19 September 2025 Document Ref: HAM2023-0058AD | Rev 2

Bloxam Burnett & Olliver (BBO)
4/18 London Street
Hamilton, 3204

Attention: Constantinos Fokianos

Dear Constantinos

RE: PRELIMINARY GEOTECHNICAL REPORT – MITRE 10
638 CAMBRIDGE ROAD, TE AWAMUTU

1.0 INTRODUCTION

CMW Geosciences (CMW) was engaged by Bloxam Burnett & Olliver (BBO) to carry out a geotechnical assessment of a site located at 638 Cambridge Road, Te Awamutu, to support a plan change application to have the site rezoned as commercial/industrial.

The scope of work and associated terms and conditions of our engagement were detailed in our services proposal letter referenced HAM2023-0058AC, Rev2 VO1 dated 4 October 2024.

2.0 SITE DESCRIPTION

2.1 Site Location

The proposed development site "the Site" is located on Cambridge Road, Te Awamutu, as shown in ***Figure 1***.

Figure 1. Site Location Plan (Source: Waipa District Maps, 2021)

The Site comprises an area of approximately 4ha and is currently used for agricultural purposes.

It is bordered by residential properties to the north, the Te Awamutu Large Format Retail Centre to the east, and grassed agricultural land to the south and west.

2.2 Landform

The Site is predominantly gently sloping, with existing ground levels ranging from approximately RL48m to RL48.5m at the northern end to RL47m at the southern end.

The northern site boundary is at the toe of low rolling hills located to the north of the site. The maximum elevation of the hills is approximately RL51m.

The land to the south and west of the site falls to approximately RL44m to RL45m.

The nearest watercourse is the Mangaohoi Stream, which at its closest, is approximately 35m from the southwestern site boundary. The stream channel is incised approximately 4m below the Site to approximately RL43m to RL44m. We understand that the stream is prone to flooding.

2.3 Site History

In addition to the infilled relict stream channels, there appears to be a depression to the northwest of the Site. This depression appears to have been infilled over time and is also shown indicatively on ***Drawings 01 and 02***.

A review of the available Retrolens and Google Earth aerial imagery from the period 1944 to 2023 was undertaken. Copies of the photographs reviewed are provided in ***Appendix A*** along with a summary of the changes observed within the Site and its surrounds, presented in **Table A1**. In summary:

- The Site has been used for agricultural purposes since the 1940s.
- Various earthworks have historically been carried out across the Site and the surrounding area including infilling or partial infilling of relict stream channels. Approximate extents of the infilled channels are shown in ***Drawing 01, with a geological section provided in Drawing 02***.
- The course of the meandering Mangaohoi Stream changed most significantly before 1958 and has remained largely unchanged since then.
- Various buildings have come and gone from within the Site.
- There have been minor changes to vegetation within the Site.
- Development of the area to the east of the Site, currently the Te Awamutu Large Format Retail Centre, commenced sometime between 1944 and 1958. The initial development was next to Cambridge Road but extended to the south over time. We understand that the Site was operated as a sawmill. The sawmill appears to have shutdown sometime between 1974 and 1995. Development of the Te Awamutu Large Format Retail Centre had commenced by 2010.

3.0 PROPOSED DEVELOPMENT

The site plan by Woodhams Meikle Zhan Architects (***Appendix B***) shows a building with a 13,000m^2 floor area covering the western side of the Site, which we assume will be a single-story warehouse building, similar to other Mitre 10 stores.

The proposed building is shown to be offset approximately 14m from the western boundary and 7m from the northern boundary. A 6m wide landscape strip is shown along the north, south, and west boundaries. It is assumed that the remainder of the site will comprise hardstand and car parking.

At the time of writing this report, cut and/or fill plans have not been provided. However, there is currently an approximate drop in level of 1.5m between the north end of the site and the south end, therefore cut and/or fill will be required to provide a level building platform.

4.0 INVESTIGATION SCOPE

4.1 Desktop Study

The desktop study undertaken for the site by CMW included review of relevant historic aerial photographs and geological mapping[1].

4.2 Field Investigation

Following a dial before you dig search, the field investigation was carried out on 18 October 2024. Fieldwork was carried out by CMW Geosciences in general accordance with the NZGS specifications[2] and logged in accordance with NZGS guidance[3].

The scope of the fieldwork was completed as follows:

- A walkover survey of the site to assess the general landform, site conditions and adjacent structures / infrastructure.
- An onsite services search was carried out by a specialist contractor to identify the presence of any underground obstructions or hazards prior to the field investigation program commencing.
- Eight Hand Auger boreholes (HA), denoted HA-01 and HA-08 were drilled using a 50mm diameter auger below existing ground levels to visually observe the near surface soil profile and to facilitate vane shear strength testing. HA01 to HA04 were terminated at depths of 1.9m to 3.6m below ground level due to hole collapse/no retrieval, prior to reaching the target depth of 5m. HA06 to HA08 were terminated at depths of 1.2m to 1.7m below ground level due to refusal on hard ground, prior to reaching the target depth of 5m. HA05 was terminated at a depth of 5m below ground level, reaching target depth. Engineering logs of the hand auger boreholes, together with peak and remoulded vane shear strengths are presented in ***Appendix C***.
- Dynamic cone (Scala) penetrometer (DCP) tests were carried out adjacent to each hand auger borehole in granular soils, to a depth of 5m below ground level, to provide soil density profiles. Graphical results of the DCP testing are presented in the borehole logs in ***Appendix C***.
- Two standpipe piezometers (piezo), denoted Piezo1 and Piezo2 were installed to allow for monitoring of perched groundwater. Piezo1 was terminated at 2m below ground level and Piezo2 was terminated at 3m below ground level, due to reaching target depth. Engineering logs of installed piezometers are presented in ***Appendix C***.

The approximate locations of the respective investigation sites referred to above are shown in the appended Site Investigation Plan (***Drawing 01***).

[1] GNS Geological Map 1:250,000 scale Geological Map No 4 'Waikato'. SW Edbrooke et al.
[2] NZ Geotechnical Society (2017) NZ Ground Investigation Specification, Volume 1 – Master Specification.
[3] NZ Geotechnical Society (2005), Field Description of Soil and Rock, Guideline for the field classification and description of soil and rock for engineering purposes.

5.0 GROUND MODEL

5.1 Published Geology

Published geological maps[1] for the area indicate the Site to be predominantly underlain by cross-bedded pumice sand, silt, gravel and interbedded peat of the Hinuera Formation (Late Pleistocene age river deposits). Recent gully alluvium and colluvium, comprised of sand, silt, mud and clay with local gravel and peat beds (Holocene age river deposits) is mapped in and around the Mangaohoi Stream channel. This alluvium is shown as extending into the southwest corner of the Site.

