Geotechnical Completion Report

Millwater Arran Hills Precinct 6 - Stages 2A and 2C

WFH Properties Limited

Reference: 773-AKLGE206639-CD

29 May 2024

MILLWATER ARRAN HILLS RESIDENTIAL SUBDIVISION, PRECINCT 6, STAGES 2A AND 2C

Geotechnical Completion Report

Report reference number: 773-AKLGE206639-CD

29 May 2024

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This Geotechnical Completion Report presents all supporting geotechnical data, Woods Limited as-built plans, and our Suitability Statement in relation to land development works undertaken to form Stages 2A and 2C of the Millwater Arran Hills Precinct 6 residential subdivision.

It has been prepared in accordance with instructions received from WFH Properties Limited and forms part of the documentation required by Auckland Council to achieve certification under Section 224(c) of the Resource Management Act.

If you have any queries or require further clarification on any aspects of this report, please do not hesitate to contact the undersigned.

For and on behalf of Tetra Tech Coffey

Stephen Parkes
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QUALITY INFORMATION

Revision history

Revision	Description	Date	Author	Reviewer	Approver
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The professional opinion contained within this report is furnished to Auckland Council and WFH Properties Limited for their purposes alone on the express condition that it will not be relied upon by any other person. Prospective purchasers should satisfy themselves as to any specific conditions pertaining to their particular land interest.

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APPENDICES

1. INTRODUCTION

This Geotechnical Completion Report (GCR) has been prepared for WFH Properties Limited (WFH) as part of the documentation required to be submitted to Auckland Council following residential subdivisional development and bulk earthworks.

It contains Tetra Tech Coffey's Suitability Statement, relevant test data, and the Woods Limited as-built plan set relating to Stages 2A and 2C of the Millwater Arran Hills, Precinct 6 residential subdivision. The Woods Limited as-built plan set is listed below in Table 1.

Table 1: Schedule of Woods Limited Precinct 6 - Stage 2A and 2C Subdivision As-Built Plans

Title	Reference No.	Date
Final Surface As-built Plans	P24-156-00-1000-AB	08/07/2024
Cut and Fill As-built Plan – Sheet 1 of 3 – Original Surface to Final Surface	P21-400-00-1100-AB	05/07/2024
Cut and Fill As-built Plan – Sheet 2 of 3 - Original Surface to Lowest Surface	P21-400-00-1101-AB	05/07/2024
Cut and Fill As-built Plan – Sheet 3 of 3 - Lowest Surface to Final Surface	P21-400-00-1102-AB	05/07/2024
Subsoils As-Built Plan	P21-400-00-1200-AB	08/07/2024
Retaining Slope As-built Plans	P21-156-00-1400 to 1403-AB	08/07/2024
Stormwater As-Built Plans	P24-156-00-3000 to 3004AB	05/07/2024
Wastewater As-Builts	P24-156-00-4000 to 4003-AB	05/07/2024
Watermain As-built Plans	P24-156-00-6000 to 603-AB	05/07/2024

The following Tetra Tech Coffey (formerly Coffey) and Woods Limited (Woods) Precinct 6 construction drawings, and Auckland Council Standard Details are presented in Appendix B for reference.

Table 2: Summary of Appended Coffey and Woods Reference Drawings

Title	Reference No.	Date
Tetra Tech Coffey Geotechnical Building Limitation Zone Plans	CD/001, 002, 003	21/05/2024
Tetra Tech Coffey Geotechnical Site Investigation Plan(1)	CD/004	12/07/2024
Tetra Tech Coffey Geotechnical Works Plans(2) 1 to 3	CD/005.1 to .3	12/07/2024
Tetra Tech Coffey Subsoil Drainage Standard Details Rev. C	AG/007	18/06/2021
Tetra Tech Coffey Undercut Detail Plan Rev. D	AG/008	27/09/2022
Coffey Reinforced Earth Slope Fill Batter Design Detail Rev. D	AF/001	14/06/2022
Coffey Reinforced Earth Slope – Cut Batter Design Detail Rev. D	AF/002	14/06/2022

Auckland Council Stormwater Pipe and Manhole Construction Clearance Requirements Rev. 3	AC-STD-SW22	17 January 2022
Auckland Council Pipe and Manhole Construction Clearance	WW26	04-12-2017
Auckland Council Building Close to or Over Local Network Wastewater	WW27	04-12-2017
Auckland Council Guideline for Building Close to or Over Transmission Wastewater	WW28	03-07-2018

Notes (relating to Table 2)

(1) Depicts Tetra Tech Coffey Geotechnical Investigation locations, carried out at the completion of Stage 2A & 2C subdivision works to assess ultimate bearing capacity and topsoil depths on the completed lots.

(2) Depicts all geotechnical works carried out within the subdivision boundary, including geotechnical works certified prior to issue of this report.

This GCR covers the construction period April 2019 to June 2024 and is intended to be used for certification purposes for the following lots associated with subdivision consent SUB60305557:

- 18 residential lots numbered Lots 64 to 71 (inclusive) and Lots 130 to 139 (inclusive);

The subdivision encompasses portions of existing property 11 Pekanga Road (legal description Lot 9000 DP 594022.

Stages 2A and 2C are bound by future subdivision stages currently undergoing bulk earthworks to the south and west. Previously completed subdivision stages bound the site to the north and east.

The earthworks detailed and certified in this report were carried out under Resource Consent LUC60305555.

2. RELATED REPORTS

The following geotechnical reports have been prepared by Tetra Tech Coffey (formerly Coffey) for various aspects of the subdivision:

- 773-AKLGE204203-AA, dated 25 May 2017 – Geotechnical Investigation Report for Millwater Precinct 6;
- 773-AKLGE206639-AE Rev.1, dated 29 November 2019 – Geotechnical Design Report for Shear Key 2;
- 773-AKLGE206639-AC Rev. 2, dated 29 November 2019 – Geotechnical Works Specification
- 773-AKLGE206639-AD Rev.1, dated 24 October 2019 – Geotechnical Design Philosophy
- 773-AKLGE206639-AF Rev.2, dated 12 April 2022 – Geotechnical Design Report for RE600 to RE603, dated 11 May 2022;
- 773-AKLGE206639-AG Rev. 1, dated 25 August 2020 – General Earthworks Design Report
- 773-AKLGE206639-AI, dated 9, December 2019 – Settlement Assessment Report;
- 773-AKLGE2066369-AN Rev.2, dated 13 May 2020 – Geotechnical Monitoring Protocol;
- 773-AKLGE206639 NTE38 – dated 15 October 2021 – Upper Gully 2 Additional Underfill Drainage;
- 773-AKLGE206639 NTE39 Rev. 1, dated 23 November 2021 – Wall 312 Drainage;
- 773-AKLGE206639 NTE48 – dated 01 February 2023 – Proposed Additional Counterfort Drain;

The following historic report was prepared by Tonkin and Taylor (T&T) for various aspects of the development, and were referenced as part of the preparing of this report;

- 21854.0034/AHP6EW.v1, dated June 2019 – Millwater Precinct 6 Enabling Works Geotechnical Completion Report

3. CONSTRUCTION WORKS

3.1 PLANT

The main items of plant used by the contractor, Hick Bros. Civil Construction Limited, included:

- D8 Bulldozer and scoop
- D7 Bulldozer and scoop
- D6 Bulldozer and scoop
- Reticulated Dump Trucks
- 623 Motor scraper
- 36-tonne excavator
- 30-tonne excavator
- 20-tonne excavator
- 8-tonne excavator
- 5-tonne excavator
- 815 compactors
- Padfoot roller
- 25-tonne water truck
- Front-end loader
- Tractor and pulled discs

3.2 CONSTRUCTION PROGRAMME

3.2.1 Enabling Earthworks (March to November 2017)

Prior to commencement of the main bulk earthworks contract, an enabling earthworks package of work was completed between March and November 2017, under the supervision of Tonkin & Taylor(T&T). This work is detailed and certified in the T&T Geotechnical Completion Report referenced 21854.0034/AHP6EW.v1, dated June 2019.

In summary, the enabling earthworks carried out within Stages 2A and 2C and adjoining land involved:

- Stripping of vegetation and organic material;
- Installation of an underfill drain through the invert of existing Gully 2;
- Excavation of a 5m deep undercut (Undercut 2) and installation of accompanying blanket drainage; and
- Earthworks involving fill placement to depths of up to 10m.

Engineered fills placed as part of these works are certified in the T&T GCR.

3.2.2 Bulk Earthworks (April 2019 to June 2024)

Bulk Earthworks carried out under the main earthworks contract encompassing Stage 2A and Stage 2C commenced in April 2019 with the stripping of topsoil and stockpiling of clay excavated from elsewhere on the site.

The stockpile placed across the Stage 2C area was significant, consisting of volumes up to 40,000m^3. This remained in place for the majority of the first earthworks season (2019 to 2020), which helped to accelerate the consolidation of underlying natural soils.

Cuts and fills progressed across Stage 2A throughout Earthworks Season 1, and sections that reached finished level quickly were used for stockpiling of topsoil, increasing the degree of consolidation of the natural subgrade soils.

Season 2 (2020-2021) involved the gradual removal of the stockpiles over the lots, and the formation of the rear undercut surface of future RE602 within Stage 2A. This did not include construction of the 6m wide reinforced portion of the slope, but formed the rear slope onto which the future drainage blanket would be placed.

Adequate factors of safety against global instability across Stages 2A and 2C were to be achieved via local undercutting of soft soils beneath steeper slopes and retaining walls and replacement with engineered clay fill, and by construction of two Shear Keys (SK1 and SK2) adjacent to the northern site boundary (see the appended Geotechnical Works Plan for location).

Shear Key 1, which enhances global stability for the eastern portion of Stage 2A, was progressed throughout Season 1, reaching completion in March 2020.

Shear Key 2, which supports Stage 2C and the western portion of Stage 2A was progressed throughout Seasons 2 and 3, reaching completion in December 2021.

The shear keys involved the excavation of up to 15m wide sections of overburden soils along the subdivision boundary, excavated to a depth of a minimum of 1m into bedrock, and replacement with engineered clay fill and drainage. This served to remove shear planes (sub-horizontal weakened surfaces on which slope failures tend to occur) from the soil mass and provide a buttress of high strength engineered soil in its place, which is ‘keyed’ into the stable rock mass below.

Each open section of shear key excavation was mapped by a Tetra Tech Coffey Engineering Geologist during construction for Quality Assurance purposes and to confirm the suitability of the ground model that formed the basis of the Shear Key design.

Season 3 (2021-2022) involved the progression of filling within the Stage 2A and Stage 2C areas. As the level of the fill came up, more topsoil was gradually stripped from the existing gully flanks. Several groundwater springs were observed seeping from the natural ground in October 2021 as more of the fill area was opened up. These springs were intercepted with subsoil drainage installed beneath the fill forming Stage 2C. The subsoil drainage falls from south to north and discharges into the RE601 blanket drain downslope.

Earthworks Season 4 (2022-2023) commenced with the excavation of Undercut 8, designed to provide suitable bearing conditions for the sections of RE602 founded in natural ground, within Stage 2A. The undercut involved the excavation of a 2m deep, 6m wide key, which was backfilled with engineered clay fill. The undercut designs are shown on the appended Tetra Tech Coffey Undercut Detail Plan, reference AG/008, in Appendix B.

Construction of the western counterfort drain, installed to control pore water pressures within the saturated soils of the western ridge cut area, was carried out in October and November 2022. This extends into Stage 2C, intersecting Undercut 9 and forming the main outlet for the drainage of RE603.

The counterfort drain was flush tested upon completion to confirm its function by connecting a water truck to the exposed end of the Novaflo pipe at the southern drain extent within Lot 69, and turning on the taps until water was observed discharging at the drain outlet.

Earthworks Season 5 (2023-2024) involved the completion of Undercut 9, the undercut designed to provide suitable bearing conditions beneath the section of RE603 founded in natural soils. The drainage blanket for RE603 was extended to the base of Undercut 9, and connected to the end of the counterfort drain constructed in November 2022, to form a continuous drainage path from RE603 to the outfall structure at the northern subdivision boundary.

This coincided with the placement of the RE602 drainage blanket and connection of the RE602 drainage to the public stormwater system. Construction of RE602 followed, with progressive placement of the reinforced soil block through late 2023 and early 2024.

RE603 commenced in late 2023 and reached completion in April 2024.

All areas of Stage 2A and 2C were topsoiled by the end of April 2024, with the exception of the front face of slopes RE602 and RE603. Due to the steep gradients present, these slopes require Geoweb erosion

protection to be installed on the face to maintain an adequate topsoil cover. As of the time of writing of this report, placement of the Geoweb was yet to be completed.

3.2.3 Civil Works (January 2023 to August 2023)

The works to construct the civil infrastructure to service Stages 2A and 2C, including the construction of Pekanga Road, public wastewater and stormwater drainage and common services, was carried out as part of subdivision Stage 2. These works are certified in Tetra Tech Coffey Geotechnical Completion Report referenced 773-AKLGE206639-BU, dated 20 October 2023.

4. QUALITY ASSURANCE AND CONTROLS

4.1 CONSTRUCTION OBSERVATIONS

Construction observations were undertaken during the earthworks and civil works on a near daily basis to assess compliance with NZS 4431 and our project specific recommendations and specifications presented in the various geotechnical reports referenced above in Section 2. Our site observation work included:

- Topsoil stripping and benching of slopes prior to the placement of earth fills;
- Placement of geogrid reinforcement and drainage for reinforced earth (RE) slopes, including connection of subsoil/underfill drainage to the sealed public stormwater network;
- Ground conditions and founding material exposed in Undercuts 8 and 9, beneath RE slopes RE602 and RE603;
- Construction of counterfort drains; and
- Flush testing of the counterfort drains upon completion.

Tests measurements undertaken during site inspections included:

- Compaction testing of clay fill in accordance with Tetra Tech Coffey Geotechnical Works Specification;

4.2 EARTH FILL QUALITY CONTROL CRITERIA

The quality control criteria for compaction testing of earth fills were based on minimum allowable shear strength and maximum allowable air voids in accordance with the Tetra Tech Coffey Geotechnical Works Specification for Millwater as follows:

Air Voids Percentage (as defined in NZS 4402:1986) taken as 1 test per 1500 m^3 of fill placed and not less than 1 test per 500mm lift of fill per fill area.

- Maximum Single Value: 12%
- Average Value: 10%

Undrained Shear Strength (measured by calibrated shear vane to BS1337 method)

- Minimum Single Value: 110kPa
- Average Value: 140kPa

In-situ density, shear strength and water contest test were carried out in areas of filling at or in excess of the frequency recommended by NZS 4431. Test results are IANZ (International Accreditation New Zealand) endorsed and fill details are appended.

In addition, laboratory Triaxial Tests of Engineered fill sampled from high importance areas (i.e. RE Slope backfill) has been carried out to confirm design soil parameters. Testing was carried out in accordance with test method AS1289.6.4.2 (Note 4).

5. PROJECT EVALUATION

5.1 STABILITY EVALUATION

Global stability conditions in Stages 2A and 2C have been assessed under a range of groundwater conditions and seismic loading. The soil parameters used for the analyses (as referred to in the Tetra tech Coffey Design

Philosophy Report reference 773-AKLGE20639-AD) were adopted based on extensive investigation and modelling of the site.

The stability analysis results have demonstrated factors of safety against instability in accordance with the requirements of the Auckland Council Code of Practice for Land Development and Subdivision – Section 2 Earthworks and Geotechnical Requirements Version 1.6 dated 24 September 2013.g

We consider that the results are acceptable, and we are therefore satisfied that the building platform areas in all lots within Stages 2A and 2C are not subject to the hazards described in Section 106 of the Resource Management Act 1991 and Section 71 (3) of the Building Act 2004.

To the best of our knowledge, there have been no significant departures to the landform that was considered in the aforementioned Tetra Tech Coffey investigation and design reports (referenced above in Section 2). Furthermore, observations of earthworks and undercuts have confirmed that the ground model forming the basis of the stability analysis presented in these reports is applicable.

On this basis, the stability analysis conclusions presented in the Tetra Tech Coffey reports may continue to be relied upon.

Notwithstanding the above, the Tetra Tech Coffey Geotechnical Building Limitation Zones Plan, reference CD-001 to CD-003, presented in Appendix B, shows the extent of a series of zones which are intended to, among other things, maintain long term factors of safety against instability.

The Building Limitation Zones shown on the plan include:

- No-build Zone; and
- Specific Design Zone (Slope);

Full description of the limitations associated with each of these zones are presented in the Suitability Statement below.

5.2 REINFORCED EARTH (RE) SLOPES

The finished lot contours have generally been eased across the subdivision by the construction of two 1V:1.5H RE slopes up to 6m in vertical height.

Table 3 below summarises the RE slope construction details.

Table 3: Summary of RE Slope Construction Details

RE Slope #	Max. Vertical Slope Height (m)	Geogrid Type	Geogrid Embedment Lengths	Design Surcharge Load at Slope Crest (kPa)
602 & 603	6	Tensar SS20	Alternating 2m and 5m lengths at 0.5m vertical centres	12

The RE slopes were constructed with subsoil drainage comprising a 300mm wide SAP50 scoria blanket drain behind the geogrid reinforced fill zone, with regular outlet connections into the sealed public stormwater drainage network or to existing subsoil drains at the locations shown on the Woods Limited as-built drawings reference P24-156-00-1400 to 1403-AB.

If any of the RE Slope drains are intercepted by future construction works, they should be reinstated under the supervision of a Chartered Professional Engineer familiar with the contents of this report. The capacity of the

subsoil drains to function should not be reduced nor compromised as blocked RE Slope drainage can in some circumstance, lead to failure of the slope.

All of the RE Slopes were installed with a Geoweb topsoil retention system to reduce the risk of scour and erosion on the slope face. The Geoweb is fixed into position via Duckbill anchors installed into the ground at approximately 1.3m lateral centres at the slope crest. It is important that no drainage or service trenches are excavated immediately behind the slope crests on the residential lots as this may cause damage to the anchors resulting in surficial slumping of the topsoil on the batter faces.

Further details relating to building limitations on lots adjoining the RE slopes is provided below in Section 5.4 and in the Suitability Statement (Section 6).

The RE slope design drawings are included in Appendix B for reference.

5.3 BUILDING LIMITATION ZONES

The steeper areas of Stages 2A and 2C and adjoining land parcels are more sensitive to future changes in geometry, groundwater and surface water than other less steep areas. Accordingly, the appended Suitability Statement and the following sub-sections contain details of building restrictions in the form of designated No Build Zones and Specific Design Zones pertaining to limiting future works carried out on and adjoining the steeper sloping portions, and on limiting future cuts near batter toes to maintain the long-term integrity of these areas.

The Building Limitation Zones are shown on Tetra Tech Coffey drawing CD-001 to CD-003 in Appendix B.

Further details follow;

5.3.1 No Build Zone

From a geotechnical perspective future building should be avoided on land having slope gradients steeper than 1V:2H or on the embankments that were constructed geogrid reinforcement to maintaining long term factors of safety against instability. For these reasons, the two RE slopes (RE602 and RE603) in Stages 2A and 2C are designated as No Build Zones.

Furthermore, a No Build Zone has been designated adjoining the toe of batter within Lots 69 and 70 and parallel with the northern lot boundary in Lot 70 (see appended Tetra Tech Coffey drawing CD-002). The No Build Zone here overlays a counterfort drain (see appended Tetra Tech Coffey drawing CD-004) whose ongoing function is critical for relieving pore water pressures within RE603.

Landscaping works (e.g. paving, fencing) may be constructed within this Zone, but no excavations, and no pile foundations, including retaining walls and suspended decks are permitted.

If the subsoil drain in Lots 69 or 70 is intercepted by any future construction works, the issue should be raised with Tetra Tech Coffey immediately so we can advise on the best course of action to reinstate the drain and to maintain its function.

Suspended cantilevered decking or slabs may encroach into the No Build Zones, but no foundations or cuts are permitted.

To reduce the potential for scour and erosion of the RE slope faces, topsoil has been placed on the batter faces and planted, and fixed in place by the Geoweb Erosion Control System. These features should be able to remain in place long term without any significant maintenance.

Any vegetation cleared beyond the immediate area of building platforms for temporary construction purposes should be replanted or replaced as soon as possible. It is important that no excavations, even of minimal depths and temporary in nature, are carried out on the batter faces as this will result in damage to the Geoweb and potentially lead to failure of the Geoweb across a large portion of the slope. This restriction also applies to excavations at the batter crest, where anchors to fix the Geoweb in place have been installed.

The contribution of appropriate vegetation cover to erosion control should not be underestimated. Weeds are permitted to the removed, but landscaped vegetation in the No Build Zones should be protected and preserved.

5.3.2 Specific Design Zone (Slope)

Specific Design Zone (Slope) has been applied to all sloping lot areas having gradients of 1V:4H or steeper and which are not geogrid reinforced or land located immediately downslope of steeper slopes. Any future buildings or earthworks within the Specific Design Zone (Slope) should be the subject of a specific engineering design carried out by a Chartered Professional Engineer experienced in geomechanics and who is familiar with the contents of this report. This will also require an assessment of natural hazards as detailed in Section 71(3) of the Building Act, 2004. The design engineer should consider the implications on stability of cutting into batters or at the bases of slopes.

Individual lot developers should take particular care when planning any unsupported cuts (e.g. for retaining walls or benched platforms), even of a temporary nature on or near these batters. Risk reduction methods that should be employed include (but are not limited to) staging of excavation works along slopes, covering excavations with polythene to prevent ingress of rainfall, installation of temporary retention piles prior to excavation works (i.e. top-down construction methodologies), careful planning of works to avoid periods of inclement weather, and ensuring that open excavations are only left unsupported for short periods of time.

5.4 FILL INDUCED SETTLEMENT

The subdivision bulk earthworks included mucking out of organic and soft deposits from gully inverts prior to placement of Engineered fill, and the installation of underfill drainage, and quality control testing during the placement of fill to confirm compliance with the fill compaction specification. These works have been undertaken as part of the normal earthworks process and, among other things, served to reduce the magnitude and time for post-construction settlements to attenuate.

Several settlement monitoring devices were installed in close proximity to Stages 2A and 2C to measure induced settlement. The locations of the monitoring devices are shown in the Settlement Monitoring Location plan in Appendix E. Settlement plates were placed on the stripped natural ground beneath fill areas prior to fill placement and brought up to ground level as filling progressed to monitor the consolidation of the underlying natural soils. In addition, settlement markers were installed into the finished ground surface to monitor surface movements upon completion of the earthworks.

As shown in the settlement monitoring graphs in Appendix E, we are satisfied that at the time of preparing this report, fill induced settlements had attenuated to acceptable levels for NZS3604 type dwellings to be constructed.

5.5 SUBSOIL DRAINAGE

The following subsections contain a description of the underfill and counterfort drainage (collectively referred to as subsoil drainage) installed during bulk earthworks to control groundwater levels across Stage 2 and to allow for the dissipation of generated pore water pressures. The drain locations are shown on the Woods Subsoil Drainage as-built plan referenced P24-156-00-1200-AB in Appendix A. The subsoil drain design details are shown on the Coffey Subsoil Drainage Standard Details drawings ref: AG/007 in Appendix B.

The capacity of the subsoil drains to function as intended should not be reduced or compromised, as blocked subsoil drainage may, in certain circumstances, have a detrimental effect on site stability.

Where any subsoil drain is intercepted by building or landscaping works it must be reinstated under the direction of a Chartered Professional Engineer experienced in geomechanics and familiar with the contents of this report, to ensure the integrity and long-term function of the subsoil drainage system is maintained.

5.5.1 Underfill Drains

Perforated underfill drains were placed in mucked out gully inverts and in gully flanks prior to placement of Engineered fill to tap groundwater seepage and springs, as required by NZS 4431.

These drains were intended to intercept localised groundwater seepage and springs during earthworks and to help provide general control over groundwater. These drains require no specific maintenance.

The locations of the underfill drains are shown on Woods drawing P24-156-00-1200-AB and Tetra Tech Coffey drawings CD-005.1 to 005.3. These drains have been installed beneath the fill areas, which is in places over 14m deep. As such, no engineering solution is required to bridge these drains where they pass beneath residential lots, and they are unlikely to be intercepted by future building works.

5.5.2 Counterfort Drains

During earthworks construction, one counterfort drain was installed under the direction of Tetra Tech Coffey, to assist in controlling local groundwater levels and to provide a suitable outlet for the RE603 slope drainage. The typical trench excavation depth for the counterfort (CF) drain was up to 3m from the undercut ground level, and a typical width of 600mm. Drainage aggregate used for the counterfort drain was SAP50 scoria.

This drain was extended north through adjoining Subdivision Stage 2 and discharges into a tributary of the Orewa River at the northern subdivision boundary via a specifically designed outfall structure. The counterfort drain was generally aligned beneath lot boundaries and constructed with a minimum 1m cap of Engineered clay fill above the drain.

5.5.3 Flushing of Subsoil Drains

Flush testing of the counterfort drain to confirm its function was undertaken using a water cart connected to the drain inlet Novaflo. A Tetra Tech Coffey engineer was on-site to observe the flushing operation. The subsoil drain was successfully flush tested prior to placing the 1m clay cap.

5.6 BEARING CAPACITY

Following the completion of earthworks operations, a series of hand auger boreholes were drilled in appropriate areas of cut and filled ground to assess representative finished subsurface conditions and hence evaluate likely foundation options for future residential building development. Our resulting bearing capacity recommendations are presented in the appended Suitability Statement.

At current subgrade levels, all cut, filled and undisturbed original ground has a geotechnical ultimate bearing capacity of 300kPa (as required by NZS3604:2011) within the zone of influence of conventional shallow residential building foundation loads.

Where a geotechnical ultimate bearing capacity greater than 300kPa is required (i.e. outside the limits of NZS 3604:2011, such as when piling is undertaken), site-specific investigation and design of foundations should be carried out prior to Building Consent application.

It should be noted that NZS 3604 only allows a maximum fill depth of 60mm above finished ground level across the building platform or a dwelling unless an Engineering design solution is proposed, due to the risk of induced settlement or instability of the subsoils caused by the weight of the fill.

5.7 EXPANSIVE SOILS

Six sets of Laboratory Expansive Soil Tests were carried out on soil samples retrieved from Lots 66, 68, 70, 66, 132, 135 and 139 (as shown on Tetra Tech Coffey drawing CD/004 in Appendix C).

Testing to assess the Shrink Swell Index (I_{SS}) was carried out in accordance with AS1289 Test 7.1.1 and was used in conjunction with the advice in Acceptable Solution B1/AS1 of the New Zealand Building Code to calculate the characteristic surface movement (y_s) and expansive soil class.

All test results are IANZ (International Accreditation New Zealand) endorsed and full details are included in Appendix C.

Based on the results of laboratory testing, plus our visual and tactile assessment for the soils on site, we have assessed the AS2870 expansive site class as M (Moderately reactive) or H (Highly reactive) for all residential lots.

On some expansive clay sites, if cast on-grade floor slab construction takes place during a long dry summer, exposed building platform soils may dry out and become highly desiccated.

Over time the presence of the floor slab will cause capillary rise of moisture to the underside of the damp proof course and potentially expansive dry ground may wet up and swell, causing floor slab uplift. The effect may be very slight in some cases and extreme in others, especially if free water can reach the central underside of the slab as could occur if any subsoil drainage is discharged beneath the slab or an under-slab water pipe leaks.

Floor slab uplift usually remains unnoticed in carpeted homes but can cause distress on tile floors and in garages where cracks are more apparent. It may also rack upper storeys if non-load bearing ground floor walls are lifted and act as struts. Further, it may cause drainage problems on flat roofed houses where gutter gradients may be reversed.

Thorough soaking (in the form of low flow sprinklers for an extended period rather than flooding of the surface with a hose once, is recommended) of the exposed building platform area, a few days before hardfill placement, can help to reduce the problem. Careful detailing of construction joints in brittle building elements can also be of benefit. Alternatively, removal and replacement of the desiccated surface layers is recommended.

It is also recommended that site specific testing is carried out by individual lot owners to ascertain the expansive site class for each individual lot.

Methods of downgrading the expansive site class (i.e. from Highly to Moderately expansive), such as saturation of the building platform prior to placement of the floor slab or replacement of surface clay layers with compacted hardfill, may be appropriate in some circumstances, but should only be performed under the instruction, supervision and certification of a Chartered Professional Engineer, familiar with the contents of this report.

5.8 STORMWATER CONTROLS

It is important on all lots that due care is paid to the design and construction of appropriate stormwater disposal systems. These systems should serve to collect all runoff from roofs, driveways and paved areas, together with discharges from retaining wall drains and other subsoil drains and should connect directly into the sealed public stormwater drainage network.

Uncontrolled stormwater discharges onto the ground surface or into soakage pits can cause erosion, scour and/or instability on sloping land and are not permitted on any of the residential lots.

5.9 SERVICE TRENCHES

As is normal on all subdivisions, construction of foundations within the 45-degree zone of influence from 0.5m below pipe inverts will require engineering input. The Auckland Council drawing referenced SW22 provided in Appendix B extracted from Chapter 4 of the Auckland Council Code of Practice for Land Development and Subdivision, version 3.0, January 2022, depicts bridging requirements for stormwater pipes. Details for water and wastewater pipes are available in Watercare CoP1, namely WW53 and WW54, which are standard construction drawings. All aforementioned details are provided in Appendix B.

A number of the lots have public drainage trenches within their boundaries as shown on the Woods Stormwater and Wastewater as-built plans referenced P24-156-00-3000 to 3004-AB, and P24-156-00-4000 to 4003-AB, respectively, in Appendix A. The resulting limitations are discussed in the following Suitability Statement.

5.10 TOPSOIL

Upon completion of the subdivisional works a series of shallow hand auger boreholes were drilled at the locations of each likely building platform (as shown on Tetra Tech Coffey drawing CD/004 in Appendix B) to assess indicative topsoil depths on all residential lots.

Depths of topsoil were found to range from 50 to 150mm, however, due to the nature of the method of investigation, variation in topsoil depths across the lots should be expected.

Site specific findings are presented in the Suitability Statement Summary (Table 5) in Section 6. However, we strongly recommend that prospective lot purchasers complete their own checks of actual topsoil depths across their specific lot.

5.11 INCOMPLETE WORKS

As of the date of writing of this report, the following items of construction were outstanding.

- Placement of the Geoweb Erosion Protection on the face of RE602 and RE603.

This will be certified in a future addendum report to be issued to Auckland Council.

5.12 CONTRACTORS WORK

We have relied on the Contractor's work practices and assume that the works have been carried out in accordance with:

- The approved Contract drawings and design details;
- The approved Contract specifications;
- Authorised Variations issued during the execution of the works;
- The conditions of Resource, Earthworks and Building Consents where applicable; and
- The relevant Tetra Tech Coffey reports, recommendations, specifications and site instructions.

In addition, we assume that all As-Built information and other details provided to the Client and/or Tetra Tech Coffey by the Contractor and other consultants are accurate and correct in all aspects.

6. STATEMENT OF PROFESSIONAL OPINION AS TO THE SUITABILITY OF LAND FOR BUILDING DEVELOPMENT

I, Stephen Parkes of Tetra Tech Coffey (NZ) Limited, Auckland, hereby confirm that:

1. I am a Chartered Professional Engineering Geologist experienced in the field of geotechnical engineering as defined in Section 1.2.3 of NZS 4404 and was retained by the Owner/Developer as the Geotechnical Engineer on Stages 2A and 2C within Precinct 6 of the Millwater residential subdivision
2. The extent of investigations carried out to date are described in the Geotechnical Investigation Report referenced 773-AKLGE204203-AA, dated 25 July 2017, and the geotechnical design reports referenced above in Section 2.

   The Tonkin and Taylor Geotechnical Completion Report referenced 21854.0034/AHP6Ew.v1, dated June 2019 provides earthworks certification for the enabling works package, completed at the site prior to the works detailed within this report.

   The conclusions and recommendations of these documents have been re-evaluated as part of the preparation of this report.
3. Engineered fill placed as part of the Precinct 6 Stages 2A and 2C construction and shown on the appended Woods Limited as-built plans, excluding fills placed during enabling earthworks under the direction of Tonkin & Taylor, is certified herein.
4. In my professional opinion, not to be construed as a guarantee, I consider that:
   a) The completed earthworks give due regard to land, slope and foundation stability considerations within the residential lots.

      As is shown on the appended Woods Limited Final Surface As Built Plan, ref P24-156-00-1000-AB, areas on some lots have gradients steeper than 1(v) in 4(h) and generally up to 1(v) in 1.5(h)), or are adjacent to land having such gradients.

      Additionally, some sloping areas have geogrid reinforcement whose structural integrity is critical in maintaining long term slope stability.

      Accordingly, limitations to future building by way of designated No Build Zone and Specific Design Zone (Slope) have been applied as depicted on Tetra Tech Coffey Geotechnical Building Limitation Zone Plans CD/001-3, dated 20/05/2024, and described as follows:

      i. **No Build Zone** has been applied to portions of Lots 64 to 70 (inclusive) and Lots 130-139 (inclusive) that have geogrid reinforced earth (RE) slopes, and in Lots 69 and 70 where there is a subsoil drain (more discussion on these areas is provided in Clause (c)). No building and no earthworks are permitted within the designated No Build Zones as development in these areas could have a detrimental effect on land stability.

      ii. **Specific Design Zone –Slope** has been applied to portions of Lots 64 to 69 (inclusive), and Lot 71, and Lots 130 to139 (inclusive) due to the presence of slope gradients of 1(v) in 4(h) to 1(v) in 1.5(h) or adjoining slopes having such gradients.

      No building construction and no earthworks (i.e. cut or fills of any depth) should take place within designated Specific Design Zone (Slope) areas unless endorsed by geotechnical design of all earthworks, foundations and retaining walls and by construction inspections undertaken by a Chartered Professional Engineer experienced in geomechanics and who is familiar with the contents of this report, as such operations may, in certain circumstances, have detrimental effects on site stability. The endorsing Engineer will need to assess natural hazards under Section 71(3) of the Building Act 2004, and consider the implications of temporary (i.e. construction case) and long-term stability conditions and soil creep on the development proposals, including the impact of surcharge loads from the land above batters, ancillary structures such as water tanks, effects of services and associated trench backfills and control of surface water.

      This limitation also applies to long term landscaping works and vegetation change, including any proposed minor cuts either on the batter slopes or at their toes, which are to be retained by landscaping walls that might not normally require specific engineering input. Risk

mitigation measures to prevent initiating instability in upslope batters during construction of these works should also be considered.

Recommended geotechnical parameters for the design of retaining walls within the Specific Design Zone (Slope) areas are as follows:

Table 4: Suggested Retaining Wall Design Parameters

Effective angle of Frictional Resistance, ø' (°)	Effective Cohesion, c' (kPa)	Undrained Shear Strength, S_u, of Foundation Soils (kPa)	Retained Soil Unit Weight, γ (kN/m^3)	Retained Soils Type
28	0	60	18	Clay

b) A geotechnical ultimate bearing capacity of 300kPa may be assumed for shallow foundation design on all residential lots in Stages 2A and 2C.

Where a geotechnical ultimate bearing capacity greater than 300kPa is required (i.e. outside the limits of NZS 3604), further specific site investigation and foundation design should be carried out prior to Building Consent application.

c) The function of the subsoil drains (including drain outlets), as depicted on the appended Woods Limited Subsoil Drainage as-built plan referenced P24-156-00-1200-AB, should not be compromised by any future building development nor landscaping works. Any bored or driven piles should be positioned to avoid damaging the drains. **Where any subsoil drain is intercepted by building works, it must be reinstated under the direction of a Chartered Professional Engineer to ensure the long-term function and integrity of the subsoil drainage system is maintained.**

   i. Additional **No Build Zone** restrictions have been applied to areas within Lots 69 and 70 to ensure the counterfort drain present at the toe of the adjoining slope to the west and aligning parallel with the northern boundary of Lot 70 (see Tetra Tech Coffey drawing CD/005.3 for drain location), is not damaged by future building or landscaping works. Surface landscaping works (e.g. paving, fencing, decks) are permitted, but no foundations, retaining walls or excavations should be carried out in this zone.

d) The backfilling and compaction of the stormwater and wastewater trenches on this subdivision has where possible, been carried out to appropriate standards having regard for the prevailing ground conditions and associated compaction induced pipe loadings.

Nevertheless, no building development should take place within the 45° zone of influence extrapolated from 0.5m beneath drain inverts unless endorsed by a Chartered Professional Engineer experienced in geomechanics to ensure that lateral stability and differential settlement issue as are addressed, and that building loads are transferred beyond the influence of the pipe and beyond the extent of the trench backfill.

Woods as-built plans P24-156-00-3000-AB to 3004-AB and P24-156-00-4000-AB to 4003-AB should be referred to the locations of public drainage on all lots.

A copy of drawing SW22 extracted from Chapter 4 of Auckland Council Code of Practice of Land Development and Subdivision is provided in Appendix A for reference. Details pertaining to building over or adjacent to public wastewater pipes are shown on Watercare drawings, namely WW53 and WW54, provided in Appendix B.

e) On no account should stormwater be concentrated into pits (including stormwater detention or bio-retention treatment type pits) near sloping ground or batters or in areas of sandy soils or fractured rock unless endorsed by specific designs and by construction inspections undertaken by a Chartered Professional Engineer experienced in geomechanics to ensure that appropriate permanent impervious lining of the pit is incorporated so that long term infiltration into the surrounding soils is not increased on account of its potentially adverse impact on local and global stability.

f) The assessed AS2870 Expansive Site Class is M (moderately reactive) for Lots 64-71 (inclusive) and Lots 130-138 (inclusive), and H (Highly Reactive) for Lot 139. It is recommended that site specific testing is carried out by individual lot owners to ascertain the expansive site Class on each individual lot.

g) The seismic site subsoil category on all residential lots is assessed to be Class C (shallow soil site) in accordance with NZS1170.5

h) Subject to the geotechnical limitations, recommendations and expansive soil assessments associated with Section 6, Items 4(a), 4(b), 4(c), 4(d), 4(e), 4(f), and 4(g) above:

   i) The cut, filled and undisturbed original ground with residential lot boundaries is generally suitable for residential buildings constructed in accordance with NZS 3604:2011 (that incorporate specific foundation and associated structural design considering the expansive soils site class) and related documents.

   ii) On all lots in Stage 2A and 2C, shallow foundation design may be carried out in accordance with AS2870 (Class M or Class H), or alternatively, a specific foundation and structural design may be undertaken for NZS3604 type foundations by a Chartered Professional Engineer who should allow for expansive soil effects in the design. In this latter case, the minimum foundation embedment depth below cleared ground level may be ascertained from Table 7.4A or 7.4B in Amendment 19 to the Acceptable Solutions and Verification Methods to Clause B1 Structure of the New Zealand Building Code, dated 28 November 2019.

Table 5 below summarises the status of each residential lot covered by this Suitability Statement.

7. LIMITATIONS

The professional opinion contained within this report is furnished to Auckland Council and WFH Properties Limited for their purposes alone on the express condition that it will not be relied upon by any other person. Prospective purchasers should satisfy themselves as to any specific conditions pertaining to their particular land interest.

This opinion does not remove the necessity for the normal inspection of ground conditions and the design of foundations as would be made under all normal conditions.

For and on behalf of Tetra Tech Coffey

Prepared by:

Fernanda Soto
Engineering Geologist
MSc Geology

Stephen Parkes
Associate Engineering Geologist
CMEng.NZ, PEngGeol

Reviewed and Authorised by:

Peter Bosselman
Senior Principal

Table 5: Suitability Statement Summary

Lot #	Comments	Indicative Topsoil Depth (mm)	Ultimate Bearing Capacity (kPa)	AS2870 Expansive Site Class
64	No Build Zone limitations apply (refer to Clause 6.4(a)(i)) Specific Design Zone (Slope) limitations apply (refer to Clause 6.4(a) (ii)) Sewer/Stormwater line limitations apply (refer to Clause 6.4(d) Care required with Stormwater disposal (refer to Clause 6.4(e) The NZS1170.5 Seismic Site Subsoil Class is assessed to be Class C (refer to Clause 6.4(g)) Elsewhere, AS 2870 foundation design or specific CPEng design with minimum footing depth in accordance with Amendment 19 to section B1 of the NZ Building Code, for Class M NZS 3604 type strip of pad foundations.	50	300	M
65	No Build Zone limitations apply (refer to Clause 6.4(a)(i)) Specific Design Zone (Slope) limitations apply (refer to Clause 6.4(a) (ii)) Sewer/Stormwater line limitations apply (refer to Clause 6.4(d) Care required with Stormwater disposal (refer to Clause 6.4(e) The NZS1170.5 Seismic Site Subsoil Class is assessed to be Class C (refer to Clause 6.4(g)) Elsewhere, AS 2870 foundation design or specific CPEng design with minimum footing depth in accordance with Amendment 19 to section B1 of the NZ Building Code, for Class M NZS 3604 type strip of pad foundations.	50	300	M
66	No Build Zone limitations apply (refer to Clause 6.4(a)(i)) Specific Design Zone (Slope) limitations apply (refer to Clause 6.4(a) (ii)) Sewer/Stormwater line limitations apply (refer to Clause 6.4(d) Care required with Stormwater disposal (refer to Clause 6.4(e) The NZS1170.5 Seismic Site Subsoil Class is assessed to be Class C (refer to Clause 6.4(g)) Elsewhere, AS 2870 foundation design or specific CPEng design with minimum footing depth in accordance with Amendment 19 to section B1 of the NZ Building Code, for Class M NZS 3604 type strip of pad foundations.	100	300	M

67	No Build Zone limitations apply (refer to Clause 6.4(a)(i)) Specific Design Zone (Slope) limitations apply (refer to Clause 6.4(a) (ii)) Protection of the function of subsoil drains required (refer to Clause (6.4(c)) Sewer/Stormwater line limitations apply (refer to Clause 6.4(d) Care required with Stormwater disposal (refer to Clause 6.4(e) The NZS1170.5 Seismic Site Subsoil Class is assessed to be Class C (refer to Clause 6.4(g)) Elsewhere, AS 2870 foundation design or specific CPEng design with minimum footing depth in accordance with Amendment 19 to section B1 of the NZ Building Code, for Class M NZS 3604 type strip of pad foundations.	150	300	M
68	No Build Zone limitations apply (refer to Clause 6.4(a)(i)) Specific Design Zone (Slope) limitations apply (refer to Clause 6.4(a) (ii)) Sewer/Stormwater line limitations apply (refer to Clause 6.4(d) Care required with Stormwater disposal (refer to Clause 6.4(e) The NZS1170.5 Seismic Site Subsoil Class is assessed to be Class C (refer to Clause 6.4(g)) Elsewhere, AS 2870 foundation design or specific CPEng design with minimum footing depth in accordance with Amendment 19 to section B1 of the NZ Building Code, for Class M NZS 3604 type strip of pad foundations.	200	300	M
69	No Build Zone limitations apply (refer to Clause 6.4(a)(i) and 6.4(c) (i)) Specific Design Zone (Slope) limitations apply (refer to Clause 6.4(a) (ii)) Protection of the function of subsoil drains required (refer to Clause (6.4(c)) Sewer/Stormwater line limitations apply (refer to Clause 6.4(d) Care required with Stormwater disposal (refer to Clause 6.4(e) The NZS1170.5 Seismic Site Subsoil Class is assessed to be Class C (refer to Clause 6.4(g)) Elsewhere, AS 2870 foundation design or specific CPEng design with minimum footing depth in accordance with Amendment 19 to section B1 of the NZ Building Code, for Class M NZS 3604 type strip of pad foundations.	200	300	M

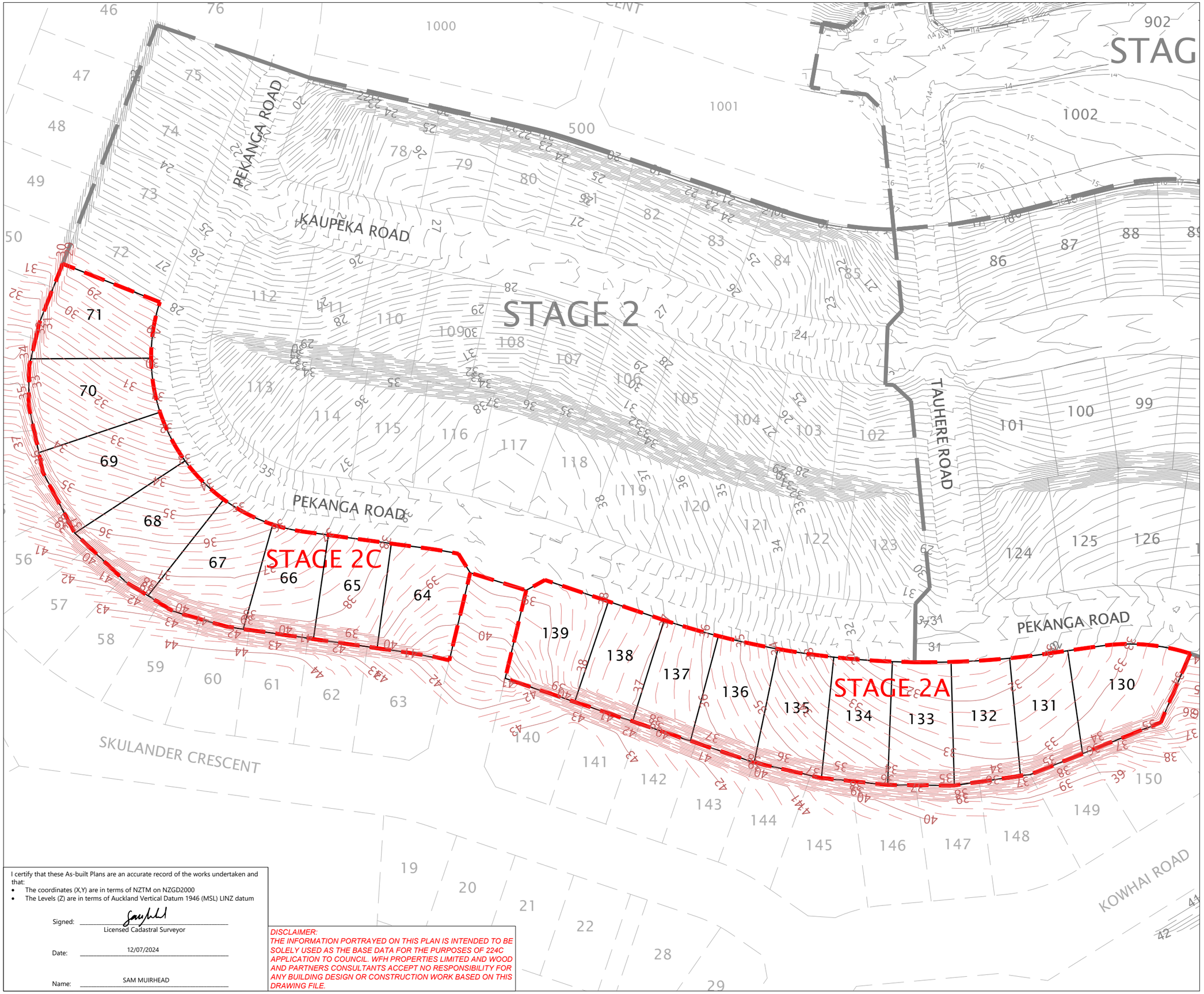
70	No Build Zone limitations apply (refer to Clause 6.4(a)(i) and 6.4(c) (i)) Protection of the function of subsoil drains required (refer to Clause (6.4(c)) Sewer/Stormwater line limitations apply (refer to Clause 6.4(d) Care required with Stormwater disposal (refer to Clause 6.4(e) The NZS1170.5 Seismic Site Subsoil Class is assessed to be Class C (refer to Clause 6.4(g)) Elsewhere, AS 2870 foundation design or specific CPEng design with minimum footing depth in accordance with Amendment 19 to section B1 of the NZ Building Code, for Class M NZS 3604 type strip of pad foundations.	50	300	M
71	Specific Design Zone (Slope) limitations apply (refer to Clause 6.4(a) (ii)) Protection of the function of subsoil drains required (refer to Clause (6.4(c)) Sewer/Stormwater line limitations apply (refer to Clause 6.4(d) Care required with Stormwater disposal (refer to Clause 6.4(e) The NZS1170.5 Seismic Site Subsoil Class is assessed to be Class C (refer to Clause 6.4(g)) Elsewhere, AS 2870 foundation design or specific CPEng design with minimum footing depth in accordance with Amendment 19 to section B1 of the NZ Building Code, for Class M NZS 3604 type strip of pad foundations.	100	300	M
130	No Build Zone limitations apply (refer to Clause 6.4(a)(i)) Specific Design Zone (Slope) limitations apply (refer to Clause 6.4(a) (ii)) Sewer/Stormwater line limitations apply (refer to Clause 6.4(d) Care required with Stormwater disposal (refer to Clause 6.4(e) The NZS1170.5 Seismic Site Subsoil Class is assessed to be Class C (refer to Clause 6.4(g)) Elsewhere, AS 2870 foundation design or specific CPEng design with minimum footing depth in accordance with Amendment 19 to section B1 of the NZ Building Code, for Class M NZS 3604 type strip of pad foundations.	100	300	M
131	No Build Zone limitations apply (refer to Clause 6.4(a)(i)) Specific Design Zone (Slope) limitations apply (refer to Clause 6.4(a) (ii))	100	300	M

	Protection of the function of subsoil drains required (refer to Clause (6.4(c)) Sewer/Stormwater line limitations apply (refer to Clause 6.4(d) Care required with Stormwater disposal (refer to Clause 6.4(e) The NZS1170.5 Seismic Site Subsoil Class is assessed to be Class C (refer to Clause 6.4(g)) Elsewhere, AS 2870 foundation design or specific CPEng design with minimum footing depth in accordance with Amendment 19 to section B1 of the NZ Building Code, for Class M NZS 3604 type strip of pad foundations.			
132	No Build Zone limitations apply (refer to Clause 6.4(a)(i)) Specific Design Zone (Slope) limitations apply (refer to Clause 6.4(a) (ii)) Sewer/Stormwater line limitations apply (refer to Clause 6.4(d) Care required with Stormwater disposal (refer to Clause 6.4(e) The NZS1170.5 Seismic Site Subsoil Class is assessed to be Class C (refer to Clause 6.4(g)) Elsewhere, AS 2870 foundation design or specific CPEng design with minimum footing depth in accordance with Amendment 19 to section B1 of the NZ Building Code, for Class M NZS 3604 type strip of pad foundations.	100	300	M
133	No Build Zone limitations apply (refer to Clause 6.4(a)(i)) Specific Design Zone (Slope) limitations apply (refer to Clause 6.4(a) (ii)) Sewer/Stormwater line limitations apply (refer to Clause 6.4(d) Care required with Stormwater disposal (refer to Clause 6.4(e) The NZS1170.5 Seismic Site Subsoil Class is assessed to be Class C (refer to Clause 6.4(g)) Elsewhere, AS 2870 foundation design or specific CPEng design with minimum footing depth in accordance with Amendment 19 to section B1 of the NZ Building Code, for Class M NZS 3604 type strip of pad foundations.	100	300	M
134	No Build Zone limitations apply (refer to Clause 6.4(a)(i)) Specific Design Zone (Slope) limitations apply (refer to Clause 6.4(a) (ii)) Sewer/Stormwater line limitations apply (refer to Clause 6.4(d)	50	300	M

	Care required with Stormwater disposal (refer to Clause 6.4(e) The NZS1170.5 Seismic Site Subsoil Class is assessed to be Class C (refer to Clause 6.4(g)) Elsewhere, AS 2870 foundation design or specific CPEng design with minimum footing depth in accordance with Amendment 19 to section B1 of the NZ Building Code, for Class M NZS 3604 type strip of pad foundations.			
135	No Build Zone limitations apply (refer to Clause 6.4(a)(i) and 6.4(c) (i)) Specific Design Zone (Slope) limitations apply (refer to Clause 6.4(a) (ii)) Protection of the function of subsoil drains required (refer to Clause (6.4(c)) Sewer/Stormwater line limitations apply (refer to Clause 6.4(d) Care required with Stormwater disposal (refer to Clause 6.4(e) The NZS1170.5 Seismic Site Subsoil Class is assessed to be Class C (refer to Clause 6.4(g)) Elsewhere, AS 2870 foundation design or specific CPEng design with minimum footing depth in accordance with Amendment 19 to section B1 of the NZ Building Code, for Class M NZS 3604 type strip of pad foundations.	100	300	M
136	No Build Zone limitations apply (refer to Clause 6.4(a)(i)) Specific Design Zone (Slope) limitations apply (refer to Clause 6.4(a) (ii)) Sewer/Stormwater line limitations apply (refer to Clause 6.4(d) Care required with Stormwater disposal (refer to Clause 6.4(e) The NZS1170.5 Seismic Site Subsoil Class is assessed to be Class C (refer to Clause 6.4(g)) Elsewhere, AS 2870 foundation design or specific CPEng design with minimum footing depth in accordance with Amendment 19 to section B1 of the NZ Building Code, for Class M NZS 3604 type strip of pad foundations.	150	300	M
137	No Build Zone limitations apply (refer to Clause 6.4(a)(i)) Specific Design Zone (Slope) limitations apply (refer to Clause 6.4(a) (ii)) Sewer/Stormwater line limitations apply (refer to Clause 6.4(d) Care required with Stormwater disposal (refer to Clause 6.4(e)	50	300	M

	The NZS1170.5 Seismic Site Subsoil Class is assessed to be Class C (refer to Clause 6.4(g)) Elsewhere, AS 2870 foundation design or specific CPEng design with minimum footing depth in accordance with Amendment 19 to section B1 of the NZ Building Code, for Class M NZS 3604 type strip of pad foundations.			
138	No Build Zone limitations apply (refer to Clause 6.4(a)(i)) Specific Design Zone (Slope) limitations apply (refer to Clause 6.4(a) (ii)) Sewer/Stormwater line limitations apply (refer to Clause 6.4(d) Care required with Stormwater disposal (refer to Clause 6.4(e) The NZS1170.5 Seismic Site Subsoil Class is assessed to be Class C (refer to Clause 6.4(g)) Elsewhere, AS 2870 foundation design or specific CPEng design with minimum footing depth in accordance with Amendment 19 to section B1 of the NZ Building Code, for Class M NZS 3604 type strip of pad foundations.	50	300	M
139	No Build Zone limitations apply (refer to Clause 6.4(a)(i) and 6.4(c) (i)) Specific Design Zone (Slope) limitations apply (refer to Clause 6.4(a) (ii)) Protection of the function of subsoil drains required (refer to Clause (6.4(c)) Sewer/Stormwater line limitations apply (refer to Clause 6.4(d) Care required with Stormwater disposal (refer to Clause 6.4(e) The NZS1170.5 Seismic Site Subsoil Class is assessed to be Class C (refer to Clause 6.4(g)) Elsewhere, AS 2870 foundation design or specific CPEng design with minimum footing depth in accordance with Amendment 19 to section B1 of the NZ Building Code, for Class H NZS 3604 type strip of pad foundations.	50	300	H

APPENDIX A: WOODS AS-BUILT DRAWINGS



WOODS
Est.1970

NOTES

1. CONTOURS ARE AT 0.25m INTERVALS.
2. BOUNDARIES ARE SUBJECT TO FINAL SURVEY AND LINZ APPROVAL.

LEGEND

- CONTOURS MAJOR
- CONTOURS MINOR
- CONTOURS EXISTING
- STAGE BOUNDARIES
- LOT BOUNDARIES
- EXISTING LOT BOUNDARIES
- FUTURE LOT BOUNDARIES

REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	STAGE NAMES UPDATED	RT	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

N

WFH PROPERTIES

MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

FINAL SURFACE AS-BUILT PLAN

STATUS	AS-BUILT	REV
SCALE	1:1000 @ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-1000-AB	

I certify that these As-built Plans are an accurate record of the works undertaken and that:

- The coordinates (X,Y) are in terms of NZTM on NZGD2000
- The Levels (Z) are in terms of Auckland Vertical Datum 1946 (MSL) LINZ datum

Signed: _____
Licensed Cadastral Surveyor

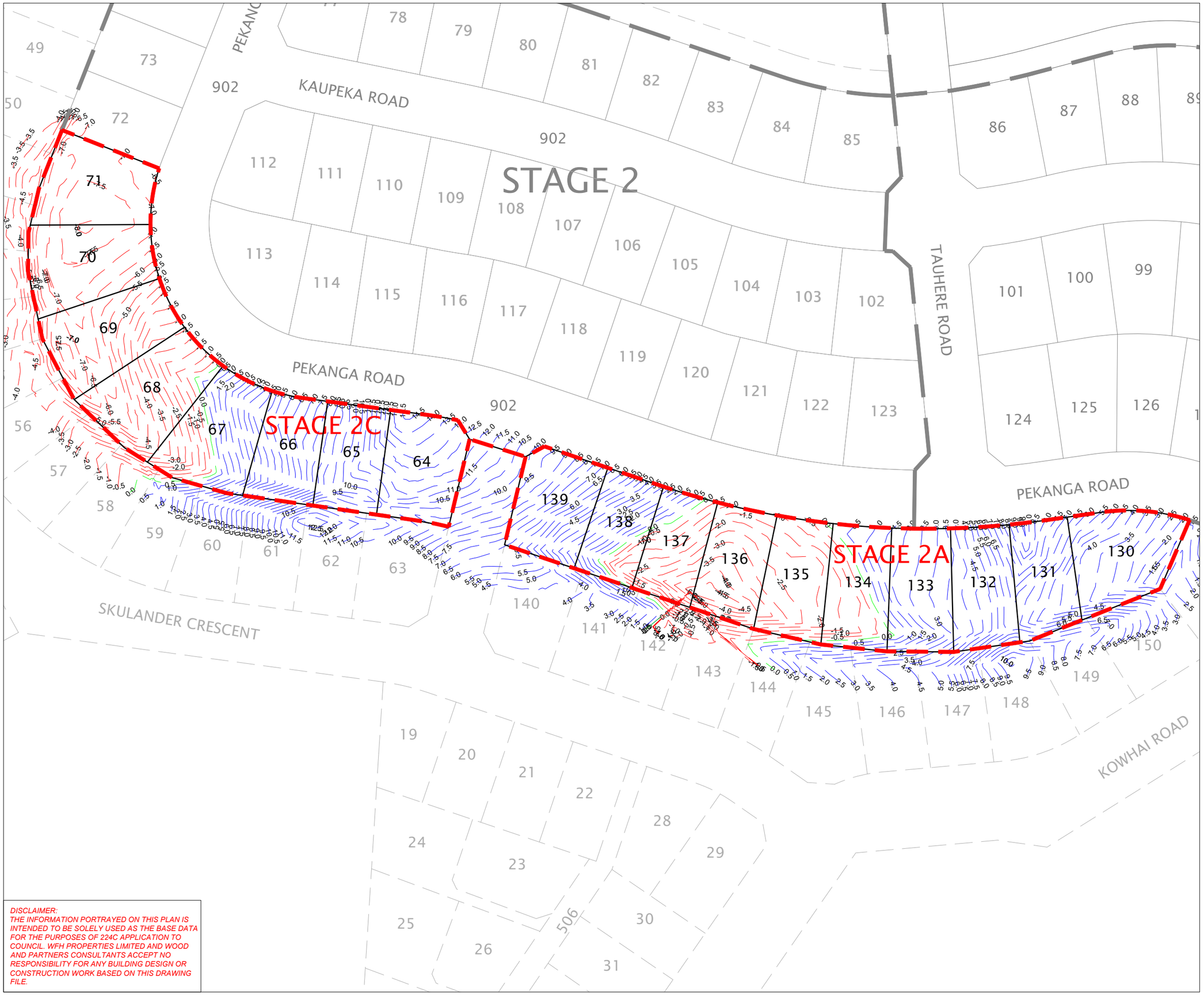
Date: 12/07/2024

Name: SAM MUIRHEAD

DISCLAIMER:
THE INFORMATION PORTRAYED ON THIS PLAN IS INTENDED TO BE SOLELY USED AS THE BASE DATA FOR THE PURPOSES OF 224C APPLICATION TO COUNCIL. WFH PROPERTIES LIMITED AND WOOD AND PARTNERS CONSULTANTS ACCEPT NO RESPONSIBILITY FOR ANY BUILDING DESIGN OR CONSTRUCTION WORK BASED ON THIS DRAWING FILE.

Plot Date: 2:40:40 pm, 12 July 2024, SAMANTHAM

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-156 - ARRAN HILL 2A & 2C_21643\02 DRAWINGS\02 SURV\ABP\P24-156-00-1000-AB FINAL SURFACE.DWG



WOODS
Est.1970

Plot Date: 4:47:54 pm,12 July 2024, RYANT

NOTES

1. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY AND LINZ APPROVAL.
2. CONTOURS ARE AT 0.5m INTERVALS.
3. PLANS SHOULS BE READ IN CONJUNCTION WITH THE GCR.
4. THE COORDINATES (X, Y) ARE IN TERMS OF NZTM ON NZGD2000.
5. THE LEVELS (Z) ARE IN TERMS OF THE AUCKLAND VERTICAL DATUM 1946 (MSL) LINZ DATUM.

LEGEND

- ZERO CONTOUR
- CUT CONTOUR
- FILL CONTOUR
- STAGE BOUNDARIES
- LOT BOUNDARIES
- EXISTING LOT BOUNDARIES
- FUTURE LOT BOUNDARIES

REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	STAGE NAMES UPDATED	RT	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

N

WFH PROPERTIES

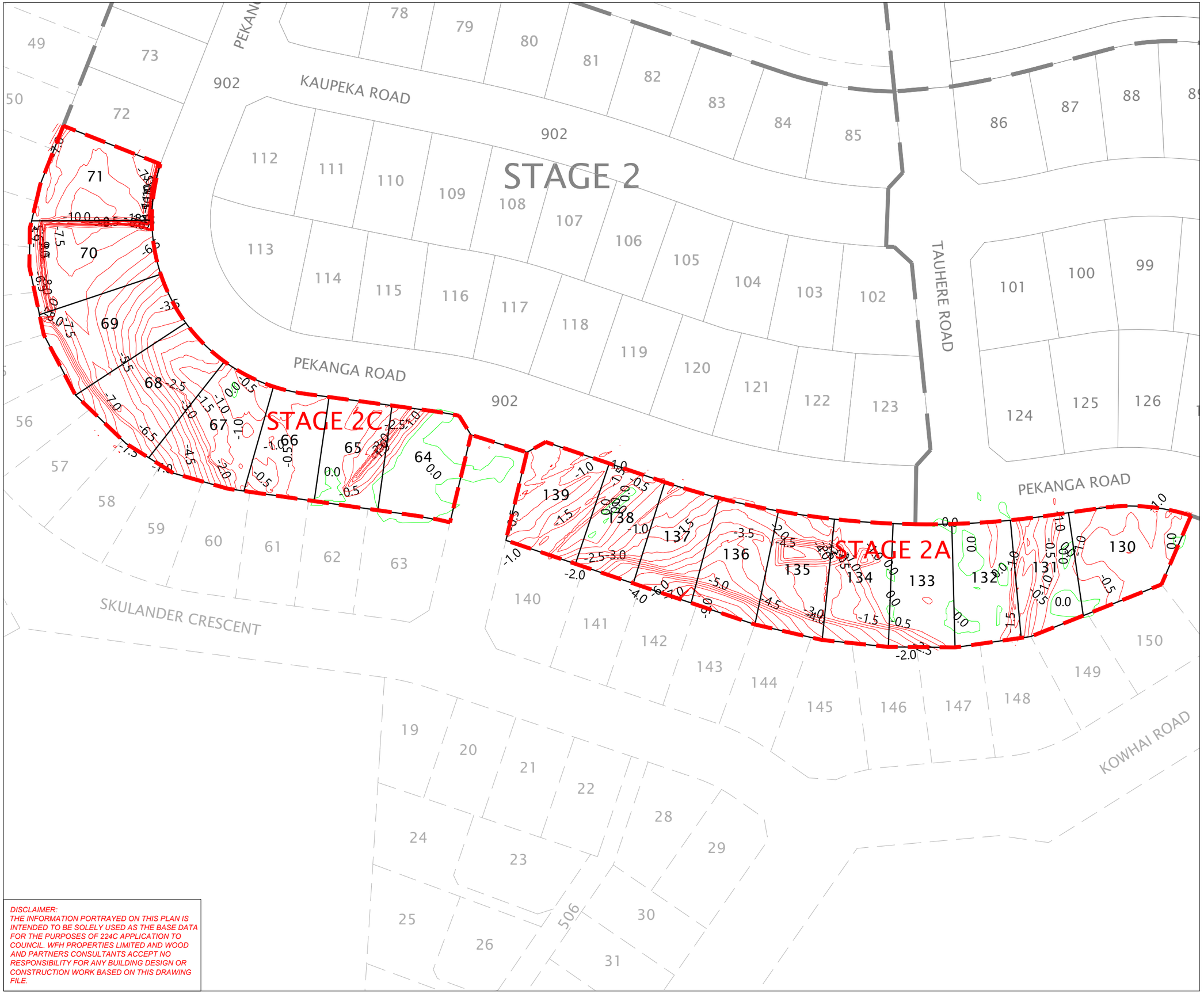
MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

CUT & FILL ASBUILT
SHEET 1 OF 3
ORIGINAL SURFACE TO
FINAL SURFACE

STATUS	FOR INFORMATION	REV
SCALE	1:1000@ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-1100-AB	

DISCLAIMER:
THE INFORMATION PORTRAYED ON THIS PLAN IS INTENDED TO BE SOLELY USED AS THE BASE DATA FOR THE PURPOSES OF 224C APPLICATION TO COUNCIL. WFH PROPERTIES LIMITED AND WOOD AND PARTNERS CONSULTANTS ACCEPT NO RESPONSIBILITY FOR ANY BUILDING DESIGN OR CONSTRUCTION WORK BASED ON THIS DRAWING FILE.

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-156 - ARRAN HILL 2A & 2C_21643\02 DRAWINGS\02 SURV\AB\P24-156-00-1100-AB CUT FILL CONTOURS.DWG



WOODS
Est.1970

Plot Date: 4:47:54 pm,12 July 2024, RYANT

NOTES

1. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY AND LINZ APPROVAL.
2. CONTOURS ARE AT 0.5m INTERVALS.
3. PLANS SHOULS BE READ IN CONJUNCTION WITH THE GCR.
4. THE COORDINATES (X, Y) ARE IN TERMS OF NZTM ON NZGD2000.
5. THE LEVELS (Z) ARE IN TERMS OF THE AUCKLAND VERTICAL DATUM 1946 (MSL) LINZ DATUM.

LEGEND

- ZERO CONTOUR
- CUT CONTOUR
- FILL CONTOUR
- STAGE BOUNDARIES
- LOT BOUNDARIES
- EXISTING LOT BOUNDARIES
- FUTURE LOT BOUNDARIES

REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	STAGE NAMES UPDATED	RT	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

N

WFH PROPERTIES

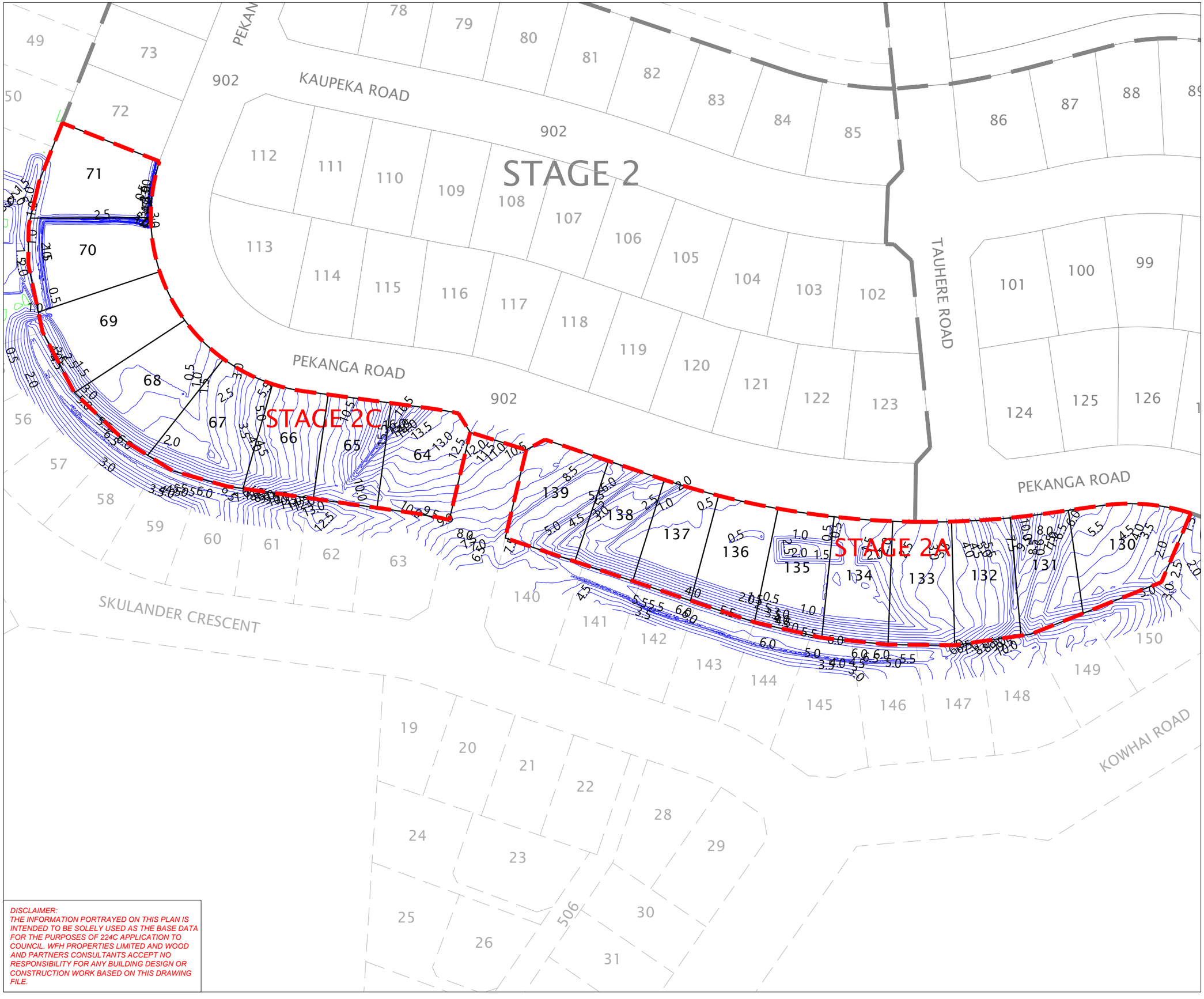
MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

CUT & FILL ASBUILT
SHEET 2 OF 3
ORIGINAL SURFACE TO LOWEST SURFACE

STATUS	FOR INFORMATION	REV
SCALE	1:1000@ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-1101-AB	

DISCLAIMER:
THE INFORMATION PORTRAYED ON THIS PLAN IS INTENDED TO BE SOLELY USED AS THE BASE DATA FOR THE PURPOSES OF 224C APPLICATION TO COUNCIL. WFH PROPERTIES LIMITED AND WOOD AND PARTNERS CONSULTANTS ACCEPT NO RESPONSIBILITY FOR ANY BUILDING DESIGN OR CONSTRUCTION WORK BASED ON THIS DRAWING FILE.

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-156 - ARRAN HILL 2A & 2C_21643\02 DRAWINGS\02 SURV\AB\P24-156-00-1100-AB CUT FILL CONTOURS.DWG



WOODS
Est.1970

Plot Date: 4:47:54 pm,12 July 2024, RYANT

NOTES

1. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY AND LINZ APPROVAL.
2. CONTOURS ARE AT 0.5m INTERVALS.
3. PLANS SHOULS BE READ IN CONJUNCTION WITH THE GCR.
4. THE COORDINATES (X, Y) ARE IN TERMS OF NZTM ON NZGD2000.
5. THE LEVELS (Z) ARE IN TERMS OF THE AUCKLAND VERTICAL DATUM 1946 (MSL) LINZ DATUM.

