

Geotechnical Completion Report

Millwater Arran Hills Precinct 6 – Stage 4

WFH Properties Limited



Reference: 773-AKLGE206639-CM

4 November 2025

MILLWATER ARRAN HILLS RESIDENTIAL SUBDIVISION, PRECINCT 6, STAGE 4

Geotechnical Completion Report

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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 Stage 4 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

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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 Stage 4 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 4 Subdivision As-Built Plans

Title	Reference No.	Date
Final Surface As-built Plans	P22-437-04-1000-AB	16/10/2025
Cut and Fill As-built Plan – Sheet 1 of 2 – Original Topographic Surface to Lowest Surface	P22-437-04-1100-AB	16/10/2025
Cut and Fill As-built Plan – Sheet 2 of 2 - Lowest Surface to Final Surface	P22-437-04-1101-AB	16/10/2025
Undercut and Subsoil As-Built Plan	P22-437-04-1200-AB	16/10/2025
Retaining Wall As-built Sheets 1 and 2	P22-437-04-1300-AB and P22-437-04-1301-AB	16/10/2025
Stormwater As-Built Plans Sheets 1 to 6	P22-437-04-3000 to 3005-AB	16/10/2025
Wastewater As-Built Plans Sheets 1 to 5	P22-437-00-4000 to 4004-AB	15/08/2025

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 Plan	CM/001	29/10/2025
Tetra Tech Coffey Geotechnical Site Investigation Plan ⁽¹⁾	CM/002	30/10/2025
Tetra Tech Coffey Geotechnical Works Plans ⁽²⁾	CM/003.1 to CM/003.3	31/10/2025
Tetra Tech Coffey Geoweb Support Anchors	CM/004.1 to CM/004.8	30/10/2025
Tetra Tech Coffey Subsoil Drainage Standard Details Rev. G	AG/007	15/05/2023
Tetra Tech Coffey Undercut Detail Plan Rev. D	AG/008	27/09/2022
Coffey In-Ground Palisade Wall Detail Rev. B - PW803	AP/003	09/04/2020
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

Tetra Tech Coffey Cantilever Pile Retaining Wall (Type 1) – Rev. C – Retaining Wall 308	AK001-2	28/02/2024
Woods Drilled Drains 1 to 4 Long Section Construction Drawings	37600-03-180-EW to 187-EW	February 2024
Woods Horizontal Bored Drains Plan	37600-03-190-EW	February 2024
Auckland Council Stormwater Pipe and Manhole Construction Clearance Requirements Rev. 3	AC-STD-SW22	17 January 2022
Watercare Pipe and Manhole Construction Clearance	WW26	04-12-2017
Watercare Building Close to or Over Local Network Wastewater	WW27	04-12-2017
Watercare 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 4 subdivision works to assess ultimate bearing capacity, soil expansivity and topsoil depths on the completed lots.
- (2) Depicts all geotechnical works carried out within the subdivision boundary.

This GCR covers the construction period April 2019 to October 2025 and is intended to be used for certification purposes for the following lots associated with subdivision consent SUB60446569:

- 23 residential lots numbered Lots 19 to 27 (inclusive), 62, 63, and 140 to 151 (inclusive);
- Three new sections of public road named Skulander Crescent (previously Road 01), Kowhai Road and one section of unnamed road which links Stage 4 and completed Stage 2 to the north; and
- One new Jointly Owned Access Lot (JOAL) numbered lot 506.

Stage 4 is bound by completed subdivision stages to the north (Stages 2, 2A and 2C), west (Stage 3) and northeast (Stage 1), the Goodson Scenic Reserve comprising dense native bush to the southwest and incomplete subdivision developments to the south.

The earthworks detailed and certified in this report were carried out under Resource Consents LUC60305555 and LUC60447131.

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-AC Rev. 2, dated 29 November 2019 – Geotechnical Works Specification
- 773-AKLGE206639-AD Rev. 1, dated 24 October 2019 – Geotechnical Design Philosophy for Millwater Precinct 6;
- 773-AKLGE206639-AE Rev.1, dated 29 November 2019 – Geotechnical Design Report for Shear Key 2;
- 773-AKLGE206639-AF Rev.2, dated 11 May 2022 – Geotechnical Design Report for RE600 to RE603;
- 773-AKLGE206639-AG Rev. 1, dated 25 August 2020 – General Earthworks Design Report
- 773-AKLGE206639-AI, dated 9 December 2019 – Settlement Analysis Report;
- 773-AKLGE206639-AK Rev. 3, dated 19 November 2021 – Geotechnical Design Report for Cantilever Retaining Wall 308;

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- 773-AKLGE2066369-AN Rev.2, dated 13 May 2020 – Geotechnical Monitoring Protocol;
 - 773-AKLGE206639-AP Rev. 1, dated 15 April 2021 – Geotechnical Design Report for Palisade Walls 801 to 803;
 - 773-AKLGE206639 NTE38, dated 15 October 2021 – Upper Gully 2 Additional Underfill Drainage;
 - 773-AKLGE206639 NTE48, dated 1 February 2023 – Proposed Additional Counterfort Drain;

The following report was prepared by Tonkin and Taylor (T&T) to certify an enabling works package carried out prior to the main Precinct 6 contract commencing. These works extend partially into the northern portion of Stage 4.

- 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 Stage 4 and adjoining land involved:

- Stripping of vegetation and undercutting of organic material and soft soils from gully inverts; and
- Earthworks involving fill placement to depths of up to 6.5m.
- Installation of underfill drains

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

3.2.2 Bulk Earthworks (April 2019 to October 2024)

Bulk Earthworks carried out under the main earthworks contract encompassing Stage 4 commenced in April 2019 with the stripping of topsoil and stockpiling of clay excavated from elsewhere on Precinct 6.

A clay stockpile that extended into the western portion of Stage 4 was significant, consisting of volumes up to 40,000m³. This remained in place for the majority of the first earthworks season (2019 to 2020) and helped to accelerate consolidation of the underlying natural soils beneath the future western fill area of Stage 4.

General earthworks operations during Season 1 involved the progression of fills within the eastern Stage 4 fill area and cuts with the central and eastern sections of Stage 4.

Season 2 (2020-2021) involved general cuts and fills, the gradual removal of stockpiles and the formation of the backslope surface of future RE602.

To maintain suitable long-term factors of safety against global instability, a Shear Key (SK2) was constructed adjacent to the northern Precinct 6 development boundary. Construction of the shear key involved excavation of the overburden soils and uppermost 1m of the bedrock, which served to remove linear planes of weakness within the soil and rock on which slope failures can occur. The excavated material was replaced with drainage and engineered fill.

Construction of the shear key commenced in March 2020 and was progressed from east to west in 25m open sections (i.e. 25m excavated and fully backfilled prior to commencement of the following 25m section), eventually extending beyond the Stage 4 landform in January 2021.

Earthworks carried out during Season 3 (2021-2022) involved the undercutting and filling of Gully 2 to the north of Stage 4 and the commencement of filling across Stage 4 West. As the fill level was raised, more topsoil was progressively stripped from the existing gully flanks and were subsequently intercepted with subsoil drainage.

Palisade Wall PW803 was installed outside of the Stage 4 boundary but supports the landform south of Skulander Crescent. This fully in-ground wall was constructed in August 2022 under Building Consent BCO10301029-4.

Earthworks Seasons 4 (2022-2023) commenced with the excavation of Undercut 8, required to provide suitable bearing conditions for RE602. The undercut involved a 2m deep, 6m wide excavation backfilled with engineered clay fill. The undercut designs are shown on Tetra Tech Coffey drawing AG/008 in Appendix B.

Several underfill drains were installed beneath the Western fill area in Stage 4 following observation of groundwater springs, prior to placement of fill.

Reinforced Earth Slope 603 (RE603) which forms the northwestern extent of Stage 4 and comprises a maximum 6m high, 1V:1.5H gradient geogrid reinforced earth slope was constructed in December 2023 to February 2024. This was followed by RE602, which forms the northeastern boundary of Stage 4. The Tetra Tech Coffey construction drawings for each of the RE Slopes are provided in Appendix B.

To preserve topsoil and vegetation on the faces of RE602 and RE603, a Geoweb cellular slope stabilisation system was installed on the slope face. This comprises 100mm deep HDPE cells fixed via Platypus anchors at the slope crests to maintain a permanent depth of topsoil on the slopes. The Geoweb was placed and anchored in September and October 2024. The slopes were planted in early 2025.

The western Stage 4 fill area reached finished level in April 2024, upon which most lots were topsoiled, prior to commencement of civil works.

Observations of a high groundwater table in Stage 4 and the adjoining incomplete Stage 5 to the south led to the prescription of an array of horizontally drilled drains, which were installed beneath Lots 19 to 27 between March and May 2024. The drains extend from the Skulander Crescent southern footpath south for roughly 300m to the southern Precinct 6 development boundary. The drainage also consists of regularly spaced vertical column drains (further details provided in Section 5.6.2) to relieve pore water pressures within the overburden soils. The horizontal drains were flush tested upon completion to confirm their function, and flushed again prior to completion of the subdivision in September 2025.