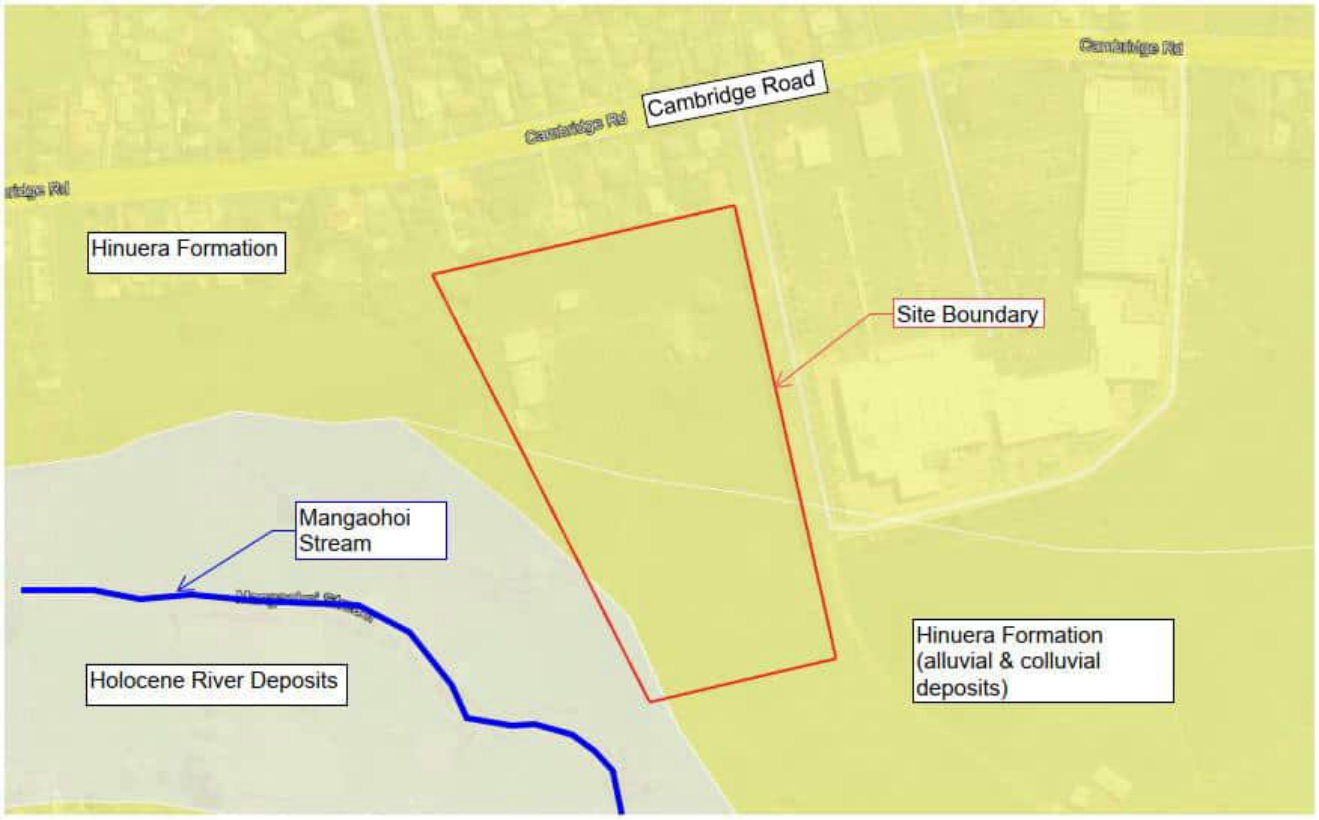

Figure 2. Published Geology (Source: Edbrooke, 2005)

Based on our knowledge of local geology, the extents of Hinuera and Piako units will be dictated by historic stream channel alignments and are expected to be highly irregular.

Based on the known history of the Site and surrounding land levels, uncontrolled fill of variable thickness is expected to be present across much of the Site due to previous earthworks.

5.2 Stratigraphic Units

The ground conditions encountered and inferred from the investigation were considered to be generally consistent with the published geology mapping for the area.

The site is predominantly underlain by crossed-bedded river deposits of the Hinuera Formation. Uncontrolled fill was encountered within the northwest corner of the site and within the infilled relict stream channels.

The distribution of the various units encountered is presented in the appended ***A-A Geological Section*** in ***Drawing 02*** and in ***Table 1*** below.

Table 1: Summary of Strata Encountered				
Unit	**Depth to base (m)**		**Thickness (m)[1]**	
	Min	**Max**	**Min**	**Max**
Topsoil	0.2		0.2	
Uncontrolled Fill – Loose to Medium Dense Silty SAND / Sandy SILT / SILT[2]	0.5	0.8	0.2	0.6
Uncontrolled Fill –WOOD SHAVINGS[2]	0.9		0.4	
Uncontrolled Fill –Organic SILT with minor/some wood fragments and trace/some sand (Fill)[2]	>1.2	1.6	>0.2	0.7
Uncontrolled Fill – Sandy Organic SILT / Organic Silt with trace sand / Organic Silty SAND[3]	0.4	>1.7	0.2	>1.5
Loose to Dense Silty SAND / Stiff Sandy SILT / Stiff to very Stiff SILT / Very Stiff Silty CLAY (Hinuera Formation)[4]	>1.9	>5.0	>0.8	>4.6
Stiff to Hard Clayey SILT / SILT (Walton Subgroup – Puketoka Formation)[5]	10	11.5	3.5	5.5
Dense to Very Dense Primary & Reworked Ignimbrite (Walton Subgroup)[5]	>15	>17	>4.5	-

Notes:
1. Thickness only recorded where base of strata has been confirmed.
2. Encountered in HA01 and HA06. Likely come from the sawmill previously on the site to the east.
3. Encountered in HA05, HA07, HA08 and Piezo1.
4. Encountered in HA01, HA02, HA03, HA04, HA05, Piezo 1 and Piezo2.
5. Interpreted from nearby CPTs.

5.3 Groundwater

During the investigation, which was completed in mid-spring conditions (October 2024), groundwater was encountered within the HA boreholes and piezometers at the depths provided in ***Table 2***.

Table 2: Depth of Groundwater Encountered		
Borehole Location	**Groundwater Depth (m)**	**Date of Test**
HA01	1.5	18/10/2024
HA02	1.3	18/10/2024
HA03	1.3	18/10/2024
HA04	1.8	18/10/2024
HA05	0.9	18/10/2024
HA06	Not encountered	18/10/2024
HA07	1	18/10/2024

Table 2: Depth of Groundwater Encountered		
Borehole Location	**Groundwater Depth (m)**	**Date of Test**
HA08	1.5	18/10/2024
Piezo1	1.3	18/10/2024
Piezo2	2.5	18/10/2024

Based on our knowledge of local ground conditions it is considered likely that the groundwater levels presented in ***Table 2*** most likely represent perched groundwater rather than the regional water table. Perched groundwater is expected to be extensively present across the site within discrete layers of the Hinuera Formation, above the regional groundwater table.

The depth to the permanent regional water table may be over 3m and is likely to draw down to the Mangaohoi Stream where its depth may increase as the ground level rises towards Cambridge Road.

Seasonal fluctuations in groundwater should be expected. It is commonly assumed that the depth to the regional water table may vary by nominally 1m between summer and winter conditions for sites across the Hamilton Basin.

6.0 GEOHAZADS ASSESSMENT

6.1 Fault Rupture

The nearest active fault is the Kerepehi fault approximately 40km to the northeast. The Site is therefore not considered to be at risk of fault rupture on the basis that there are no mapped active faults in the area.

6.2 Liquefaction

The loose to medium dense sands of the Hinuera Formation and the Holocene Alluvium are susceptible to liquefaction and free-field liquefaction induced settlements during a ULS seismic event. The magnitude of liquefaction induced settlement is likely to vary across the Site and differential settlement should be anticipated.

Based on liquefaction assessments on the neighbouring site, the induced ULS total free-field settlement for Importance Level 2 (IL2) structures with a design life of 50years may be up to approximately 100mm. Differential settlements are often estimated as 1/2 to 2/3 of the total settlement over the width of the building. Settlements of this order of magnitude for large portal frame structures (ie. future Mitre 10 building) can typically be accommodated in their structural design.

The free-field settlement estimate does not account for surface expression of liquefaction or load induced shear settlements that may result in additional settlement where shallow groundwater is present. These possible sources of settlement should be considered during detailed design, although based on our knowledge of local ground conditions we do not expect these to pose a significant risk to the proposed development.

Liquefaction induced settlement is highly dependent on the location of the groundwater table – both perched and regional. The groundwater model for the Site will need to be refined at later stages of the project through further geotechnical investigation and groundwater monitoring, and a site-specific quantitative liquefaction assessment carried out.

6.3 Cyclic Softening

The fine-grained Holocene alluvium, while not liquefiable due to its high plasticity, may be susceptible to some strength loss, referred to as cyclic softening, during a ULS seismic event. This should be evaluated as part of detailed design when considering global stability and lateral spread.

6.4 Lateral Spread

Following the onset of liquefaction, the liquefied soils behave as a very weak undrained material, which can give rise to lateral spreading where a free face is present or where proposed cut and fill batters are proposed over or within liquefied soils.

Free-faces are present along the south and west sides of the Site where the ground level falls towards the Mangaohoi Stream. Free-faces are also present along the Mangaohoi Stream and its relict channels and a manmade drain near the northwestern site boundary.

In cases where flow failure is not predicted to occur, the maximum extent of lateral stretch is typically taken as 4 times the free-face height measured back from the slope crest. Based on this, the currently proposed building setbacks from the Site boundary are expected to be adequate to address lateral spread risk.

The extent and magnitude of lateral spreading that may occur following liquefaction is highly dependent on both the extent and depth of liquified soils, the steepness of the slopes and the setback of any loads applied near the slope crest. Lateral spreading will need to be assessed in more detail once deep geotechnical investigation data is available. Recommendations on mitigating lateral spread are provided in Section 7.2.

6.5 Slope Stability

Based on the site topography and our knowledge of local ground conditions, the existing natural slopes at the Site are not considered at risk of slope instability during static (non-seismic) conditions.

6.6 Load Induced Settlement

Based on the preliminary investigation results and our experience with similar projects across the region, the underlying Hinuera or Puketoka Formation soils have a moderate susceptibility the undergoing settlement when exposed to fill embankment and building loads. The magnitude of those settlements is dictated by the thickness of compressible silt layers and the magnitude of load applied.