LEGEND

- ZERO CONTOUR
- CUT CONTOUR
- FILL CONTOUR
- STAGE BOUNDARIES
- LOT BOUNDARIES
- EXISTING LOT BOUNDARIES
- FUTURE LOT BOUNDARIES

REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	STAGE NAMES UPDATED	RT	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

N

WFH PROPERTIES

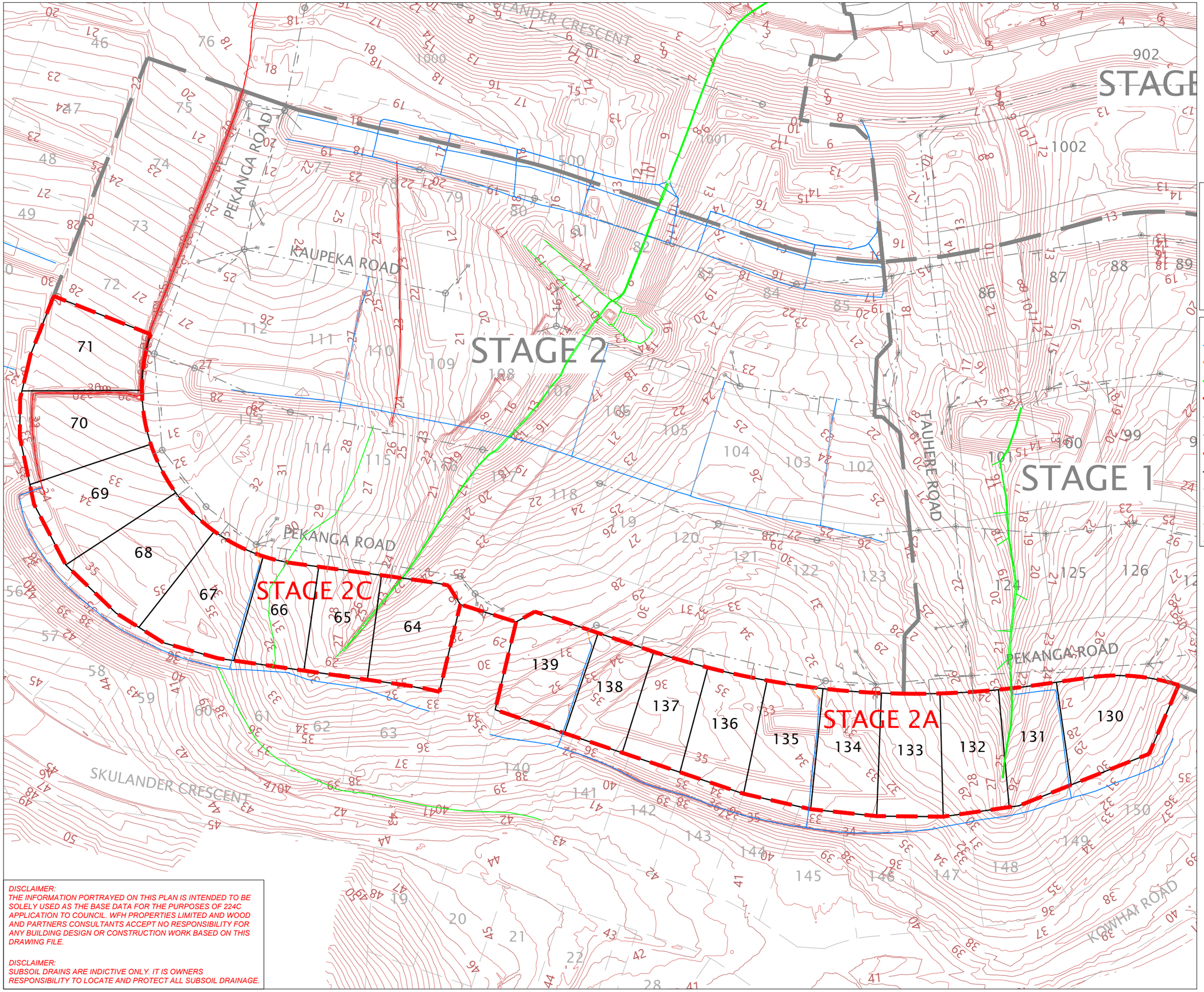
MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

CUT & FILL ASBUILT
SHEET 3 OF 3
LOWEST SURFACE TO FINAL SURFACE

STATUS	FOR INFORMATION	REV
SCALE	1:1000@ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-1102-AB	

DISCLAIMER:
THE INFORMATION PORTRAYED ON THIS PLAN IS INTENDED TO BE SOLELY USED AS THE BASE DATA FOR THE PURPOSES OF 224C APPLICATION TO COUNCIL. WFH PROPERTIES LIMITED AND WOOD AND PARTNERS CONSULTANTS ACCEPT NO RESPONSIBILITY FOR ANY BUILDING DESIGN OR CONSTRUCTION WORK BASED ON THIS DRAWING FILE.

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-156 - ARRAN HILL 2A & 2C_21643\02 DRAWINGS\02 SUR\AB\P24-156-00-1100-AB CUT FILL CONTOURS.DWG



NOTES

1. COORDINATES SHOWN ARE IN TERMS OF NEW ZEALAND TRANSVERSE MERCATOR (NZTM) PROJECTION.
2. LEVELS SHOWN ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946.
3. SUBSOIL DRAINAGE DATA SUPPLIED BY CONTRACTOR.
4. BOUNDARIES ARE SUBJECT TO FINAL SURVEY AND LINZ APPROVAL.
5. PLANS HAVE BEEN REVIEWED BY TETRA TECH COFFEY.
6. PLANS SHOULD BE READ IN CONJUNCTION WITH THE GCR.
7. CONTOURS ARE AT 0.25m INTERVALS.

LEGEND

- RE SLOPE DRAINAGE
- INDICATIVE SUBSOIL CONNECTION
- UNDERFILL DRAIN
- COUNTERFORT DRAIN
- EXISTING COUNTERFORT DRAINS
- EXISTING UNDERFILL DRAINS
- STAGE BOUNDARIES
- LOT BOUNDARIES
- EXISTING LOT BOUNDARIES
- FUTURE LOT BOUNDARIES
- LOWEST SURFACE MAJOR CONTOURS
- LOWEST SURFACE MINOR CONTOURS

REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	SUBSOILS AMENDED	SM	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

N

WFH PROPERTIES

MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

SUBSOILS PLAN

STATUS	FOR INFORMATION	REV
SCALE	1:1000 @ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-1200-AB	

DISCLAIMER:
THE INFORMATION PORTRAYED ON THIS PLAN IS INTENDED TO BE SOLELY USED AS THE BASE DATA FOR THE PURPOSES OF 224C APPLICATION TO COUNCIL. WFH PROPERTIES LIMITED AND WOOD AND PARTNERS CONSULTANTS ACCEPT NO RESPONSIBILITY FOR ANY BUILDING DESIGN OR CONSTRUCTION WORK BASED ON THIS DRAWING FILE.

DISCLAIMER:
SUBSOIL DRAINS ARE INDICTIVE ONLY. IT IS OWNERS RESPONSIBILITY TO LOCATE AND PROTECT ALL SUBSOIL DRAINAGE.

Plot Date: 2:22:05 pm,12 July 2024, RYANT

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-156 - ARRAN HILL 2A & 2C_21643\02 DRAWINGS\02 SURV\AB\P24-156-00-1200-AB SUBSOILS.DWG

DISCLAIMER:
THE INFORMATION PORTRAYED ON THIS PLAN IS INTENDED TO BE SOLELY USED AS THE BASE DATA FOR THE PURPOSES OF 224C APPLICATION TO COUNCIL. WFH PROPERTIES LIMITED AND WOOD AND PARTNERS CONSULTANTS ACCEPT NO RESPONSIBILITY FOR ANY BUILDING DESIGN OR CONSTRUCTION WORK BASED ON THIS DRAWING FILE.

DISCLAIMER:
SUBSOIL DRAINS ARE INDICTIVE ONLY. IT IS OWNERS RESPONSIBILITY TO LOCATE AND PROTECT ALL SUBSOIL DRAINAGE.

I certify that these As-built Plans are an accurate record of the works undertaken and that:

- The coordinates (X,Y) are in terms of NZTM on NZGD2000
- The Levels (Z) are in terms of Auckland Vertical Datum 1946 (MSL) LINZ datum

Signed: _____ Licensed Cadastral Surveyor

Date: 12/07/2024

Name: SAM MUIRHEAD

WOODS Est.1970

Plot Date: 2:35:20 pm, 12 July 2024, SAMANTHAM

TAUHERE ROAD
800
802 ESPLANADE RESERVE
SKULANDER CRESCENT
1000
902
STAGE 1C
1001
1002
1003
500
501
CONCRETE BLOCK WALL POOL STYLE FENCE AT TOP
VEGETATED REINFORCED EARTH BATTER
PEKANGA ROAD
KAUPEKA ROAD
SHEET 1401
STAGE 2
SHEET 1402
SHEET 1403
STAGE 1
STAGE 2C
STAGE 2A
KOWHAI ROAD
DULC
SKULANDER CRESCENT
506
507

NOTES

1. SUBSOIL DRAINAGE DATA SUPPLIED BY CONTRACTOR.
2. BOUNDARIES SUBJECT TO FINAL SURVEY

LEGEND:

- BOTTOM FACE OF WALL
- TOP FACE OF WALL
- RE SLOPE DRAINAGE
- COUNTERFORT DRAIN
- FENCE
- TOP OF BANK
- BOTTOM OF BANK
- BOUNDARY
- EXISTING STORMWATER LINE & MANHOLE
- SLOPE STABILISATION DEVICE
- INDICATIVE SUBSOIL CONNECTION

REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	SLOPE EXTENT/STAGE NAME AMENDED	SM	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

N

WFH PROPERTIES

MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

RETAINING SLOPE ASBUILT
SHEET 1 OF 4
OVERALL PLAN LAYOUT

STATUS	AS-BUILT	REV
SCALE	1:1500 @ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-1400-AB	

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-156 - ARRAN HILL 2A & 2C_21643\02 DRAWINGS\02 SURV\ABP24-156-00-1400-AB SLOPES.DWG

I certify that these As-built Plans are an accurate record of the works undertaken and that:

- The coordinates (X,Y) are in terms of NZTM on NZGD2000
- The Levels (Z) are in terms of Auckland Vertical Datum 1946 (MSL) LINZ datum

Signed: _____
Licensed Cadastral Surveyor

Date: 12/07/2024

Name: SAM MUIRHEAD

WOODS
Est.1970

Plot Date: 2:35:20 pm, 12 July 2024, SAMANTHAM

NOTES

1. SUBSOIL DRAINAGE DATA SUPPLIED BY CONTRACTOR.
2. BOUNDARIES SUBJECT TO FINAL SURVEY

LEGEND:

- BOTTOM FACE OF WALL
- TOP FACE OF WALL
- RE SLOPE DRAINAGE
- COUNTERFORT DRAIN
- FENCE
- TOP OF BANK
- BOTTOM OF BANK
- BOUNDARY
- EXISTING STORMWATER LINE & MANHOLE
- SLOPE STABILISATION DEVICE
- INDICATIVE SUBSOIL CONNECTION

REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	SLOPE EXTENT/STAGE NAME AMENDED	SM	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

N

WFH PROPERTIES

MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

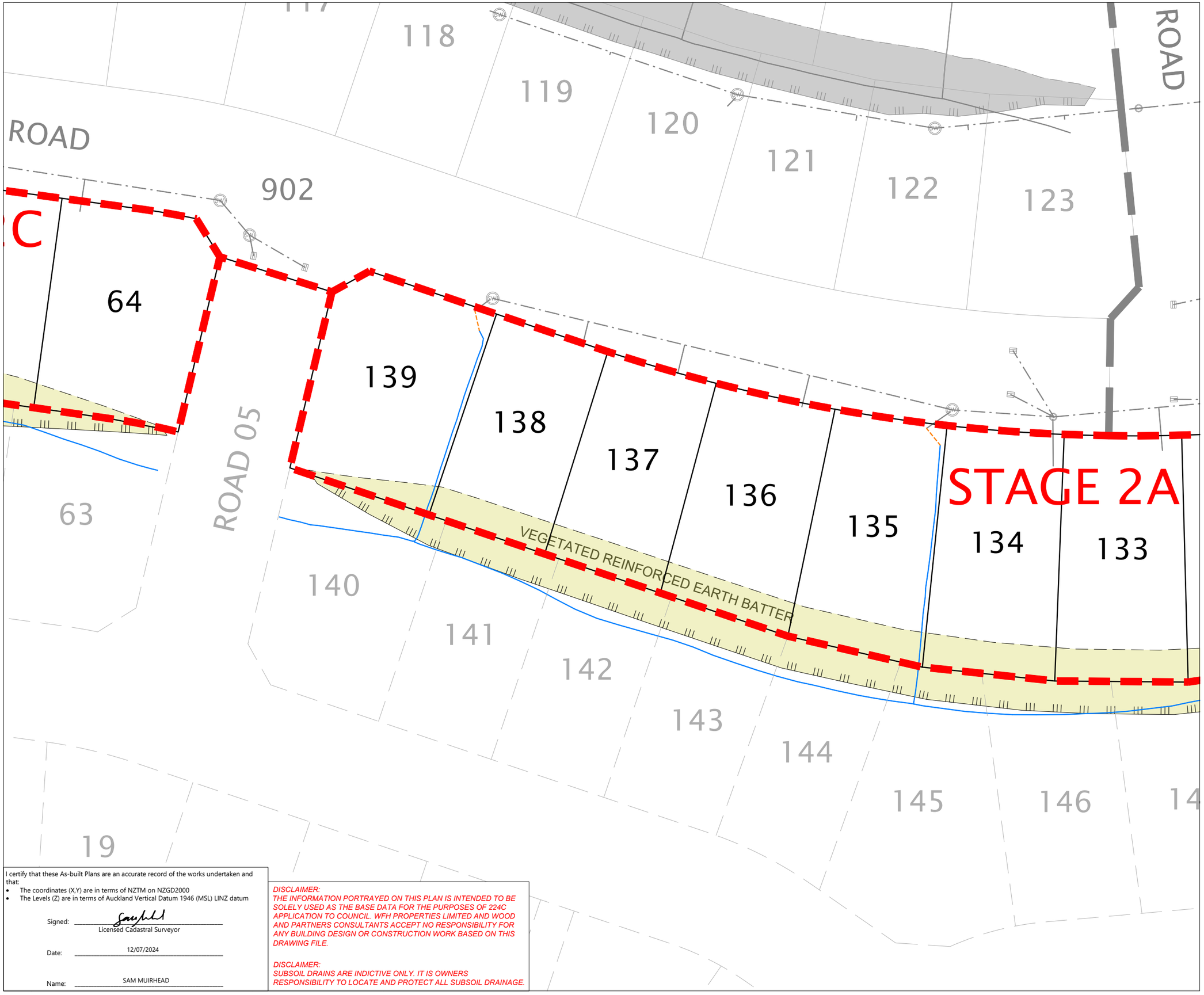
RETAINING SLOPE ASBUILT
SHEET 2 OF 4

STATUS	AS-BUILT	REV
SCALE	1:500 @ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-1401-AB	

DISCLAIMER:
THE INFORMATION PORTRAYED ON THIS PLAN IS INTENDED TO BE SOLELY USED AS THE BASE DATA FOR THE PURPOSES OF 224C APPLICATION TO COUNCIL. WFH PROPERTIES LIMITED AND WOOD AND PARTNERS CONSULTANTS ACCEPT NO RESPONSIBILITY FOR ANY BUILDING DESIGN OR CONSTRUCTION WORK BASED ON THIS DRAWING FILE.

DISCLAIMER:
SUBSOIL DRAINS ARE INDICTIVE ONLY. IT IS OWNERS RESPONSIBILITY TO LOCATE AND PROTECT ALL SUBSOIL DRAINAGE.

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-156 - ARRAN HILL 2A & 2C_21643\02 DRAWINGS\02 SURV\AB\P24-156-00-1400-AB SLOPES.DWG



WOODS
Est.1970

Plot Date: 2:35:20 pm, 12 July 2024, SAMANTHAM

NOTES

1. SUBSOIL DRAINAGE DATA SUPPLIED BY CONTRACTOR.
2. BOUNDARIES SUBJECT TO FINAL SURVEY

LEGEND:

- BOTTOM FACE OF WALL
- TOP FACE OF WALL
- RE SLOPE DRAINAGE
- COUNTERFORT DRAIN
- FENCE
- TOP OF BANK
- BOTTOM OF BANK
- BOUNDARY
- EXISTING STORMWATER LINE & MANHOLE
- SLOPE STABILISATION DEVICE
- INDICATIVE SUBSOIL CONNECTION

REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	SLOPE EXTENT/STAGE NAME AMENDED	SM	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

N

WFH PROPERTIES

MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

RETAINING SLOPE ASBUILT SHEET 3 OF 4

STATUS	AS-BUILT	REV
SCALE	1:500 @ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-1402-AB	

I certify that these As-built Plans are an accurate record of the works undertaken and that:

- The coordinates (X,Y) are in terms of NZTM on NZGD2000
- The Levels (Z) are in terms of Auckland Vertical Datum 1946 (MSL) LINZ datum

Signed: _____
Licensed Cadastral Surveyor

Date: 12/07/2024

Name: SAM MUIRHEAD

DISCLAIMER:
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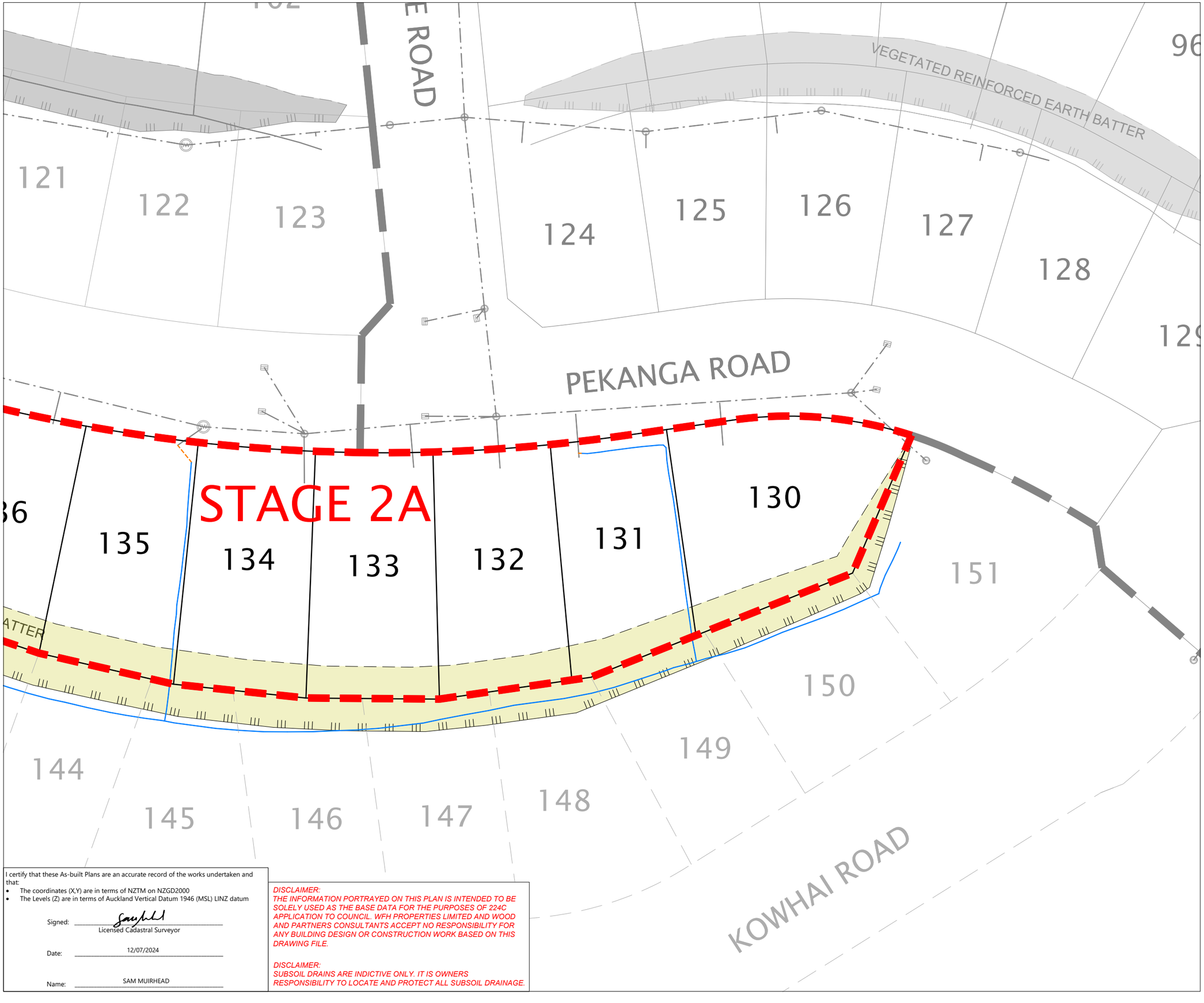
File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-156 - ARRAN HILL 2A & 2C_21643\02 DRAWINGS\02 SUR\AB\P24-156-00-1400-AB-SLOPES.DWG



WOODS
Est.1970

NOTES

1. SUBSOIL DRAINAGE DATA SUPPLIED BY CONTRACTOR.
2. BOUNDARIES SUBJECT TO FINAL SURVEY

LEGEND:

- BOTTOM FACE OF WALL
- TOP FACE OF WALL
- RE SLOPE DRAINAGE
- COUNTERFORT DRAIN
- FENCE
- TOP OF BANK
- BOTTOM OF BANK
- BOUNDARY
- EXISTING STORMWATER LINE & MANHOLE
- SLOPE STABILISATION DEVICE
- INDICATIVE SUBSOIL CONNECTION

REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	SLOPE EXTENT/STAGE NAME AMENDED	SM	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

N

WFH PROPERTIES

MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

RETAINING SLOPE ASBUILT
SHEET 4 OF 4

STATUS	AS-BUILT	REV
SCALE	1:500 @ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-1403-AB	

I certify that these As-built Plans are an accurate record of the works undertaken and that:

- The coordinates (X,Y) are in terms of NZTM on NZGD2000
- The Levels (Z) are in terms of Auckland Vertical Datum 1946 (MSL) LINZ datum

Signed: _____
Licensed Cadastral Surveyor

Date: 12/07/2024

Name: SAM MUIRHEAD

DISCLAIMER:
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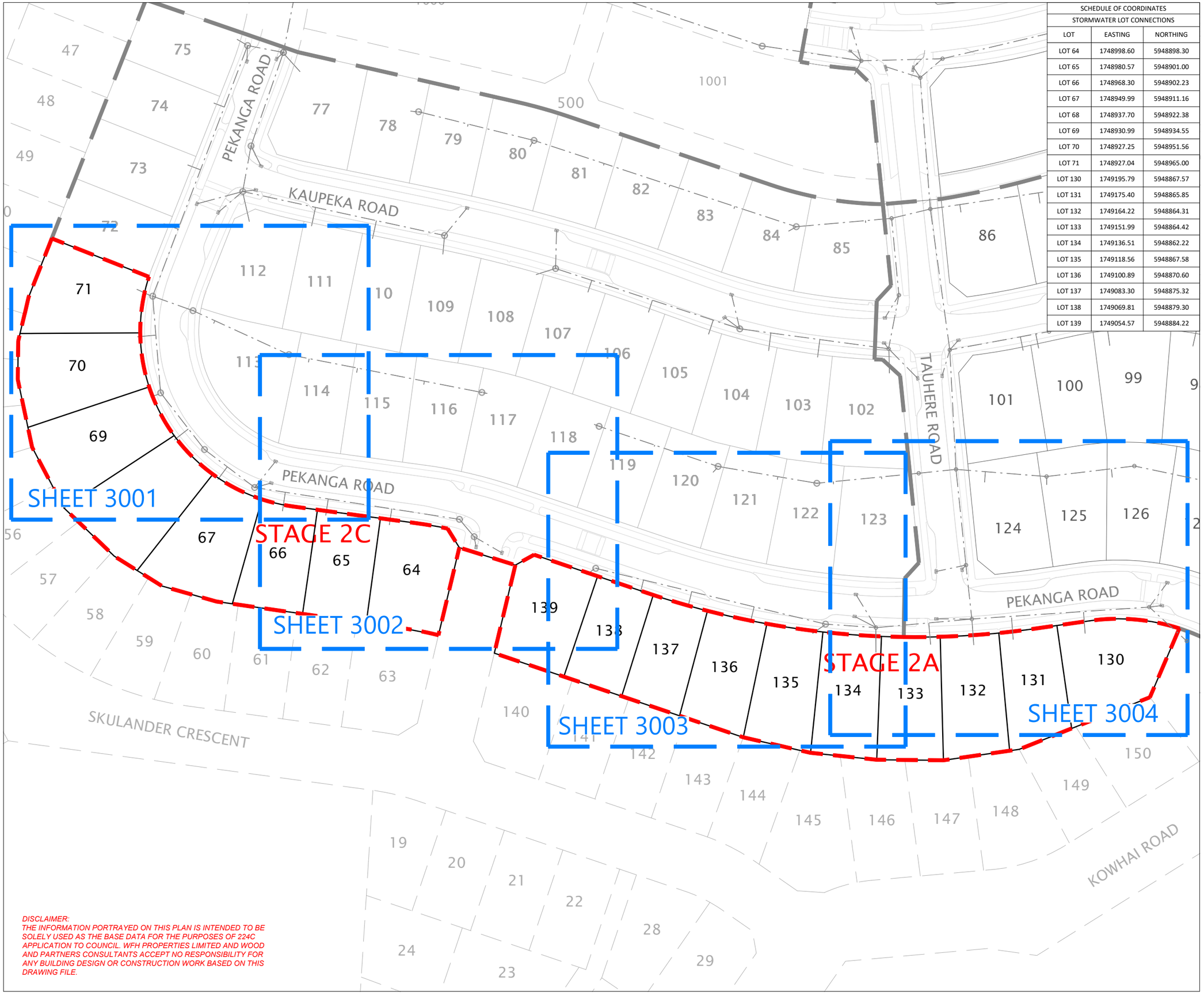
Plot Date: 2:35:20 pm, 12 July 2024, SAMANTHAM

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-156 - ARRAN HILL 2A & 2C_21643\02 DRAWINGS\02 SURV\AB\P24-156-00-1400-AB-SLOPES.DWG



SCHEDULE OF COORDINATES		
STORMWATER LOT CONNECTIONS		
LOT	EASTING	NORTHING
LOT 64	1748998.60	5948898.30
LOT 65	1748980.57	5948901.00
LOT 66	1748968.30	5948902.23
LOT 67	1748949.99	5948911.16
LOT 68	1748937.70	5948922.38
LOT 69	1748930.99	5948934.55
LOT 70	1748927.25	5948951.56
LOT 71	1748927.04	5948965.00
LOT 130	1749195.79	5948867.57
LOT 131	1749175.40	5948865.85
LOT 132	1749164.22	5948864.31
LOT 133	1749151.99	5948864.42
LOT 134	1749136.51	5948862.22
LOT 135	1749118.56	5948867.58
LOT 136	1749100.89	5948870.60
LOT 137	1749083.30	5948875.32
LOT 138	1749069.81	5948879.30
LOT 139	1749054.57	5948884.22

WOODS
Est.1970

Plot Date: 3:39:57 pm,12 July 2024, RYANT

LEGEND

- EXISTING STORMWATER MANHOLE
- EXISTING STORMWATER CESSPIT
- EXISTING STORMWATER
- LOT BOUNDARIES
- STAGE BOUNDARY
- EXISTING LOT BOUNDARIES
- FUTURE LOT BOUNDARIES

NOTES

1. EXISTING STORMWATER CONSTRUCTED UNDER APPROVED EPA: ENG60362263.
2. COORDINATES (X,Y) ARE IN TERMS OF NZTM ON NZGD2000.
3. LEVELS (Z) ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946 (MSL) LINZ DATUM.
4. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY AND LINZ APPROVAL.
5. ASBUILT DATA HAS BEEN SOURCED FROM A COMBINATION OF WOODS SURVEY DATA AND CONTRACTOR RECEIVED DATA.
6. ALL PRIVATE LOT CONNECTIONS ARE 100mmØ uPVC SN16.
7. LOT CONNECTION LENGTHS ARE 2D LENGTHS CALCULATED FROM CONTRACTOR DATA WHERE THE LOT CONNECTION ENTERS THE MAIN LINE TO ITS TERMINATION COORDINATE WITHIN THE LOT.
8. ALL PIPE DIAMETERS ARE INTERNAL AND SHOWN IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	STAGE NAMES UPDATED	RT	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

N

WFH PROPERTIES

MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

STORMWATER ASBUILT PLAN
SHEET 1 OF 5
OVERALL LAYOUT PLAN

STATUS	FOR INFORMATION	REV
SCALE	1:1000 @ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-3000-AB	

DISCLAIMER:
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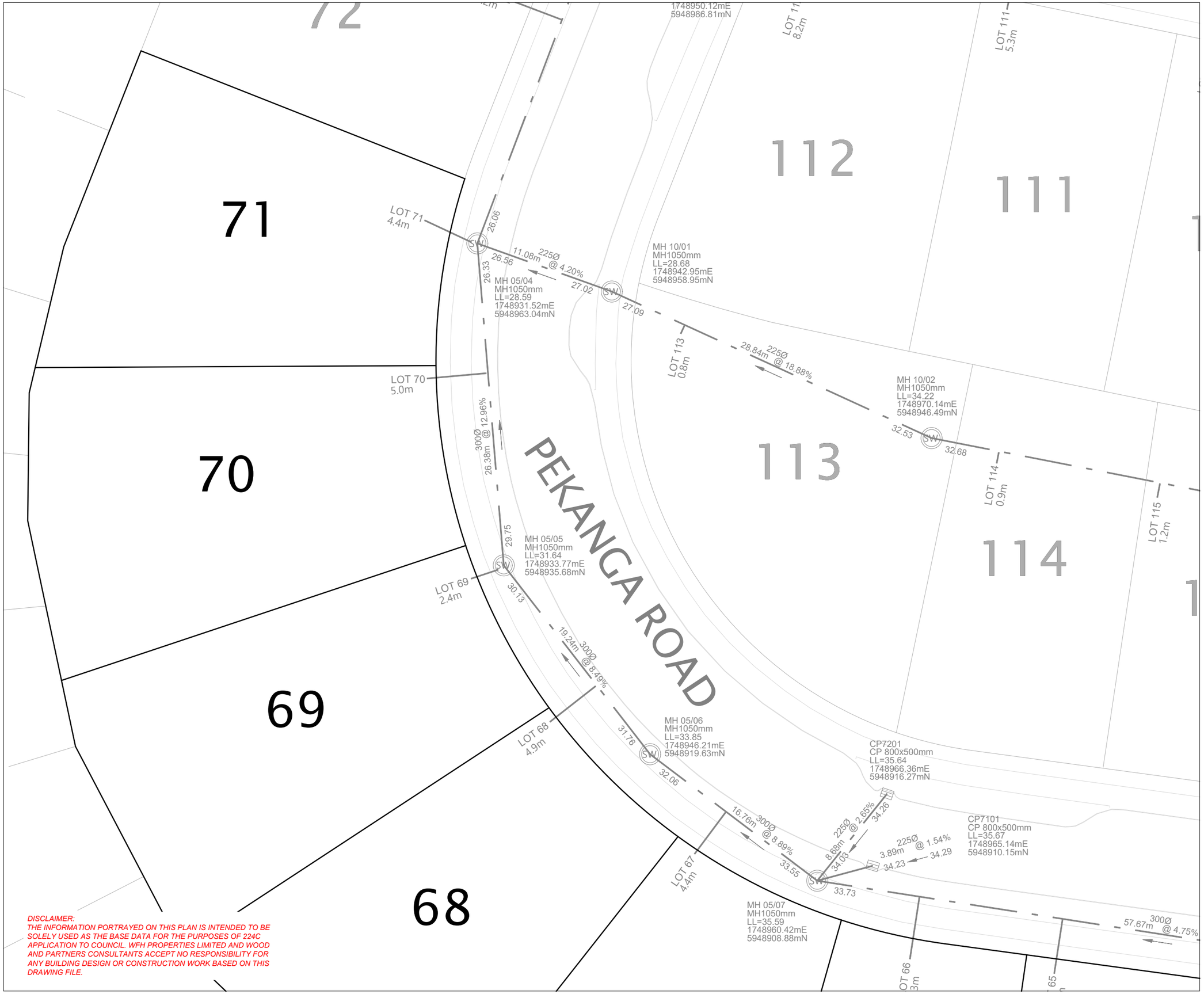
File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-156 - ARRAN HILL 2A & 2C_21643\02 DRAWINGS\02 SURV\AB\P24-156-00-3000-AB STORMWATER.DWG



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WOODS
Est.1970

Plot Date: 3:39:58 pm,12 July 2024, RYANT

LEGEND

- EXISTING STORMWATER MANHOLE
- EXISTING STORMWATER CESSPIT
- EXISTING STORMWATER
- LOT BOUNDARIES
- STAGE BOUNDARY
- EXISTING LOT BOUNDARIES
- FUTURE LOT BOUNDARIES

NOTES

1. EXISTING STORMWATER CONSTRUCTED UNDER APPROVED EPA: ENG60362263.
2. COORDINATES (X,Y) ARE IN TERMS OF NZTM ON NZGD2000.
3. LEVELS (Z) ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946 (MSL) LINZ DATUM.
4. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY AND LINZ APPROVAL.
5. ASBUILT DATA HAS BEEN SOURCED FROM A COMBINATION OF WOODS SURVEY DATA AND CONTRACTOR RECEIVED DATA.
6. ALL PRIVATE LOT CONNECTIONS ARE 100mmØ uPVC SN16.
7. LOT CONNECTION LENGTHS ARE 2D LENGTHS CALCULATED FROM CONTRACTOR DATA WHERE THE LOT CONNECTION ENTERS THE MAIN LINE TO ITS TERMINATION COORDINATE WITHIN THE LOT.
8. ALL PIPE DIAMETERS ARE INTERNAL AND SHOWN IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	STAGE NAMES UPDATED	RT	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

N

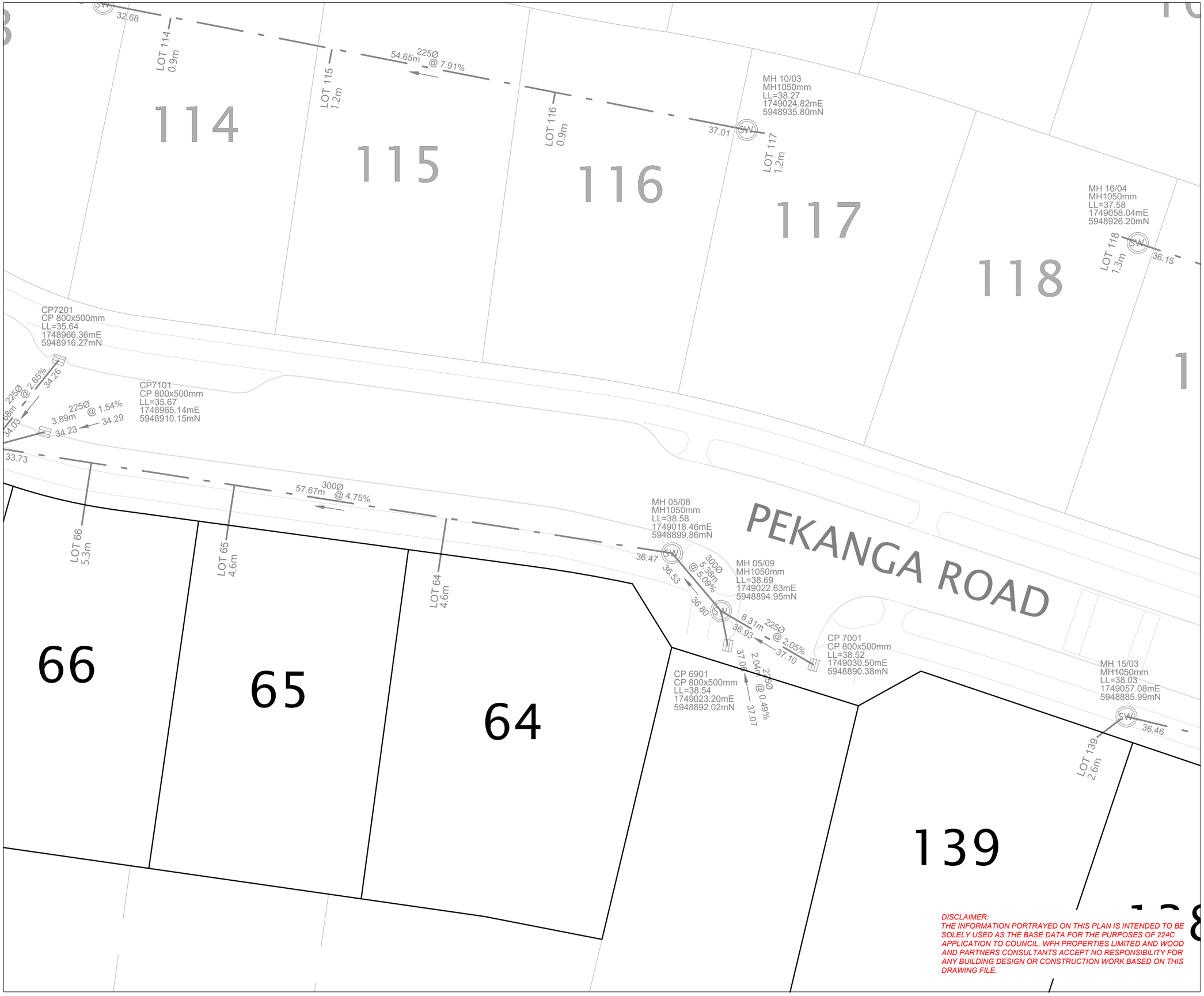
WFH PROPERTIES

MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

STORMWATER ASBUILT PLAN
SHEET 2 OF 5

STATUS	FOR INFORMATION	REV
SCALE	1:300 @ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-3001-AB	

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-156 - ARRAN HILL 2A & 2C_21643\02 DRAWINGS\02 SURV\AB\P24-156-00-3000-AB STORMWATER.DWG



WOODS
Est.1970

LEGEND

- EXISTING STORMWATER MANHOLE
- EXISTING STORMWATER CESSPIT
- EXISTING STORMWATER
- LOT BOUNDARIES
- STAGE BOUNDARY
- EXISTING LOT BOUNDARIES
- FUTURE LOT BOUNDARIES

NOTES

1. EXISTING STORMWATER CONSTRUCTED UNDER APPROVED EPA: ENG60362263.
2. COORDINATES (X,Y) ARE IN TERMS OF NZTM ON NZGD2000.
3. LEVELS (Z) ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946 (MSL) LINZ DATUM.
4. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY AND LINZ APPROVAL.
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REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	STAGE NAMES UPDATED	RT	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

N

WFH PROPERTIES

MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

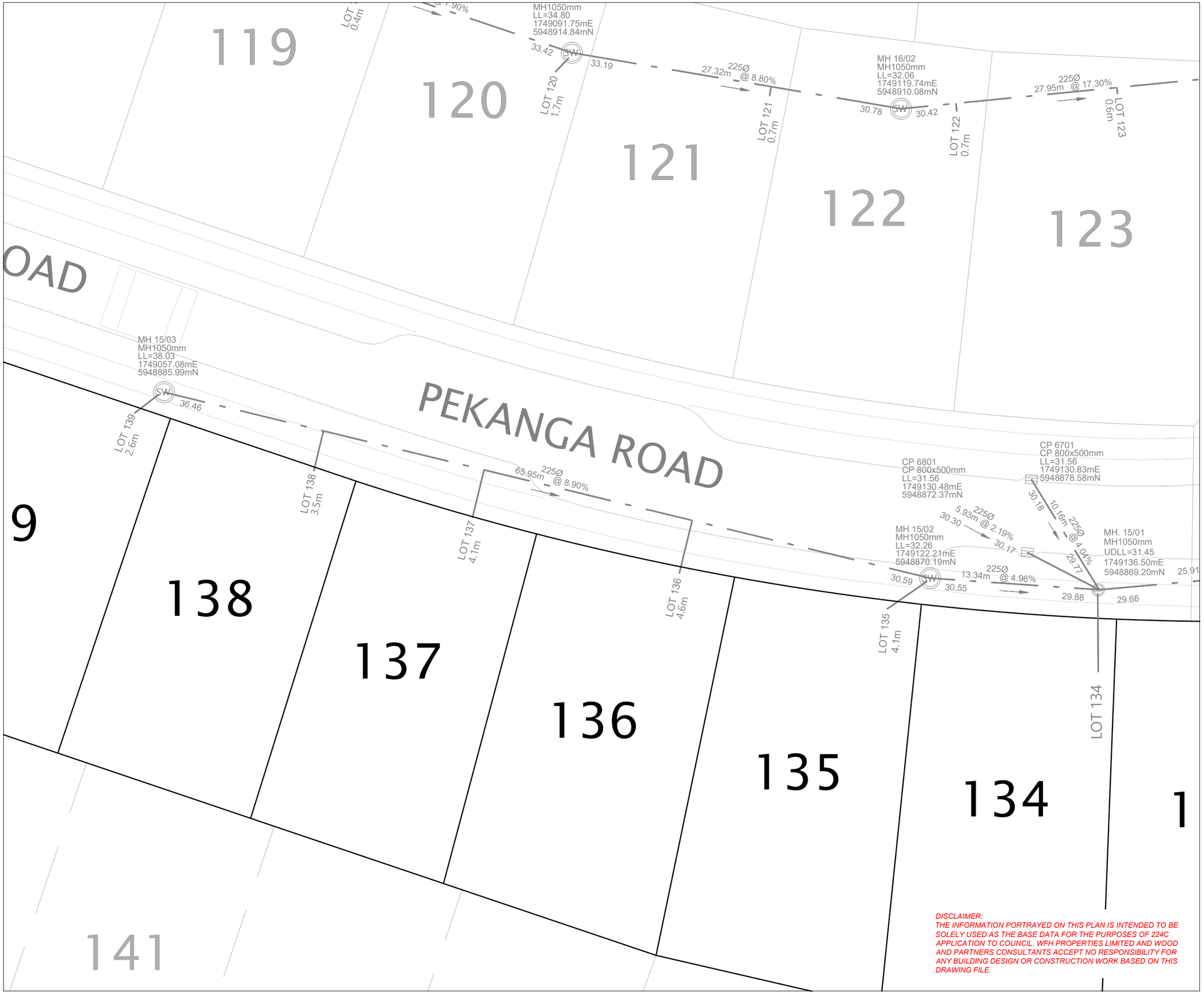
STORMWATER ASBUILT PLAN
SHEET 3 OF 5

STATUS	FOR INFORMATION	REV
SCALE	1:300 @ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-3002-AB	

DISCLAIMER:
THE INFORMATION PORTRAYED ON THIS PLAN IS INTENDED TO BE SOLELY USED AS THE BASE DATA FOR THE PURPOSES OF 224C APPLICATION TO COUNCIL. WFH PROPERTIES LIMITED AND WOOD AND PARTNERS CONSULTANTS ACCEPT NO RESPONSIBILITY FOR ANY BUILDING DESIGN OR CONSTRUCTION WORK BASED ON THIS DRAWING FILE.

Plot Date: 3:39:58 pm,12 July 2024, RYANT

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-156 - ARRAN HILL 2A & 2C_21643\02 DRAWINGS\02 SUR\VABP24-156-00-3000-AB STORMWATER.DWG



LEGEND

- EXISTING STORMWATER MANHOLE
- EXISTING STORMWATER CESSPIT
- EXISTING STORMWATER
- LOT BOUNDARIES
- STAGE BOUNDARY
- EXISTING LOT BOUNDARIES
- FUTURE LOT BOUNDARIES

NOTES

1. EXISTING STORMWATER CONSTRUCTED UNDER APPROVED EPA: ENG60362263.
2. COORDINATES (X,Y) ARE IN TERMS OF NZTM ON NZGD2000.
3. LEVELS (Z) ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946 (MSL) LINZ DATUM.
4. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY AND LINZ APPROVAL.
5. ASBUILT DATA HAS BEEN SOURCED FROM A COMBINATION OF WOODS SURVEY DATA AND CONTRACTOR RECEIVED DATA.
6. ALL PRIVATE LOT CONNECTIONS ARE 100mmØ uPVC SN16.
7. LOT CONNECTION LENGTHS ARE 2D LENGTHS CALCULATED FROM CONTRACTOR DATA WHERE THE LOT CONNECTION ENTERS THE MAIN LINE TO ITS TERMINATION COORDINATE WITHIN THE LOT.
8. ALL PIPE DIAMETERS ARE INTERNAL AND SHOWN IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	STAGE NAMES UPDATED	RT	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

STORMWATER ASBUILT PLAN SHEET 4 OF 5

STATUS	FOR INFORMATION	REV
SCALE	1:300 @ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-3003-AB	

DISCLAIMER:
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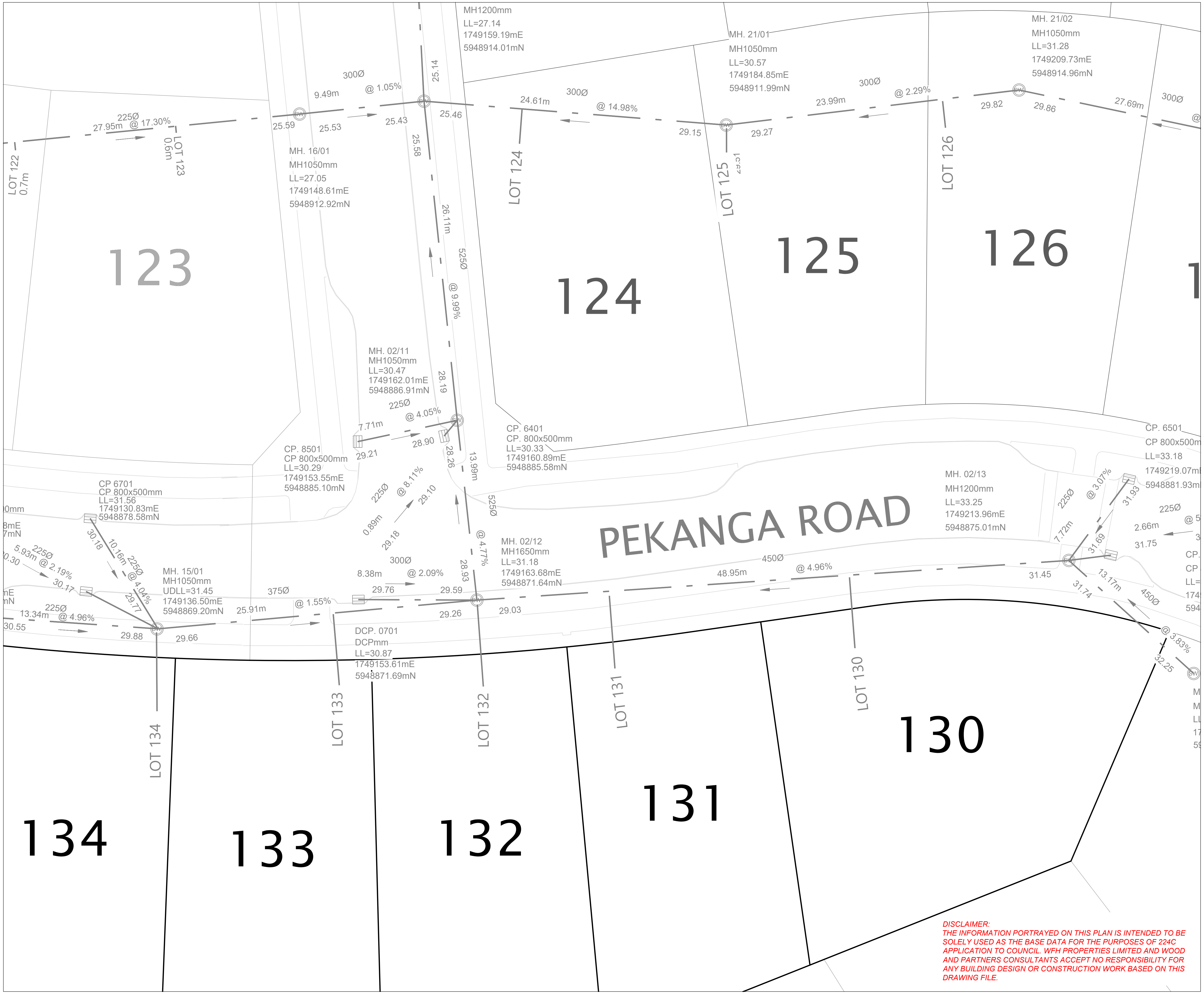
Plot Date: 3:39:58 pm,12 July 2024, RYANT

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-156 - ARRAN HILL 2A & 2C_21643\02 DRAWINGS\02 SURV\AB\P24-156-00-3000-AB STORMWATER.DWG



LEGEND

EXISTING STORMWATER MANHOLE	
EXISTING STORMWATER CESSPIT	
EXISTING STORMWATER	
LOT BOUNDARIES	
STAGE BOUNDARY	
EXISTING LOT BOUNDARIES	
FUTURE LOT BOUNDARIES	

NOTES

1. EXISTING STORMWATER CONSTRUCTED UNDER APPROVED EPA: ENG60362263.
2. COORDINATES (X,Y) ARE IN TERMS OF NZTM ON NZGD2000.
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8. ALL PIPE DIAMETERS ARE INTERNAL AND SHOWN IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	STAGE NAMES UPDATED	RT	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1, 8 NUGENT ST, GRAFTON, AUCKLAND 1023, +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

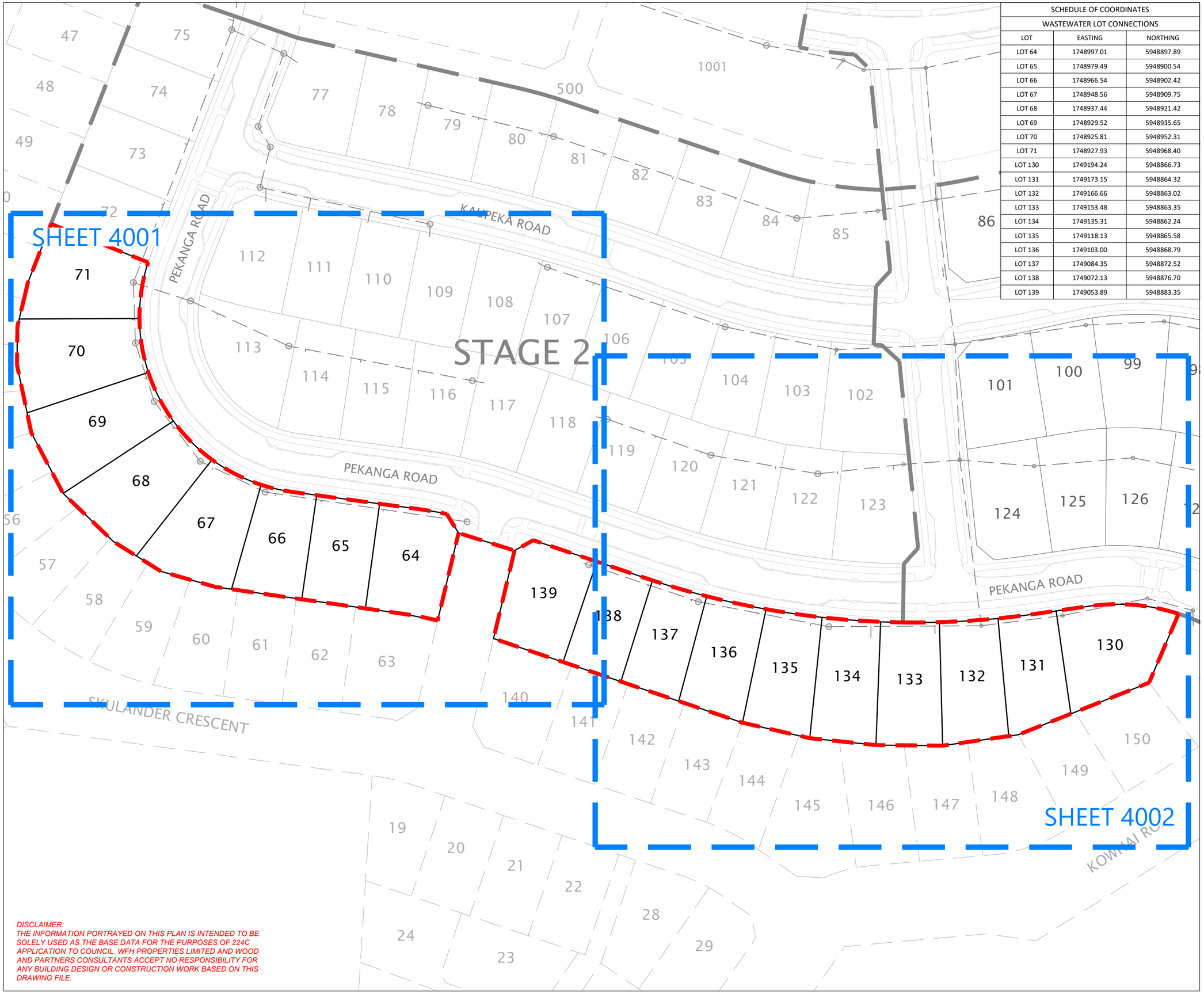
MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

STORMWATER ASBUILT PLAN
SHEET 5 OF 5

STATUS	FOR INFORMATION	REV
SCALE	1:300 @ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-3004-AB	

DISCLAIMER:
THE INFORMATION PORTRAYED ON THIS PLAN IS INTENDED TO BE SOLELY USED AS THE BASE DATA FOR THE PURPOSES OF 224C APPLICATION TO COUNCIL. WFH PROPERTIES LIMITED AND WOOD AND PARTNERS CONSULTANTS ACCEPT NO RESPONSIBILITY FOR ANY BUILDING DESIGN OR CONSTRUCTION WORK BASED ON THIS DRAWING FILE.

Plot Date: 3:39:59 pm,12 July 2024, RYANT



SCHEDULE OF COORDINATES		
WASTEWATER LOT CONNECTIONS		
LOT	EASTING	NORTHING
LOT 64	1748997.01	5948897.89
LOT 65	1748979.49	5948900.54
LOT 66	1748966.54	5948902.42
LOT 67	1748948.56	5948909.75
LOT 68	1748937.44	5948921.42
LOT 69	1748929.52	5948935.65
LOT 70	1748925.81	5948952.31
LOT 71	1748927.93	5948968.40
LOT 130	1749194.24	5948866.73
LOT 131	1749173.15	5948864.32
LOT 132	1749166.66	5948863.02
LOT 133	1749153.48	5948863.35
LOT 134	1749135.31	5948862.24
LOT 135	1749118.13	5948865.58
LOT 136	1749103.00	5948868.79
LOT 137	1749084.35	5948872.52
LOT 138	1749072.13	5948876.70
LOT 139	1749053.89	5948883.35

LEGEND

- EXISTING WASTEWATER
- DROP PROTECTION STRUCTURE (DPS)
- LOT BOUNDARY
- EXISTING LOT BOUNDARY
- FUTURE LOT BOUNDARY
- STAGE BOUNDARY

NOTES

1. APPROVED EPA NUMBER: ENG60362263
2. COORDINATES (X,Y) ARE IN TERMS OF NZTM ON NZGD2000.
3. LEVELS (Z) ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946 (MSL) LINZ DATUM.
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7. ALL PIPE DIAMETERS ARE INTERNAL AND SHOWN IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	STAGE NAMES UPDATED	RT	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

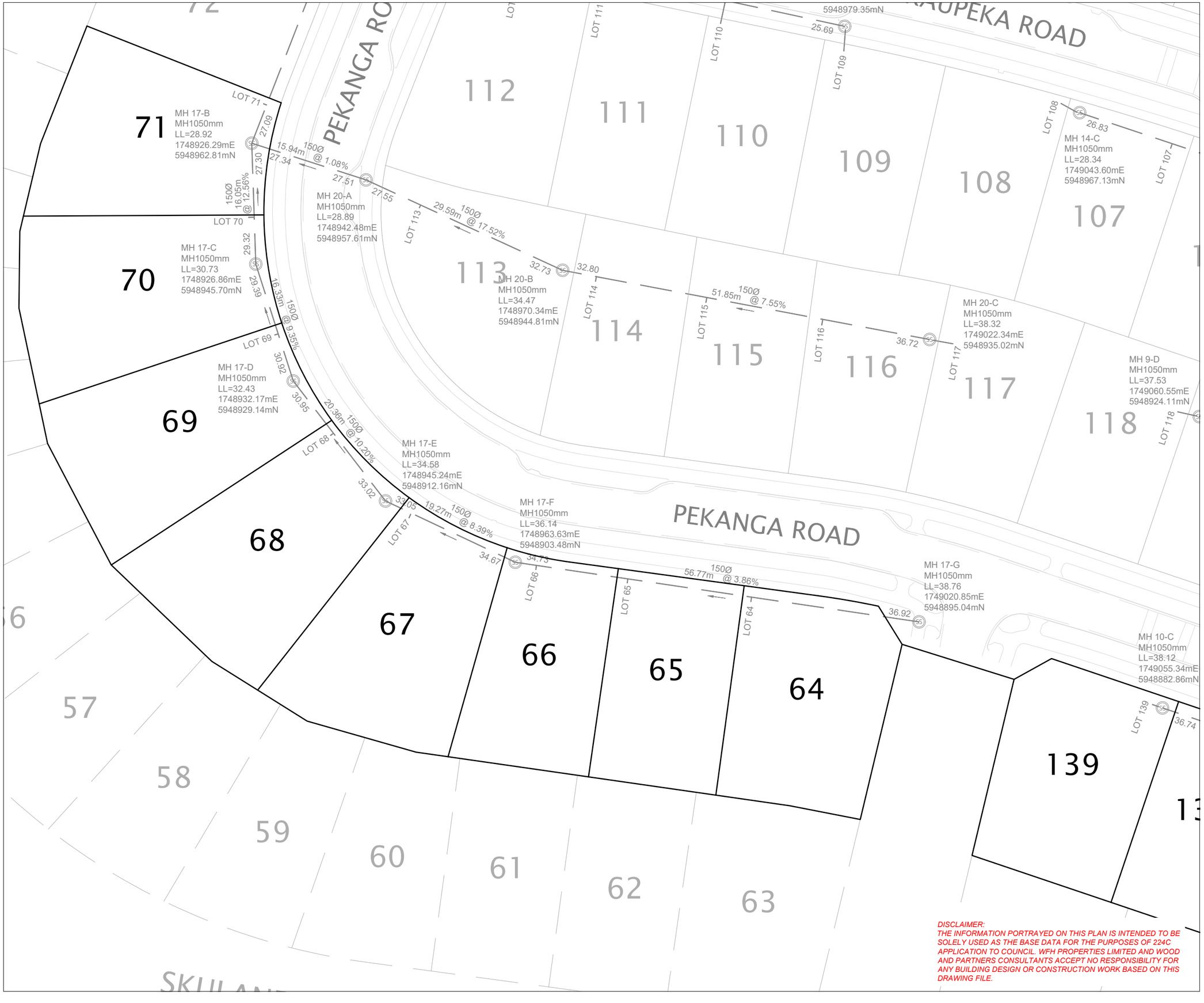
WASTEWATER ASBUILT PLAN
SHEET 1 OF 3
OVERALL LAYOUT PLAN

STATUS	FOR INFORMATION	REV
SCALE	1:1000 @ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-4000-AB	

DISCLAIMER:
THE INFORMATION PORTRAYED ON THIS PLAN IS INTENDED TO BE SOLELY USED AS THE BASE DATA FOR THE PURPOSES OF 224C APPLICATION TO COUNCIL. WFH PROPERTIES LIMITED AND WOOD AND PARTNERS CONSULTANTS ACCEPT NO RESPONSIBILITY FOR ANY BUILDING DESIGN OR CONSTRUCTION WORK BASED ON THIS DRAWING FILE.

Plot Date: 3:07:32 pm,12 July 2024, RYANT

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-156 - ARRAN HILL 2A & 2C_21643\02 DRAWINGS\02 SURVAB\P24-156-00-4000-AB WASTEWATER.DWG



LEGEND

- EXISTING WASTEWATER
- DROP PROTECTION STRUCTURE — DPS
- LOT BOUNDARY
- EXISTING LOT BOUNDARY
- FUTURE LOT BOUNDARY
- STAGE BOUNDARY

NOTES

1. APPROVED EPA NUMBER: ENG60362263
2. COORDINATES (X,Y) ARE IN TERMS OF NZTM ON NZGD2000.
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REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	STAGE NAMES UPDATED	RT	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

N

MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

WASTEWATER ASBUILT PLAN
SHEET 2 OF 3

STATUS	FOR INFORMATION	REV
SCALE	1:500 @ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-4001-AB	

DISCLAIMER:
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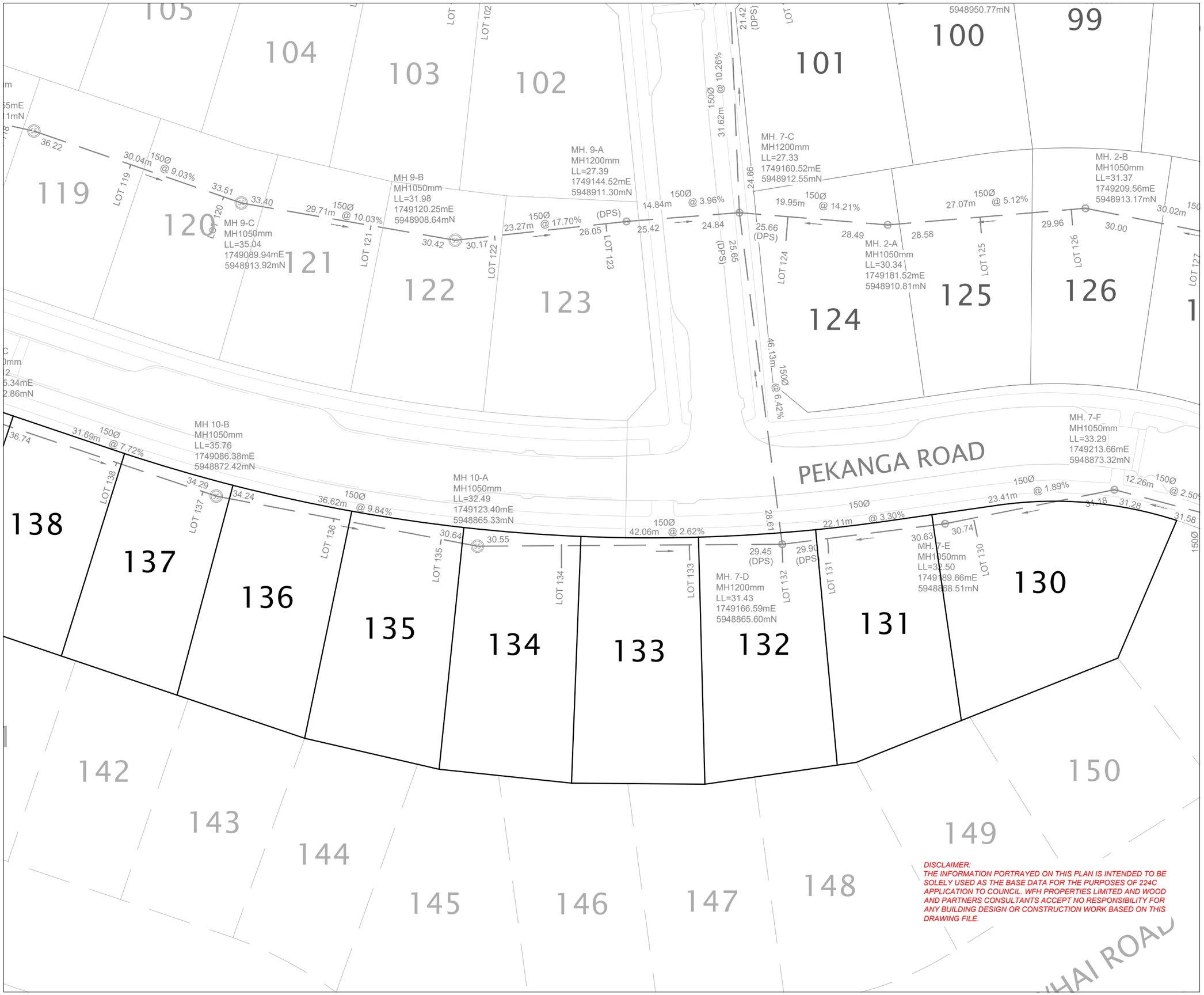
Plot Date: 3:07:32 pm,12 July 2024, RYANT

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-156 - ARRAN HILL 2A & 2C_21643\02 DRAWINGS\02 SURV\AB\P24-156-00-4000-AB WASTEWATER.DWG



WOODS
Est.1970

LEGEND

- EXISTING WASTEWATER
- DROP PROTECTION STRUCTURE (DPS)
- LOT BOUNDARY
- EXISTING LOT BOUNDARY
- FUTURE LOT BOUNDARY
- STAGE BOUNDARY

NOTES

1. APPROVED EPA NUMBER: ENG60362263
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REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	STAGE NAMES UPDATED	RT	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

N

WFH PROPERTIES

MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

WASTEWATER ASBUILT PLAN SHEET 3 OF 3

STATUS	FOR INFORMATION	REV
SCALE	1:500 @ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-4002-AB	

Plot Date: 3:07:33 pm,12 July 2024, RYANT

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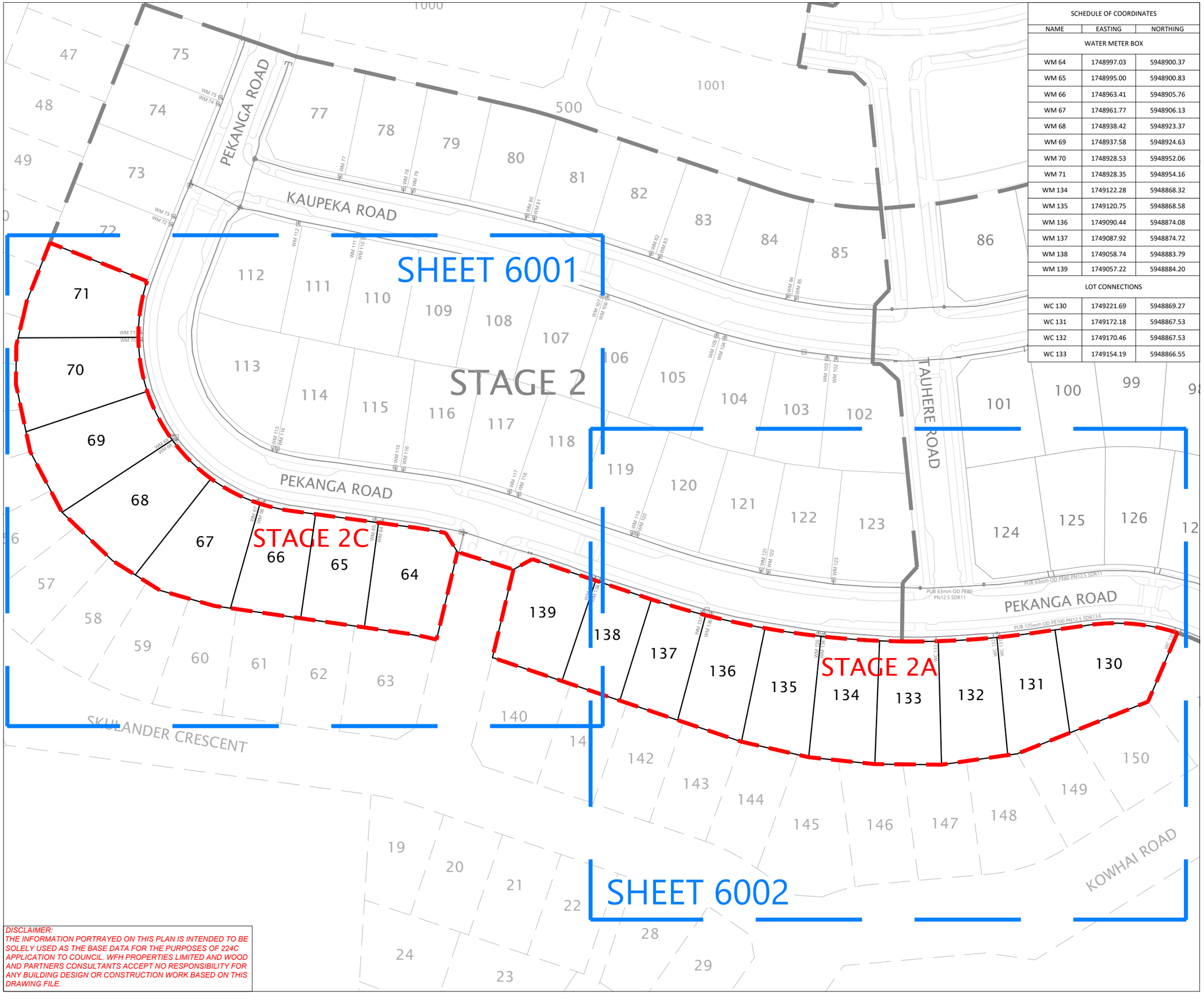

SCHEDULE OF COORDINATES		
NAME	EASTING	NORTHING
WATER METER BOX		
WM 64	1748997.03	5948900.37
WM 65	1748995.00	5948900.83
WM 66	1748963.41	5948905.76
WM 67	1748961.77	5948906.13
WM 68	1748938.42	5948923.37
WM 69	1748937.58	5948924.63
WM 70	1748928.53	5948952.06
WM 71	1748928.35	5948954.16
WM 134	1749122.28	5948868.32
WM 135	1749120.75	5948868.58
WM 136	1749090.44	5948874.08
WM 137	1749087.92	5948874.72
WM 138	1749058.74	5948883.79
WM 139	1749057.22	5948884.20
LOT CONNECTIONS		
WC 130	1749221.69	5948869.27
WC 131	1749172.18	5948867.53
WC 132	1749170.46	5948867.53
WC 133	1749154.19	5948866.55

NOTES

1. PIPE SIZES SHOWN ARE EXTERNAL DIAMETER.
2. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY.
3. ASBUILT DATA HAS BEEN SOURCED FROM CONRACTOR DATA AND WOODS SURVEY DATA.

