6]	NL[10]	<LoR	1,540	< 40	< 50	< 40	240	170	< 40	< 40	< 40	290	< 40	< 40	< 40	< 40	< 60	< 40	< 40	< 50	< 50	105
Total hydrocarbons (C7-C36)	-	-	<LoR	1,560	< 70	< 90	< 70	240	170	< 70	< 70	< 70	290	< 70	< 70	< 70	< 70	< 100	< 70	< 70	< 90	< 80	105
VOC																							
Tetrachloroethene (tetrachloroethylene)	390[12]	34[13]	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	-	6	<LoR	0	-	-	-	-	-	-	-	-	-	-	-	-	< 0.07	< 0.11	< 0.06	< 0.07	< 0.09	< 0.08	< 0.10
All other VOCs reported as less than laboratory detection [7]																							
Semi Volatile Organic Compounds (SVOC)																							
All SVOCs reported as less than laboratory detection [7]																							

Notes:

Red values indicate that results exceed NESCS criteria: Commercial/industrial

Underlined values indicate that results exceed AUP criteria

Bold values indicate that results exceed non-volcanic background levels for Auckland (default cleanfill disposal criteria)

All values are reported in mg/kg (ppm) unless otherwise stated.

<LoR = Below laboratory detection level

NL = Not limiting (i.e. >10,000 mg/kg)

ND = not detected

Grey values indicate the result is below the laboratory detection level

*Acceptance of material at the disposal location remains at the discretion of the receiving site.