Settlements will be assessed at the detailed design stage when fill depths and building loads are known and when appropriate deep geotechnical investigations have been undertaken.

The uncontrolled fill within the infilled gullies and north-western corner is of relatively poor quality and is expected to present greater load induced settlement and therefore differential settlement relative to the adjacent natural ground areas.

Recommendations for mitigation of load induced settlement are provided in Section 7.6.

6.7 Erosion

Given the general site gradient, runoff is expected to flow from north to south. The predominantly silty and sandy silts of the near surface Hinuera Formation soils, are prone to erosion due to surface water flow. Rill and channel erosion are to be expected where the stripped subgrade is left exposed during the winter months.

6.8 Sensitive Soils

The silty soils of the Hinuera Formation can be sensitive and rapidly lose strength if they get wet or are disturbed, for example through trafficking. The Puketoka Formation soils underlying the Hinuera Formation

soils are typically very sensitive. The sensitivity of these soils needs specific consideration in selecting suitable earthworks methodologies.

7.0 GEOTECHNICAL RECOMMENDATIONS

7.1 Seismic Site Subsoil Category

Based on a joint study by the University of Auckland and University of Waikato[4], the fundamental site period is expected to be greater than 0.6s, therefore, structural designers working on this site should assess seismic parameters in accordance with NZS1170:2004 and assuming Site Subsoil Class D.

7.2 Liquefaction and Lateral Spread Mitigation

Liquefaction induced settlement magnitudes, the risk of surface expression of liquefaction, and lateral stretch magnitudes will need to be assessed in detail once appropriate site-specific geotechnical investigation, including confirmation of groundwater levels, has been undertaken. The investigation will need to include assessment of a site specific Vs30 (average shear wave velocity within the top 30m) for use in seismic assessment. Structural design should consider both total and differential liquefaction induced settlements.

For lateral spread, where the predicted extent and magnitudes are small, the risk may be mitigated through sufficient setback of buildings and critical infrastructure from the free face.

Where more extensive lateral spreading is predicted, or where vertical liquefaction settlements exceed design tolerances, ground improvement may be required. Options that may be suitable include drainage to lower groundwater levels, or installation of Rammed Aggregate Pier (RAP) ground improvement.

7.3 Slope Stability Management

Due to the low slope heights, it is expected that any risk of static slope instability could be mitigated through sufficient setback of buildings from the site slope crest. Current proposed building setback are appropriate based on the information available. A quantitative slope stability assessment is recommended to confirm the building setbacks once more detailed site investigation data is available.

7.4 Settlement Mitigation

Where it is determined at the detailed design stage that post-construction load induced total and/or differential settlements exceed structural design tolerances, mitigation measures can be adopted. Ground improvement options that could be considered include:

- Undercutting and replacement or reworking of pre-existing uncontrolled fill and / or soft ground.
- Construction of temporary surcharge fills (pre-loading) for several months to over consolidate any compressible layers to reduce post construction settlements to tolerable magnitudes.
- Installation of deep ground improvement, comprising Rammed Aggregate Piers (RAPs), drilled or driven displacement rigid inclusions or conventional piles.

We consider that it will be possible to address static and seismic settlement risks for the development through appropriate geotechnical investigation, analysis, and design during subsequent stages of the development.

7.5 Earthworks

Preparation of the stiff to very stiff subgrade beneath the any proposed fill areas should comprise stripping of all vegetation, topsoil, any pre-existing fill materials or weak colluvium followed by benching of the exposed

[4] (Jeong & Wotherspoon, 2019)

subgrade where natural slopes beneath the fill exceed gradients of nominally 1:5 (vertical to horizontal). The subgrade should then be scarified and moisture conditioned where necessary and then proof rolled to verify the subgrade stiffness and consistency. Where any particularly weak materials are encountered that weave excessively during the proof rolling process, they should be undercut and removed prior to placing engineered fill.

The Hinuera Formation soils are generally suitable for reuse as engineered fill. The silts can be sensitive and lose strength when they are disturbed or allowed to get wet. Discing and drying is typically required when re-working Hinuera Formation silts as engineered fill.

The Holocene alluvium and Puketoka formation silts may be encountered in the southern end of the site. These silts are typically highly sensitive and can experience significant strength loss when re-worked. This can make them particularly challenging to earthwork. These materials can sometimes be used within engineered fills, by adopting appropriate construction methods.

Uncontrolled fill in the relict stream channels and depressions will need to be undercut and replaced with engineered fill. Groundwater will likely to be encountered while undercutting and the use of temporary underfill drainage will likely be required to enable fill placement.

Groundwater may also be encountered at shallow depth within excavations and temporary dewatering may be required for shallow excavations such as for building footings and service trenches. Sacrificial/temporary subsoils may be required to facilitate earthworks.

7.6 Foundation Bearing Capacity

All uncontrolled fill is to be removed and replaced with engineered fill. Geotechnical ultimate bearing capacity for engineered fill is expected to be 300kPa.

For the natural subsoils (Holocene Alluvium, Hinuera Formation, Puketoka Formation soils), the very loose to loose sand lenses will limit the limit foundation loads due to settlement. In areas where these loose sandy soils form the foundation subgrade, geotechnical ultimate bearing capacity may be limited to 200kPa. Geotechnical ultimate bearing capacity may be improved in these areas by removing the loose subgrade and recompacting or replacing with flowable fill.

The natural cohesive subgrade is stiff to very stiff and the geotechnical ultimate foundation bearing capacity in these soils is expected to be 300kPa.

Further geotechnical investigation, particularly at proposed foundation locations is needed to confirm the available bearing capacity.

8.0 FURTHER WORK

- Further geotechnical investigation, including CPTs and deep test pits, for use in refining the ground model, and informing detailed geohazard assessment, selection of geotechnical design parameters, and design and construction recommendations. Investigation to include assessment of a site specific Vs30 (average shear wave velocity within the top 30mbgl) for use in seismic assessment.
- Geotechnical analysis and reporting, suitable to support future project stages including resource consent application, detailed design, and building consent application.
- Design of ground improvement if necessary to mitigate load or liquefaction induced settlement, or lateral spread.

9.0 CLOSURE

Additional important information regarding the use of your CMW report is provided in the '*Using your CMW Report*' document attached to this report.

This report has been prepared for use by BBO in relation to the Mitre 10, Te Awamutu project in accordance with the scope, proposed uses and limitations described in the report. Should you have further questions relating to the use of your report please do not hesitate to contact us.

Where a party other than BBO seeks to rely upon or otherwise use this report, the consent of CMW should be sought prior to any such use. CMW can then advise whether the report and its contents are suitable for the intended use by the other party.

For and on behalf of CMW Geosciences

Prepared by:

Caitlyn Gillard
Engineering Geologist MEngNZ

Reviewed and authorised by:

Aine Colson
Associate Geotechnical Engineer, CMEngNZ, CPEng

Distribution: 1 electronic copy to Bloxam Burnett & Olliver (BBO) via email
Original held at CMW Geosciences

Attachments: Drawing 01 - Site Investigation Plan

Drawing 02 - A-A Cross Section

Appendix A – Historical Aerial Photographs

Appendix B – Site Plan

Appendix C – Hand Auger Borehole Logs

CMW Geosciences
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DRAWINGS

Document Set ID: 11541074
Version: 1, Version Date: 29/09/2025

LEGEND:

- SITE BOUNDARY
- ORIGINAL GROUND CONTOUR (MAJOR)
- ORIGINAL GROUND CONTOUR (MINOR)
- PROPOSED BUILDING BOUNDARY
- HA01 HAND AUGER (HA) LOCATION
- PIEZO GROUND WATER MONITORING
- APPROXIMATE EXTENT OF UNCONTROLLED FILL
- INDICATIVE GULLY INFILL

NOTES:

1. AERIAL IMAGE COURTESY OF LINZ WAIKATO 0.3m RURAL AERIAL PHOTOS (2021-2024).
2. BASE PLAN ADAPTED FROM HAM2023-0058AB Rev0 AND PROPOSED REZONING OF LAND.
3. EXISTING GROUND CONTOURS ADAPTED FROM LINZ WAIKATO LiDAR 1m DEM (2021), SHOWN IN 0.5m INTERVALS.
4. CRS: NZGD2000 / MOUNT EDEN 2000. VERTICAL DATUM IN TERMS OF NZVD 2016.
5. TEST LOCATIONS ARE INDICATIVE ONLY.