LEGEND

- EXISTING WATERMAIN
- EXISTING SLUICE VALVE
- EXISTING PEET VALVE
- EXISTING FIRE HYDRANT
- EXISTING BLANK CAP
- STAGE BOUNDARY
- LOT BOUNDARY
- EXISTING LOT BOUNDARY
- FUTURE LOT BOUNDARY

REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	STAGE NAMES UPDATED	RT	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

N

WFH PROPERTIES

MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

WATERMAIN ASBUILT PLAN
SHEET 1 OF 3
OVERALL LAYOUT PLAN

STATUS	FOR INFORMATION	REV
SCALE	1:1000 @ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-6000-AB	

DISCLAIMER:
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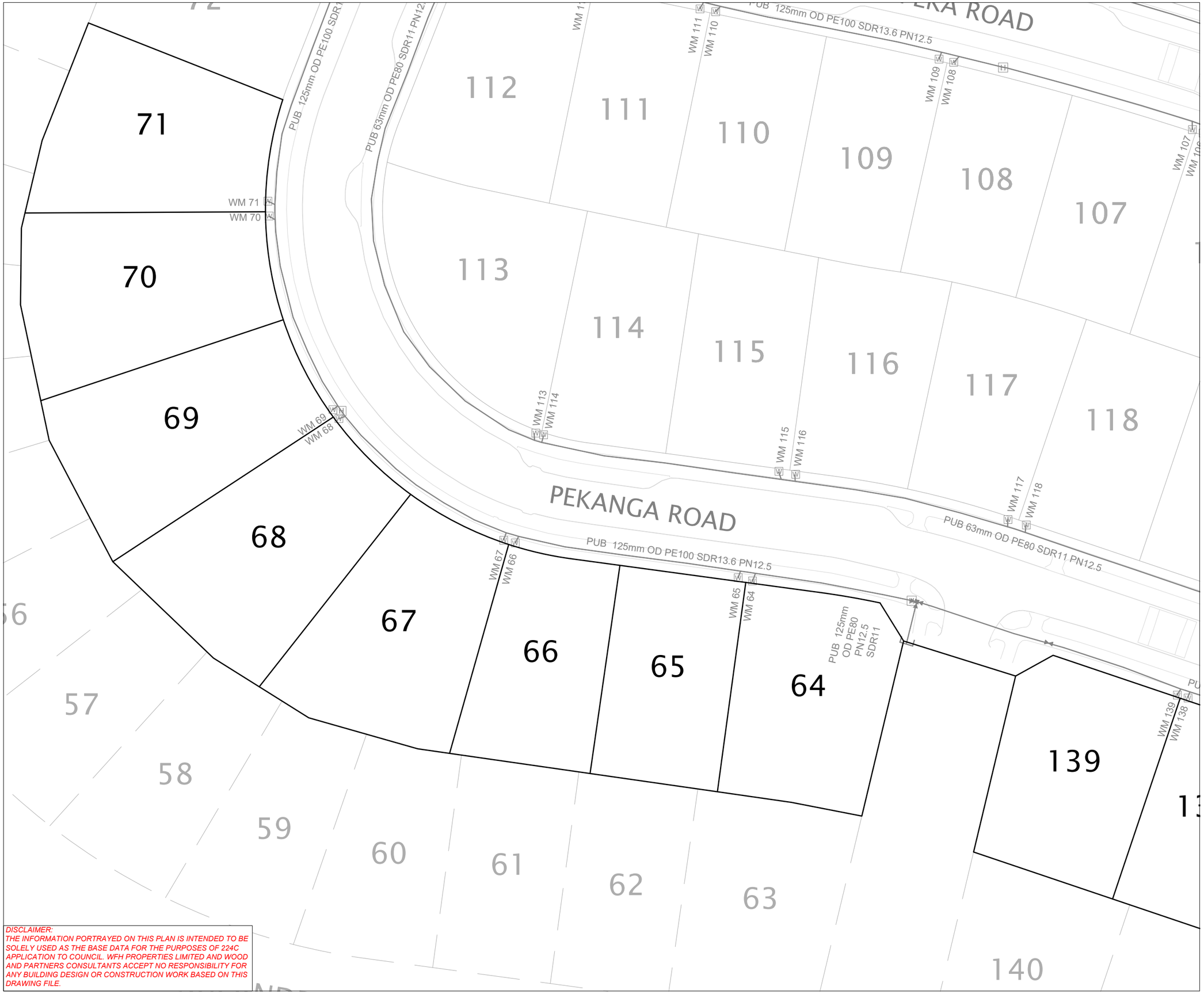
Plot Date: 3:04:41 pm,12 July 2024, RYANT

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-156 - ARRAN HILL 2A & 2C_21643\02 DRAWINGS\02 SURV\AB\P24-156-00-6000-AB WATERMAIN.DWG



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WOODS Est.1970

Plot Date: 3:04:41 pm,12 July 2024, RYANT

NOTES

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LEGEND

- EXISTING WATERMAIN
- EXISTING SLUICE VALVE
- EXISTING PEET VALVE
- EXISTING FIRE HYDRANT
- EXISTING BLANK CAP
- STAGE BOUNDARY
- LOT BOUNDARY
- EXISTING LOT BOUNDARY
- FUTURE LOT BOUNDARY

REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	STAGE NAMES UPDATED	RT	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

N

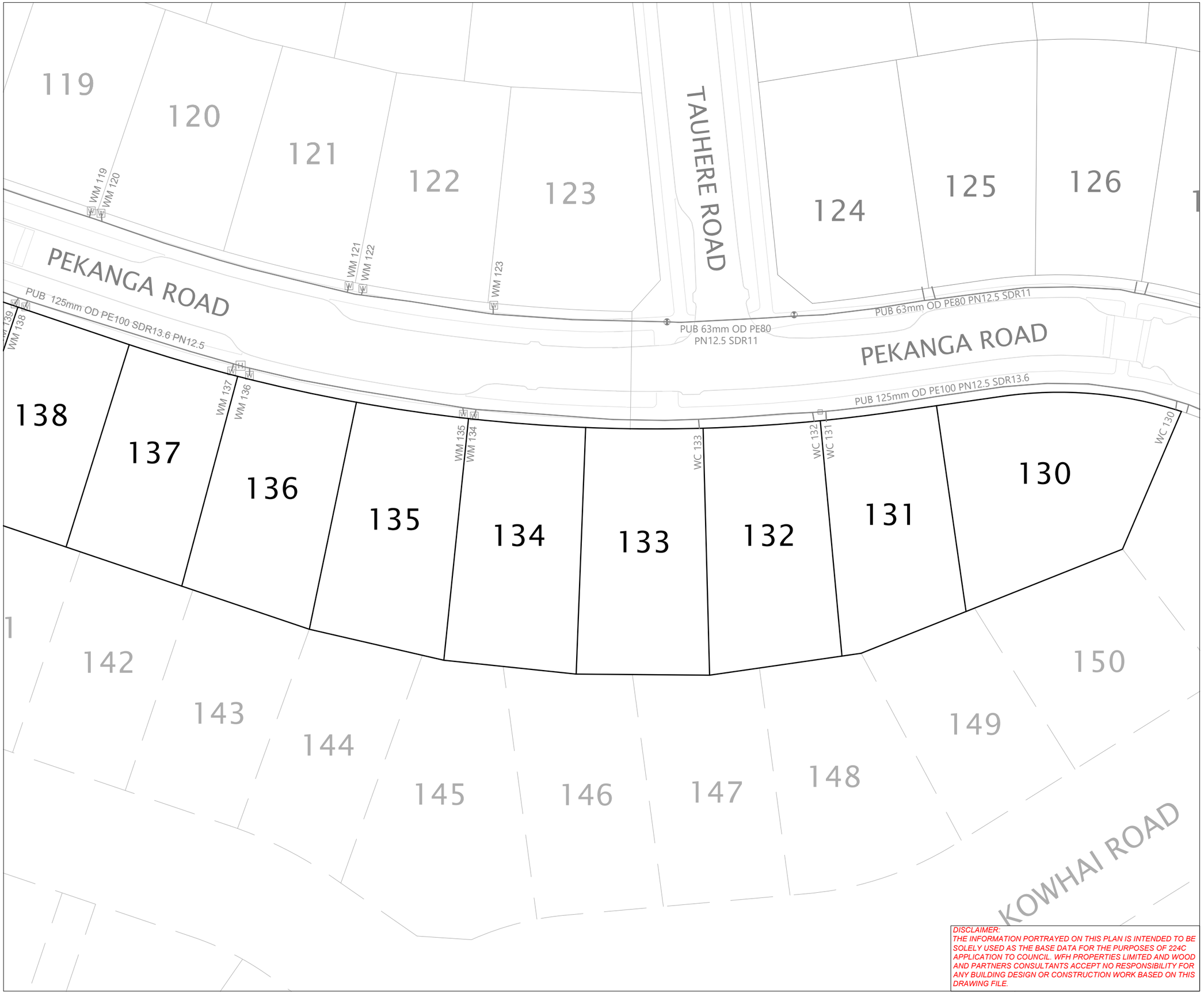
WFH PROPERTIES

MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

WATERMAIN ASBUILT PLAN SHEET 2 OF 3

STATUS	FOR INFORMATION	REV
SCALE	1:500 @ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-6001-AB	

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-156 - ARRAN HILL 2A & 2C_21643\02 DRAWINGS\02 SURV\ABP24-156-00-6000-AB WATERMAIN.DWG



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WOODS Est.1970

Plot Date: 3:04:41 pm,12 July 2024, RYANT

NOTES

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2. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY.
3. ASBUILT DATA HAS BEEN SOURCED FROM CONRACTOR DATA AND WOODS SURVEY DATA.

LEGEND

- EXISTING WATERMAIN
- EXISTING SLUICE VALVE
- EXISTING PEET VALVE
- EXISTING FIRE HYDRANT
- EXISTING BLANK CAP
- STAGE BOUNDARY
- LOT BOUNDARY
- EXISTING LOT BOUNDARY
- FUTURE LOT BOUNDARY

REVISION DETAILS		BY	DATE
1	FOR INFORMATION	SM	05/07/24
2	STAGE NAMES UPDATED	RT	12/07/24

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229
DESIGNED	WOODS	
DRAWN	RT	
CHECKED	NC	
APPROVED	SM	WOODS.CO.NZ

N

WFH PROPERTIES

MILLWATER OREWA WEST PRECINCT 6 - STAGE 2A & 2C

WATERMAIN ASBUILT PLAN
SHEET 3 OF 3

STATUS	FOR INFORMATION	REV
SCALE	1:500 @ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-156-00-6002-AB	

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-156 - ARRAN HILL 2A & 2C_21643\02 DRAWINGS\02 SURV\AB\P24-156-00-6000-AB WATERMAIN.DWG

APPENDIX B: REFERENCE DRAWINGS

LEGEND

- NO BUILD ZONE
- SPECIFIC DESIGN ZONE (SLOPE)
- SPECIFIC DESIGN ZONE (RETAINING WALLS)
- STAGE 2A & 2C SUBDIVISION BOUNDARY

THE DIMENSIONS DEPICTED ON THIS PLAN ARE MEASURED FROM THE TOE OF ADJOINING SLOPES OR FROM LOT BOUNDARIES (LOT 69 AND 70).

KAUPEKA ROAD

PEKANGA ROAD

STAGE 2C

STAGE 2A

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	SP	SP	21/05/2024

0 10 20 30 40 50
SCALE 1:2000 (A3) METRES

drawn	SP
approved	SP
date	21/05/2024
scale	AS SHOWN
original size	A3

TETRA TECH COFFEY

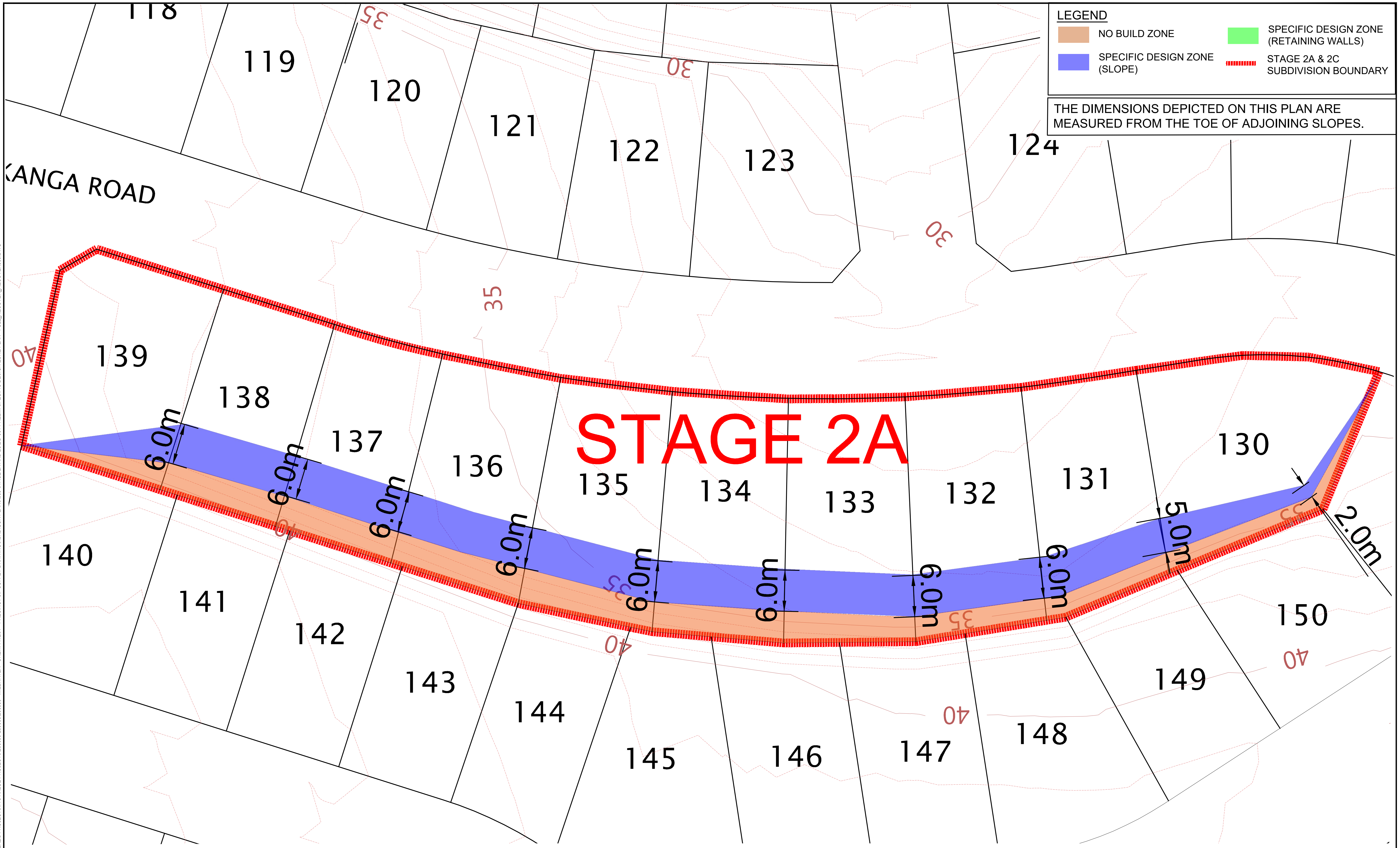
client: WFH PROPERTIES LIMITED

project: MILLWATER ARRAN HILLS PRECINCT 6 - STAGE 2A & 2C

title: GEOTECHNICAL BUILDING LIMITATION ZONE PLAN 1/3

project no: 773-AKLGE206639 | figure no: CD/001 | rev: A

PLOT DATE: 15/07/2024 11:23:24 am DWG FILE: F:\GEN\29 PROJECTS\773-AKLGE PROJECTS\200000-299000\206639 - MILLWATER - OREWA WEST - PRECINCT 6\7 COFFEY DRAWINGS\CAD\GCR PLANS\005 STAGE 2A AND 2C\BD-001 PRELIM SPECIFIC DESIGN ZONE PLAN - FULL_RECOVER.DWG



revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	SP	SP	21/05/2024

N

0 5 10 15 20 25
SCALE 1:500 (A3) METRES

drawn	SP
approved	SP
date	21/05/2024
scale	1:500
original size	A3

TETRA TECH COFFEY

client: WFH PROPERTIES LIMITED

project: MILLWATER ARRAN HILLS PRECINCT 6 - STAGE 2A

title: GEOTECHNICAL BUILDING LIMITATION ZONE PLAN 2/3

project no: 773-AKLGE206639 | figure no: CD/002 | rev: A

PLOT DATE: 15/07/2024 11:37:47 am DWG FILE: F:\GENZ\9 PROJECTS\773-AKLGE PROJECTS\200000-299000\206639 - MILLWATER - OREWA WEST - PRECINCT 6\7 COFFEY DRAWINGS\CAD\GCR PLANS\005 STAGE 2A AND 2C\BD-001 PRELIM SPECIFIC DESIGN ZONE PLAN - FULL_RECOVER_RECOVER000.DWG

LEGEND

- NO BUILD ZONE
- SPECIFIC DESIGN ZONE (SLOPE)
- SPECIFIC DESIGN ZONE (RETAINING WALLS)
- STAGE 2A & 2C SUBDIVISION BOUNDARY

THE DIMENSIONS DEPICTED ON THIS PLAN ARE MEASURED FROM THE TOE OF ADJOINING SLOPES OR FROM LOT BOUNDARIES (LOT 69 AND 70).

STAGE 2C

PEKANGA ROA

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	SP	SP	21/05/2024

SCALE 1:500 (A3) METRES

drawn	SP
approved	SP
date	21/05/2024
scale	1:500
original size	A3

TETRA TECH COFFEY

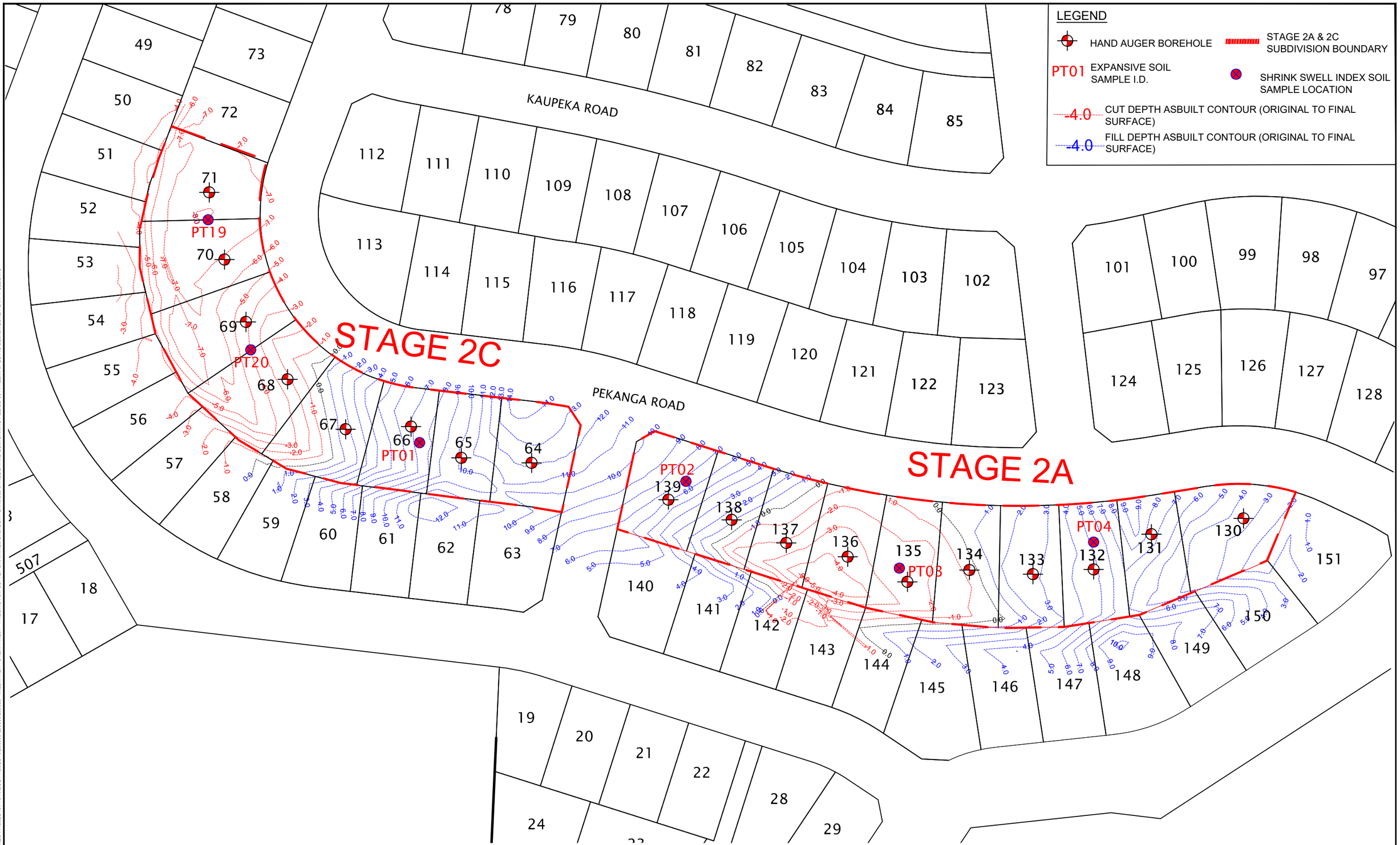
client: WFH PROPERTIES LIMITED

project: MILLWATER ARRAN HILLS PRECINCT 6 - STAGE 2C

title: GEOTECHNICAL BUILDING LIMITATION ZONE PLAN 3/3

project no: 773-AKLGE206639 | figure no: CD/003 | rev: A

PLOT DATE: 15/07/2024 11:31:03 am DWG FILE: F:\GEN\Z9 PROJECTS\773-AKLGE PROJECTS\200000-299000\206639 - MILLWATER - OREWA WEST - PRECINCT 6\7 COFFEY DRAWINGS\CAD\GCR PLANS\005 STAGE 2A AND 2C\BD-001 PRELIM SPECIFIC DESIGN ZONE PLAN - FULL_RECOVER_RECOVER000.DWG



PLOT DATE: 15/07/2024 11:54:58 am DWG FILE: F:\GENZ9 PROJECTS\773-AKLGE PROJECTS\200000-299000\206639 - MILLWATER - OREWA WEST - PRECINCT 6\7 COFFEY DRAWINGS\CAD\GCR PLANS\006 STAGE 2A AND 2C\WORKING FILE\CD-001 PRELIM SPECIFIC DESIGN ZONE PLAN - FULL.DWG

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	FS	SP	12/07/2024

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drawn	SP
approved	SP
date	12/07/2024
scale	1:2000
original size	A3

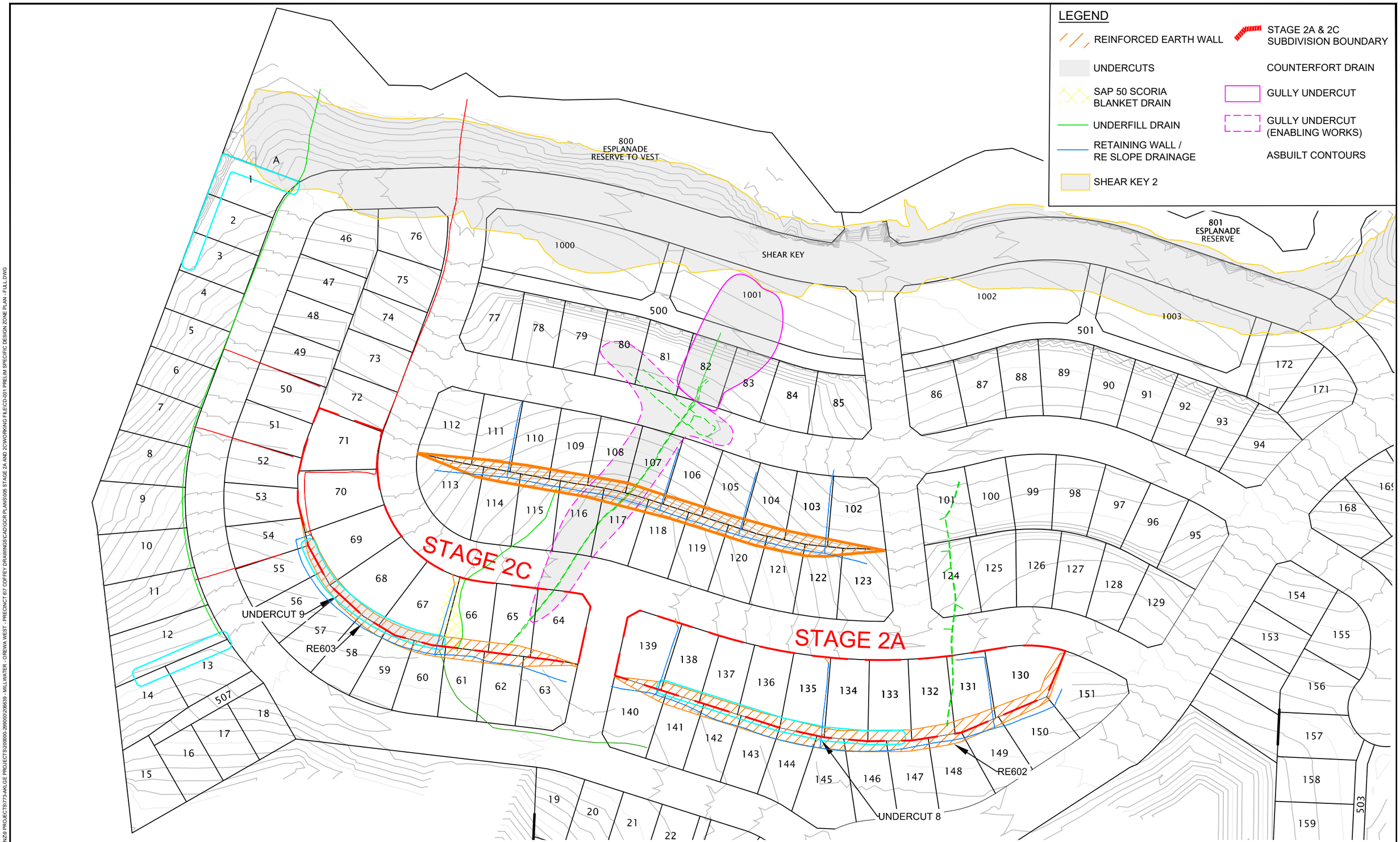
TETRA TECH COFFEY

client: WFH PROPERTIES LIMITED

project: MILLWATER ARRAN HILLS PRECINCT 6 - STAGE 2A & 2C

title: GEOTECHNICAL SITE INVESTIGATION PLAN

project no: 773-AKLGE206639 | figure no: CD/004 | rev: A



revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	FS	SP	12/07/2024

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drawn	SP
approved	SP
date	12/07/2024
scale	1:3000
original size	A3

TETRA TECH COFFEY

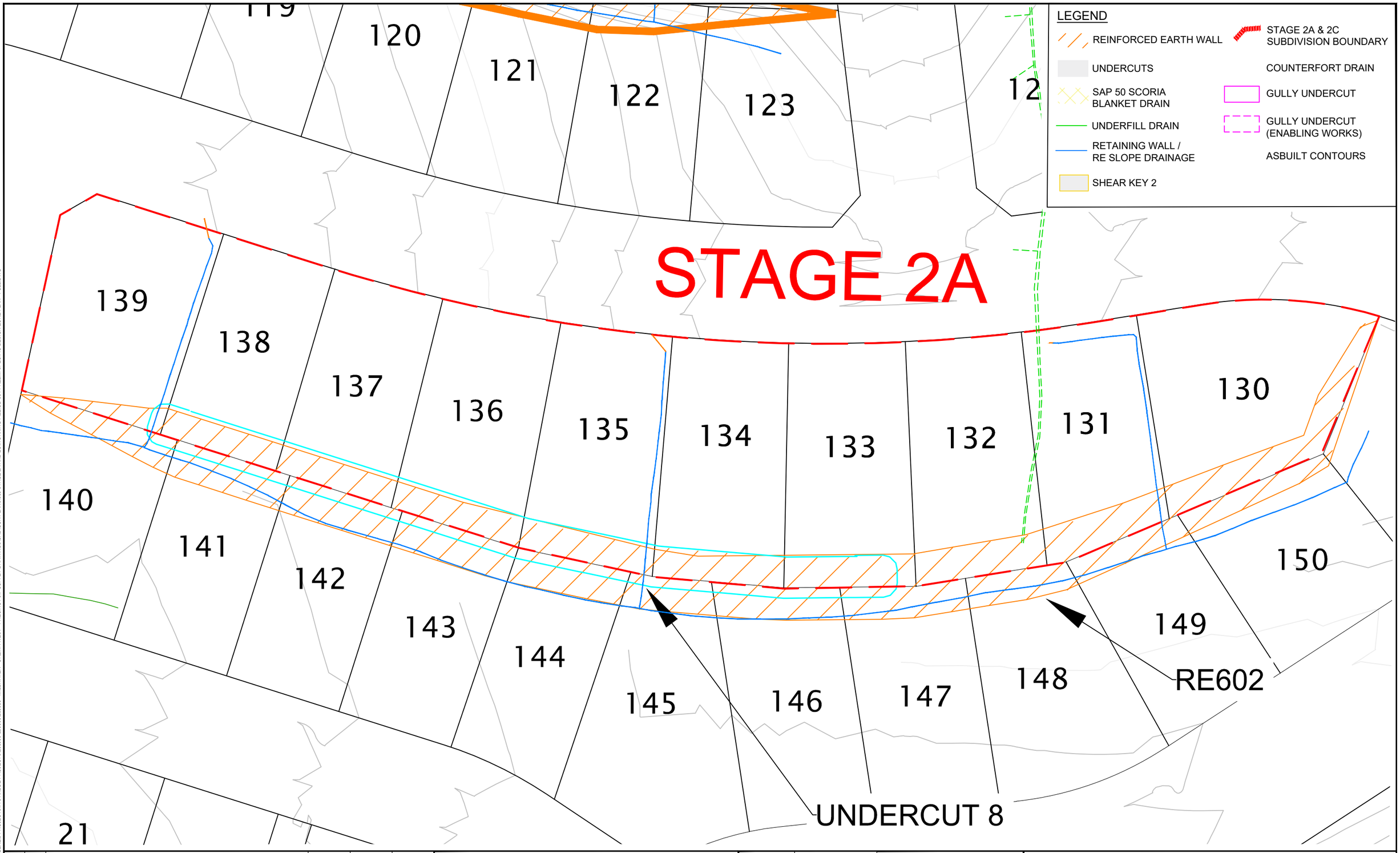
client: WFH PROPERTIES LIMITED

project: MILLWATER ARRAN HILLS PRECINCT 6 - STAGE 2A & 2C

title: GEOTECHNICAL WORKS PLAN 1/3

project no: 773-AKLGE206639 | figure no: CD/005.1 | rev: A

PLOT DATE: 15/07/2024 11:58:28 am DWG FILE: F:\GENZ6\PROJECTS\773-AKLGE PROJECTS\200000-299000\206639 - MILLWATER - OREWA WEST - PRECINCT 6\7 COFFEY DRAWINGS\CAD\GCR PLANS\005 STAGE 2A AND 2C\WORKING FILE\CD-001 PRELIM SPECIFIC DESIGN ZONE PLAN - FULL.DWG



revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	FS	SP	12/07/2024

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SCALE 1:1000 (A3) METRES

drawn	SP
approved	SP
date	12/07/2024
scale	1:1000
original size	A3

TETRA TECH COFFEY

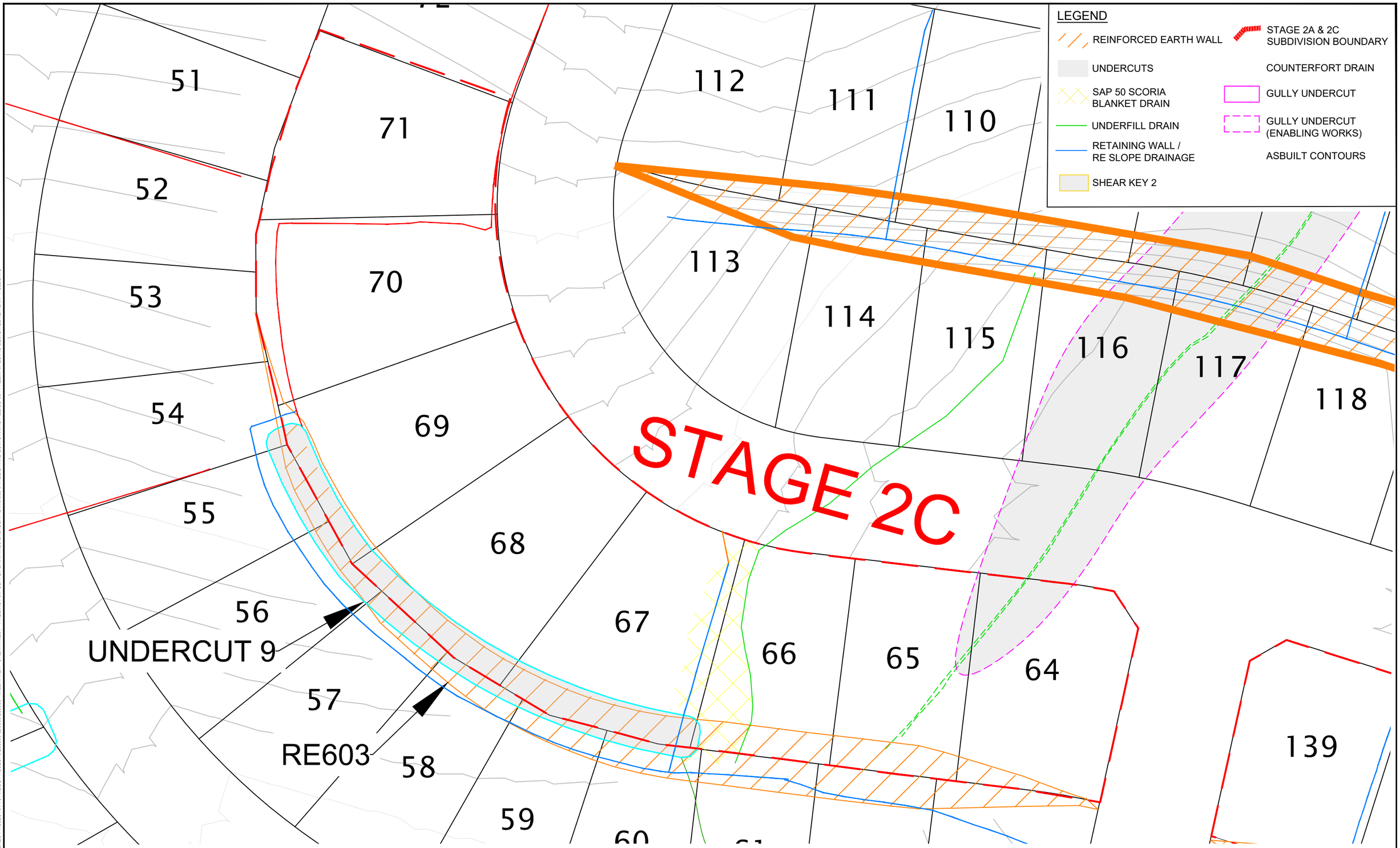
client: WFH PROPERTIES LIMITED

project: MILLWATER ARRAN HILLS PRECINCT 6 - STAGE 2A

title: GEOTECHNICAL WORKS PLAN 2/3

project no: 773-AKLGE206639 | figure no: CD/005.2 | rev: A

PLOT DATE: 15/07/2024 12:13:52 pm DWG FILE: F:\GENZ9 PROJECTS\773-AKLGE PROJECTS\200000-299000\206639 - MILLWATER - OREWA WEST - PRECINCT 6\7 COFFEY DRAWINGS\CAD\GCR PLANS\005 STAGE 2A AND 2C\WORKING FILE\CD-001 PRELIM SPECIFIC DESIGN ZONE PLAN - FULL.DWG



revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	FS	SP	12/07/2024

SCALE 1:1000 (A3) METRES
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drawn	SP
approved	SP
date	12/07/2024
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original size	A3

TETRA TECH COFFEY

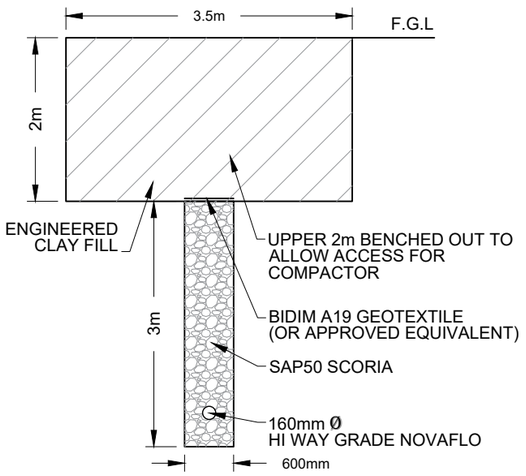
client: WFH PROPERTIES LIMITED

project: MILLWATER ARRAN HILLS PRECINCT 6 - STAGE 2C

title: GEOTECHNICAL WORKS PLAN 3/3

project no: 773-AKLGE206639 | figure no: CD/005.3 | rev: A

PLOT DATE: 15/07/2024 12:00:30 pm DWG FILE: F:\GEN\Z09 PROJECTS\773-AKLGE PROJECTS\200000-299000\206639 - MILLWATER - OREWA WEST - PRECINCT 6\7 COFFEY DRAWINGS\CAD\GCR PLANS\005 STAGE 2A AND 2C\WORKING FILE\CD-001 PRELIM SPECIFIC DESIGN ZONE PLAN - FULL.DWG



CF DRAIN DETAIL 1
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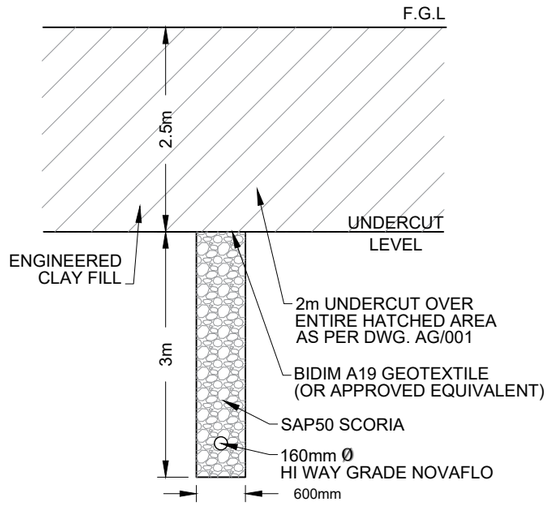

CF DRAIN DETAIL 2
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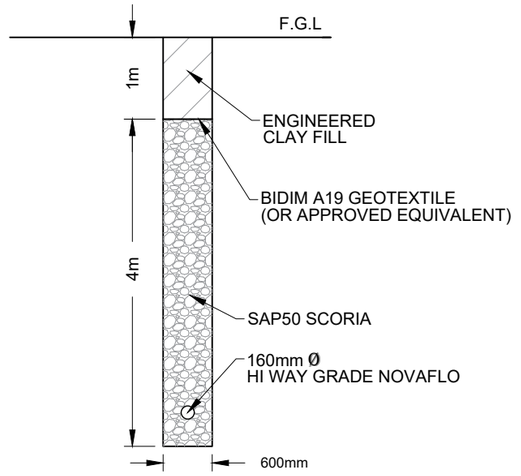

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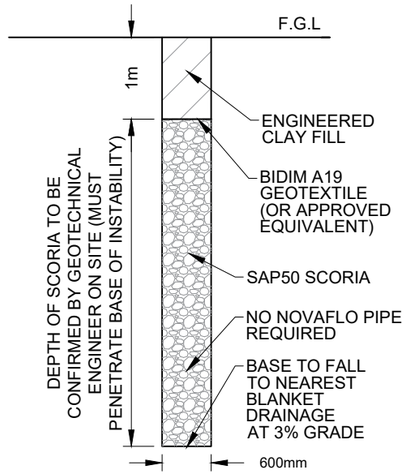
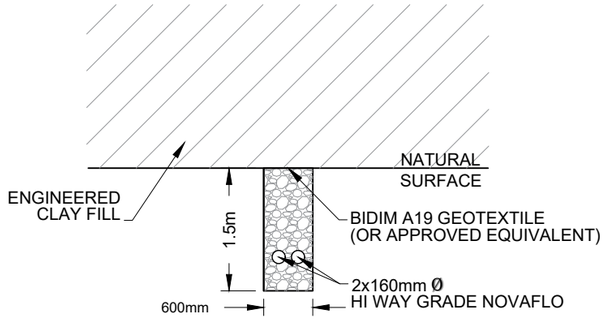
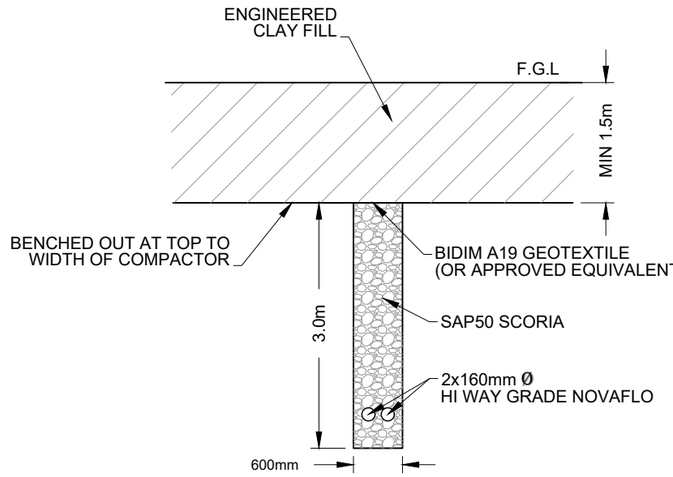


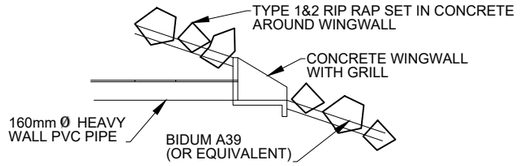
CF DRAIN DETAIL 4
SCALE:1:75



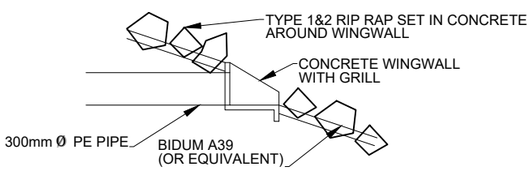
UNDERFILL DRAIN STANDARD DETAIL
SCALE:1:75



COLLECTOR DRAIN DETAIL
SCALE:1:75



SHEARKEY OUTLET DETAIL
SCALE:1:150



UNDERFILL OUTLET DETAIL
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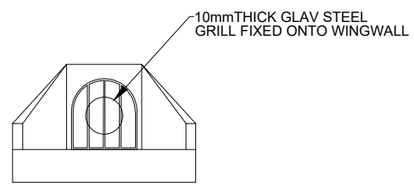


WINGWALL GRILL DETAIL
SCALE:1:150

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE (FOR EW GDR)	RZ	SP	04/12/2019
	B	UPDAT TO CF DRAIN LAYOUT	RZ	SP	20/07/2020
	C	UPDATED AS OF END OF 2020/2021 EARTHWORKS SEASON	RZ	SP	18/06/2021

drawn	RZ
approved	SP
date	18/06/2021
scale	AS SHOWN
original size	A3

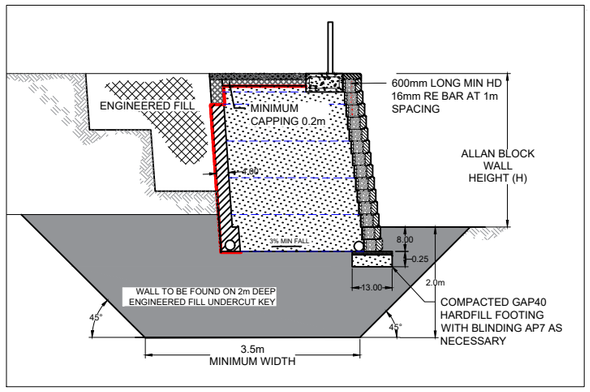
TETRA TECH COFFEY

client: WFH PROPERTIES LTD

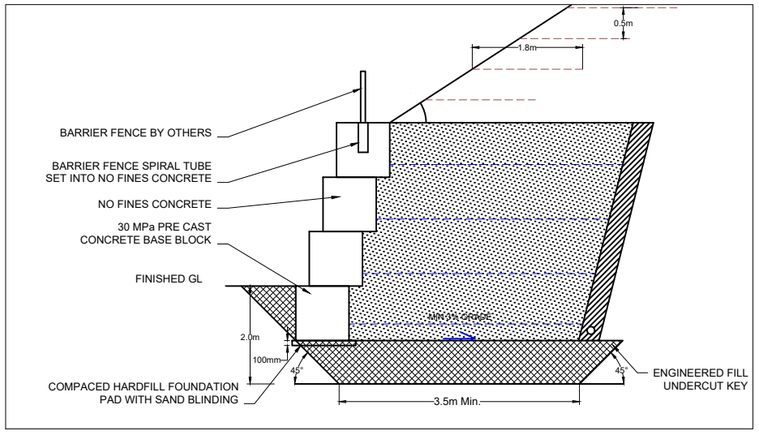
project: MILLWATER - OREWA WEST - PRECINCT 6

title: SUBSOIL DRAINAGE STANDARD DETAILS

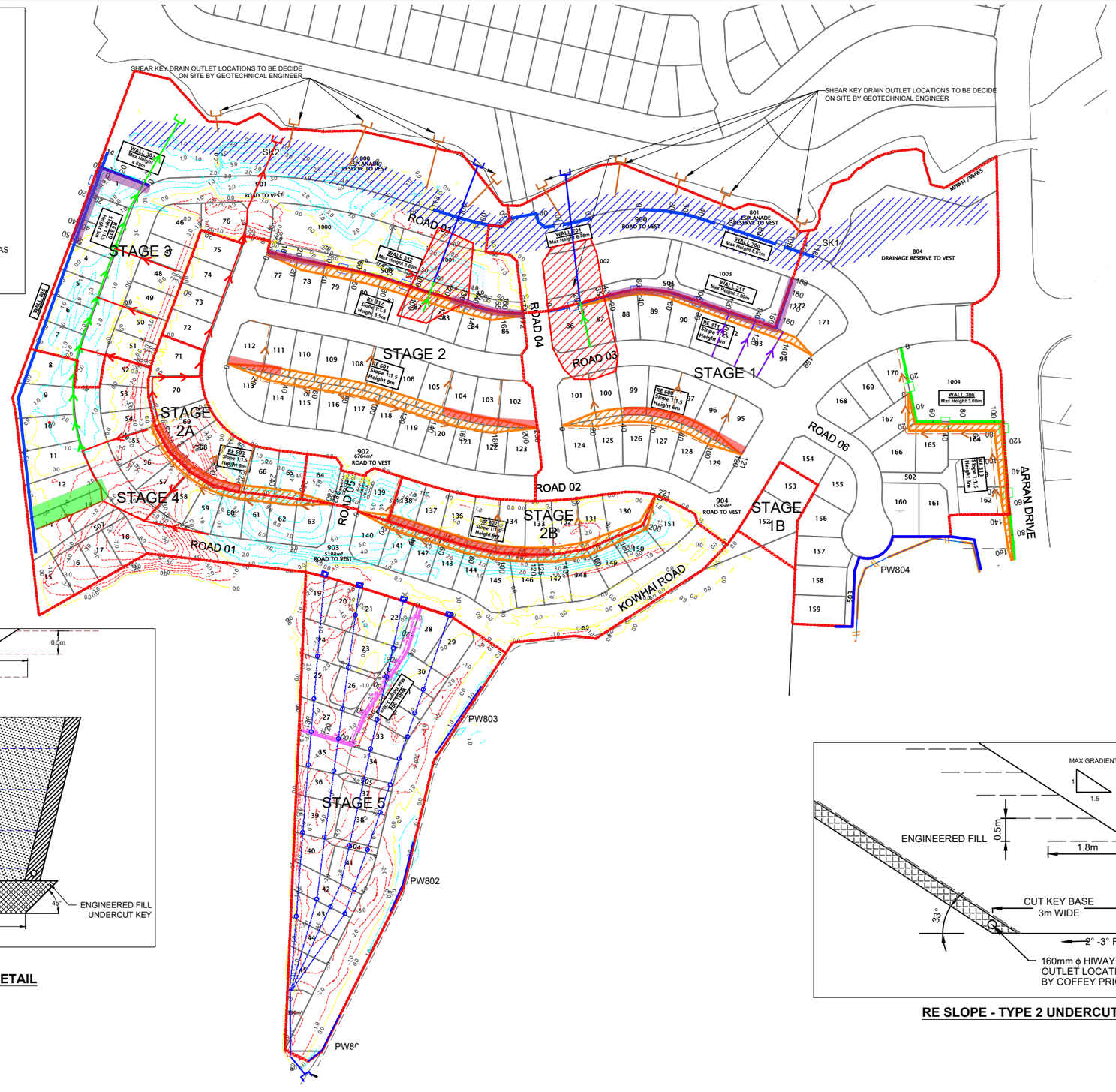
project no: 773-AKLGE206639 | figure no: AG/007 | rev: C

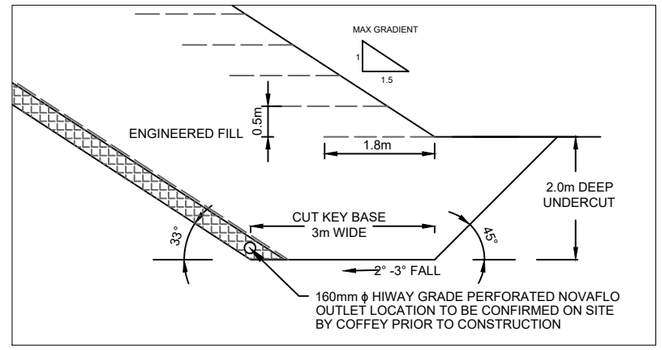


ALLAN BLOCK WALL UNDERCUT KEY DETAIL



MASS BLOCK WALL UNDERCUT KEY DETAIL





RE SLOPE - TYPE 2 UNDERCUT KEY DETAIL

LEGEND

- PROPOSED CUT CONTOURS (1m INTERVAL)
- PROPOSED FILL CONTOURS (1m INTERVAL)
- RETAINING WALL - KEYSTONE
- RETAINING WALL - MASS BLOCK
- RETAINING WALL - TIMBER
- PROPOSED PALISADE WALLS
- SITE BOUNDARY
- STAGE BOUNDARY
- SHEAR KEY EXCAVATION
- 2.5M NOMINAL UNDERCUTS
- UNSUITABLE UNDERCUTS
- ALLAN BLOCK WALL UNDERCUT KEY DETAIL
- MASS BLOCK WALL UNDERCUT KEY DETAIL
- RE SLOPE TYPE 2 UNDERCUT KEY DETAIL
- UNDERCUT KEY
- REINFORCED EARTH WALL

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	RZ	SP	20/11/2019
	B	AMENDED FOR 2021/2022 EARTHWORKS SEASON	RZ	SP	19/11/2021
	C	AMENDED FOR 2022/20223 EARTHWORKS SEASON	SP	SP	14/06/2022
	D	AMENDED FOR START OF 2022 - 2023 EARTHWORKS SEASON	SP	SP	27/09/2022

0 30 60 90 120 150
SCALE 1:3000 (A3) METRES

drawn	SP
approved	SP
date	27/09/2022
scale	AS SHOWN
original size	A3

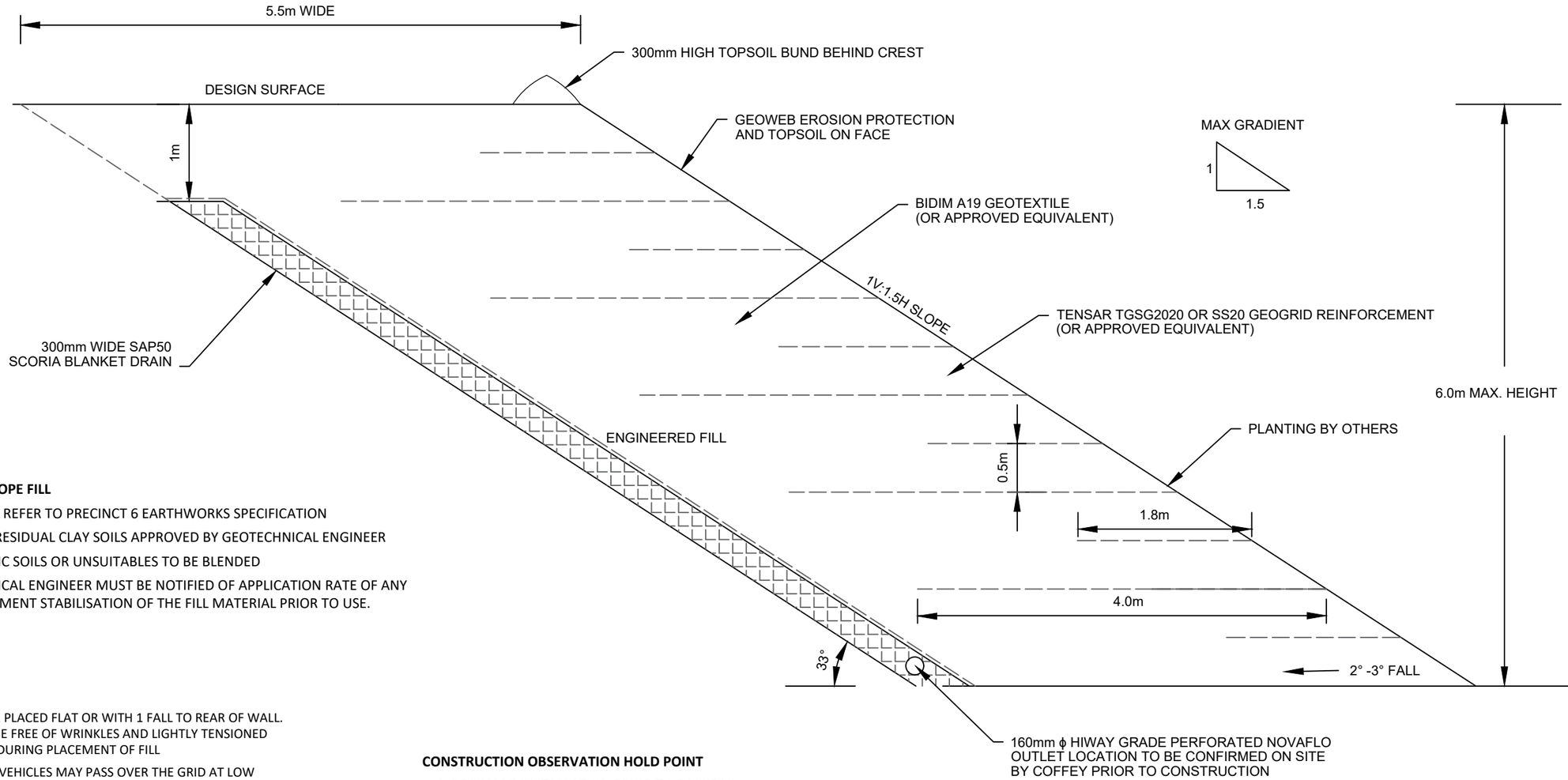
TETRA TECH COFFEY

client: WFH PROPERTIES LTD

project: MILLWATER - OREWA WEST - PRECINCT 6

title: UNDERCUT DETAIL PLAN

project no: 773-AKLGE206639 | figure no: AG/008 | rev: D



ENGINEERED SLOPE FILL

- MATERIAL - REFER TO PRECINCT 6 EARTHWORKS SPECIFICATION
- SITE WON RESIDUAL CLAY SOILS APPROVED BY GEOTECHNICAL ENGINEER
- NO ORGANIC SOILS OR UNSUITABLES TO BE BLENDED
- GEOTECHNICAL ENGINEER MUST BE NOTIFIED OF APPLICATION RATE OF ANY LIME OR CEMENT STABILISATION OF THE FILL MATERIAL PRIOR TO USE.

GENERAL NOTES:

1. GEOGRID TO BE PLACED FLAT OR WITH 1 FALL TO REAR OF WALL. GRID SHOULD BE FREE OF WRINKLES AND LIGHTLY TENSIONED PRIOR TO AND DURING PLACEMENT OF FILL
2. RUBBER TYPED VEHICLES MAY PASS OVER THE GRID AT LOW SPEEDS. A MINIMUM OF 150MM OF FILL SHALL BE PLACED ON THE GRID PRIOR TO TRAFFICKING BY TRACKED VEHICLES. EXTRA CARE MUST BE TAKEN WHEN USING SHEEPSFOOT TYPE COMPACTORS TO ENSURE THE GRID IS NOT DAMAGED DURING COMPACTION.
3. GRID LAYER MUST BE CONTINUOUS OVER THE DESIGN EMBEDMENT LENGTH. NO JOINS ARE PERMITTED PARALLEL TO THE FACE. LAPS PERPENDICULAR TO THE FACE ARE TO OVERLAP BY 100MM.
4. SUBSOIL DRAINS TO MAINTAIN CONTINUOUS FALL OF A MINIMUM OF 8% TO THE OUTLET. CONNECTION TO STORMWATER MANHOLE TO COMPRISE OF A SOLID 100MM PVC CONNECTION.

CONSTRUCTION OBSERVATION HOLD POINT

1. DRAINAGE INSTALLATION PRIOR TO BACKFILL;
2. GRID LAYER PLACEMENT;
3. COMPACTION TEST FREQUENCY OF 1 TEST PER METRE;
4. CONNECTION OF DRAINAGE TO PUBLIC STORMWATER NETWORK;
5. PLACEMENT OF TOP SOIL AND GEOWEB.

FILL BATTER DETAIL FOR RE 600, 601, 602 AND 603
MAX BATTER HEIGHT 6m MAX BATTER GRADIENT 1V:1.5H

FOR CONSTRUCTION

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	RZ	SP	18/07/2019
	B	UPDATED AFTER AMENDMENTS TO DESIGN	RZ	AC	26/02/2020
	C	FOR CONSTRUCTION	RZ	SP	18/06/2020
	D	DESIGN CHANGE	SP	SP	14/06/2022

SCALE 0 0.5 1 1.5 2 2.5 METRES — 1:50 (A3)

drawn	SP
approved	SP
date	14/06/2022
scale	AS SHOWN
original size	A3

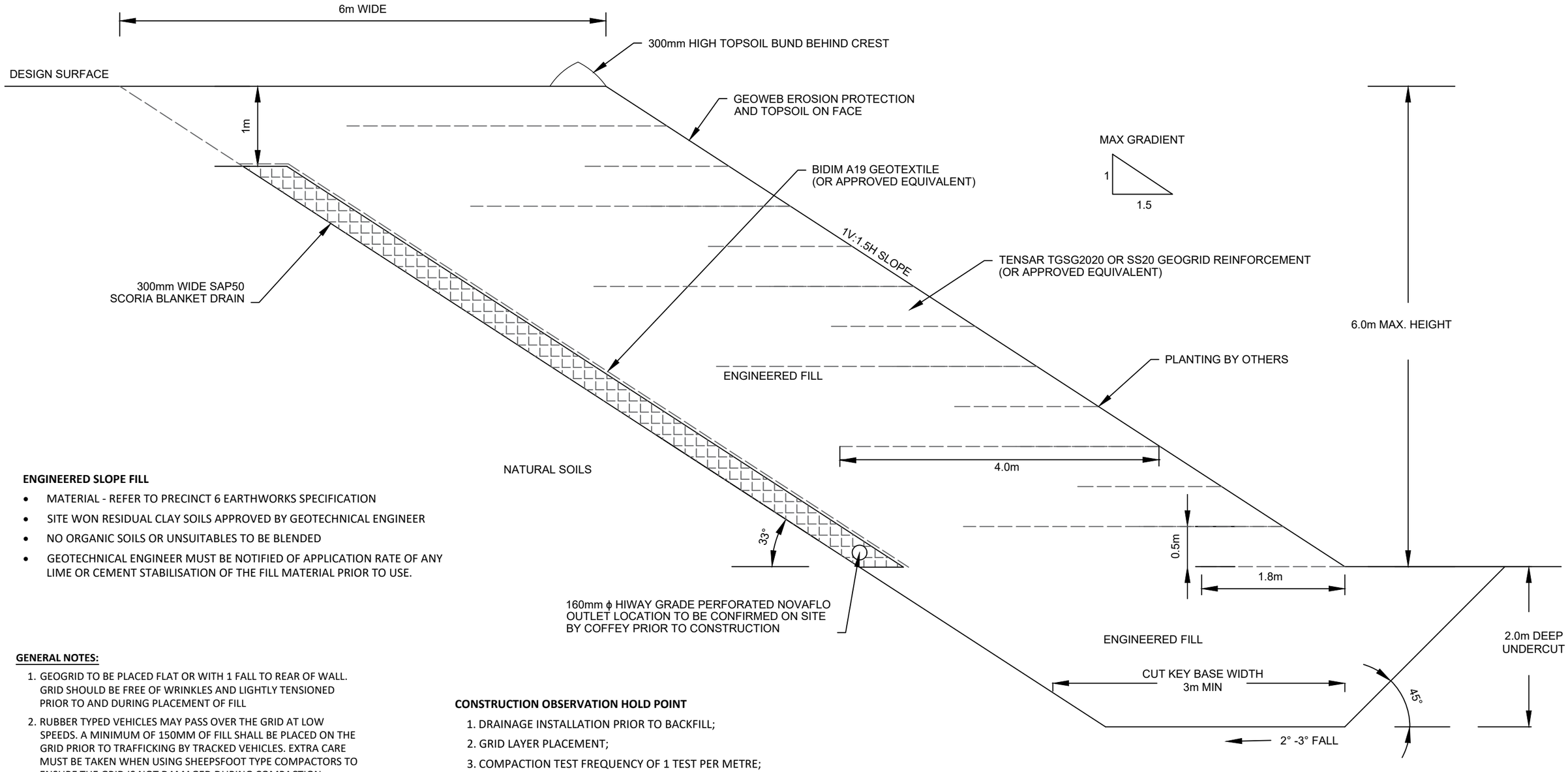
coffey
A TETRA TECH COMPANY

client: WFH PROPERTY LTD.

project: MILLWATER PRECINCT 6

title: REINFORCED EARTH SLOPE - FILL BATTER DETAIL

project no: 773-AKLGE206639 | figure no: AF/001 | rev: D



ENGINEERED SLOPE FILL

- MATERIAL - REFER TO PRECINCT 6 EARTHWORKS SPECIFICATION
- SITE WON RESIDUAL CLAY SOILS APPROVED BY GEOTECHNICAL ENGINEER
- NO ORGANIC SOILS OR UNSUITABLES TO BE BLENDED
- GEOTECHNICAL ENGINEER MUST BE NOTIFIED OF APPLICATION RATE OF ANY LIME OR CEMENT STABILISATION OF THE FILL MATERIAL PRIOR TO USE.

GENERAL NOTES:

1. GEOGRID TO BE PLACED FLAT OR WITH 1 FALL TO REAR OF WALL. GRID SHOULD BE FREE OF WRINKLES AND LIGHTLY TENSIONED PRIOR TO AND DURING PLACEMENT OF FILL
2. RUBBER TYPED VEHICLES MAY PASS OVER THE GRID AT LOW SPEEDS. A MINIMUM OF 150MM OF FILL SHALL BE PLACED ON THE GRID PRIOR TO TRAFFICKING BY TRACKED VEHICLES. EXTRA CARE MUST BE TAKEN WHEN USING SHEEPSFOOT TYPE COMPACTORS TO ENSURE THE GRID IS NOT DAMAGED DURING COMPACTION.
3. GRID LAYER MUST BE CONTINUOUS OVER THE DESIGN EMBEDMENT LENGTH. NO JOINS ARE PERMITTED PARALLEL TO THE FACE. LAPS PERPENDICULAR TO THE FACE ARE TO OVERLAP BY 100MM.
4. SUBSOIL DRAINS TO MAINTAIN CONTINUOUS FALL OF A MINIMUM OF 8% TO THE OUTLET. CONNECTION TO STORMWATER MANHOLE TO COMPRISE OF A SOLID 100MM PVC CONNECTION.

CONSTRUCTION OBSERVATION HOLD POINT

1. DRAINAGE INSTALLATION PRIOR TO BACKFILL;
2. GRID LAYER PLACEMENT;
3. COMPACTION TEST FREQUENCY OF 1 TEST PER METRE;
4. CONNECTION OF DRAINAGE TO PUBLIC STORMWATER NETWORK;
5. PLACEMENT OF TOP SOIL AND GEOWEB.

CUT BATTER DETAIL FOR RE 600,601, 602 AND 603
MAX BATTER HEIGHT 6m MAX BATTER GRADIENT 1V:1.5H

FOR CONSTRUCTION

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	RZ	SP	18/07/2019
	B	UPDATED AFTER AMENDMENTS TO DESIGN	RZ	AC	26/02/2020
	C	FOR CONSTRUCTION	RZ	SP	18/06/2020
	D	DESIGN CHANGE	SP	SP	14/06/2022

0 0.5 1 1.5 2 2.5
SCALE 1:50 (A3) METRES

drawn	SP
approved	SP
date	14/06/2022
scale	AS SHOWN
original size	A3

coffey
A TETRA TECH COMPANY

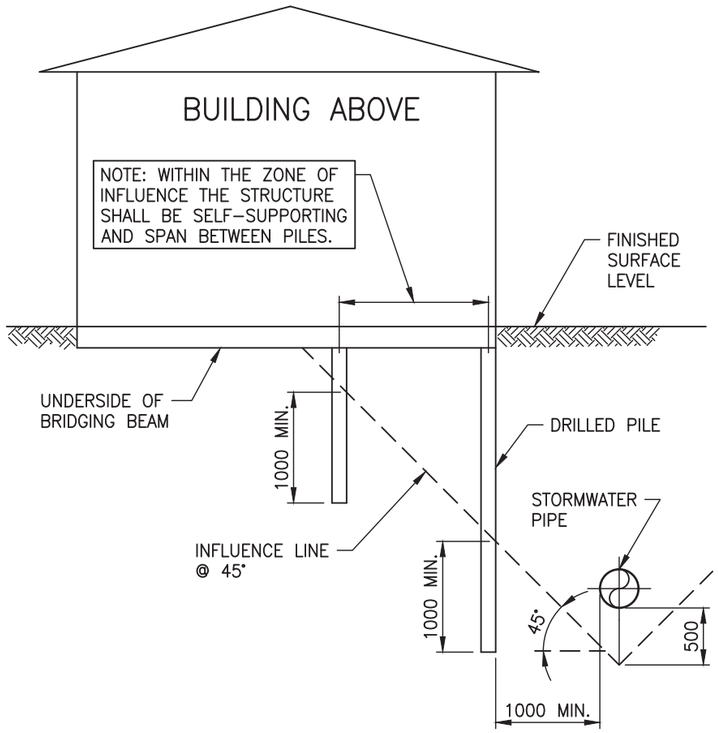
client: WFH PROPERTY LTD.

project: MILLWATER PRECINCT 6

title: REINFORCED EARTH SLOPE - CUT BATTER DETAIL

project no: 773-AKLGE206639 | figure no: AF/002 | rev: D

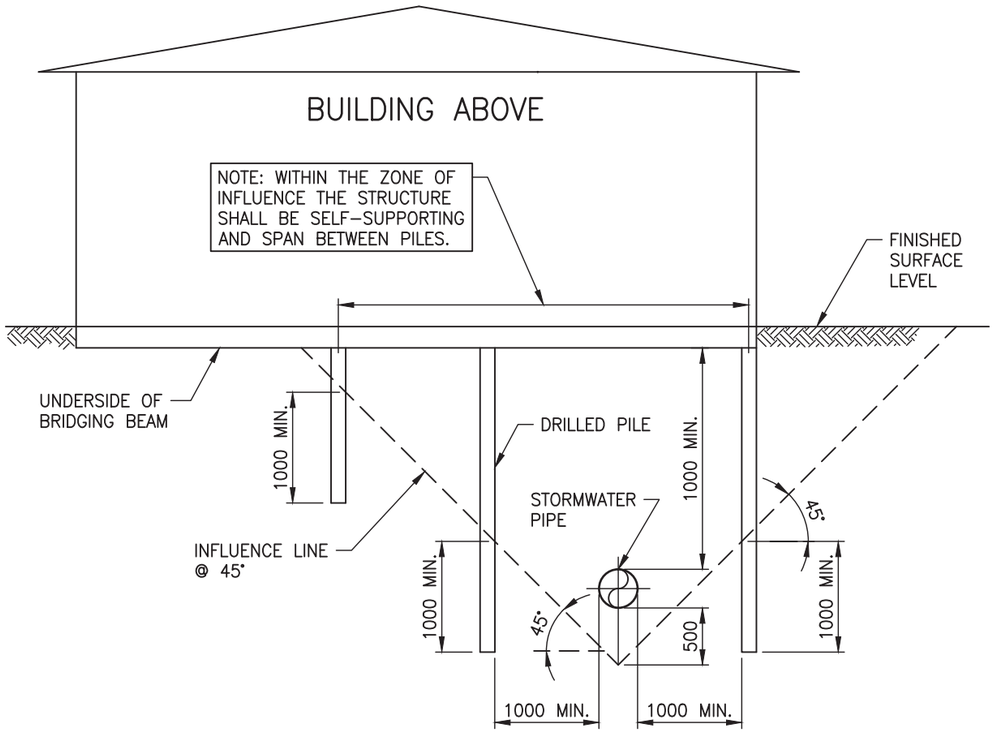
PLOT DATE: 14/06/2022 5:12:29 pm DWG FILE: F:\GEN\Z9 PROJECTS\773-AKLGE PROJECTS\206639 - MILLWATER - OREWA WEST - PRECINCT 6\7 COFFEY DRAWINGS\CAD\TONY\AF\773-AKLGE206639-AF02.DWG



BUILD CLOSE

'WORKS CLOSE' NOTES:

1. OUTSIDE ZONE OF INFLUENCE, NORMAL FOUNDATION REQUIREMENTS APPLY.
2. SPECIFIC APPROVAL IS REQUIRED FROM AUCKLAND COUNCIL IF WORKS ARE ADJACENT TO PIPES LARGER THAN 375mm INTERNAL DIAMETER, OR GREATER THAN 2.0m DEEP.
3. BUILDING SHALL BE OUTSIDE ALL OVERLAND FLOW PATHS AND FLOODPLAINS. SEE SECTION 4.3.5.6 AND 4.3.5.7 OF THE SWCoP FOR FURTHER DETAILS.
4. PILES SHALL BE CONSTRUCTED TO A DEPTH OF 1.0m BELOW INFLUENCE LINE.



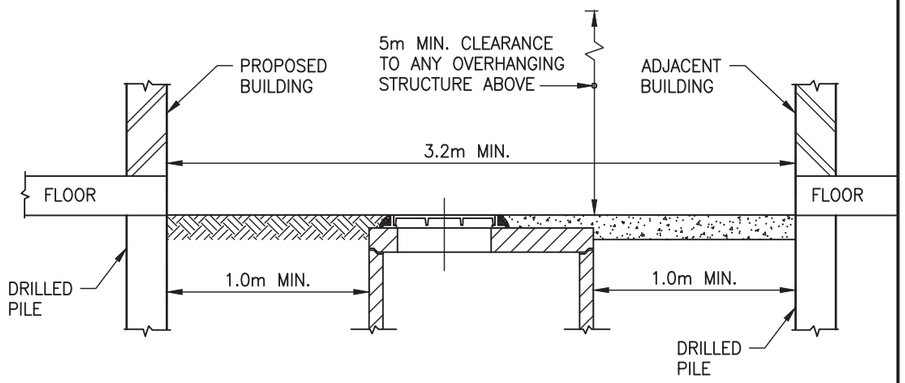
BUILD OVER

'WORKS OVER' NOTES:

1. OUTSIDE ZONE OF INFLUENCE, NORMAL FOUNDATION REQUIREMENTS APPLY.
2. THE DETAIL APPLIES TO STORMWATER PIPES ≤ 375mm NOMINAL DIAMETER AND ≤ 2.0m DEPTH TO INVERT.
3. WORKS OVER PIPES LARGER THAN 375mm NOMINAL DIAMETER IS NOT ALLOWED.
4. PILES SHALL BE CONSTRUCTED TO A DEPTH OF 1.0m BELOW INFLUENCE LINE.
5. BRIDGING IS NOT ALLOWED OVER PIPES WHERE CLEAR VERTICAL SEPARATION DISTANCE FROM TOP OF PIPE TO UNDERSIDE OF BRIDGING BEAM IS LESS THAN 1.0m.

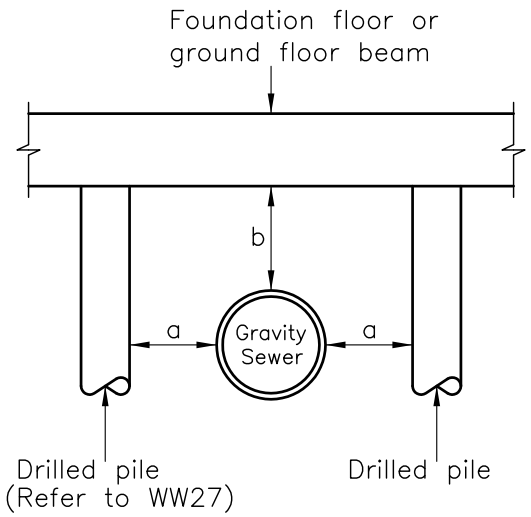
GENERAL NOTES:

1. THE INFORMATION ON THIS PAGE IS INTENDED TO SHOW EXAMPLES OF TYPICAL SCENARIOS AND SHALL BE USED FOR GENERAL GUIDANCE PURPOSES ONLY. SIGNIFICANT VARIATIONS ON A SITE-BY-SITE BASIS ARE TO BE EXPECTED AND IT IS IN NO WAY IMPLIED THAT MEETING ANY OF THESE REQUIREMENTS WILL GUARANTEE APPROVAL.
2. WHERE CONSTRUCTION WORKS ARE PROPOSED IN THE VICINITY OF EXISTING PUBLIC STORMWATER ASSETS, ANY NECESSARY MEASURES TO PROTECT SUCH ASSETS SHALL BE IMPLEMENTED, IN ACCORDANCE WITH SECTION 4.3.23 OF THE SWCoP.
3. REQUIREMENTS FOR FOUNDATION DESIGN, ETC. APPLY TO BOTH SIDES OF THE PIPE.
4. NO DRIVEN PILES ARE PERMITTED WITHIN 10m OF BRICK STORMWATER STRUCTURES, OR WITHIN 5m OF ALL OTHER STORMWATER STRUCTURES.
5. SPECIFIC APPROVAL IS REQUIRED FROM AUCKLAND COUNCIL FOR DRIVEN PILES IN PARTIALLY DRILLED HOLES, WITHIN THE 5m-10m ZONE.
6. PILES THAT MAY BE REQUIRED TO RESIST HORIZONTAL FORCES WILL REQUIRE SPECIFIC DESIGN.
7. PILE/FOOTING LOCATION POINT MUST BE BELOW 45° "ZONE OF INFLUENCE".
8. ALL MANHOLES SHALL HAVE 24 HOURS UNOBSTRUCTED ACCESS.
9. MANHOLES IN BASEMENTS, OR IN LOCATIONS WHERE SUFFICIENT CLEARANCE IS UNAVAILABLE, ARE NOT PERMITTED.
10. ALL PIPE 'WORK OVER' WILL REQUIRE SPECIFIC APPROVAL BY AUCKLAND COUNCIL.
11. REFER TO SECTION 4.3.23 OF THE SWCOP FOR PIPE 'WORK OVER' REQUIREMENTS.
12. FOR MANHOLES GREATER THAN 4m DEEP OR LARGER THAN 1200mm DIA. SPECIFIC DESIGN (INCLUDING CLEARANCE REQUIREMENTS) IS REQUIRED.
13. SPECIFIC APPROVAL FROM COUNCIL IS REQUIRED FOR WORKS WITHIN 10 METERS OF A RISING MAIN.
14. WORKS OVER RISING MAIN IS NOT ALLOWED.