Retaining Wall 308, which marks the southern subdivision boundary, was constructed in June and July 2024. The wall consists of steel Universal Beam (UB) uprights and timber lagging. The wall construction drawings are provided in Appendix B.

3.2.3 Civil Works (November 2024 to September 2025)

Stage 4 civil works commenced in November 2024 with the gulletting of Skulander Crescent to subgrade and installation of under channel drains. All necessary road undercuts were completed and backfilled prior to subgrade testing in the new year.

Stormwater and wastewater drainage was completed in January 2025 including installation of catchpits on Skulander Crescent. Stormwater drainage was installed in February 2025, with wastewater and watermain commencing in other parts of Stage 4 during March. Watermain was livened at the end of May.

Road gulletting in Kowhai Road was completed in March and sub-basecourse aggregate was placed and compacted throughout March to May, followed by subbase stabilisation in June, and placement of basecourse aggregate in July.

JOAL 506 subgrade was trimmed and metalled prior to pouring of concrete in July 2025.

The compaction of both pavement layers was tested via Nuclear Densometer Test at a frequency of 1 test per linear 10m of road pavement, and the basecourse layer deflections were also assessed via Benkelman Beam Testing to confirm performance criteria. All roads were sealed with asphalt in late August 2025.

Other concrete works including kerbing, parking bays, vehicle crossings and footpaths were poured throughout April to July, eventually reaching completion in August 2025.

All services including electricity, gas, water, telecommunications and fibre were connected by the end of July 2025.

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;
- Ground conditions exposed in Undercut 8 beneath RE602;
- Placement of geogrid reinforcement and drainage for reinforced earth slopes RE602 and RE603, including connection of subsoil drainage to the downslope stormwater network;
- Construction of counterfort, underfill, vertical column and horizontally drilled drains;
- Construction of Retaining Wall 308 including observations of ground conditions exposed in pile holes, pile hole dimensions and spacing, drainage construction, wall structural components including pedestrian fall protection barrier and wall backfilling;
- Flush testing of all subsoil drains upon completion;
- Exposed ground conditions, pile hole specifications and structural components of Palisade Wall PW803;

Tests measurements undertaken during site inspections included:

- Compaction testing of clay fill and hardfill in accordance with the Tetra Tech Coffey Geotechnical Works Specification;
- Dynamic Cone Penetrometer Tests (Scala's) on natural and stabilised road and JOAL pavement subgrades in accordance with NZS 4402: 1998 Test 6.5.2 – Hand method using a Dynamic Cone Penetrometer.
- Nuclear Densometer (NDM) Compaction testing of subbase course and basecourse aggregates for public roads.

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 m³ 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 content 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.

5. PROJECT EVALUATION

5.1 STABILITY EVALUATION

Global stability conditions in Stage 4 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 referenced 773-AKLGE20639-AD) were adopted based on extensive investigation, laboratory testing 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 (i.e. the consent specification document).

We consider that the results are acceptable, and we are therefore satisfied that the building platform areas in all lots within Stage 4 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 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, referenced CM/001, 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;
- Specific Design Zone (Slope);
- Specific Design Zone (Retaining Wall)

Full description of the limitations associated with each of these zones are presented in the Suitability Statement and Section 5.4 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 gradient RE slope 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	6	Tensar SS20	Alternating 2m and 5m lengths at 0.5m vertical centres	12
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, 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 referenced P22-437-04-1200-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 Platypus anchors installed into the ground at approximately 1.3m lateral centres within 1m of 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. Likewise, deck piles or fence posts should not be installed immediately behind the slope crest, unless the tendons connecting the Geoweb cells to the Platypus anchors are first located so that any structures can be appropriately offset. The appended Tetra Tech Coffey Geoweb Support Anchors drawings referenced CM004.1 to CM004.8 show the as-built locations of the anchors on each of the affected lots. This as-built data may be requested from Tetra Tech Coffey if works are planned within this area.

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 RETAINING WALLS

5.3.1 Existing Retaining Walls

One 138m long cantilevered soldier pile retaining wall (Retaining Wall 308) was constructed to support JOAL 506 and Lot 27 at the location shown on the Woods Retaining Wall asbuilt plans ref: P22-437-04-1300 and 1301-AB. The wall consists of galvanised steel Universal Beam (UB) uprights and timber lagging. The wall drainage discharges to a concrete outfall structure downslope.

The wall design is shown on the Tetra Tech Coffey Cantilever Pile Retaining Wall design drawing in Appendix B.

The wall design incorporated a uniformly distributed 12kPa vertical surcharge load applied across the upslope land to the crest of the wall.

Building limitations associated with building in close proximity to the wall are discussed in Section 5.4.

5.3.2 Future Retaining Walls

Retaining walls to be constructed on the residential lots may be designed in accordance with the soil parameters provided in Table 4 below:

Table 4: Summary of Retaining Wall Design Parameters

Soil Unit Weight, γ (kN/m ³)	Effective Cohesion, c' (kPa)	Effective Internal Angle of Frictional Resistance, ϕ' (degrees)	Undrained Shear Strength of Foundation Soils, s_u (kPa)
18	0	28	50

Retaining wall designs should consider any sloping ground above or below the proposed wall locations and make appropriate allowances for traffic and building surcharge loads.

Care should be taken when forming temporary excavations to construct retaining walls to ensure the risk of initiating instability within upslope land is minimised. This is particularly relevant to retaining walls constructed within Lots 19 to 27. Risk reduction methods that should be considered include, but are not limited to:

- Staging excavations to coincide with wall construction (i.e. only portions of the excavation are opened up at any one time, prior to construction and backfilling of sections of the retaining wall)
- Covering excavations with polythene to prevent saturation of the excavation face
- Installation of temporary retention piles prior to excavation works (i.e. top-down construction methodologies)
- Careful planning of retaining wall construction works to avoid inclement weather and ensure excavations are only left unsupported for short periods of time

The retaining wall designs should, where applicable, be carried out in accordance with the Specific Design Zone building requirements discussed in Section 5.4 and the Suitability Statement.

5.4 BUILDING LIMITATION ZONES

The steeper areas of Stage 4 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 of Specific Design Zones pertaining to cutting near batter toes or filling/loading near batter crests to maintain the long-term integrity of these areas.

The Building Limitation Zones are shown on Tetra Tech Coffey drawing CM/001 in Appendix B.

Further details follow;

5.4.1 No Build Zone

From a geotechnical perspective, future building should be avoided on land having slope gradients steeper than 1V:2H or on the slopes that incorporate geogrid reinforcement to maintain long term factors of safety against instability. For these reasons, the RE slopes (RE602 and RE603) in Stage 4 have been designated as No Build Zone.

Building slabs may be suspended and cantilevered into the No Build Zone but no foundations and no earthworks are permitted.

To reduce the potential for scour and erosion of the RE slope faces, topsoil has been placed on the batter faces 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 or 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 be removed, but landscaped vegetation in the No Build Zones should be protected and preserved.

5.4.2 Specific Design Zone (Slope)

Specific Design Zone (Slope) has been applied to all lot areas located immediately upslope of the RE 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 land stability of filling or loading behind the batter crests, and of the potential of soil creep and its impacts on the proposed dwellings.

In addition, it is important that neither groundwater nor surface water is concentrated on or near these areas. Any future development on or close to batter crests will need to ensure that temporary works and landscaping does not result in land shaping that directs surface water over the batters. On no account should unlined stormwater soakage pits (or similar) be located on lots above the batters or elsewhere, as discussed in the appended Suitability Statement.

Excavations or piles proposed within 1m of RE Slope crests should first locate the tendons that secure the Geoweb slope stabilisation system to the installed ground anchors, to ensure the Geoweb support is not compromised during construction of dwellings. Further information regarding the tendon locations is shown on the appended Tetra Tech Coffey Geoweb Support Anchors drawings referenced CM004.1 to CM004.8, and in section 5.2.

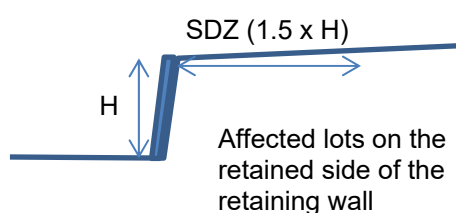
5.4.3 Specific Design Zone (Retaining Wall)

Specific Design Zone (Retaining Wall) has been applied to areas within the residential lots and JOAL 506 located immediately upslope of Retaining Wall 308.

Development within this zone is to be designed and certified by a Chartered Professional Engineer experienced in geomechanics and familiar with the contents of this report, to ensure that surcharge loads applied above the wall do not exceed those assumed in the wall design or that proposed works are carried out in such a way as to not compromise the function of the retaining wall.

The Specific Design Zone (Retaining Wall) has been applied to land dimensions equivalent to 1.5 x the wall height, for a lateral width above the wall. The application of the Specific Design Zone (Retaining Wall) is depicted below in Figure 1.

Further details on the requirements associated with building within the Specific Design Zone (Retaining Wall) on affected lots is provided in the Suitability Statement.