Table Appendix B.1: Summary of analytical results

Sample ID/Guidelines	Human Health	Discharge / Environmental	Disposal *		E201	E202	E203	E204	E205	E206	E207
Depth (m)	NES Soil (Commercial/ Industrial) [1]	AUP Permitted Activity Criteria (Discharge) [8]	Background Auckland non-volcanic soils [11]	Maximum	0.3-1.5	0.3-1.5	0.3-1.5	0.3-1.5	0.3-1.5	0.4-1.5	0.5-0.9
Soil type					FILL, gravel						
Sampled by					Babbage						
Date					14/07/2015						
Location					B1 and B2 Development Area						
Asbestos											
Asbestos type	-	-	<LoR		-	-	-	-	-	-	-
Asbestos form	-	-	<LoR								
Asbestos as ACM (w/w%)	0.05% [2]	-	<LoR								
Asbestos Fibres/Fine (w/w %)	0.001% [2]	-	<LoR								
Cyanide											
Total Cyanide	>10,000 [3]	8.0 [9]	<LoR	74.0	0.22	0.69	0.36	0.28	106	0.12	1.01
Metals											
Arsenic	70	100	12	66	17	43	11	60	5	8	13
Cadmium	1,300	7.5	0.65	21	0.48	4.1	0.41	0.65	0.12	0.36	0.52
Chromium	6,300	400	125	1,300	51	31	220	50	92	37	58
Copper	NL	325	45	2,600	870	14,700	220	760	60	410	310
Lead	3,300	250	65	6,800	970	2,600	570	4,200	103	800	630
Mercury	4,200	0.75	0.45	1	0.11	0.46	0.36	1.32	1.26	0.39	2.4
Nickel	6,000 [4]	105	35	200	134	93	37	71	81	66	118
Zinc	NL [4]	400	180	5,100	740	6,900	410	1,010	117	460	440
Polycyclic Aromatic Hydrocarbons											
Acenaphthene	-	-	<LoR	1	< 0.03	< 0.03	< 0.04	< 0.04	0.13	< 0.03	0.5
Acenaphthylene	-	-	<LoR	1	0.07	0.07	0.1	0.06	0.33	0.06	2.5
Anthracene	-	-	<LoR	3	0.1	0.12	0.15	0.07	1.07	0.19	1.9
Benzo[a]anthracene	-	-	<LoR	14	0.79	0.6	0.83	0.32	2.1	0.48	14.9
Benzo[a]pyrene (BAP)	-	-	<LoR	19	1.44	0.85	1.18	0.51	1.69	0.62	33
Benzo[b]fluoranthene + Benzo[j]fluoranthene	-	-	<LoR	16	1.48	0.95	1.42	0.69	3.1	0.73	34
Benzo[g,h,i]perylene	-	-	<LoR	16	1.14	0.7	0.96	0.42	1.97	0.45	24
Benzo[k]fluoranthene	-	-	<LoR	7	0.78	0.39	0.54	0.25	1.3	0.28	13.8
Chrysene	-	-	<LoR	14	0.86	0.61	0.82	0.35	2.2	0.44	12.5
Dibenzo[a,h]anthracene	-	-	<LoR	3	0.2	0.09	0.13	0.06	0.32	0.06	3.9
Fluoranthene	-	-	<LoR	29	1.54	1.22	1.57	0.63	6	1.01	18.6
Fluorene	-	-	<LoR	0	< 0.03	< 0.03	0.04	< 0.04	0.65	0.04	0.4
Indeno(1,2,3-c,d)pyrene	-	-	<LoR	17	1.1	0.88	1.29	0.57	2.6	0.62	28
Naphthalene	210 [5]	0.28 [10]	<LoR	0	< 0.13	< 0.15	< 0.16	< 0.16	1.88	< 0.14	< 1.3
Phenanthrene	-	-	<LoR	10	0.37	0.46	0.41	0.23	3.2	0.29	6.2
Pyrene	NL [5]	7.9 [10]	<LoR	32	1.84	1.36	1.78	0.72	6.2	1.07	25
BaP equivelant	35	20	<LoR	28	2.08	1.24	1.74	0.76	3	0.91	46.28
Total Petroleum Hydrocarbons											
C7 - C9	5,200 [6]	5,200 [10]	<LoR	0	< 8	< 9	< 10	< 10	10	< 9	< 8
C10 - C14	7,800 [6]	9,200 [10]	<LoR	0	< 20	67	< 20	< 20	49	< 20	< 20
C15 - C36	NL [6]	NL [10]	<LoR	1,540	420	199	95	154	240	230	1,720
Total hydrocarbons (C7-C36)	-	-	<LoR	1,560	420	270	95	154	300	230	1,720
VOC											
Tetrachloroethene (tetrachloroethylene)	390 [12]	34 [13]	-	10	-	-	-	-	-	-	-
Toluene	-	6	<LoR	0	0.06	1	0.11	0.54	0.29	< 0.06	0.08
All other VOCs reported as less than laboratory detection [7]											
Semi Volatile Organic Compounds (SVOC)											
All SVOCs reported as less than laboratory detection [7]											

Notes:

Red values indicate that results exceed NESCS criteria: Commercial/industrial

Underlined values indicate that results exceed AUP criteria

Bold values indicate that results exceed non-volcanic background levels for Auckland (default cleanfill disposal criteria)

All values are reported in mg/kg (ppm) unless otherwise stated.

<LoR = Below laboratory detection level

NL = Not limiting (i.e. >10,000 mg/kg)

ND = not detected

Grey values indicate the result is below the laboratory detection level

*Acceptance of material at the disposal location remains at the discretion of the receiving site.

Table Appendix B.2: Results of groundwater sampling (Babbage 2017)

