



ENGEO Limited

Level 1, 1 – 7 The Strand, Takapuna, Auckland 0622

PO Box 33-1527, Takapuna, Auckland 0740

T: +64 9 972 2205

www.engeo.co.nz



Project Number 21170.000.001

Site Management Plan / Remedial Action Plan

484 Madras Street, St Albans, Christchurch

Submitted to:
Woolworths New Zealand Limited
80 Favona Road
Mangere
Auckland 2024

Contents

1	Introduction.....	1
2	Objectives and Relevance of the SMP / RAP	2
2.1	Objective.....	2
2.2	Relevance	2
3	Previous Investigation.....	3
3.1	Preliminary Site Investigation (2022).....	3
3.2	Detailed Site Investigation (2024)	4
4	Summary of Development Activities Relevant to this SMP/RAP	6
5	Remedial Works	7
5.1	Remediation Options.....	7
5.2	Remedial Strategy.....	7
5.3	Remedial Volume	8
5.4	Capping Works.....	8
6	Site Management Practices and Controls.....	9
7	Asbestos Controls.....	12
8	Unanticipated Ground Conditions.....	13
9	Documentation	14
10	Completion Reporting	15
11	Limitations	16
12	References.....	17

Tables

Table 1:	Site Summary
Table 2:	Assigned Responsibilities for Site Work
Table 3:	Conceptual Site Model from DSI (modified for this report)
Table 4:	Remedial Volume Estimation
Table 5:	Site Management Practices
Table 6:	Typical Indicators of Contamination
Table 7:	Contractor Documentation

Appendices

Figures

Appendix 1:	Draft Redevelopment Plans
Appendix 2:	DSI Results Table
Appendix 3:	Site Controls
Appendix 4:	Asbestos Controls

ENGEO Document Control:

Report Title	Site Management Plan / Remedial Action Plan - 484 Madras Street, St Albans			
Project No.	21170.000.001	Doc ID	12	
Client	Woolworths New Zealand Limited	Client Contact	Peter Buchan	
Distribution (PDF)	Woolworths New Zealand Limited			
Date	Revision Details / Status	Author	Reviewer	WP
24/07/2024	Issued to Client	TP	DR	JT
16/08/2024	Issued to Client	TP	DR	JT

SQEP Certifying Statement

I certify that the site has been assessed in accordance with current New Zealand Regulations and guidance documents and that this report has been prepared in general accordance with the Ministry for the Environment's Contaminated Land Management Guidelines No. 1: Reporting on Contaminated Sites in New Zealand, 2021.

I am considered by ENGEO Limited to be a suitably qualified and experienced practitioner (SQEP) able to certify reports pursuant to the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011, based on the company's definition of a SQEP as given below.



Dave Robotham

16 August 2024

ENGEO Limited requires that a SQEP has the following Qualifications / Experience:

- *Tertiary science or engineering qualification relevant to environmental assessment.*
- *A minimum of ten years of relevant experience.*
- *Registration with a professional body that assess and certifies environmental professionals in the competency criteria of training, experience, professional conduct and ethical behaviour.*

1 Introduction

ENGEO Ltd was requested by Woolworths New Zealand Limited to undertake a Site Management Plan / Remedial Action Plan (SMP / RAP) for soil disturbance activities to be carried out at 484 Madras Street, St Albans, Christchurch, (herein referred to as ‘the site’; Figure 1). This work has been carried out in accordance with our proposal, dated 15 July 2024.

We have been provided with draft development plans (Woodhams Meikle Zhan Architects; 14 August 2024: RMA-101) indicating the construction of a supermarket and associated retail and carparking (Appendix 1). Additionally, we have been provided with cut / fill plans (prepared by Eliot Sinclair, dated 7 August 2024; reference 532253, C1, C102 – A) indicating a maximum cut depth of 1.0 meters across the site.

This report has been prepared to support an application to Christchurch City Council (CCC) for redevelopment at the site, and address requirements of The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations (2011) (NESC, 2011), as well as short-term discharges (during earthworks). This report *does not* address long-term groundwater discharges (to be addressed in a separate application to Environment Canterbury (ECan)). As such, this report focuses on human health exceedances and the associated remedial measures and excludes information relevant to environmental discharges.

Additionally, the remedial methodology and management procedures focus solely on the proposed commercial redevelopment at the site and has not made considerations for the proposed residential portion of the redevelopment.

Based on the previous investigations undertaken by ENGEO, potential contaminants of concern are present in soil above the adopted criteria (discussed further in Section 3). Key findings are summarised in Table 1.

Table 1: Site Summary

Contaminants identified on-site	Lead was detected in one sample (S30) above the adopted human health criteria. Asbestos was detected in one sample (S25) above the adopted human health criteria
--	---

This SMP / RAP contains:

- A summary of previous investigations completed at the site.
- Details of the proposed remedial options.
- Management procedures to assist in achieving a safe working environment for relevant personnel.

2 Objectives and Relevance of the SMP / RAP

2.1 Objective

The objectives of the SMP / RAP are to:

- Support an application to Christchurch City Council (CCC) for redevelopment at the site.
- Detail remedial actions for the site based on previous investigation(s), in the context of human health, and focusing specifically on the proposed commercial redevelopment area on the site.
- Outline monitoring and management procedures to be implemented during earthworks to mitigate risks to human health.
- Outline actions to be undertake if unidentified contamination is encountered.

2.2 Relevance

This document has been prepared in general accordance with the Ministry for the Environment's (MfE's) Contaminated Land Management Guidelines No.1 – Reporting on Contaminated Sites in New Zealand (MfE, 2021a) and should be read in conjunction with the ENGEO Preliminary Site Investigation (PSI; ENGEO, 2022) and ENGEO Detailed Site Investigation (DSI; ENGEO, 2024), prepared for the site. A combined SMP and RAP has been prepared to ensure all relevant information is available in one location to facilitate implementation on-site.

The information and recommendations provided herein are to augment the processes on-site and are not intended to relieve any contractor or the controller of the place of work of their responsibility for the health and safety of their workers and contractors. Nor is it intended to relieve contractors undertaking work on the site of their responsibilities under the Health and Safety at Work Act 2015 and subsequent amendments.

The provisions of the SMP / RAP are mandatory for all persons entering the site and all contractor and sub-contractor employees who will be involved in implementing the procedures identified in this document.

The contractor shall develop a site-specific health and safety plan to complement this SMP / RAP and to address other health and safety requirements that may be applicable to their site works.

This SMP / RAP is considered suitable to provide controls based on the contamination identified during the previous investigation works. If contamination is found that varies from what has been assumed in preparing this SMP / RAP, the SMP / RAP will need to be updated to account for the changed site understanding. If a revised SMP / RAP is prepared, it will be re-distributed to Council and the project team (Table 2) prior to earthworks commencing.

Table 2: Assigned Responsibilities for Site Work

Role	Responsibility
Site Owner Woolworths New Zealand Limited	To distribute this SMP / RAP and be responsible for ensuring that the site works are undertaken in accordance with this document and any revisions to this document.
Site Contractor Main Contractor / General Earthworks) <i>to be confirmed</i>	To distribute the SMP / RAP to employees and subcontractors, including updated versions, and to ensure that the correct copy of the SMP / RAP is on-site at all times. To provide control and oversee the redevelopment works. It is recommended that a designated, suitably trained Site Supervisor is present to oversee the works. The Site Supervisor would address changes to site procedures, as necessary, should unanticipated conditions arise. This also includes ensuring that all site staff and subcontractors are aware of and comply with the procedures and health and safety requirements contained within this document. It is anticipated that this Site Supervisor would represent the main site contractor. Should an incident occur on-site which may result in discharges, the supervisor will take control of the situation and coordinate the efforts of all on-site to minimise the impact. Worker and public Health and Safety concerns will take precedence over environmental discharges, should it be unsafe to employ controls or emergency measures immediately. As a minimum, the Site Supervisor should have received non-certified training in asbestos identification, safe handling and suitable controls, to ensure that, if asbestos / asbestos containing materials (ACMs) are encountered they are identified and appropriately managed. A copy of the training shall be kept on record.
Contaminated Land Specialist ENGEO	A Contaminated Land Specialist company with Suitably Qualified and Experienced Practitioners (SQEPs) in contaminated land management shall be appointed to liaise with the contractor during the course of the works. Representatives from the Contaminated Land Specialist company shall: • Visit the site on at least one occasions during remedial works to assess the controls and procedures on-site, as they relate to this SMP / RAP. • Provide support during site works (if required) and prepare a report at the completion of works.