Cantilever Pole Retaining Wall

For private land located on the retained side of the wall (above/ upslope of the retaining wall)

The wall is retaining private land (to the right of the diagram) and a Specific Design Zone is applied on the retained side immediately above the wall to ensure buildings or placement of fill within a zone equivalent to 1.5 x the retained height is appropriately designed and constructed in a way that does not adversely affect the retaining wall.

Applied to: Lot 27, JOAL 506

Figure 1: Application of Specific Design Zone (Retaining Walls)

5.5 FILL INDUCED SETTLEMENT

The subdivision bulk earthworks included mucking out of organic and soft deposits from gully inverts prior to placement of Engineered fill, 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.

One settlement monitoring device (SM04) was installed within the boundary of Stage 4 to measure induced ground settlements from fills placed in the western portion of the subdivision. The location of this monitoring device is shown in the Settlement Monitoring Location plan in Appendix E. The settlement plate was placed on the stripped natural ground beneath the fill area prior to fill placement and brought up to ground level as filling progressed to monitor the ongoing consolidation of the underlying natural soils.

As shown in the settlement monitoring graphs in Appendix E, we are satisfied that at the time of preparing this report, fill induced settlements within Stage 4 had attenuated to acceptable levels for NZS3604 type dwellings to be constructed.

5.6 SUBSOIL DRAINAGE

The following subsections contain a description of the underfill and horizontally drilled drains (collectively referred to as subsoil drains) installed during bulk earthworks to control groundwater levels and allow for the dissipation of generated pore water pressures within the natural soils and rock beneath Stage 4. The drain locations are shown on the Woods Subsoil Drainage as-built plan referenced P22-437-04-1200-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.

5.6.1 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, to reduce settlement times and to divert water to appropriate outfall structures.

As shown in Woods Asbuilt drawing P22-437-04-1200-AB, one underfill drain is present within the northwestern portion of Stage 4. This drain has been installed beneath several metres of fill or within designated front yard areas. As such, no engineering solution is required to bridge this drain where it passes beneath residential lots, and it is unlikely to be intercepted by future building works.

5.6.2 Horizontally Drilled Drains & Vertical Column Drains

Four lines of horizontally drilled drains were extended roughly 300m from the southern Precinct 6 development boundary northwards beneath the adjoining unfinished subdivision Stage 5, and beneath the southern portion of Stage 4. The drains terminate within the southern footpath of Skulander Crescent, at the locations shown on the appended Woods Subsoil Drainage Asbuilt Plan.

The drains comprise a perforated 63mm diameter MDPE pipe installed within a directionally drilled hole, which align with regularly placed vertical column drains (i.e. 600mm diameter drilled pile holes backfilled with TNZ F/2 and 150/65 aggregate) designed to relieve pore water pressures within the near surface soils.

The end of the drains terminate within Stage 4 and consist of a PVC flushing port connected to the ends of the drains, and brought up to ground level where they have been capped by a flush toby box set into the concrete footpath.

The horizontally drilled drains were designed to be installed at depths beneath the zone of influence of conventional shallow foundations. Piles for boundary retaining walls should however be positioned to span across the drain alignments. As built alignments may be requested from Tetra Tech Coffey by future lot owners to facilitate this. The design elevations of the drains are shown on the Woods Bored Drain construction drawings referenced 37600-03-180 EW to 187-EW and 37600-03-190 EW in Appendix B.

The vertical column drains have been installed with a 2m thick clay cap and positioned within lower elevation portions of private land away from building platforms, so are unlikely to be intercepted by construction works. In the unlikely event that they are intercepted by future works however, the issue should be relayed back to us immediately so that we can advise on how best to reinstate the drains to preserve their function.

The drains are able to remain in place long term without specific maintenance, however some periodic flushing at the flushing ports may prolong peak drain performance.

5.6.3 Flushing of Subsoil Drains

Upon completion, all subsoil drains were successfully flush tested to confirm their function. The flush testing was undertaken by connecting a water truck and hose to the exposed subsoil drainage inlet pipes. A Tetra Tech Coffey engineer was on-site to observe water discharging at the drainage outlet points.

5.7 FOUNDATIONS AND 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, further 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 600mm 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.

On sloping lots, piled foundations may be the most appropriate foundation system. Pile foundations on this subdivision may be designed in accordance with the following design parameters:

Table 6: Suggested Pile Design Parameters

Effective Internal Angle of Frictional Resistance, ϕ' (degrees)	Soil Unit Weight, γ (kN/m ³)	Undrained Shear Strength, s_u (kPa)	Ultimate side adhesion beyond 1.0m depth (kPa)*
28	18	60	30

*Side adhesion to be ignored within the upper 1m of soil

The structural designer should attend to the details of pile type, depth, spacing, diameter and load capacity, and also ensure there is allowance in the design for any differential movements that may occur between piled and unpiled portions of the dwelling.

Soil creep on sloping ground should be mitigated by designing piles to resist lateral loads over the upper 1.0m of pile equivalent to 3 x pile diameters.

5.8 EXPANSIVE SOILS

Six sets of Laboratory Expansive Soil Tests were carried out on soil samples retrieved from the boundaries of Lots 61 & 62, 24 & 25, 143 & 144, 146 & 147 and adjacent Lot 132 (as shown on Tetra Tech Coffey drawing CM/002 in Appendix B, results in Appendix C).

Testing to assess the soil 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 and BRANZ Addendum Study 120A (2008) *Soil Expansivity in the Auckland Region* 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 on a single occasion is recommended) of the exposed building platform area, a few days before hardfill placement, can help to reduce the problem and is strongly recommended. 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 surficial 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.

5.9 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.

5.10 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 shown in drawings WW26, WW27 and WW28 extracted from Watercare CoP 1.

A number of the lots have public drainage trenches within their boundaries as shown on the Woods Stormwater and Wastewater as-built plans referenced P22-437-04-3000 to 3005-AB, and P22-437-00-4000 and 4004-AB, respectively, in Appendix A. The resulting limitations are discussed in the following Suitability Statement.

5.11 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 CM/002 in Appendix B) to assess indicative topsoil depths on all residential lots.

Depths of topsoil were found to range from 100 to 300mm, 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 8) in Section 6. However, we strongly recommend that prospective lot purchasers complete their own checks of actual topsoil depths across their specific lot.

5.12 PUBLIC ROAD AND JOAL SUBGRADES

Scala Penetration Resistance (Dynamic Cone Penetrometer) Tests were undertaken at regular intervals along the road and JOAL subgrades in Stage 4. The test results were subsequently forwarded to Woods for pavement design validation purposes. Areas demonstrating low equivalent CBR values were typically either reworked with lime/cement stabilisation treatment or undercut and replaced with hardfill or engineered clay fill.

5.13 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 Stage 4 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 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 Stage 4 construction works 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 P22-437-04-1000-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 slopes contain geogrid reinforcement whose structural integrity is critical in maintaining long term slope stability, and some lot areas adjoin constructed subdivision retaining walls encompassing particular design requirements.

Accordingly, limitations to future building by way of designated No Build Zone and Specific Design Zone (Slope), and Specific Design Zone (Retaining Wall) have been applied as depicted on Tetra Tech Coffey Geotechnical Building Limitation Zone Plan CM/001, dated 10/09/25, and described as follows:

- i. **No Build Zone** has been applied to portions of Lots 62, 63 and 140 to 151 (inclusive) and encompasses land containing geogrid reinforced earth (RE) slopes. 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 Lots 62, 63 and 140 to 151 (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 changes.

Foundations constructed within the Specific Design Zone (Slope) in Lots 61, 62, and 140 to 151 inclusive should include the piling of leading (downslope) edge foundations and deck foundations. Suggested parameters for design of pile foundations are as follows:

Effective Internal Angle of Frictional Resistance, ϕ' (degrees)	Soil Unit Weight, γ (kN/m ³)	Undrained Shear Strength, s_u (kPa)	Ultimate side adhesion beyond 1.0m depth (kPa)*
28	18	60	30

*Side adhesion to be ignored within the upper 1m of soil

Table 7: Pile Design Parameters

The structural designer should attend to the details of pile type, depth, spacing, diameter and load capacity, and also ensure there is allowance in the design for any differential movements that may occur between piled and unpiled portions of the dwelling.

Piling or excavations within 1m of the batter crest should first locate the tendons that connect the Geoweb Erosion Control System placed on the slope face, to their anchor supports, as severing of the tendons may result in slumping of the topsoil and planting on the downslope batter.

- iii. **Specific Design Zone (Retaining Wall)** has been applied to Lot 27 and JOAL 506 and encompasses land upslope or downslope of subdivision retaining walls, for a lateral extent of land equivalent to 1.5 x the vertical height of the wall at that location.

No building or earthworks should take place within these zones unless endorsed by specific engineering design and construction monitoring of all earthworks, foundations and retaining walls performed by a Chartered Professional Engineer, experienced in Geomechanics, who is familiar with the contents of this report, to ensure the integrity of the adjoining retaining walls is not compromised by excessive loading from structures or fill placement upslope of the wall.