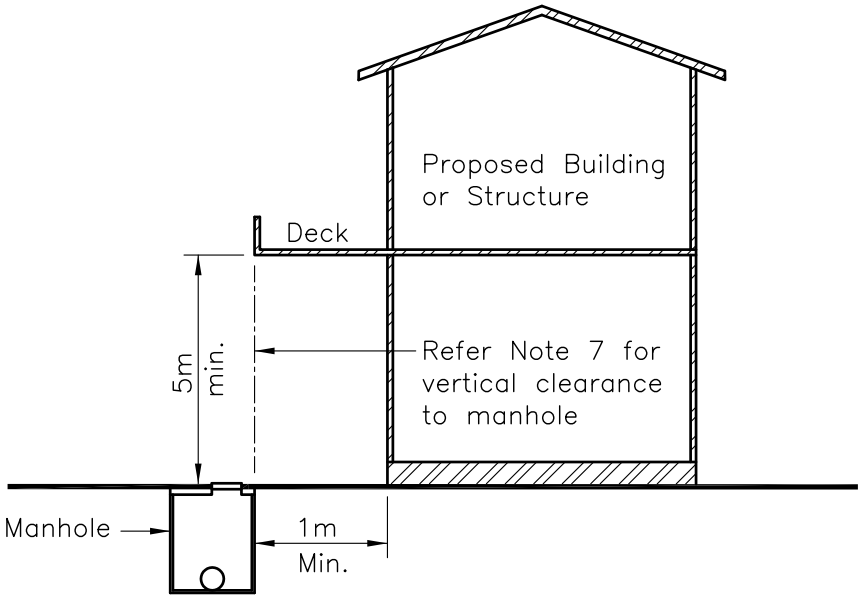
MANHOLE CONSTRUCTION CLEARANCE

STORMWATER CODE OF PRACTICE STANDARD DETAILS REVISION: 3 REV DATE: 17 JANUARY 2022 CAD FILENAME: AC-STD-SW22.DWG	AUCKLAND COUNCIL STORMWATER PIPE AND MANHOLE CONSTRUCTION CLEARANCE REQUIREMENTS MANHOLES NEAR WORKS AND WORKS CLOSE TO, OR OVER, PIPES	ENVIRONMENTAL-SW	ORIGINAL SCALE A3 SCALE: N.T.S. DRAWING SET: SWCoP SHEET: 1 OF 1 DRAWING No.: SW22 REV: 3



Minimum Pile Clearances						
Type of Sewer	Sewer Depth < 3m		Sewer Depth 3m–5m		Sewer Depth >5m	
	a	b	a	b	a	b
Local Wastewater Network	1m	0.6m	1m	0.6m	1.5m	0.6m
Transmission (Trunk) Sewer	1m	1m	2m	1m	3m	1.5m

PIPE CONSTRUCTION CLEARANCE FOR BRIDGING OPTIONS



MANHOLE CONSTRUCTION CLEARANCE

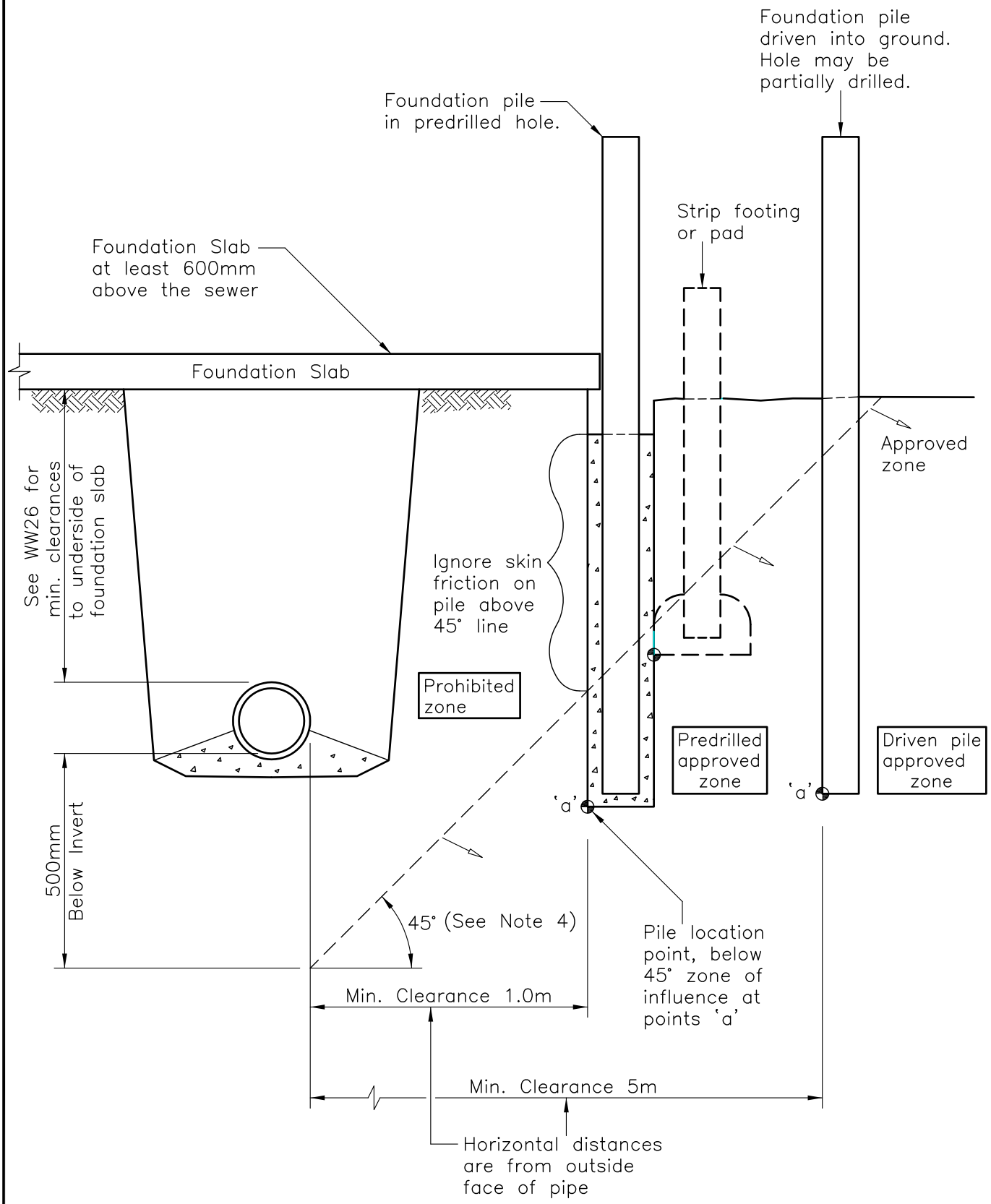
NOTES:

1. Locate sewer to survey accuracy or by hand piloting.
2. No driven piles within 5m of a sewer or 10m of brick sewer.
3. All manholes shall have 24 hrs unobstructed access.
4. No construction shall occur above a manhole or within tolerances 'a' or 'b' in table above.
5. Pressure mains shall not be built over.
6. Brick or poor condition wastewater pipe shall not be built over. Bridging options must be approved.
7. Vertical clearance from the top of the chamber shall be 5m Min. over the full width of the chamber.

O:\---\ EGCADFI \ 2017 \ WATER & WASTEWATER NETWORK STD DWGS \ 2010070.044D .DWG

PIPE AND MANHOLE CONSTRUCTION CLEARANCE

SCALE:	N.T.S.
ISSUE DATE:	04–12–2017
DWG No.	2010070.044D
REFERENCE No.	WW 26



NOTES:

1. No driven piles are permitted within 10m of brick Sewers, or within 5m of all other sewers.
2. Piles that are required to resist horizontal forces will require specific design.
3. Pile/Footing location point must be below 45° zone of influence.
4. Zone of influence typically 45° or angle determined by a structural engineer.

O:\---\ EGCADFI \ 2017 \ WATER & WASTEWATER NETWORK STD DWGS \ 2010070.045B .DWG

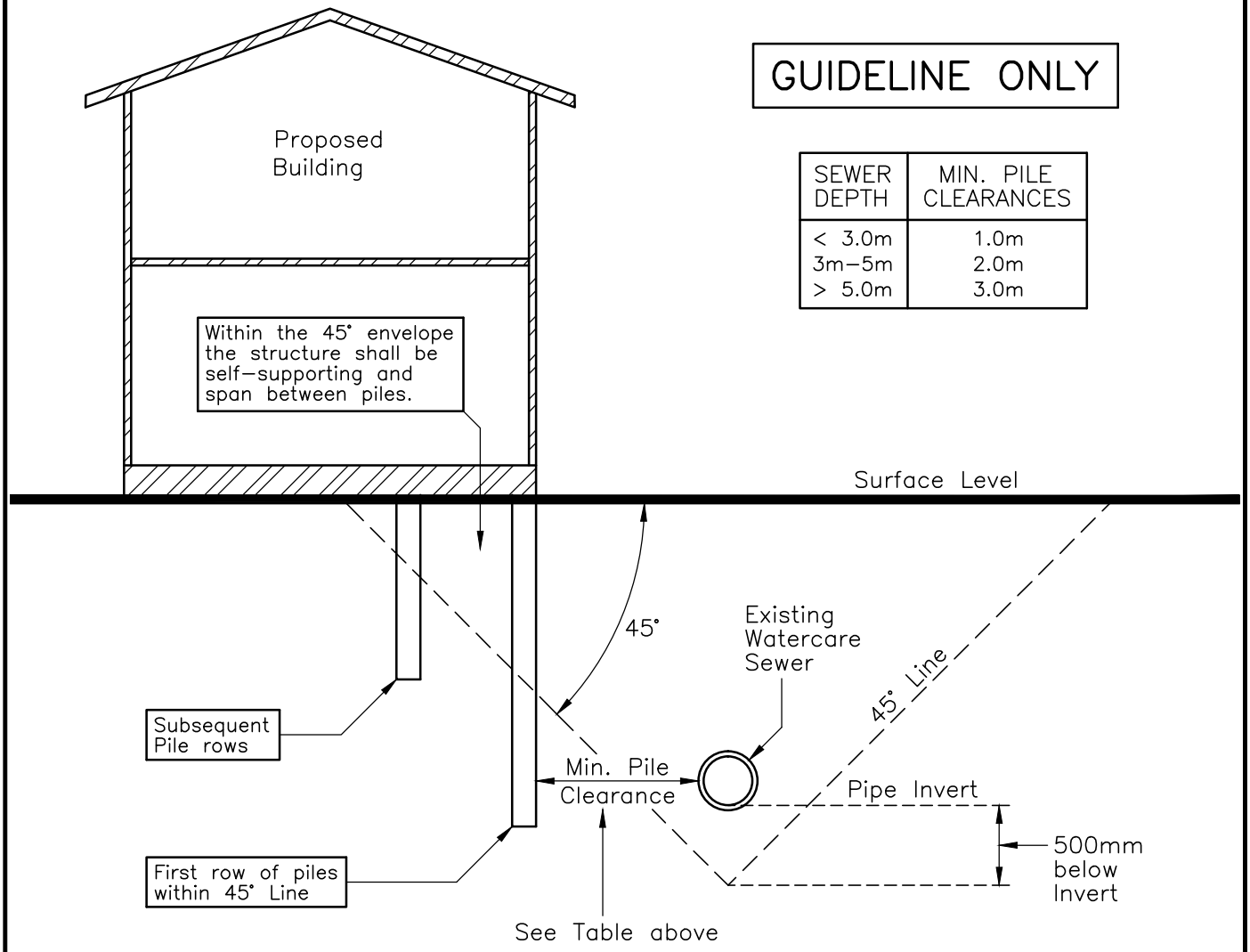
Watercare

BUILDING CLOSE TO OR OVER LOCAL NETWORK WASTEWATER

SCALE:	N.T.S.
ISSUE DATE:	04–12–2017
DWG No.	2010070.045B
REFERENCE No.	WW 27

GUIDELINE ONLY

SEWER DEPTH	MIN. PILE CLEARANCES
< 3.0m	1.0m
3m–5m	2.0m
> 5.0m	3.0m



SECTION THROUGH BUILDING AND TRANSMISSION SEWER

NOTES:

1. This detail shall be used as a guideline only. All applications will be assessed on individual basis and conditions imposed could be more specific than these shown.
2. No structural loads are to be placed on public sewer lines.
3. All structural loads on piles shall be absorbed outside the 45° envelope and below the pipe invert level for the first row of piles.
4. Where raft foundations or strip footings are proposed within the 45° envolope, statement from a structural engineer is required to confirm that the foundation design complies with Clause 2.
5. Driven piles are not permitted within 10 metres of a brick sewer or 5 metres of any other sewers.
6. Closed Circuit Television (CCTV) inspections of Transmission sewer only on approval from Watercare Services Ltd.
7. Manholes shall be minimum 1m clear from buildings as per drawing WW20 and building eaves shall be completely clear.
8. Drawings of the proposed works must accurately identify the location of the sewer/s affected and the distances with cross–section details for all structures. Watercare approved registered surveyor must be engaged to carry out the mark out.

O:\---\ EGCADFI \ 2017 \ WATER & WASTEWATER NETWORK STD DWGS \ 2010070.051C .DWG

Watercare

GUIDELINE FOR BUILDING CLOSE TO OR OVER TRANSMISSION WASTEWATER

SCALE:	N.T.S.
ISSUE DATE:	13–07–2018
DWG No.	2010070.051C
REFERENCE No.	WW 28

APPENDIX C: CLASSIFICATION TESTS

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Shrink Swell Index Report

Report No: SSI:ETAM24S-05125
Issue No: 1

Client: Tetra Tech Coffey (NZ) Limited- Auckland
Coffey House, Level 4, Teed Street
New Market Auckland 1023

Principal: Stephen Parkes
Project No.: 773-ETAM01553
Project Name: 773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.: - **TRN:** -

Approved Signatory: James McKelvey
(Senior Technician)
IANZ Accredited Laboratory Number:105
Date of Issue: 12/06/2024

Sample Details

Sample ID:	ETAM24S-05125	**Sampling Method:**	Unknown (Not IANZ Endorsed)
Date Sampled:	27/05/2024	**Material:**	Undisturbed Soil
Date Submitted:	30/05/2024	**Source:**	Unknown (Sampled by Client)
Date Tested:	4/06/2024		
Project Location:	117 Kowhai Road, Orewa		
Sample Location:	PT01, 0.20 - 0.35 m		
Borehole Number:	PT01		
Borehole Depth (m):	0.20 - 0.35		

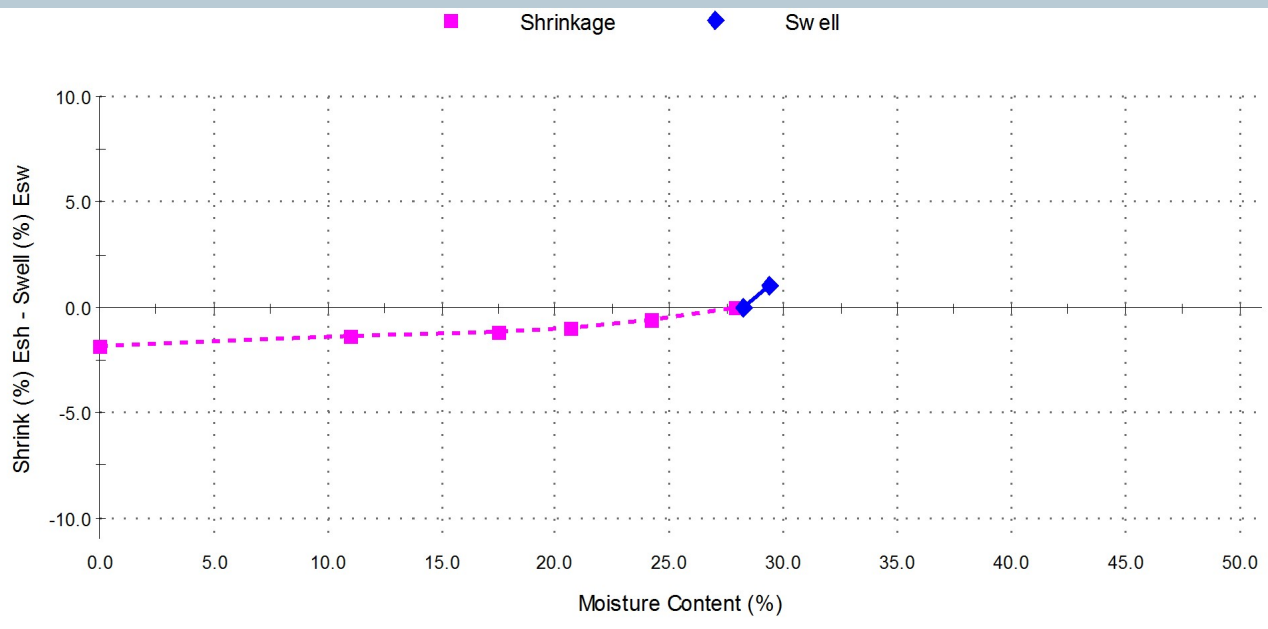
Swell Test — AS 1289.7.1.1

Swell on Saturation (%):	1.0
Moisture Content before (%):	28.3
Moisture Content after (%):	29.4
Est. Unc. Comp. Strength before (kPa):	450
Est. Unc. Comp. Strength after (kPa):	400

Shrink Test — AS 1289.7.1.1

Shrink on drying (%):	1.8
Shrinkage Moisture Content (%):	27.9
Est. inert material (%):	2%
Crumbling during shrinkage:	2%
Cracking during shrinkage:	3%

Shrink Swell



Shrink Swell Index - Iss (%): 1.3

Comments

Not accredited
Est. Unc. Comp. Strength readings are not IANZ Endorsed as part of this Report.
Work Order No : ETAM24W01200
Tested By: JM

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Shrink Swell Index Report

Report No: SSI:ETAM24S-05126
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	- **TRN:** -

Tests indicated as not accredited are outside the scope of the laboratory's accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: James McKelvey
(Senior Technician)
IANZ Accredited Laboratory Number:105
Date of Issue: 12/06/2024

Sample Details

Sample ID:	ETAM24S-05126	**Sampling Method:**	Unknown (Not IANZ Endorsed)
Date Sampled:	27/05/2024	**Material:**	Undisturbed Soil
Date Submitted:	30/05/2024	**Source:**	Unknown (Sampled by Client)
Date Tested:	4/06/2024		
Project Location:	117 Kowhai Road, Orewa		
Sample Location:	PT02, 0.2 - 0.3 m		
Borehole Number:	PT02		
Borehole Depth (m):	0.2 - 0.3		

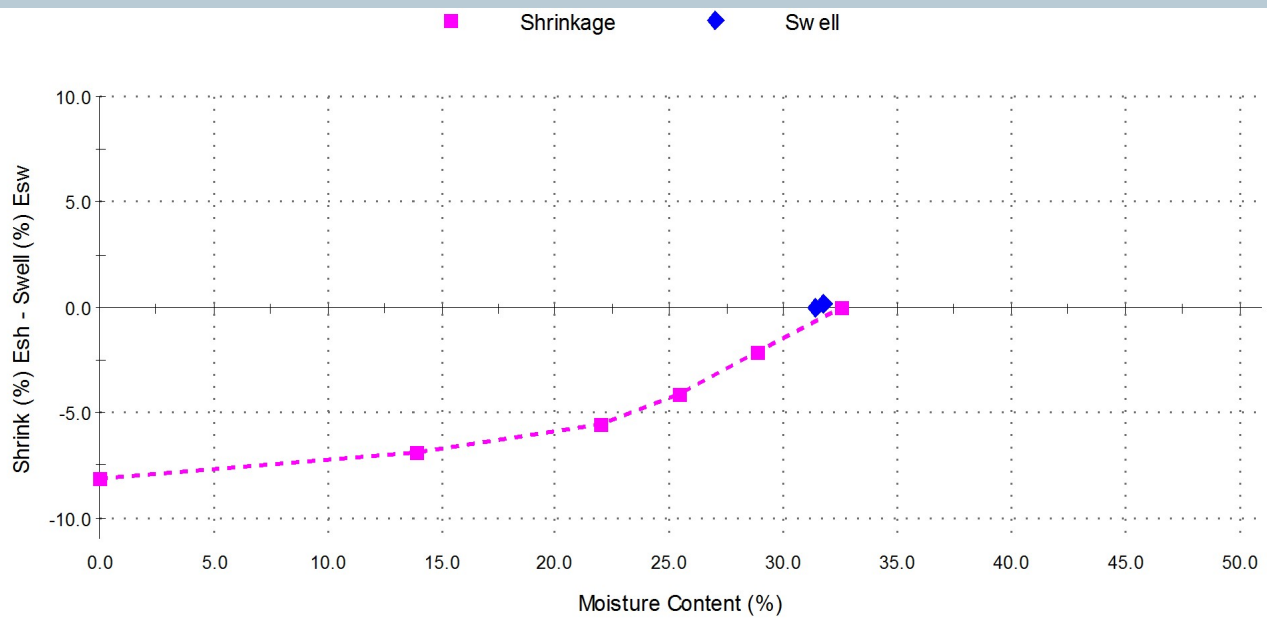
Swell Test — AS 1289.7.1.1

Swell on Saturation (%):	0.1
Moisture Content before (%):	31.4
Moisture Content after (%):	31.8
Est. Unc. Comp. Strength before (kPa):	225
Est. Unc. Comp. Strength after (kPa):	300

Shrink Test — AS 1289.7.1.1

Shrink on drying (%):	8.1
Shrinkage Moisture Content (%):	32.5
Est. inert material (%):	2%
Crumbling during shrinkage:	0%
Cracking during shrinkage:	0%

Shrink Swell



Shrink Swell Index - Iss (%): 4.5

Comments

Not accredited
Est. Unc. Comp. Strength readings are not IANZ Endorsed as part of this Report.
Work Order No : ETAM24W01200
Tested By: JM

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Shrink Swell Index Report

Report No: SSI:ETAM24S-05127
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	- **TRN:** -

Tests indicated as not accredited are outside the scope of the laboratory's accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: James McKelvey
(Senior Technician)
IANZ Accredited Laboratory Number:105
Date of Issue: 12/06/2024

Sample Details

Sample ID:	ETAM24S-05127	**Sampling Method:**	Unknown (Not IANZ Endorsed)
Date Sampled:	27/05/2024	**Material:**	Undisturbed Soil
Date Submitted:	30/05/2024	**Source:**	Unknown (Sampled by Client)
Date Tested:	4/06/2024		
Project Location:	117 Kowhai Road, Orewa		
Sample Location:	PT03, 0.20 - 0.35 m		
Borehole Number:	PT03		
Borehole Depth (m):	0.20 - 0.35		

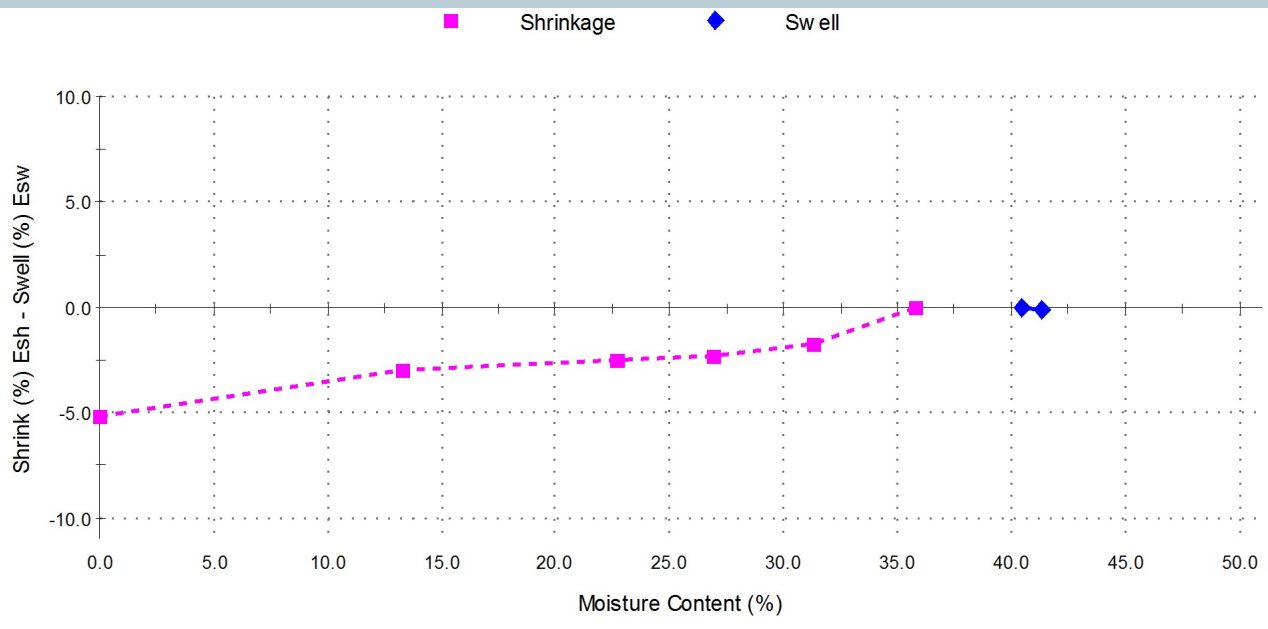
Swell Test — AS 1289.7.1.1

Swell on Saturation (%):	-0.1
Moisture Content before (%):	40.5
Moisture Content after (%):	41.4
Est. Unc. Comp. Strength before (kPa):	275
Est. Unc. Comp. Strength after (kPa):	275

Shrink Test — AS 1289.7.1.1

Shrink on drying (%):	5.2
Shrinkage Moisture Content (%):	35.8
Est. inert material (%):	1%
Crumbling during shrinkage:	1%
Cracking during shrinkage:	5%

Shrink Swell



Shrink Swell Index - Iss (%): 2.9

Comments

Not accredited
Est. Unc. Comp. Strength readings are not IANZ Endorsed as part of this Report.
Work Order No : ETAM24W01200
Tested By: JM

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Shrink Swell Index Report

Report No: SSI:ETAM24S-05128
Issue No: 1

Client: Tetra Tech Coffey (NZ) Limited- Auckland
Coffey House, Level 4, Teed Street
New Market Auckland 1023

Principal: Stephen Parkes
Project No.: 773-ETAM01553
Project Name: 773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.: - **TRN:** -

Approved Signatory: James McKelvey
(Senior Technician)
IANZ Accredited Laboratory Number:105
Date of Issue: 12/06/2024

Sample Details

Sample ID:	ETAM24S-05128	**Sampling Method:**	Unknown (Not IANZ Endorsed)
Date Sampled:	27/05/2024	**Material:**	Undisturbed Soil
Date Submitted:	30/05/2024	**Source:**	Unknown (Sampled by Client)
Date Tested:	5/06/2024		
Project Location:	117 Kowhai Road, Orewa		
Sample Location:	PT04, 0.2 - 0.3 m		
Borehole Number:	PT04		
Borehole Depth (m):	0.2 - 0.3		

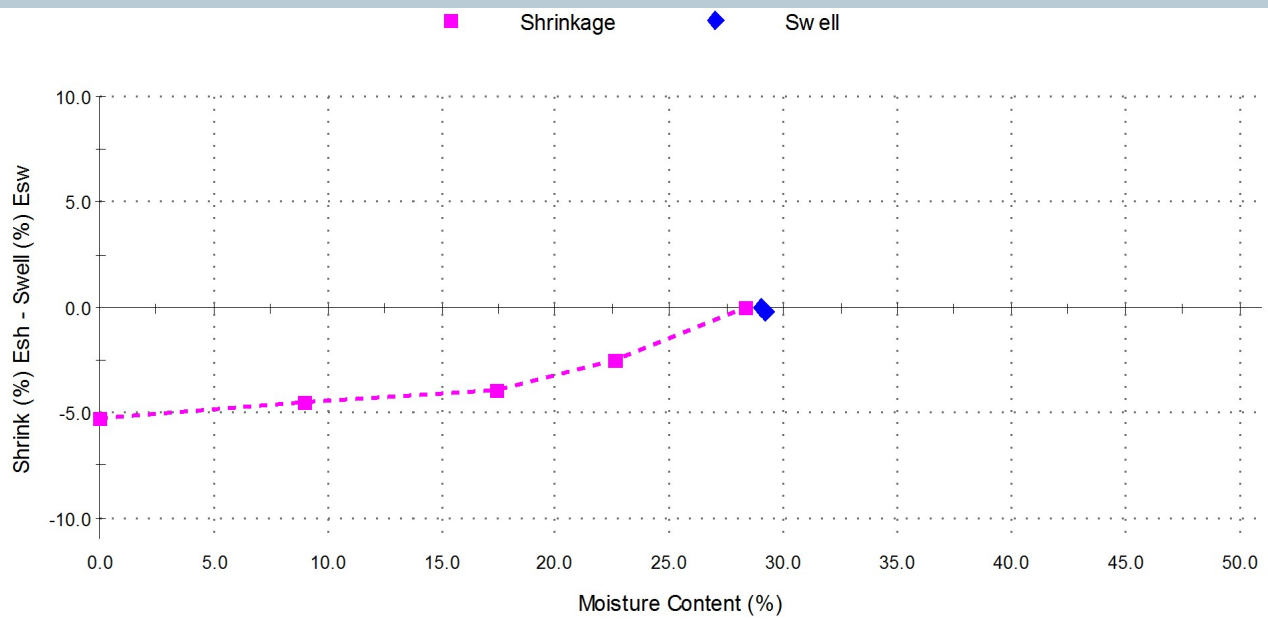
Swell Test — AS 1289.7.1.1

Swell on Saturation (%):	-0.2
Moisture Content before (%):	29.0
Moisture Content after (%):	29.2
Est. Unc. Comp. Strength before (kPa):	225
Est. Unc. Comp. Strength after (kPa):	275

Shrink Test — AS 1289.7.1.1

Shrink on drying (%):	5.3
Shrinkage Moisture Content (%):	28.4
Est. inert material (%):	4%
Crumbling during shrinkage:	0.5%
Cracking during shrinkage:	0.5%

Shrink Swell



Shrink Swell Index - Iss (%): 3.0

Comments

Not accredited
Est. Unc. Comp. Strength readings are not IANZ Endorsed as part of this Report.
Work Order No : ETAM24W01200
Tested By: JM

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Shrink Swell Index Report

Report No: SSI:ETAM23S-05111
Issue No: 1

Client: Tetra Tech Coffey (NZ) Limited- Auckland
Coffey House, Level 4, Teed Street
New Market Auckland 1023

Principal: Stephen Parkes
Project No.: 773-ETAM01553
Project Name: 773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.: - **TRN:** -

Tests indicated as not accredited are outside the scope of the laboratory's accreditation.

Approved Signatory: James McKelvey
(Senior Technician)
IANZ Accredited Laboratory Number:105
Date of Issue: 6/07/2023

Sample Details

Sample ID:	ETAM23S-05111	**Sampling Method:**	Unknown (Not IANZ Endorsed)
Date Sampled:	21/06/2023	**Material:**	Undisturbed Soil
Date Submitted:	23/06/2023	**Source:**	Unknown (Sampled by Client)
Date Tested:	26/06/2023		
Project Location:	117 Kowhai Road, Orewa		
Sample Location:	PT19		
Borehole Number:	PT19		
Borehole Depth (m):	-		

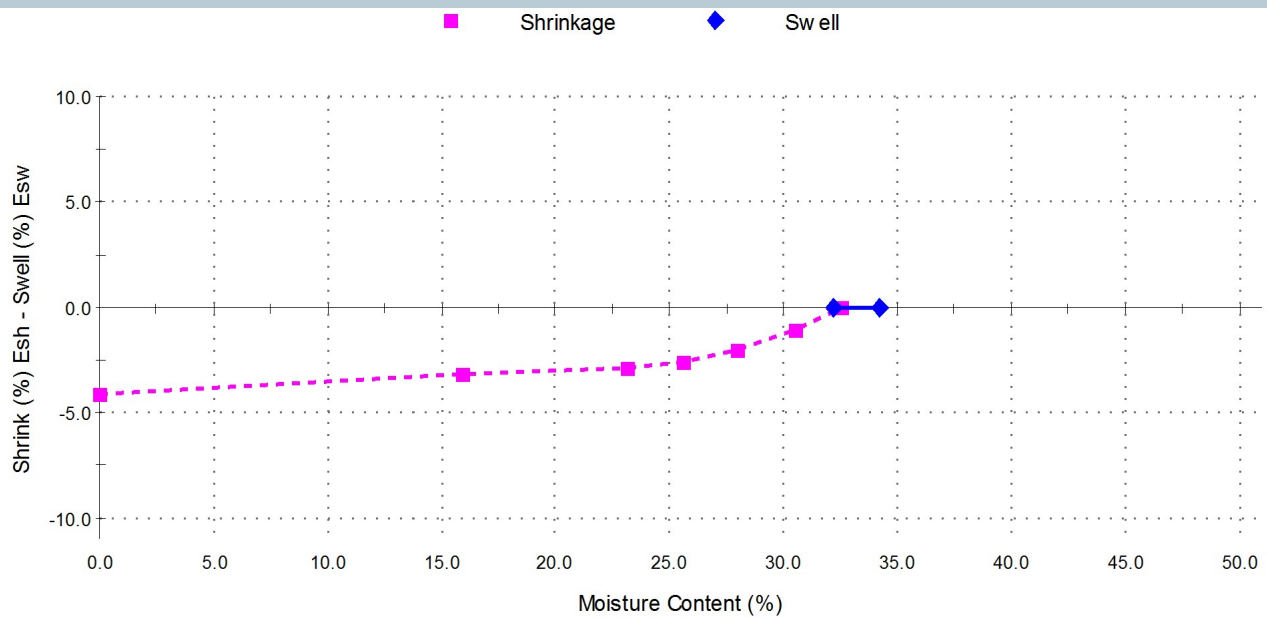
Swell Test — AS 1289.7.1.1

Swell on Saturation (%):	0.0
Moisture Content before (%):	32.2
Moisture Content after (%):	34.2
Est. Unc. Comp. Strength before (kPa):	450+
Est. Unc. Comp. Strength after (kPa):	450+

Shrink Test — AS 1289.7.1.1

Shrink on drying (%):	4.1
Shrinkage Moisture Content (%):	32.6
Est. inert material (%):	1%
Crumbling during shrinkage:	0.5%
Cracking during shrinkage:	1.5%

Shrink Swell



Shrink Swell Index - Iss (%): 2.3

Comments

Not accredited
Est. Unc. Comp. Strength readings are not IANZ Endorsed as part of this Report.
Work Order No : ETAM23W01213
Tested By: JM

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Shrink Swell Index Report

Report No: SSI:ETAM23S-05112
Issue No: 1

Client: Tetra Tech Coffey (NZ) Limited- Auckland
Coffey House, Level 4, Teed Street
New Market Auckland 1023

Principal: Stephen Parkes
Project No.: 773-ETAM01553
Project Name: 773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.: - **TRN:** -

Tests indicated as not accredited are outside the scope of the laboratory's accreditation.
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Approved Signatory: James McKelvey
(Senior Technician)
IANZ Accredited Laboratory Number:105
Date of Issue: 6/07/2023

Sample Details

Sample ID:	ETAM23S-05112	**Sampling Method:**	Unknown (Not IANZ Endorsed)
Date Sampled:	21/06/2023	**Material:**	Undisturbed Soil
Date Submitted:	23/06/2023	**Source:**	Unknown (Sampled by Client)
Date Tested:	27/06/2023		
Project Location:	117 Kowhai Road, Orewa		
Sample Location:	PT20		
Borehole Number:	PT20		
Borehole Depth (m):	-		

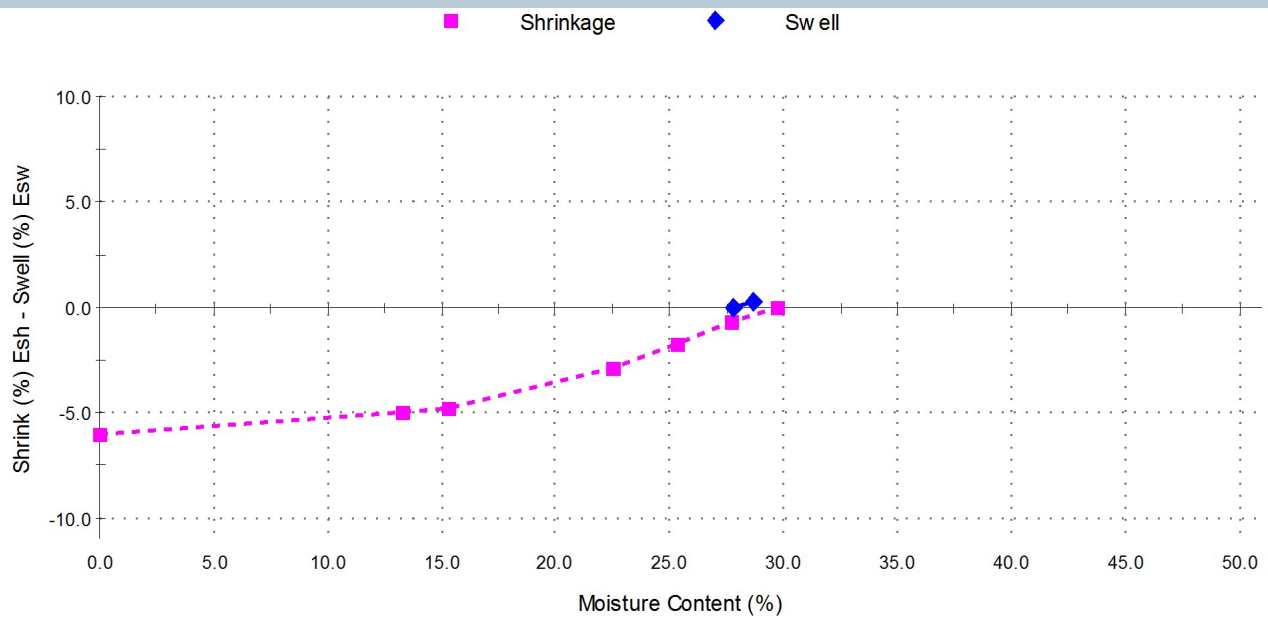
Swell Test — AS 1289.7.1.1

Swell on Saturation (%):	0.2
Moisture Content before (%):	27.8
Moisture Content after (%):	28.7
Est. Unc. Comp. Strength before (kPa):	425
Est. Unc. Comp. Strength after (kPa):	350

Shrink Test — AS 1289.7.1.1

Shrink on drying (%):	6.0
Shrinkage Moisture Content (%):	29.7
Est. inert material (%):	6%
Crumbling during shrinkage:	0.5%
Cracking during shrinkage:	0.5%

Shrink Swell



Shrink Swell Index - Iss (%): 3.4

Comments

Not accredited
Est. Unc. Comp. Strength readings are not IANZ Endorsed as part of this Report.
Work Order No : ETAM23W01213
Tested By: JM

APPENDIX D: EARTHWORKS FIELD DENSITY SUMMARY SHEETS

Coffey Services NZ Ltd
144A Cryers Road, East Tamaki, Auckland 2103
PO Box 58877, Botany, Manukau, Auckland 2163
t +64 92723375 f +92723378
www.coffey.com

Client:	Coffey Services NZ Ltd (Auckland)	**PROJECT CODE:**	773-ETAM00991AA
Address	PO Box 8261, Symonds Street, Auckland 1150	Page:	1 of 2
Attention:	Stephen Parkes		
c.c:	-		
Project:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6		
Location:	Access off Arran Drive, Orewa		

IANZ ACCREDITED LABORATORY — All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Approved Signatory: Cesar Pura
Issue date: 19/02/2020

Test method: Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM…	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL(m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa (UTP = Unable to penetrate)				Wet Density (T/m^3)	Oven Water Content (%)	Dry Density (T/m^3)	Solid Density (T/m^3) Assumed	Air Voids (%)
12/02/2020	20W00319	TR	**141**	Fill	Silty CLAY	Gully 1	1749157	5948822	35.70	150		189	150	202	202	1.90	27.6	1.49	2.70	4
12/02/2020	20W00319	TR	**142**	Fill	Silty CLAY	Gully 1	1749174	5948806	35.50	150		189	198	202	202	1.91	28.9	1.48	2.70	2
12/02/2020	20W00319	TR	**143**	Fill	Silty CLAY	Gully 1	1749189	5948816	35.30	150		180	189	202	157	1.89	26.7	1.49	2.70	5
12/02/2020	20W00319	TR	**144**	Fill	Silty CLAY	Shearkey 1	1749270	5949028	7.20	150		162	185	150	157	1.75	44.4	1.21	2.70	1
12/02/2020	20W00319	TR	**145**	Fill	Silty CLAY	Shearkey 1	1749288	5949031	6.70	150		185	202	173	171	1.75	36.0	1.29	2.70	6

Coffey Services NZ Ltd
144A Cryers Road, East Tamaki, Auckland 2103, New Zealand
PO Box 58 877, Botany, Manukau 2163, New Zealand
t+64 9 272 3375 f+64 9 272 3378 www.coffey.com

SITE PLAN

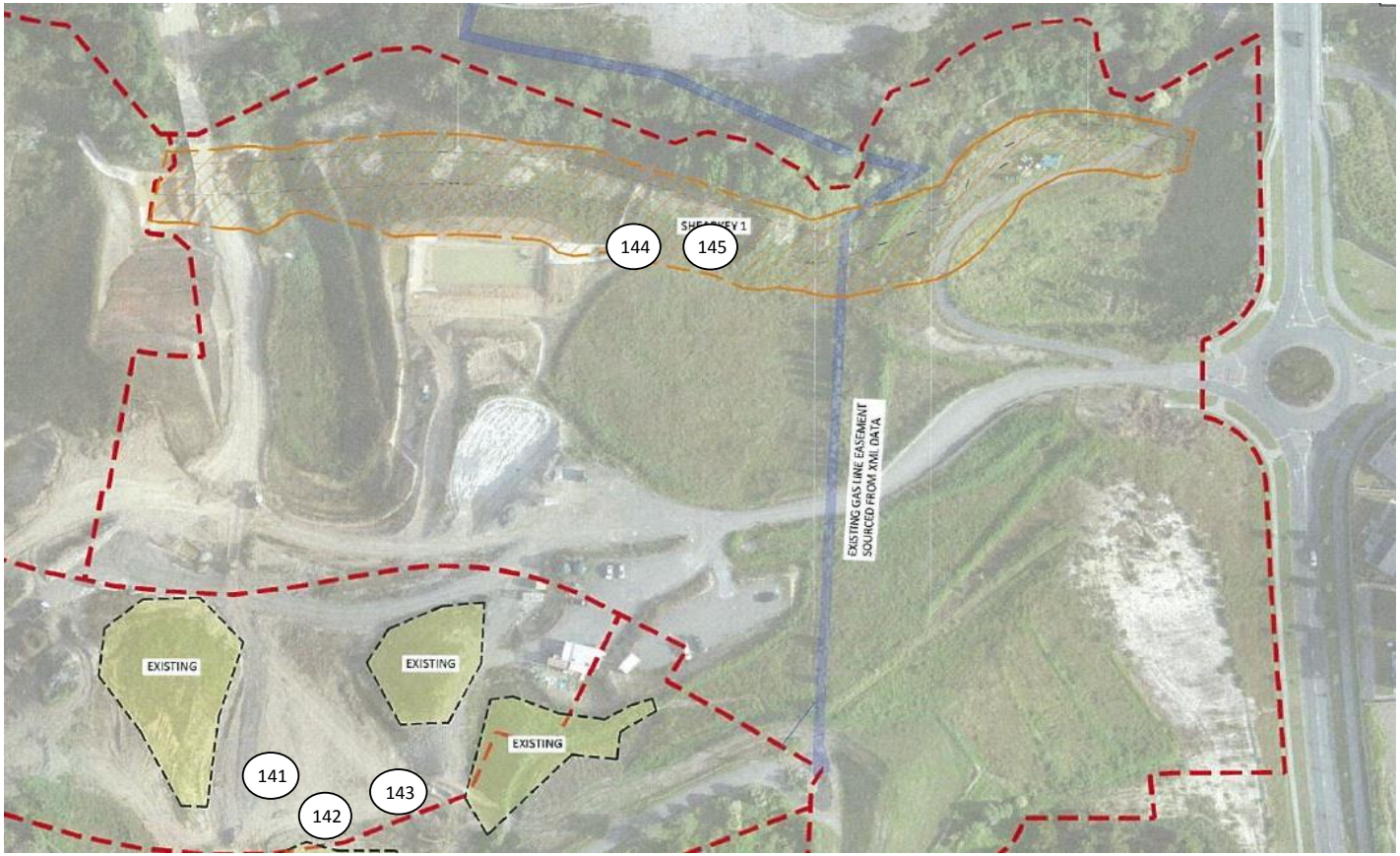
NOT TO SCALE

Project No: 773-ETAM00991AA
Work Order No: ETAM20W00319
Page No: 2 of 2

Project: 773-AKLGE-206639 - 773-Millwater-Orewa Precinct 6

Location: As below

Tested by: TR
Date tested: 12/02/2020



Issue date: 050517

Coffey Services NZ Ltd
144A Cryers Road, East Tamaki, Auckland 2103
PO Box 58877, Botany, Manukau, Auckland 2163
t +64 92723375 f +92723378
www.coffey.com

Client:	Coffey Services NZ Ltd (Auckland)	**PROJECT CODE:**	773-ETAM00991AA
Address	PO Box 8261, Symonds Street, Auckland 1150	Page:	1 of 2
Attention:	Stephen Parkes		
c.c:	-		
Project:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6		
Location:	Access off Arran Drive, Orewa	Approved Signatory:	Cesar Pura
		Issue date:	19/02/2020

IANZ ACCREDITED LABORATORY — All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Test method: Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM…	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL(m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa (UTP = Unable to penetrate)				Wet Density (T/m^3)	Oven Water Content (%)	Dry Density (T/m^3)	Solid Density (T/m^3) Assumed	Air Voids (%)
13/02/2020	20W00321	LW	**146**	Fill	Clayey SILT	Shearkey 1	1749264	5949026	8.80	150		145	179	184+	151	1.83	32.4	1.38	2.70	4
13/02/2020	20W00321	LW	**147**	Fill	Clayey SILT	Shearkey 1	1749280	5949021	8.60	150		138	147	179	174	1.88	28.6	1.46	2.70	4
13/02/2020	20W00321	LW	**148**	Fill	Clayey SILT	Refer to plan	1749185	5948815	35.80	150		170	147	184+	156	1.88	31.3	1.43	2.70	2
13/02/2020	20W00321	LW	**149**	Fill	Clayey SILT	Refer to plan	1749206	5948834	35.30	150		179	161	134	147	1.78	33.0	1.34	2.70	6

Coffey Services NZ Ltd
144A Cryers Road, East Tamaki, Auckland 2103, New Zealand
PO Box 58 877, Botany, Manukau 2163, New Zealand
t+64 9 272 3375 f+64 9 272 3378 www.coffey.com

SITE PLAN

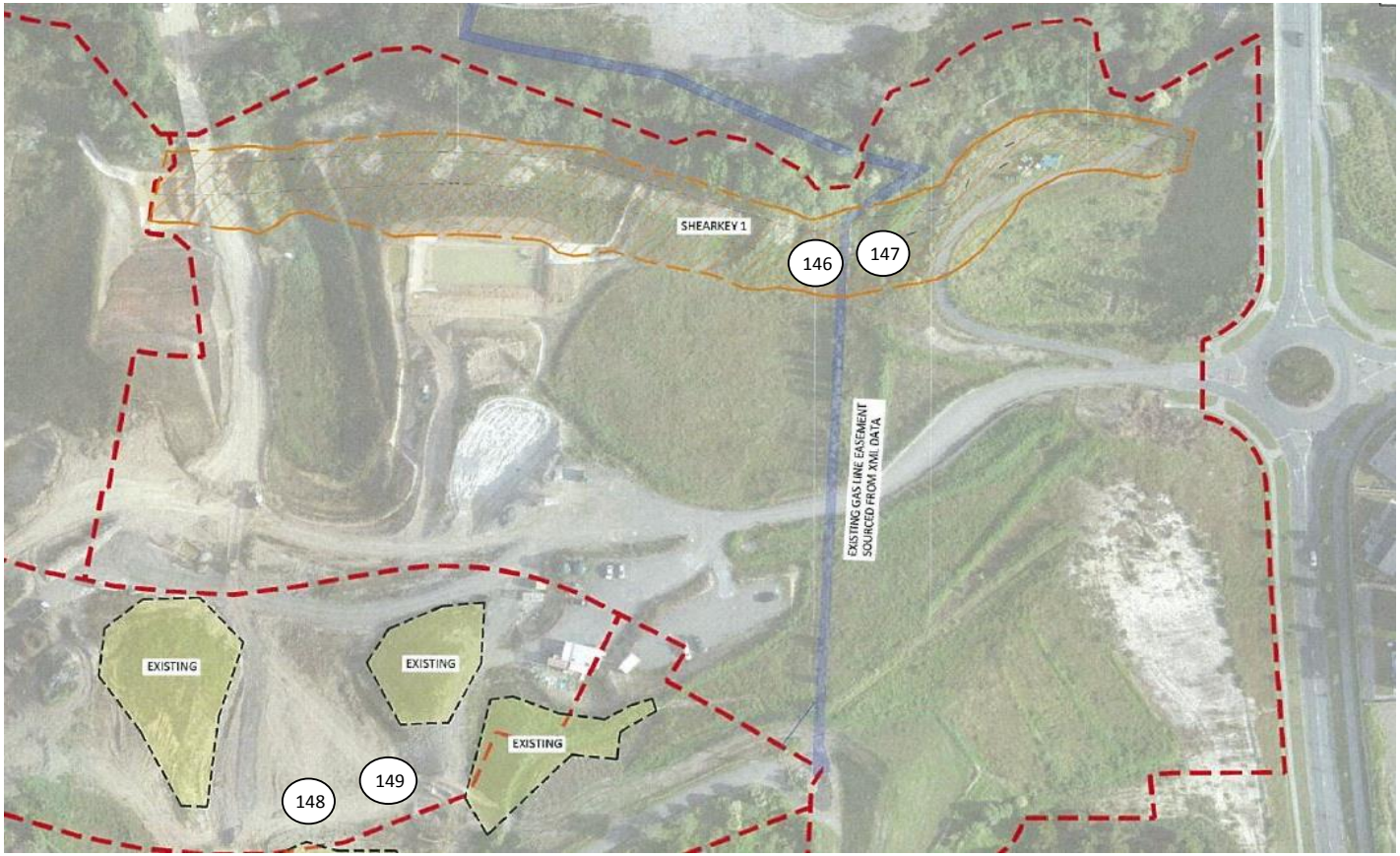
NOT TO SCALE

Project No: 773-ETAM00991AA
Work Order No: ETAM20W00321
Page No: 2 of 2

Project: 773-AKLGE-206639 - 773-Millwater-Orewa Precinct 6

Location: As below

Tested by: LW
Date tested: 13/02/2020



Issue date: 050517

Coffey Services NZ Ltd
144A Cryers Road, East Tamaki, Auckland 2103
PO Box 58877, Botany, Manukau, Auckland 2163
t +64 92723375 f +92723378
www.coffey.com

Client:	Coffey Services NZ Ltd (Auckland)	**PROJECT CODE:**	773-ETAM00991AA
Address	PO Box 8261, Symonds Street, Auckland 1150	Page:	1 of 2
Attention:	Stephen Parkes		
c.c:	-		
Project:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6		
Location:	Access off Arran Drive, Orewa	Approved Signatory:	Cesar Pura
		Issue date:	19/02/2020

IANZ ACCREDITED LABORATORY — All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Test method: Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM…	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL(m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa (UTP = Unable to penetrate)				Wet Density (T/m^3)	Oven Water Content (%)	Dry Density (T/m^3)	Solid Density (T/m^3) Assumed	Air Voids (%)
14/02/2020	20W00335	LW	**150**	Fill	Clayey SILT	Shearkey 1	1749288	5949021	8.90	150		184	170	184+	179	1.81	35.8	1.33	2.70	3
14/02/2020	20W00335	LW	**151**	Fill	Clayey SILT	Shearkey 1	1749236	5949040	10.50	150		UTP	UTP	UTP	184+	1.88	25.9	1.49	2.70	6
14/02/2020	20W00335	LW	**152**	Fill	Clayey SILT	Refer to plan	1749161	5948823	36.60	150		UTP	UTP	184+	156	1.87	31.9	1.42	2.70	2
14/02/2020	20W00335	LW	**153**	Fill	Clayey SILT	Refer to plan	1749170	5948806	36.60	150		UTP	UTP	UTP	170	1.87	31.7	1.42	2.70	2
14/02/2020	20W00335	LW	**154**	Fill	Clayey SILT	Refer to plan	1749201	5948819	36.50	150		184	165	156	184+	1.85	32.0	1.40	2.70	3

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SITE PLAN

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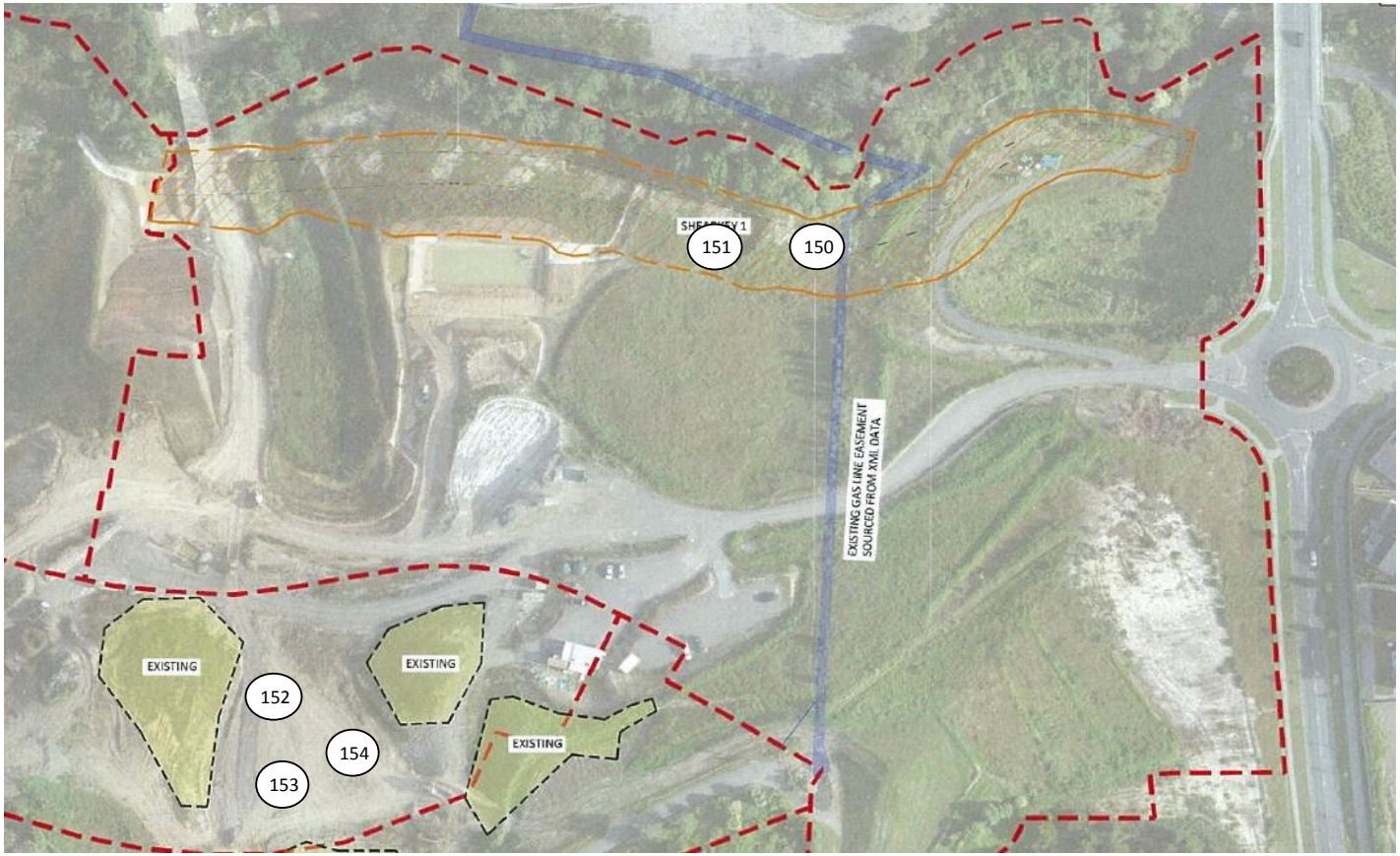
Project No: 773-ETAM00991AA
Work Order No: ETAM20W00335
Page No: 2 of 2

Project: 773-AKLGE-206639 - 773-Millwater-Orewa Precinct 6

Location: As below

Tested by: LW
Date tested: 14/02/2020



Issue date: 050517

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Client:	Coffey Services NZ Ltd (Auckland)
Address	PO Box 8261, Symonds Street, Auckland 1150
Attention:	Stephen Parkes
c.c:	-
Project:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6
Location:	Access off Arran Drive, Orewa

PROJECT CODE: 773-ETAM00991AA

Page: 1 of 2

IANZ ACCREDITED LABORATORY — All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Approved Signatory: Cesar Pura

Issue date: 2/24/2020

Test method: Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM…	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL(m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa (UTP = Unable to penetrate)				Wet Density (T/m^3)	Oven Water Content (%)	Dry Density (T/m^3)	Solid Density (T/m^3) Assumed	Air Voids (%)
19/02/2020	20W00361	TR	**163**	Fill	Silty CLAY	Gully 1	1749179	5948827	37.20	150		155	UTP	169	UTP	1.89	24.7	1.52	2.70	6
19/02/2020	20W00361	TR	**164**	Fill	Silty CLAY	Gully 1	1749174	5948807	36.80	150		155	162	169	155	1.86	31.3	1.42	2.70	3
19/02/2020	20W00361	TR	**165**	Fill	Silty CLAY	Gully 1	1749219	5948842	37.50	150		UTP	UTP	UTP	UTP	1.86	33.4	1.39	2.70	2
19/02/2020	20W00361	TR	**166**	Fill	Silty CLAY	Shearkey 1	1749310	5949023	5.90	150		143	148	155	182	1.81	35.6	1.33	2.70	3
19/02/2020	20W00361	TR	**167**	Fill	Silty CLAY	Shearkey 1	1749320	5949018	5.70	150		148	155	147	162	1.81	33.3	1.36	2.70	5

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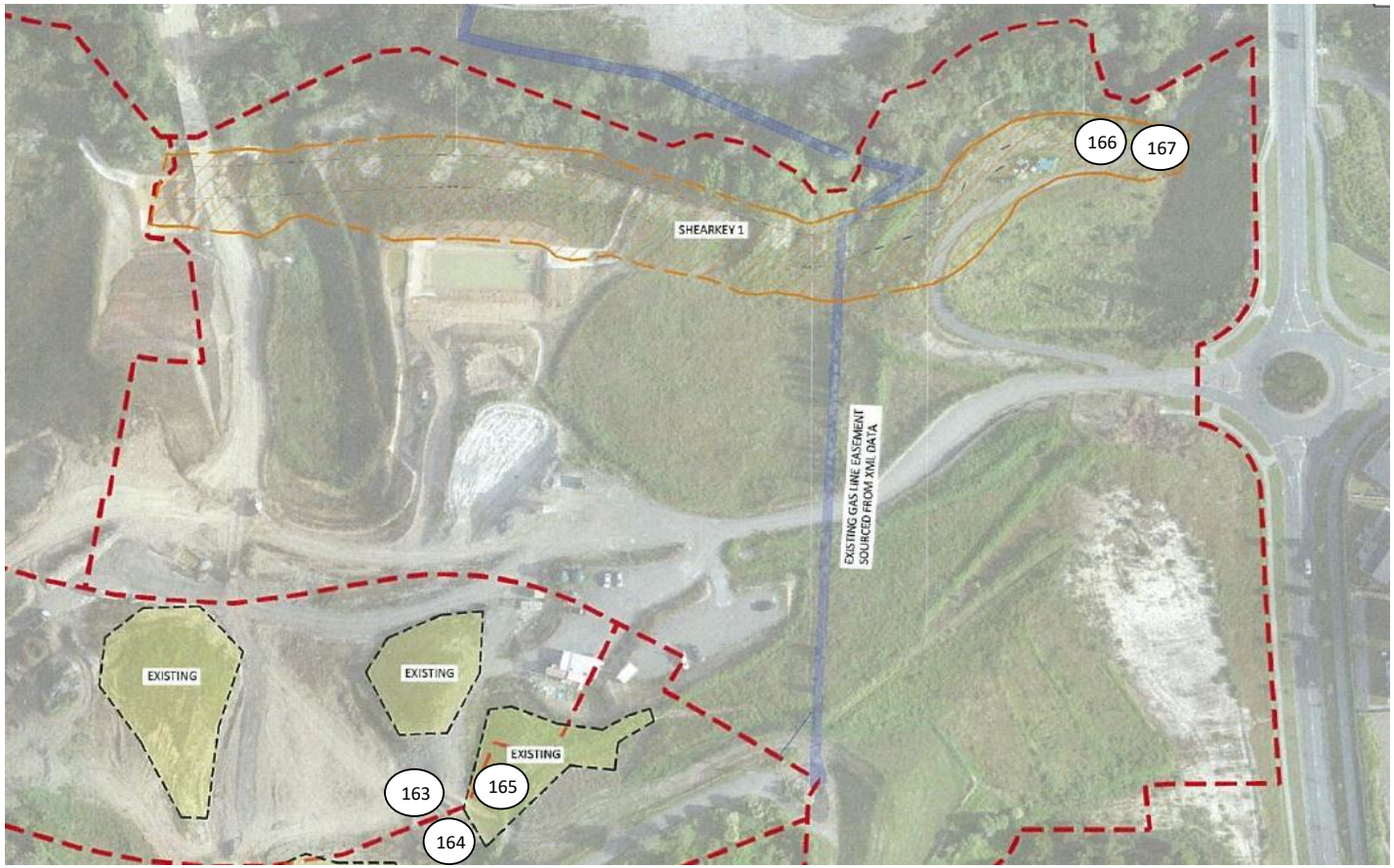
Project No:	**773-ETAM00991AA**
Work Order No:	ETAM20W00361
Page No:	2 of 2

Project: 773-AKLGE-206639 - 773-Millwater-Orewa Precinct 6

Location: As below

Tested by: TR

Date tested: 19/02/20



Issue date: 050517

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Client:	Coffey Services NZ Ltd (Auckland)	**PROJECT CODE:**	773-ETAM00991AA
Address	PO Box 8261, Symonds Street, Auckland 1150	Page:	1 of 2
Attention:	Stephen Parkes		
c.c:	-		
Project:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6		
Location:	Access off Arran Drive, Orewa	Approved Signatory:	Cesar Pura
		Issue date:	27/02/2020

IANZ ACCREDITED LABORATORY — All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

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Date	Work Order No: ETAM…	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL(m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa (UTP = Unable to penetrate)				Wet Density (T/m^3)	Oven Water Content (%)	Dry Density (T/m^3)	Solid Density (T/m^3) Assumed	Air Voids (%)
20/02/2020	20W00368	TR	**168**	Fill	Silty CLAY	Gully 1	1749153	5948815	37.90	150		155	142	172	169	1.86	31.3	1.42	2.70	3
20/02/2020	20W00368	TR	**169**	Fill	Silty CLAY	Gully 1	1749174	5948814	37.80	150		UTP	UTP	UTP	169	1.88	30.0	1.44	2.70	3
20/02/2020	20W00368	TR	**170**	Fill	Silty CLAY	Gully 1	1749180	5948808	37.50	150		169	159	162	155	1.89	28.8	1.47	2.70	4

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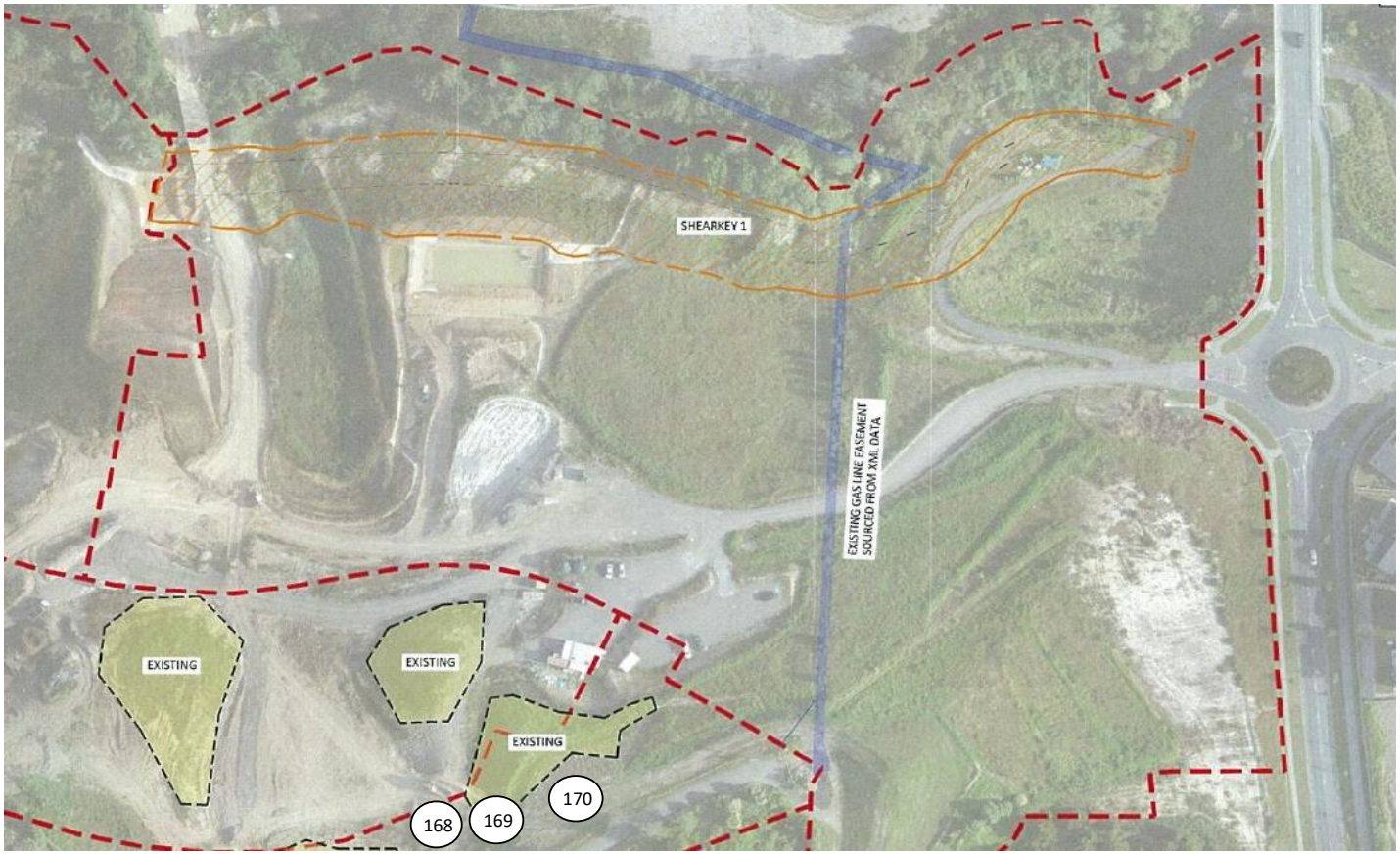
Project No: 773-ETAM00991AA
Work Order No: ETAM20W00368
Page No: 2 of 2

Project: 773-AKLGE-206639 - 773-Millwater-Orewa Precinct 6

Location: As below

Tested by: TR
Date tested: 20/02/20



Issue date: 050517

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Client:	Coffey Services NZ Ltd (Auckland)	**PROJECT CODE:**	773-ETAM00991AA
Address	PO Box 8261, Symonds Street, Auckland 1150	Page:	1 of 2
Attention:	Stephen Parkes		
c.c:	-		
Project:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6		
Location:	Access off Arran Drive, Orewa	Approved Signatory:	Cesar Pura
		Issue date:	27/02/2020

IANZ ACCREDITED LABORATORY — All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Test method: Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM…	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL(m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa (UTP = Unable to penetrate)				Wet Density (T/m^3)	Oven Water Content (%)	Dry Density (T/m^3)	Solid Density (T/m^3) Assumed	Air Voids (%)
21/02/2020	20W00376	TR	**171**	Fill	Silty CLAY	Gully 1	1749154	5948806	38.50	150		UTP	UTP	UTP	148	1.92	28.4	1.49	2.70	2
21/02/2020	20W00376	TR	**172**	Fill	Silty CLAY	Gully 1	1749177	5948806	38.00	150		142	169	170	142	1.88	25.5	1.50	2.70	6
21/02/2020	20W00376	TR	**173**	Fill	Silty CLAY	Gully 1	1749181	5948819	37.00	150		181+	181+	181+	181+	1.90	25.3	1.52	2.70	5
21/02/2020	20W00376	TR	**174**	Fill	Silty CLAY	Gully 1	1749198	5948816	37.80	150		UTP	169	169	155	1.88	29.3	1.45	2.70	4

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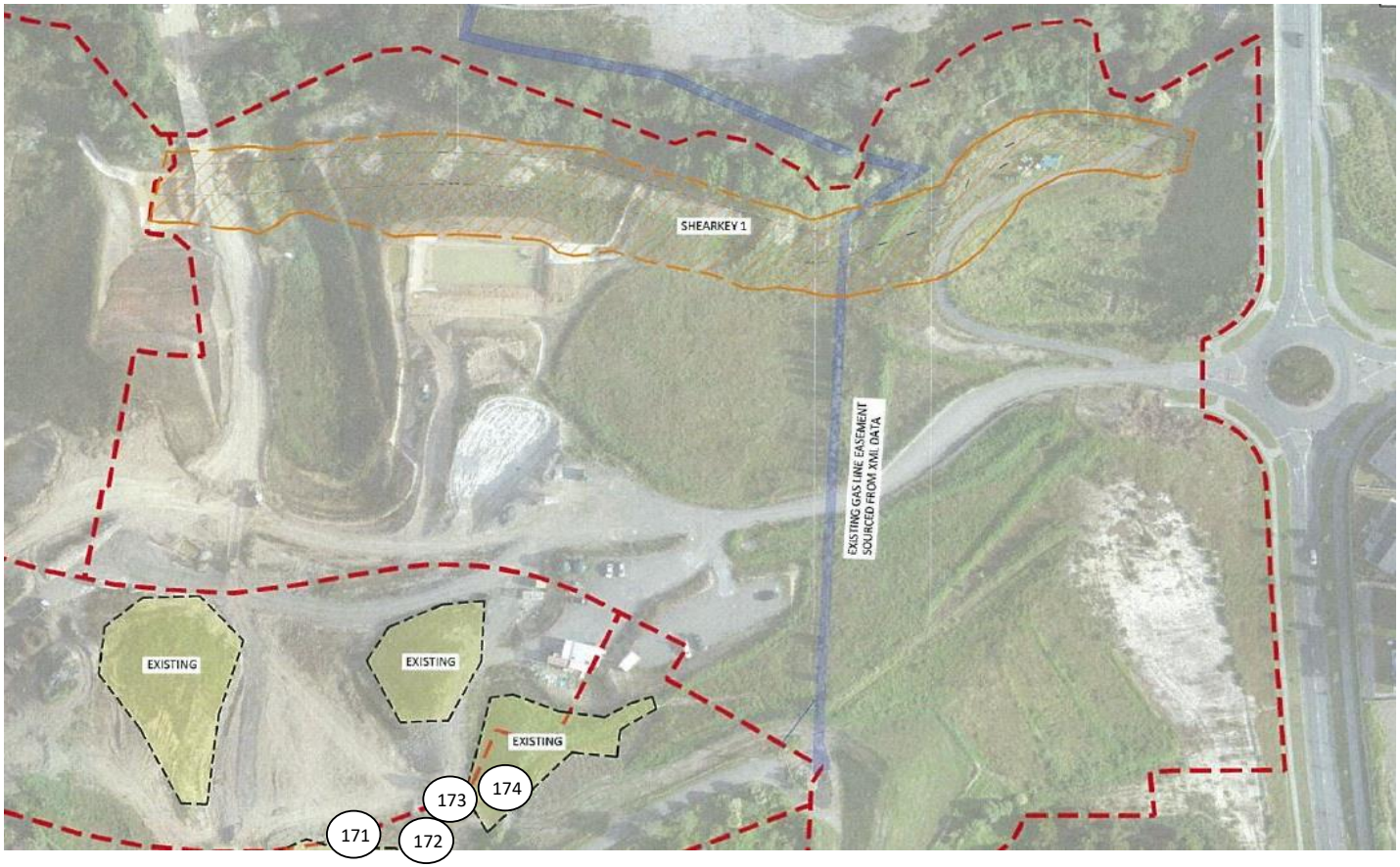
Project No: 773-ETAM00991AA
Work Order No: ETAM20W00376
Page No: 2 of 2