3 Previous Investigation

3.1 Preliminary Site Investigation (2022)

ENGEO prepared a desktop-based preliminary site investigation (PSI; ENGEO, 2022) to assess for current or historical activities with the potential to cause ground contamination at the site and report of likely development implications. We note that the site boundary provided within the PSI extends further than indicated on the updated redevelopment plans (Appendix 1).

The PSI indicated that activities included on the Ministry for the Environment's (MfE's) Hazardous Activities and Industries List (HAIL; MfE, 2021b) may have been undertaken, including:

- **HAIL ID A17: Storage tanks or drums for fuel, chemicals or liquid waste.** Two underground fuel systems have been present at the site. Oil was also stored in above ground tanks.
- **HAIL ID B2: Electrical transformers, including the manufacturing, repairing or disposing of electrical transformers or other heavy electrical equipment.** The site was formerly used by Orion NZ as a maintenance yard – transformer units were stored on-site.
- **HAIL ID E1: Asbestos products manufacture or disposal, including sites with buildings containing asbestos products known to be in a deteriorated condition.** Multiple residential and commercial properties have been demolished at the site, with construction material potentially containing asbestos.
- **HAIL ID F4: Motor vehicle workshops.** Orion NZ reportedly used the site to repair vehicles.
- **HAIL ID G3: Uncontrolled filling.** Fill material containing anthropogenic material has been encountered in numerous investigations at the site. Aerial photography indicates that filling events have occurred at the site.
- **HAIL ID I: Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment.** Potential for lead-based paints used in former site buildings to have weathered and impacted surrounding soils.

3.2 Detailed Site Investigation (2024)

Following the PSI, a detailed site investigation (DSI) was prepared for the site (April 2024; ENGEO, 2024). The investigation involved the completion of 30 test pits across the site with soil samples taken from the various depths, positioned to target potential ground contamination based on the HAIL activities identified during the PSI. We note that the site boundary provided within the PSI extends further than indicated on the updated redevelopment plans (Appendix 1). As such, information summarised in this section relates to samples collected within the updated site boundary (as per Appendix 1).

Soil samples were collected and analysed for contaminants of concern (heavy metals / metalloids, polycyclic aromatic hydrocarbons (PAHs), and asbestos). A sample location plan is provided as Figure 2.

Analytical results were compared to the relevant Soil Contaminants Standard (SCS) based on the proposed future land use (i.e., residential and / or commercial / industrial).

Results of the investigation (in relation to human health and the portion of the site proposed redeveloped as a supermarket and associated retail and carparking) are summarised below and included as Appendix 2 (extracted from the DSI).

- Lead and zinc exceeded the commercial / industrial land use criteria in one sample (S30 @ 1.0-1.2 m bgl).
- Asbestos was identified at S25 (at 0.2 – 0.4 m bgl) in excess of the adopted commercial / industrial guideline criteria. The deeper sample collected at S25 (at 1 – 1.5 m bgl) also indicated asbestos, however the concentration was below the relevant guideline asbestos was also detected at S8, but below the commercial / industrial guideline criteria.

It is also noted that contaminant concentrations (metals / metalloids and PAHs) were detected on-site in excess of the regional background criteria.

The conceptual site model (CSM) developed for the site as part of the DSI has been modified (i.e., considers human health risk and short-term discharges, but does not include long-term risk / discharges to groundwater) and included in Table 3 below.

Table 3: Conceptual Site Model from DSI (modified for this report)

Potential Sources	Contaminants of Concern	Exposure Route and Pathways	Receptors	Acceptable Risk?
Former underground storage tanks	Total petroleum hydrocarbons (TPH) Heavy metals BTEX (benzene, toluene, ethylene and xylene)	Dermal contact with impacted soil, inhalation of dust or vapours and incidental ingestion during earthworks and long-term use of the site.	Redevelopment workers Future subsurface maintenance workers Future commercial site users	Unknown Additional information required.
Electrical transformer storage	Heavy metals, polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs) and PAHs	Dermal contact with impacted soil, inhalation of dust or vapours and incidental ingestion during earthworks and long-term use of the site.	Redevelopment workers Future subsurface maintenance workers Future commercial site users	Likely Previous investigations identified concentrations below guideline criteria.
Building materials	Asbestos and Lead	Dermal contact with impacted soil, inhalation of dust or vapours and incidental ingestion during earthworks and long-term use of the site.	Redevelopment workers Future commercial site users	Likely One exceedance of guideline criteria but can be managed through site works management procedures.

Potential Sources	Contaminants of Concern	Exposure Route and Pathways	Receptors	Acceptable Risk?
Former maintenance of vehicles	Heavy metals, PAHs and TPHs	Dermal contact with impacted soil, inhalation of dust or vapours and incidental ingestion during earthworks and long-term use of the site.	Redevelopment workers Future subsurface maintenance workers Future commercial site users	Likely Previous investigations identified concentrations below guideline criteria.
Uncontrolled filling of the site	Heavy metals, PAHs and asbestos	Dermal contact with impacted soil, inhalation of dust or vapours and incidental ingestion during earthworks and long-term use of the site.	Redevelopment workers Future subsurface maintenance workers	Likely One exceedance of guideline criteria but can be managed through site works.
			Future commercial site users	Likely One exceedance of guideline criteria but can be managed through site works.

Due to the exceedances of the guideline criteria and the presence of contaminants above regional background criteria, the proposed development works were likely to be considered a restricted discretionary activity under Regulation 10 of the NESCS for assessing and Managing Contaminants in Soil to Protect Human Health.

Figure 3 provides an approximate location plan of soil likely exceeding the relevant human health criteria.

4 Summary of Development Activities Relevant to this SMP/RAP

Site Preparation

Site preparation activities include site establishment (i.e., mobilisation, erecting fences, and establishing site security) and set-up of stormwater / silt control measures.

Earthworks

All soil disturbance works in the commercial area including excavations for utility installation, construction of building platforms, and foundation excavations.

5 Remedial Works

5.1 Remediation Options

The remedial objective is to mitigate risk to future site users. The following options have been identified for this site.

Off-site Disposal

Removal of soil from site that has been identified as containing contaminants above the adopted human health criteria.

Off-site disposal to an appropriately licensed landfill facility permanently removes risk to human health, and the requirement for long-term management.

Encapsulation / Capping / Re-use

This remedial strategy is considered to offer a more sustainable approach and be equally or more protective than disposing of this material at a landfill as it minimises disturbance and transport of contaminated material. A suitable capping layer will be placed where impacted material is proposed to be retained *in situ*. This remedial methodology is particularly relevant to the proposed commercial land use area, as the surface is likely to comprise hardstand (i.e., carparking, building footprints) as part of the redevelopment.

5.2 Remedial Strategy

The remedial strategy for the proposed commercial area comprises a combination of off-site disposal and capping. We understand (based on cut / fill plans) that approximately 0.5 meter of soil from the remedial area (Figure 3) will require disposal from site to allow for construction of the hardstand surface (i.e., carparking / pavement). Therefore, the proposed remedial strategy comprises excavation of the upper 0.5 meter of soil within the area of contaminated soils (as per Figure 3), and disposal of this material to a licensed facility / landfill. The soil remaining on-site in the area of contamination will then be capped to construct the hardstand surface.

Metal / metalloid concentrations exceeding the commercial / industrial human health criteria have been detected at one location (S30 – Figure 3) at a depth of 1-1.2 m bgl and therefore, shallow soil disturbance (i.e., <1.0 m bgl; for general earthworks / foundations etc.) is unlikely to present a risk to site redevelopment workers. However, it is noted that shallow material at this location has not been tested, and therefore, there is potential for elevated contaminants in the shallow soil at this location. Controls to address potential contamination (yet to be identified) has been provided in Section 6.