1:2000 0 20 40 60 80 100 m

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CLIENT: BBO		DRAWN: JRS	PROJECT: HAM2023-0058
PROJECT: MITRE 10, TE AWAMUTU		CHECKED: CG	DRAWING: 01
		REVISION: 0	SCALE: 1:2000
TITLE: SITE INVESTIGATION PLAN		DATE: 14/11/2024	SHEET: A3 L

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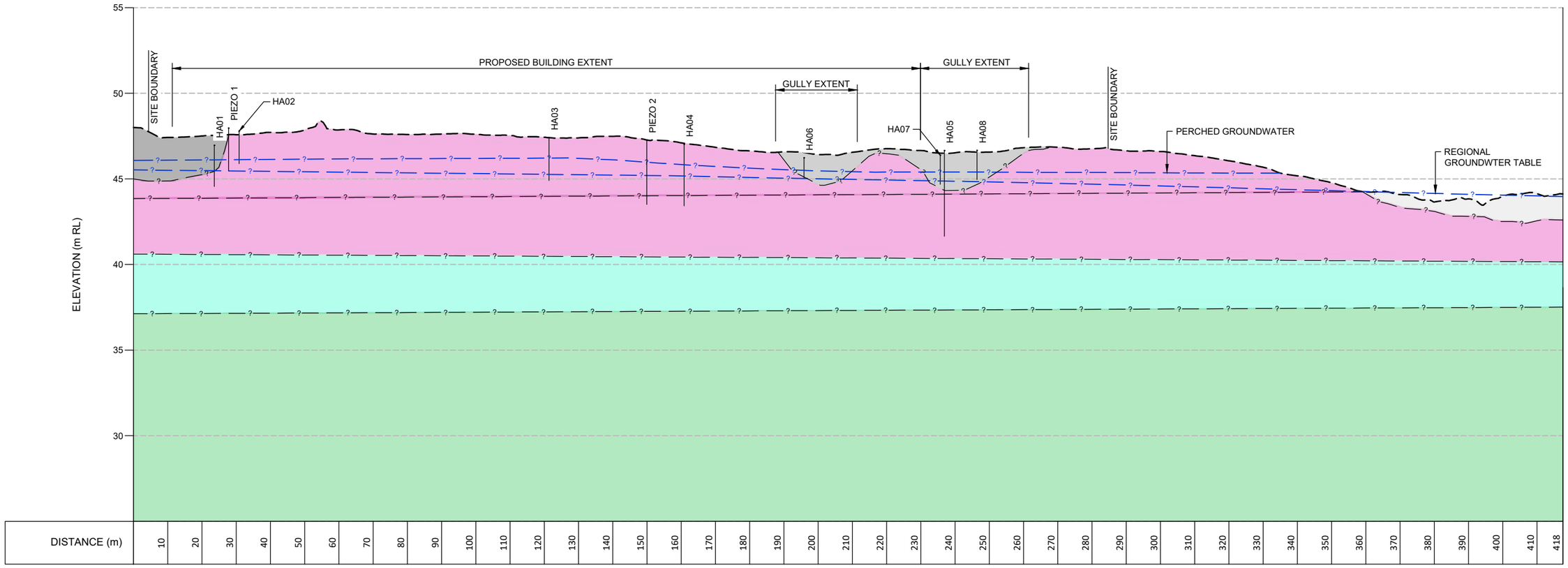

CROSS SECTION A

LEGEND:

- EXISTING GROUND PROFILE
- INFERRED GEOLOGY BOUNDARY
- GROUND WATER LEVEL
- SANDY SILT / ORGANIC SILT (UNCONTROLLED FILL)
- ORGANIC SILT AND WOOD SHAVINGS (UNCONTROLLED FILL)
- RECENT ALLUVIUM
- PIAKO SUBGROUP - HINUERA FORMATION
- WALTON SUBGROUP - PUKETOKA FORMATION
- WALTON SUBGROUP - PRIMARY & REWORKED IGNIMBRITES

NOTES:

1. EXISTING GROUND PROFILE ADAPTED FROM LINZ WAIKATO LiDAR 1m DEM (2021).
2. VERTICAL DATUM IN TERMS OF NZVD 2016.
3. TEST LOCATIONS ARE INDICATIVE ONLY.
4. ALL STRATA BOUNDARIES ARE INDICATIVE BASED ON KNOWLEDGE OF LOCAL GROUND CONDITIONS. THE RL OF THE STRATA BOUNDARIES IS EXPECTED TO VARY ACROSS THE SITE.
5. GROUNDWATER LEVELS ARE INDICATIVE LEVELS BASED ON KNOWLEDGE OF LOCAL GROUND CONDITIONS AND THE PRELIMINARY GEOTECHNICAL INVESTIGATION.
6. PERCHED GROUNDWATER MAY BE ENCOUNTERED AT SHALLOWER DEPTHS THAN THOSE RECORDED IN THE HAND AUGER BOREHOLES.
7. THIS SECTION IS NOT SUITABLE FOR USE IN DETAILED DESIGN.

HORI: 1:1500 — 0 15 30 45 60 75 m

VERT: 1:250 — 0 2.5 5 7.5 10 12.5 m

PRINT IN COLOUR

CMW Geosciences
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CLIENT: BBO	DRAWN: JRS	PROJECT: HAM2023-0058	
PROJECT: MITRE 10, TE AWAMUTU	CHECKED: CG	DRAWING: 02	
	REVISION: 0	SCALE: AS SHOWN	
TITLE: PRELIMINARY GEOLOGICAL CROSS SECTION	DATE: 14/11/2024	SHEET: A3 L	