- b) A geotechnical ultimate bearing capacity of 300kPa may be assumed for shallow foundation design on all residential lots in Stages 4.

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, as depicted on the appended Woods Limited Subsoil Drainage as-built plan referenced P22-437-04-1200-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, particularly on Lots 19 to 27 (inclusive) where horizontally drilled drains have been installed beneath the lots. **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.**
- 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 P22-437-04-3000 to 3005-AB and P22-437-00-4000 to 4004-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 WW26, WW27 and WW28, also 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 class M (moderately reactive) for lots 19 to 27 (inclusive), and 142 to 151 (inclusive), and H (Highly Reactive) for lots 62, 63, 140 and 141. 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 4, 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 8 below summarises the status of each residential lot covered by this Suitability Statement.

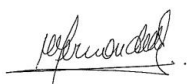
7. LIMITATIONS

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
CMEngNZ, PEngGeol

Table 8: Suitability Statement Summary

Lot #	Comments	Indicative Topsoil Depth (mm)	Ultimate Bearing Capacity (kPa)	AS2870 Expansive Site Class
19	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 or pad foundations.	100	300	M
20	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 or pad foundations.	100	300	M
21	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 or pad foundations.	100	300	M
22	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))	100	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 or pad foundations.			
23	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 or pad foundations.	100	300	M
24	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 or pad foundations.	100	300	M
25	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 or pad foundations.	300	300	M
26	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))	100	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 or pad foundations.			
27	Specific Design Zone (Retaining Walls) limitations apply (refer to Clause 6.4(a) (iii)) 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 or pad foundations.	200	300	M
62	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 H NZS 3604 type strip or pad foundations.	200	300	H
63	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))	100	300	H

	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 or pad foundations.			
140	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 H NZS 3604 type strip or pad foundations.	100	300	H
141	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 H NZS 3604 type strip or pad foundations.	100	300	H
142	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 or pad foundations.	100	300	M

143	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 or pad foundations.	100	300	M
144	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 or pad foundations.	100	300	M
145	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 or pad foundations.	100	300	M
146	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))	100	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 or pad foundations.			
147	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 or pad foundations.	100	300	M
148	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 or pad foundations.	100	300	M
149	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	200	300	M

	accordance with Amendment 19 to section B1 of the NZ Building Code for Class M NZS 3604 type strip or pad foundations.			
150	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 or pad foundations.	200	300	M
151	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 or pad foundations.	200	300	M

APPENDIX A: WOODS AS-BUILT DRAWINGS

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: 16/10/2025

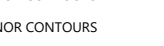
Name: SAM MUIRHEAD



NOTES

1. COORDINATES ARE IN TERMS OF NZTM AND ORIGIN IS ALP 10 DP 537959 SOURCED FROM LINZ DATABASE
~ 5948844.96mN 1749267.16mE
2. LEVELS ARE IN TERMS OF AVD46 AND ORIGIN IS CA 15 (GD CODE B3BQ), RL = 24.82m, SOURCED FROM LINZ DATABASE.
3. CONVERSION FACTOR FROM AVD46 TO NZVD16 IS -0.310m.
4. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY AND LINZ APPROVAL.
5. CONTOURS ARE AT 0.25m INTERVALS.

LEGEND



MAJOR CONTOURS	
MINOR CONTOURS	
EXISTING CONTOURS	
LOT BOUNDARY	
EXISTING LOT BOUNDARY	
FUTURE LOT BOUNDARY	
STAGE BOUNDARY	

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 AND WOOD AND PARTNERS
CONSULTANTS ACCEPT NO RESPONSIBILITY FOR ANY
BUILDING DESIGN OR CONSTRUCTION BASED ON THIS
DRAWING FILE.

REVISION DETAILS		BY	DATE
1	ISSUED FOR INFORMATION	EC	16/10/25

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT STREET GRAFTON AUCKLAND 1023
DESIGNED	WOODS	
DRAWN	EC	
CHECKED	TT COFFEY	
APPROVED	SM	WOODS.CO.NZ



WFH
PROPERTIES

MILLWATER OREWA WEST
PRECINCT 6 - STAGE 4

FINAL SURFACE ASBUILT

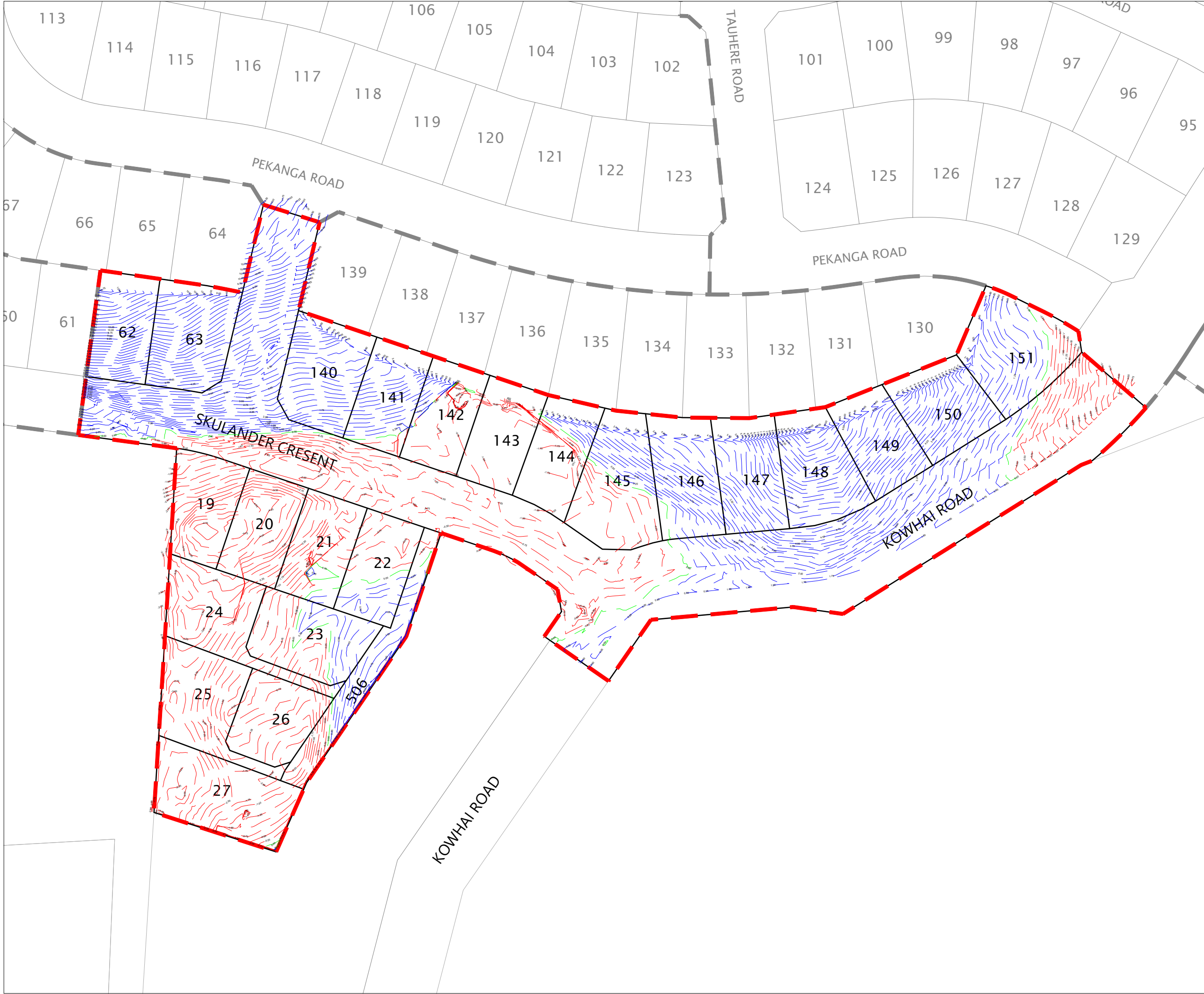
STATUS	AS BUILT	REV
SCALE	1:1000 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P22-437-04-1000-AB	

Plot Date: 9:13:43 am, 17 October 2025, SAMANTHAM

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\p22-437 - P6 STAGE 3 AND 4_21253\CAD\SURV\ABSA\p22-437-04-1000-AB FINAL SURFACE.DWG



Plot Date: 2:15:45 pm, 17 October 2025, SAMANTHAM



- NOTES**
- COORDINATES ARE IN TERMS OF NZTM.
 - LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY AND LINZ APPROVAL.
 - CONTOURS ARE AT 0.25m INTERVALS.
 - PLANS SHOULD BE READ IN CONJUNCTION WITH GCR.

LEGEND

ZERO CONTOUR	0.0
CUT CONTOUR	-1.0
FILL CONTOUR	1.0
LOT BOUNDARY	
EXISTING LOT BOUNDARY	
FUTURE LOT BOUNDARY	
STAGE BOUNDARY	

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 AND WOOD AND PARTNERS CONSULTANTS ACCEPT NO RESPONSIBILITY FOR ANY BUILDING DESIGN OR CONSTRUCTION BASED ON THIS DRAWING FILE.