Project: 773-AKLGE-206639 - 773-Millwater-Orewa Precinct 6

Location: As below

Tested by: TR
Date tested: 2/21/2020



Issue date: 050517

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Client:	Coffey Services NZ Ltd (Auckland)	**PROJECT CODE:**	773-ETAM00991AA
Address	PO Box 8261, Symonds Street, Auckland 1150	Page:	1 of 2
Attention:	Stephen Parkes		
c.c:	-		
Project:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6		
Location:	Access off Arran Drive, Orewa	Approved Signatory:	Cesar Pura
		Issue date:	5/03/2020

IANZ ACCREDITED LABORATORY — All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Test method: Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM…	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL(m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa (UTP = Unable to penetrate)				Wet Density (T/m^3)	Oven Water Content (%)	Dry Density (T/m^3)	Solid Density (T/m^3) Assumed	Air Voids (%)
24/02/2020	20W00401	TR	**175**	Fill	Silty CLAY	Gully 1	1749191	5948824	38.50	150		148	169	162	176	1.82	35.1	1.35	2.70	3
24/02/2020	20W00401	TR	**176**	Fill	Silty CLAY	Gully 1	1749206	5948812	38.40	150		UTP	UTP	UTP	UTP	1.84	28.7	1.43	2.70	6
24/02/2020	20W00401	TR	**177**	Fill	Silty CLAY	Gully 1	1749165	5948801	38.90	150		UTP	UTP	UTP	UTP	2.00	21.0	1.65	2.70	4
24/02/2020	20W00401	TR	**178**	Fill	Silty CLAY	Gully 1	1749141	5948813	39.40	150		169	148	181+	181+	1.85	29.2	1.43	2.70	5

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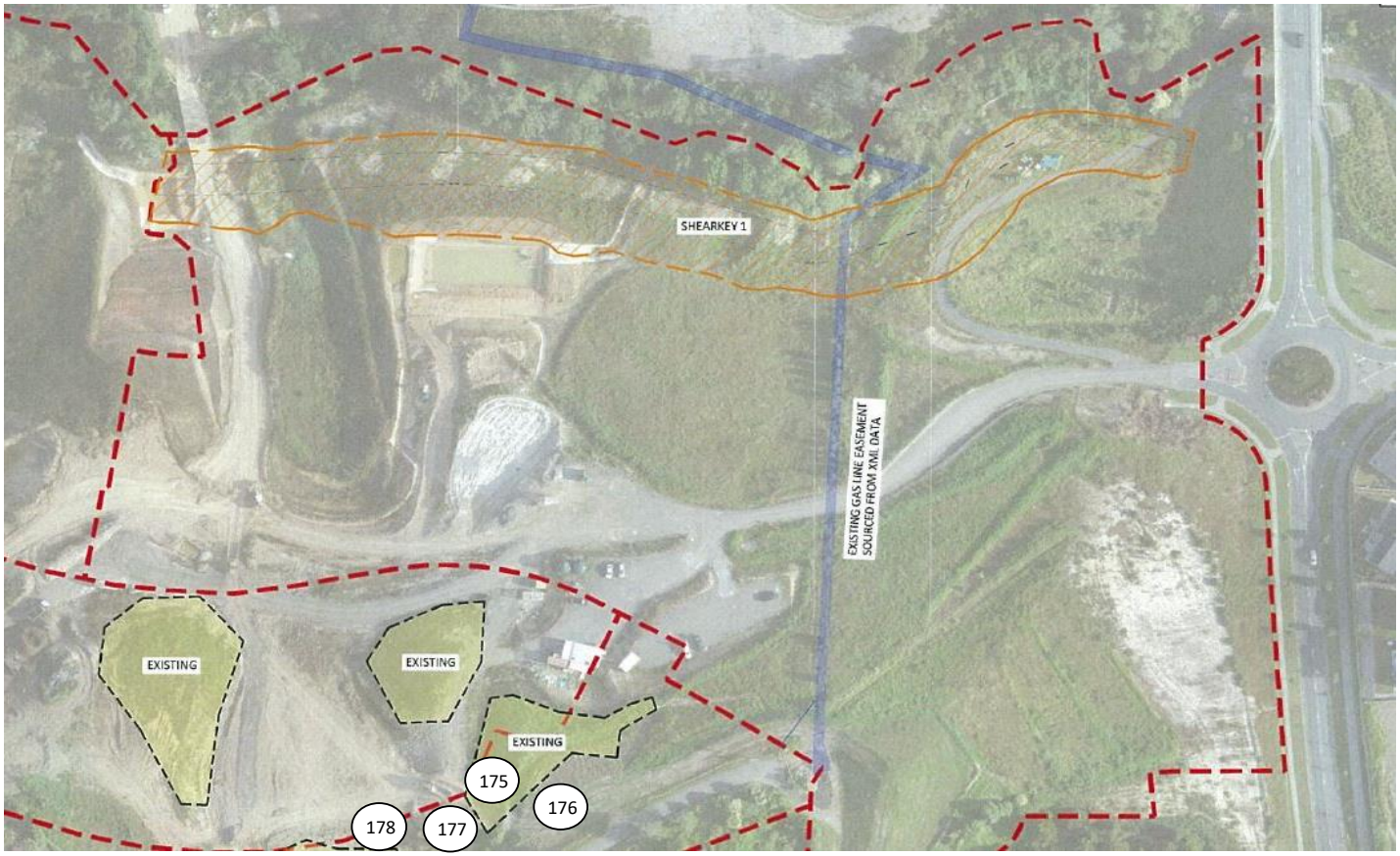
Project No: 773-ETAM00991AA
Work Order No: ETAM20W00401
Page No: 2 of 2

Project: 773-AKLGE-206639 - 773-Millwater-Orewa Precinct 6

Location: As below

Tested by: TR
Date tested: 24/02/2020



Issue date: 050517

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Client:	Coffey Services NZ Ltd (Auckland)	**PROJECT CODE:**	773-ETAM00991AA
Address	PO Box 8261, Symonds Street, Auckland 1150	Page:	1 of 2
Attention:	Stephen Parkes		
c.c:	-		
Project:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6		
Location:	Access off Arran Drive, Orewa	Approved Signatory:	Cesar Pura
		Issue date:	11/03/2020

IANZ ACCREDITED LABORATORY — All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Test method: Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM…	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL(m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa (UTP = Unable to penetrate)				Wet Density (T/m^3)	Oven Water Content (%)	Dry Density (T/m^3)	Solid Density (T/m^3) Assumed	Air Voids (%)
25/02/2020	20W00403	TR	**179**	Fill	Silty CLAY	Gully 1	1749183	5948799	39.50	150		181+	181+	181+	181+	1.85	27.1	1.45	2.70	7
25/02/2020	20W00403	TR	**180**	Fill	Silty CLAY	Gully 1	1749156	5948809	39.80	150		169	176	179	181	1.90	30.1	1.46	2.70	2
25/02/2020	20W00403	TR	**181**	Fill	Silty CLAY	Shearkey 1	1749347	5949027	4.50	150		169	162	155	166	1.76	36.3	1.29	2.70	5

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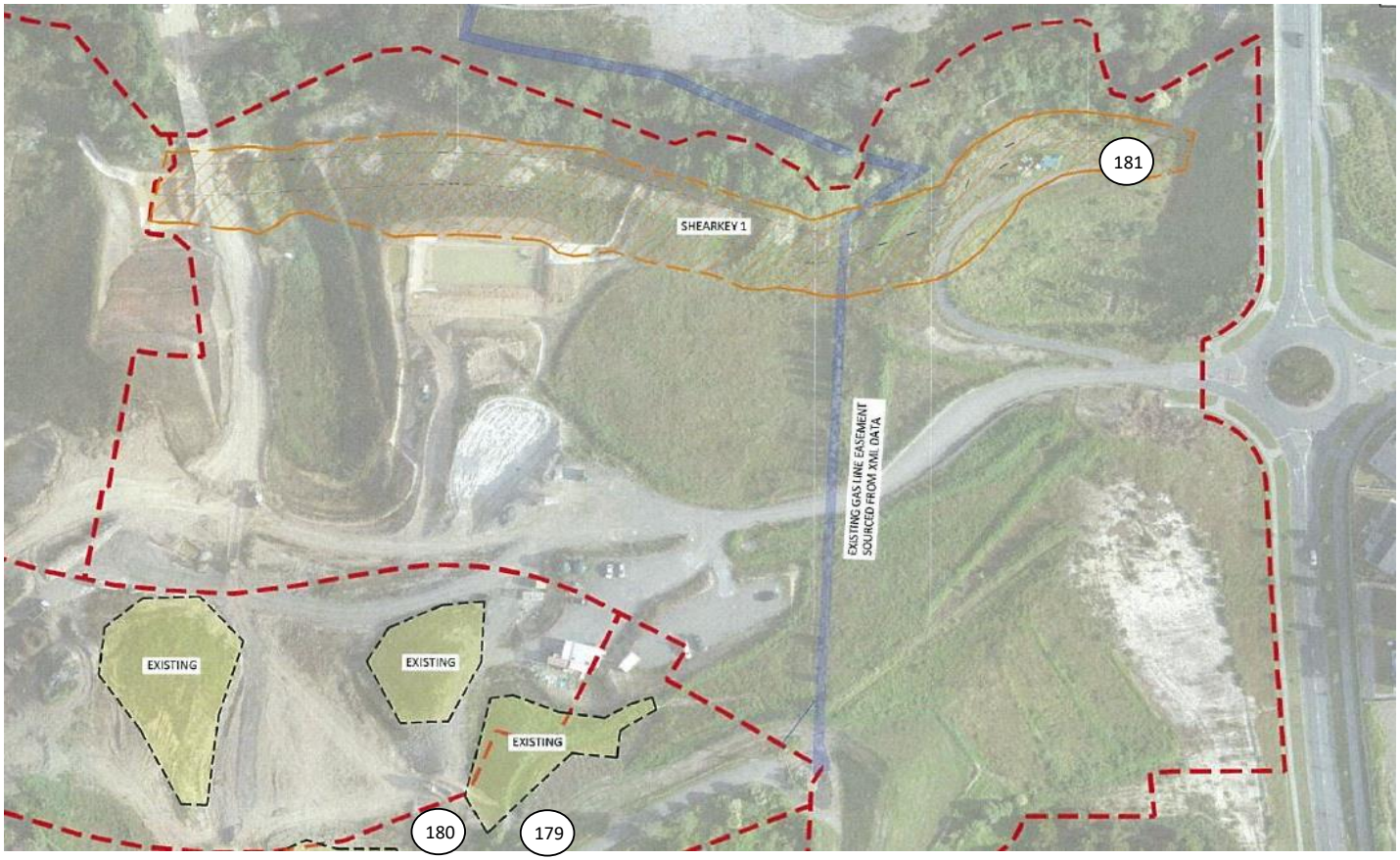
Project No: 773-ETAM00991AA
Work Order No: ETAM20W00403
Page No: 2 of 2

Project: 773-AKLGE-206639 - 773-Millwater-Orewa Precinct 6

Location: As below

Tested by: TR
Date tested: 25/02/2020



Issue date: 050517

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Client:	Coffey Services NZ Ltd (Auckland)	**PROJECT CODE:**	773-ETAM00991AA
Address	PO Box 8261, Symonds Street, Auckland 1150	Page:	1 of 2
Attention:	Stephen Parkes		
c.c:	-		
Project:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6		
Location:	Access off Arran Drive, Orewa	Approved Signatory:	Cesar Pura
		Issue date:	20/03/2020

IANZ ACCREDITED LABORATORY — All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Test method: Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM…	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL(m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa (UTP = Unable to penetrate)				Wet Density (T/m^3)	Oven Water Content (%)	Dry Density (T/m^3)	Solid Density (T/m^3) Assumed	Air Voids (%)
4/03/2020	20W00476	TR	**204**	Fill	Gravelly CLAY	Gully 1	1749168	5948903	27.50	150		181+	181+	181+	181+	1.93	31.7	1.47	2.70	0
4/03/2020	20W00476	TR	**205**	Fill	Gravelly CLAY	Gully 1	1749203	5948894	26.70	150		144	148	181+	181+	1.87	26.3	1.48	2.70	6

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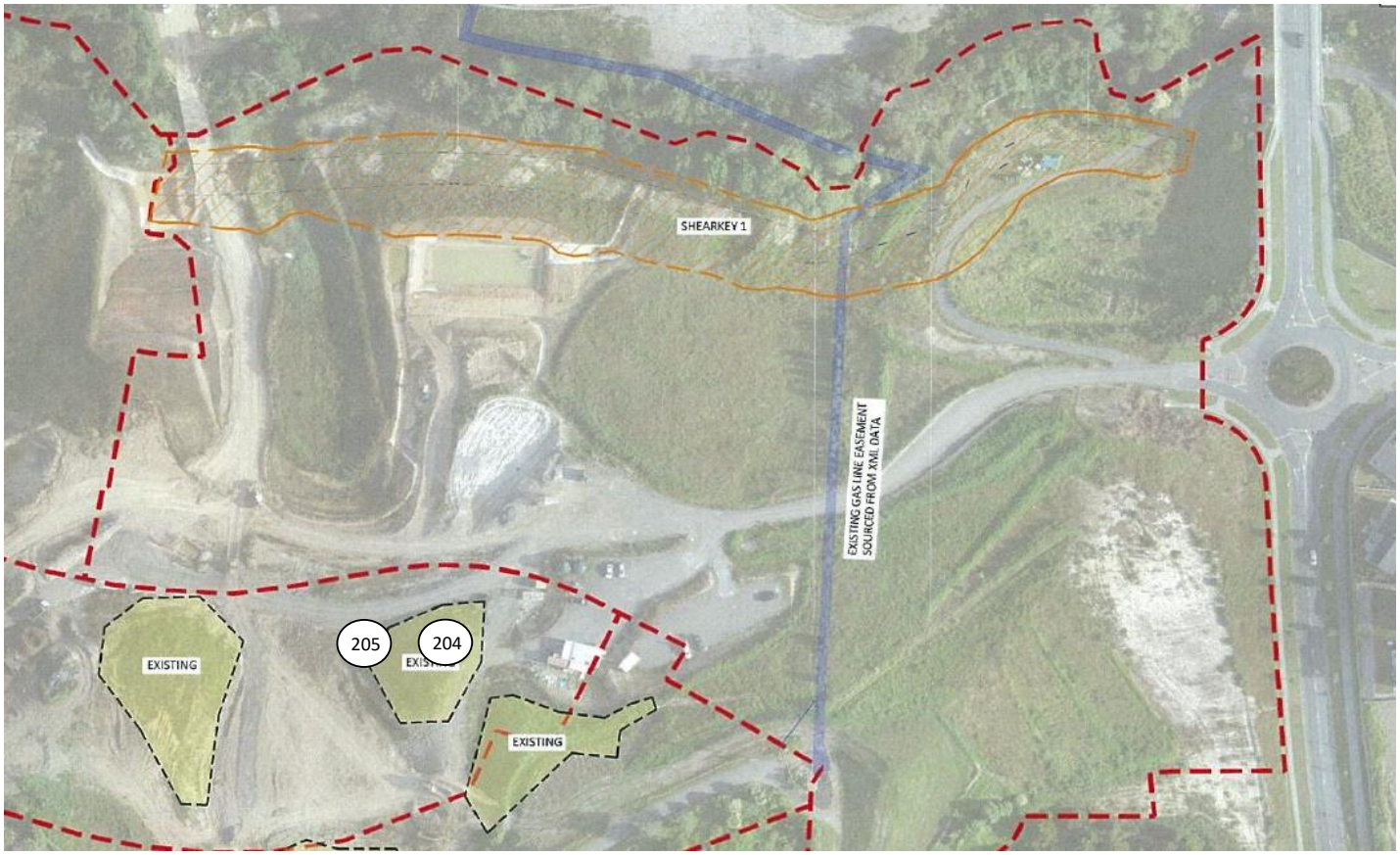
Project No: 773-ETAM00991AA
Work Order No: ETAM20W00476
Page No: 2 of 2

Project: 773-AKLGE-206639 - 773-Millwater-Orewa Precinct 6

Location: As below

Tested by: TR
Date tested: 4/03/2020



Issue date: 050517

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Client:	Coffey Services NZ Ltd (Auckland)	**PROJECT CODE:**	773-ETAM00991AA
Address	PO Box 8261, Symonds Street, Auckland 1150	Page:	1 of 2
Attention:	Stephen Parkes		
c.c:	-		
Project:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6		
Location:	Access off Arran Drive, Orewa	Approved Signatory:	Cesar Pura
		Issue date:	20/03/2020

IANZ ACCREDITED LABORATORY — All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

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Date	Work Order No: ETAM…	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL(m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa (UTP = Unable to penetrate)				Wet Density (T/m^3)	Oven Water Content (%)	Dry Density (T/m^3)	Solid Density (T/m^3) Assumed	Air Voids (%)
5/03/2020	20W00495	TR	**206**	Fill	Silty CLAY	Shearkey 1	1749331	5949010	11.30	150		148	148	154	155	1.84	36.2	1.35	2.70	1
5/03/2020	20W00495	TR	**207**	Fill	Silty CLAY	Shearkey 1	1749340	5949022	10.90	150		181+	181+	181+	181+	1.80	36.9	1.31	2.70	3
5/03/2020	20W00495	TR	**208**	Fill	Silty CLAY	Gully 1	1749192	5948879	27.90	150		181+	181+	181+	181+	1.89	32.3	1.43	2.70	1
5/03/2020	20W00495	TR	**209**	Fill	Gravelly CLAY	Gully 1	1749232	5948908	26.90	150		UTP	181+	181+	181+	1.95	26.8	1.54	2.70	2

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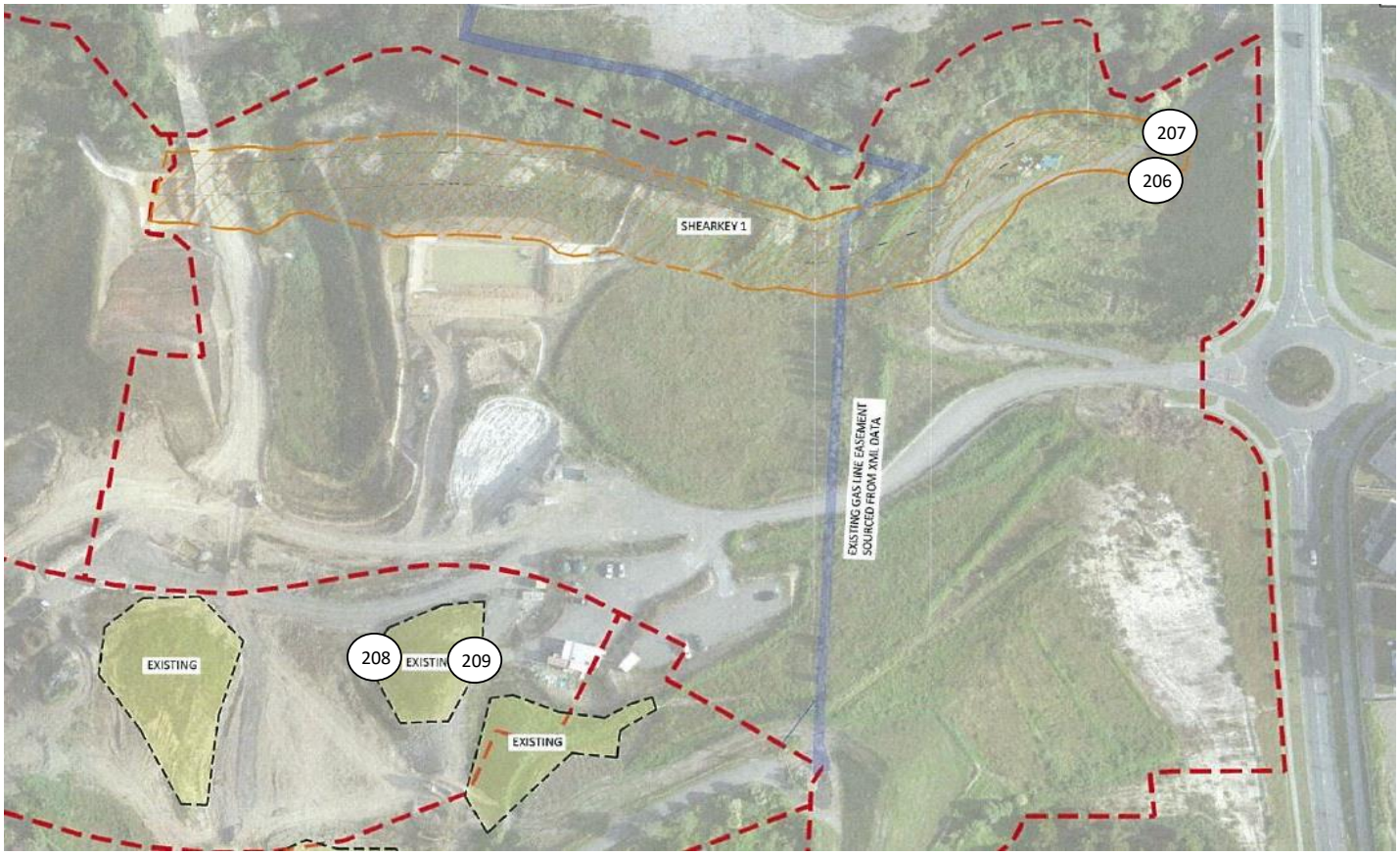
Project No: 773-ETAM00991AA
Work Order No: ETAM20W00495
Page No: 2 of 2

Project: 773-AKLGE-206639 - 773-Millwater-Orewa Precinct 6

Location: As below

Tested by: TR
Date tested: 5/03/2020



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Client:	Coffey Services NZ Ltd (Auckland)	**PROJECT CODE:**	773-ETAM00991AA
Address	PO Box 8261, Symonds Street, Auckland 1150	Page:	1 of 2
Attention:	Stephen Parkes		
c.c:	-		
Project:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6		
Location:	Access off Arran Drive, Orewa	Approved Signatory:	Cesar Pura
		Issue date:	20/03/2020

IANZ ACCREDITED LABORATORY — All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Test method: Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM…	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL(m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa (UTP = Unable to penetrate)				Wet Density (T/m^3)	Oven Water Content (%)	Dry Density (T/m^3)	Solid Density (T/m^3) Assumed	Air Voids (%)
6/03/2020	20W00496	LW	**210**	Fill	Clayey SILT	Behind Wall 700	1749311	5949004	12.05	150		UTP	UTP	UTP	UTP	1.89	24.1	1.52	2.70	7
6/03/2020	20W00496	LW	**211**	Fill	Clayey SILT	Behind Wall 700	1749328	5949002	11.99	150		UTP	UTP	UTP	UTP	1.89	22.8	1.54	2.70	8
6/03/2020	20W00496	LW	**212**	Fill	Clayey SILT	Behind Wall 700	1749328	5949008	12.05	150		UTP	UTP	UTP	UTP	1.90	29.0	1.47	2.70	3
6/03/2020	20W00496	LW	**213**	Fill	Clayey SILT	General Fill	1749221	5948909	27.30	150		UTP	UTP	UTP	UTP	1.85	27.6	1.45	2.70	7
6/03/2020	20W00496	LW	**214**	Fill	Clayey SILT	General Fill	1749180	5948886	28.10	150		UTP	UTP	UTP	UTP	1.89	28.2	1.47	2.70	4

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SITE PLAN

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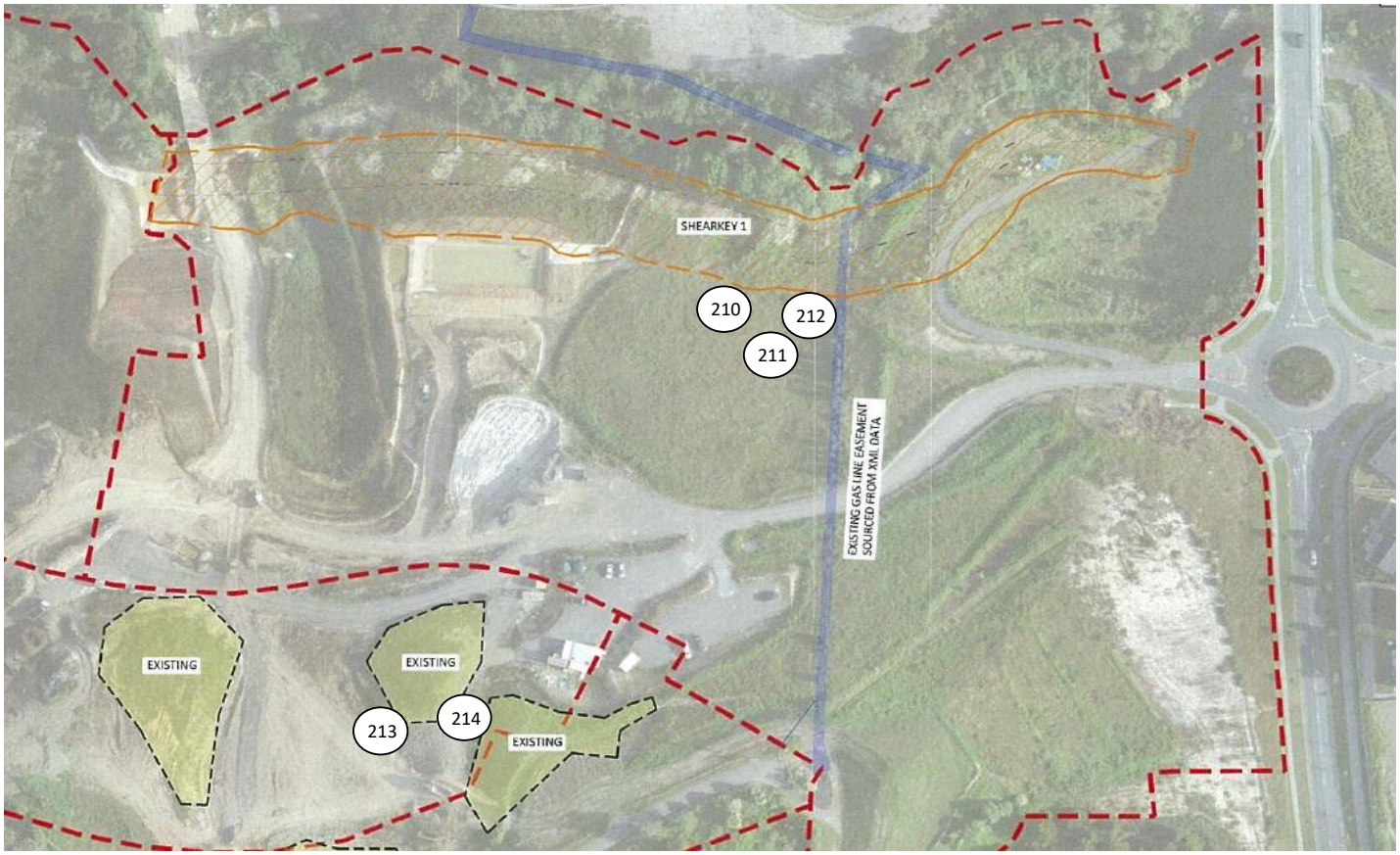
Project No: 773-ETAM00991AA
Work Order No: ETAM20W00496
Page No: 2 of 2

Project: 773-AKLGE-206639 - 773-Millwater-Orewa Precinct 6

Location: As below

Tested by: LW
Date tested: 6/03/2020



Issue date: 050517

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Client:	Coffey Services NZ Ltd (Auckland)	**PROJECT CODE:**	773-ETAM00991AA
Address	PO Box 8261, Symonds Street, Auckland 1150	Page:	1 of 2
Attention:	Stephen Parkes		
c.c:	-		
Project:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6		
Location:	Access off Arran Drive, Orewa	Approved Signatory:	Cesar Pura
		Issue date:	20/03/2020

IANZ ACCREDITED LABORATORY — All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Test method: Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM…	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL(m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa (UTP = Unable to penetrate)				Wet Density (T/m^3)	Oven Water Content (%)	Dry Density (T/m^3)	Solid Density (T/m^3) Assumed	Air Voids (%)
11/03/2020	20W00549	TR	**222**	Fill	Silty CLAY	Gully 1	1749199	5948906	29.10	150		169	170	155	162	1.91	33.5	1.43	2.70	0
11/03/2020	20W00549	TR	**223**	Fill	Silty CLAY	Gully 1	1749218	5948905	28.80	150		UTP	UTP	181	181	1.87	31.2	1.43	2.70	3
11/03/2020	20W00549	TR	**224**	Fill	Silty CLAY	Refer to plan	1749382	5948941	18.50	150		181+	181+	UTP	169	1.75	40.8	1.24	2.70	3

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SITE PLAN

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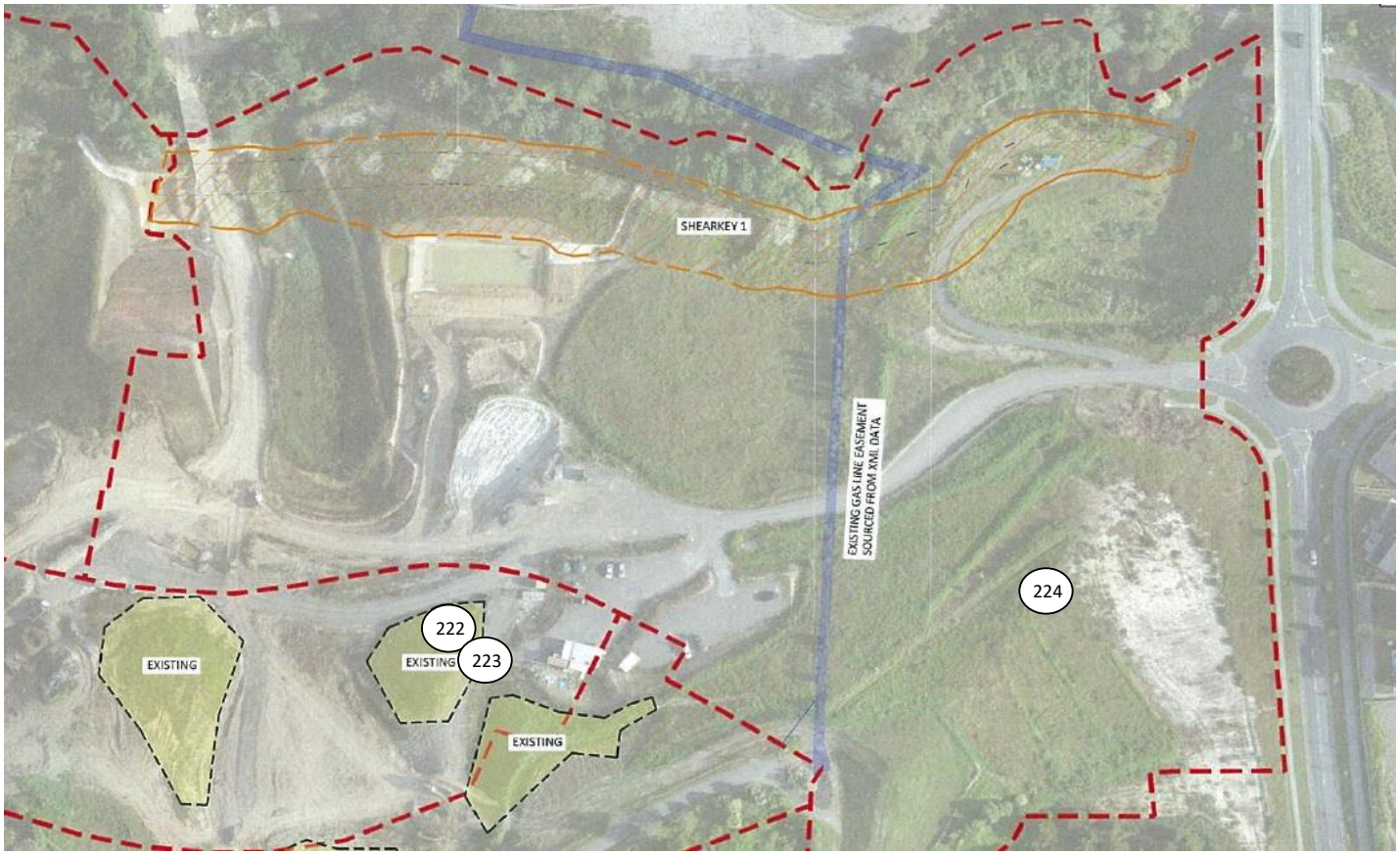
Project No: 773-ETAM00991AA
Work Order No: ETAM20W00549
Page No: 2 of 2

Project: 773-AKLGE-206639 - 773-Millwater-Orewa Precinct 6

Location: As below

Tested by: TR
Date tested: 11/03/2020



Issue date: 050517

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Client:	Coffey Services NZ Ltd (Auckland)	**PROJECT CODE:**	773-ETAM00991AA
Address	PO Box 8261, Symonds Street, Auckland 1150	Page:	1 of 2
Attention:	Stephen Parkes		
c.c:	-		
Project:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6		
Location:	Access off Arran Drive, Orewa	Approved Signatory:	Cesar Pura
		Issue date:	23/03/2020

IANZ ACCREDITED LABORATORY — All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Test method: Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM…	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL(m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa (UTP = Unable to penetrate)				Wet Density (T/m^3)	Oven Water Content (%)	Dry Density (T/m^3)	Solid Density (T/m^3) Assumed	Air Voids (%)
12/03/2020	20W00562	TR	**225**	Fill	Silty CLAY	Gully 1	1749197	5948887	29.30	150		181+	181+	169	155	1.84	33.2	1.38	2.70	3
12/03/2020	20W00562	TR	**226**	Fill	Silty CLAY	Gully 1	1749196	5948902	29.40	150		148	169	155	181+	1.90	25.6	1.51	2.70	5
12/03/2020	20W00562	TR	**227**	Fill	Silty CLAY	Gully 1	1749175	5948893	29.60	150		UTP	UTP	181+	181+	1.86	36.6	1.36	2.70	0
12/03/2020	20W00562	TR	**228**	Fill	Silty CLAY	Undercut 5	1749249	5948992	12.60	150		148	155	170	175	1.82	33.2	1.36	2.70	4
12/03/2020	20W00562	TR	**229**	Fill	Silty CLAY	Undercut 5	1749205	5948998	13.40	150		UTP	UTP	181+	181+	1.84	32.7	1.39	2.70	3
12/03/2020	20W00562	TR	**230**	Fill	Gravelly CLAY	Wall 306	1749382	5948937	19.12	150		UTP	UTP	UTP	UTP	1.77	29.8	1.37	2.70	9
12/03/2020	20W00562	TR	**231**	Fill	Gravelly CLAY	Wall 306	1749386	5948908	19.65	150		UTP	UTP	181+	181+	1.76	37.2	1.28	2.70	5

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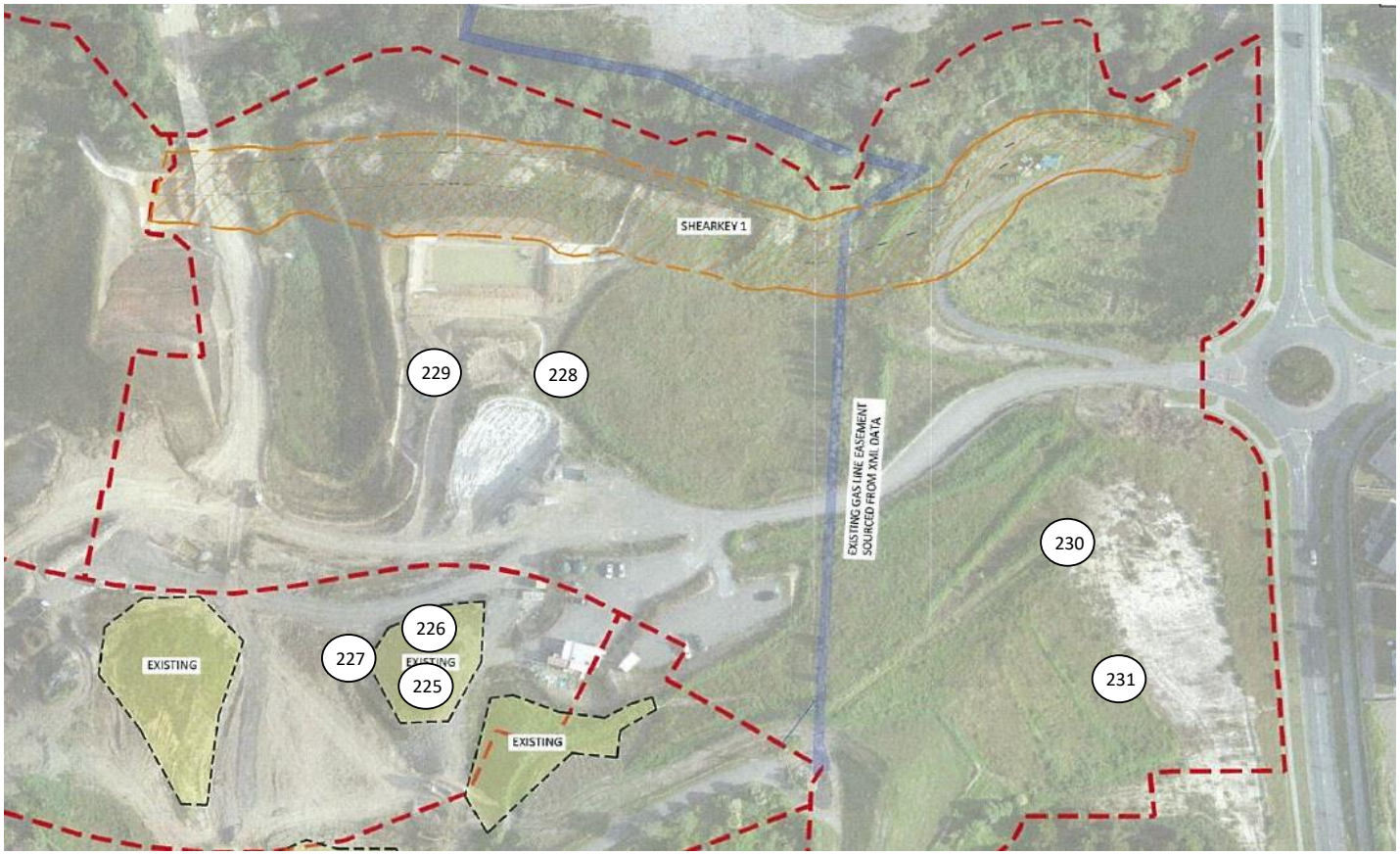
Project No: 773-ETAM00991AA
Work Order No: ETAM20W00562
Page No: 2 of 2

Project: 773-AKLGE-206639 - 773-Millwater-Orewa Precinct 6

Location: As below

Tested by: TR
Date tested: 12/03/2020



Issue date: 050517

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Client:	Coffey Services NZ Ltd (Auckland)	**PROJECT CODE:**	773-ETAM00991AA
Address	PO Box 8261, Symonds Street, Auckland 1150	Page:	1 of 2
Attention:	Stephen Parkes		
c.c:	-		
Project:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6		
Location:	Access off Arran Drive, Orewa		

IANZ ACCREDITED LABORATORY

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Approved Signatory: Cesar Pura

Issue date: 24/03/2020

Test method: Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM…	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL(m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa (UTP = Unable to penetrate)				Wet Density (T/m^3)	Oven Water Content (%)	Dry Density (T/m^3)	Solid Density (T/m^3) Assumed	Air Voids (%)
18/03/2020	20W00604	MA	**242**	Fill	CLAY	Gully 1 above Wall 306	1749209	5948885	30.50	150		181+	163	172	155	1.80	41.4	1.27	2.70	0
18/03/2020	20W00604	MA	**243**	Fill	CLAY	RE Wall 600	1749219	5948869	31.30	150		UTP	UTP	UTP	UTP	1.77	37.8	1.28	2.70	4

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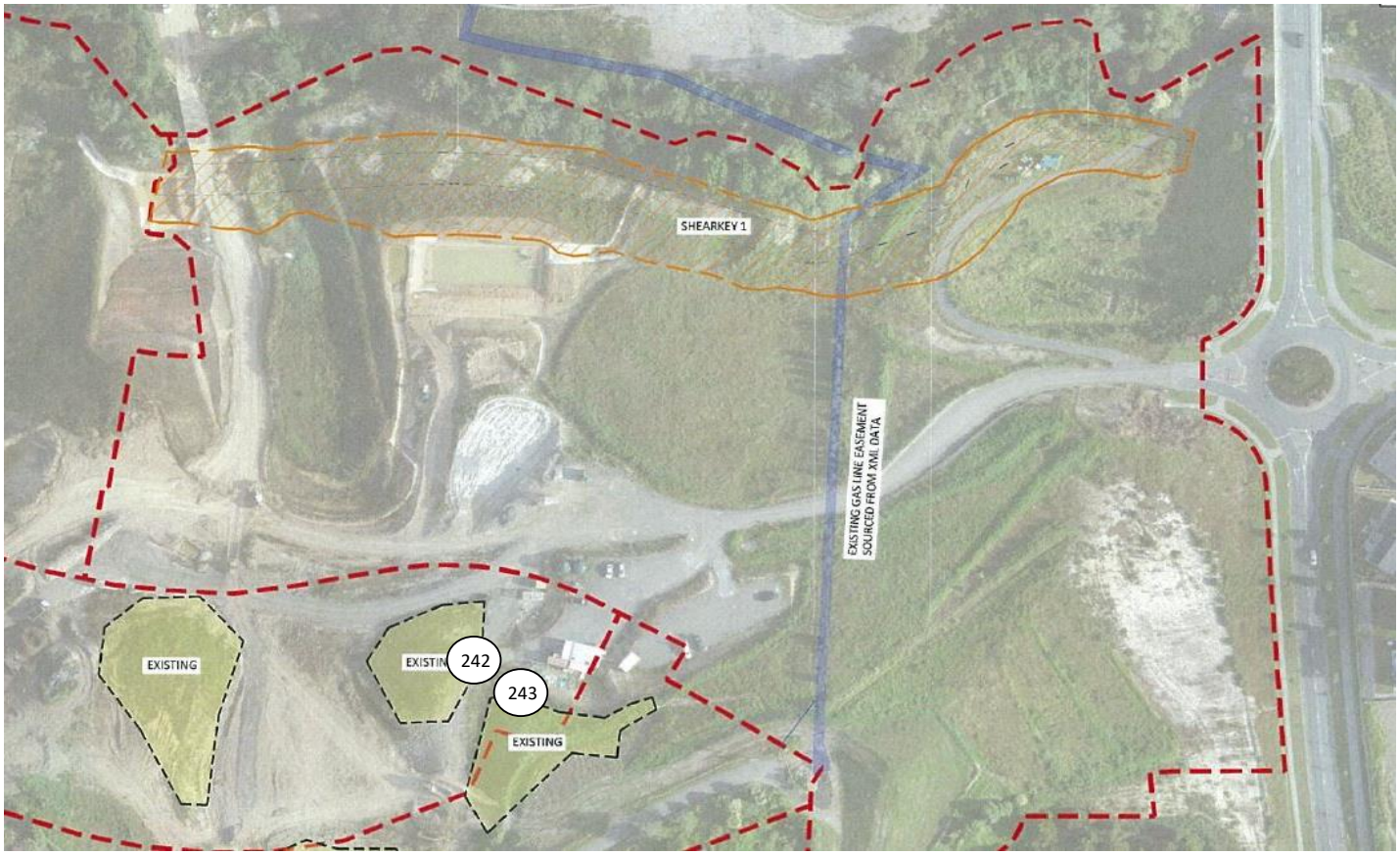
Project No: 773-ETAM00991AA
Work Order No: ETAM20W00604
Page No: 2 of 2

Project: 773-AKLGE-206639 - 773-Millwater-Orewa Precinct 6

Location: As below

Tested by: MA
Date tested: 18/03/2020



Issue date: 050517

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Client:	Coffey Services NZ Ltd (Auckland)	**PROJECT CODE:**	773-ETAM00991AA
Address	PO Box 8261, Symonds Street, Auckland 1150	Page:	1 of 2
Attention:	Stephen Parkes		
c.c:	-		
Project:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6		
Location:	Access off Arran Drive, Orewa	Approved Signatory:	Cesar Pura
		Issue date:	25/03/2020

IANZ ACCREDITED LABORATORY — All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Test method: Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM…	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL(m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa (UTP = Unable to penetrate)				Wet Density (T/m^3)	Oven Water Content (%)	Dry Density (T/m^3)	Solid Density (T/m^3) Assumed	Air Voids (%)
19/03/2020	20W00611	MA	**244**	Fill	CLAY	Refer to plan	1749203	5948890	32.00	150		UTP	UTP	UTP	UTP	1.75	38.1	1.27	2.70	5
19/03/2020	20W00611	MA	**245**	Fill	CLAY	Refer to plan	1749208	5948861	31.00	150		139	185	UTP	UTP	1.81	31.7	1.37	2.70	6

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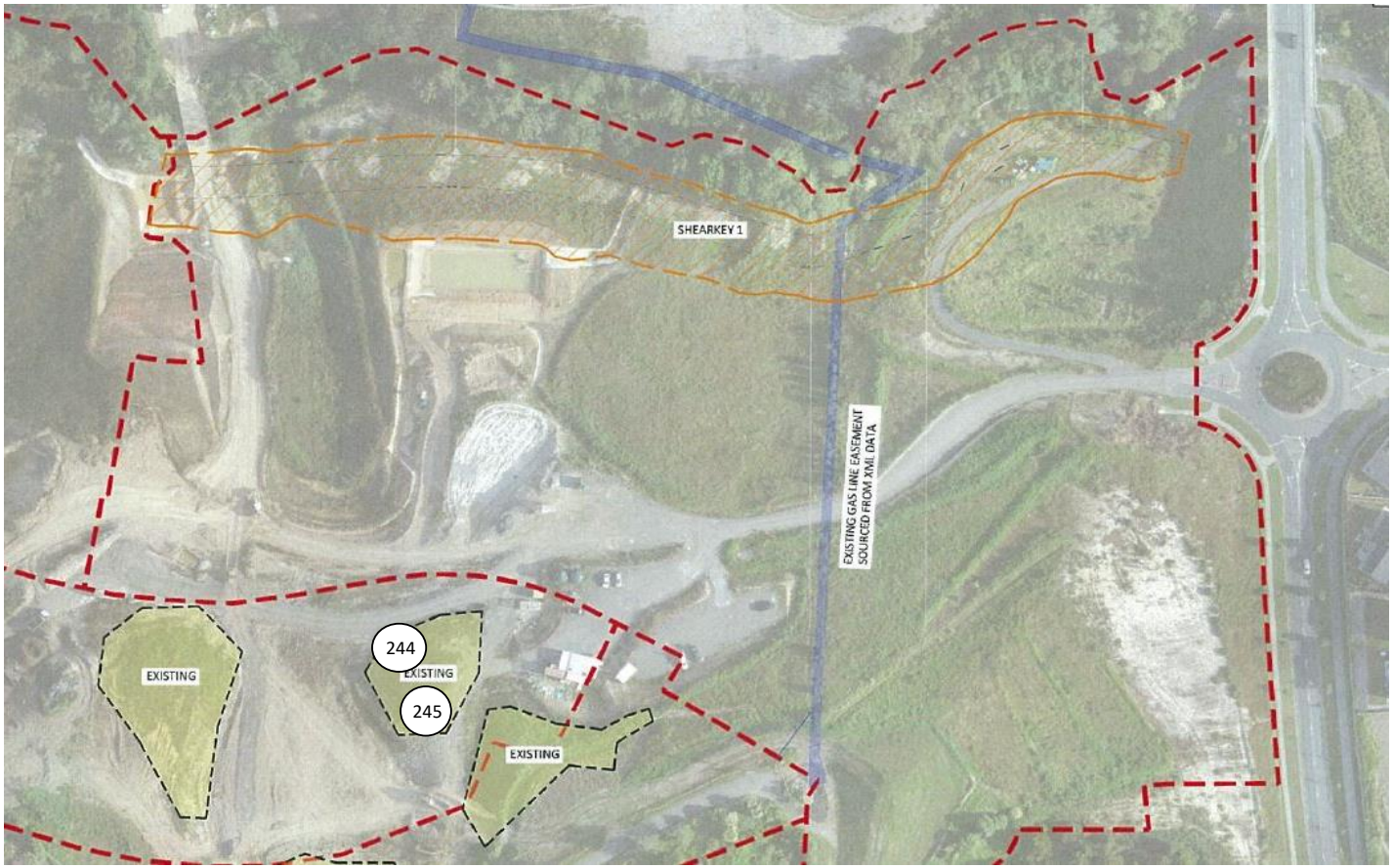
Project No: 773-ETAM00991AA
Work Order No: ETAM20W00611
Page No: 2 of 2

Project: 773-AKLGE-206639 - 773-Millwater-Orewa Precinct 6

Location: As below

Tested by: MA
Date tested: 19/03/2020



Issue date: 050517

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Client:	Coffey Services NZ Ltd (Auckland)	**PROJECT CODE:**	773-ETAM00991AA
Address	PO Box 8261, Symonds Street, Auckland 1150	Page:	1 of 2
Attention:	Stephen Parkes		
c.c:	-		
Project:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6		
Location:	Access off Arran Drive, Orewa	Approved Signatory:	Cesar Pura
		Issue date:	25/03/2020

IANZ ACCREDITED LABORATORY — All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Test method: Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM…	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL(m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa (UTP = Unable to penetrate)				Wet Density (T/m^3)	Oven Water Content (%)	Dry Density (T/m^3)	Solid Density (T/m^3) Assumed	Air Voids (%)
20/03/2020	20W00625	SC	**246**	Fill	Silty CLAY	Refer to plan	1749191	5948894	-	150	At Finished Level	183+	183+	UTP	UTP	1.92	25.9	1.53	2.70	4
20/03/2020	20W00625	SC	**247**	Fill	Silty CLAY	Refer to plan	1749217	5948880	-	150	At Finished Level	UTP	UTP	183+	183+	1.85	30.1	1.42	2.70	4

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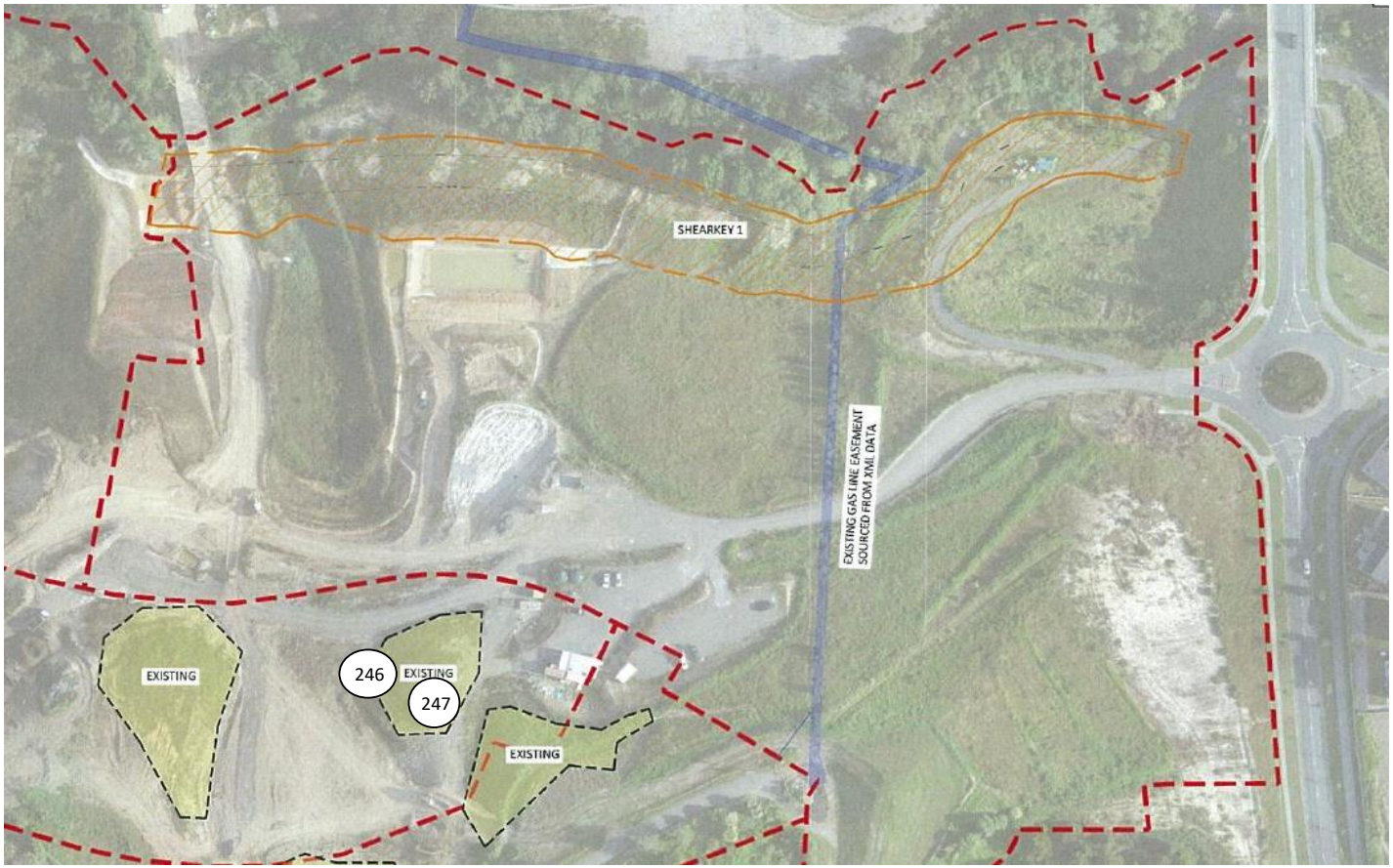
Project No: 773-ETAM00991AA
Work Order No: ETAM20W00625
Page No: 2 of 2

Project: 773-AKLGE-206639 - 773-Millwater-Orewa Precinct 6

Location: As below

Tested by: SC
Date tested: 20/03/2020



Issue date: 050517

East Tamaki Laboratory
Paton Geotechnical Testing Limited
Unit 10, 333 East Tamaki Road, Otara, Auckland 2103
Phone: 027 475 4011

Client:	Coffey Services NZ Ltd (Auckland)	**PROJECT CODE:**	773-ETAM00991AA
Address	PO Box 8261, Symonds Street, Auckland 1150	Page:	1 of 2
Attention:	Stephen Parkes		
c.c:	-		
Project:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6		
Location:	Access off Arran Drive, Orewa		

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Approved Signatory: Cesar Pura

Issue date: 5/11/2020

Test method: Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM…	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL(m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa (UTP = Unable to penetrate)				Wet Density (T/m^3)	Oven Water Content (%)	Dry Density (T/m^3)	Solid Density (T/m^3) Assumed	Air Voids (%)
3/11/2020	20W01694	LW	**273**	Fill	Clayey SILT	Pond 5 Western Wall	1749028	5948970	-	150	At Finished Level	UTP	UTP	177+	177+	1.88	33.1	1.41	2.70	1
3/11/2020	20W01694	LW	**274**	Fill	Clayey SILT	Pond 5 Western Wall	1749025	5948984	-	150	At Finished Level	140	164	150	177+	1.87	36.7	1.37	2.70	0
3/11/2020	20W01694	LW	**275**	Fill	Clayey SILT	Gullly 1, RW 302	1749158	5948873	-	150		UTP	UTP	UTP	UTP	1.85	29.8	1.43	2.70	5
3/11/2020	20W01694	LW	**276**	Fill	Clayey SILT	Gullly 1, RW 302	1749138	5948846	-	150		UTP	UTP	UTP	UTP	1.91	33.8	1.43	2.70	0
3/11/2020	20W01694	LW	**277**	Fill	Clayey SILT	Gullly 1, RW 302	1749196	5948865	-	150		UTP	UTP	UTP	177+	1.92	41.5	1.36	2.70	0

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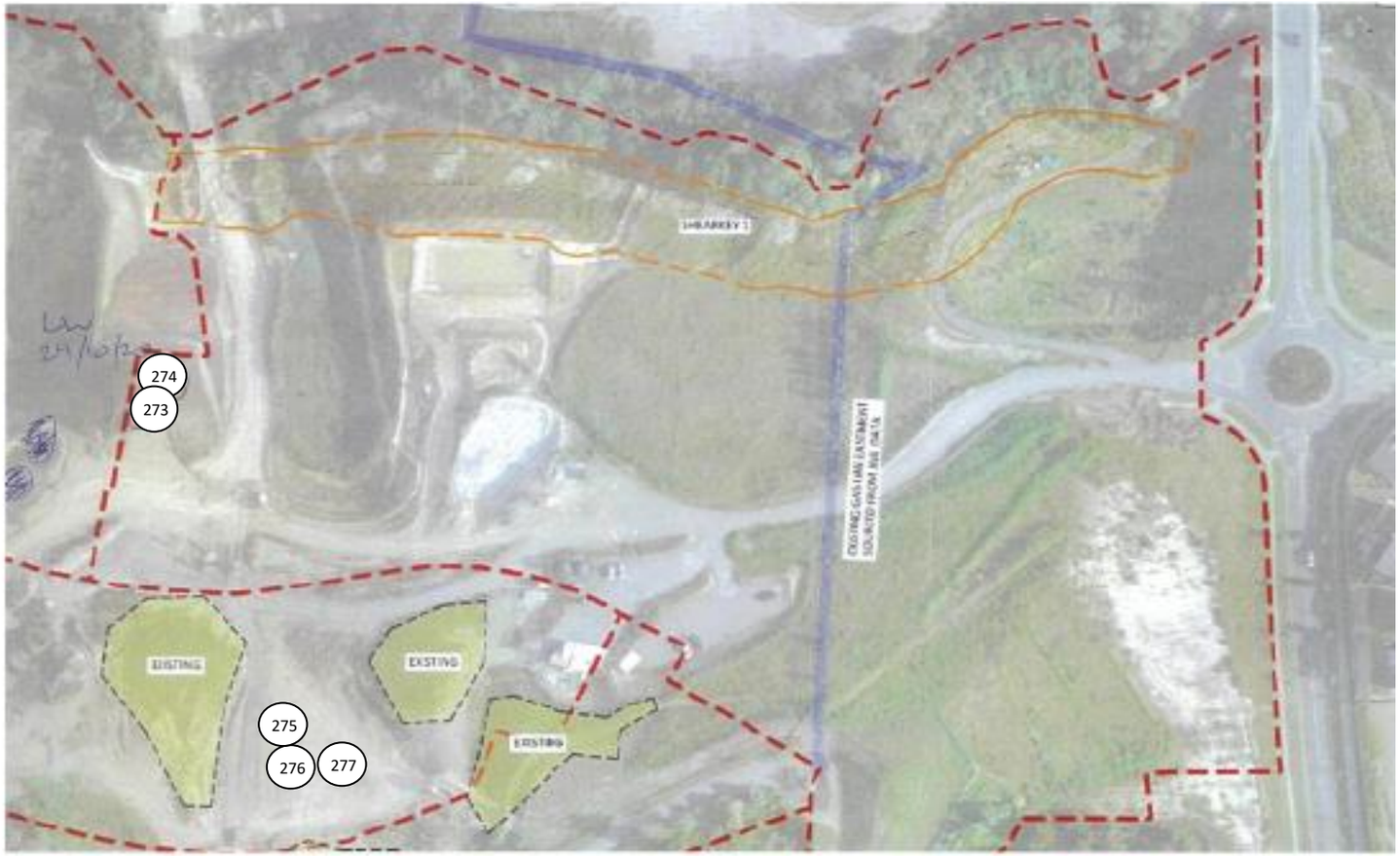
Project No: 773-ETAM00991AA
Work Order No: ETAM20W01694
Page No: 2 of 2

Project: 773-AKLGE206639 - 773-Millwater-Orewa Precinct 6

Location: As below

Tested by: LW
Date tested: 3/11/2020



Issue date: 050517

East Tamaki Laboratory

Paton Geotechnical Testing Limited
333 Unit K East Tamaki Road
Otara Auckland, 2013
Phone: 09 272 3375

Earthworks Fill Report

Report No: EFIL:ETAM21W00571
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W00571

Client:	Coffey Services (NZ) Limited (Auckland) PO Box 8261, Symonds Street Auckland 1150
Principal:	Stephen Parkes
cc to:	Ricky Thomson
Project No.:	773-ETAM00991AA
Project Name.:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6
Project Location:	Access off Arran Drive, Orewa

Approved Signatory: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 30/04/2021

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZGS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1):

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
29/04/2021	ETAM21W00571	LW	491	1.86	38.5	1.34	2.70	0	171	179+	179+	179+	RE Wall	1749266	5948898	-	Clayey SILT	1.5 m below finished level
29/04/2021	ETAM21W00571	LW	492	1.87	33.2	1.40	2.70	2	179+	179+	179+	149	RE Wall	1749240	5948907	-	Clayey SILT	1.0 m below finished level
29/04/2021	ETAM21W00571	LW	493	1.94	30.9	1.48	2.70	0	179+	179+	179+	168	RW 311	1749217	5948992	-	Clayey SILT	1.5 m below finished level
29/04/2021	ETAM21W00571	LW	494	1.91	29.4	1.47	2.70	2	179+	179+	179+	179+	RW 311	1749238	5948996	-	Clayey SILT	1.0 m below finished level

Comments:
Moisture contents and dry densities are corrected against oven dried moisture content testing. Probe Depth: 150mm; SG= 2.70 T/m3 (Assumed)

Form Number: R031N Issue Date: 20/09/2018

East Tamaki Laboratory
Paton Geotechnical Testing Limited
Unit 10, 333 East Tamaki Road, Otara, Auckland 2103
Phone: 027 475 4011

SITE PLAN

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Project No: 773-ETAM00991AA
Work Order No: ETAM21W00571
Page No: 2 of 2

Project: 773-AKLGE206639 - 773-Millwater-Orewa Precinct 6

Location: As below

Tested by: LW
Date tested: 29/04/2021

Issue date: 050517

East Tamaki Laboratory
Paton Geotechnical Testing Limited
Unit 10, 333 East Tamaki Road, Otara, Auckland 2103
Phone: 027 475 4011

Client:	Coffey Services (NZ) Limited (Auckland)	**PROJECT CODE:**	773-ETAM00991AA
Address	PO Box 8261, Symonds Street, Auckland 1150	Page:	1 of 2
Attention:	Stephen Parkes		
c.c:	-		
Project:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6		
Location:	Access off Arran Drive, Orewa		

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Approved Signatory: James McKelvey

Issue date: 11/05/2021

Test method: Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM…	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL(m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa (UTP = Unable to penetrate)				Wet Density (T/m^3)	Oven Water Content (%)	Dry Density (T/m^3)	Solid Density (T/m^3) Assumed	Air Voids (%)
7/05/2021	21W00619	LW	**512**	Fill	Clayey SILT	RE Wall	1749248	5948857	-	150	1.5 m to finished level	179+	179+	179+	179+	1.86	30.5	1.43	2.70	3.6
7/05/2021	21W00619	LW	**513**	Fill	Clayey SILT	RE Wall	1749245	5948838	-	150	1.5 m to finished level	179+	179+	179+	179+	1.90	30.9	1.45	2.70	1.4
7/05/2021	21W00619	LW	**514**	Fill	Clayey SILT	Retaining Wall 311	1749195	5948994	17.40	150	-	179+	179+	179+	179+	1.92	30.7	1.47	2.70	0.5
7/05/2021	21W00619	LW	**515**	Fill	Clayey SILT	Retaining Wall 311	1749234	5948998	17.40	150	-	179+	179+	179+	179+	1.86	32.6	1.40	2.70	2.3

SITE PLAN

NOT TO SCALE

Project No: **773-ETAM00991AA**

Work Order No: ETAM21W00619

Page No: 2 of 2

Project: 773-AKLGE206639 - 773-Millwater-Orewa Precinct 6

Location: As below

Tested by: LW

Date tested: 7/05/2021

Issue date: 050517

East Tamaki Laboratory

Paton Geotechnical Testing Limited
333 Unit K East Tamaki Road
Otara Auckland, 2013
Phone: 09 272 3375

Earthworks Fill Report

Report No: EFIL:ETAM21W00626
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W00626

Client:	Coffey Services (NZ) Limited (Auckland) PO Box 8261, Symonds Street Auckland 1150
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM00991AA
Project Name.:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6
Project Location:	Access off Arran Drive, Orewa

Approved Signatory: James McKelvey
Senior Technician
IANZ Site Number: 105
Date of Issue: 13/05/2021

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
10/05/2021	ETAM21W00626	LW	00516	1.83	34.0	1.37	2.70	2.9	134	140	179+	179+	Retaining Wall 311	1749242	5948992	18.60	Fill - clayey SILT	0
10/05/2021	ETAM21W00626	LW	00517	1.87	31.8	1.42	2.70	2.6	143	171	179+	168	Retaining Wall 311	1749280	5948978	18.80	Fill - clayey SILT	0

Comments:

East Tamaki Laboratory

Paton Geotechnical Testing Limited
333 Unit K East Tamaki Road
Otara Auckland, 2013
Phone: 09 272 3375

Earthworks Fill Report

Report No: EFIL:ETAM21W00626
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W00626

Client:	Coffey Services (NZ) Limited (Auckland) PO Box 8261, Symonds Street Auckland 1150
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM00991AA
Project Name.:	773-AKLGE206639 - 773-Millwater-Orewa Precinct 6
Project Location:	Access off Arran Drive, Orewa

Approved Signatory: James McKelvey
Senior Technician
IANZ Site Number: 105
Date of Issue: 13/05/2021

Site Plan - not to scale

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM21W01330
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W01330

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	AKLGE206639 - Millwater Precinct 6k, Orewa
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 9/11/2021

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1):

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL (m)	Material Tested	Comments
5/11/2021	ETAM21W01330	LW	537	1.93	31.5	1.47	2.70	0	179+	179+	179+	164	Gully	1749038	5948918	26.00	Clayey SILT	
5/11/2021	ETAM21W01330	LW	538	1.89	33.8	1.41	2.70	0	143	156	168	175	Gully	1749006	5948904	27.60	Clayey SILT	
5/11/2021	ETAM21W01330	LW	539	1.91	31.5	1.45	2.70	1	179+	179+	146	140	Gully	1748987	5948875	31.18	Clayey SILT	

Comments:
Moisture contents and dry densities are corrected against oven dried moisture content testing. Probe Depth: 150mm; SG= 2.70 T/m3 (Assumed)

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM21W01330
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W01330

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	AKLGE206639 - Millwater Precinct 6k, Orewa
Project Location:	117 Kowhai Road, Orewa

ACCREDITED IANZ TESTING LABORATORY

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 9/11/2021

SITE PLAN (NOT TO SCALE)

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM21W01344
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W01344

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	AKLGE206639 - Millwater Precinct 6k, Orewa
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 11/11/2021

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1):

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL (m)	Material Tested	Comments
9/11/2021	ETAM21W01344	LW	540	1.90	28.2	1.49	2.70	3	160	152	175	179+	Gully	1748976	5948881	31.40	Clayey SILT	
9/11/2021	ETAM21W01344	LW	541	1.90	27.8	1.49	2.70	4	179+	179+	179+	171	Gully	1749005	5948893	27.90	Clayey SILT	
9/11/2021	ETAM21W01344	LW	542	1.91	27.5	1.50	2.70	3	175	146	156	164	Gully	1749039	5948930	26.20	Clayey SILT	

Comments:
Moisture contents and dry densities are corrected against oven dried moisture content testing. Probe Depth: 150mm; SG= 2.70 T/m3 (Assumed)

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM21W01344
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W01344

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	AKLGE206639 - Millwater Precinct 6k, Orewa
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 11/11/2021

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM21W01351
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W01351

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	AKLGE206639 - Millwater Precinct 6k, Orewa
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 12/11/2021

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1):

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL (m)	Material Tested	Comments
10/11/2021	ETAM21W01351	LW	543	1.85	32.0	1.40	2.70	3	146	160	168	149	Gully	1748980	5948880	31.60	Silty CLAY	
10/11/2021	ETAM21W01351	LW	544	1.85	33.1	1.39	2.70	2	143	160	179	168	Gully	1749013	5948893	28.05	Silty CLAY	
10/11/2021	ETAM21W01351	LW	545	1.86	32.9	1.40	2.70	2	175	140	146	137	Gully	1749056	5948917	26.35	Silty CLAY	

Comments:
Moisture contents and dry densities are corrected against oven dried moisture content testing. Probe Depth: 150mm; SG= 2.70 T/m3 (Assumed)

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM21W01351
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W01351

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	AKLGE206639 - Millwater Precinct 6k, Orewa
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 12/11/2021

SITE PLAN (NOT TO SCALE)

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM21W01358
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W01358

Client: Tetra Tech Coffey (NZ) Limited- Auckland
Coffey House, Level 4, Teed Street
New Market Auckland 1023

Principal: Stephen Parkes

cc to: -

Project No.: 773-ETAM01553

Project Name.: AKLGE206639 - Millwater Precinct 6k, Orewa

Project Location: 117 Kowhai Road, Orewa

Approved Signatory: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 12/11/2021

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1):

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL (m)	Material Tested	Comments
11/11/2021	ETAM21W01358	LW	546	1.92	29.2	1.49	2.70	2	UTP	UTP	UTP	UTP	RW 701	1749137	5949044	8.00	Clayey SILT	
11/11/2021	ETAM21W01358	LW	547	1.92	26.2	1.52	2.70	4	UTP	UTP	UTP	UTP	RW 701	1749148	5949049	8.05	Clayey SILT	
11/11/2021	ETAM21W01358	LW	548	1.87	34.1	1.40	2.70	1	175	143	149	145	Gully	1748972	5948879	31.75	Clayey SILT	
11/11/2021	ETAM21W01358	LW	549	1.87	35.4	1.38	2.70	0	168	164	140	149	Gully	1749003	5948873	31.65	Clayey SILT	

Comments:
Moisture contents and dry densities are corrected against oven dried moisture content testing. Probe Depth: 150mm; SG= 2.70 T/m3 (Assumed)

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM21W01358
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W01358

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	AKLGE206639 - Millwater Precinct 6k, Orewa
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 12/11/2021

SITE PLAN (NOT TO SCALE)

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM21W01415
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W01415

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 24/11/2021

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1):

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL (m)	Material Tested	Comments
22/11/2021	ETAM21W01415	LW	556	1.94	29.2	1.50	2.70	0	UTP	UTP	UTP	UTP	Retaining Wall 701	1749132	5949026	8.60	Clayey SILT	
22/11/2021	ETAM21W01415	LW	557	1.95	29.0	1.51	2.70	0	UTP	UTP	UTP	UTP	Retaining Wall 702	1749142	5949029	8.80	Clayey SILT	
22/11/2021	ETAM21W01415	LW	558	1.92	35.9	1.41	2.70	0	179+	179+	179+	164	Gully	1748968	5948880	32.40	Clayey SILT	
22/11/2021	ETAM21W01415	LW	559	1.93	35.5	1.42	2.70	0	179+	179+	156	168	Gully	1748986	5948894	29.60	Clayey SILT	
22/11/2021	ETAM21W01415	LW	560	1.91	36.6	1.40	2.70	0	164	149	140	179	Gully	1749006	5948904	28.50	Clayey SILT	
22/11/2021	ETAM21W01415	LW	561	1.94	34.7	1.44	2.70	0	179+	146	156	164	Gully	1749018	5948919	27.10	Clayey SILT	

Form Number: R031N Issue Date: 20/09/2018

Comments:

Moisture contents and dry densities are corrected against oven dried moisture content testing. Probe Depth: 150mm; SG= 2.70 T/m3 (Assumed)

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM21W01415
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W01415

Client:	Tetra Tech Coffey (NZ) Limited- Auckland
	Coffey House, Level 4, Teed Street
	New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 24/11/2021

SITE PLAN (NOT TO SCALE)

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM21W01446
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W01446

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 29/11/2021

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1):

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL (m)	Material Tested	Comments
26/11/2021	ETAM21W01446	LW	562	1.95	29.9	1.50	2.70	0	UTP	UTP	UTP	208	Gully	1748990	5948890	30.10	Silty CLAY	
26/11/2021	ETAM21W01446	LW	563	1.96	31.3	1.50	2.70	0	UTP	UTP	UTP	UTP	Gully	1749016	5948909	29.50	Silty CLAY	
26/11/2021	ETAM21W01446	LW	564	1.89	34.1	1.41	2.70	0	196	168	160	146	Gully	1749044	5948956	25.80	Silty CLAY	
26/11/2021	ETAM21W01446	LW	565	1.90	32.7	1.43	2.70	0	165	196	188	180	Gully	1749063	5948982	25.40	Silty CLAY	