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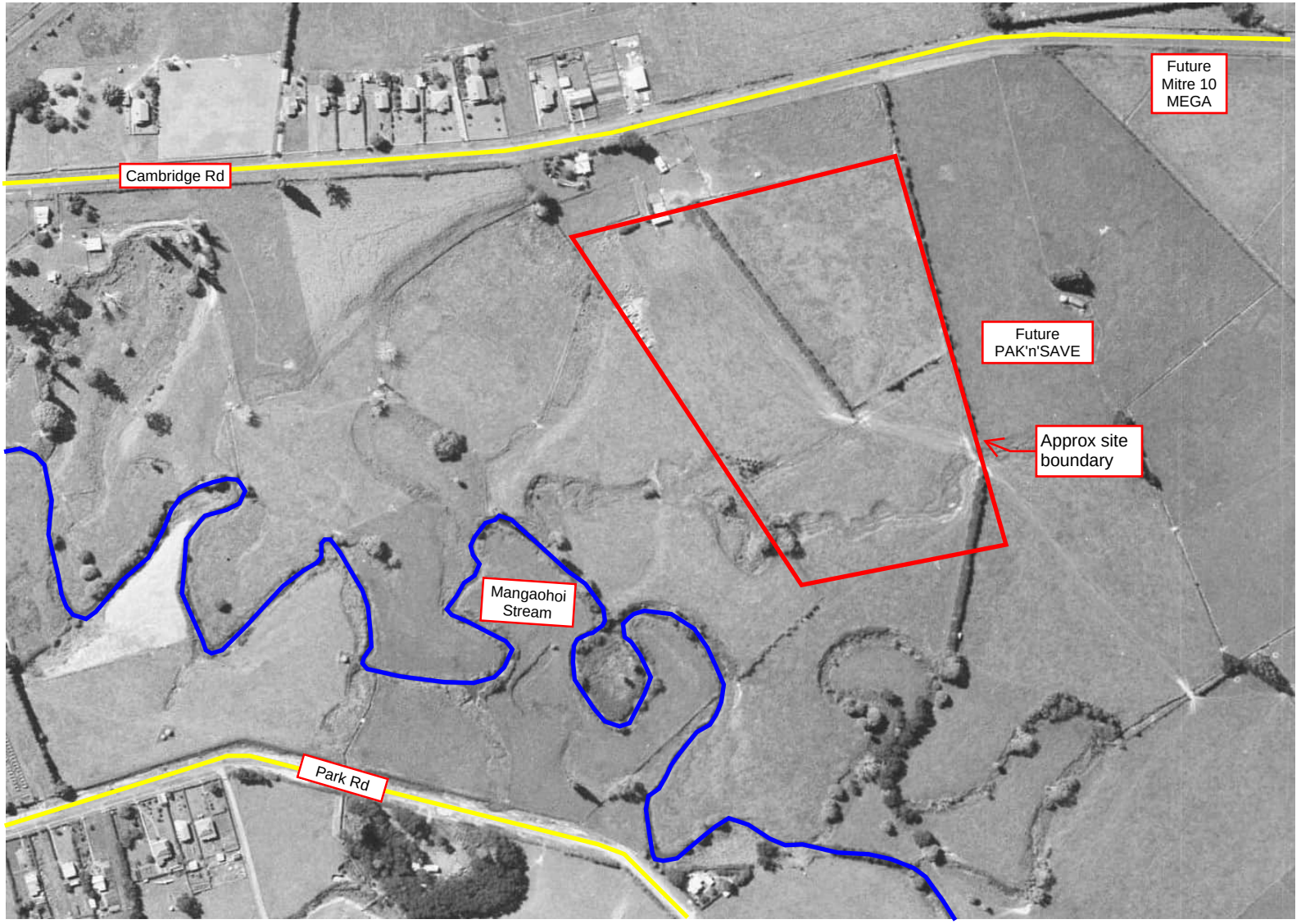
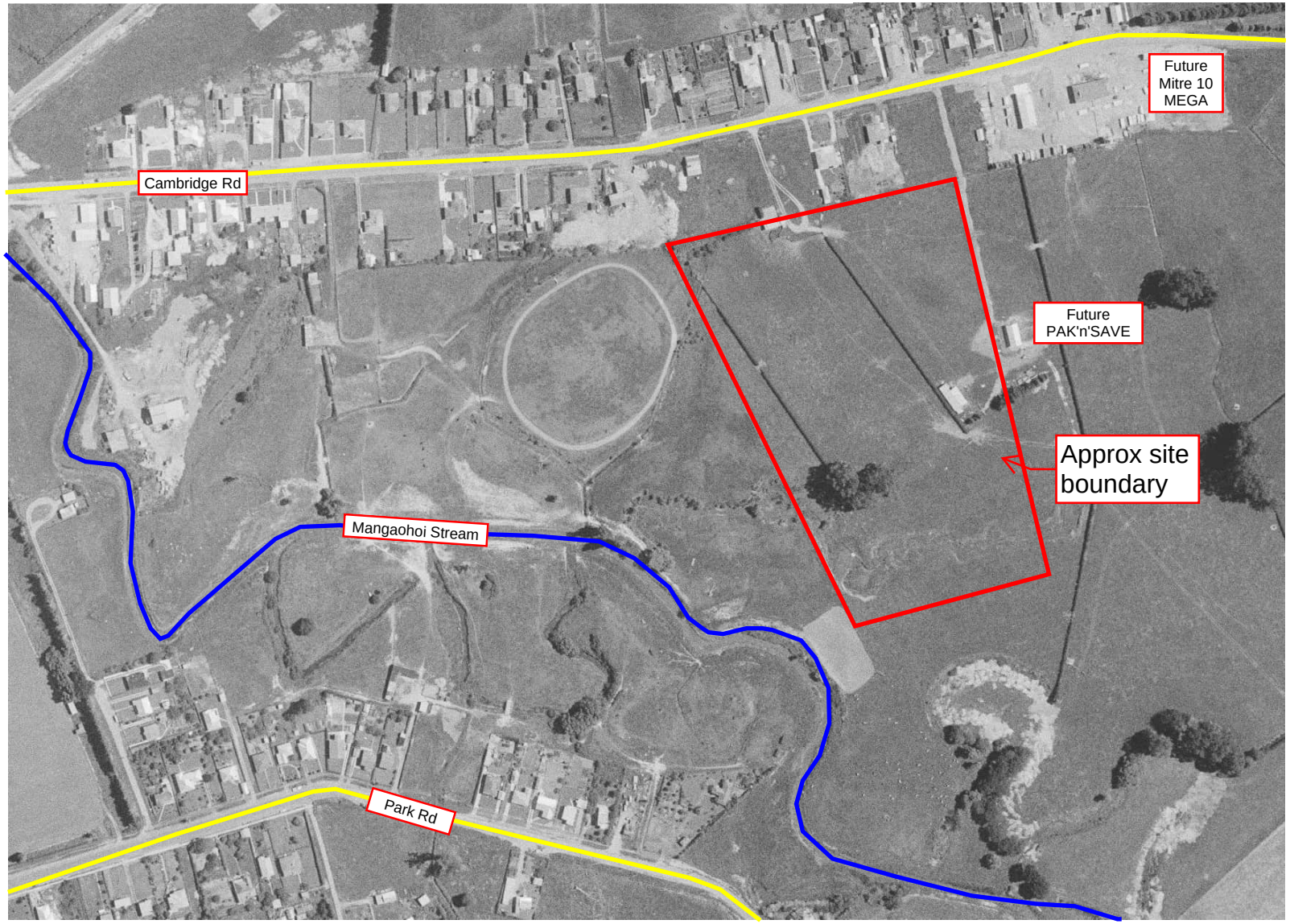
APPENDIX A

Historical Aerial Photographs

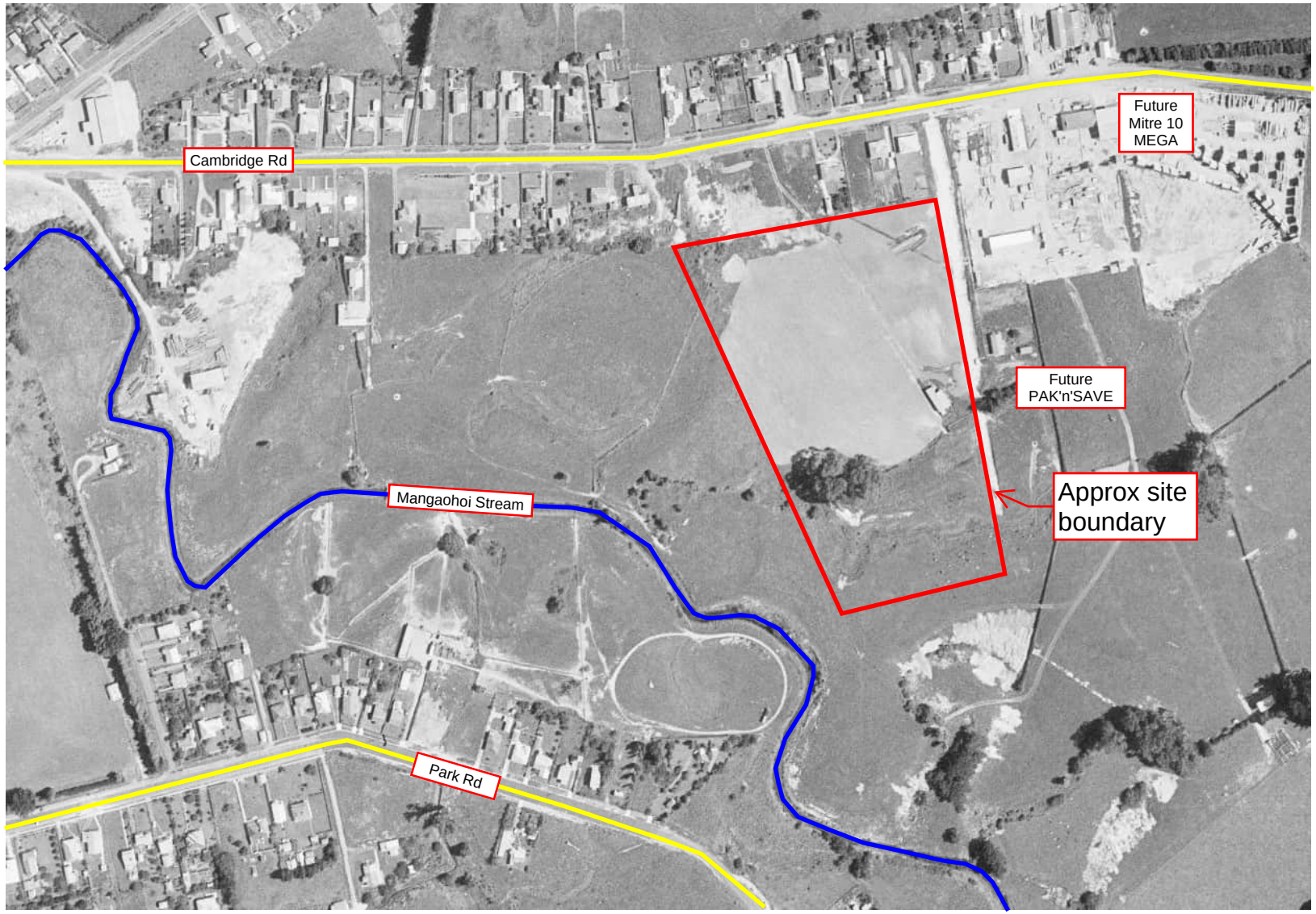
Historical Aerial - 1944 (Retrolens)