Asbestos has been noted above the relevant criteria at one sample (S25). Section 7 (and Appendix 4) provides controls to address asbestos contamination during redevelopment works.

The primary pathway for metals / metalloid contamination (i.e., elevated lead) is inhalation / dermal contact / ingestion of soil. The primary pathway for asbestos contamination is inhalation. Capping soil following any required soil disturbance (i.e., recontouring to achieve the design levels) is likely to eliminate these possible pathways, and therefore, material containing elevated contaminants is unlikely to present an unacceptable risk to human health following capping.

We also note that concentrations across the site exceed regional background concentrations, and therefore, if material from outside of the contaminated soil area (Figure 3) requires excavation and disposal, it cannot be disposed as “cleanfill” and instead should be disposed to a facility licensed to accept the level of contamination detected.

This document provides the controls to be implemented during the works, as well as controls for soil exceeding regional background concentrations.

5.3 Remedial Volume

The area requiring remediation is provided in Figure 3. As discussed above, the area is proposed to be excavated to an approximate depth of 0.5 m below ground level (bgl) to allow for construction of the hardstand surfaces. Based on this information, an estimate remedial volume has been provided in Table 4 below.

Table 4: Remedial Volume Estimation

Sample ID exceeding criteria	Exceedance	Estimated Area of Impact (m ²)	Depth of Remedial Excavation (m bgl)	Estimated Soil Volume to be removed (m ³)
S30	Lead	1,430 ¹	0.5 ²	715
S25	Asbestos			

Notes:

1. The lateral extent of the remedial area can be delineated via further investigations if required.
2. The remedial depth provided is based on the proposed cut / fill depth within the area of contamination. We note that contamination is present at a depth greater than 0.5 meters, however, will be capped during the construction of hardstand surfaces, eliminating the pathway between contaminated soil and future site users.

5.4 Capping Works

Draft development plans (attached as Appendix 1) indicate that the location of identified contamination (S30 and S25) are within the footprint of the proposed supermarket, retail stores and carparking area. Following removal of the upper 0.5 meters of soil, capping of material at this location should comprise the following above the levelled site surface:

- Concrete slab.
- Damp proof membrane.
- Suitable thickness and specification of fill materials.

To ensure appropriate long-term management of the site, as built remediation level drawings will be prepared. This will be accomplished by surveying the site, prior and post placement of the capping layer. Completion of these works will confirm adequate placement of the capping layer and also provide information regarding depth of contaminated materials for future site excavation activities.

6 Site Management Practices and Controls

The site management practices listed in this section are relevant to all earthworks at the site.

The site management practices in Table 5 shall be implemented during all ground-disturbing unless advised otherwise by the Contaminated Land Specialist (e.g., following identification of cleanfill areas on-site through additional testing). Many of the required control measures are standard construction site procedures; however, the relevance and effectiveness of these protocols shall be reviewed by the Site Supervisor on a daily basis during work at the site. The appended plan (Appendix 3) provides an overview of controls required, and it is anticipated that this will be displayed on-site for contractor reference.

During the works, a SQEP from the Contaminated Land Specialist company, shall visit the site to observe site activities and confirm that the works are being performed in accordance with this SMP. The number of visits required will be subject to the staging and duration of works.

Table 5: Site Management Practices

General Site Procedures	Contractor staff, subcontractors and visitors shall be inducted before entering the site or commencing work to ensure they are aware of the potential hazards relating to contaminated soil at the site. The following general safety procedures shall be followed by all staff entering or working in the immediate area of the earthworks: • Site workers shall avoid unnecessary contact with site soils. • Hands are to be washed in a dedicated area prior to eating, drinking or smoking. All incidents shall be reported to the main contractor's health and safety advisor, or equivalent responsible person on-site.
Personal Protective Equipment (PPE)	To minimise the effects of potential contamination exposure via incidental ingestion of soil, skin contact with soil or inhalation of dust the following should be considered over-and-above standard PPE requirements for construction sites (e.g. safety boots) when coming into contact with soil: • P2 Dust mask (if visible dust is present) or Half-face P3 respirator with particulate filter. • Work gloves / Coveralls (if contact with soil unavoidable).

Boundary Controls	Security fencing and appropriate warning signs erected around earthworks areas to prevent unauthorised access. Appropriate sediment control measures shall be implemented to minimise sediment runoff from the site. Minimum controls shall include: • A stabilised site entrance to minimise the movement of soil off-site. • Suitable sediment controls (e.g. silt fencing) shall be placed around the perimeter of the works area and stormwater drains where there is a potential for runoff. Set up of clean and dirty areas to minimise tracking potentially impacted soils around the site and off-site. • Any machinery used on-site shall be cleaned of loose soil in a designated 'wash down' area (e.g. paved area or area of existing hardfill) prior to leaving site. • Once loose soil has been removed, the cleaned item can be moved to the clean area. Any wastewater generated should not be discharged off-site and should be allowed to drain back into the site. • Imported rock / utilised in the 'wash down area' and / or 'truck loading area' (if relevant) should be disposed of as contaminated material, unless tested.
Stockpiling	Stockpiling of contaminated material shall be avoided. Stockpiles shall be located on an impermeable surface. If this is not possible, the underlying material should be considered potentially contaminated, and shall be managed / disposed of appropriately.

Groundwater	Site Specific Detail and Dewatering	A groundwater assessment was not completed as part of the previous investigation; however, observations during the intrusive investigation indicates that groundwater is likely present at a depth of between 0.3 – 1.8 m bgl. Based on these depths, dewatering may be required during earthworks, if dewatering is undertaken, disposal options are as follows. <u>Site Dewatering</u> The taking of water from groundwater for the purpose of dewatering and discharge of that water is a permitted activity (as per Rule 5.119 of the Canterbury Land and Water Regional Plan), provided that the following conditions are met. • The take continues only for the time required to carry out the work, but the take shall not last for a period exceeding six months; and • The take or discharge is not from, into, or onto contaminated or potentially contaminated land; and • The take does not lower the groundwater level more than 8 m below the current ground level of the site or cause subsidence of any other site; and • The take does not have a moderate, high, or direct stream depletion effect on a surface waterbody, determined in accordance with Schedule 9, unless the abstracted groundwater is being discharged to the surface waterbody to which it is hydraulically connected; and • An assessment of interference effects, undertaken in accordance with Schedule 12, does not show that any community, group or private drinking water supply bore will be prevented from taking water; and • At the point and time of any discharge to surface water, the rate of flow in the river or artificial watercourse is at least five times the rate of the discharge; and • The concentration of total suspended solids in any discharge to a surface water body does not exceed: a) 50 g/m³ where the discharge is to any Spring-fed river, Banks Peninsula river, or to a lake or wetland: or b) 100 g/m³ where the discharge is to any other river or to an artificial watercourse; and • The discharge after reasonable mixing with the receiving waterbody meets the visual clarity standards in Schedule 5; and • The point of discharge is not within a community drinking-water protection zone as set out in Schedule 1.
Stormwater		Uncontrolled discharge of stormwater from earthworks sites shall not be permitted, therefore mitigation of any unexpected discharges will be required to be immediately implemented. If the on-site erosion and sediment control measures fail, a vacuum truck shall be called to site immediately so that the discharge of stormwater from site is eliminated. It may be necessary to test any such water removed off-site to identify an appropriate disposal site.