REVISION DETAILS		BY	DATE
1	ISSUED FOR INFORMATION	EC	16/10/25

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT STREET GRAFTON AUCKLAND 1023 WOODS.CO.NZ
DESIGNED	TT COFFEY	
DRAWN	EC	
CHECKED	TT COFFEY	
APPROVED	SM	

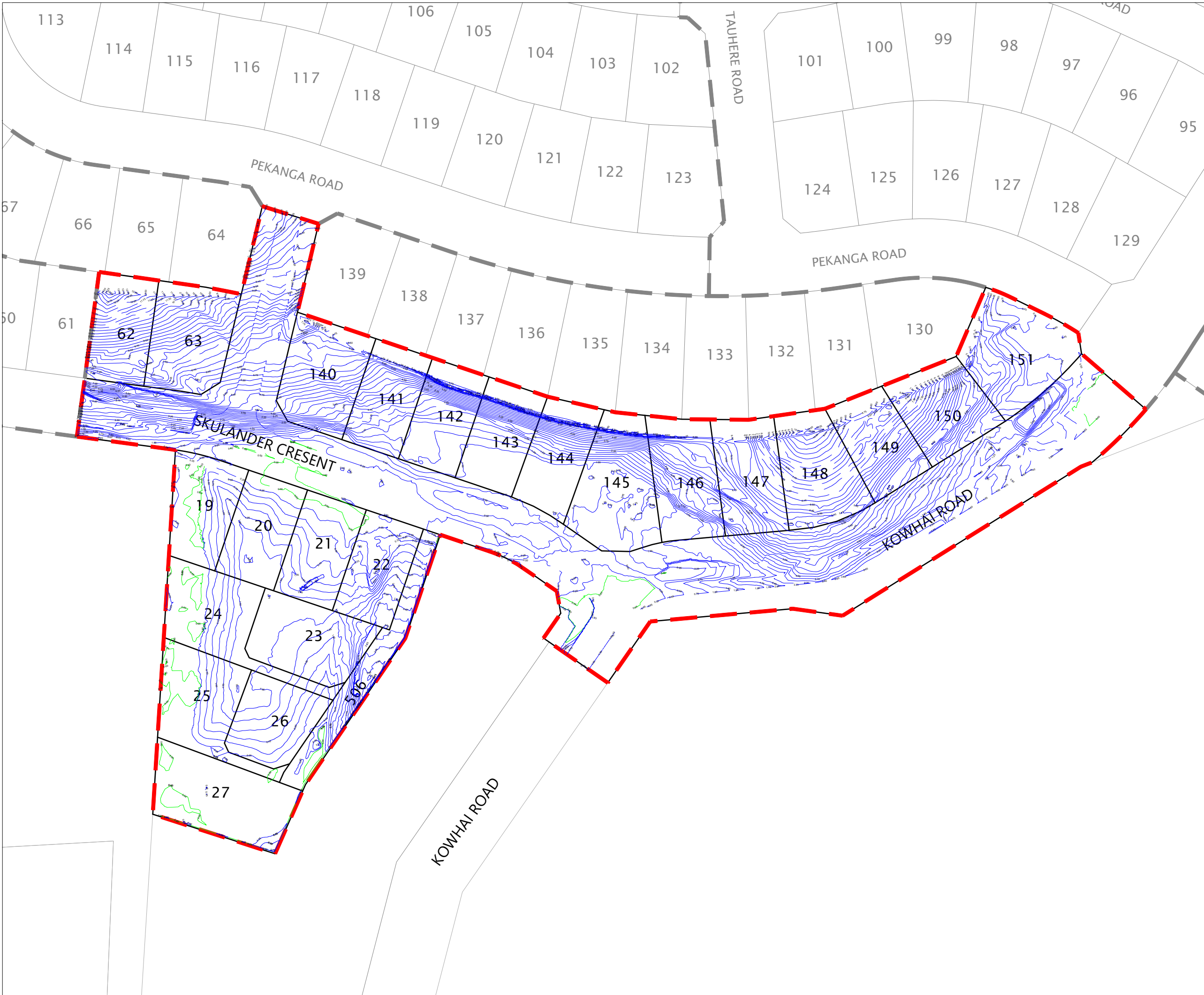


**MILLWATER OREWA WEST
PRECINCT 6 - STAGE 4**

CUT AND FILL ASBUILT
ORIGINAL TOPOGRAPHIC SURFACE
TO FINAL SURFACE

STATUS	ISSUED FOR INFORMATION	REV
SCALE	1:1000 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P22-437-04-1100-AB	

File: C:\12DSYNERGY\DATA\WIP-PEN-APP-01\P22-437 - P6 STAGE 3 AND 4_21253\CAD\SURV\ABS\WIP22-437-04-1100-AB CUT FILL.DWG



- NOTES**
- COORDINATES ARE IN TERMS OF NZTM.
 - LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY AND LINZ APPROVAL.
 - CONTOURS ARE AT 0.25m INTERVALS.
 - PLANS SHOULD BE READ IN CONJUNCTION WITH GCR.

LEGEND

ZERO CONTOUR	0.0
CUT CONTOUR	-1.0
FILL CONTOUR	1.0
LOT BOUNDARY	
EXISTING LOT BOUNDARY	
FUTURE LOT BOUNDARY	
STAGE BOUNDARY	

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 AND WOOD AND PARTNERS CONSULTANTS ACCEPT NO RESPONSIBILITY FOR ANY BUILDING DESIGN OR CONSTRUCTION BASED ON THIS DRAWING FILE.

REVISION DETAILS		BY	DATE
1	ISSUED FOR INFORMATION	EC	16/10/25

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT STREET GRAFTON AUCKLAND 1023 WOODS.CO.NZ
DESIGNED	TT COFFEY	
DRAWN	EC	
CHECKED	TT COFFEY	
APPROVED	SM	

**MILLWATER OREWA WEST
PRECINCT 6 - STAGE 4**

**CUT AND FILL ASBUILT
LOWEST SURFACE TO
FINAL SURFACE**

STATUS	ISSUED FOR INFORMATION	REV
SCALE	1:1000 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P22-437-04-1101-AB	

NOTES

1. COORDINATES ARE IN TERMS OF NZTM.
2. LEVELS ARE IN TERMS OF AVD46.
3. CONVERSION FACTOR FROM AVD46 TO NZVD16 IS -0.310m.
4. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY AND LINZ APPROVAL.
5. DATA SUPPLIED BY CONTRACTOR.
6. CONTOURS ARE OF LOWEST SURFACE AND AT 0.25m INTERVALS.
7. PLANS SHOULD BE READ IN CONJUNCTION WITH GCR.

LEGEND

- RE SLOPE/ RETAINING WALL DRAINAGE
- COUNTERFORT DRAINS
- UNDERFILL DRAINS
- BORED HORIZONTAL DRAIN
- BORED DRAIN FLUSHING POINT
- VERTICAL COLUMN DRAINS
- STAGE BOUNDARY
- LOT BOUNDARY
- EXISTING LOT BOUNDARY
- FUTURE LOT BOUNDARY
- LOWEST SURFACE MAJOR CONTOURS
- LOWEST SURFACE MINOR CONTOURS

REVISION DETAILS		BY	DATE
1	ISSUED FOR INFORMATION	EC	16/10/25
2	VERTICAL COLUMN DRAINS ADDED	SM	30/10/25

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT STREET GRAFTON AUCKLAND 1023
DESIGNED	TT COFFEY	
DRAWN	EC	
CHECKED	TT COFFEY	
APPROVED	SM	
		WOODS.CO.NZ