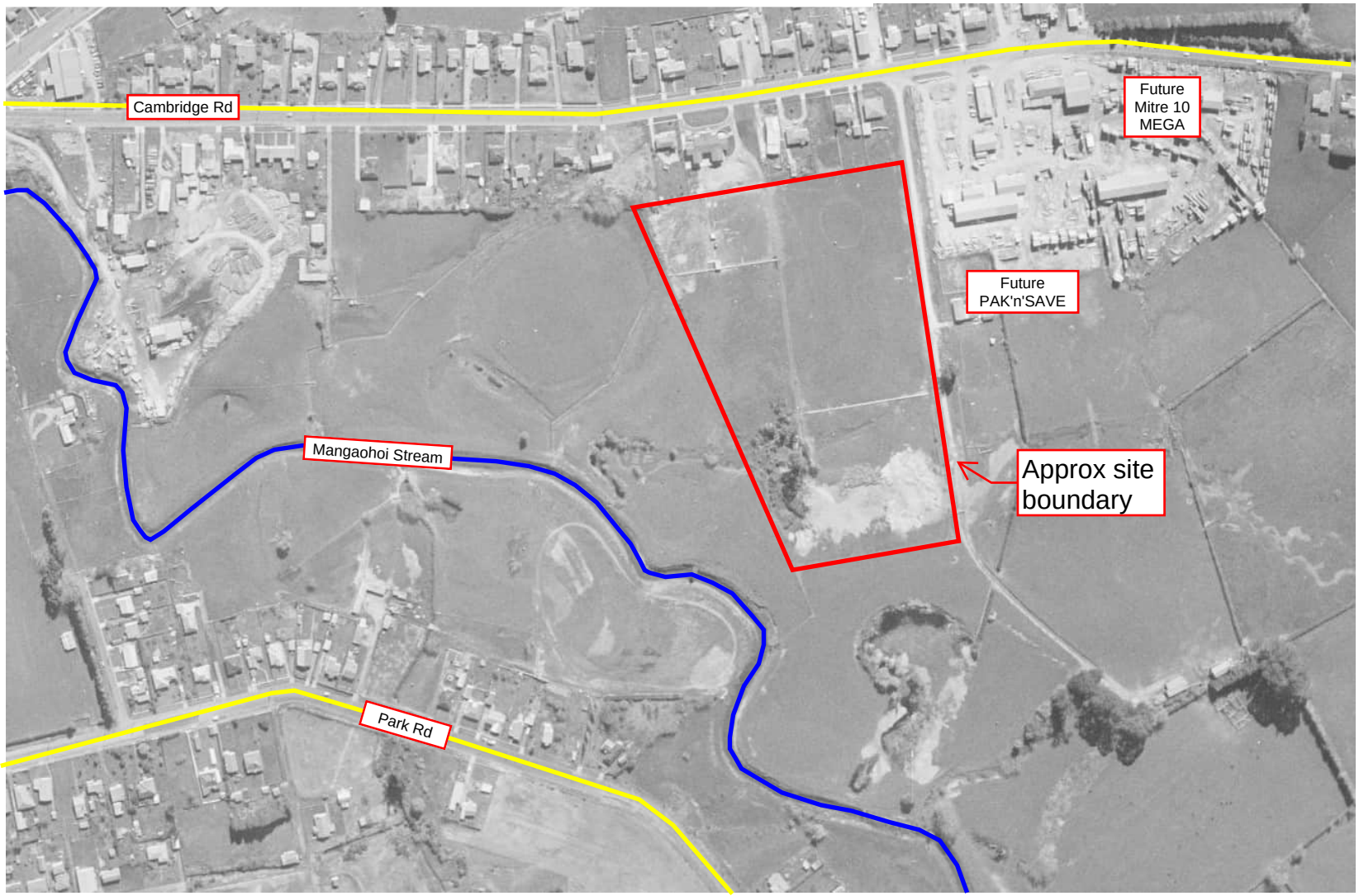
Historical Aerial - 1958 (Retrolens)



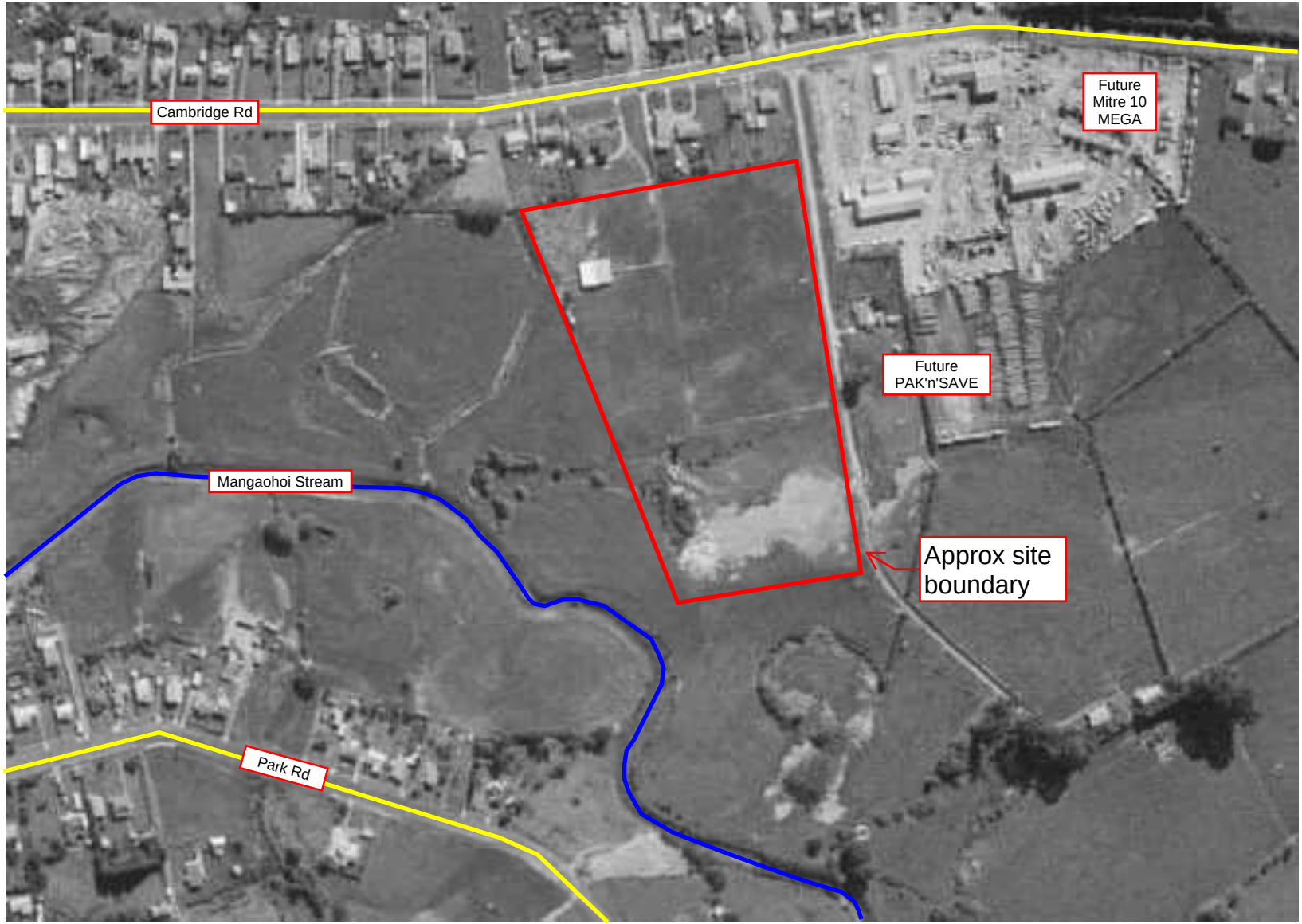
Historical Aerial - 1966 (Retrolens)



Historical Aerial - 1971 (Retrolens)



Historical Aerial - 1974 (Retrolens)



Historical Aerial - 1995 (Retrolens)

Historical Aerial - 2008 (Google Earth)

Historical Aerial - 2010 (Google Earth)

Historical Aerial - 2014 (Google Earth)

Historical Aerial - 2015 (Google Earth)

Historical Aerial - 2018 (Google Earth)

Historical Aerial - 2021 (Google Earth)

Historical Aerial - 2023 (Google Earth)

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APPENDIX B
Draft Site Plan

TOTAL SITE AREA **10.032 ha**

Area A	= 5.99 ha
Area B	= 4.04 ha

TOTAL GROSS FLOOR AREA **32,200m²**

Area A	(19,200 m²)	
-A1	6,200 m²	(SUPERMARKET)
-A2	4,500 m²	
-A3	7,000 m²	
-A4	550 m²	
-A5	650 m²	
-A6	300 m²	(PETROL STATION)
Area B	(13,000 m²)	
-A7	13,000 m²	(BUILDING IMPROVEMENT CENTRE & CAFE)

SITE PLAN Scale 1:750 @ A1, 1:1500 @ A3

TE AWAMUTU LARGE FORMAT RETAIL AREA PLAN

LOCATION: 688 CAMBRIDGE ROAD, TE AWAMUTU| DATE: 23-07-2025 | JOB: 1454-05 | DWG: RC100-09

RMA ISSUE

1. ALL DEVELOPMENT BOUNDARIES AND DIMENSIONS ARE TO BE CHECKED AND VERIFIED BY A REGISTERED SURVEYOR.
2. SITE AND BUILDING LEVELS TO BE VERIFIED BY A TOPOGRAPHICAL SURVEY PROVIDED BY A REGISTERED SURVEYOR.
3. A PLANNING CONSULTANT IS REQUIRED TO VERIFY ALL PLANNING RULES AND ASSUMPTIONS.
4. A CERTIFICATE OF TITLE IS REQUIRED TO VERIFY EXISTING SITE CONSTRAINTS, EASEMENTS AND LEGAL RESTRICTIONS.