Dust	Dust shall be managed in accordance with consent requirements and relevant regulations. The contractor shall consider the following (as appropriate): • Limit vehicle access onto the excavated areas as far as possible. • Dampen surface soil using a water truck or portable water sprays. Ensure that the volume of water used does not induce soil erosion, or cause surface ponding or runoff, that could discharge into natural water bodies or stormwater drains. • Use wind screens or avoid work during windy conditions. • Consider use of surfactants or polymers where a reliable source of water is not available. In the unlikely event that unsatisfactory dust emissions emanate from the site on a sustained basis or complaints are received in relation to the works, mitigation of the adverse effects shall be applied in accordance with the hierarchy of control described in the Health and Safety at Work Act 2015 (MBIE, 2015) -eliminate the risk, so far as is reasonably practicable; and if it is not reasonably practicable to eliminate a risk, to minimise those risks so far as is reasonably practicable. If the emission or discharges persist, professional advice shall be sought in order to define appropriate control measures including on-site real time monitoring with alarm levels. It is recommended that consultation with appropriate council representatives also be undertaken prior to recommencing works.
Odour	If excavated material is odorous, odour control measures shall be put in place. This could include covering the material with cleanfill, a polythene cover or instituting a deodoriser system.
Soil Disposal and Management	Trucks shall be loaded within the site where runoff and possible spills during loading will be controlled and contained. Loads must be securely covered during off-site transport. Soil must be taken to an appropriate soil disposal facility authorised to accept the contaminants present. Prior to acceptance, the results of the soil testing, may be requested by the receiving facility. Requirements for additional testing and truck lining / soil wrapping should be confirmed with the receiving landfill.

7 Asbestos Controls

The objective of the asbestos controls is to eliminate personal exposure to airborne asbestos on and off-site, so far as reasonably practicable. In accordance with the WorkSafe Approved Code of Practice (herein referred to as ‘the ACOP’; WorkSafe, 2016), if it is not reasonably practicable to eliminate personal exposure to airborne asbestos, exposure must be minimised, so far as is reasonably practicable through such controls as described in this section of the SMP.

Given the relatively low concentration of asbestos fibres detected in soil (and as the contamination does not appear widespread), and with suitable controls, we anticipate that fibre concentrations within air are

unlikely to exceed trace levels. Trace level is defined in the Health and Safety at Work Act, as “in air, an average concentration of less than 0.01 respirable asbestos fibres per millilitre of air”. Soil disturbance around S25 should be undertaken as Asbestos Related Works and the controls outlined in Appendix 4 put in place.

If asbestos is identified in other areas during the redevelopment works (e.g. if asbestos cement pipes are encountered), the controls for the relevant asbestos works classification in Appendix 4 shall be implemented. As asbestos is considered primarily a human health contaminant, the objective of these asbestos controls is to eliminate personal exposure to airborne asbestos on- and off-site, so far as reasonably practicable. In accordance with the WorkSafe Approved Code of Practice (herein referred to as ‘the ACOP’; WorkSafe, 2016), if it is not reasonably practicable to eliminate personal exposure to airborne asbestos, exposure must be minimised, so far as is reasonably practicable. The Contaminated Land Specialist shall assess the appropriate level of asbestos controls to be implemented.

The control measures in Appendix 4 have been designed to meet the Safe Work Practices specified in the ACOP (WorkSafe, 2016), and the NZGAMAS (BRANZ, 2017); an asbestos removal plan will need to be prepared if asbestos pipes are identified. As the NZGAMAS (BRANZ, 2017) is referenced in the WorkSafe ACOP, the NZGAMAS (BRANZ, 2017) or higher level of controls are required to be adhered to.

8 Unanticipated Ground Conditions

Should any unanticipated contaminated material be uncovered during earthworks, works shall stop in that area and a SQEP from the Contaminated Land Specialist company shall be called out to assess the potential risk and advise on what measures should be taken to manage the soil in that area.

Typical indicators of contamination include but are not limited to:

- Buried waste (for example drums or tanks with unknown liquid).
- Odour (petroleum hydrocarbons, oil).
- Discoloured soil (black, purple, or green staining most common).
- Asbestos containing materials (ACM) as fragments are visible with the naked eye.
- Uncontrolled fill material.

Examples of typical indicators of contamination have been provided in Table 6.

Table 6: Typical Indicators of Contamination

Uncontrolled Filling Building debris may contain asbestos or other contaminants.	
Asbestos Containing Material Intact sheets or broken into smaller pieces, may be mixed with other material.	
Separate-phase Hydrocarbons Black liquid, odours, sheen.	

9 Documentation

In order to demonstrate that the requirements of this SMP / RAP have been adhered to, the documents listed in Table 7 should be forwarded from the Contaminated Land Specialist company in the timeframes stipulated below. These documents will be included in a completion report for the site (discussed further in Section 10).

Table 7: Contractor Documentation

Prior to Earthworks Commencing	• Written confirmation from the proposed disposal site(s) confirming that they are able to accept excess material from the site and stating which type of material. • For any material that is to be imported to the site as cleanfill on the basis of direct testing, a copy of the analytical laboratory test report must be provided prior to transport.
Within Two Weeks of Earthworks Being Completed (or on an ongoing basis during works)	• Daily site photographs showing the site entrance, the area of work, sediment control measures and any stockpiles resulting from the works. • A site plan showing any areas where site-won material (cleanfill or controlled material only) has been reused. • Disposal dockets if material is removed from the site. The dockets should contain the following information: ○ Date and time dispatched. ○ Material description. ○ The volume of material in the load. ○ Haulage contractor details (name, address, contact person, contact telephone number). ○ Truck and trailer registration number. ○ The destination of material. • Documentation for all imported fill which shall include: ○ Date and time dispatched. ○ Address of source site. ○ Type and proposed use of material. ○ Weight and / or volume of material carried. ○ Basis for treating the material as cleanfill (e.g., directly tested and confirmed to be cleanfill or directly sourced from a licensed quarry). • Information relating to any incidents or complaints and how these were managed.

10 Completion Reporting

A Summary of Works (SoW) report will likely be required following site development activities. The report shall be prepared in accordance with MfE Contaminated Land Management Guideline No. 1 (MfE, 2021a) by a Contaminated Land Specialist SQEP who has monitored the earthworks on-site. The report shall, as a minimum, include the following information:

- Summary of soil disturbance works on-site and information relating to discovery of additional contamination (if any), or site observations.
- Information relating to the capping details / construction of the capping layer.
- Documentation relating to the disposal of contaminated soil / fill (if any) and used PPE.
- Documentation relating to the importation of cleanfill (if relevant).

11 Limitations

- i. We have prepared this report in accordance with the brief as provided. This report has been prepared for the use of our client, Woolworths New Zealand Limited, their professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.
- ii. The recommendations in this report are based on the ground conditions indicated from published sources, site assessments and subsurface investigations described in this report based on accepted normal methods of site investigations. Only a limited amount of information has been collected to meet the specific financial and technical requirements of the client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it should be appreciated that actual conditions could vary from the assumed model.
- iii. Subsurface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.
- iv. This Limitation should be read in conjunction with the Engineering NZ/ACENZ Standard Terms of Engagement.
- v. This report is not to be reproduced either wholly or in part without our prior written permission.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on (09) 972 2205 if you require any further information.

Report prepared by



Tyler Paterson

Environmental Scientist

Report reviewed by



Dave Robotham, CEnvP SC

Principal Environmental Consultant

12 References

BRANZ, 2017. New Zealand Guidelines for Assessing and Managing Asbestos in Soil (NZGAMAS). The Building Research Association New Zealand.

ENGEO, 2022. ENGEO Limited. (2022). Preliminary Environmental Site Investigation – 484 Madras Street, St Albans, Christchurch (report reference: 21170.000.001_04).

ENGEO, 2024. ENGEO Limited. (2024). Detailed Site Investigation – 484 Madras Street, St Albans, Christchurch (report reference: 21170.000.001_09).

MfE, 2021a. Ministry for the Environment. (2021). Contaminated Land Management Guidelines No.1: Reporting on Contaminated Sites in New Zealand (revised 2021)

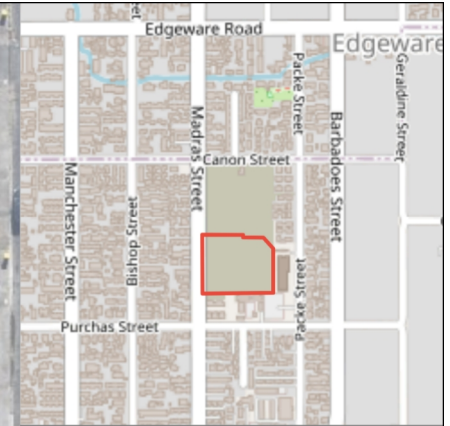
MfE, 2021b. Hazardous Activities and Industries List (HAIL). Ministry for the Environment.