Parameter	Unit	Well E1 (n=1)	Well E7 (n=2)	Well E9 (n=1)	Guideline
Water type	-	Na-Cl	Na-Cl	Na-Cl	NA
pH	-	8.1	7.6-7.7	7.3	NA
Electrical conductivity	mS/cm	223	202-272	160	NA
Hardness	g/m³ $CaCO_3$	220	350-410	540	NA
Arsenic	mg/m³	<2	<2	2.6	-
Boron	g/m³	1.0	2.9-3.1	3.3	>4.5*
Cadmium	mg/m³	<0.1	<0.1	<0.05	36
Chromium	mg/m³	<1	<1	<0.5	85
Copper	mg/m³	<1	<1	<0.5	8.0
Lead	mg/m³	<0.2	<0.2	<0.1	12
Mercury	mg/m³		<0.08		1.4
Nickel	mg/m³	<1 (13 in 2014)	<1	0.6	560
Silver	mg/m³	<0.2	<0.2	<0.1	2.6
Zinc	mg/m³	<2	<2	2.0	43
Total cyanide	mg/m³	1.6	**23-26 (32 in 2014)**	**36 (76 in 2014)**	14
Acenaphthene	mg/m³	<0.008	3.8	0.085	-
Acenaphthylene	mg/m³	<0.008	0.064-0.066	<0.008	-
Anthracene	mg/m³	<0.008	0.12-0.13	<0.008	-
Fluoranthene	mg/m³	<0.008	0.064	0.044	-
Fluorene	mg/m³	<0.008	0.69-0.80	<0.008	-
Naphthalene	mg/m³	<0.04	0.11-0.13	<0.04	120
Phenanthrene	mg/m³	<0.008	0.68-0.83	0.010	-
Pyrene	mg/m³	0.021	0.057	0.044	-

Notes: All other PAH compounds below laboratory limit of reporting in all samples. *Ambient seawater concentration. Results in red are elevated above the relevant ANZECC 80 % trigger value for the protection of marine ecosystems

Appendix D Pre-works investigation sampling plan

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LEGEND

- Site boundary
- Proposed development area

Contamination Areas

- Workshop/engine maintenance and repairs
- Underground and above ground fuel storage
- Bus parking
- Electrical transformers
- Pre-2000 building structures

Previous investigations

- T+T Borehole location (2026)
- T+T groundwater well (2026)
- Babbage Borehole location (2014 and 2015)
- Babbage Groundwater Monitoring Well (2014)

Pre-works investigation locations

- Systematic soil sample location
- Targeted area

Placement of reclamation fill

Pakenham St W

Halsey St

Gaunt St

Amey Daldy Park

31-79

139

117

101

140

104

112

110

306/77

58R

58

301/21

5A/

B1

B2

B3

B4

B5

E1

E2A

E3A

E4

E5

E8

E9

E201

E202

E203

E204

E205

E206

E207

BH201

BH202

TTBH01

TTBH02

TTBH03

TTBH04

TTBH05

A3 SCALE 1:744

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LOCATION PLAN

PROJECT No.	1101937.1000		
DESIGNED	CAVE	SEP.26	APPROVED
DRAWN	-WEB-	SEP.26	
CHECKED			DATE

CLIENT **NZ CRE 100 HALSEY LIMITED**

PROJECT **CONTAMINATION SITE MANAGMENT PLAN**

TITLE PRE-WORKS INVESTIGATION SAMPLING PLAN

SCALE (A3) 1:744 FIG No. FIGURE APPENDIX D.1 REV 0

Appendix E Contingency measures

The following actions are proposed in the event that unexpected conditions are encountered, discharges occur and/or complaints are received in relation to the works. Mitigation measures should be applied in accordance with the hierarchy of control – eliminate, isolate and minimise.

E1 Emergency response procedures

Should an incident occur on-site which may result in any unauthorised discharges (vapour, odour, water, soil, separate phase hydrocarbons (SPH) etc.), the Contractor's site supervisor will take control of the situation and coordinate the efforts of all on-site to minimise the impact. Ultimately, in the event, albeit unlikely, that sustained and uncontrollable discharges (exceeding the specified action levels) occur from the site, emergency response and evacuation procedures, including provisions for notifying and managing neighbouring site users, shall be implemented. The emergency response and evacuation procedures shall be specified in the project specific health and safety plan.