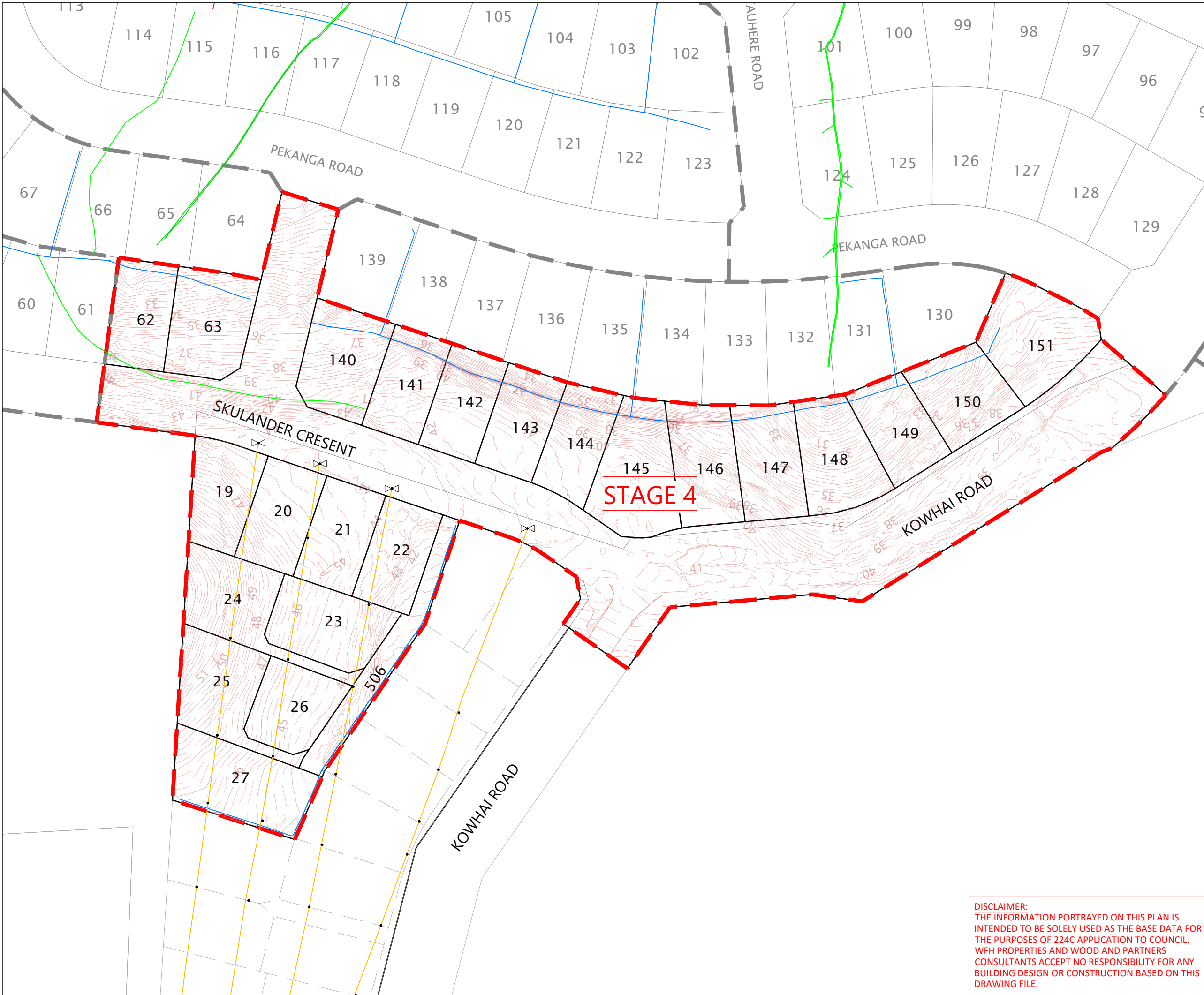


MILLWATER OREWA WEST
PRECINCT 6 - STAGE 4

UNDERCUT AND SUBSOIL
ASBUILT

STATUS	ISSUED FOR INFORMATION	REV
SCALE	1:1000 @ A3	2
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P22-437-04-1200-AB	

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



LEGEND

TOP OF WALL
BOTTOM OF WALL
WALL TO BOUNDARY OFFSET
FENCE
WALL DRAIN COIL
WALL CATCH PIT
STORMWATER NETWORK
LOT BOUNDARY
EXISTING LOT BOUNDARY
FUTURE LOT BOUNDARY
STAGE BOUNDARY
SPECIFIC DESIGN ZONE



- NOTES**
1. APPROVED BC NUMBER: BCO10379203
 2. COORDINATES ARE IN TERMS OF NZTM AND ORIGIN IS ALP 10 DP 537959 SOURCED FROM LINZ DATABASE.
~ 5948844.96mN 1749267.16mE
 3. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY AND LINZ APPROVAL.
 4. SUBSOIL DATA SUPPLIED BY CONTRACTOR.
 5. BOUNDARY OFFSET DIMENSIONS MEASURED FROM BOTTOM OF WALL UNLESS OTHERWISE SPECIFIED.

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: 16/10/2025

Name: SAM MUIRHEAD

DISCLAIMER:
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REVISION DETAILS		BY	DATE
1	ISSUED FOR INFORMATION	EC	16/10/25

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT STREET GRAFTON AUCKLAND 1023 WOODS.CO.NZ
DESIGNED	WOODS	
DRAWN	EC	
CHECKED	FS	
APPROVED	SM	

**MILLWATER OREWA WEST
PRECINCT 6 - STAGE 4**

RETAINING WALL ASBUILT
SHEET 1 OF 2

STATUS	AS-BUILT	REV
SCALE	1:1000 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P22-437-04-1300-AB	



LEGEND

TOP OF WALL

BOTTOM OF WALL

WALL TO BOUNDARY OFFSET

FENCE

WALL DRAIN COIL

WALL CATCH PIT

STORMWATER NETWORK

LOT BOUNDARY

EXISTING LOT BOUNDARY

FUTURE LOT BOUNDARY

STAGE BOUNDARY

SPECIFIC DESIGN ZONE



- NOTES
1.

2.

3.

4.

5.
- APPROVED BC NUMBER: BCO10379203

COORDINATES ARE IN TERMS OF NZTM AND ORIGIN IS ALP 10 DP 537959 SOURCED FROM LINZ DATABASE.
~ 5948844.96mN 1749267.16mE

LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY AND LINZ APPROVAL.

SUBSOIL DATA SUPPLIED BY CONTRACTOR.

BOUNDARY OFFSET DIMENSIONS MEASURED FROM BOTTOM OF WALL UNLESS OTHERWISE SPECIFIED.

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:

16/10/2025

Name:

SAM MUIRHEAD

DISCLAIMER:

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REVISION DETAILS		BY	DATE
1	ISSUED FOR INFORMATION	EC	16/10/25

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT STREET GRAFTON AUCKLAND 1023 WOODS.CO.NZ
DESIGNED	WOODS	
DRAWN	EC	
CHECKED	FS	
APPROVED	SM	

N

WFH

PROPERTIES

MILLWATER OREWA WEST
PRECINCT 6 - STAGE 4

RETAINING WALL ASBUILT
SHEET 2 OF 2

STATUS	AS-BUILT	REV
SCALE	1:400 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P22-437-04-1301-AB	

SCHEDULE OF COORDINATES		
STORMWATER LOT CONNECTIONS		
ID	EASTING	NORTHING
LOT 19	1749011.35	5948815.66
LOT 20	1749028.31	5948811.90
LOT 21	1749044.95	5948805.94
LOT 22	1749059.35	5948798.44
LOT 23	1749043.78	5948773.51
LOT 24	1749032.02	5948756.82
LOT 25	1749018.79	5948732.81
LOT 26	1749032.58	5948752.68
LOT 27	1749022.78	5948725.79

LOT 62	1748987.63	5948865.46
LOT 63	1749010.81	5948863.75
LOT 140	1749031.16	5948858.42
LOT 141	1749062.86	5948842.66
LOT 142	1749078.31	5948834.58
LOT 143	1749094.51	5948829.37
LOT 144	1749110.4	5948825.22
LOT 145	1749125.69	5948823.53
LOT 146	1749144.39	5948821.41
LOT 147	1749163.26	5948823.35
LOT 148	1749179.09	5948825.79
LOT 149	1749196.6	5948833.06
LOT 150	1749217.84	5948842.52
LOT 151	1749225.51	5948863.79

DISCLAIMER:
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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, and are within +/- 50mm.
- The Levels (Z) are in terms of the LINZ Auckland Vertical Datum 1946 (MSL), and are within the following tolerances:
 - For all pipe inverts & channels to be within +/- 10mm (locally)
 - For all other assets +/-20mm (e.g. Manhole covers, Earthworks)

Signed: 
Licensed Cadastral Surveyor

Date: 16/10/2025

Name: SAM MUIHREAD

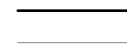
- NOTES**
- APPROVED EPA NUMBER: ENG60362263
 - COORDINATES ARE IN TERMS OF NZTM AND ORIGIN IS ALP 10 DP 537959 SOURCED FROM LINZ DATABASE.
~ 5948844.96mN 1749267.16mE
 - LEVELS ARE IN TERMS OF AVD46 AND ORIGIN IS CA 15 (GD CODE B3BQ), RL = 24.82m, SOURCED FROM LINZ DATABASE.
 - CONVERSION FACTOR FROM AVD46 TO NZVD16 IS -0.310m.
 - LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY AND LINZ APPROVAL.
 - ASBUILT DATA HAS BEEN SOURCED FROM A COMBINATION OF WOODS SURVEY DATA AND CONTRACTOR RECEIVED DATA.
 - MANHOLE COORDINATES ARE TO CENTRE OF CONCRETE MANHOLE CHAMBER.
 - ALL PIPES ARE RCRJ AND PIPE AND MH DIAMETERS ARE INTERNAL AND SHOWN IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
 - ALL MANHOLES ARE REINFORCED CONCRETE UNLESS OTHERWISE SPECIFIED.
 - ALL PRIVATE LOT CONNECTIONS ARE 100mmØ uPVC.
 - 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.