NESCS, 2011. The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations (2011).

MBIE, 2015. Ministry for Business, Innovation and Employment. (2015). Health and Safety at Work Act.

WorkSafe, 2016. Approved Code of Practice, (2016).

FIGURES



Legend

Site Boundary

© Nearmap

ENGEO

Produced by [Datanest.earth](#)

Title: Site Location Plan		
Client: Woolworths New Zealand		Size: A4
Project: WWNZ Madras Street	Drawn: TP	Figure No.: 1
Date: 23-07-2024	Checked: JR	
Proj No: 21170.000.000	Scale: 1:1000	Version: 1.0



Legend

- Environmental Sample Locations
- Site Boundary

010 m20 m

© Nearmap

ENGEO

Produced by Datanest.earth

Title: Environmental Sampling Locations

Client: Woolworths New Zealand

Size: A4

Project: WWNZ Madras Street

Drawn: TP

Figure No.: 2

Date: 23-07-2024

Checked: JR

Proj No: 21170.000.000

Scale: 1:1000

Version: 1.0



Legend

- Environmental Sample Locations
- Site Boundary
- Soil exceeding the regional background criteria
- Soil exceeding the relevant human health criteria

0 10 m 20 m
© Nearmap

ENGEO

Produced by Datanest.earth

Title: Location of Contaminated Soil

Client: Woolworths New Zealand

Size: A4

Project:
WWNZ Madras
Street

Drawn: TP

Figure No.: 3

Date: 23-07-2024

Checked: JR

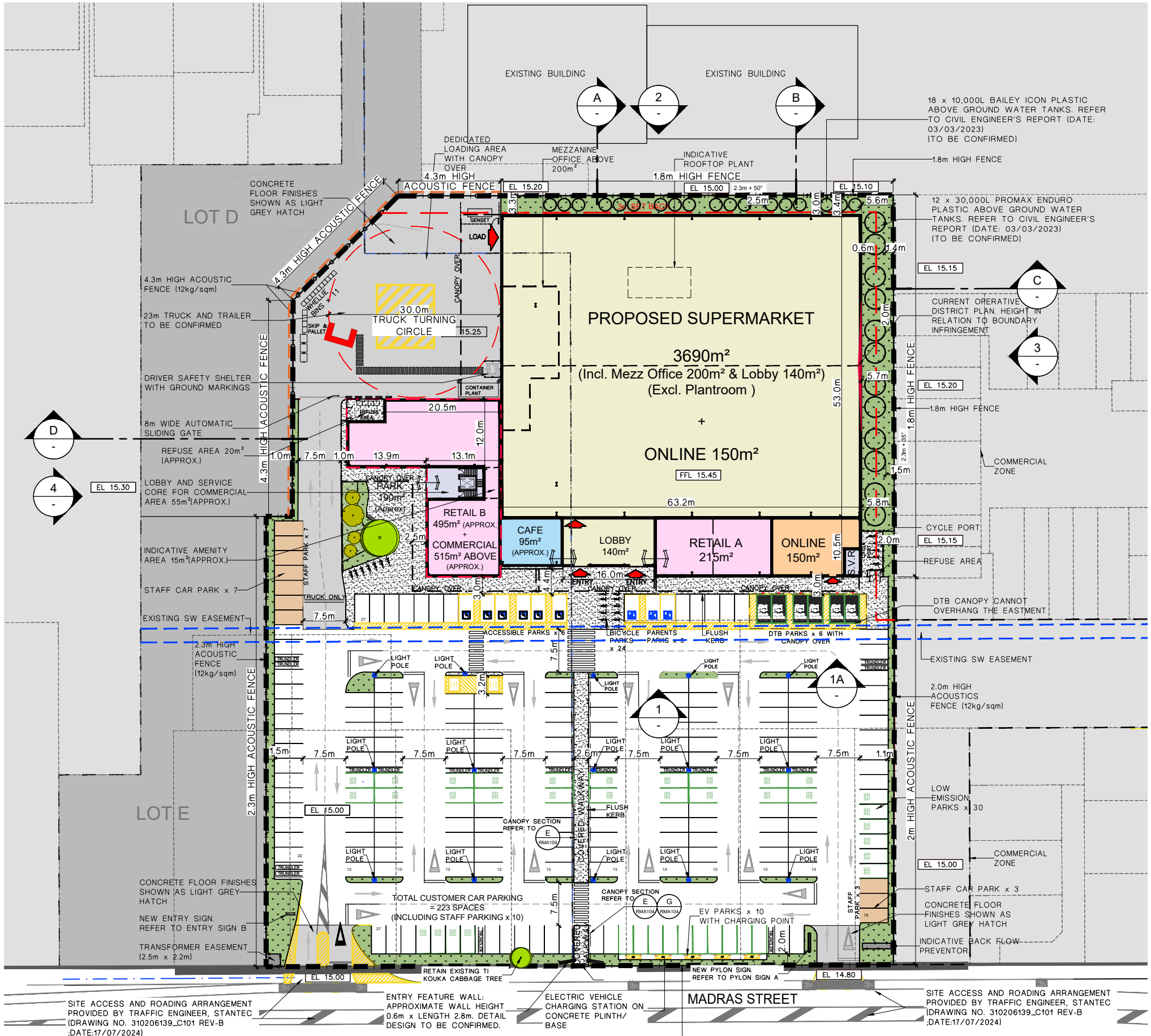
Proj No:
21170.000.000

Scale: 1:1000

Version: 1.0

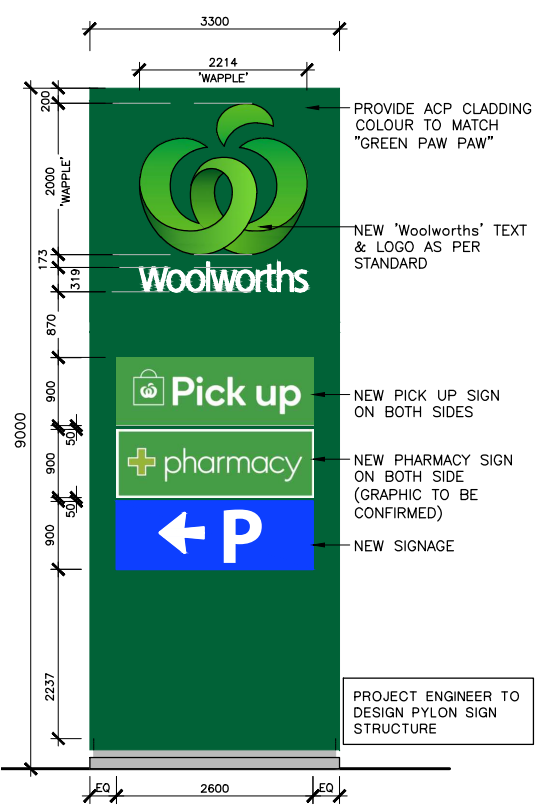
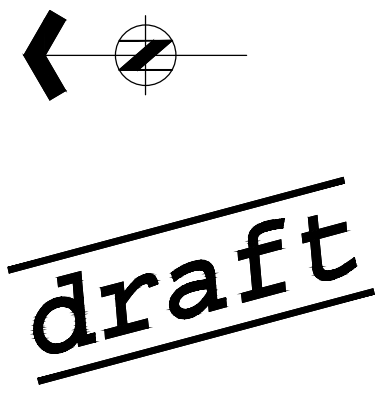