E2 Unexpected ground conditions

The onus is on the site staff to note where visual and olfactory indicators of impacted soil/water exist and notify the Land Remediation Specialist to ensure the appropriate procedures are put in place depending on the type and level of conditions encountered. Typical visual and olfactory indicators of impacted soil could include the following:

- Odour (petroleum hydrocarbons, oil).
- Black staining coupled with an odour may indicate the presence of heavy oil or hydrocarbons.
- Green/yellow discoloured soil may indicate high levels of copper and chromium.
- Black gravel/sand may be boiler ash materials that could be high in metals and PAHs.
- Inclusions of deleterious materials such as timber, plastic, rubber, metal.
- Archaeological finds while excavating e.g. shells, pottery, glass, partial structures (former dockyard); and
- Buried demolition debris containing suspected ACM.

The presence of other chemical compounds at high levels may dictate further controls be implemented and additional or different containment/disposal be required. The first response procedures are to ensure it is appropriately contained while decisions about its management are being undertaken. The following is a "first response" checklist for site staff to follow should visual or olfactory evidence of impacted soil is encountered during the works on-site.

Appendix E Table 1: First response checklist – impacted soils

First Response Checklist:	
Stop work in the immediate vicinity of the discovery and isolate the area by taping, coning or fencing off.	☐
Advise contractor site manager and/or contaminated land specialist (CLS).	☐
Update the site Hazard Board and prevent access to the area by unnecessary personnel.	☐
If ACM is observed minimise site disturbance at that location and provide barriers to stop staff entering area. *In the event that ACM is observed, the contractor shall contact both the CLS and the project appointed asbestos licensed removalist.*	☐
If odours are present cover the material over with non-odorous soil or hay/straw and lime to prevent nuisance odour.	☐

First Response Checklist:	
The CLS to inspect and advise of specific controls. No materials shall be removed from the affected area until approval has been provided by the CLS.	☐

E3 Complaints procedure

A written record of all complaints received shall be maintained. The Contractor's site supervisor shall initiate an investigation and notify Auckland Council as soon as practicable on receipt of a complaint, including providing details of any corrective actions taken.

Appropriate feedback will be provided to the complainant, such as the response made and any corrective actions taken, in response to the complaint.

E4 Notification requirements

NZCRE or the client appointed representative shall be notified immediately in the event that any contingency measures are required to be implemented.

Auckland Council (regulatory) shall be notified in writing as soon as practicable in the event of receiving any complaints.

Appendix F Contractor checklist

Contractor checklist

Summary of key CSMP requirements

Timing	Key task	Details	Completed
Prior to ground works commencing	Site set up	a Developer to advise Auckland Council of works commencing.	
		b Appoint a Contaminated Land Specialist (CLS): Name: Contact:	
		c Prior to works commencing, CLS to undertake pre-works testing and update CSMP.	
		d Establish earthworks controls (dust, erosion, sediment, stormwater, odour).	
		e Hazard board to state contaminated soil may be present and indicating health and safety requirements for workers.	
		f Obtain PPE: Have on hand disposable gloves and P2 masks (in the event of an accidental discovery).	
During the works	General CSMP Compliance	g Maintain earthworks controls (dust, erosion, sediment, stormwater, odour).	
		h Retain all weighbridge and disposal dockets provided to the Contractor.	
		i Ensure imported material meets requirements in Table 6.1**.**	
		j Ensure compliance with any other procedures outlined by the CLS.	
	Alert Developer and/or the site appointed Project Manager and CLS	If any of the following situations arise: k Contaminated soil is encountered that includes: - Odours (petroleum/oil) - Discolouration (green/blue staining most common). - Refuse or inclusions of non-cleanfill allowable deleterious materials (i.e. plastic, rubber, metal). - Suspected asbestos containing materials (ACM).	
		l Groundwater with an oil sheen, odour or discolouration is encountered.	
		m If soil is to be disposed offsite, soil samples may need to be collected and tested.	
Within one month of completion of the relevant works	Provide contaminated land-related information to CLS	n Details of any contaminated land complaints made during works i.e. odour, dust etc.	
		o Details of accidental discoveries/events and the actions taken.	
		p Details of visits made by Auckland Council representatives.	
		q Summary of weighbridge information for disposal verification (if required)	