LEGEND

NEW STORMWATER MANHOLE 

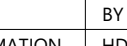
NEW STORMWATER CESSPIT 

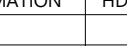
NEW STORMWATER 

EXISTING STORMWATER 

LOT BOUNDARY 

EXISTING LOT BOUNDARY 

FUTURE LOT BOUNDARY 

STAGE BOUNDARY 

REVISION DETAILS		BY	DATE
1	ISSUED FOR INFORMATION	HD	16/10/25

SURVEYED	HD	BUILDING B, LEVEL 1 8 NUGENT STREET GRAFTON AUCKLAND 1023
DESIGNED	WOODS	
DRAWN	HD	
CHECKED	FS	
APPROVED	SM	
		WOODS.CO.NZ



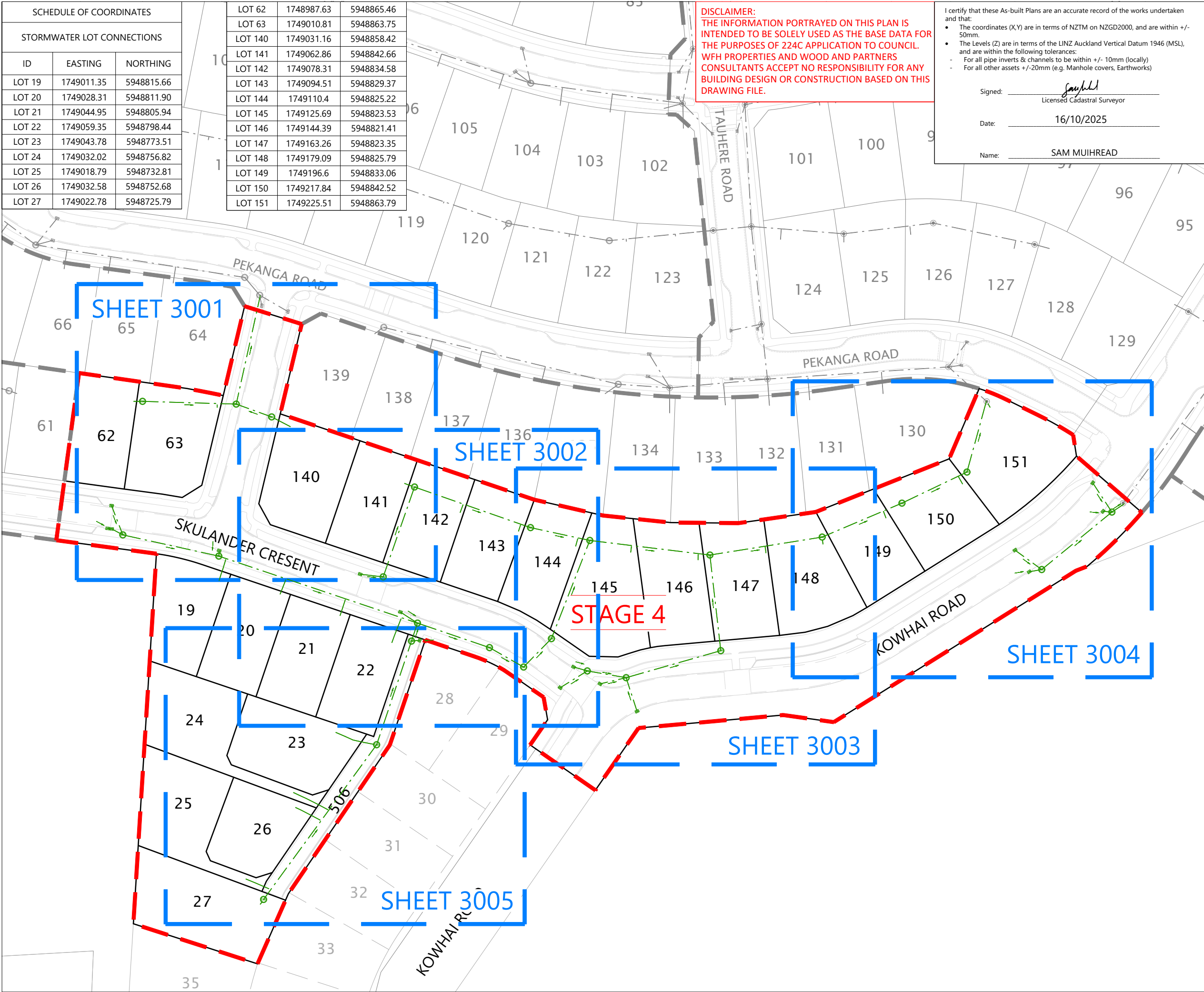
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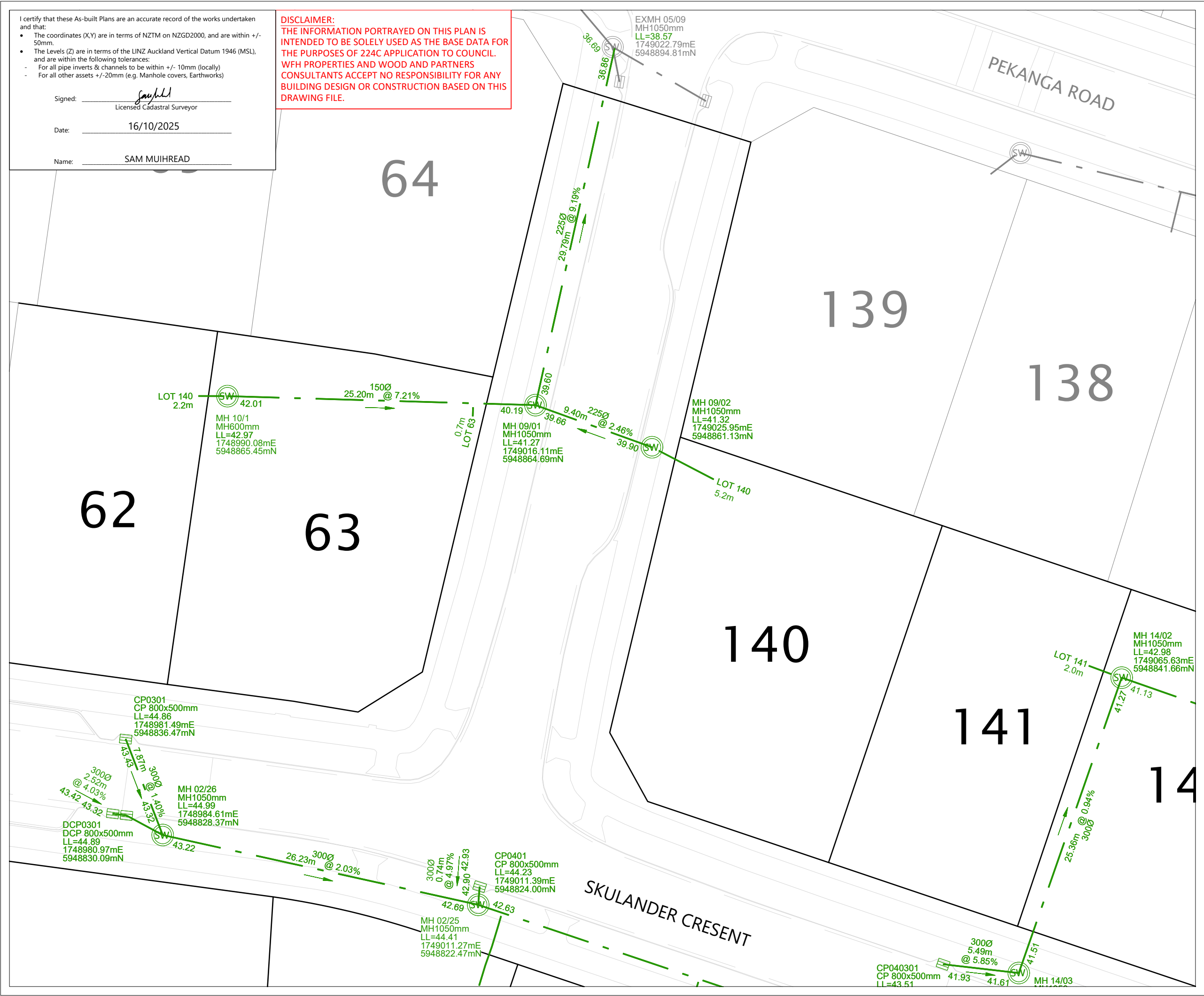
**MILLWATER OREWA WEST
PRECINCT 6 - STAGE 4**

**STORMWATER ASBUILT PLAN
SHEET 1 OF 6**

STATUS	ASBUILT	REV
SCALE	1:1000 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P22-437-04-3000-AB	



Plot Date: 2:05:33 pm, 17 October 2025, SAMANTHAM
File: C:\12DSY\ENERGY\DATA\WP-PEN-APP-01\P22-437 - P6 STAGE 3 AND 4_21253\CAD\SURV\ABS\AP22-437-04-3000-AB STORMWATER.DWG



- NOTES**
- APPROVED EPA NUMBER: ENG60362263
 - COORDINATES ARE IN TERMS OF NZTM AND ORIGIN IS ALP 10 DP 537959 SOURCED FROM LINZ DATABASE.
~ 5948844.96mN 1749267.16mE
 - LEVELS ARE IN TERMS OF AVD46 AND ORIGIN IS CA 15 (GD CODE B3BQ), RL = 24.82m, SOURCED FROM LINZ DATABASE.
 - CONVERSION FACTOR FROM AVD46 TO NZVD16 IS -0.310m.
 - LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY AND LINZ APPROVAL.
 - ASBUILT DATA HAS BEEN SOURCED FROM A COMBINATION OF WOODS SURVEY DATA AND CONTRACTOR RECEIVED DATA.
 - MANHOLE COORDINATES ARE TO CENTRE OF CONCRETE MANHOLE CHAMBER.
 - ALL PIPES ARE RCRRJ AND PIPE AND MH DIAMETERS ARE INTERNAL AND SHOWN IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
 - ALL MANHOLES ARE REINFORCED CONCRETE UNLESS OTHERWISE SPECIFIED.
 - ALL PRIVATE LOT CONNECTIONS ARE 100mmØ uPVC.
 - LOT CONNECTION LENGTHS ARE 2D LENGTHS CALCULATED FROM CONTRACTOR DATA WHERE THE LOT CONNECTION ENTERS THE MAIN LINE TO IT'S TERMINATION COORDINATE WITHIN THE LOT.