APPENDIX 1: Draft Redevelopment Plans

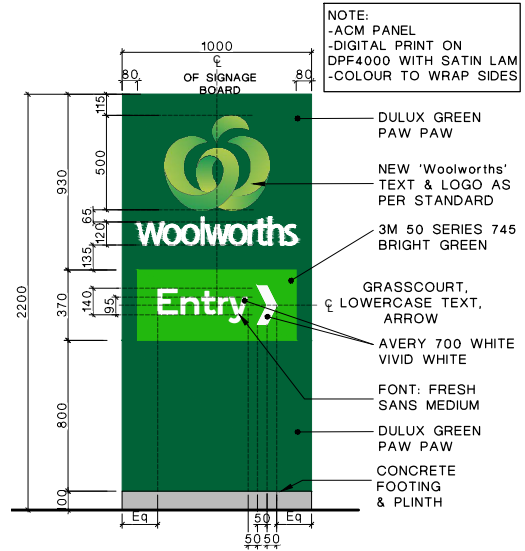


PROPOSED SITE PLAN
Scale 1:750 at A3

- DEVELOPMENT SUMMARY:**
- 1 SUPERMARKET DEVELOPMENT SITE AREA = 14330m² (APPROX.)
 - 2 SUPERMARKET AREA = 3550m² (1:20) (Incl. Mezz Office 200m²) (Excl. Plantroom)
 - 3 ONLINE = 150m² (1:50)
 - 4 HEADEROOM = 60m² (APPROX.)
 - 5 LOBBY = 140m² (APPROX.)
 - 6 RETAIL A + B + CAFE = 805m² (1:30)
 - 7 COMMERCIAL (ABOVE RETAIL B) = 515m² (1:30)
 - 8 CORE = 70m² (APPROX.)
 - 9 S.V.R. = 13m²
- PARKING SUMMARY:**
- 10 TOTAL PARKING PROVIDED = 223 SPACES (INCLUDING STAFF PARKING x 10)



PROPOSED PYLON SIGN A
Scale 1:100 at A3



PROPOSED ENTRY SIGN B
Scale 1:40 at A3



PROPOSED WOOLWORTHS SUPERMARKET RMA
Woolworths Madras Street, Christchurch, New Zealand

SCALE: AS SHOWN
DATE: 13 August 2024
JOB NO: 2028-15
DWG NO: RMA-101

WOODHAMS MEIKLE ZHAN ARCHITECTS

APPENDIX 2: DSI Results Table

Results Table 1: Soil Results

			Heavy Metals / Metalloids							Polycyclic Aromatic Hydrocarbons	Asbestos (% w/w)
			Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Benz[a]pyrene TEQ	Presence / Absence
Human Health Criteria - Commercial / Industrial			70 ¹	1300 ¹	6300 ¹	10000 ¹	3300 ¹	6000 ²	400000 ²	35 ¹	0.001 ³
Background Criteria (Christchurch Urban - Organic)			15.1	0.12	12.7	14.8	47.3	13.1	72.4	-	-
Sample Location	Depth (m bgl)	Date Sampled									
S3	0.2 - 0.4	18-Jan-23	37	0.17	14	38	135	13	167	2.6	NAD
S4	0.2 - 0.4	18-Jan-23	12	0.55	16	56	280	16	350	1.98	NAD
S5	0 - 0.3	18-Jan-23	7	0.78	15	58	580	13	660	-	NAD
S6	0 - 0.3	18-Jan-23	13	1.09	18	51	60	19	430	-	NAD
S7	0.2 - 0.4	18-Jan-23	8	0.25	15	48	330	17	260	-	NAD
S8	0.2 - 0.5	18-Jan-23	10	0.3	15	54	250	16	260	-	Chrysotile (0.00027%)
S9	0 - 0.4	18-Jan-23	7	0.26	15	28	187	18	200	-	-
S9	0.2 - 0.5	18-Jan-23	3	<0.1	12	6	11.3	10	37	-	NAD
S10	0 - 0.4	18-Jan-23	10	0.33	19	43	330	23	200	29	NAD
S11	0 - 0.3	18-Jan-23	-	-	-	-	-	-	-	-	NAD
S13	0 - 0.4	18-Jan-23	7	<0.1	13	26	36	10	71	-	NAD
S13	0.5 - 1.0	18-Jan-23	11	0.18	8	440	50	11	123	-	-
S13	1 - 1.5	18-Jan-23	-	-	-	-	-	-	-	-	NAD
S14	1 - 1.3	18-Jan-23	4	<0.1	14	13	24	12	61	<0.039	NAD
S15	0 - 0.5	18-Jan-23	3	<0.1	10	6	11.6	9	35	-	NAD
S16	0 - 0.5	18-Jan-23	3	<0.1	11	7	20	10	41	-	NAD
S17	0 - 0.4	18-Jan-23	10	<0.1	12	10	35	10	46	-	NAD
S18	0.5 - 0.8	18-Jan-23	<2	<0.1	10	6	12.5	9	34	-	NAD
S21	0 - 0.3	18-Jan-23	3	<0.1	12	8	12.7	10	40	-	NAD
S25	0.2 - 0.4	18-Jan-23	11	0.78	33	270	290	37	680	4.8	Chrysotile (0.00153%)
S25	1 - 1.5	18-Jan-23	12	1.19	56	220	330	21	850	3.3	Chrysotile (0.00017%)
S26	0.2 - 0.5	18-Jan-23	8	1.34	17	59	250	17	1630	7.2	NAD
S27	1 - 1.5	18-Jan-23	8	0.62	104	133	370	34	640	21	NAD
S29	0.3 - 0.5	18-Jan-23	3	<0.1	12	7	14.4	10	41	<0.025	NAD
S30	1 - 1.2	18-Jan-23	22	0.69	172	290	5700	20	740	21	NAD
S31	1.3 - 1.6	18-Jan-23	6	<0.1	18	24	54	12	80	13.7	NAD
S32	0 - 0.4	18-Jan-23	4	<0.1	13	7	13.5	10	40	-	NAD
S33	0.4 - 0.6	18-Jan-23	<2	<0.1	11	5	9.8	9	33	-	NAD
S34	0 - 0.5	18-Jan-23	4	<0.1	13	10	20	11	51	-	NAD

Table Notes:
All results and criteria are presented in milligram per kilogram (mg/kg) on a dry weight basis, except asbestos which is reported as % weight of asbestos / weight of sample (%w/w)
Selected results shown; Full results are included in the laboratory reports
Assumes a soil pH of 5 for Cadmium
- : not analysed or no applicable criteria
m bgl: metres below ground level
: NAD: No Asbestos Detected

Criteria notes:
1. Human Health Criteria for Commercial / Industrial Land use selected in general accordance with CLMG No. 2 (MfE, 2011). Unless otherwise stated, criteria from MfE (2011) Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health (Commercial / Industrial Land Use)
2. NEPM HILS. Criteria for Human Health - Commercial / Industrial Land Use
3. New Zealand Guidelines for Assessing and Managing Asbestos in Soil. (BRANZ, 2017). All site land uses for fibrous asbestos / asbestos fines (FA/AF).



APPENDIX 3: Site Controls

SITE SUMMARY

Proposed works	Soil disturbance / encapsulation associated with commercial redevelopment.
Contaminants identified on-site	Lead above the relevant human health criteria, and metals and hydrocarbons in site soil above natural background ranges.
Potential Risks to Site Workers	Incidental skin contact, ingestion of soil, or inhalation of dust should be avoided / mitigated through use of PPE and welfare measures.

KEY CONTACTS

WorkSafe	0800 030 040
Contaminated Land Specialist (ENGEO)	(09) 972 2205

HEALTH & SAFETY

All contractors and visitor shall be **inducted** before entering or commencing work to ensure they are **aware of the potential hazards** relating to contaminated soil at the site.

As a minimum, facilities to wash and dry hands prior to eating, drinking or vaping / smoking should be provided.

PPE / RPE to minimise the effects of potential contamination exposure. Along with standard PPE requirements for construction sites (e.g., safety boots) the following should be considered:

- P2 Dust Mask (if visible dust is present)
- Work gloves / Coveralls (if contact with soil unavoidable)

Works shall temporarily stop and the Contaminated Land Specialist contacted should any areas of potential contamination be discovered during works. Typical indicators of contamination are asbestos containing material, staining, odorous material, visible sheen on water.