Comments:
Moisture contents and dry densities are corrected against oven dried moisture content testing. Probe Depth: 150mm; SG= 2.70 T/m3 (Assumed)

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM21W01446
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W01446

Client:	Tetra Tech Coffey (NZ) Limited- Auckland
	Coffey House, Level 4, Teed Street
	New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 29/11/2021

SITE PLAN (NOT TO SCALE)

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM21W01476
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W01476

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 6/12/2021

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1):

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL (m)	Material Tested	Comments
3/12/2021	ETAM21W01476	LW	572	1.88	32.8	1.41	2.70	1	149	172	175+	175+	Shear Key	1748998	5949081	8.10	Clayey SILT	
3/12/2021	ETAM21W01476	LW	573	1.89	33.3	1.42	2.70	0	175+	175+	175+	164	Shear Key	1748991	5949076	9.30	Clayey SILT	
3/12/2021	ETAM21W01476	LW	574	1.87	31.4	1.42	2.70	3	137	175+	175+	153	Gully	1748976	5948881	31.95	Clayey SILT	
3/12/2021	ETAM21W01476	LW	575	1.84	34.1	1.37	2.70	2	149	160	156	153	Gully	1748995	5948918	29.55	Clayey SILT	
3/12/2021	ETAM21W01476	LW	576	1.93	27.6	1.51	2.70	2	UTP	UTP	175+	175+	Gully	1749072	5948958	26.90	Clayey SILT	
3/12/2021	ETAM21W01476	LW	577	1.91	26.7	1.51	2.70	4	UTP	UTP	UTP	175+	Gully	1749105	5948969	27.10	Clayey SILT	

Comments:
Moisture contents and dry densities are corrected against oven dried moisture content testing. Probe Depth: 150mm; SG= 2.70 T/m3 (Assumed)

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM21W01476
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W01476

Client:	Tetra Tech Coffey (NZ) Limited- Auckland
	Coffey House, Level 4, Teed Street
	New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 6/12/2021

SITE PLAN (NOT TO SCALE)

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM21W01503
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W01503

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 10/12/2021

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1):

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL (m)	Material Tested	Comments
8/12/2021	ETAM21W01503	LW	587	1.93	31.0	1.47	2.70	0	175+	175+	175+	175+	Gully	1748979	5948874	32.50	Clayey SILT	
8/12/2021	ETAM21W01503	LW	588	1.89	30.7	1.45	2.70	2	168	153	146	172	Gully	1748972	5948918	31.90	Clayey SILT	

Comments:
Moisture contents and dry densities are corrected against oven dried moisture content testing. Probe Depth: 150mm; SG= 2.70 T/m3 (Assumed)

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM21W01503
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W01503

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 10/12/2021

SITE PLAN (NOT TO SCALE)

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00006
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00006

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 11/01/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
7/01/2022	ETAM22W00006	LW	605	1.91	34.4	1.42	2.70	-1.5	UTP	UTP	UTP	UTP	Gully	1749009	5948891	-	Clayey Silt	-
7/01/2022	ETAM22W00006	LW	606	1.93	35.2	1.43	2.70	-3.0	UTP	UTP	UTP	175	Gully	1749036	5948905	-	Clayey Silt	-
7/01/2022	ETAM22W00006	LW	607	1.94	33.1	1.46	2.70	-2.1	UTP	UTP	UTP	UTP	Gully	1749082	5948942	-	Clayey Silt	-
7/01/2022	ETAM22W00006	LW	608	1.93	33.8	1.44	2.70	-2.1	UTP	UTP	UTP	UTP	Gully	1749078	5948960	-	Clayey Silt	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00006
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00006

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 11/01/2022

SITE PLAN (NOT TO SCALE)

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00062
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00062

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 26/01/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
18/01/2022	ETAM22W00062	IA	632	1.90	26.8	1.50	2.70	4.3	UTP	UTP	UTP	UTP	Ref to plan	1749120	5948916	27.5	Silty Clay	-
18/01/2022	ETAM22W00062	IA	633	1.89	24.1	1.52	2.70	6.8	UTP	UTP	UTP	UTP	Ref to plan	1749100	5948926	27.5	Silty Clay	-
18/01/2022	ETAM22W00062	IA	634	1.86	28.9	1.44	2.70	4.9	UTP	UTP	UTP	UTP	Ref to plan	1748961	5948916	28.7	Silty Clay	-
18/01/2022	ETAM22W00062	IA	635	1.89	29.6	1.46	2.70	2.9	184	150	134	UTP	Ref to plan	1749007	594888	28.7	Silty Clay	-

Comments:

Oven Moistures

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00062
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00062

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 26/01/2022

SITE PLAN (NOT TO SCALE)

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00113
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00113

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 2/02/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
20/01/2022	ETAM22W00113	LW	644	1.85	40.1	1.32	2.70	0.0	175	175	149	160	Gully	1749034	5948927	28.95	Silty CLAY	-
20/01/2022	ETAM22W00113	LW	645	1.87	42.5	1.31	2.70	0.0	146	140	172	175	Gully	1748977	5948921	29.1	Silty CLAY	-
20/01/2022	ETAM22W00113	LW	646	1.84	42.0	1.30	2.70	0.0	175	175	175	137	Gully	1749009	5948886	29.55	Silty CLAY	-
20/01/2022	ETAM22W00113	LW	647	1.85	44.7	1.28	2.70	0.0	149	164	175	146	Gully	1748991	5948873	30.15	Silty CLAY	-
20/01/2022	ETAM22W00113	LW	648	1.95	26.4	1.54	2.70	2.2	UTP	UTP	UTP	175	RE Wall 604A	1749076	5949073	8.85	Silty CLAY	-
20/01/2022	ETAM22W00113	LW	649	1.89	25.5	1.51	2.70	5.9	175	175	175	UTP	RE Wall 604A	1749077	5949061	8.75	Silty CLAY	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00113
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00113

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 2/02/2022

SITE PLAN (NOT TO SCALE)

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00117
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00117

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 2/02/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
21/01/2022	ETAM22W00117	LW	650	1.90	31.5	1.44	2.70	1.1	175	149	137	149	Gully	1748995	5948879	30.2	Sility Clay	-
21/01/2022	ETAM22W00117	LW	651	1.91	30.7	1.46	2.70	1.0	175	175	175	160	Gully	1749062	5948926	28	Sility Clay	-
21/01/2022	ETAM22W00117	LW	652	1.92	31.2	1.46	2.70	0.3	168	160	175	175	Gully	1749043	5948902	29.15	Sility Clay	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00117
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00117

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 2/02/2022

SITE PLAN (NOT TO SCALE)

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00123
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00123

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 2/02/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
28/01/2022	ETAM22W00123	LW	653	1.94	30.4	1.49	2.70	0.0	149	175	175	175	Gully	1748886	5948860	30.78	Silty Clay	-
28/01/2022	ETAM22W00123	LW	654	1.90	36.5	1.39	2.70	0.0	175	175	172	153	Gully	1749007	5948874	29.52	Silty Clay	-
28/01/2022	ETAM22W00123	LW	655	1.86	40.0	1.33	2.70	0.0	175	175	175	175	Gully	1749009	5948909	28.95	Silty Clay	-
28/01/2022	ETAM22W00123	LW	656	1.87	34.8	1.39	2.70	0.3	175	175	175	163	Gully	1749029	5948916	28.78	Silty Clay	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00123
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00123

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 2/02/2022

SITE PLAN (NOT TO SCALE)

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00179
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00179

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 8/02/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
4/02/2022	ETAM22W00179	LW	667	1.86	32.6	1.41	2.70	2.1	149	160	175	175	RE Wall 604A	1749068	5949063	9.7	Silty Clay	-
4/02/2022	ETAM22W00179	LW	668	1.89	32.4	1.43	2.70	0.7	175	175	175	175	RE Wall 604A	1749075	5949054	9.8	Silty Clay	-
4/02/2022	ETAM22W00179	LW	669	1.90	33.3	1.43	2.70	0.0	175	175	175	175	RW 701	1749100	5949041	11.3	Silty Clay	-
4/02/2022	ETAM22W00179	LW	670	1.88	34.8	1.39	2.70	0.1	172	140	149	156	RW 701	1749116	5949042	11.35	Silty Clay	-
4/02/2022	ETAM22W00179	LW	671	1.92	30.8	1.47	2.70	0.3	146	143	153	140	Gully	1748980	5948855	31.3	Silty Clay	-
4/02/2022	ETAM22W00179	LW	672	1.89	29.7	1.46	2.70	2.7	160	175	175	160	Gully	1748990	5948900	29.85	Silty Clay	-
4/02/2022	ETAM22W00179	LW	673	1.95	29.6	1.50	2.70	0.0	175	175	175	175	Gully	1749009	5948909	28.15	Silty Clay	-
4/02/2022	ETAM22W00179	LW	674	1.85	29.4	1.43	2.70	4.8	153	156	140	146	Gully	1749026	5948921	28.05	Silty Clay	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00179
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00179

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 8/02/2022

SITE PLAN (NOT TO SCALE)

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00221
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00221

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 17/02/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
15/02/2022	ETAM22W00221	SC	675	1.91	28.5	1.49	2.70	2.5	UTP	UTP	UTP	UTP	Gully	1749010	5948850	-	Silty Clay	-
15/02/2022	ETAM22W00221	SC	676	1.85	26.3	1.47	2.70	7.1	UTP	UTP	UTP	UTP	Gully	1748977	5948911	-	Silty Clay	-
15/02/2022	ETAM22W00221	SC	677	1.96	26.4	1.55	2.70	1.5	UTP	UTP	UTP	UTP	Gully	1749014	5948884	-	Silty Clay	-

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00221
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00221

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 17/02/2022

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00276
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00276

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 25/02/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
24/02/2022	ETAM22W00276	SC	700	1.87	30.0	1.44	2.70	3.8	UTP	UTP	168	168	Refer to Plan	1749096	5948920	-	Silty CLAY	RL unavailable
24/02/2022	ETAM22W00276	SC	701	1.76	37.6	1.28	2.70	4.5	146	155	168	146	Silt Pond	1749017	5948946	-	Silty CLAY	RL unavailable
24/02/2022	ETAM22W00276	SC	702	1.79	32.2	1.35	2.70	6.5	146	155	146	155	Silt Pond	1749009	5948975	-	Silty CLAY	RL unavailable
24/02/2022	ETAM22W00276	SC	703	1.87	31.1	1.43	2.70	2.7	168	168	180	180	Gully	1748994	5948873	-	Silty CLAY	RL unavailable
24/02/2022	ETAM22W00276	SC	704	1.87	31.2	1.43	2.70	2.6	160	168	155	160	Gully	1749001	5948917	-	Silty CLAY	RL unavailable

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00276
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00276

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 25/02/2022

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00291
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00291

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 28/02/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
25/02/2022	ETAM22W00291	SC	705	1.88	29.5	1.45	2.70	3.5	155	155	168	172	Gully	1748973	5948893	-	Silty CLAY	RLs unavailable
25/02/2022	ETAM22W00291	SC	706	1.84	28.5	1.43	2.70	6.1	168	155	155	155	Gully	1749001	5948883	-	Silty CLAY	RLs unavailable

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

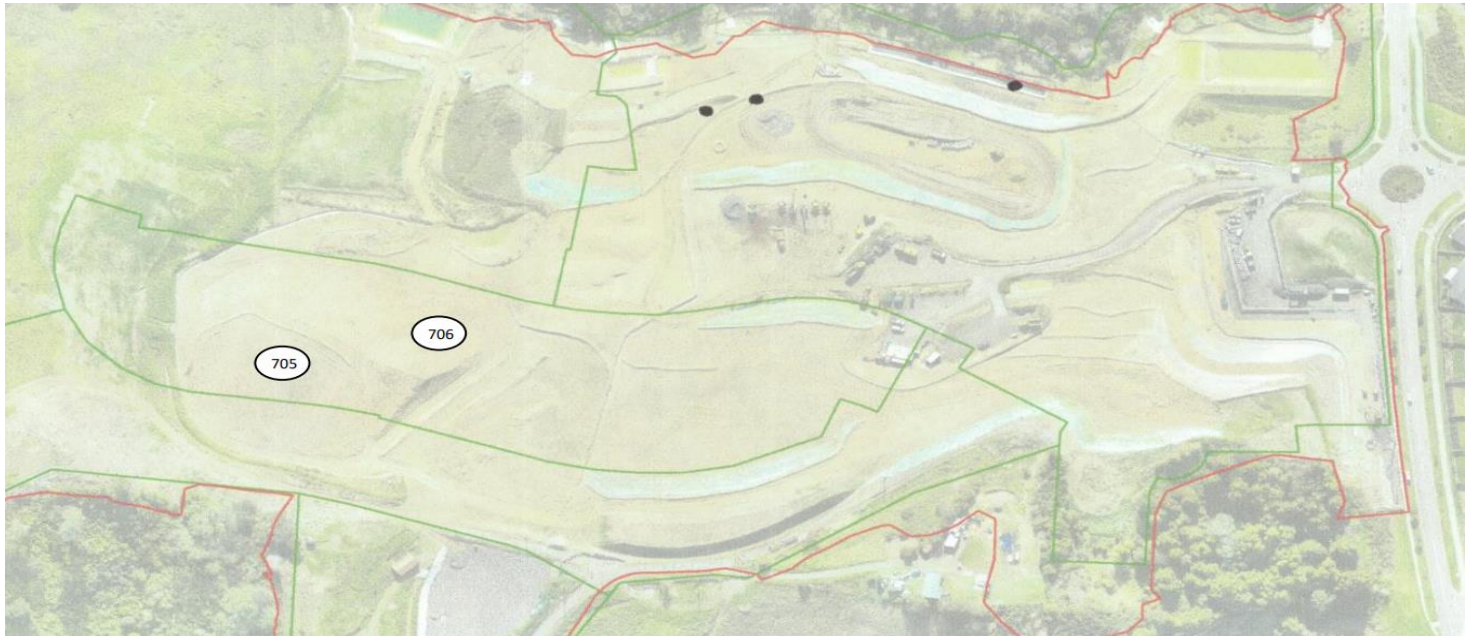
Earthworks Fill Report

Report No: EFIL:ETAM22W00291
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00291

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 28/02/2022



Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00308
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00308

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 3/03/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
1/03/2022	ETAM22W00308	SC	707	1.77	38.2	1.28	2.70	3.9	168	176	160	160	Undercut 3	1748985	5949026	18.40	Silty CLAY	-
1/03/2022	ETAM22W00308	SC	708	1.81	33.2	1.36	2.70	4.5	176	176	160	160	Undercut 3	1749000	5949019	18.43	Silty CLAY	-
1/03/2022	ETAM22W00308	SC	709	1.89	29.3	1.46	2.70	3.1	176	176	176	176	Silt Pond Fill	1749011	5948986	-	Silty CLAY	RL unavailable
1/03/2022	ETAM22W00308	SC	710	1.86	27.4	1.46	2.70	6.0	168	168	176	176	Silt Pond Fill	1749005	5948952	-	Silty CLAY	RL unavailable
1/03/2022	ETAM22W00308	SC	711	1.89	27.1	1.48	2.70	4.9	UTP	UTP	UTP	UTP	Gully 2	1749125	5948916	-	Silty CLAY	RL unavailable
1/03/2022	ETAM22W00308	SC	712	1.90	27.8	1.49	2.70	3.6	UTP	UTP	UTP	UTP	Gully 2	1749075	5948945	-	Silty CLAY	RL unavailable
1/03/2022	ETAM22W00308	SC	713	1.92	26.6	1.52	2.70	3.3	UTP	UTP	UTP	UTP	Gully 2	1749002	5948912	-	Silty CLAY	RL unavailable
1/03/2022	ETAM22W00308	SC	714	1.89	26.8	1.49	2.70	4.7	UTP	UTP	UTP	UTP	Gully 2	1748987	5948881	-	Silty CLAY	RL unavailable

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00308
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00308

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 3/03/2022

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00327
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00327

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 7/03/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
4/03/2022	ETAM22W00327	SC	719	1.88	29.9	1.44	2.70	3.4	UTP	UTP	UTP	UTP	Gully 2	1749048	5948882	-	Silty CLAY	RLs unavailable
4/03/2022	ETAM22W00327	SC	720	1.85	30.1	1.42	2.70	4.7	208+	208+	188	188	Gully 2	1748994	5948895	-	Silty CLAY	RLs unavailable
4/03/2022	ETAM22W00327	SC	721	1.89	28.3	1.47	2.70	3.9	UTP	UTP	UTP	UTP	Gully 2	1749009	5948858	-	Silty CLAY	RLs unavailable
4/03/2022	ETAM22W00327	SC	722	1.90	30.0	1.46	2.70	2.0	UTP	UTP	UTP	UTP	Undercut 1	1749338	5948819	-	Silty CLAY	RLs unavailable

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00327
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00327

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 7/03/2022

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00341
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00341

Client: Tetra Tech Coffey (NZ) Limited- Auckland
Coffey House, Level 4, Teed Street
New Market Auckland 1023

Principal: Stephen Parkes

cc to: -

Project No.: 773-ETAM01553

Project Name.: 773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA

Project Location: 117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 9/03/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
7/03/2022	ETAM22W00341	SC	723	1.90	28.3	1.48	2.70	3.2	208+	208+	208+	UTP	Gully 2	1748981	5948889	-	Silty CLAY	RL unavailable
7/03/2022	ETAM22W00341	SC	724	1.87	29.3	1.45	2.70	4.1	208+	208+	UTP	UTP	Gully 2	1749004	5948916	-	Silty CLAY	RL unavailable
7/03/2022	ETAM22W00341	SC	725	1.90	31.9	1.44	2.70	1.0	188	188	208+	208+	Gully 2	1749060	5948901	-	Silty CLAY	RL unavailable
7/03/2022	ETAM22W00341	SC	726	1.83	29.5	1.42	2.70	5.8	200	200	UTP	UTP	Silt Pond	1749004	5948988	-	Silty CLAY	RL unavailable
7/03/2022	ETAM22W00341	SC	727	1.74	23.0	1.41	2.70	15.3	UTP	UTP	UTP	UTP	A7-A15	1749168	5948985	-	Silty CLAY	At finished level
7/03/2022	ETAM22W00341	SC	728	1.69	25.0	1.35	2.70	16.1	UTP	UTP	UTP	UTP	A15-15B	1749200	5948998	-	Silty CLAY	At finished level
7/03/2022	ETAM22W00341	SC	729	1.68	25.6	1.34	2.70	16.1	UTP	UTP	UTP	UTP	15B-15C	1749220	5948990	-	Silty CLAY	At finished level
7/03/2022	ETAM22W00341	SC	730	1.84	29.5	1.42	2.70	5.5	UTP	UTP	UTP	UTP	15C-15D	1749248	5948982	-	Silty CLAY	At finished level
7/03/2022	ETAM22W00341	SC	731	1.73	23.4	1.40	2.70	15.3	UTP	UTP	UTP	UTP	15-15D	1749275	5948977	-	Silty CLAY	At finished level

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00341
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00341

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 9/03/2022

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00351
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00351

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 11/03/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
9/03/2022	ETAM22W00351	SC	732	1.87	28.6	1.45	2.70	4.6	188	188	188	188	Main Gully Fill	1749017	5948885	-	Silty Clay	-
9/03/2022	ETAM22W00351	SC	733	1.95	25.2	1.56	2.70	3.2	UTP	UTP	UTP	UTP	Main Gully Fill	1749412	5948860	-	Silty Clay	-
9/03/2022	ETAM22W00351	SC	734	1.90	28.3	1.48	2.70	3.2	208	208	188	188	Main Gully Fill	1749120	5948777	-	Silty Clay	-
9/03/2022	ETAM22W00351	SC	735	1.87	28.0	1.46	2.70	4.9	UTP	UTP	UTP	UTP	Main Gully Fill	1749054	5948932	-	Silty Clay	-
9/03/2022	ETAM22W00351	SC	736	1.88	26.9	1.48	2.70	5.4	UTP	UTP	UTP	UTP	Silt Pond	1749012	5948989	-	Silty Clay	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00351
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00351

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 11/03/2022

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00363
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00363

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 14/03/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
10/03/2022	ETAM22W00363	SC	737	1.82	25.2	1.45	2.70	9.7	UTP	UTP	UTP	UTP	A 7 - A 15 Retest	1749168	5948985	-	Silty Clay	Finished Level
10/03/2022	ETAM22W00363	SC	738	1.84	24.8	1.47	2.70	9.0	UTP	UTP	UTP	UTP	15 A - 15 B	1749200	5948998	-	Silty Clay	Finished Level
10/03/2022	ETAM22W00363	SC	739	1.89	25.5	1.51	2.70	5.9	UTP	UTP	UTP	UTP	15 B - 15 C	1749220	5948996	-	Silty Clay	Finished Level
10/03/2022	ETAM22W00363	SC	740	1.93	26.3	1.53	2.70	3.1	UTP	UTP	UTP	UTP	15 C - 15 D	1749275	5948977	-	Silty Clay	Finished Level
10/03/2022	ETAM22W00363	SC	741	1.95	25.3	1.56	2.70	3.1	UTP	UTP	UTP	UTP	Main Gully Fill	1748979	5948877	-	Silty Clay	Finished Level
10/03/2022	ETAM22W00363	SC	742	1.89	29.3	1.46	2.70	2.9	UTP	UTP	UTP	UTP	Main Gully Fill	1748992	5948915	-	Silty Clay	Finished Level
10/03/2022	ETAM22W00363	SC	743	1.85	29.8	1.43	2.70	4.7	168	168	160	160	Main Gully Fill	1749052	5948941	-	Silty Clay	Finished Level
10/03/2022	ETAM22W00363	SC	744	1.84	33.0	1.38	2.70	3.3	146	146	160	160	Silt Pond	1749012	5948961	-	Silty Clay	Finished Level

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

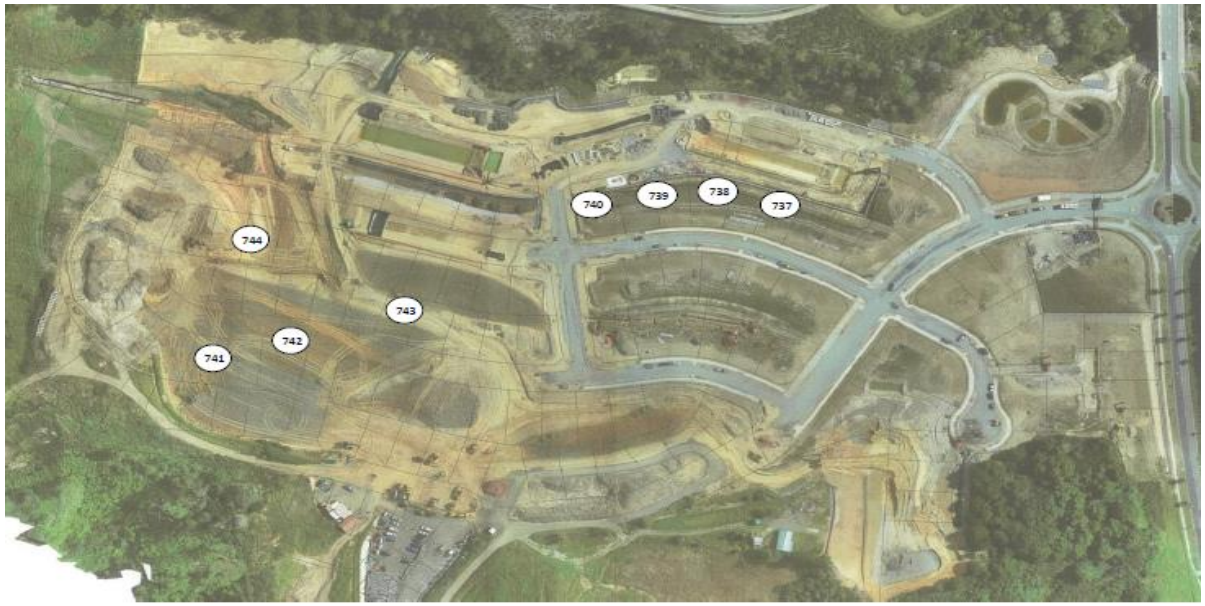
GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00363
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00363

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 14/03/2022



Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00378
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00378

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 14/03/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
11/03/2022	ETAM22W00378	SC	745	1.86	35.3	1.37	2.70	0.7	208	208	200	200	Main Gully Fill	1748980	5948912	-	Silty Clay	-
11/03/2022	ETAM22W00378	SC	746	1.91	29.2	1.48	2.70	2.0	UTP	UTP	UTP	UTP	Main Gully Fill	1749034	5948881	-	Silty Clay	-
11/03/2022	ETAM22W00378	SC	747	1.78	35.7	1.31	2.70	4.6	160	145	155	160	Silt Pond	1749021	5948974	-	Silty Clay	-

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00378
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00378

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 14/03/2022

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00396
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00396

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	Millwater Precinct K

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 17/03/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
14/03/2022	ETAM22W00396	SC	748	1.72	37.4	1.25	2.70	6.7	196	208	208	176	Undercut 10	1748969	5948955	-	Silty Clay	-
14/03/2022	ETAM22W00396	SC	749	1.86	30.4	1.43	2.70	3.6	176	208	208	176	Gully	1749055	5948941	-	Silty Clay	-
14/03/2022	ETAM22W00396	SC	750	1.81	34.9	1.34	2.70	3.4	184	184	184	184	Gully	1749016	5948905	-	Silty Clay	-
14/03/2022	ETAM22W00396	SC	751	1.92	26.4	1.52	2.70	3.7	188	208	208	208	Gully	1748990	5948876	-	Silty Clay	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00396
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00396

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	Millwater Precinct K

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 17/03/2022

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00405
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00405

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 17/03/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
15/03/2022	ETAM22W00405	SC	752	1.79	27.4	1.40	2.70	9.6	145	188	UTP	139	Undercut 10	1748973	5948952	-	Silty Clay	-
15/03/2022	ETAM22W00405	SC	753	1.86	30.8	1.42	2.70	3.6	157	168	157	UTP	Gully	1749062	5948940	-	Silty Clay	-
15/03/2022	ETAM22W00405	SC	754	1.82	31.9	1.38	2.70	4.7	187	187	UTP	UTP	Gully	1749003	5948870	-	Silty Clay	-
15/03/2022	ETAM22W00405	SC	755	1.86	31.4	1.41	2.70	3.3	UTP	UTP	UTP	UTP	Gully	1749053	5948897	-	Silty Clay	-
15/03/2022	ETAM22W00405	SC	756	1.81	26.9	1.42	2.70	9.0	UTP	UTP	UTP	UTP	Lot 1004	1749395	5948931	-	Silty Clay	Finished Level
15/03/2022	ETAM22W00405	SC	757	1.85	28.3	1.44	2.70	5.6	UTP	UTP	UTP	UTP	Lot 1004	1749430	5948917	-	Silty Clay	Finished Level

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00405
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00405

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 17/03/2022

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00436
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00436

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 23/03/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
17/03/2022	ETAM22W00436	SC	758	1.91	30.6	1.46	2.70	1.0	176	184	184	180	Gully	1749040	5948865	-	Silty Clay	-
17/03/2022	ETAM22W00436	SC	759	1.88	32.9	1.42	2.70	0.9	192	188	192	180	Gully	1748983	5948888	-	Silty Clay	-
17/03/2022	ETAM22W00436	SC	760	1.90	29.8	1.46	2.70	2.4	176	176	168	UTP	Gully	1749049	5948940	-	Silty Clay	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00436
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00436

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 23/03/2022

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00450
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00450

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 25/03/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
18/03/2022	ETAM22W00450	SC	761	1.79	29.2	1.39	2.70	8.1	UTP	UTP	UTP	UTP	Refer to map	1749161	5948803	-	Silty Clay	-
18/03/2022	ETAM22W00450	SC	762	1.92	28.1	1.50	2.70	2.4	UTP	UTP	UTP	UTP	Refer to map	1749217	5948823	-	Silty Clay	-
18/03/2022	ETAM22W00450	SC	763	1.94	28.9	1.51	2.70	0.6	UTP	UTP	UTP	UTP	Refer to map	1749031	5948867	-	Silty Clay	-
18/03/2022	ETAM22W00450	SC	764	1.81	31.4	1.38	2.70	5.8	142	UTP	UTP	UTP	Refer to map	1748977	5945905	-	Silty Clay	-
18/03/2022	ETAM22W00450	SC	765	1.88	31.5	1.43	2.70	1.9	176	UTP	UTP	UTP	Refer to map	1748970	5948958	-	Silty Clay	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00450
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00450

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 25/03/2022

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00509
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00509

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 30/03/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
29/03/2022	ETAM22W00509	LW	766	1.92	27.4	1.51	2.70	2.9	UTP	UTP	175	175	Gully 2	1749052	5948934	-	Silty Clay	-
29/03/2022	ETAM22W00509	LW	767	1.91	28.3	1.49	2.70	2.7	UTP	UTP	UTP	UTP	Gully 2	1748998	5948921	-	Silty Clay	-
29/03/2022	ETAM22W00509	LW	768	1.94	30.5	1.49	2.70	0.0	175	175	175	175	Gully 2	1748983	5948904	-	Silty Clay	-
29/03/2022	ETAM22W00509	LW	769	1.93	27.2	1.52	2.70	2.5	175	175	175	175	Gully 2	1748987	5948869	-	Silty Clay	-
29/03/2022	ETAM22W00509	LW	770	1.91	27.5	1.50	2.70	3.4	149	160	143	172	Gully 2	1749034	5948858	-	Silty Clay	-
29/03/2022	ETAM22W00509	LW	771	1.90	28.0	1.48	2.70	3.5	146	153	175	175	Gully 2	1749058	5948888	-	Silty Clay	-

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00509
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00509

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 30/03/2022

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00530
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00530

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 1/04/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
30/03/2022	ETAM22W00530	SC	772	1.91	29.4	1.48	2.70	1.7	188	188	192	192	Gully	1749043	5948936	-	Silty Clay	-
30/03/2022	ETAM22W00530	SC	773	1.85	32.2	1.40	2.70	3.2	168	168	172	172	Gully	1749064	5948897	-	Silty Clay	-
30/03/2022	ETAM22W00530	SC	774	1.88	25.5	1.50	2.70	6.4	188	188	168	168	Gully	1749029	5948866	-	Silty Clay	-
30/03/2022	ETAM22W00530	SC	775	1.81	33.6	1.35	2.70	4.3	165	168	188	188	Gully	1749216	5948821	-	Silty Clay	-

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00530
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00530

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 1/04/2022

SITE PLAN (NOT TO SCALE)

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00541
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00541

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 4/04/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
31/03/2022	ETAM22W00541	LW	776	1.89	25.9	1.50	2.70	5.5	143	UTP	UTP	UTP	Gully 2	1748989	5948858	-	Silty Clay	-
31/03/2022	ETAM22W00541	LW	777	1.84	28.5	1.44	2.70	6.0	UTP	UTP	175	175	Gully 2	1749003	5948886	-	Silty Clay	-
31/03/2022	ETAM22W00541	LW	778	1.85	30.2	1.42	2.70	4.4	UTP	UTP	UTP	UTP	Gully 2	1749060	5948893	-	Silty Clay	-
31/03/2022	ETAM22W00541	LW	779	1.83	35.3	1.35	2.70	2.0	UTP	UTP	UTP	UTP	Gully 2	1749029	5948921	-	Silty Clay	-

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00541
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00541

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 4/04/2022

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00560
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00560

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 5/04/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
1/04/2022	ETAM22W00560	LW	780	1.87	37.5	1.36	2.70	0.0	175	175	175	164	Gully 2	1749023	5948965	-	Silty Clay	-
1/04/2022	ETAM22W00560	LW	781	1.93	30.1	1.48	2.70	0.6	175	175	175	175	Gully 2	1749051	5948939	-	Silty Clay	-
1/04/2022	ETAM22W00560	LW	782	1.89	28.6	1.47	2.70	3.5	175	175	175	175	Gully 2	1749016	5948904	-	Silty Clay	-
1/04/2022	ETAM22W00560	LW	783	1.90	30.6	1.45	2.70	1.6	175	175	175	175	Gully 2	1749042	5948855	-	Silty Clay	-

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00560
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00560

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 5/04/2022

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00577
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00577

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 5/04/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
4/04/2022	ETAM22W00577	LW	784	1.88	36.1	1.38	2.70	0.0	175	175	175	175	RW 312	1748989	5949022	-	Silty Clay	~6m to FL
4/04/2022	ETAM22W00577	LW	785	1.84	33.9	1.38	2.70	2.4	175	175	175	175	RW 312	1749014	5949016	-	Silty Clay	~6m to FL
4/04/2022	ETAM22W00577	LW	786	1.88	31.8	1.42	2.70	2.1	163	153	143	137	Gully 2	1749009	5948875	-	Silty Clay	-
4/04/2022	ETAM22W00577	LW	787	1.88	32.5	1.42	2.70	1.6	160	140	172	153	Gully 2	1749016	5948902	-	Silty Clay	-

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00577
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00577

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 5/04/2022

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00594
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00594

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 7/04/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
5/04/2022	ETAM22W00594	LW	788	1.86	32.6	1.40	2.70	2.6	168	164	175	175	Refer to plan	1749187	5948799	-	Silty Clay	1m to FL
5/04/2022	ETAM22W00594	LW	789	1.86	32.0	1.41	2.70	3.0	175	175	175	160	Refer to plan	1749164	5948816	-	Silty Clay	1m to FL
5/04/2022	ETAM22W00594	LW	790	1.88	32.8	1.41	2.70	1.4	175	175	175	175	Gully 2	1749013	5948869	-	Silty Clay	-
5/04/2022	ETAM22W00594	LW	791	1.88	33.3	1.41	2.70	0.8	175	175	175	175	Gully 2	1749025	5948887	-	Silty Clay	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00594
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00594

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 7/04/2022

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00635
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00635

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 19/04/2022

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
7/04/2022	ETAM22W00635	LW	796	1.87	38.4	1.35	2.70	0.0	168	153	172	160	Gully 2	1749025	5948942	-	Silty Clay	-
7/04/2022	ETAM22W00635	LW	797	1.88	38.7	1.36	2.70	0.0	143	149	172	175	Gully 2	1749042	5948893	-	Silty Clay	-
7/04/2022	ETAM22W00635	LW	798	1.86	37.6	1.35	2.70	0.0	140	140	149	172	Gully 2	1748990	5948902	-	Silty Clay	-
7/04/2022	ETAM22W00635	LW	799	1.88	39.9	1.34	2.70	0.0	143	153	146	143	Gully 2	1749026	5948867	-	Silty Clay	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM22W00635
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00635

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 19/04/2022

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM23W00321
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W00321

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 10/03/2023

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
7/03/2023	ETAM23W00321	SC	1068	1.82	29.5	1.41	2.65	5.4	155	155	158	158	Gully 2	1749012	5948870	-	Silty CLAY	-
7/03/2023	ETAM23W00321	SC	1069	1.88	29.2	1.45	2.65	2.8	192+	192+	192+	192+	Gully 2	1748963	5948858	-	Silty CLAY	-
7/03/2023	ETAM23W00321	SC	1070	1.85	30.3	1.42	2.65	3.4	186	186	186	186	Gully 2	1748987	5948836	-	Silty CLAY	-
7/03/2023	ETAM23W00321	SC	1071	1.91	37.2	1.39	2.65	0.0	170	170	155	158	Shear Key	1748893	5948093	-	Clayey SILT	-
7/03/2023	ETAM23W00321	SC	1072	1.85	33.2	1.39	2.65	1.4	185	185	170	170	Shear Key	1448893	5949103	-	Clayey SILT	-
7/03/2023	ETAM23W00321	SC	1073	1.85	37.8	1.35	2.65	0.0	155	155	158	158	Shear Key	1748914	5949098	-	Clayey SILT	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM23W00321
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W00321

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
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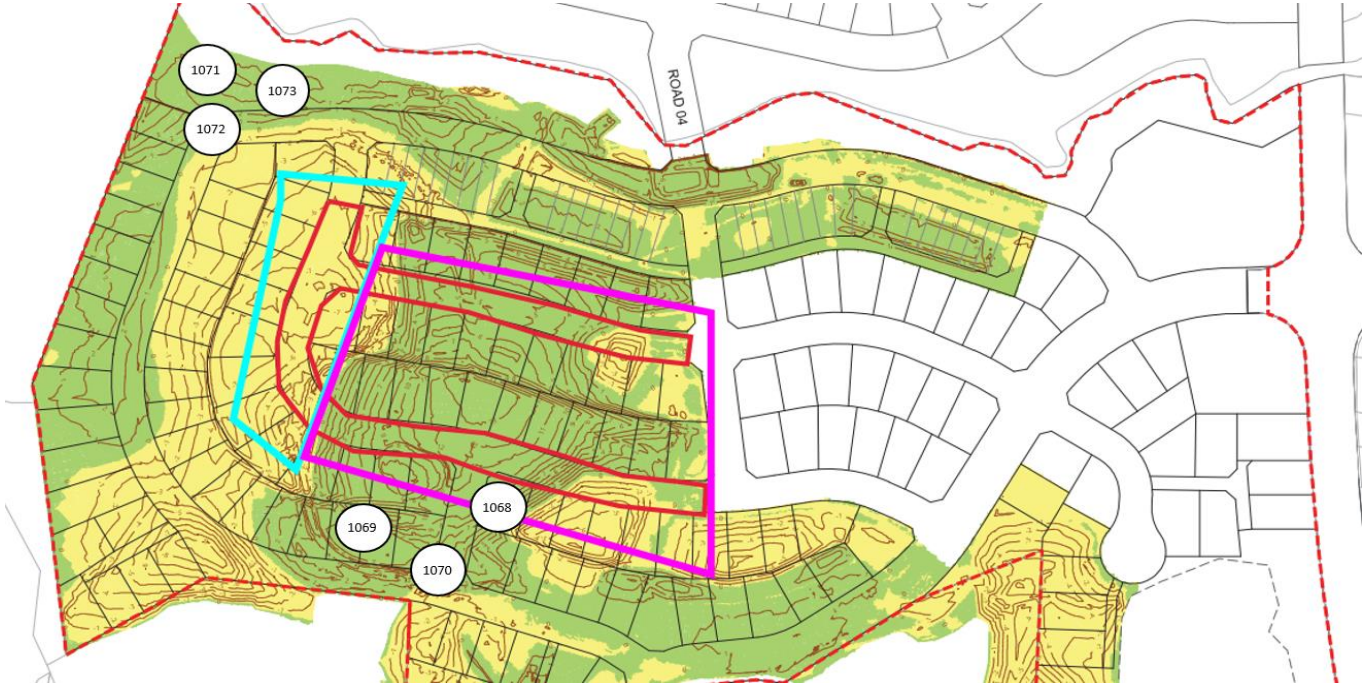
Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 10/03/2023



Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM23W00333
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W00333

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 10/03/2023

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
8/03/2023	ETAM23W00333	SC	1074	1.85	29.5	1.43	2.65	3.8	174	152	150	143	Gully 2	1749002	5948823	41.1	Silty Clay	-
8/03/2023	ETAM23W00333	SC	1075	1.77	35.3	1.31	2.65	4.2	155	155	152	152	Gully 2	1748945	5948853	41.4	Silty Clay	-
8/03/2023	ETAM23W00333	SC	1076	1.85	32.0	1.40	2.65	2.3	155	155	170	170	Shear Key	1748896	5949094	-	Silty Clay	-
8/03/2023	ETAM23W00333	SC	1077	1.82	31.4	1.38	2.65	4.3	147	152	152	152	Shear Key	1478919	5949097	-	Silty Clay	-

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM23W00333
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W00333

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 10/03/2023

SITE PLAN (NOT TO SCALE)

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM23W00372
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W00372

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 15/03/2023

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
9/03/2023	ETAM23W00372	SC	1078	1.85	33.8	1.38	2.65	0.9	186	186	170	170	Gully	1749012	5948843	-	Silty Clay	-
9/03/2023	ETAM23W00372	SC	1079	1.81	33.8	1.35	2.65	3.5	155	155	167	167	Gully	1748973	5948848	-	Silty Clay	-
9/03/2023	ETAM23W00372	SC	1080	1.86	29.3	1.44	2.65	3.4	192	192	192	192	Shear Key	1748903	5949097	-	Silty Clay	-
9/03/2023	ETAM23W00372	SC	1081	1.81	30.5	1.39	2.65	5.3	186	186	186	186	Shear Key	1748904	5949111	-	Silty Clay	-

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM23W00372
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W00372

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
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Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 15/03/2023

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM23W00386
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W00386

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 16/03/2023

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
13/03/2023	ETAM23W00386	SC	1084	1.88	29.7	1.45	2.65	2.3	186	186	186	186	Shear Key	1748891	5949112	-	Silty Clay	-
13/03/2023	ETAM23W00386	SC	1085	1.83	32.8	1.38	2.65	2.7	186	186	192	192	Shear Key	1748899	5949101	-	Silty Clay	-
13/03/2023	ETAM23W00386	SC	1086	1.83	31.8	1.39	2.65	3.3	170	186	186	170	Gully	1748968	5948834	-	Silty Clay	-
13/03/2023	ETAM23W00386	SC	1087	1.88	34.4	1.40	2.65	-0.7	173	170	167	182	Gully	1748982	5948843	-	Silty Clay	-

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM23W00386
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W00386

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 16/03/2023

SITE PLAN (NOT TO SCALE)

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM23W00404
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W00404

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 16/03/2023

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
15/03/2023	ETAM23W00404	SC	1092	1.82	31.4	1.38	2.65	4.4	155	158	152	155	Gully 2	1749040	5948826	-	Silty Clay	-
15/03/2023	ETAM23W00404	SC	1093	1.84	30.6	1.41	2.65	3.5	192	192	192	192	Gully 2	1748968	5948835	-	Silty Clay	-
15/03/2023	ETAM23W00404	SC	1094	1.86	31.4	1.41	2.65	2.2	186	186	192	192	Shear Key	1748891	5949103	-	Silty Clay	-
15/03/2023	ETAM23W00404	SC	1095	1.88	31.9	1.42	2.65	1.0	192	192	192	192	Shear Key	1748931	5949093	-	Silty Clay	-
15/03/2023	ETAM23W00404	SC	1096	1.79	40.6	1.27	2.65	0.4	155	170	167	158	Gully 2	1748991	5948873	-	Silty Clay	-

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM23W00404
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W00404

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
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Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 16/03/2023

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM23W00417
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W00417

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 17/03/2023

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
16/03/2023	ETAM23W00417	SC	1097	1.89	30.9	1.45	2.65	0.7	192	192	192	192	Gully Main Fill	1749005	5948863	-	Silty Clay	-
16/03/2023	ETAM23W00417	SC	1098	1.86	32.1	1.41	2.65	1.6	186	170	170	155	Gully Main Fill	1749019	5948878	-	Silty Clay	-
16/03/2023	ETAM23W00417	SC	1099	1.83	37.0	1.33	2.65	0.3	170	170	182	182	Shear Key	1748893	5949105	-	Silty Clay	-
16/03/2023	ETAM23W00417	SC	1100	1.84	36.6	1.34	2.65	0.1	155	158	161	158	Shear Key	1748897	5949057	-	Silty Clay	-

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM23W00417
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W00417

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 17/03/2023

SITE PLAN (NOT TO SCALE)

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM23W00465
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W00465

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 22/03/2023

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
17/03/2023	ETAM23W00465	SC	1101	1.86	31.4	1.41	2.65	2.3	186	186	192	192	Gully 2	1749023	5948858	-	Silty CLAY	-
17/03/2023	ETAM23W00465	SC	1102	1.84	32.3	1.39	2.65	2.8	186	186	186	186	Gully 2	1748991	5948880	-	Silty CLAY	-
17/03/2023	ETAM23W00465	SC	1103	1.80	32.6	1.36	2.65	4.5	170	173	167	170	Shear Key	1748890	5949100	11.56	Silty CLAY	-
17/03/2023	ETAM23W00465	SC	1104	1.86	29.9	1.43	2.65	3.4	170	170	173	173	Shear Key	1748934	5949088	11.42	Silty CLAY	-
17/03/2023	ETAM23W00465	SC	1105	1.90	32.1	1.44	2.65	0.0	170	170	170	170	Shear Key	1748966	5949095	12.51	Clayey SILT	-
17/03/2023	ETAM23W00465	SC	1106	1.85	30.8	1.41	2.65	3.1	167	186	170	170	Shear Key	1748995	5949064	13.40	Clayey SILT	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

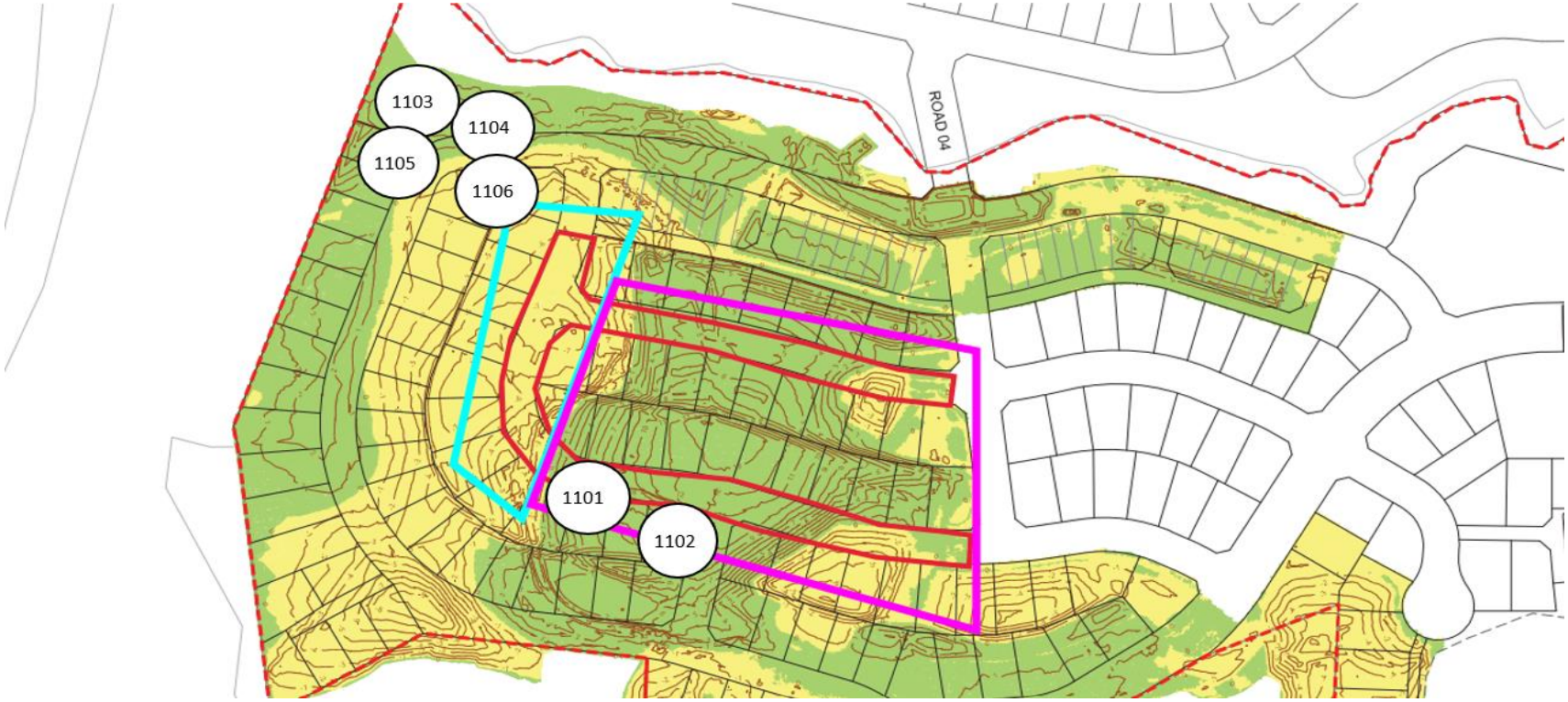
Earthworks Fill Report

Report No: EFIL:ETAM23W00465
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W00465

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 22/03/2023



Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM23W00726
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W00726

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 26/04/2023

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
20/04/2023	ETAM23W00726	SC	1139	1.81	32.1	1.37	2.65	4.1	170	170	170	170	Gully 2	1749034	5948876	-	Clayey Silt	-
20/04/2023	ETAM23W00726	SC	1140	1.86	34.8	1.38	2.65	0.0	170	170	186	186	Gully 2	1748980	5948884	-	Clayey Silt	-
20/04/2023	ETAM23W00726	SC	1141	1.86	25.8	1.47	2.65	6.3	186	186	186	186	Gully 2	1749021	5948838	-	Clayey Silt	-
20/04/2023	ETAM23W00726	SC	1142	1.90	27.9	1.48	2.65	2.7	192	192	192	192	Gully 2	1748981	5948842	-	Clayey Silt	-
20/04/2023	ETAM23W00726	SC	1143	1.82	32.0	1.38	2.65	3.9	158	158	170	170	Shear Key	1748914	5949079	17.06	Clayey Silt	-
20/04/2023	ETAM23W00726	SC	1144	1.85	30.5	1.42	2.65	3.2	186	186	170	170	Shear Key	1748942	5949074	17.08	Clayey Silt	-

Comments:

Auckland Laboratory

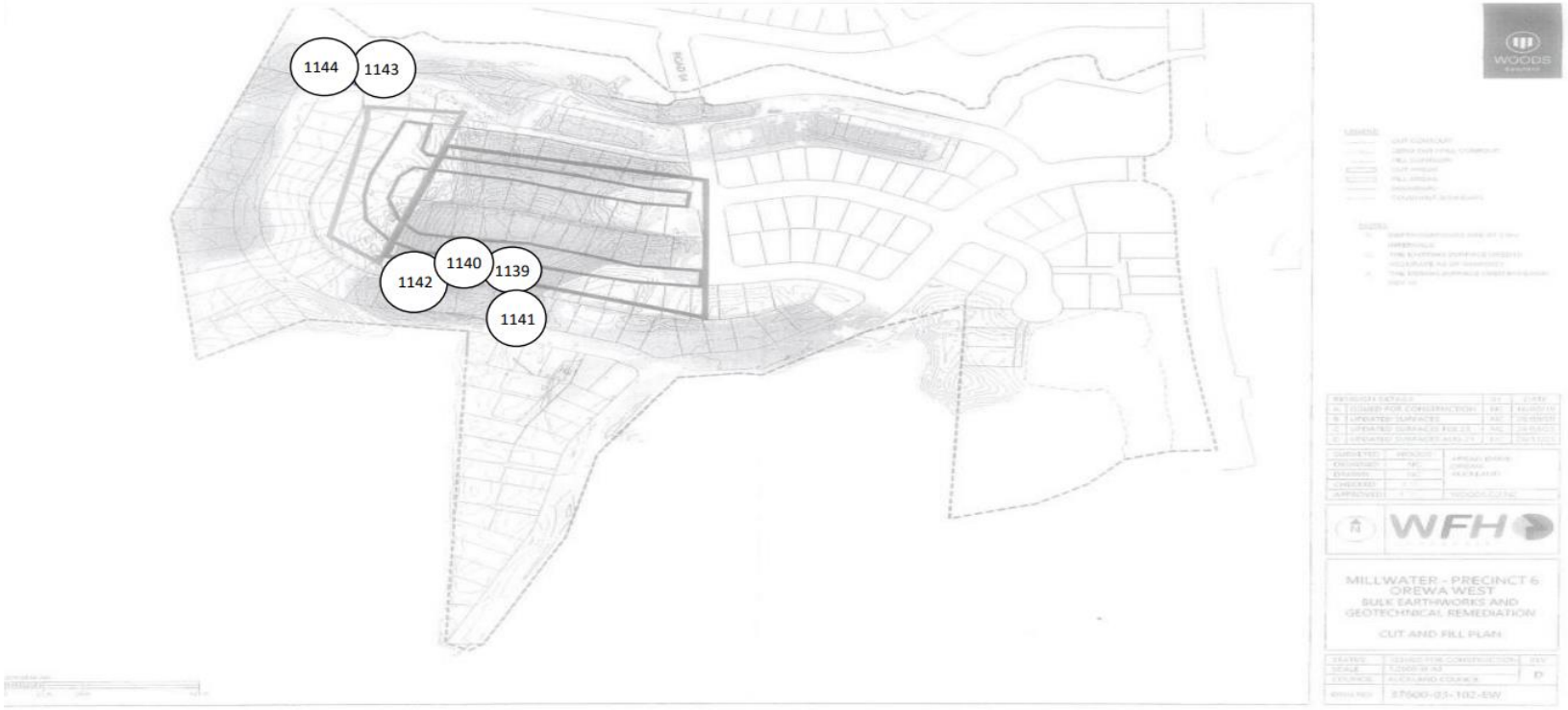
GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM23W00726
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W00726

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 26/04/2023



Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM23W01814
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W01814

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 26/10/2023

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
17/10/2023	ETAM23W01814	SC	1170	1.84	29.2	1.42	2.65	4.7	207	207	183	183	Gully (Refer to plan)	1748989	5948884	36.40	Silty CLAY	-
17/10/2023	ETAM23W01814	SC	1171	1.78	35.5	1.32	2.65	3.6	157	157	183	183	Gully (Refer to plan)	1749008	5948856	36.40	Silty CLAY	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM23W01814
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

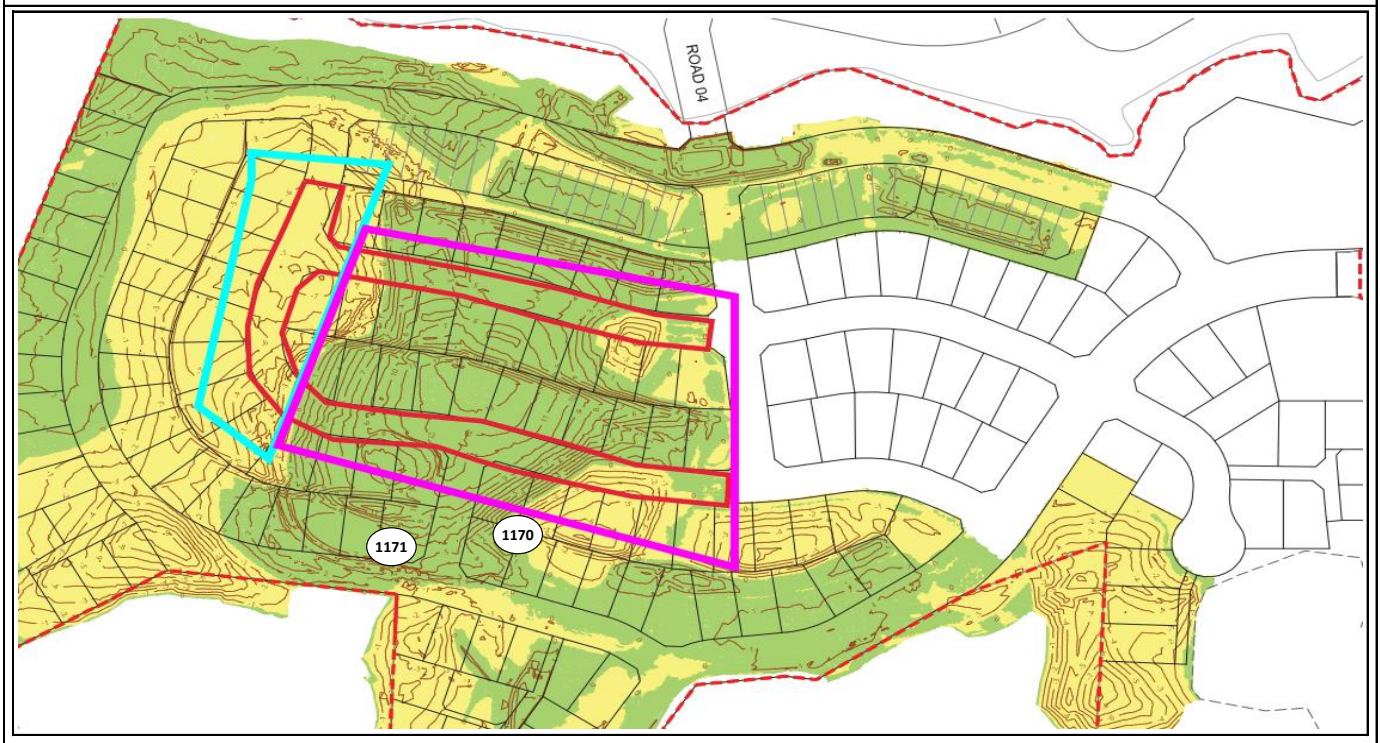
Approved Signatory: Eric Paton
(Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 26/10/2023

SITE PLAN
* NOT TO SCALE *

Project No: 773-ETAM01553
Work Order No: ETAM23W01814

Location Gully (See Below)

Tested by: SC
Date Tested: 17/10/2023



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM23W01911
Issue No:2
This report replaces all previous issues of report no. EFIL:ETAM23W01911

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 13/11/2023

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
7/11/2023	ETAM23W01911	LW	1176	1.89	27.2	1.49	2.65	3.4	164	188	149	168	Gully 2	1748995	5948872	36.80	Silty CLAY	-
7/11/2023	ETAM23W01911	LW	1177	1.86	31.3	1.42	2.65	2.0	180	153	143	172	Gully 2	1749022	5948869	36.90	Silty CLAY	-
7/11/2023	ETAM23W01911	LW	1178	1.88	27.3	1.48	2.65	3.8	137	149	164	153	RE Wall 604 C	1748911	5949069	10.00	Silty CLAY	-
7/11/2023	ETAM23W01911	LW	1179	1.90	28.6	1.48	2.65	2.1	180	164	143	149	RE Wall 604 C	1748936	5949071	10.00	Silty CLAY	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM23W01911
Issue No: 2
This report replaces all previous issues of report no 'EFIL:ETAM23W01911'.

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

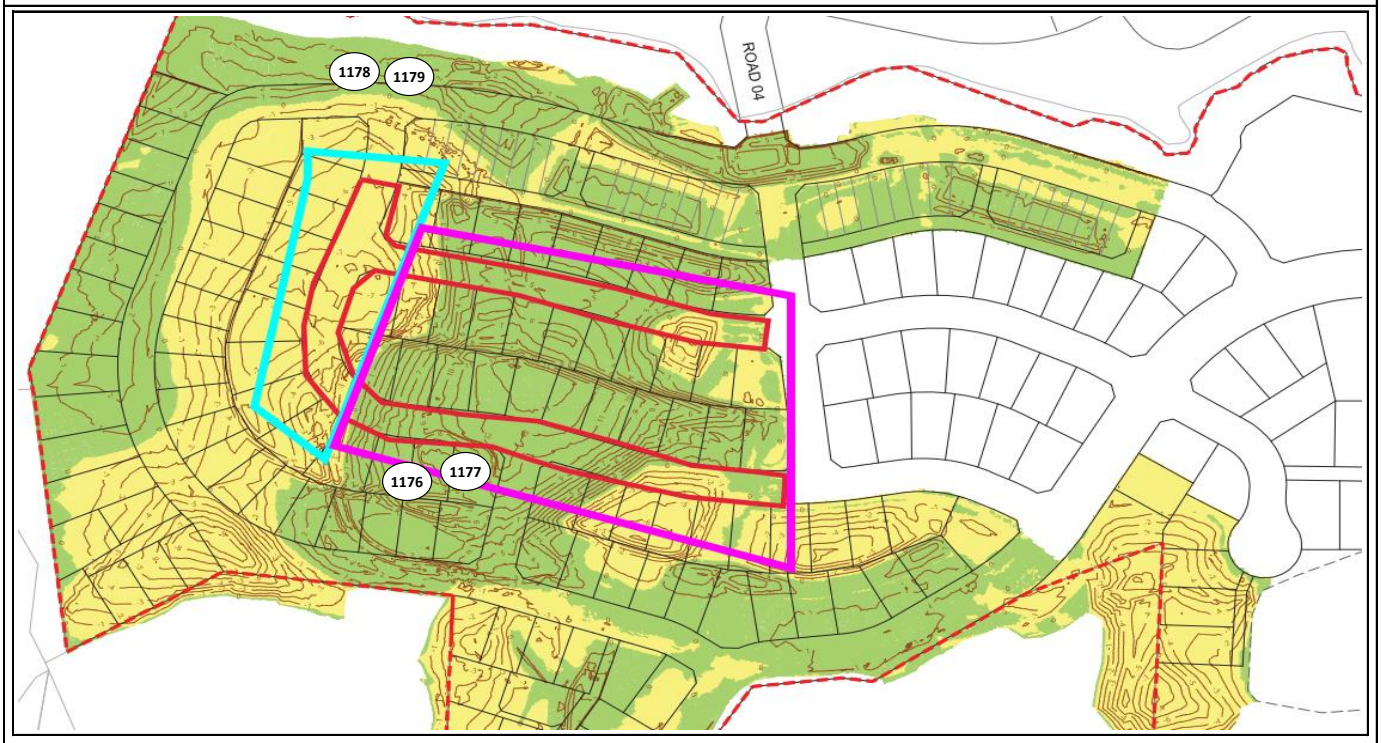
Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 13/11/2023

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAMW01911
Page No: 2 of 2

Location: Gully 2 and RE Wall 604 C

Tested by: LW
Date Tested: 7/11/2023



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM23W02017
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W02017

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Cesar Pura
Laboratory Supervisor
IANZ Site Number: 105
Date of Issue: 5/12/2023

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL (m)	Material Tested	Comments
30/11/2023	ETAM23W02017	SC	1204	1.88	31.4	1.43	2.65	1	194	175	159	175	RE Wall	1748971	5949079	15.99	Silty CLAY	-
30/11/2023	ETAM23W02017	SC	1205	1.87	30.7	1.43	2.65	2	188	198+	198+	198+	RE Wall	1748981	5949060	16.00	Silty CLAY	-
30/11/2023	ETAM23W02017	SC	1206	1.89	28.6	1.47	2.65	3	198+	175	198+	175	Western Fill Area	1748841	5948993	-	Silty CLAY	RL not available
30/11/2023	ETAM23W02017	SC	1207	1.91	27.0	1.51	2.65	3	UTP	UTP	UTP	UTP	Western Fill Area	1748828	5948956	-	Silty CLAY	RL not available
30/11/2023	ETAM23W02017	SC	1208	1.86	32.9	1.40	2.65	1	152	149	159	175	Western Fill Area	1748848	5948913	-	Silty CLAY	RL not available
30/11/2023	ETAM23W02017	SC	1209	1.92	26.3	1.52	2.65	3	UTP	UTP	UTP	UTP	Gully Fill Area	1748975	5948886	-	Silty CLAY	RL not available
30/11/2023	ETAM23W02017	SC	1210	1.90	22.8	1.55	2.65	6	UTP	UTP	UTP	143	Gully Fill Area	1749004	5948871	-	Silty CLAY	RL not available

Comments:

Moisture contents and dry densities are corrected against oven dried moisture content testing. Probe Depth: 150mm; SG= 2.65 T/m3 (Assumed)
Reduced level (RL) was supplied by contractor and not IANZ endorsed.