WOODHAMS MEIKLE ZHAN ARCHITECTS

WOODHAMS MEIKLE ZHAN NEW ZEALAND LIMITED | LEVEL 4, 65 UPPER QUEEN STREET, AUCKLAND 1010 , NEW ZEALAND | T (+64) 09 377 5215 | WWW.WMZA.CO.NZ

APPENDIX C
Hand Auger Boreholes

HAND AUGER BOREHOLE LOG - HA01

Client: BBO
Project: 638 Cambridge Road - Mitre 10 Plan Change
Site Location: 638 Cambridge Road, Te Awamutu
Project No.: HAM2023-0058
Date: 18/10/2024
Borehole Location: Refer to Site Plan Logged by: WD Checked by: MM Scale: 1:25 Sheet 1 of 1

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Position: 450280.0mE; 674657.0mN Projection: Mount Eden 2000
Datum: Moturiki 1953 Survey Source: Hand-held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
				0		OL: Organic SILT: brown. No plasticity. (Topsoil)	M	L to MD	5, 2, 2
						SP: Silty Fine SAND: light brown with orange brown. Poorly graded. (Uncontrolled Fill)		VL to L	1, 1, 2
						WOOD SHAVINGS: dark brown. Slightly degraded. (Uncontrolled Fill)			
	1.0	Peak = 64kPa Residual = 19kPa		1		OL: Organic SILT: with some wood fragments and minor fine sand. Dark greyish brown. Low plasticity. (Uncontrolled Fill)	W	F to St	
▼	1.3	Peak = 27kPa Residual = 16kPa				*... at 1.10m, thin lens of wood shavings: light brown.*			
				2		SP: Silty Fine SAND: light grey stained brown. Poorly graded. (Hinuera Formation)	S	MD to D	4, 5, 5, 6, 7, 7, 6, 8
						Borehole terminated at 2.4 m			7, 5, 9, 9, 8, 13, 14, 13, 11, 15, 12, 9, 8, 8, 9, 13, 12, 12, 11, 13, 13, 13, 12, 14, 10
				3					
				4					
				5					

Termination Reason: Hole collapse/no retrieval.
Shear Vane No: 3434 DCP No: 17B
Remarks: Groundwater encountered at 1.5m.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA02

Client: BBO
Project: 638 Cambridge Road - Mitre 10 Plan Change
Site Location: 638 Cambridge Road, Te Awamutu
Project No.: HAM2023-0058
Date: 18/10/2024
Borehole Location: Refer to Site Plan Logged by: LA Checked by: MM Scale: 1:25 Sheet 1 of 1
Position: 450347.4mE; 674721.8mN Projection: Mount Eden 2000
Datum: Moturiki 1953 Survey Source: Hand-held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
				0		OL: Organic SILT: black. No plasticity. (Topsoil)			
	0.3	Peak = 125kPa Residual = 25kPa				ML: SILT: orange brown. Low plasticity, moderately sensitive to sensitive. (Hinuera Formation)	M	St to VSt	
	0.6	Peak = 84kPa Residual = 22kPa							
	0.9	Peak = 75kPa Residual = 22kPa					M to W		
				1		ML: Fine Sandy SILT: orange brown Low plasticity, moderately sensitive. (Hinuera Formation)	W	St	
▼						SP: Silty Fine SAND: light orange brown. Poorly graded, subangular to subrounded. (Hinuera Formation)		L	2
	1.4	Peak = 69kPa Residual = 28kPa				ML: Fine Sandy SILT: light brownish grey. Low plasticity, moderately sensitive. (Hinuera Formation)	S	St	
	1.7	Peak = 78kPa Residual = 28kPa							
						Borehole terminated at 1.9 m			6
				2					8
									6
									6
									7
									6
									5
									6
									6
									7
									5
				3					8
									7
									8
									8
									8
									5
									7
									5
									6
									5
				4					8
									8
									12
									14
									12
									13
									14
									12
									10
				5					

Termination Reason: Hole collapse.
Shear Vane No: 2993 DCP No: 25
Remarks: Groundwater encountered at 1.3m.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA03

Client: BBO
Project: 638 Cambridge Road - Mitre 10 Plan Change
Site Location: 638 Cambridge Road, Te Awamutu
Project No.: HAM2023-0058
Date: 18/10/2024
Borehole Location: Refer to Site Plan Logged by: WD Checked by: MM Scale: 1:25 Sheet 1 of 1

CMW Geosciences
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Position: 450380.3mE; 674592.7mN Projection: Mount Eden 2000
Datum: Moturiki 1953 Survey Source: Hand-held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
						OL: Organic SILT: brown. No plasticity. (Topsoil)			
	0.3	Peak = 121kPa Residual = 32kPa				CH: Silty CLAY: light orange grey. High plasticity. Moderately sensitive. (Hinuera Formation)	M	VSt	
						SP: Silty Fine SAND: light orange grey. Poorly graded. (Hinuera Formation)			2
									2
									1
						... from 0.90m to 1.00m, lens of silt with some fine sand: light grey			1
18-10-2024				1		Silty Fine to medium SAND: grey streaked greyish brown. Poorly graded. (Hinuera Formation)	W		2
								VL to L	3
									2
							S		3
									2
									2
						... at 1.70m, becoming orange brown, slightly iron stained.			3
									2
						... at 1.90m, becoming grey.			3
				2		SP: Silty Fine SAND: grey speckled dark brown. Poorly graded. (Hinuera Formation)			4
								MD to D	8
									8
									10
									8
									5
						Borehole terminated at 2.5 m			8
									6
									7
									5
									6
				3					10
									12
									14
									10
									6
									6
									7
									5
									6
									5
				4					8
									11
									10
									7
									7
									5
									5
									6
				5					8

Termination Reason: Hole collapse/no retrieval.
Shear Vane No: 3434 DCP No: 17B
Remarks: Groundwater encountered at 1.3m.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA04

Client: BBO
Project: 638 Cambridge Road - Mitre 10 Plan Change
Site Location: 638 Cambridge Road, Te Awamutu
Project No.: HAM2023-0058
Date: 18/10/2024
Borehole Location: Refer to Site Plan Logged by: WD Checked by: MM Scale: 1:25 Sheet 1 of 1

CMW Geosciences
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Position: 450358.4mE; 674536.9mN Projection: Mount Eden 2000
Datum: Moturiki 1953 Survey Source: Hand-held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
						OL: Organic SILT: brown. No plasticity. (Topsoil)			
	0.3	Peak = 145kPa Residual = 30kPa				ML: SILT: orange brown. Low plasticity. Moderately sensitive. (Hinuera Formation)		St to VSt	
	0.6	Peak = 78kPa Residual = 27kPa				... at 0.60m, becoming light orange brown.	M		
				1		SP: Silty Fine SAND: light orange grey. Poorly graded. (Hinuera Formation)		L	2, 1, 2, 2, 2, 3, 2, 1, 1
						... from 1.10m to 1.20m, becoming orange brown, slightly iron stained.			
						... at 1.40m, becoming light grey streaked light orange grey.	W		
▼	1.7	Peak = 78kPa Residual = 30kPa				ML: SILT: with trace fine sand. Light grey. Low plasticity. Dilatant. (Hinuera Formation)		St	
	2.0	Peak = 54kPa Residual = 32kPa		2		... at 2.00m, poor retention.			
						SP: Silty Fine to medium SAND: light grey. Poorly graded. (Hinuera Formation)	S	L to MD	2, 2, 1, 3, 3, 4
	2.9	Peak = 94kPa Residual = 43kPa		3		ML: SILT: light grey. Low plasticity. (Hinuera Formation)		F to St	
	3.3	Peak = 40kPa Residual = 40kPa							
						SP: Silty Fine SAND: grey. Poorly graded. (Hinuera Formation)		MD	4, 6, 4, 7, 4
						Borehole terminated at 3.6 m			
				4					5, 4, 3, 5, 4, 5, 4, 4, 4
				5					