Legend

- Environmental Sample Locations
- Site Boundary
- Soil exceeding the regional background criteria
- Soil exceeding the relevant human health criteria

1

Image extracted from Figure 3

Contaminated Material (shaded purple on figure)

- Contamination (lead above the relevant human health criteria) has been detected at S30 (at 1.2-1.5 m bgl).
- Contamination (asbestos above the relevant human health criteria) has been detected at S25 (at 0.2 – 0.4 m bgl).
- This area is proposed excavated to 0.5 meters bgl and disposed off-site, with the remaining soil to be capped to reduce the pathway to future site users.

Controlled Material (shaded yellow on figure)

- Soil is suitable to remain on-site, however contaminant concentrations exceed cleanfill criteria for disposal purposes.
- If material in this area requires off-site disposal it cannot be disposed as “cleanfill” and instead should be disposed to a facility licensed to accept the level of contamination detected.

DAILY SITE CHECK (take photographs to record check)

- Security fencing and appropriate warning signs are in place.
- Sediment control measures in good condition and working as designed.
- Check site entrance and adjacent public road for silt / sediment deposition.
- Check integrity of stockpile controls (if applicable).
- Check excavations to see if **perched groundwater or surface water** requires removal. Approval from local authority is required to discharge to local network – refer to SMP / RAP.

GENERAL SITE CONTROLS

- Dust shall be managed in accordance with consent requirements and relevant regulations.
- If excavated material is **odorous**, odour control measures shall be put in place.
- If **perched groundwater or surface water** is encountered the controls in the SMP / RAP shall be implemented.
- If **temporary stockpiling of non-cleanfill material** is necessary, dust shall be controlled through wetting during the workday. If left overnight, the material shall be covered (e.g., with plastic) and protected by erosion / sediment controls (e.g., bunded).
- Stockpiles of non-cleanfill material shall be located either on an impermeable surface, or the underlying material should be considered potentially contaminated, and shall be managed in accordance with the SMP / RAP.
- Clean and dirty areas should be managed to prevent tracking potentially impacted soils around the site and off-site.
- Any wastewater generated, or rock / soil utilised in a truck loading area should be disposed of as contaminated material, unless tested.

RECORD KEEPING

- Daily photographs to be made available on request.
- Disposal docket for all material should be forwarded to the Contaminated Land Specialist.
- Fill imported to site shall meet the Auckland Council definition of cleanfill.
- The location of any contaminated soils retained on-site shall be recorded on as built drawings.

OFF-SITE DISPOSAL OF CONTAMINATED SOIL

- Trucks shall be loaded in a location within the site where runoff and possible spills during loading will be controlled and contained. Loads must be securely covered during off-site transport. Soil must be taken to an appropriate soil disposal facility authorised to accept the contaminants identified.
- Prior to acceptance the results of the soil testing may be requested by the receiving facility.
- Requirements for additional testing and truck lining / soil wrapping should be confirmed with the receiving landfill.
- Further testing may be required to assess whether deeper material is cleanfill / managed fill.

For details of the controls refer to the current site-specific SMP / RAP prepared by ENGEO. All site staff and subcontractors are aware of and comply with the procedures and health and safety requirements contained within this document.

ENGEO

14.08.2024
21170.000.001



APPENDIX 4: Asbestos Controls

484 Madras Street, St Albans, Christchurch

Asbestos Controls

Scenario (NZ GAMAS 2017 definitions)	Control Measure Objectives	Unlicensed Asbestos Work	Asbestos-related Work	Class B: non-friable	Class A: friable	Source Guideline Reference
FA/AF % w/w in soil		≤ 0.001	> 0.001	> 0.01	> 1	
ACM % w/w		≤ 0.01%	> 0.01	> 1	-	
Scale, soil volume		≤ NESCS	> NESCS	-	-	
Asbestos in air		< 0.01 f/mL in air	< 0.01 f/mL in air	≥ 0.01 f/mL in air	≥ 0.01 f/mL in air	
REMOVAL WORKS RESPONSIBILITIES						
Remedial Works Supervision / Oversight	OBJECTIVE: <i>Undertake work by persons who have adequate knowledge and experience to assess the risks and implement appropriate control measures</i>	A Suitably Qualified and Experienced Practitioner (Contaminated Land – refer to NESCS)		Class B Supervisor	Class A Supervisor	ACOP
WorkSafe Notification		Not required		Notification five days before earthworks are to be undertaken		ACOP
Contractor License Requirements		Not required		Class B License	Class A License	ACOP
Training/Certification Requirements		Non-certified training in asbestos identification, safe handling and suitable controls. A copy of the training shall be kept on record.		Certified training for workers. Certified, competent supervisors.	Certified training for workers. Certified, competent supervisors. Certified safety management system.	Figure 17 ACOP
SITE SET-UP						
Boundary Controls	OBJECTIVE: <i>Prevent unauthorised access into works areas and accidental transport of contaminated soils on boots, clothing, equipment, skin, or in air / dust.</i>	Physical barriers must be in place to prevent unauthorised access.	Physical barriers must be in place to prevent unauthorised access. Warning signs must be present that clearly show that asbestos related works are underway.	Physical barriers must be in place to prevent unauthorised access. Polythene sheeting may be necessary to prevent spread of airborne fibres outside of works area. Warning signs must be present that clearly show that asbestos removal works are underway.	Physical barriers must be in place to prevent unauthorised access. Consider use of solid hoarding placed at a suitable distance beyond the works area, or full enclosure. Warning signs must be present that clearly show that asbestos removal works are underway.	ACOP
Personal Decontamination Facilities		Educate site workers to minimise contact with soil. Provide a boot wash and lidded and plastic lined bin for secure disposal of used PPE.	Basic disposable decontamination tent and boot wash.		Basic disposable wet decontamination tent or trailer.	NZ GAMAS Table 6
Dust / Asbestos Fibre Suppression	OBJECTIVE: <i>Minimise the release of asbestos fibres from soils.</i>	Minimise the size of the earthworks areas and time exposed to the elements. Stabilise exposed earth surfaces as soon as possible following works.				
		Spray mist water via localised points. Consider use of surfactants or polymers where a reliable source of water is not available. Consider implementing additional controls (as per Class B works) if sensitive receptors nearby (such as adjacent to busy centres, schools).		Spray mist water via localised points. Addition of surfactants and polymers where the location is sensitive (such as adjacent to busy centres, schools) or if a source of water is not readily available. Consider temporary cover of contaminated areas awaiting remediation.		NZ GAMAS Table 6