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM23W02017
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

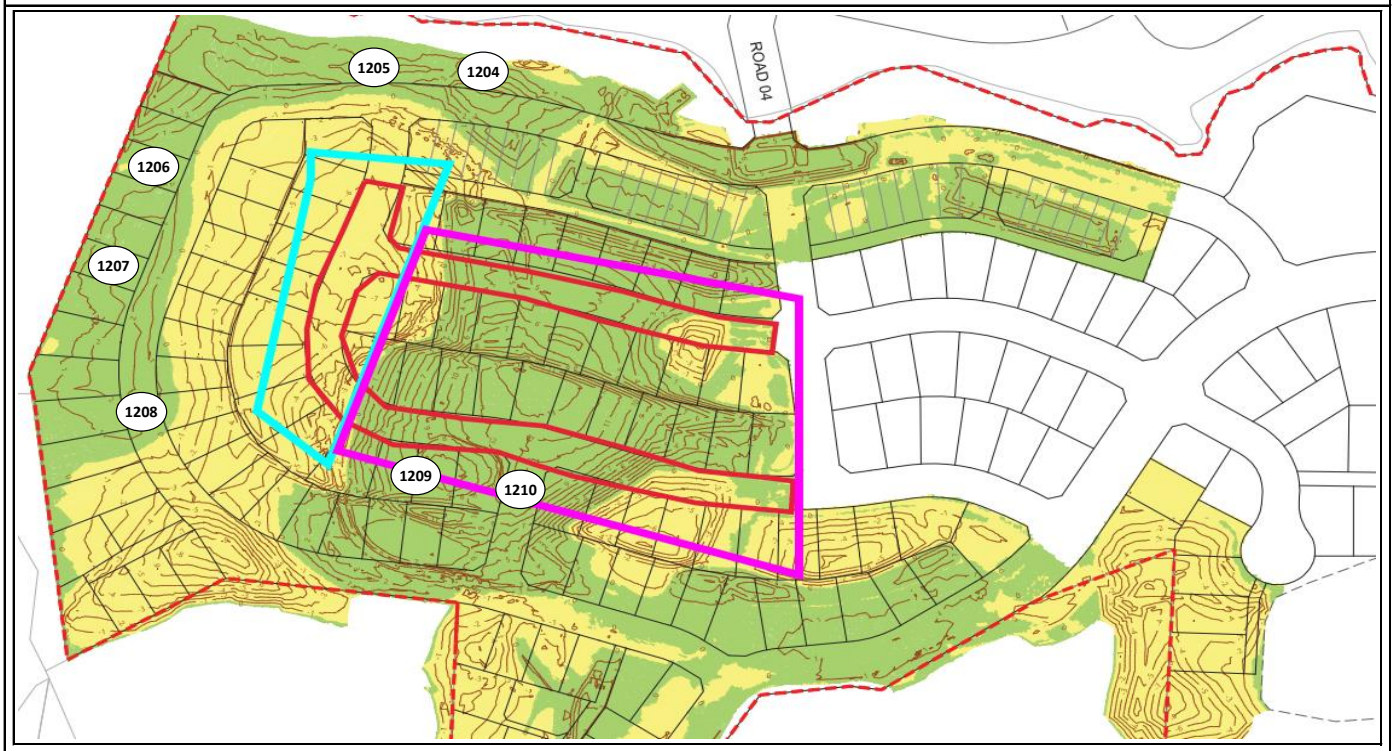
Approved Signatory: Cesar Pura
(Laboratory Supervisor)
IANZ Accredited Laboratory Number:105
Date of Issue: 5/12/2023

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAMW02017
Page No: 2 of 2

Location: RE Wall + Western Area + Gully Fill Area

Tested by: SC
Date Tested: 30/11/2023



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM23W02123
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W02123

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 21/12/2023

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
19/12/2023	ETAM23W02123	RP	1230	1.84	35.8	1.36	2.65	0.1	155	159	188	188	Western Fill Area	1748882	5949036	-	Silty CLAY	RL not available
19/12/2023	ETAM23W02123	RP	1231	1.91	27.7	1.50	2.65	2.0	UTP	UTP	UTP	UTP	Western Fill Area	1748869	5949009	-	Silty CLAY	RL not available
19/12/2023	ETAM23W02123	RP	1232	1.91	26.5	1.51	2.65	3.2	UTP	UTP	UTP	UTP	Road Undercut	1748882	5948872	-	Silty CLAY	RL not available
19/12/2023	ETAM23W02123	RP	1233	1.95	29.0	1.51	2.65	0.0	UTP	UTP	UTP	UTP	Road Undercut	1748916	5948846	-	Silty CLAY	RL not available
19/12/2023	ETAM23W02123	RP	1234	1.91	27.5	1.50	2.65	2.4	UTP	UTP	UTP	UTP	Gully 2	1749018	5948848	-	Silty CLAY	RL not available
19/12/2023	ETAM23W02123	RP	1235	1.97	24.3	1.59	2.65	1.5	UTP	UTP	UTP	UTP	Gully 2	1748999	5948876	-	Silty CLAY	RL not available
19/12/2023	ETAM23W02123	RP	1236	1.87	25.4	1.49	2.65	5.8	UTP	UTP	UTP	UTP	Undercut 9	1748913	5948894	-	Silty CLAY	RL not available
19/12/2023	ETAM23W02123	RP	1237	1.93	24.9	1.54	2.65	3.3	UTP	UTP	UTP	UTP	Undercut 9	1748930	5948885	-	Silty CLAY	RL not available

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM23W02123
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

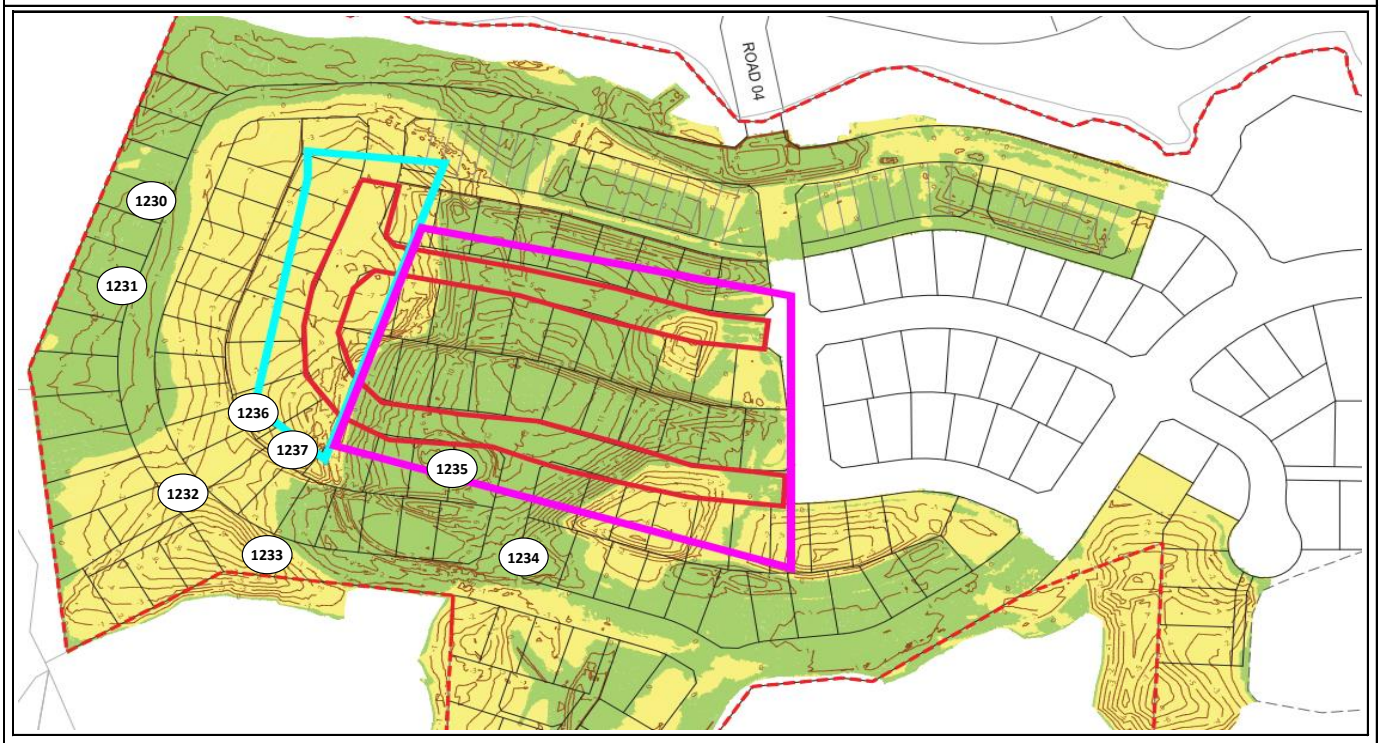
Approved Signatory: Eric Paton
(Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 21/12/2023

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAMW02123
Page No: 2 of 2

Location: Western Area + Gully 2 + Road Undercut

Tested by: RP
Date Tested: 19/12/2023



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00012
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00012

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 14/01/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
9/01/2024	ETAM24W00012	RP	1242	1.94	27.6	1.52	2.65	0.5	175	198+	UTP	UTP	Gully (refer to plan)	1748982	5948889	-	Silty CLAY	RL not available
9/01/2024	ETAM24W00012	RP	1243	1.90	30.0	1.46	2.65	1.2	UTP	UTP	UTP	UTP	Gully (refer to plan)	1749022	5948860	-	Silty CLAY	RL not available
9/01/2024	ETAM24W00012	RP	1244	1.96	29.3	1.51	2.65	0.0	UTP	UTP	UTP	UTP	Gully (refer to plan)	1748982	5948864	-	Silty CLAY	RL not available

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00012
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

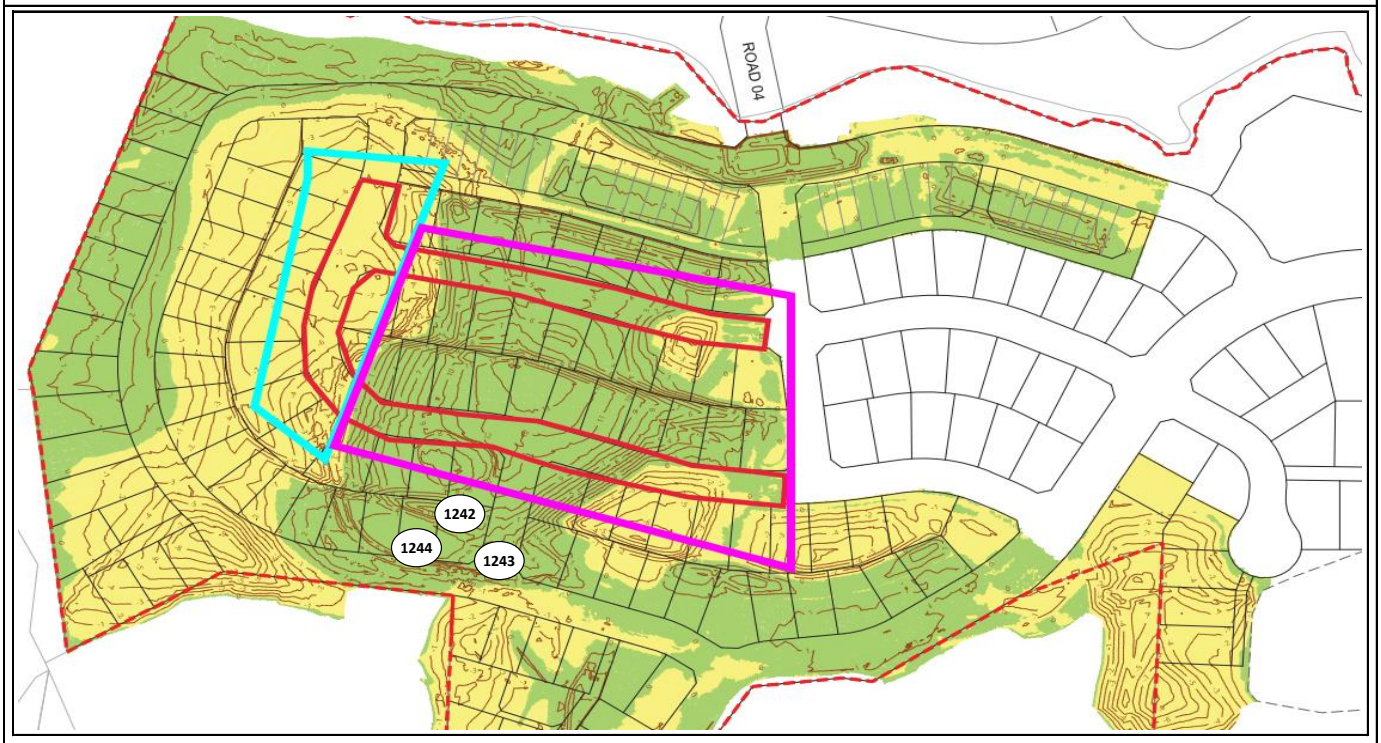
Approved Signatory: Eric Paton
(Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 14/01/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00012
Page No: 2 of 2

Location: Gully

Tested by: RP
Date Tested: 9/01/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00042
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00042

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 19/01/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
15/01/2024	ETAM24W00042	LW	1254	1.95	21.2	1.60	2.65	5.4	UTP	UTP	UTP	UTP	RE Wall 603	1748933	5948887	34.5	Silty CLAY	-
15/01/2024	ETAM24W00042	LW	1255	1.84	28.6	1.43	2.65	5.1	180	UTP	UTP	UTP	RE Wall 603	1748897	5948919	34.5	Silty CLAY	-
15/01/2024	ETAM24W00042	LW	1256	1.93	25.4	1.54	2.65	3.1	UTP	UTP	UTP	UTP	RE Wall 602	1749126	5948835	34.0	Silty CLAY	-
15/01/2024	ETAM24W00042	LW	1257	1.93	25.0	1.54	2.65	3.3	UTP	UTP	UTP	UTP	RE Wall 602	1749163	5948834	34.0	Silty CLAY	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00042
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

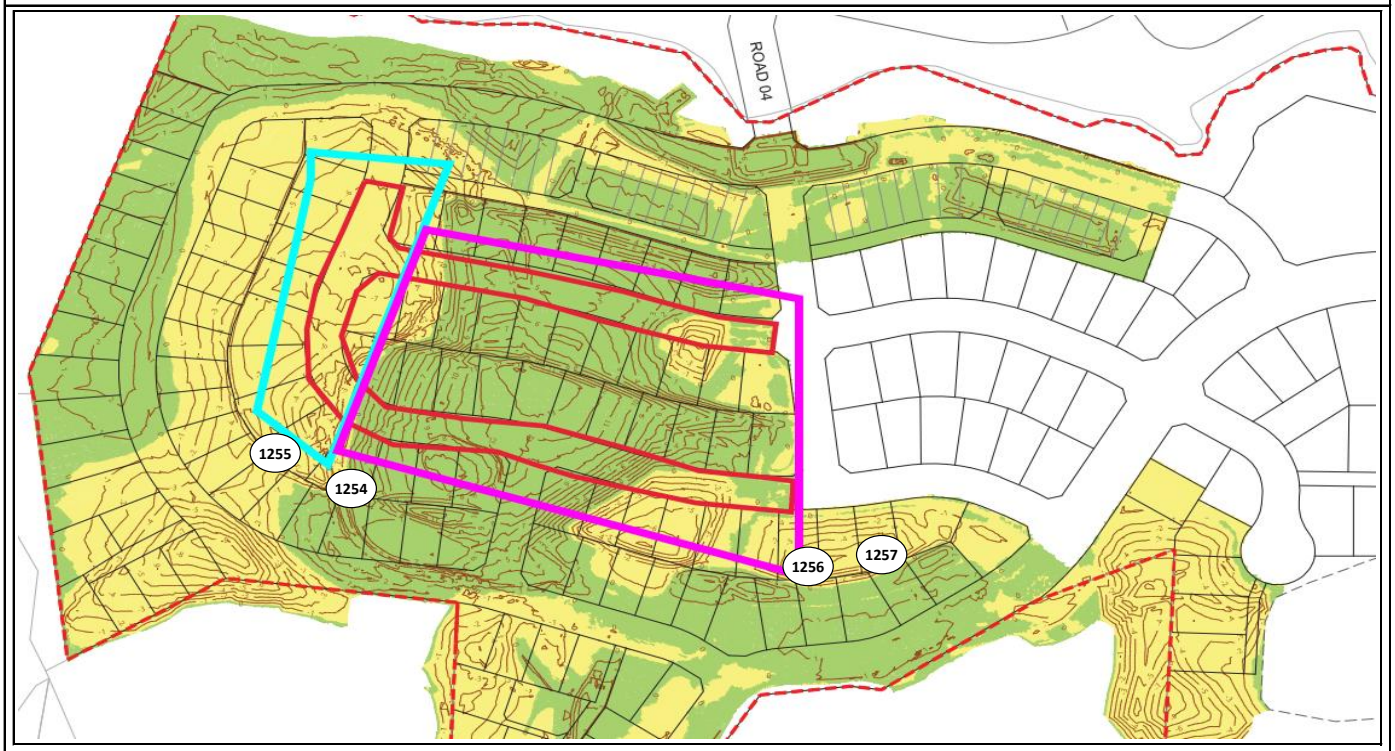
Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 19/01/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00042
Page No: 2 of 2

Location: RE Wall 603 - 602

Tested by: RP
Date Tested: 15/01/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00044
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00044

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 19/01/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
16/01/2024	ETAM24W00044	RP	1258	1.85	33.7	1.38	2.65	1.3	183	183	198+	198+	RE Wall 602	1749156	5948775	-	Silty CLAY	RL not available
16/01/2024	ETAM24W00044	RP	1259	1.84	29.6	1.42	2.65	4.4	175	188	159	162	RE Wall 602	1749163	5948836	-	Silty CLAY	RL not available
16/01/2024	ETAM24W00044	RP	1260	1.91	28.0	1.49	2.65	1.7	UTP	UTP	UTP	UTP	RE Wall 602	1749217	5948855	-	Silty CLAY	RL not available

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00044
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

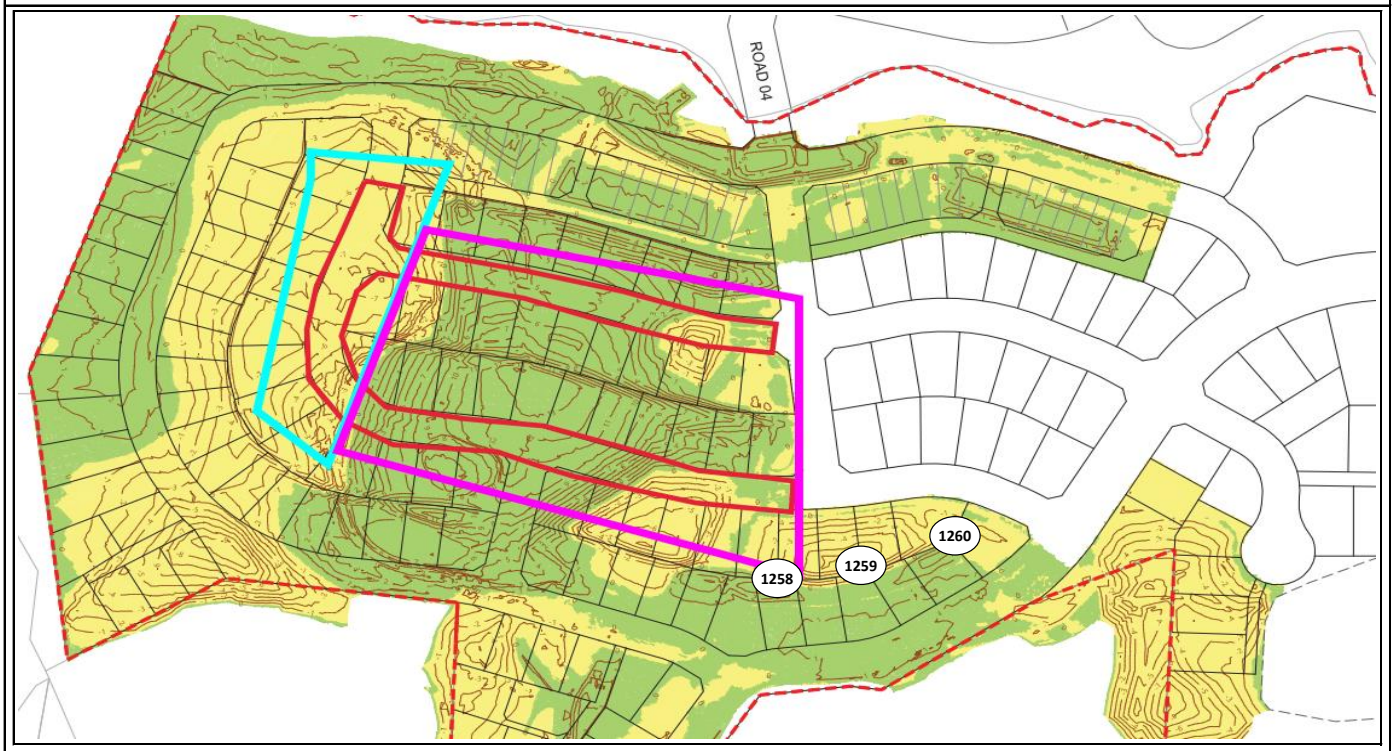
Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 19/01/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00044
Page No: 2 of 2

Location: RE Wall 602

Tested by: RP
Date Tested: 16/01/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00049
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00049

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 25/01/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
17/01/2024	ETAM24W00049	RP	1261	1.87	29.0	1.45	2.65	3.3	UTP	UTP	159	198+	RE Wall 602	1749107	5948838	35.3	Silty CLAY	-
17/01/2024	ETAM24W00049	RP	1262	1.87	29.8	1.44	2.65	2.8	UTP	UTP	UTP	UTP	RE Wall 602	1749135	5948833	35.3	Silty CLAY	-
17/01/2024	ETAM24W00049	RP	1263	1.85	29.1	1.43	2.65	4.3	UTP	UTP	UTP	UTP	RE Wall 602	1749167	5948833	35.3	Silty CLAY	-

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00049
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

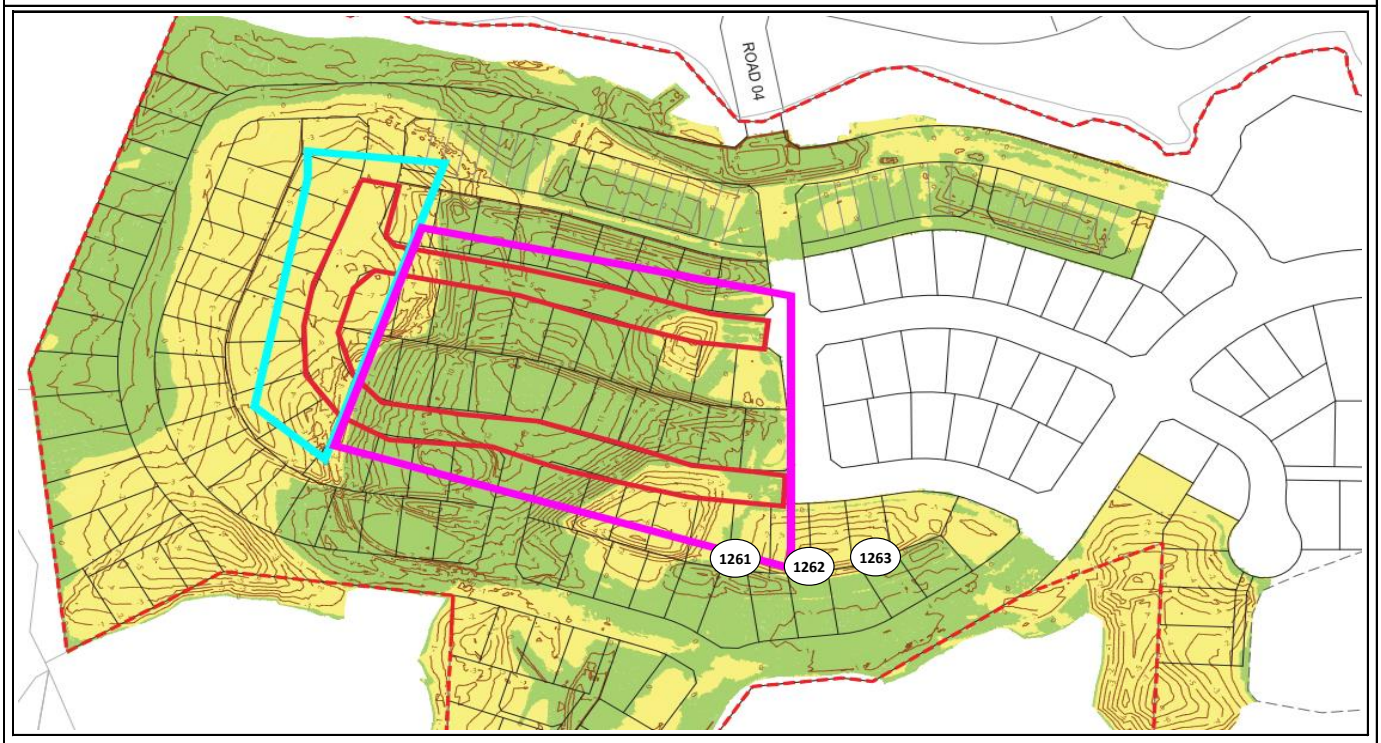
Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 25/01/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00049
Page No: 2 of 2

Location: RE Wall 602

Tested by: RP
Date Tested: 17/01/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00067
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00067

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 25/01/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
19/01/2024	ETAM24W00067	RP	1266	1.92	25.8	1.52	2.65	3.2	UTP	UTP	UTP	UTP	RE Wall 602	1749102	5948837	-	Silty CLAY	RL not available
19/01/2024	ETAM24W00067	RP	1267	1.94	25.7	1.55	2.65	2.0	UTP	UTP	UTP	UTP	RE Wall 602	1749154	5948830	-	Silty CLAY	RL not available
19/01/2024	ETAM24W00067	RP	1268	1.88	29.5	1.45	2.65	2.3	UTP	UTP	UTP	UTP	Silt Pond	1749102	5949016	16.2	Silty CLAY	-
19/01/2024	ETAM24W00067	RP	1269	1.88	25.7	1.49	2.65	5.4	UTP	UTP	UTP	UTP	Silt Pond	1749081	5949025	14.2	Silty CLAY	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00067
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

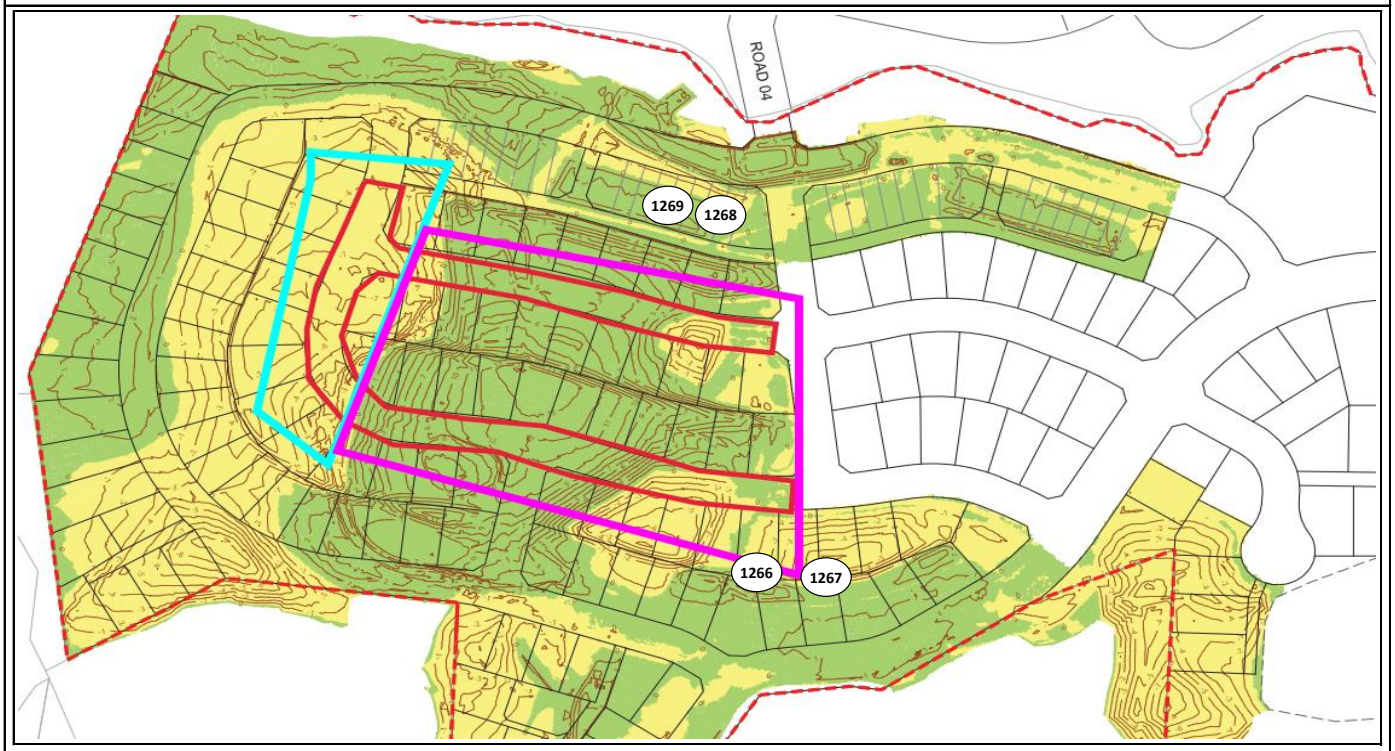
Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 25/01/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00067
Page No: 2 of 2

Location: RE Wall 602 + Silt Pond

Tested by: RP
Date Tested: 19/01/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00074
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00074

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 26/01/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
22/01/2024	ETAM24W00074	LW	1270	1.88	27.9	1.47	2.65	3.3	220+	220+	220+	220+	Undercut Area	1748832	5948869	-	Silty CLAY	RL not available
22/01/2024	ETAM24W00074	LW	1271	1.82	31.0	1.39	2.65	4.5	220+	220+	220+	149	Undercut Area	1748852	5948881	-	Silty CLAY	RL not available
22/01/2024	ETAM24W00074	LW	1272	1.94	27.1	1.53	2.65	0.9	220+	220+	220+	220+	RE Wall 602	1749200	5948845	-	Silty CLAY	RL not available
22/01/2024	ETAM24W00074	LW	1273	1.90	27.8	1.49	2.65	2.4	220+	220+	220+	220+	RE Wall 602	1749165	5948831	-	Silty CLAY	RL not available
22/01/2024	ETAM24W00074	LW	1274	1.90	29.7	1.47	2.65	1.1	220+	220+	220+	220+	Silt Pond	1749094	5949020	-	Silty CLAY	RL not available
22/01/2024	ETAM24W00074	LW	1275	1.90	27.5	1.49	2.65	3.0	220+	220+	220+	220+	Silt Pond	1749079	5949025	-	Silty CLAY	RL not available

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00074
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

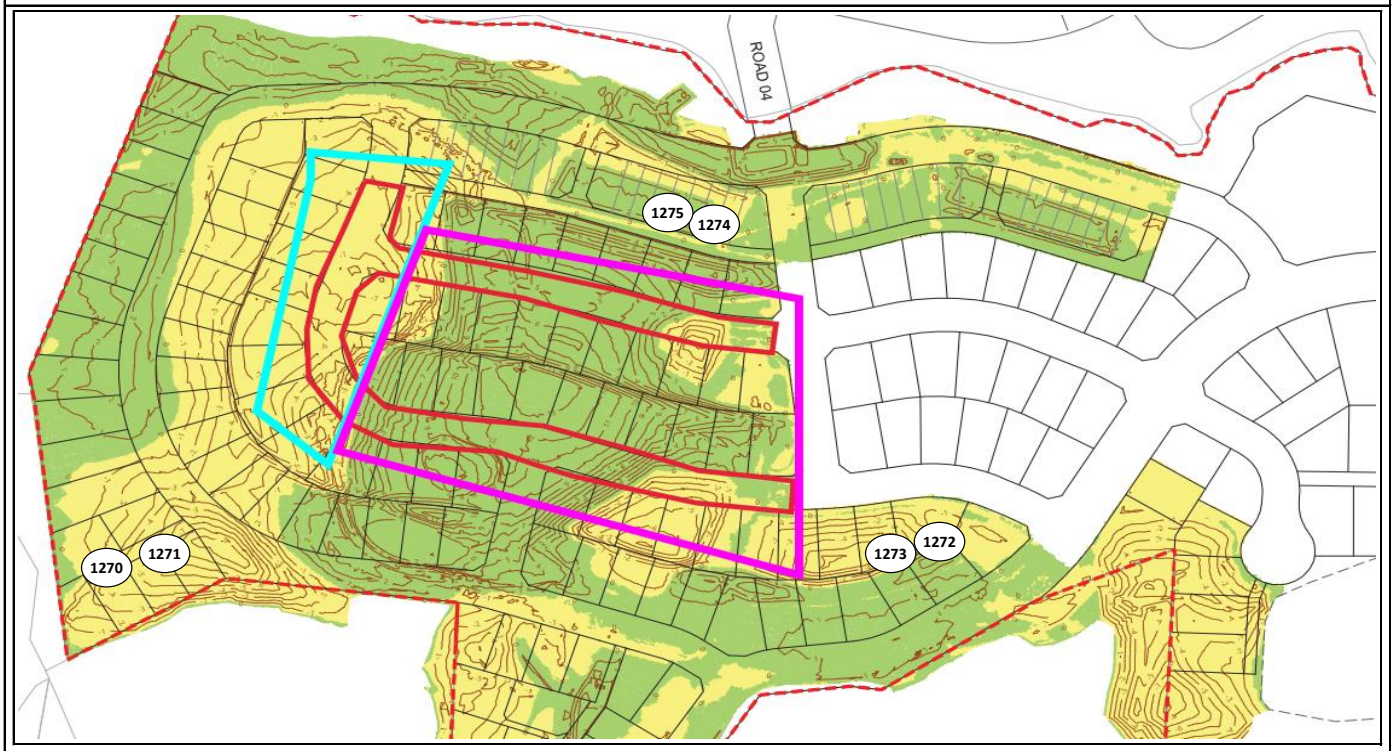
Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 26/01/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00074
Page No: 2 of 2

Location: Undercut Area + RE Wall 602 + Silt Pond

Tested by: LW
Date Tested: 22/01/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00083
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00083

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 26/01/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
23/01/2024	ETAM24W00083	SC	1276	1.87	28.3	1.46	2.65	3.8	172	172	201	201	RE Wall 602	1749194	5948837	37.0	Silty CLAY	-
23/01/2024	ETAM24W00083	SC	1277	1.91	27.1	1.50	2.65	2.7	201	201	201	201	RE Wall 602	1749150	5948829	37.0	Silty CLAY	-
23/01/2024	ETAM24W00083	SC	1278	1.91	25.3	1.53	2.65	3.9	192	201	172	188	RE Wall 602	1749073	5948846	37.0	Silty CLAY	-
23/01/2024	ETAM24W00083	SC	1279	1.87	28.0	1.46	2.65	3.8	192	192	172	172	Silt Pond	1749072	5949018	-	Silty CLAY	RL not availale
23/01/2024	ETAM24W00083	SC	1280	1.85	30.1	1.42	2.65	3.4	168	172	192	188	Silt Pond	1749076	5949024	-	Silty CLAY	RL not availale

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00083
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

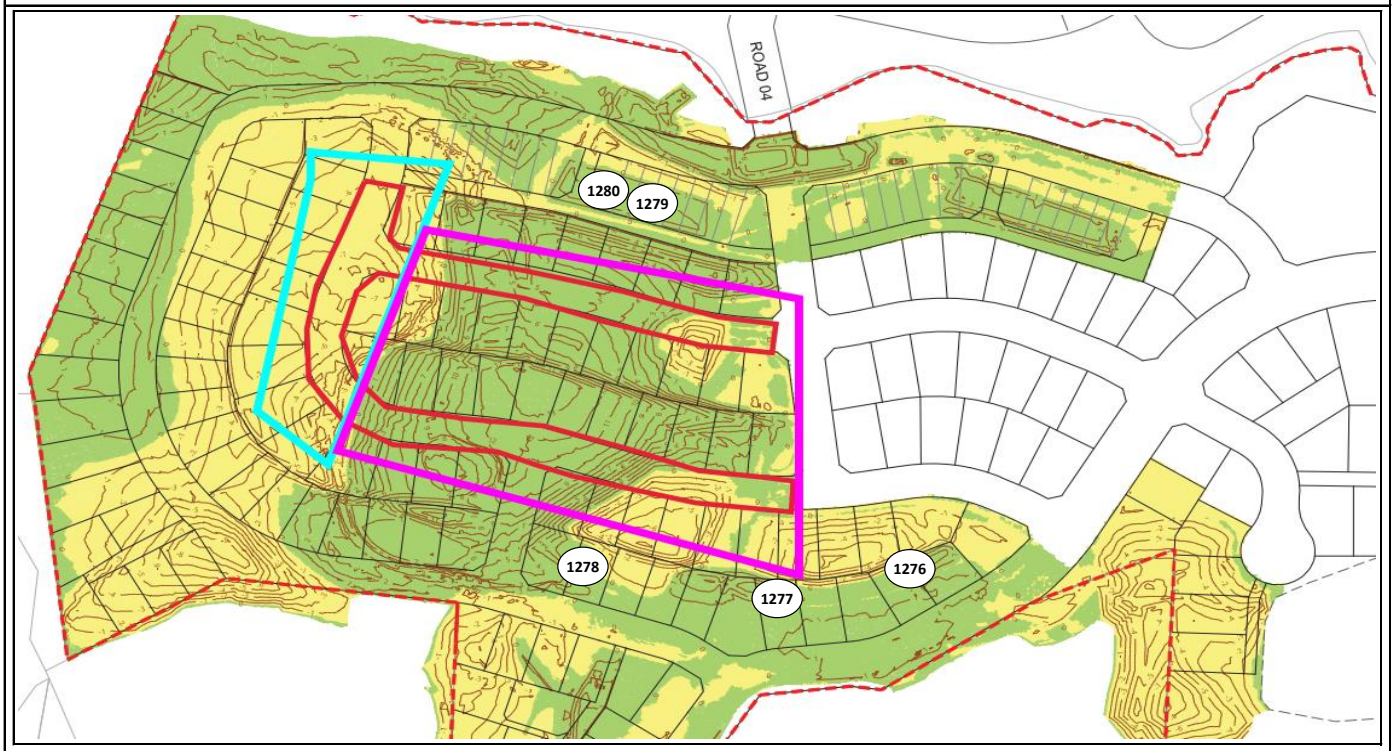
Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 26/01/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00083
Page No: 2 of 2

Location: Gully + Silt Pond

Tested by: SC
Date Tested: 23/01/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Shear Vane Strength Test Report

Report No: SVS:ETAM24S-00248

Issue No:1

This report replaces all previous issues of report no. SVS:ETAM24S-00248

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street, New Market Auckland 1023	**Date Tested:**	22/01/24
		Tested by:	Ramon Powell
Project Number:	773-ETAM01553	**Layer Tested:**	
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA	**Material Tested:**	Silty CLAY *
Test Location	117 Kowhai Road, Orewa	**Sample Number:**	ETAM24S-00248
Lot No.:	**TRN:**	**Work Order No.:**	ETAM24W00071

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
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This report relates only to the positions tested.}

Approved Signatory: Liam Walker
Assistant Manager
IANZ Accredited Laboratory Number: 105
Date of Issue: 25/01/2024

Test Results

Test Method: *Determination of the Vane Strength of a Cohesive Soil using a hand held field shear vane in accordance with NZ Geotechnical Society Inc 2001*

Test No.	Site Number	Easting	Offset (m)	Northing	Test Depth (m)	Material Description	Comments	Field Shear Strength			
								Dial Reading	Remoulded Dial Reading	Vane Shear Strength (kPa)	Rounded Vane Shear Strength (kPa)
1	1	1749103	-	5948846	0	Silty CLAY	-	**UTP**	-	**UTP**	-
2	1	1749103	-	5948846	0	Silty CLAY	-	**UTP**	-	**UTP**	-
3	1	1749103	-	5948846	0	Silty CLAY	-	**UTP**	-	**UTP**	-
4	1	1749103	-	5948846	0	Silty CLAY	-	**UTP**	-	**UTP**	-
5	**2**	1749139	-	5948827	0	Silty CLAY	-	**UTP**	-	**UTP**	-
6	**2**	1749139	-	5948827	0	Silty CLAY	-	**UTP**	-	**UTP**	-
7	**2**	1749139	-	5948827	0	Silty CLAY	-	**UTP**	-	**UTP**	-
8	**2**	1749139	-	5948827	80	Silty CLAY	-	122	-	**191**	-
9	3	1749183	-	5948832	0	Silty CLAY	-	**UTP**	-	**UTP**	-
10	3	1749183	-	5948832	0	Silty CLAY	-	**UTP**	-	**UTP**	-
11	3	1749183	-	5948832	0	Silty CLAY	-	**UTP**	-	**UTP**	-
12	3	1749183	-	5948832	0	Silty CLAY	-	**UTP**	-	**UTP**	-
13	**4**	1749220	-	5948847	0	Silty CLAY	-	**UTP**	-	**UTP**	-
14	**4**	1749220	-	5948847	0	Silty CLAY	-	**UTP**	-	**UTP**	-
15	**4**	1749220	-	5948847	0	Silty CLAY	-	**UTP**	-	**UTP**	-
16	**4**	1749220	-	5948847	0	Silty CLAY	-	**UTP**	-	**UTP**	-

Comments:

Shear Vane only - Requested by client. Machines unavailable.

Form Number: R022A Issue Date: 07/07/2017

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Shear Vane Test Report NZ

Report No: SVS:ETAM24S-00248
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

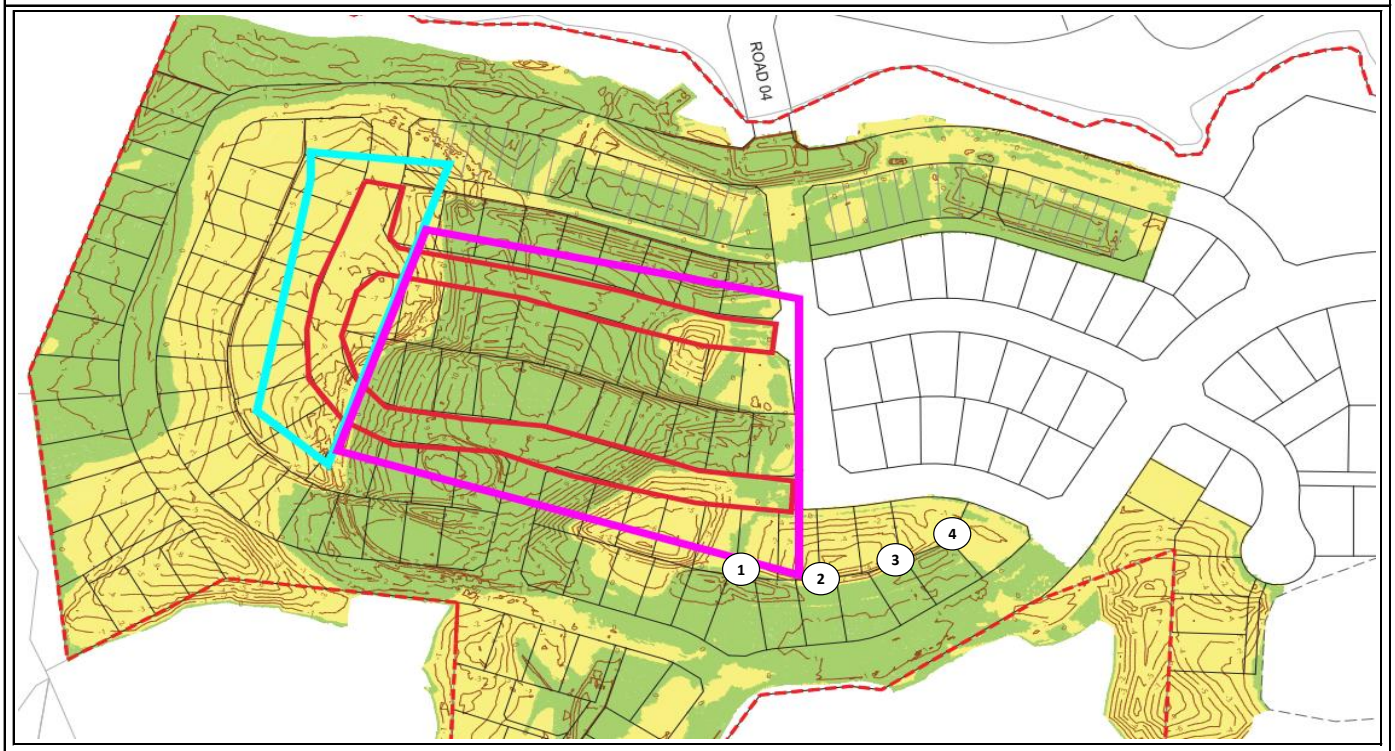
Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 25/01/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00071
Page No: 2 of 2

Location: RE Wall 602
(Shear Vanes)

Tested by: RP
Date Tested: 18/01/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00094
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00094

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 28/01/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
24/01/2024	ETAM24W00094	SC	1281	1.90	29.0	1.47	2.65	1.6	175	175	175	175	Gully Main Fill	1749020	5948858	-	Silty CLAY	RL not available
24/01/2024	ETAM24W00094	SC	1282	1.85	32.2	1.40	2.65	2.4	162	162	171	171	Gully Main Fill	1748980	5948881	-	Silty CLAY	RL not available
24/01/2024	ETAM24W00094	SC	1283	1.94	25.6	1.54	2.65	2.3	UTP	UTP	UTP	UTP	Gully Main Fill	1748940	5948893	-	Silty CLAY	RL not available
24/01/2024	ETAM24W00094	SC	1284	1.90	24.9	1.52	2.65	4.8	UTP	UTP	UTP	UTP	Gully Main Fill	1748977	5948871	-	Silty CLAY	RL not available
24/01/2024	ETAM24W00094	SC	1285	1.99	28.6	1.55	2.65	0.0	UTP	UTP	UTP	UTP	Undercut Key	1748831	5948867	-	Silty CLAY	RL not available
24/01/2024	ETAM24W00094	SC	1286	1.93	29.3	1.49	2.65	0.1	UTP	UTP	UTP	UTP	Undercut Key	1748854	5948878	-	Silty CLAY	RL not available
24/01/2024	ETAM24W00094	SC	1287	1.93	29.9	1.49	2.65	0.0	175	175	171	171	RE Wall 602	1749142	5948829	37.5	Silty CLAY	-
24/01/2024	ETAM24W00094	SC	1288	1.92	28.7	1.49	2.65	1.0	198+	198+	188	188	RE Wall 602	1749087	5948842	37.5	Silty CLAY	-

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00094
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.

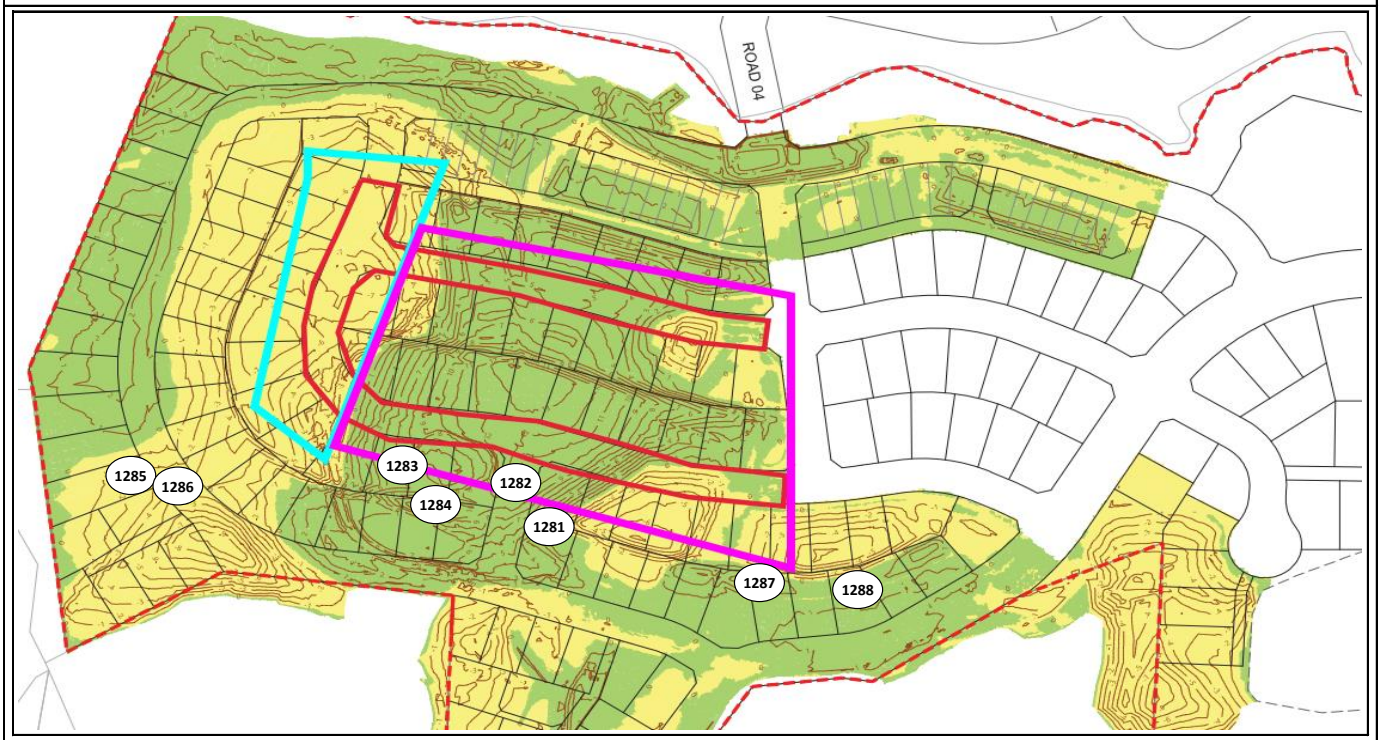
Approved Signatory: Eric Paton
(Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 28/01/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00094
Page No: 2 of 2

Location: Gully Main Fill + Undercut Key + RE Wall 602

Tested by: SC
Date Tested: 24/01/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00097
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00097

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 30/01/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
25/01/2024	ETAM24W00097	SC	1289	1.96	28.9	1.52	2.65	0.0	UTP	UTP	UTP	UTP	Undercut Key	1748856	5948875	-	Silty CLAY	RL not available
25/01/2024	ETAM24W00097	SC	1290	1.89	31.5	1.43	2.65	0.7	188	188	194	194	Undercut Key	1748826	5948872	-	Silty CLAY	RL not available
25/01/2024	ETAM24W00097	SC	1291	1.86	29.3	1.44	2.65	3.6	UTP	UTP	UTP	UTP	Gully Main Fill	1749016	5948854	-	Silty CLAY	RL not available
25/01/2024	ETAM24W00097	SC	1292	1.93	28.9	1.50	2.65	0.2	194	198+	188	194	Gully Main Fill	1748941	5948892	-	Silty CLAY	RL not available

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00097
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

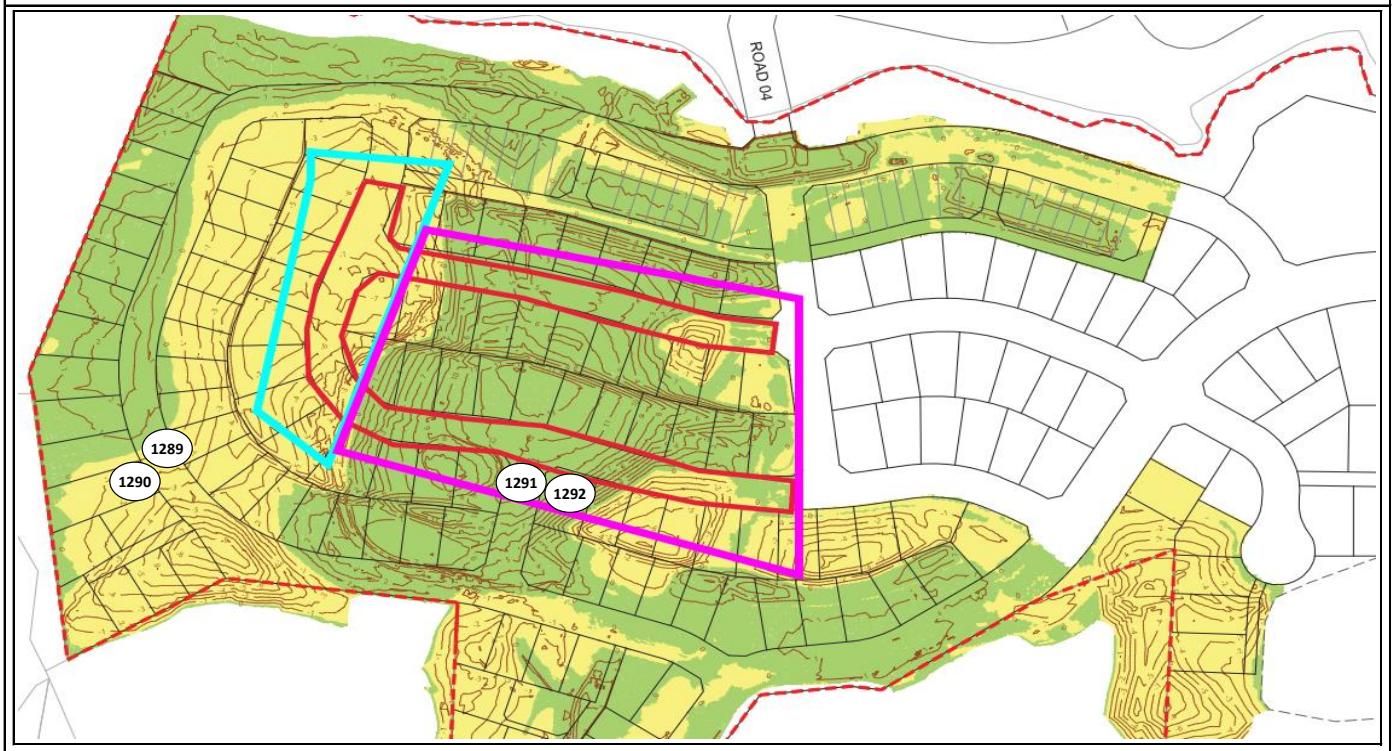
Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 30/01/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00097
Page No: 2 of 2

Location: Gully Main Fill + Undercut Key

Tested by: SC
Date Tested: 25/01/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00127
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00127

Client: Tetra Tech Coffey (NZ) Limited- Auckland
Coffey House, Level 4, Teed Street
New Market Auckland 1023

Principal: Stephen Parkes

cc to: -

Project No.: 773-ETAM01553

Project Name.: 773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA

Project Location: 117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 7/02/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
31/01/2024	ETAM24W00127	SC	1303	1.94	28.9	1.51	2.65	0.0	UTP	UTP	UTP	UTP	Fill Area (refer to plan)	1749029	5948846	-	Silty CLAY	Not Applicable
31/01/2024	ETAM24W00127	SC	1304	1.92	27.2	1.51	2.65	2.2	198+	198+	198+	198+	RE Wall 602	1749164	5948825	38.7	Silty CLAY	-
31/01/2024	ETAM24W00127	SC	1305	1.91	28.5	1.49	2.65	1.5	198	198	198	198	RE Wall 602	1749119	5948829	38.7	Silty CLAY	-
31/01/2024	ETAM24W00127	SC	1306	1.92	31.5	1.46	2.65	0.0	198+	198+	198	198	RE Wall 602	1749066	5948850	38.7	Silty CLAY	-
31/01/2024	ETAM24W00127	SC	1307	1.92	26.3	1.52	2.65	2.6	198	198	198	198	RE Wall 603	1748900	5948907	37.2	Silty CLAY	-
31/01/2024	ETAM24W00127	SC	1308	1.78	29.1	1.38	2.65	7.7	175	175	185	185	RE Wall 603	1748905	5948900	37.2	Silty CLAY	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00127
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

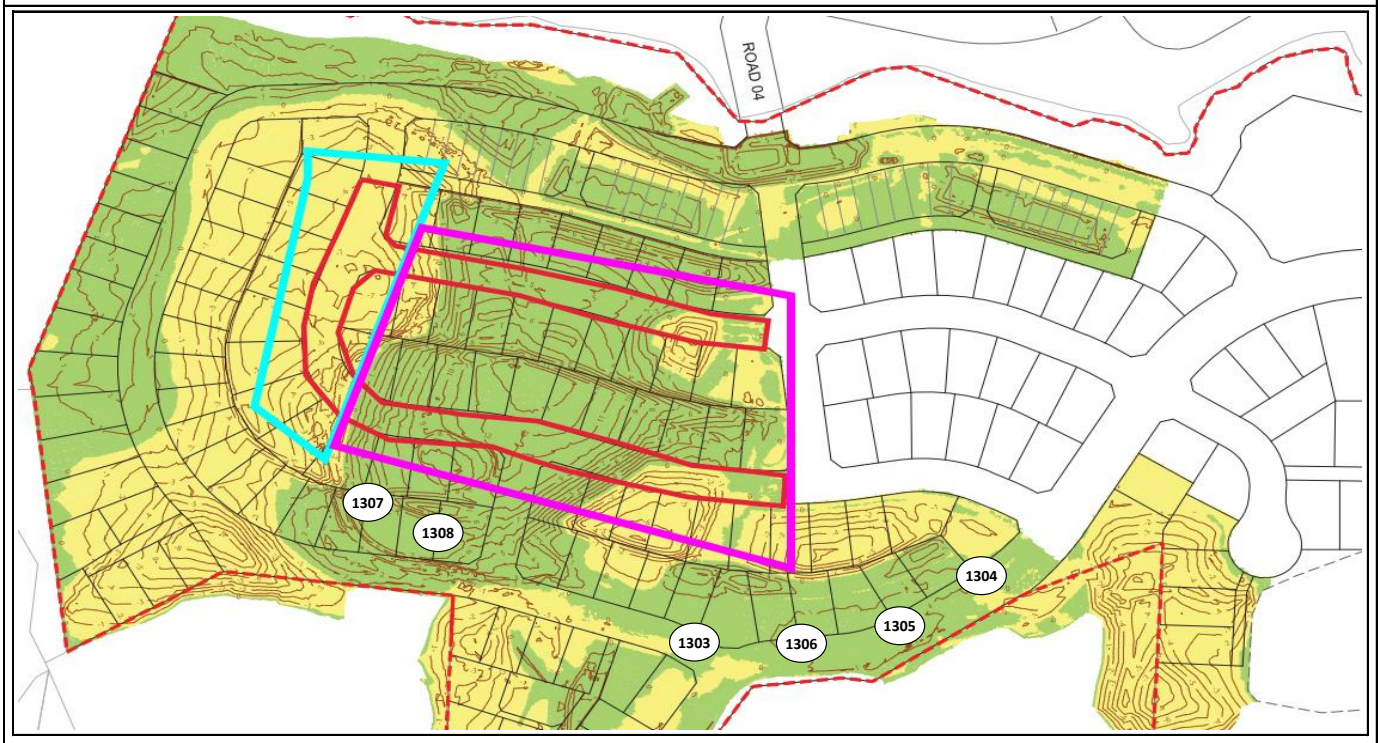
Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 7/02/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00127
Page No: 2 of 2

Location: Fill Areas + RE Wall 602 + 603

Tested by: SC
Date Tested: 31/01/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00146
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00146

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 12/02/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
2/02/2023	ETAM24W00146	RP	1315	1.82	30.0	1.40	2.65	5.5	198+	198+	UTP	UTP	Undercut Area	1748834	5948862	-	Silty CLAY	RL not available
2/02/2023	ETAM24W00146	RP	1316	1.89	25.9	1.50	2.65	4.5	UTP	UTP	UTP	UTP	Undercut Area	1748822	5948868	-	Silty CLAY	RL not available
2/02/2023	ETAM24W00146	RP	1317	1.86	26.2	1.47	2.65	5.9	UTP	UTP	UTP	UTP	RE Wall 603	1748927	5948889	-	Silty CLAY	RL not available
2/02/2023	ETAM24W00146	RP	1318	1.92	28.0	1.50	2.65	1.3	UTP	198+	198+	198+	RE Wall 603	1748901	5948906	-	Silty CLAY	RL not available
2/02/2023	ETAM24W00146	RP	1319	1.88	27.8	1.47	2.65	3.8	UTP	UTP	UTP	198+	RE Wall 602	1749048	5948851	-	Silty CLAY	RL not available
2/02/2023	ETAM24W00146	RP	1320	1.89	25.7	1.51	2.65	4.4	UTP	UTP	UTP	UTP	RE Wall 602	1749084	5948835	-	Silty CLAY	RL not available
2/02/2023	ETAM24W00146	RP	1321	1.71	26.5	1.35	2.65	13.4	UTP	UTP	UTP	UTP	Silt Pond	1749064	5949028	16.66	Silty CLAY	-
2/02/2023	ETAM24W00146	RP	1322	1.84	26.8	1.45	2.65	6.2	UTP	UTP	UTP	UTP	Silt Pond	1749054	5949029	16.26	Silty CLAY	-
2/02/2023	ETAM24W00146	RP	1323	1.85	31.1	1.41	2.65	2.9	UTP	UTP	UTP	UTP	Silt Pond	1749084	5949017	17.21	Silty CLAY	-

Form Number: R031N Issue Date: 20/09/2018

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00146
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

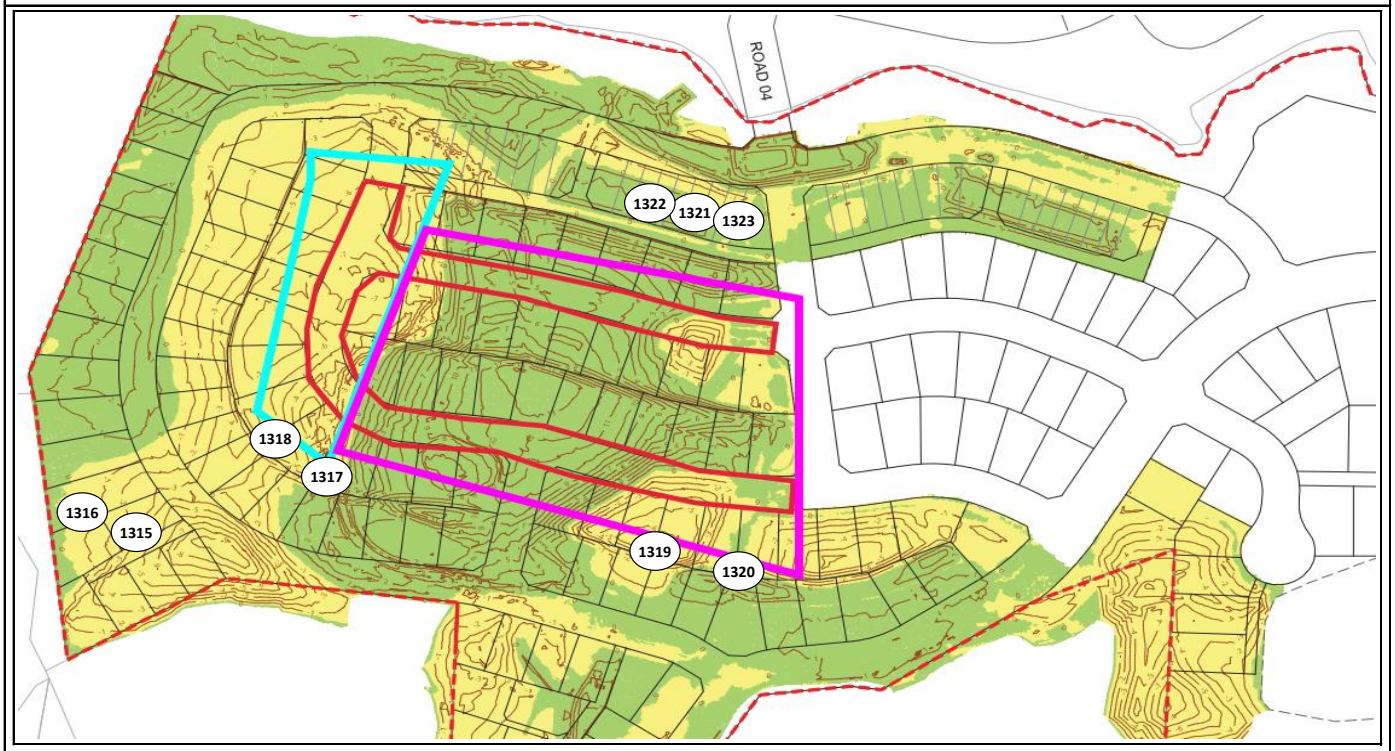
Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 12/02/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00146
Page No: 2 of 2

Location: Undercut Area + RE Wall 602 + 603 + Silt Pond

Tested by: RP
Date Tested: 2/02/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00198
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00198

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Eric Paton
Managing Director-Testing
IANZ Site Number: 105
Date of Issue: 20/02/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
12/02/2024	ETAM24W00198	LW	1343	1.85	28.8	1.44	2.65	4.3	220+	220+	220+	220+	Gully 2	1748995	5948872	-	Silty CLAY	RL not available
12/02/2024	ETAM24W00198	LW	1344	1.89	28.7	1.47	2.65	2.6	220+	220+	220+	220+	Gully 2	1749012	5948879	-	Silty CLAY	RL not available

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00198
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

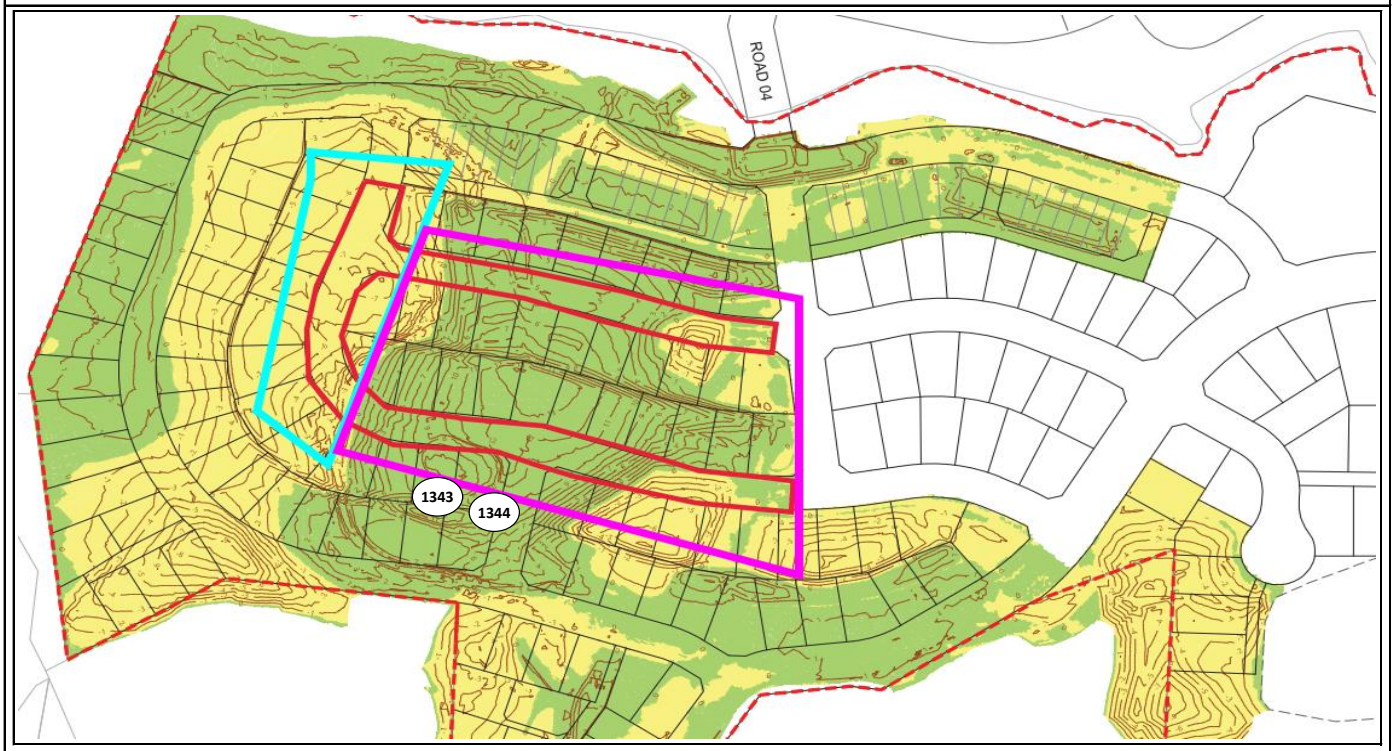
Approved Signatory: Eric Paton
(Managing Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 20/02/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00198
Page No: 2 of 2

Location: Gully 2

Tested by: LW
Date Tested: 12/02/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00172
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00172

Client: Tetra Tech Coffey (NZ) Limited- Auckland
Coffey House, Level 4, Teed Street
New Market Auckland 1023

Principal: Stephen Parkes

cc to: -

Project No.: 773-ETAM01553

Project Name.: 773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA

Project Location: 117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 13/02/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
7/02/2024	ETAM24W00172	SC	1324	1.89	27.9	1.48	2.65	2.8	191	191	188	188	RE Wall 602	1749052	5948709	-	Silty CLAY	RL not available
7/02/2024	ETAM24W00172	SC	1325	1.91	32.0	1.44	2.65	0.0	UTP	UTP	188	188	RE Wall 602	1749085	5948835	-	Silty CLAY	RL not available
7/02/2024	ETAM24W00172	SC	1326	1.98	25.6	1.58	2.65	0.0	UTP	UTP	198	198	RE Wall 603	1748900	5948910	37.5	Silty CLAY	-
7/02/2024	ETAM24W00172	SC	1327	1.95	29.5	1.50	2.65	0.0	188	188	194	194	RE Wall 603	1748935	5948883	37.5	Silty CLAY	-
7/02/2024	ETAM24W00172	SC	1328	1.99	26.3	1.58	2.65	0.0	198+	198+	198+	198+	SPR 7	1749056	5949031	-	Silty CLAY	RL not available
7/02/2024	ETAM24W00172	SC	1329	1.99	26.2	1.58	2.65	0.0	UTP	UTP	UTP	UTP	SPR 7	1749070	5949033	-	Silty CLAY	RL not available

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00172
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

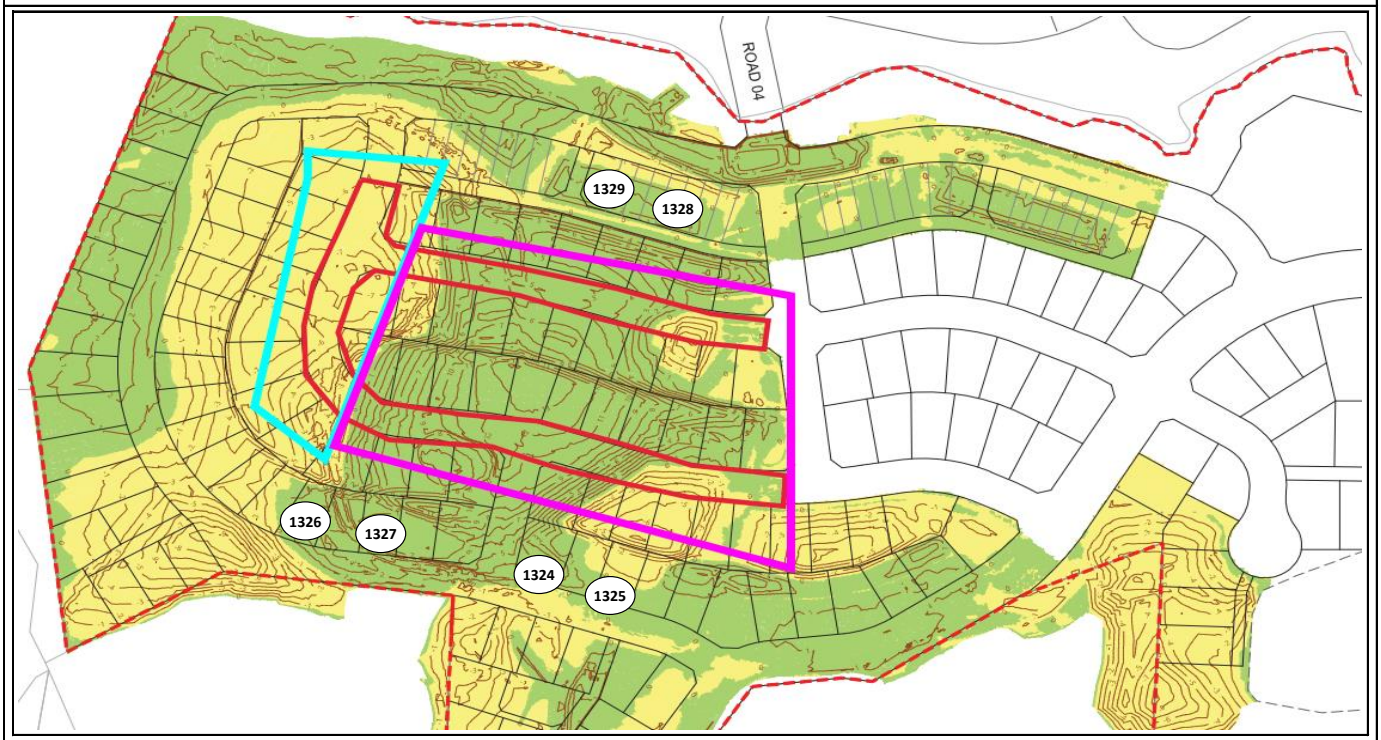
Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 13/02/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00172
Page No: 2 of 2

Location: RE Wall 602 + 603 + SPR 7

Tested by: SC
Date Tested: 7/02/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00179
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00179

Client: Tetra Tech Coffey (NZ) Limited- Auckland
Coffey House, Level 4, Teed Street
New Market Auckland 1023

Principal: Stephen Parkes

cc to: -

Project No.: 773-ETAM01553

Project Name.: 773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA

Project Location: 117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 13/02/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
8/02/2024	ETAM24W00179	SC	1330	1.84	29.9	1.42	2.65	4.0	175	175	171	171	RE Wall 602	1749085	5948837	42.00	Silty CLAY	-
8/02/2024	ETAM24W00179	SC	1331	1.86	30.4	1.43	2.65	2.7	185	175	188	183	RE Wall 602	1749064	5948839	42.00	Silty CLAY	-
8/02/2024	ETAM24W00179	SC	1332	1.90	21.4	1.56	2.65	7.4	UTP	UTP	UTP	UTP	RE Wall 603	1748900	5948905	38.00	Silty CLAY	-
8/02/2024	ETAM24W00179	SC	1333	1.88	27.8	1.47	2.65	3.8	UTP	UTP	UTP	UTP	RE Wall 603	1748942	5948879	38.00	Silty CLAY	-
8/02/2024	ETAM24W00179	SC	1334	1.92	31.3	1.46	2.65	0.0	UTP	UTP	UTP	UTP	Lot 11 Undercut	1748826	5948891	39.40	Silty CLAY	-
8/02/2024	ETAM24W00179	SC	1335	1.92	32.4	1.45	2.65	0.0	188	188	185	185	Lot 12 Undercut	1748817	5948870	41.65	Silty CLAY	-
8/02/2024	ETAM24W00179	SC	1336	2.01	25.9	1.60	2.65	0.0	UTP	UTP	UTP	UTP	Silt Pond (Retest)	1749064	5949028	16.66	Silty CLAY	-
8/02/2024	ETAM24W00179	SC	1337	1.89	25.2	1.51	2.65	5.0	UTP	UTP	UTP	UTP	Silt Pond (Retest)	1749048	5949029	16.66	Silty CLAY	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00179
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

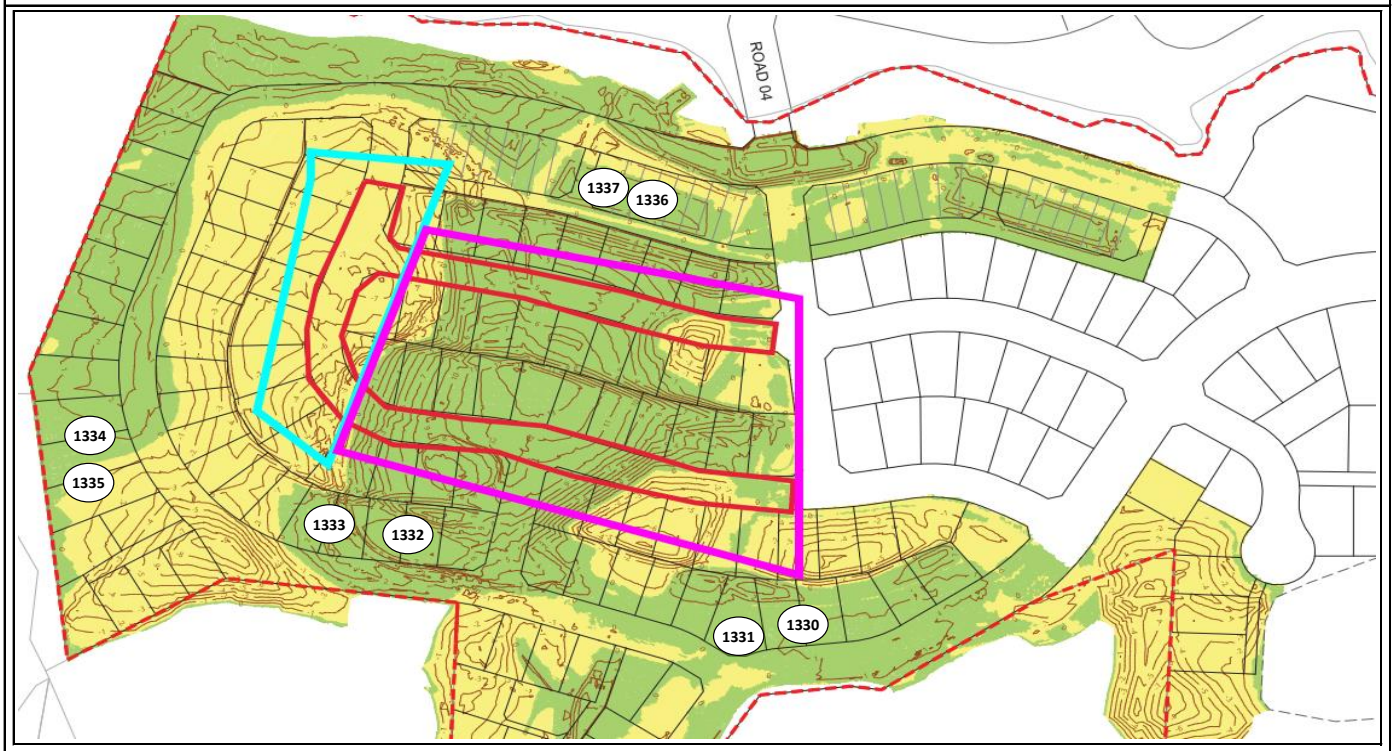
Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 13/02/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00179
Page No: 2 of 2

Location: RE Wall 602 & 603 + Lot 11 & 12 Undercut + Silt Pond

Tested by: SC
Date Tested: 8/02/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00198
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00198

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Managing Director-Testing
IANZ Site Number: 105
Date of Issue: 20/02/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
12/02/2024	ETAM24W00198	LW	1343	1.85	28.8	1.44	2.65	4.3	220+	220+	220+	220+	Gully 2	1748995	5948872	-	Silty CLAY	RL not available
12/02/2024	ETAM24W00198	LW	1344	1.89	28.7	1.47	2.65	2.6	220+	220+	220+	220+	Gully 2	1749012	5948879	-	Silty CLAY	RL not available

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00198
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

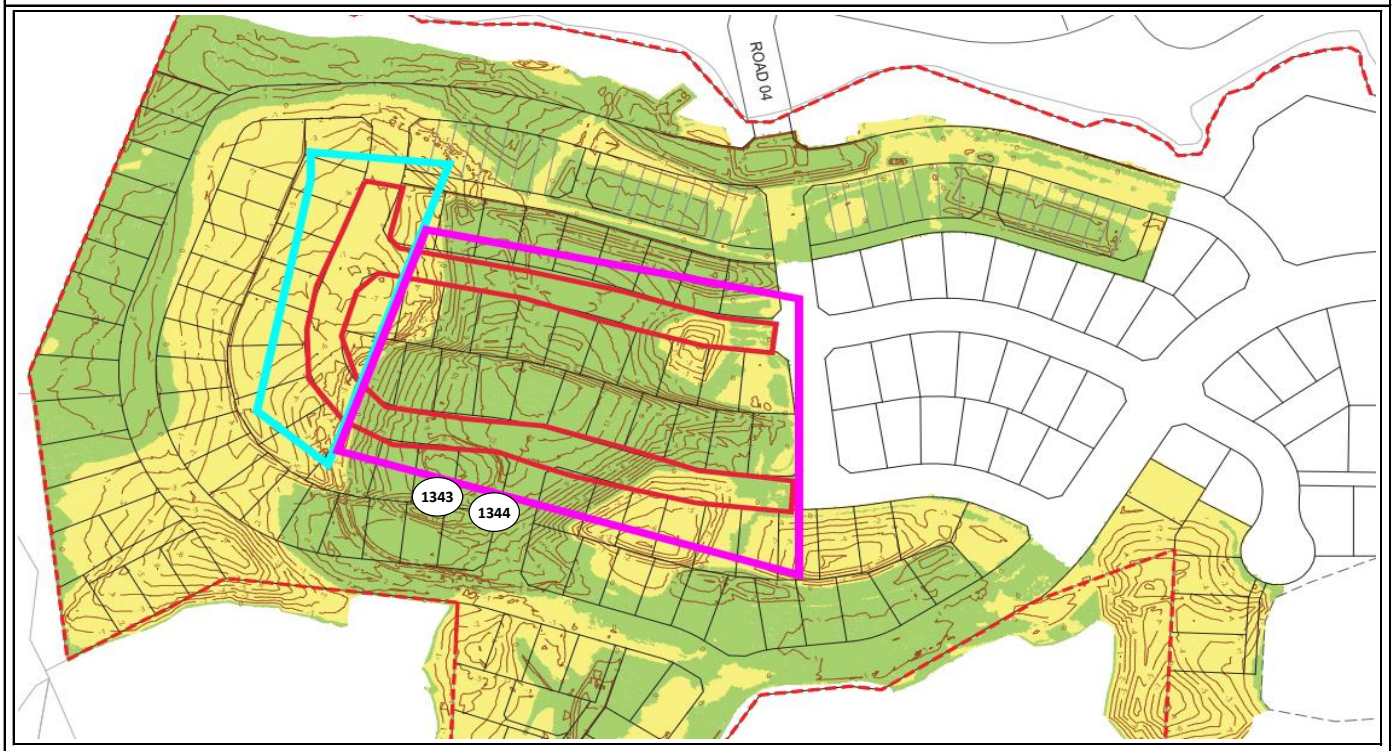
Approved Signatory: Eric Paton
(Managing Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 20/02/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00198
Page No: 2 of 2

Location: Gully 2

Tested by: LW
Date Tested: 12/02/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00249
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00249

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Managing Director-Testing
IANZ Site Number: 105
Date of Issue: 20/02/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
15/02/2024	ETAM24W00249	LW	1349	1.86	33.2	1.39	2.65	1.1	220+	220+	220+	220+	DEB Pond 12-13-14	1749132	5948859	-	Silty CLAY	1.0m to FL
15/02/2024	ETAM24W00249	LW	1350	1.87	29.0	1.45	2.65	3.5	220+	220+	220+	220+	DEB Pond 12-13-14	1749144	5948861	-	Silty CLAY	1.0m to FL
15/02/2024	ETAM24W00249	LW	1351	1.95	31.3	1.49	2.65	0.0	UTP	UTP	UTP	UTP	DEB Pond 12-13-14	1749159	5948864	-	Silty CLAY	1.0m to FL

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00249
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

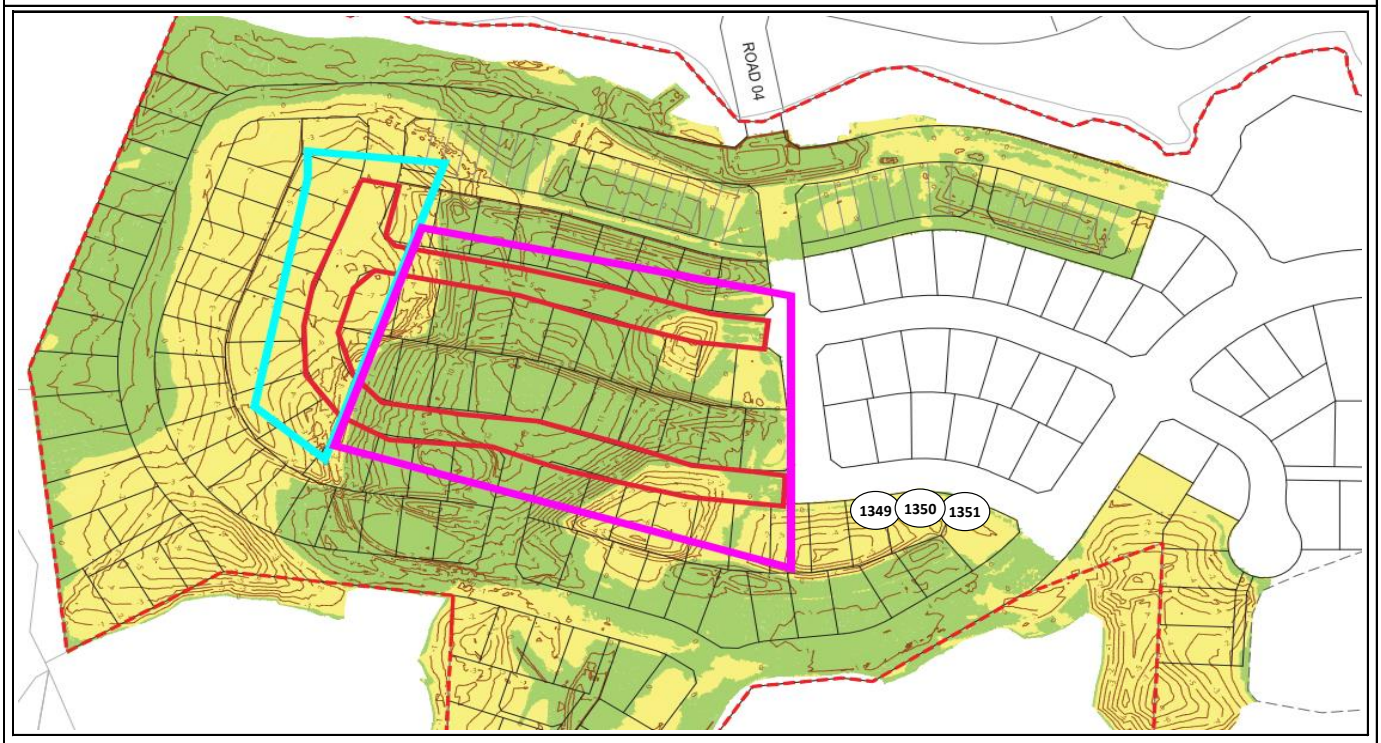
Approved Signatory: Eric Paton
(Managing Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 20/02/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00249
Page No: 2 of 2

Location: DEB Pond 12-13-14

Tested by: LW
Date Tested: 15/02/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00285
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00285

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Managing Director-Testing
IANZ Site Number: 105
Date of Issue: 27/02/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
20/02/2024	ETAM24W00285	LW	1358	1.85	30.6	1.41	2.65	3.3	220+	220+	220+	220+	RE Wall 603	1748968	5948888	-	Silty CLAY	RL not available
20/02/2024	ETAM24W00285	LW	1359	1.85	31.0	1.41	2.65	2.8	220+	220+	220+	220+	RE Wall 603	1748947	5948890	-	Silty CLAY	RL not available
20/02/2024	ETAM24W00285	LW	1360	1.91	30.9	1.46	2.65	0.0	UTP	UTP	UTP	UTP	04/01 - 04/02	1748884	5949063	-	Silty CLAY	At Finish Level
20/02/2024	ETAM24W00285	LW	1361	1.82	29.3	1.40	2.65	5.8	220+	220+	220+	220+	03/10 - 03/11	1748869	5948969	-	Silty CLAY	At Finish Level

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00285
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

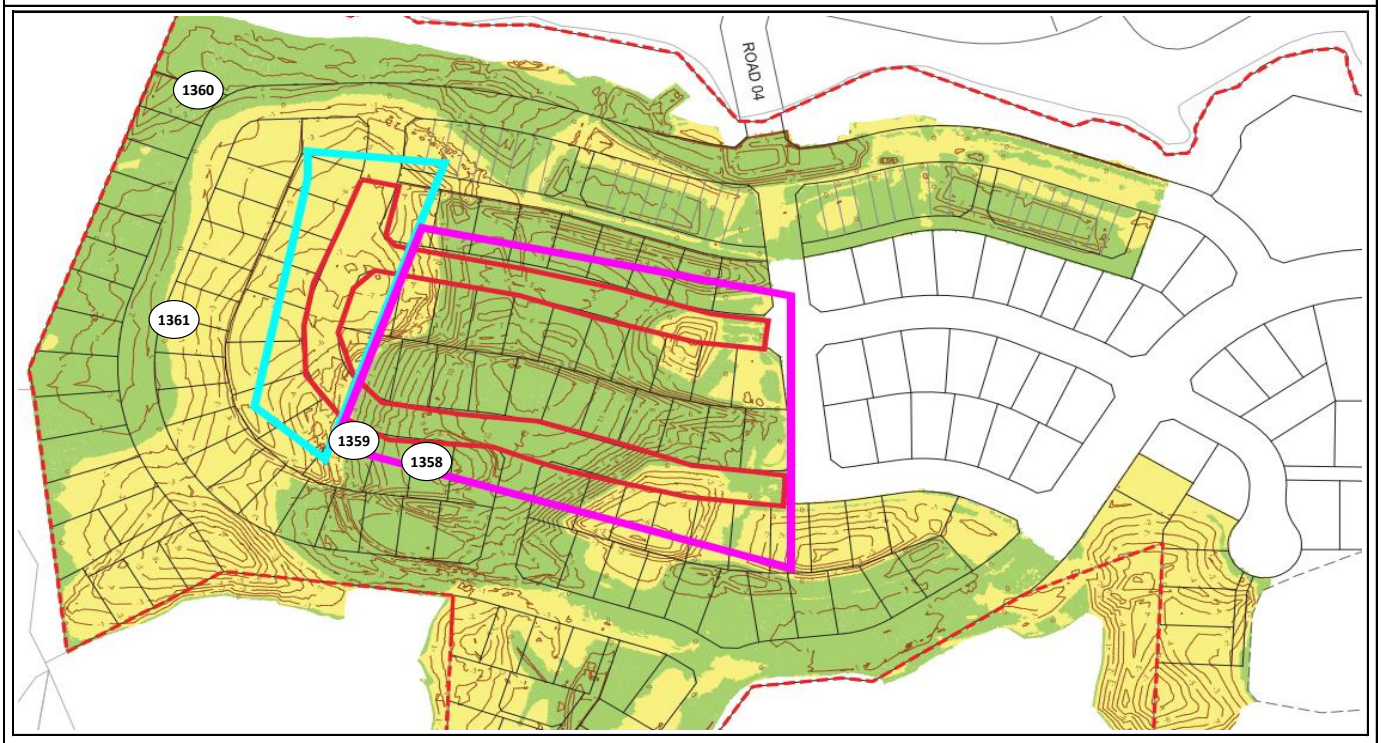
Approved Signatory: Eric Paton
(Managing Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 27/02/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00285
Page No: 2 of 2

Location: RE Wall 603 + 04/01-04/02 + 03/10-03/11

Tested by: LW
Date Tested: 20/02/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00301
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00301

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 27/02/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
22/02/2024	ETAM24W00301	LW	1362	1.93	30.2	1.48	2.65	0.0	UTP	UTP	UTP	UTP	Gully 2	1749006	5948880	-	Clayey SILT	RL not available
22/02/2024	ETAM24W00301	LW	1363	1.94	27.1	1.53	2.65	0.9	UTP	UTP	UTP	UTP	Gully 2	1748974	5948863	-	Clayey SILT	RL not available
22/02/2024	ETAM24W00301	LW	1364	1.93	28.6	1.50	2.65	0.6	UTP	UTP	UTP	UTP	Gully 2	1748994	5948857	-	Clayey SILT	RL not available

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00301
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.