Appendix G Example Agreement and Acknowledgement Sheet

AGREEMENT AND ACKNOWLEDGMENT SHEET

All persons involved in undertaking ground-breaking activities must sign this Agreement and Acknowledgment Sheet prior to conducting activities at this site

I sign to acknowledge that I have been informed of the site hazards detailed in this Contamination Site Management Plan (CSMP) and will abide by its provisions and aid in the implementation of effective site safety, health and environmental practices (Note: this CSMP does not preclude any persons from taking any other steps they consider necessary to comply with relevant health and safety legislation).	
Name	Signature
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Company	Date
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Company	Date
Name	Signature
Company	Date
Name	Signature
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Appendix H Asbestos Controls Table

Table Appendix H.1: Asbestos controls

Scenario / asbestos concentration	Class A works –friable	Class B works – non-friable	Low-level asbestos contamination	Trace asbestos contamination
	>1% w/w AF+FA in soil	>0.01% w/w AF+FA in soil >1% ACM	>0.001% w/w AF+FA in soil >0.01 % w/w ACM	≤0.001% w/w AF+FA in soil <0.01% w/w ACM
Additional documentation/ notification requirements	Asbestos removal control plan and WorkSafe notification for asbestos removal.	Asbestos removal control plan and WorkSafe notification for asbestos removal.	No additional notification required.	No additional notification required.
Oversight by a licensed removalist	Required.	Required.	Not required but recommended.	Not required.
Personal protective equipment	Disposable coveralls rated type 5, category 3, nitrile gloves, steel toe capped gumboots or safety footwear with disposable overshoes.	Disposable coveralls rated type 5, category 3, nitrile gloves, steel toe capped gumboots or safety footwear with disposable overshoes.	Disposable coveralls rated type 5, category 3, nitrile gloves, steel toe capped gumboots or safety footwear with disposable overshoes.	No asbestos-specific PPE as concentrations are unlikely to exceed trace levels in air.
Respiratory protective equipment	Full-face P3 respirator with particulate filter.	Half-face P3 respirator with particulate filter.	Disposable P2 dust mask.	No asbestos-specific requirements as concentrations are unlikely to exceed trace levels in air.
Dust/asbestos fibre suppression	Water and polymer spray via localised points before and during works.	Water and polymer spray via localised points before and during works.	Water spray via localised points.	Water spray via localised points.
Air monitoring	Air monitoring required.	Air monitoring not required but recommended given setting and to confirm that concentrations are below 0.01 f/ml.	Air monitoring not required but recommended given setting and to confirm that concentrations are below 0.01 f/ml.	Air monitoring not required.
Cleaning facilities	Dedicated wet cleaning area or trailer. Consider powered and plumbed unit.	Dedicated cleaning area and foot wash.	Dedicated cleaning area and foot wash.	Foot wash and used PPE collection area.
Vehicle (truck) protection	200 µm heavy-gauge polythene wrapped soil/lined trays and truck covered.	200 µm heavy-gauge polythene wrapped soil/lined trays and truck covered.	Truck lining/soil wrapping depends on the receiving landfill. All trucks should be covered.	Truck lining/soil wrapping depends on the receiving landfill. All trucks should be covered.
	HEPA filter system fitted for all occupied vehicles filter replaced or clean down with HEPA vacuum cleaner post work.	HEPA filter system fitted for all occupied vehicles where friable ACM on-site (lagging, insulation, etc).	Standard air conditioning.	Standard air conditioning.
Vehicle Washing Facilities	Visual assessment plus swab and air sampling inside the cab by an independent assessor or competent person.*	Visual assessment plus swab (if friable) by an independent assessor or competent person* or SQEP following brush and or wash down.	Visual assessment by a competent person* or SQEP following brush and or wash down.	Visual assessment by a competent person* or SQEP following brush and or wash down.

Note:

Full details of asbestos controls are found in the Asbestos in Soil Guidelines and ACoP.

* Typically, a CLS meets with the requirements of the Health and Safety at work (Asbestos) Regulations 2016.



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