484 Madras Street, St Albans, Christchurch

Asbestos Controls

Scenario (NZ GAMAS 2017 definitions)		Control Measure Objectives	Unlicensed Asbestos Work	Asbestos-related Work	Class B: non-friable	Class A: friable	Source Guideline Reference
FA/AF % w/w in soil			≤ 0.001	> 0.001	> 0.01	> 1	
ACM % w/w			≤ 0.01%	> 0.01	> 1	-	
Scale, soil volume			≤ NESCS	> NESCS	-	-	
Asbestos in air			< 0.01 f/mL in air	< 0.01 f/mL in air	≥ 0.01 f/mL in air	≥ 0.01 f/mL in air	
OCCUPATIONAL HEALTH AND SAFETY							
Personal Protective Equipment & Respiratory Protective Equipment		OBJECTIVE: <i>Minimise workers exposure to asbestos fibres.</i> <i>Reduce accidental transport of asbestos contaminated soils off site on workers clothing, boots.</i>	Educate site workers to minimise contact with soil; to clean equipment and to undertake activities in a manner that reduces dust.	Disposable coveralls rated type 5, category 3, nitrile gloves Steel toe capped gumboots are preferred as these can be readily washed down. Disposable overshoes can be used to prevent contamination of laces.			NZ GAMAS Table 6
				Disposable P2 dust mask recommended.	Half-face P3 respirator with particulate filter. Consider increasing to full-face if friable ACM present.	Full-face P3 respirator with particulate filter. Consider increasing to power-assisted if required.	NZ GAMAS Table 6 <i>Refer to Part C section 14 of the ACOP and AS/NZS 1715:2009 for more information</i>
Contractor Health Monitoring		OBJECTIVE: <i>Mitigate risks to workers from the potentially harmful effects of asbestos through the workplace.</i>	The contractor must ensure that worker health monitoring is undertaken in accordance with the Asbestos Regulations Clause 15 and 16.		In accordance with the Asbestos Regulations Clause 15 and 16, a PCBU must ensure that health monitoring is provided to workers involved in more than four weeks of Class B work in any twelve-month period. Refer ACOP Section 16	In accordance with the Asbestos Regulations Clause 15 and 16, a PCBU must ensure that health monitoring is provided to workers involved in Class A work. Refer ACOP Section 16	ACOP Section 16
MONITORING PROCEDURES							
Air Monitoring	Responsibility	OBJECTIVE: <i>Provide a clear expectation of who is responsible for undertaking monitoring, and that the person has the appropriate skills and knowledge to do so.</i>	SQEP / Competent Person		Independent Licensed Asbestos Assessor OR Independent Competent Person as defined within Section 30.4 of the ACOP	Independent Licensed Asbestos Assessor	Section 30.4 of the ACOP
	Requirement	<i>To provide verification that works have been safely undertaken.</i> <i>To provide early warning of potentially harmful levels of exposure.</i> <i>To identify when asbestos is present in air at a concentration that presents an</i>	Air monitoring is not required for Unlicensed Asbestos works, or Asbestos Related works (as defined under the NZ GAMAS) however it is recommended where possible to provide assurances regarding cross contamination and protection of workers.		If the SQEP or competent person considers that the trace level of 0.01 f/ml may be exceeded, then air monitoring must be undertaken.	Air monitoring must be conducted before and during Class A asbestos removal work.	NZ GAMAS Section 5.5

484 Madras Street, St Albans, Christchurch

Asbestos Controls

Scenario (NZ GAMAS 2017 definitions)		Control Measure Objectives	Unlicensed Asbestos Work	Asbestos-related Work	Class B: non-friable	Class A: friable	Source Guideline Reference
FA/AF % w/w in soil			≤ 0.001	> 0.001	> 0.01	> 1	
ACM % w/w			≤ 0.01%	> 0.01	> 1	-	
Scale, soil volume			≤ NESCS	> NESCS	-	-	
Asbestos in air			< 0.01 f/mL in air	< 0.01 f/mL in air	≥ 0.01 f/mL in air	≥ 0.01 f/mL in air	
	Compliance	unacceptable risk to site workers and surrounding receptors. Undertake works by persons who have been trained to manage the risks associated with asbestos. Implement additional control measures when necessary.	If the concentration exceeds 0.01 f/ml then works are Class B or Class A works under the NZ GAMAS definition.		All results shall be below 0.01 fibres / ml. < 0.01 f/ml – continue with works > 0.01 f/ml – investigate the cause and implement additional controls > 0.02 f/ml – stop works and investigate, notify WorkSafe >0.1 f/ml – Remedial works required. PCBUs with management or control of workplace are to ensure that exposure of a person at the workplace to airborne asbestos is eliminated so far as is reasonably practicable.		Section 30 of the ACOP
SITE CONTROLS							
Vehicle Decontamination	Vehicle assessment before demobilisation from site	OBJECTIVE: Minimise the potential for accidental transport of contaminated soils or asbestos fibres out of the works areas on, or in vehicles.	Minimise vehicle transport onto site areas containing asbestos soils, or in locations where asbestos fibres may be present in air.		Visual (plus swab samples if friable ACM is elsewhere on-site – lagging, insulation, etc).	Visual plus swab samples, air sampling should be undertaken inside the cab.	NZ GAMAS Table 7
	Visual assessment.						
	Vehicle assessment completed by		Competent person or SQEP.		Independent licensed assessor or independent competent person (meeting the requirements of regulation 41(3) under the Asbestos Regulations).	Independent licensed assessor.	NZ GAMAS Table 7
	Truck/excavator air conditioning	OBJECTIVE: To prevent the contamination of internal spaces of equipment where people work. To avoid worker exposure to asbestos fibres.	Standard air conditioning.		HEPA filter system fitted for all occupied vehicles where friable ACM on-site.	HEPA filter system fitted for all occupied vehicles, filter replaced or clean down with HEPA vacuum cleaner post work.	NZ GAMAS Table 7
MANAGEMENT OF CONTAMINATED MATERIAL							
Stockpiles of impacted soils		OBJECTIVE: To minimise the release of asbestos fibres into air.	Stockpiles should be avoided where possible to ensure that exposed areas of soil are minimised. All temporary stockpiled asbestos contaminated material which is created and not proposed to be immediately moved should be covered. Stockpiles shall be located on an impermeable surface within an area protected by erosion and sediment controls. Consider covering stockpiles with polythene.				NZ GAMAS Section 6.6

484 Madras Street, St Albans, Christchurch

Asbestos Controls

Scenario (NZ GAMAS 2017 definitions)	Control Measure Objectives	Unlicensed Asbestos Work	Asbestos-related Work	Class B: non-friable	Class A: friable	Source Guideline Reference
FA/AF % w/w in soil		≤ 0.001	> 0.001	> 0.01	> 1	
ACM % w/w		≤ 0.01%	> 0.01	> 1	-	
Scale, soil volume		≤ NESCS	> NESCS	-	-	
Asbestos in air		< 0.01 f/mL in air	< 0.01 f/mL in air	≥ 0.01 f/mL in air	≥ 0.01 f/mL in air	
Used PPE	<i>Asbestos contaminated material is to be appropriately transported and disposed in a location where the material presents no unacceptable human health risk.</i>	All disposable PPE used during remediation of asbestos impacted soil should be placed in a 200 micron HDPE plastic bag within the decontamination area. The bag should be taped closed (in a goose neck fashion) after each item is added and kept damp via the addition of water. Once full, the bag should be double bagged (200 micron HDPE) and labelled “Asbestos hazard – wear respirator and protective clothing while handling contents”.				NZ GAMAS Section 6.6
Contaminated Soil		The location of any soils retained on-site shall be recorded on as built drawings.				NZ GAMAS Section 6.6
		The receiving facility should be contacted in advance of the soil disposal to verify the requirements for receiving the wastes.				
		Trucks shall have their loads securely covered during off-site transport of material.				
Contaminated Water		Waste manifests should be completed and retained for all off-site disposal of soils.				NZ GAMAS Section 6.6
	Site records shall be cross checked against receipts of soil disposal from the receiving facility.					
Contaminated Soil	<i>To track the movement of contaminated materials.</i>	The bins / skips or trucks shall be loaded within the site where runoff and possible spills during loading will be controlled and contained.				NZ GAMAS Section 6.6
		Special waste bins / skips or trucks, approved for the transport of ACM to the appointed licensed landfill facility shall be placed on-site. The bins / skips or trucks will be lined / wrapped in accordance with requirements of receiving facility.		Special waste bins / skips or trucks, approved for the transport of ACM to the appointed licensed landfill facility shall be placed on-site. The bins / skips or trucks will be lined with 200 micron sealed plastic.		
Contaminated Water	<i>To track the movement of contaminated materials.</i>	It is recommended that any soil which contains asbestos in concentrations >0.001% w/w is considered hazardous and the controls stated in the Land Transport Rules adopted. For asbestos soil waste in significant quantities, hazard label signage should be displayed on the vehicles transporting the soil for disposal.		It is recommended that any soil which contains asbestos in concentrations >0.001% w/w is considered hazardous and the controls stated in the Land Transport Rules adopted. For asbestos soil waste in significant quantities, hazard label signage should be displayed on the vehicles transporting the soil for disposal.		NZ GAMAS Section 6.6
		Water used for cleaning asbestos-contaminated equipment (including vehicles) shall be placed into a drum or skip and disposed of at an appropriately licensed facility.				
Contaminated Water	<i>To track the movement of contaminated materials.</i>	If excessive water is applied, ponding or runoff may occur which could permit the transport and accumulation of asbestos fines outside of the site. Water from the work area should be retained inside the boundary of the site and wash water directed back into excavations and the site.				NZ GAMAS Section 6.6