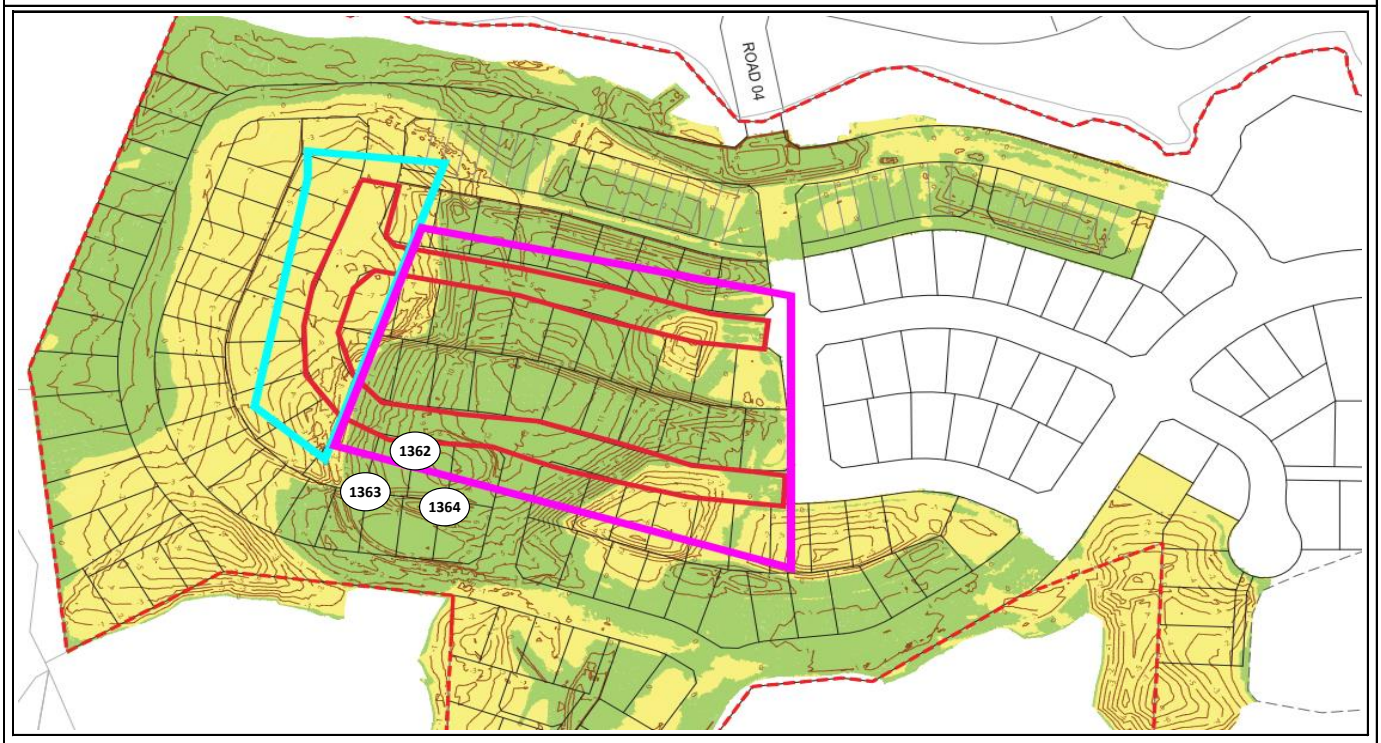
Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 27/02/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00301
Page No: 2 of 2

Location: Gully 2

Tested by: LW
Date Tested: 22/02/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00428
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00428

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Managing Director-Testing
IANZ Site Number: 105
Date of Issue: 12/03/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
7/03/2024	ETAM24W00428	LW	1368	1.84	30.2	1.41	2.65	4.0	192	188	153	143	Gully 2	1748973	5948845	-	Silty CLAY	RL not available
7/03/2024	ETAM24W00428	LW	1369	1.87	27.3	1.47	2.65	4.4	196	164	172	188	Gully 2	1748998	5948843	-	Silty CLAY	RL not available

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00428
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

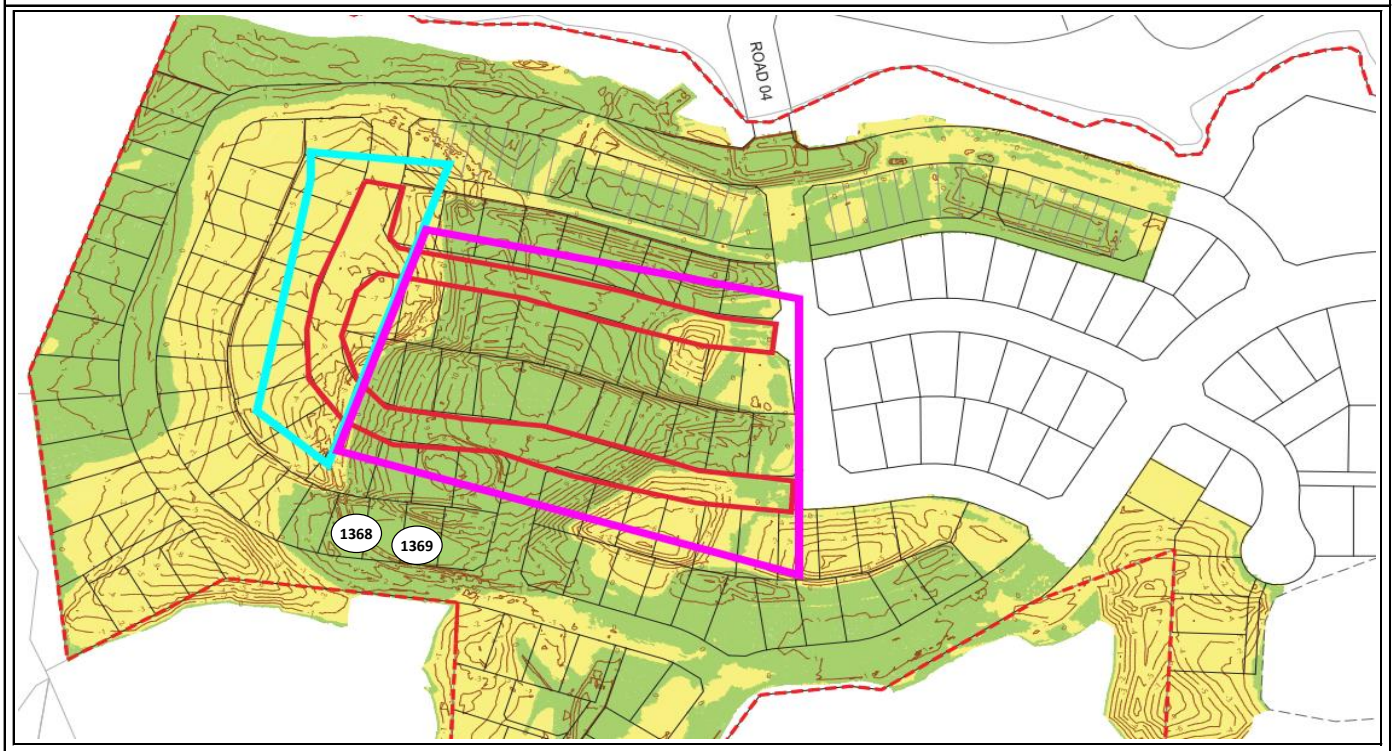
Approved Signatory: Eric Paton
(Managing Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 12/03/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00428
Page No: 2 of 2

Location: Gully 2

Tested by: LW
Date Tested: 7/03/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00301
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00301

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 27/02/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
22/02/2024	ETAM24W00301	LW	1362	1.93	30.2	1.48	2.65	0.0	UTP	UTP	UTP	UTP	Gully 2	1749006	5948880	-	Clayey SILT	RL not available
22/02/2024	ETAM24W00301	LW	1363	1.94	27.1	1.53	2.65	0.9	UTP	UTP	UTP	UTP	Gully 2	1748974	5948863	-	Clayey SILT	RL not available
22/02/2024	ETAM24W00301	LW	1364	1.93	28.6	1.50	2.65	0.6	UTP	UTP	UTP	UTP	Gully 2	1748994	5948857	-	Clayey SILT	RL not available

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00301
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.

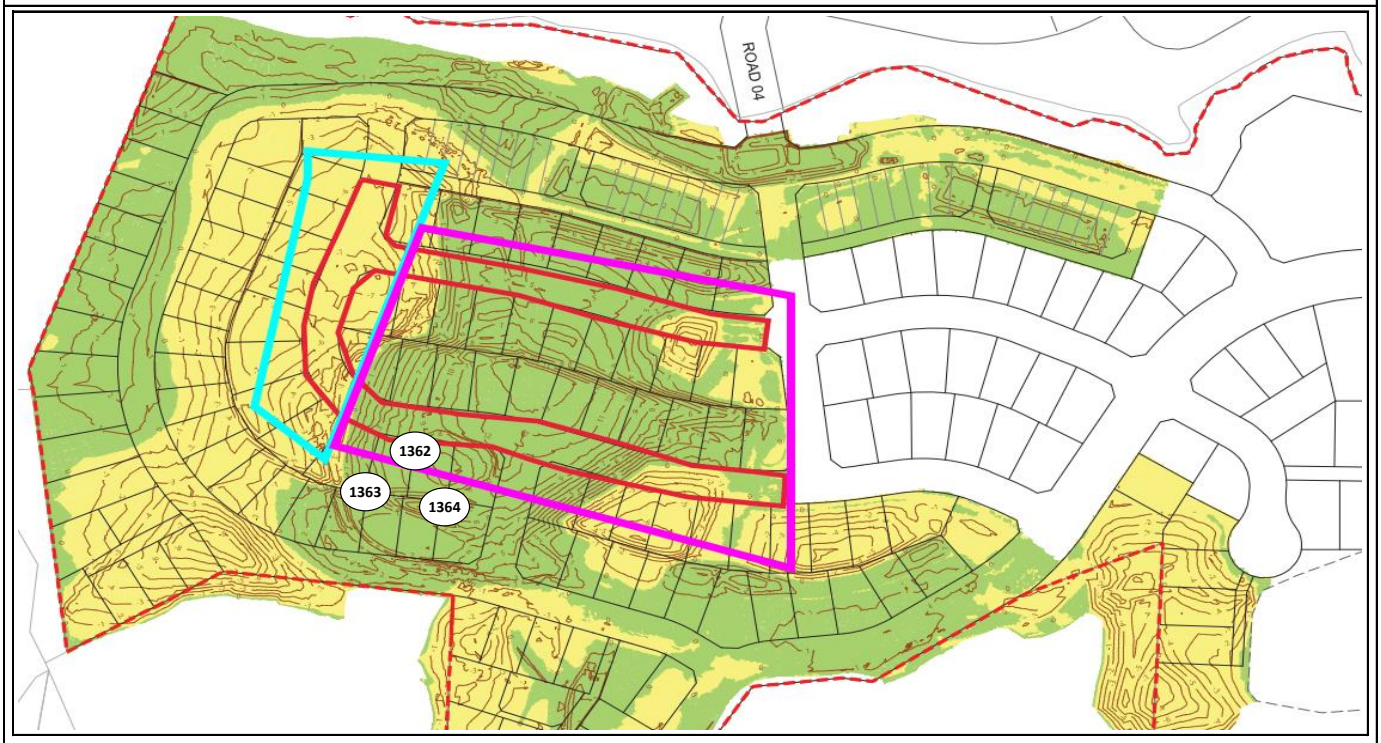
Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 27/02/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00301
Page No: 2 of 2

Location: Gully 2

Tested by: LW
Date Tested: 22/02/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00356
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00356

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Managing Director-Testing
IANZ Site Number: 105
Date of Issue: 5/03/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
29/02/2024	ETAM24W00356	RP	1365	1.93	30.3	1.48	2.65	0.0	UTP	UTP	UTP	UTP	Gully	1748995	5948855	-	Silty CLAY	RL not available
29/02/2024	ETAM24W00356	RP	1366	1.96	23.8	1.58	2.65	2.6	UTP	UTP	UTP	UTP	Gully	1748977	5948861	-	Silty CLAY	RL not available
29/02/2024	ETAM24W00356	RP	1367	1.84	24.9	1.48	2.65	7.5	UTP	UTP	UTP	UTP	Gully	1748995	5948855	-	Silty CLAY	RL not available

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00356
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

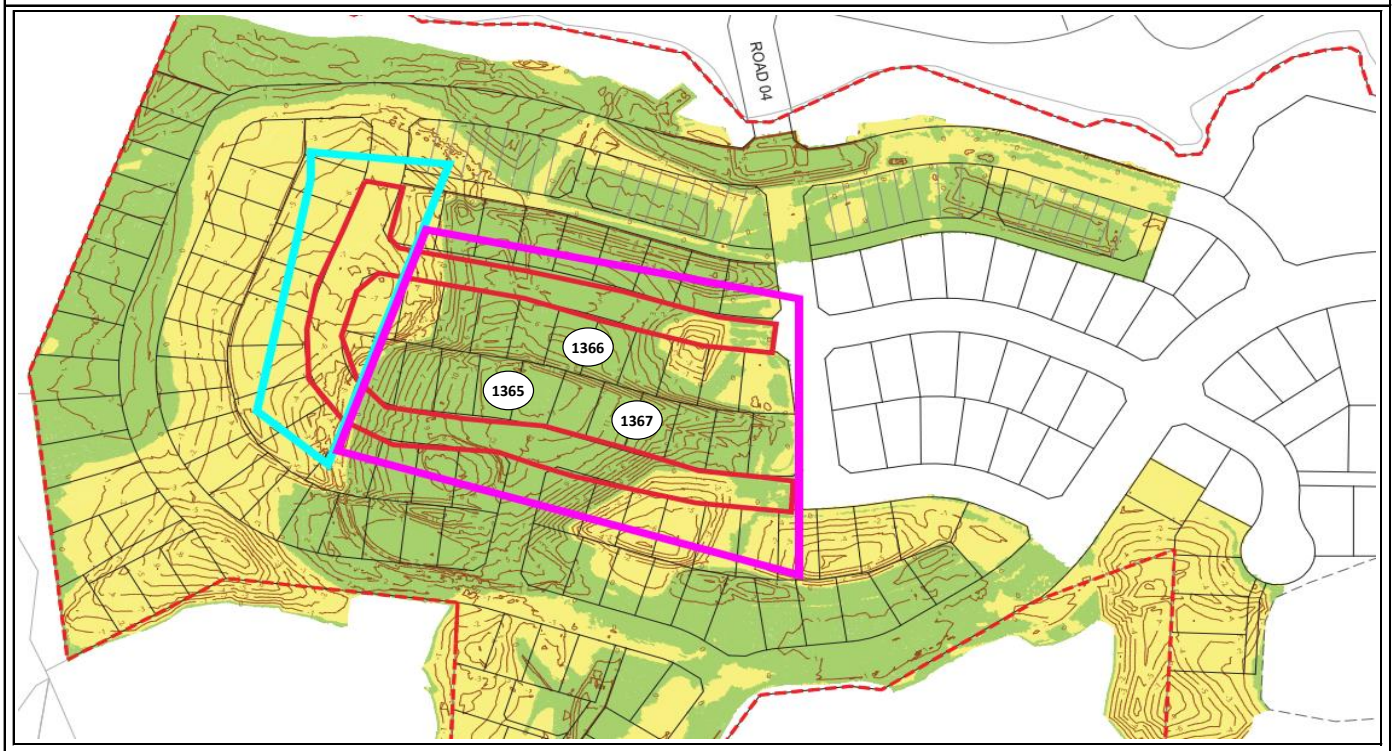
Approved Signatory: Eric Paton
(Managing Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 5/03/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00356
Page No: 2 of 2

Location: Gully

Tested by: RP
Date Tested: 29/02/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00428
Issue No:2
This report replaces all previous issues of report no. EFIL:ETAM24W00428

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Managing Director-Testing
IANZ Site Number: 105
Date of Issue: 12/03/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
7/03/2024	ETAM24W00428	LW	1368	1.84	30.2	1.41	2.65	4.0	192	188	153	143	Gully 2	1748973	5948845	-	Silty CLAY	RL not available
7/03/2024	ETAM24W00428	LW	1369	1.87	27.3	1.47	2.65	4.4	196	164	172	188	Gully 2	1748998	5948843	-	Silty CLAY	RL not available

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00428
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

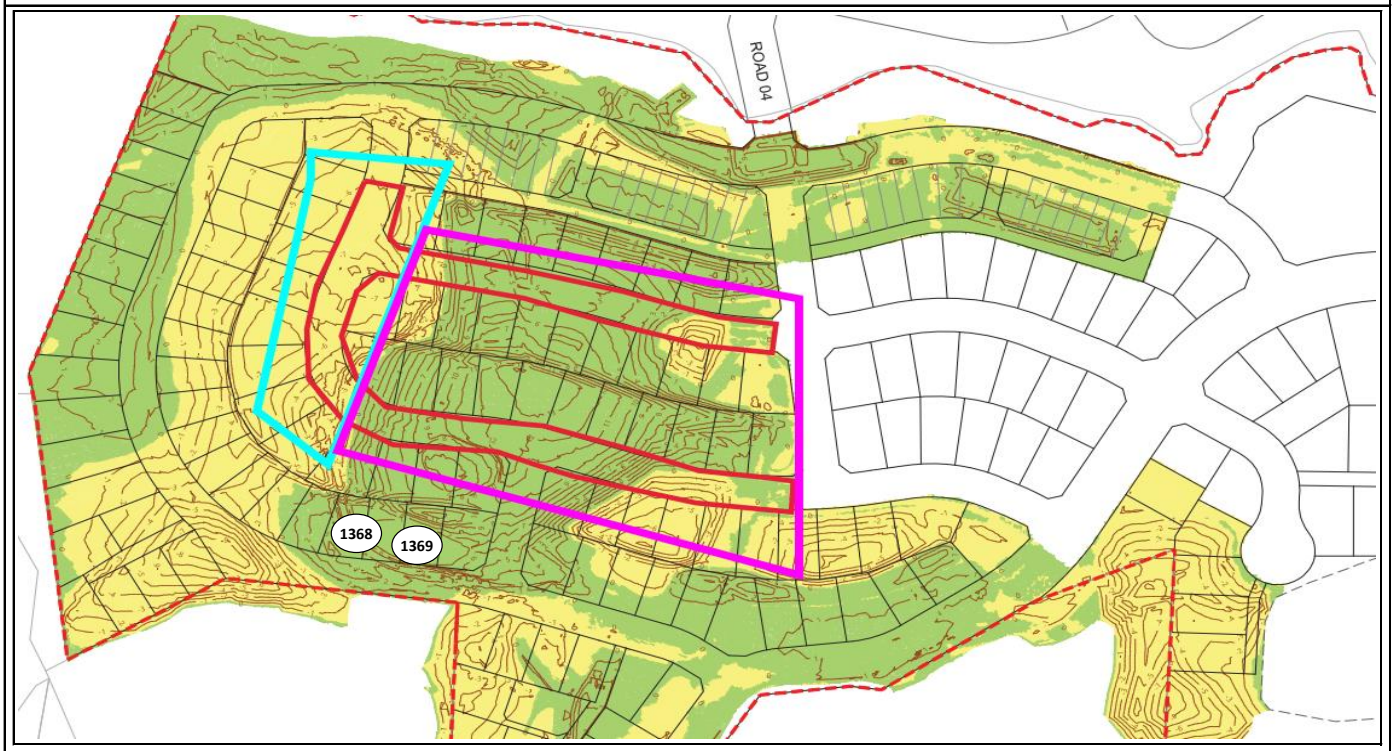
Approved Signatory: Eric Paton
(Managing Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 12/03/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00428
Page No: 2 of 2

Location: Gully 2

Tested by: LW
Date Tested: 7/03/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00539
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00539

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Managing Director-Testing
IANZ Site Number: 105
Date of Issue: 27/03/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
22/03/2024	ETAM24W00539	RP	1370	1.93	26.7	1.52	2.65	1.9	175	198+	198+	198+	Gully 2	1748990	5948832	-	Silty CLAY	RL not available
22/03/2024	ETAM24W00539	RP	1371	1.88	30.3	1.44	2.65	1.9	168	175	198+	198+	Gully 2	1748959	5948847	-	Silty CLAY	RL not available
22/03/2024	ETAM24W00539	RP	1372	1.93	24.6	1.55	2.65	3.5	155	175	159	188	Gully 2	1749006	5948844	-	Silty CLAY	RL not available

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00539
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

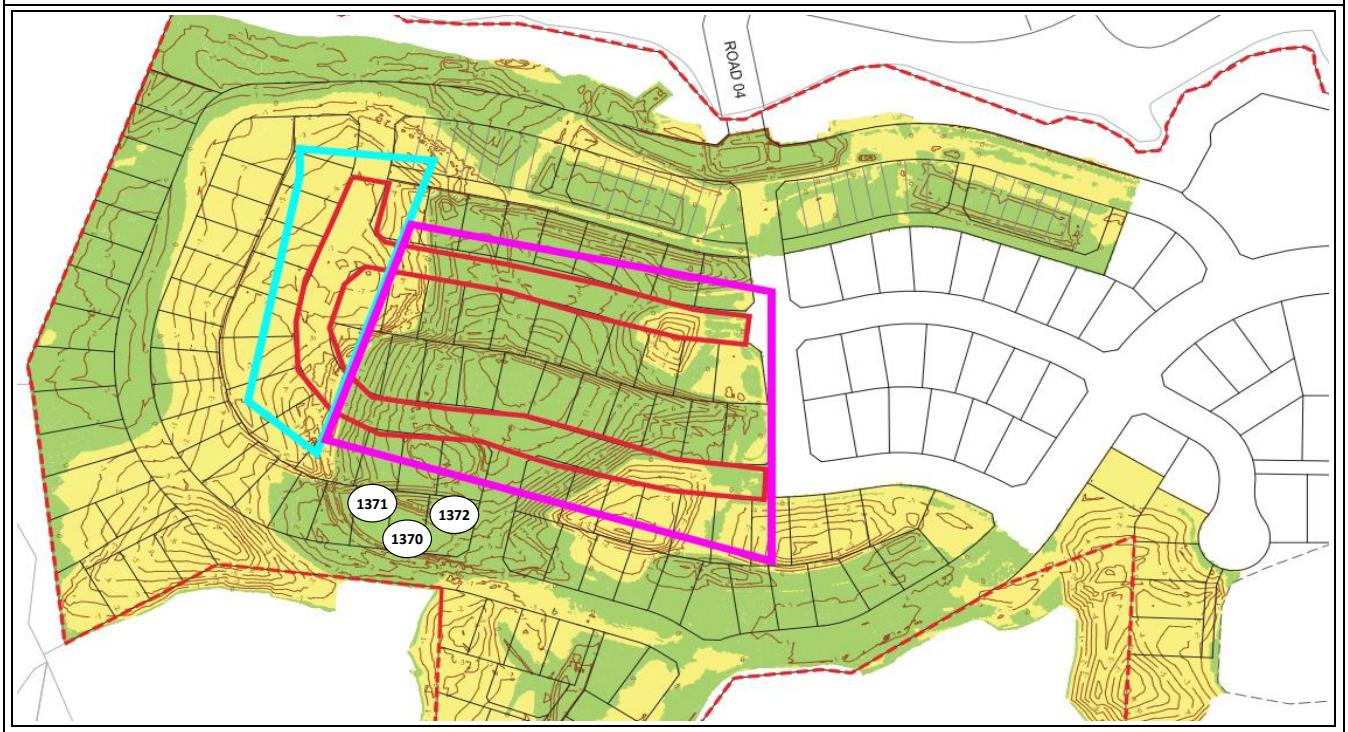
Approved Signatory: Eric Paton
(Managing Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 27/03/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00539
Page No: 2 of 2

Location: Gully 2

Tested by: RP
Date Tested: 22/03/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00576
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00576

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Eric Paton
Managing Director-Testing
IANZ Site Number: 105
Date of Issue: 5/04/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
27/03/2024	ETAM24W00576	LW	1373	1.97	23.3	1.59	2.65	2.6	UTP	UTP	UTP	UTP	Gully 2	1749001	5948849	-	Clayey SILT	RL not available
27/03/2024	ETAM24W00576	LW	1374	1.90	22.4	1.55	2.65	6.6	UTP	UTP	UTP	UTP	Gully 2	1748980	5948840	-	Clayey SILT	RL not available

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00576
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

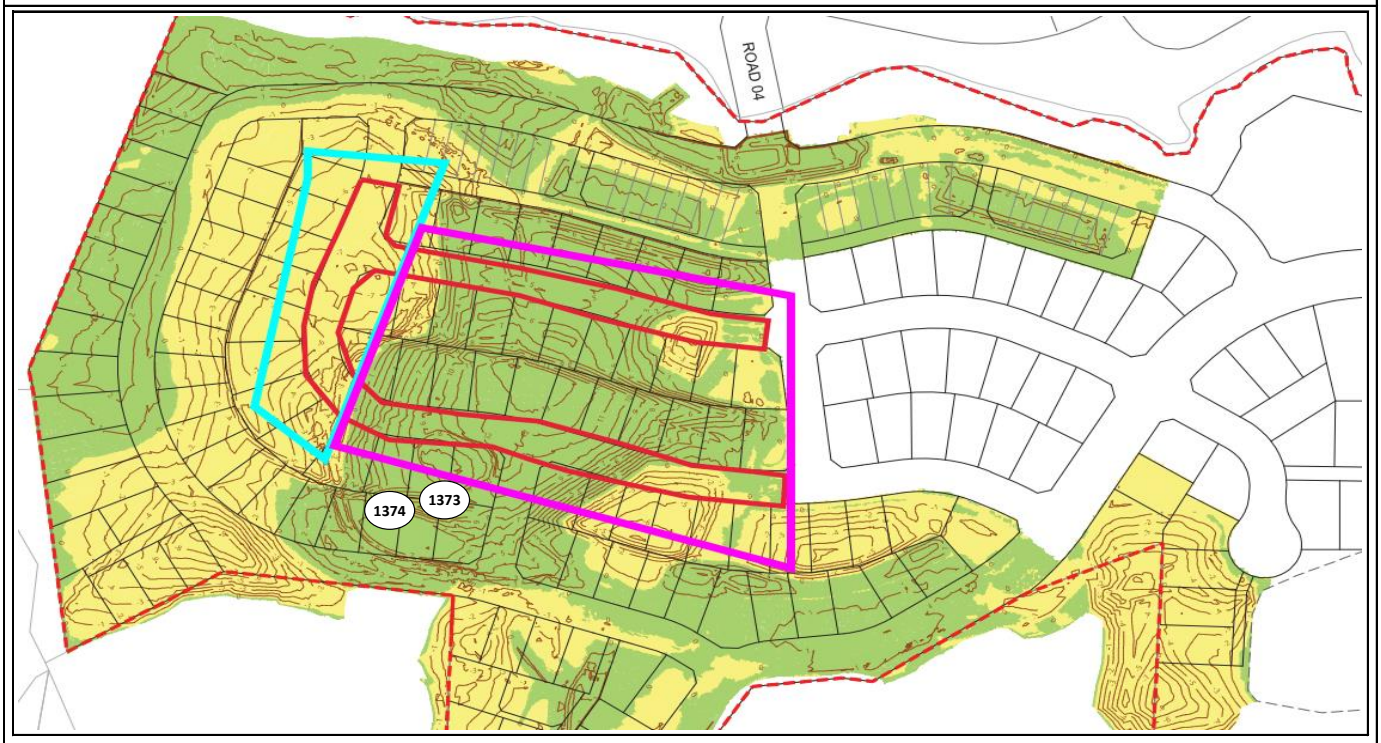
Approved Signatory: Eric Paton
(Managing Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 5/04/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00576
Page No: 2 of 2

Location: Gully 2

Tested by: RP
Date Tested: 29/03/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00655
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00655

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Approved Signatory: Eric Paton
Managing Director-Testing
IANZ Site Number: 105
Date of Issue: 9/04/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
5/04/2024	ETAM24W00655	LW	1377	1.96	23.7	1.58	2.65	2.9	UTP	UTP	UTP	UTP	RE Wall 603	1748979	5948871	40.25	Silty CLAY	-
5/04/2024	ETAM24W00655	LW	1378	2.00	24.9	1.60	2.65	0.0	UTP	UTP	UTP	UTP	RE Wall 603	1748963	5948875	40.25	Silty CLAY	-
5/04/2024	ETAM24W00655	LW	1379	1.98	24.0	1.59	2.65	1.6	UTP	UTP	UTP	UTP	RE Wall 603	1748948	5948876	40.25	Silty CLAY	-
5/04/2024	ETAM24W00655	LW	1380	1.99	20.4	1.65	2.65	3.8	UTP	UTP	UTP	UTP	RE Wall 603	1748935	5948879	40.25	Silty CLAY	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00655
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

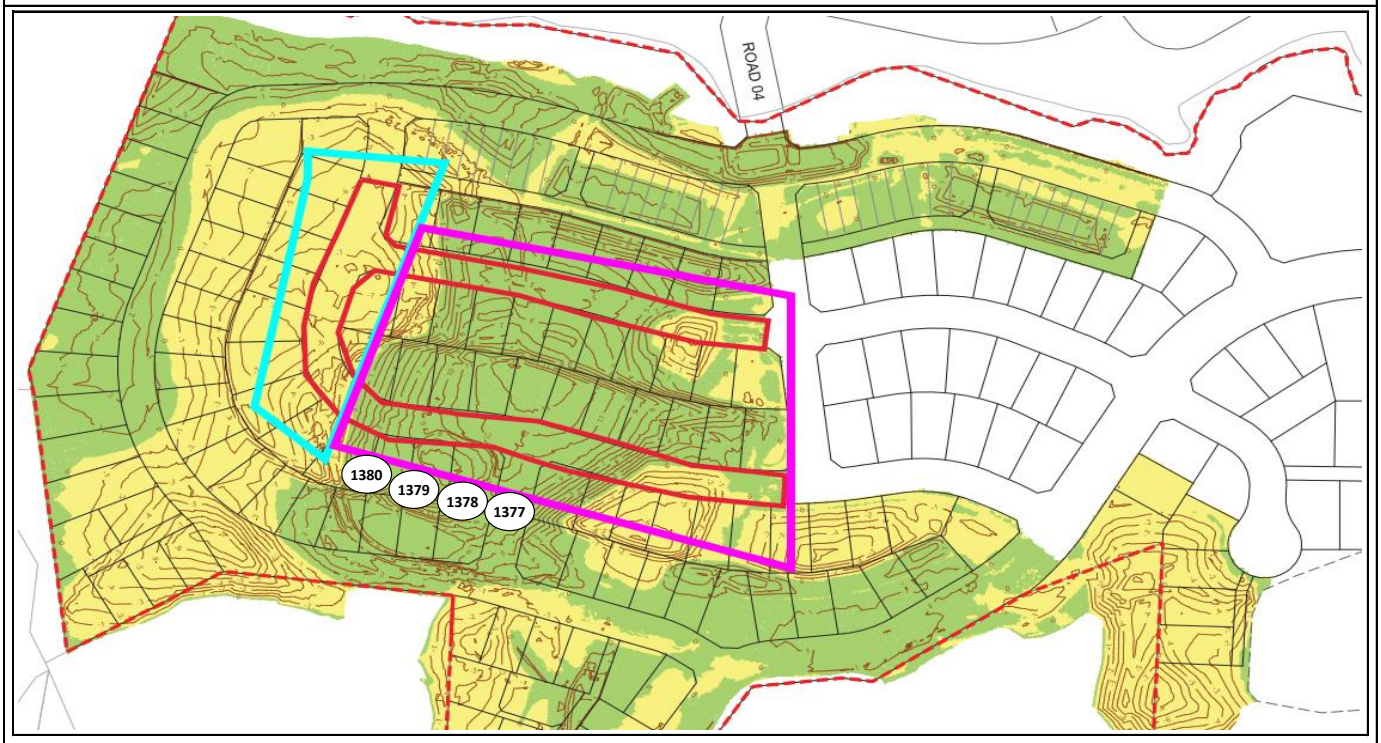
Approved Signatory: Eric Paton
(Managing Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 9/04/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00655
Page No: 2 of 2

Location: RE Wall 603

Tested by: LW
Date Tested: 5/04/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00697
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00697

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Managing Director-Testing
IANZ Site Number: 105
Date of Issue: 15/04/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
9/04/2024	ETAM24W00697	LW	1385	1.89	26.7	1.49	2.65	4.0	UTP	UTP	UTP	UTP	RE Wall 603	1748936	5948876	41.75	Silty CLAY	-
9/04/2024	ETAM24W00697	LW	1386	1.87	29.1	1.45	2.65	3.4	UTP	UTP	UTP	UTP	RE Wall 603	1748982	5948869	41.75	Silty CLAY	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00697
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

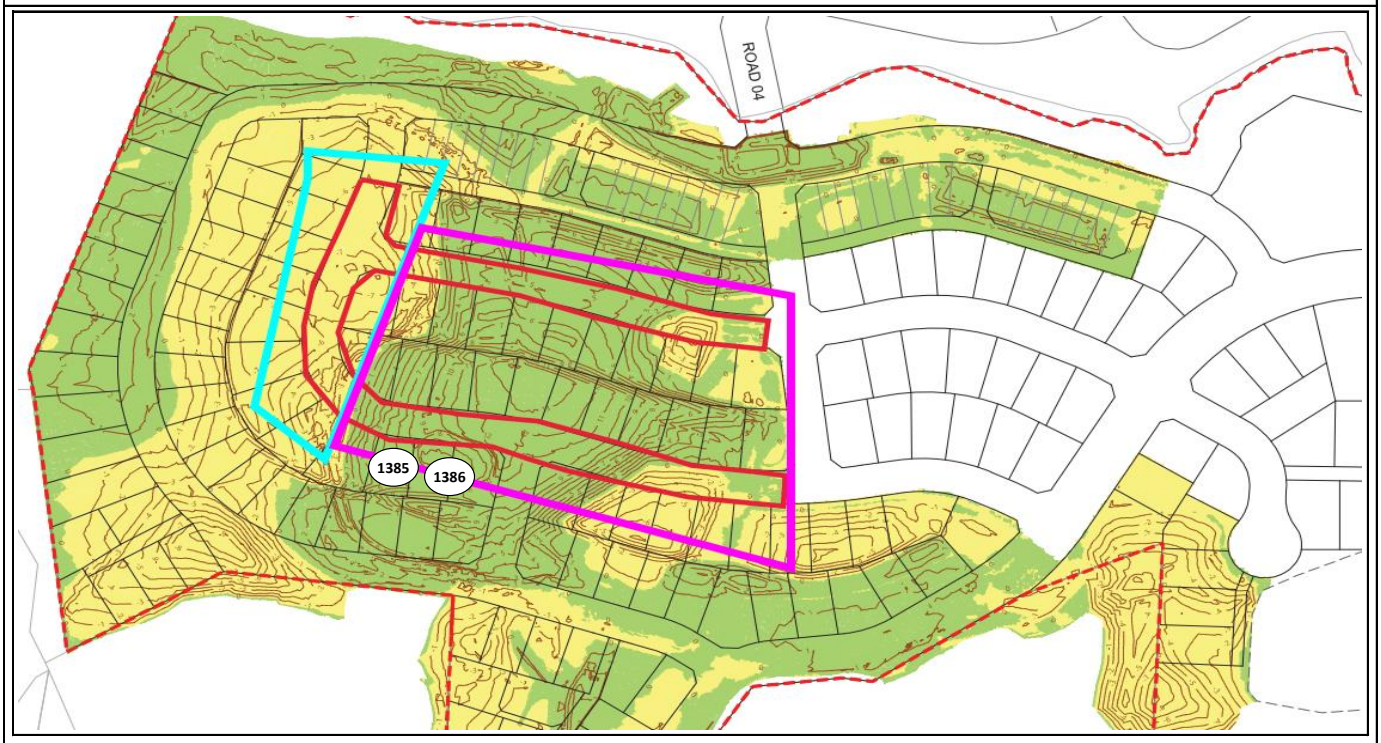
Approved Signatory: Eric Paton
(Managing Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 15/04/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00697
Page No: 2 of 2

Location: RE Wall 603

Tested by: LW
Date Tested: 9/04/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00710
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00710

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Managing Director-Testing
IANZ Site Number: 105
Date of Issue: 15/04/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
10/04/2024	ETAM24W00710	LW	1387	1.93	26.3	1.53	2.65	2.2	232+	232+	232+	232+	RE Wall 603	1748977	5948874	42.25	Silty CLAY	-
10/04/2024	ETAM24W00710	LW	1388	1.94	24.4	1.56	2.65	3.2	232+	232+	232+	232+	RE Wall 603	1748940	5948871	42.25	Silty CLAY	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00710
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

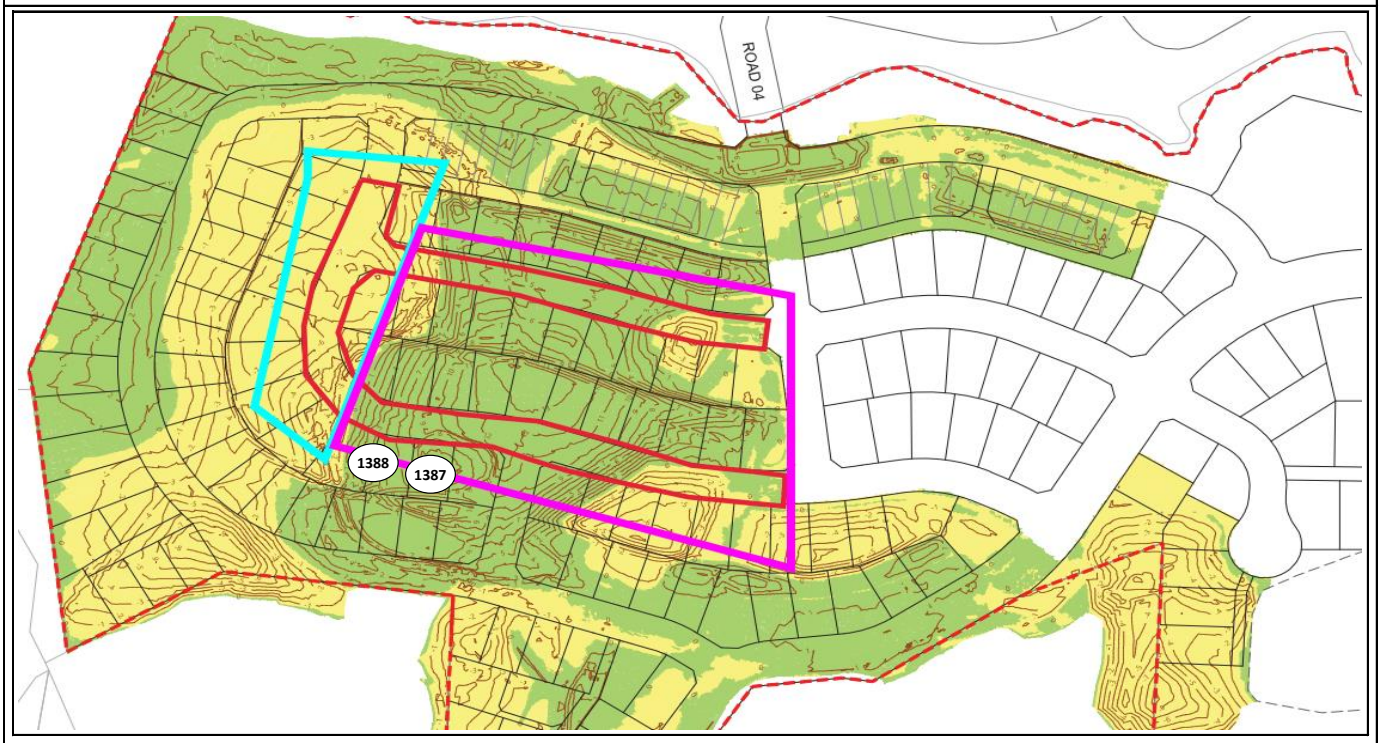
Approved Signatory: Eric Paton
(Managing Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 15/04/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00710
Page No: 2 of 2

Location: RE Wall 603

Tested by: LW
Date Tested: 10/04/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00721
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00721

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Managing Director-Testing
IANZ Site Number: 105
Date of Issue: 15/04/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
11/04/2024	ETAM24W00721	LW	1389	1.95	25.7	1.55	2.65	1.6	UTP	UTP	UTP	UTP	RE Wall 603	1748961	5948848	43.25	Silty CLAY	-
11/04/2024	ETAM24W00721	LW	1390	1.98	22.1	1.62	2.65	3.2	UTP	UTP	UTP	UTP	RE Wall 603	1748941	5948868	43.25	Silty CLAY	-

Comments:

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00721
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

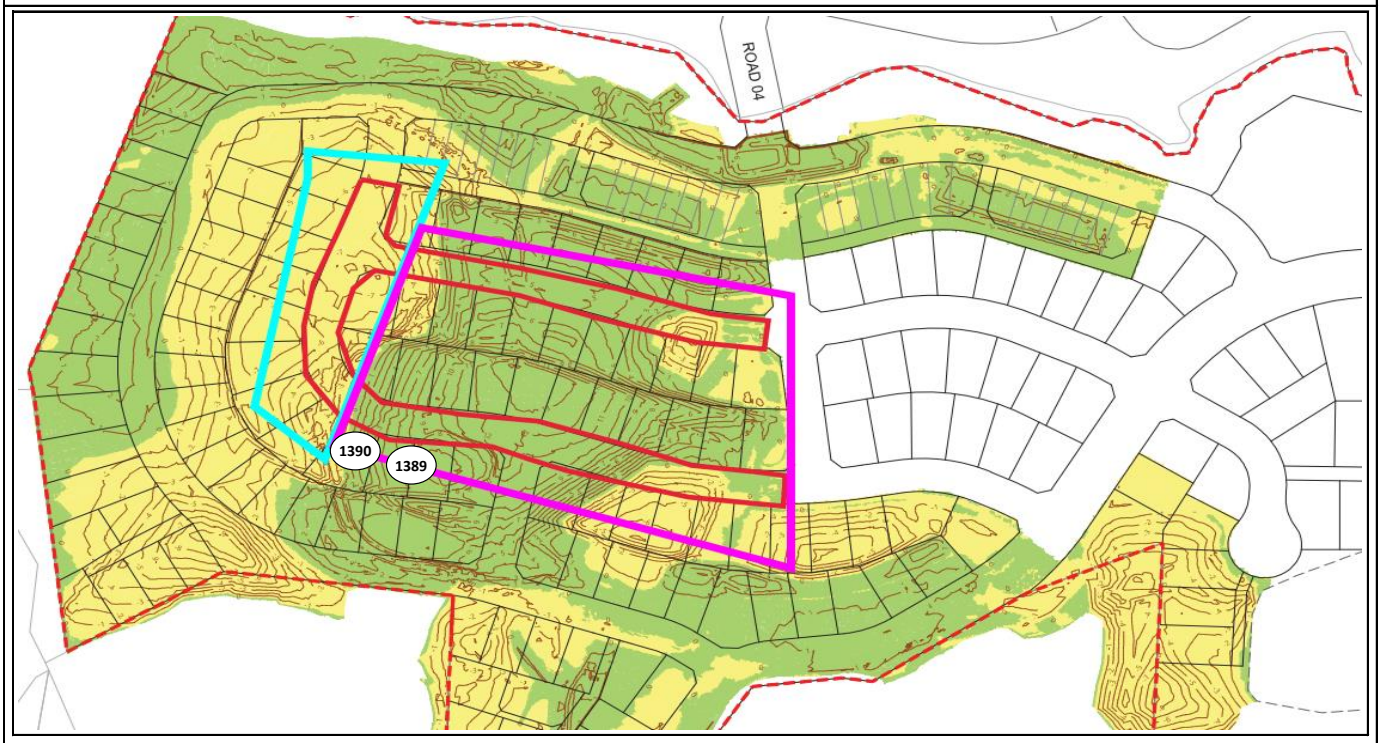
Approved Signatory: Eric Paton
(Managing Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 15/04/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00721
Page No: 2 of 2

Location: RE Wall 603

Tested by: LW
Date Tested: 11/04/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00872
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00872

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Managing Director-Testing
IANZ Site Number: 105
Date of Issue: 28/04/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
24/04/2024	ETAM24W00872	LW	1391	1.96	24.9	1.57	2.65	1.9	UTP	UTP	UTP	UTP	RE Wall 603	1748987	5948866	-	Silty CLAY	At Finish Level
24/04/2024	ETAM24W00872	LW	1392	1.96	23.5	1.59	2.65	2.8	UTP	UTP	UTP	UTP	RE Wall 603	1748969	5948866	-	Silty CLAY	At Finish Level
24/04/2024	ETAM24W00872	LW	1393	1.98	23.3	1.60	2.65	2.0	UTP	UTP	UTP	UTP	RE Wall 603	1748938	5948872	-	Silty CLAY	At Finish Level

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

Report No: EFIL:ETAM24W00872
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

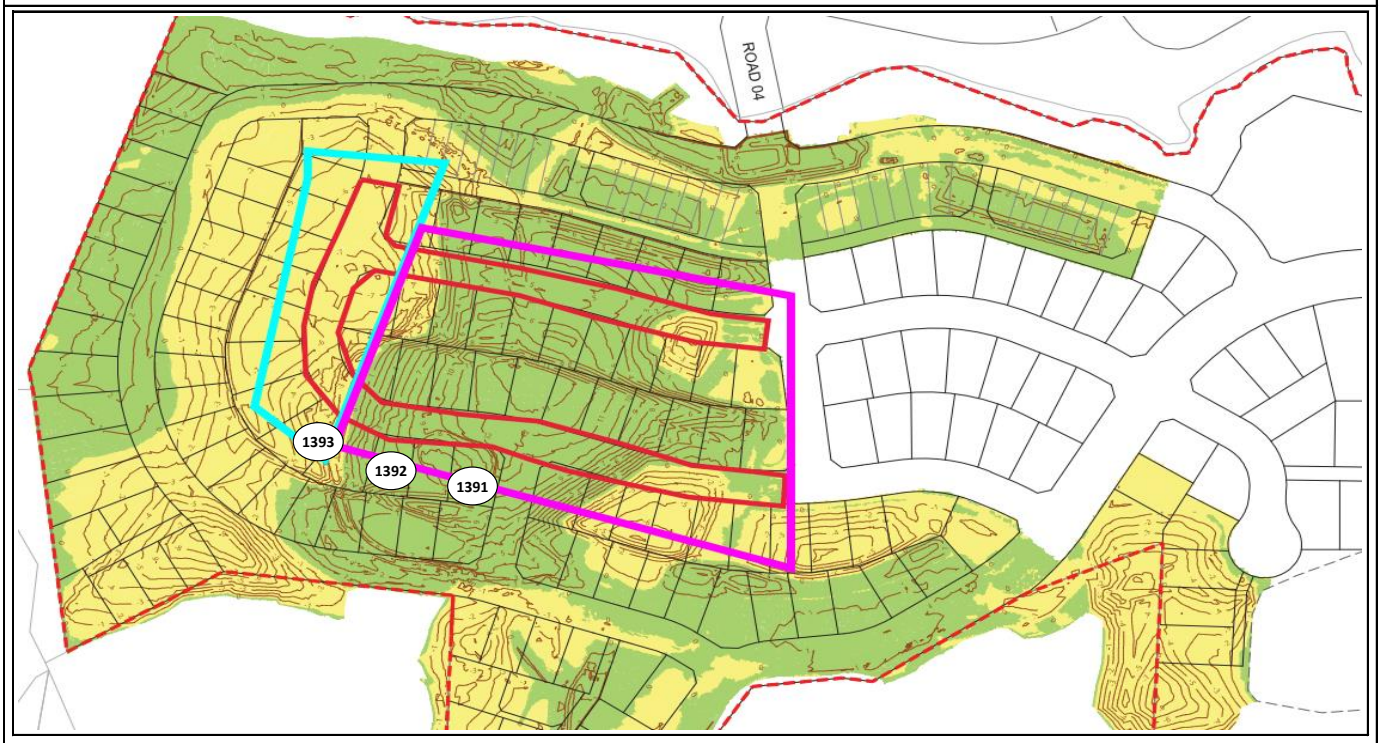
Approved Signatory: Eric Paton
(Managing Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 28/04/2024

SITE PLAN
* NOT TO SCALE *

Work Order No: ETAM24W00872
Page No: 2 of 2

Location: RE Wall 603

Tested by: LW
Date Tested: 24/04/2024



SITE PLAN * NOT TO SCALE *

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Report

Report No: EFIL:ETAM24W00969
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00969

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
cc to:	-
Project No.:	773-ETAM01553
Project Name.:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Project Location:	117 Kowhai Road, Orewa

Approved Signatory: Eric Paton
Managing Director-Testing
IANZ Site Number: 105
Date of Issue: 12/05/2024

Test Results

Test Methods : Shear Strength (using field Shear vane in accordance with NZS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.2.7)

Date Sampled	Work Order	Tested By	Test No.	Wet Density t/m^3	Oven Water Content %	Dry Density t/m^3	Solid Density t/m^3	Air Voids %	Field Shear Strength (UTP = Unable to penetrate) kPa				Test Location	Easting	Northing	RL	Material Tested	Comments
1/05/2024	ETAM24W00969	LW	1394	1.87	30.5	1.43	2.65	2.2	147	168	183	157	RE Slope	1748935	5948925	-	Silty CLAY	0.5m to Finish Level
1/05/2024	ETAM24W00969	LW	1395	1.83	31.0	1.40	2.65	3.7	163	157	147	173	RE Slope	1748937	5948931	-	Silty CLAY	0.5m to Finish Level

Comments:

Form Number: R031N Issue Date: 20/09/2018

Auckland Laboratory

GeoLab Limited
333K East Tamaki Road
Otara Auckland, 2013
Phone: 027 475 4011

Earthworks Fill Test Report NZ

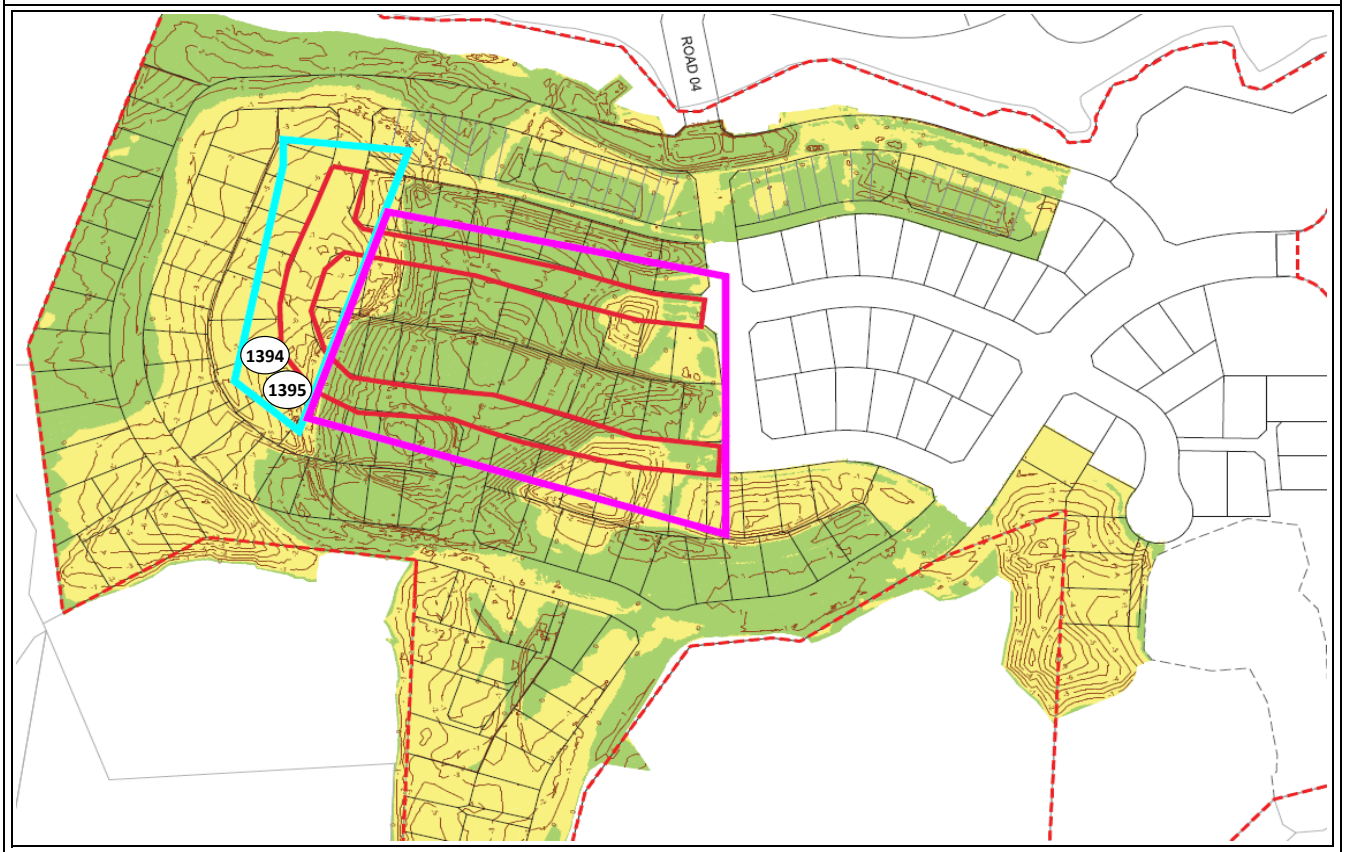
Report No: EFIL:ETAM24W00969
Issue No: 1

Client:	Tetra Tech Coffey (NZ) Limited- Auckland Coffey House, Level 4, Teed Street New Market Auckland 1023
Principal:	Stephen Parkes
Project No.:	773-ETAM01553
Project Name:	773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA
Lot No.:	**TRN:**

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

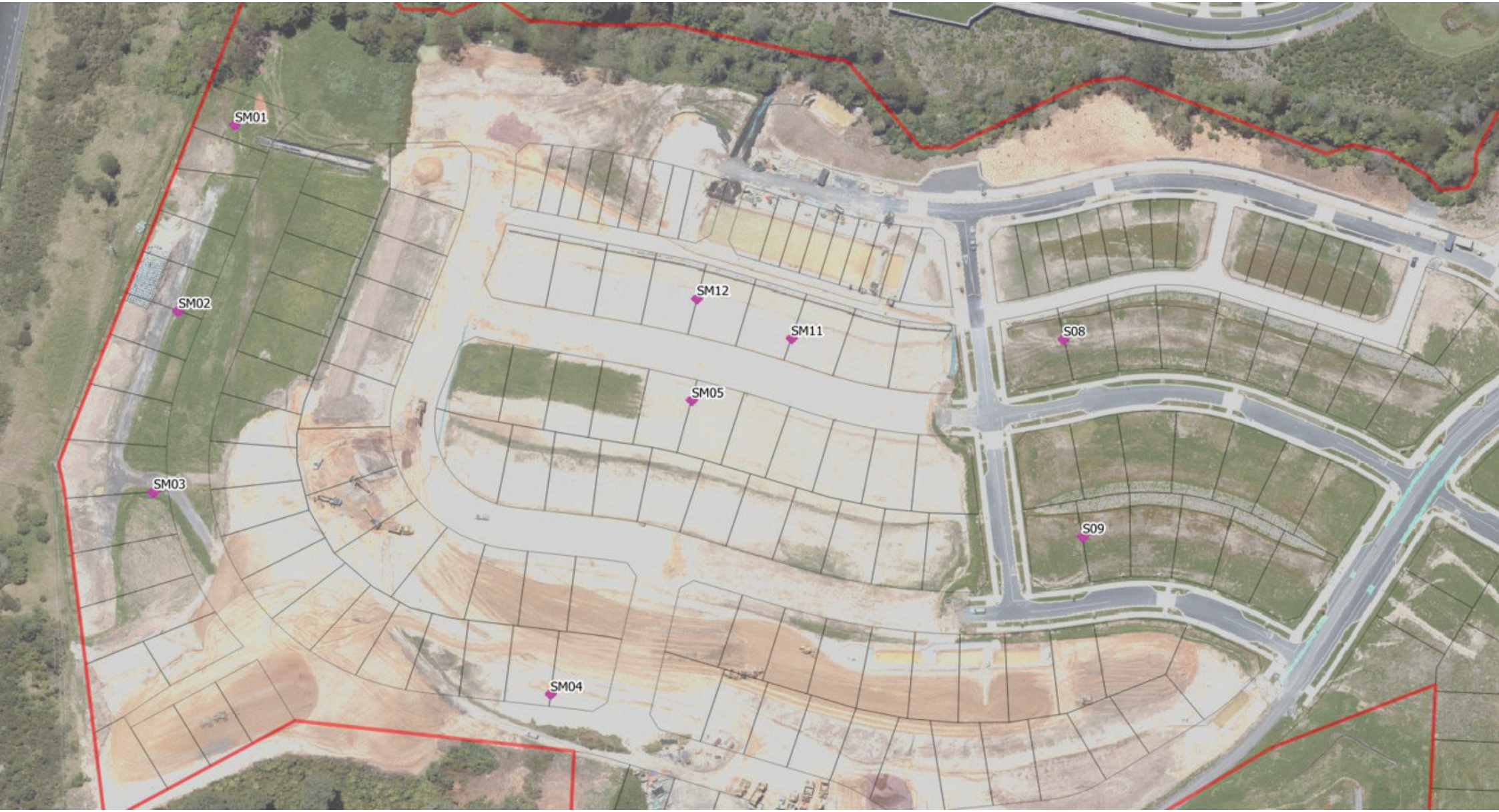
Approved Signatory: Eric Paton
(Managing Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 12/05/2024

Location: RE Slope **Date Tested:** 1/05/2024 **Tested by:** LW



SITE PLAN * NOT TO SCALE *

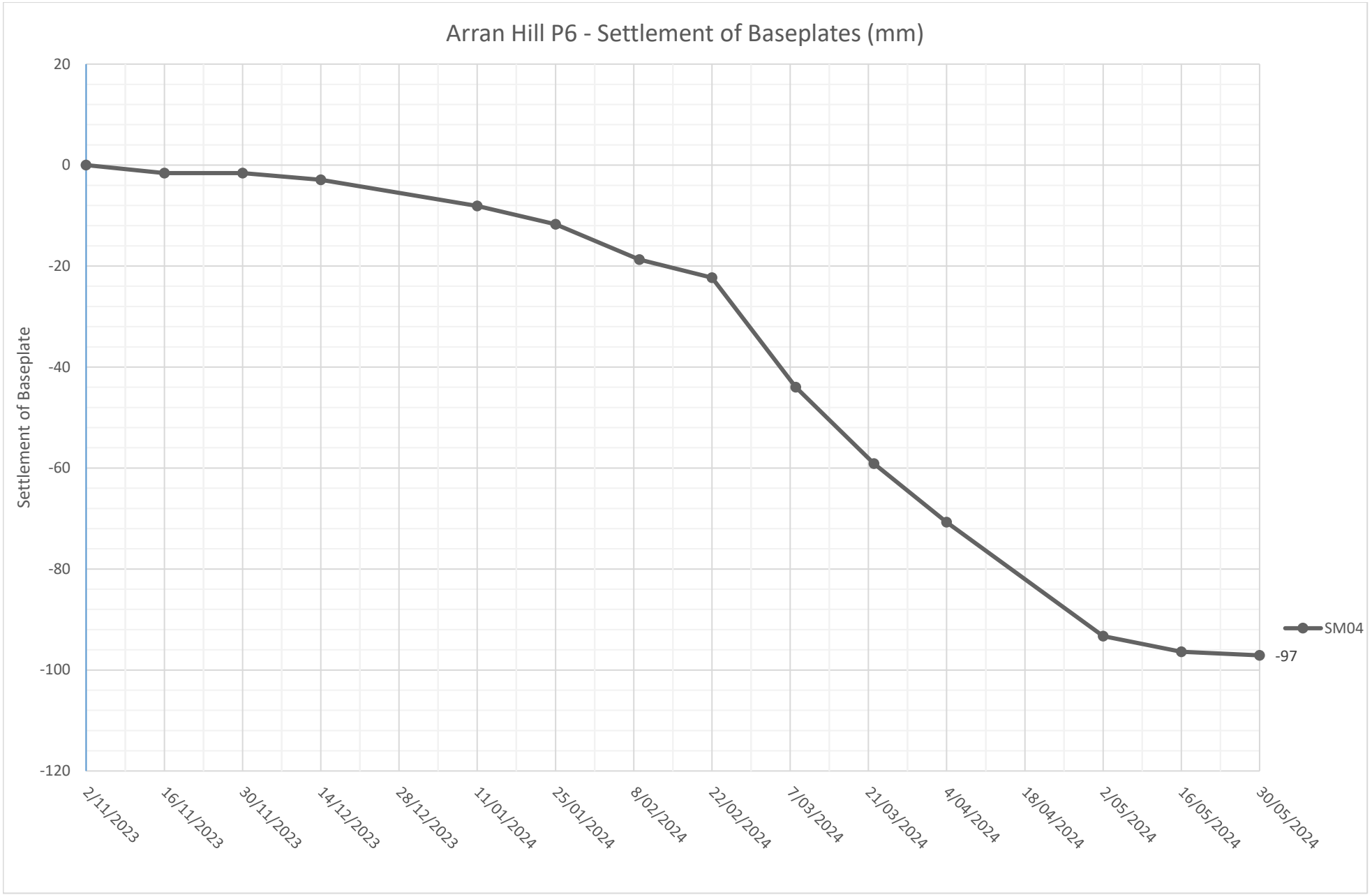
APPENDIX E: MONITORING RESULTS


SM01
SM02
SM03
SM04
SM05
SM11
SM12
S08
S09

WOODS
Est.1970

ARRAN HILL P6
SETTLEMENT ROD

BASE READING	SM04	
	41.775	
Date	Height	Settlement (mm)
2/11/2023	41.775	0
16/11/2023	41.773	-2
30/11/2023	41.773	-2
14/12/2023	41.772	-3
11/01/2024	41.767	-8
15/01/2024		
25/01/2024	41.763	-12
9/02/2024	41.756	-19
22/02/2024	41.753	-22
8/03/2024	41.731	-44
22/03/2024	41.716	-59
4/04/2024	41.704	-71
2/05/2024	41.682	-93
16/05/2024	41.679	-96
30/05/2024	41.678	-97


Arran Hill P6 - Settlement of Baseplates (mm)
Settlement of Baseplate
20
0
-20
-40
-60
-80
-100
-120
2/11/2023
16/11/2023
30/11/2023
14/12/2023
28/12/2023
11/01/2024
25/01/2024
8/02/2024
22/02/2024
7/03/2024
21/03/2024
4/04/2024
18/04/2024
2/05/2024
16/05/2024
30/05/2024
SM04
-97