Termination Reason: Hole collapse/no retrieval.
Shear Vane No: 3434 DCP No: 17B
Remarks: Groundwater encountered at 1.8m.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA05

Client: BBO
Project: 638 Cambridge Road - Mitre 10 Plan Change
Site Location: 638 Cambridge Road, Te Awamutu
Project No.: HAM2023-0058
Date: 18/10/2024
Borehole Location: Refer to Site Plan Logged by: LA Checked by: MM Scale: 1:25 Sheet 1 of 1

CMW Geosciences
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Position: 450466.9mE; 674498.0mN Projection: Mount Eden 2000
Datum: Moturiki 1953 Survey Source: Hand-held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
						OL: Organic SILT: black. No plasticity. (Topsoil)			
	0.3	Peak = UTP				OL: Sandy Organic SILT. : dark brown. Low plasticity (Uncontrolled Fill)		H	
						ML: Medium Sandy SILT. : dark orange brown. Low plasticity, moderately sensitive. (Hinuera Formation)	M		
	0.7	Peak = 69kPa Residual = 25kPa						St	
▼							W		
				1		SP: Medium Silty SAND: light greyish brown. Poorly graded, subrounded. (Hinuera Formation)		MD	3, 4
	1.2	Peak = 144kPa Residual = 25kPa				ML: SILT: light brownish grey. Low plasticity, moderately sensitive to sensitive. (Hinuera Formation)			
	1.5	Peak = 88kPa Residual = 28kPa							
	1.8	Peak = 94kPa Residual = 31kPa							
				2					
	2.1	Peak = 78kPa Residual = 38kPa							
	2.4	Peak = 78kPa Residual = 34kPa							
	2.7	Peak = 113kPa Residual = 41kPa						St to VSt	
	3.0	Peak = 66kPa Residual = 38kPa		3			S		
	3.3	Peak = 97kPa Residual = 44kPa							
	3.6	Peak = 75kPa Residual = 31kPa							
	3.9	Peak = 128kPa Residual = 50kPa		4					
	4.2	Peak = 94kPa Residual = 31kPa				ML: SILT: grey. Low plasticity, moderately sensitive. (Hinuera Formation)			
	4.5	Peak = 125kPa Residual = 47kPa						St to VSt	
	4.9	Peak = 109kPa Residual = 50kPa							
				5		Borehole terminated at 5.0 m			

Termination Reason: Target depth reached.
Shear Vane No: 2993 DCP No: 25
Remarks: Groundwater encountered at 0.9m.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA06

Client: BBO
Project: 638 Cambridge Road - Mitre 10 Plan Change
Site Location: 638 Cambridge Road, Te Awamutu
Project No.: HAM2023-0058
Date: 18/10/2024
Borehole Location: Refer to Site Plan Logged by: LA Checked by: MM Scale: 1:25 Sheet 1 of 1

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Position: 450366.6mE; 674501.5mN Projection: Mount Eden 2000
Datum: Moturiki 1953 Survey Source: Hand-held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geological unit)	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm) 5 10 15
				0		OL: Organic SILT: black. No platsicity. (Topsoil)			
						ML: Fine Sandy SILT: light brownish grey mottled orange brown. Low plasticity. (Uncontrolled Fill)	M		
						OL: Organic SILT: black. Low plasticity. (Uncontrolled Fill)			
				1		OL: Organic SILT: with some fine to coarse sand and minor wood chips. Dark brown mottled black. Low plasticity (Uncontrolled Fill)			
						Borehole terminated at 1.2 m			
				2					
				3					
				4					
				5					

Termination Reason: Refusal on hard ground.
Shear Vane No: DCP No:
Remarks: Groundwater not encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA07

Client: BBO
Project: 638 Cambridge Road - Mitre 10 Plan Change
Site Location: 638 Cambridge Road, Te Awamutu
Project No.: HAM2023-0058
Date: 18/10/2024
Borehole Location: Refer to Site Plan Logged by: LA Checked by: MM Scale: 1:25 Sheet 1 of 1

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Position: 450422.8mE; 674720.4mN Projection: Mount Eden 2000
Datum: Moturiki 1953 Survey Source: Hand-held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
▼				0		OL: SILT: black. No plasticity. (Topsoil)			
						OL: Organic SILT and SILT: with trace sand. Dark brown mottled orange brown. Low plasticity. (Uncontrolled Fill)	M		
				1		*... at 1.00m, becoming dark brown*	S		
						Borehole terminated at 1.7 m			
				2					
				3					
				4					
				5					

Dynamic Cone Penetrometer (Blows/100mm): 5, 10, 15

Termination Reason: Refusal on hard ground.
Shear Vane No: DCP No:
Remarks: Groundwater encountered at 1.0m.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA08

Client: BBO
Project: 638 Cambridge Road - Mitre 10 Plan Change
Site Location: 638 Cambridge Road, Te Awamutu
Project No.: HAM2023-0058
Date: 18/10/2024

CMW Geosciences
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Borehole Location: Refer to Site Plan | Logged by: LA | Checked by: MM | Scale: 1:25 | Sheet 1 of 1

Position: 450438.6mE; 674477.2mN | Projection: Mount Eden 2000
Datum: Moturiki 1953 | Survey Source: Hand-held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description (Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geological unit))	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm) 5 10 15
				0		OL: Organic SILT: dark brown. (Topsoil)			
						OL: Organic SILT: with trace coarse sand. Dark brown mottled orange brown. Low plasticity. (Uncontrolled Fill)			
						ML: SILT: orange brown. Low plasticity. (Uncontrolled Fill)			
						OL: Organic SILT and SILT: with trace medium sand. Dark brown mottled orange brown. Low plasticity. (Uncontrolled Fill)	M		
				1					
▼						OL: Organic SILT: dark brown. Low plasticity. (Uncontrolled Fill)	S		
						Borehole terminated at 1.7 m			
				2					
				3					
				4					
				5					

Termination Reason: Refusal on hard ground.
Shear Vane No: DCP No:
Remarks: Groundwater encountered at 1.5m.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - Piezo1

Client: BBO
Project: 638 Cambridge Road - Mitre 10 Plan Change
Site Location: 638 Cambridge Road, Te Awamutu
Project No.: HAM2023-0058
Date: 18/10/2024
Borehole Location: Refer to Site Plan Logged by: LA Checked by: MM Scale: 1:25 Sheet 1 of 1

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Position: 450338.8mE; 674708.2mN Projection: Mount Eden 2000
Datum: Moturiki 1953 Survey Source: Hand-held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geological unit)	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm) 5 10 15
				0		OL: Organic SILT: black. No plasticity. (Topsoil)			
						OL: Fine to coarse Organic Silty SAND: with trace fine gravel. Dark brown. No plasticity. (Uncontrolled Fill)			
						ML: SILT: orange brown. No plasticity (Hinuera Formation)	M		
				1		ML: Fine Sandy SILT: light orange brown mottled dark orange brown. Low plasticity. (Hinuera Formation)	M to W		
							W		
						ML: SILT: light brownish grey. Low plasticity. (Hinuera Formation)	S		
				2		Borehole terminated at 2.0 m			
				3					
				4					
				5					

Termination Reason: Target depth reached.
Shear Vane No: DCP No:
Remarks: Groundwater encountered at 1.3m. Piezometer installed.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - Piezo2

Client: BBO
Project: 638 Cambridge Road - Mitre 10 Plan Change
Site Location: 638 Cambridge Road, Te Awamutu
Project No.: HAM2023-0058
Date: 18/10/2024
Borehole Location: Refer to Site Plan

PRELIMINARY

CMW Geosciences
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Scale: 1:25 Sheet 1 of 1

Position: 450358.4mE; 674536.9mN Projection: Mount Eden 2000
Datum: Moturiki 1953 Survey Source: Hand Held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geological unit)	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm) 5 10 15
				0		OL: Organic SILT: brown. No plasticity. (Topsoil)			
						ML: SILT: orange brown. Low plasticity. Moderately sensitive. (Hinuera Formation)			
						SP: Silty Fine SAND: light orange grey. Poorly graded. (Hinuera Formation)	M		
				1					
						ML: SILT: with trace fine sand. Light grey. Low plasticity. Dilatant. (Hinuera Formation)			
				2			W		
							S		
				3		Borehole terminated at 3.0 m			
				4					
				5					

Termination Reason: Target depth reached.
Shear Vane No: DCP No:
Remarks: Groundwater encountered at 2.5m.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.