LEGEND

NEW STORMWATER MANHOLE

NEW STORMWATER CESSPIT

NEW STORMWATER

EXISTING STORMWATER

LOT BOUNDARY

EXISTING LOT BOUNDARY

FUTURE LOT BOUNDARY

STAGE BOUNDARY

REVISION DETAILS		BY	DATE
1	ISSUED FOR INFORMATION	HD	16/10/25

SURVEYED	HD	BUILDING B, LEVEL 1 8 NUGENT STREET GRAFTON AUCKLAND 1023
DESIGNED	WOODS	
DRAWN	HD	
CHECKED	FS	
APPROVED	SM	
		WOODS.CO.NZ

**MILLWATER OREWA WEST
PRECINCT 6 - STAGE 4**

**STORMWATER ASBUILT PLAN
SHEET 2 OF 6**

STATUS	ASBUILT	REV
SCALE	1:300 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P22-437-04-3001-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.
WFF PROPERTIES AND WOOD AND PARTNERS
CONSULTANTS ACCEPT NO RESPONSIBILITY FOR ANY
BUILDING DESIGN OR CONSTRUCTION BASED ON THIS
DRAWING FILE.

Signed: _____
Licensed Cadastral Surveyor

Date: _____
16/10/2025

Name: _____
SAM MUIHREAD



1. APPROVED EPA NUMBER: ENG60362263
2. COORDINATES ARE IN TERMS OF NZTM AND ORIGIN IS ALP 10 DP 537959 SOURCED FROM LINZ DATABASE.
~ 5948844.96mN 1749267.16mE
3. LEVELS ARE IN TERMS OF AVD46 AND ORIGIN IS CA 15 (GD CODE B3BQ), RL = 24.82m, SOURCED FROM LINZ DATABASE.
4. CONVERSION FACTOR FROM AVD46 TO NZVD16 IS -0.310m.
5. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY AND LINZ APPROVAL.
6. ASBUILT DATA HAS BEEN SOURCED FROM A COMBINATION OF WOODS SURVEY DATA AND CONTRACTOR RECEIVED DATA.
7. MANHOLE COORDINATES ARE TO CENTRE OF CONCRETE MANHOLE CHAMBER.
8. ALL PIPES ARE RCCRJ AND PIPE AND MH DIAMETERS ARE INTERNAL AND SHOWN IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
9. ALL MANHOLES ARE REINFORCED CONCRETE UNLESS OTHERWISE SPECIFIED.
10. ALL PRIVATE LOT CONNECTIONS ARE 100mmØ uPVC.
11. LOT CONNECTION LENGTHS ARE 2D LENGTHS CALCULATED FROM CONTRACTOR DATA WHERE THE LOT CONNECTION ENTERS THE MAIN LINE TO IT'S TERMINATION COORDINATE WITHIN THE LOT.

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

REVISION DETAILS		BY	DATE
1	ISSUED FOR INFORMATION	HD	16/10/25

SURVEYED	HD	BUILDING B, LEVEL 1 8 NUGENT STREET GRAFTON AUCKLAND 1023
DESIGNED	WOODS	
DRAWN	HD	
CHECKED	FS	
APPROVED	SM	



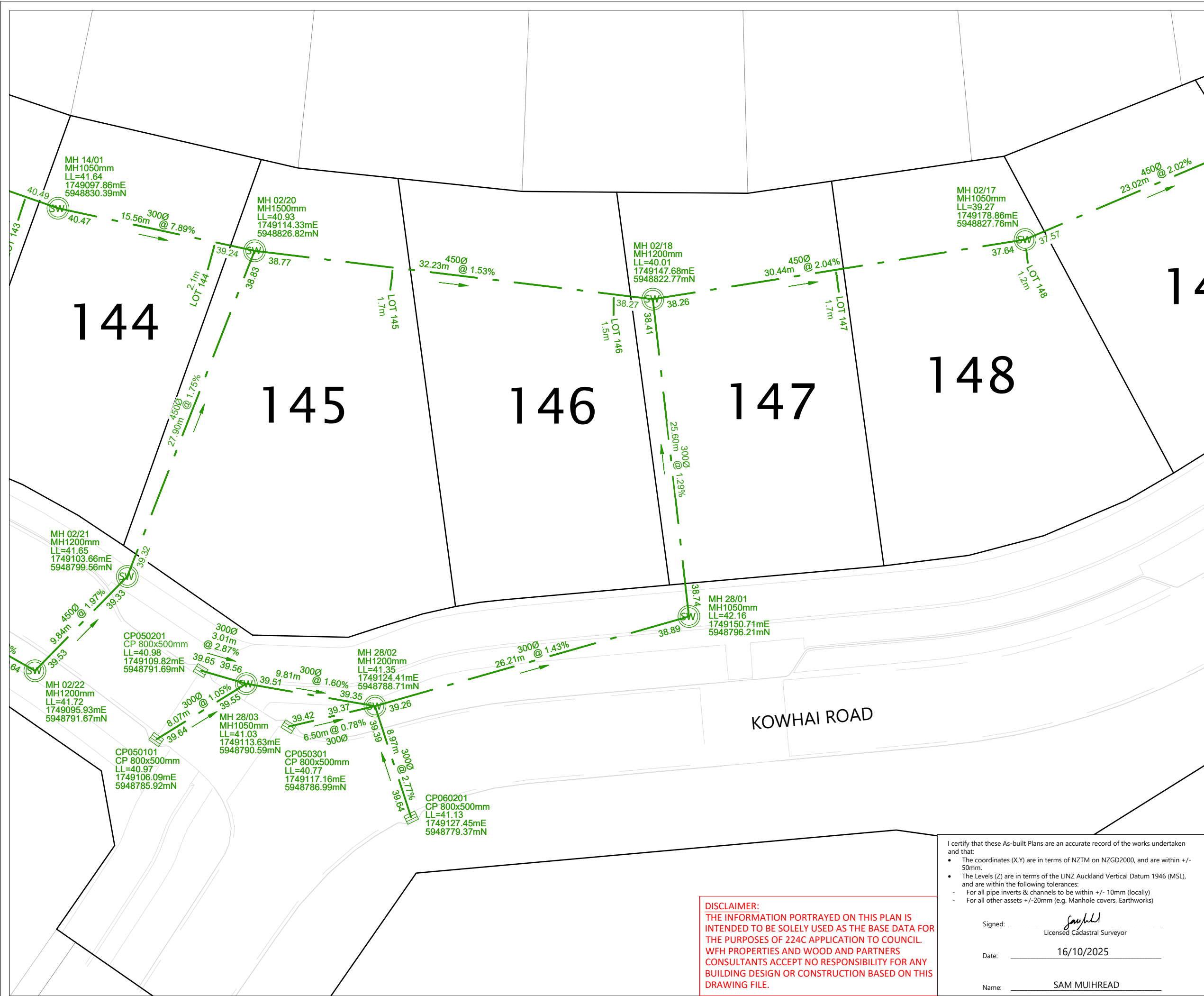
WFH
PROPERTIES

STORMWATER ASBUILT PLAN
SHEET 3 OF 6

STATUS	ASBUILT	REV
SCALE	1:300 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P22-437-04-3002-AB	

Plot Date: 2:05:34 pm,17 October 2025, SAMANTHAM

File: C:\12DS\ENERGY\DATA\WP-PEN-APP-01\p22-437 - P6 STAGE 3 AND 4_21253\CAD\SURV\ABS4\p22-437-04-3000-AB STORMWATER.DWG



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LEGEND

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

REVISION DETAILS		BY	DATE
1	ISSUED FOR INFORMATION	HD	16/10/25

SURVEYED	HD	BUILDING B, LEVEL 1 8 NUGENT STREET GRAFTON AUCKLAND 1023 WOODS.CO.NZ
DESIGNED	WOODS	
DRAWN	HD	
CHECKED	FS	
APPROVED	SM	

MILLWATER OREWA WEST
PRECINCT 6 - STAGE 4

STORMWATER ASBUILT PLAN
SHEET 4 OF 6

STATUS	ASBUILT	REV
SCALE	1:300 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P22-437-04-3003-AB	

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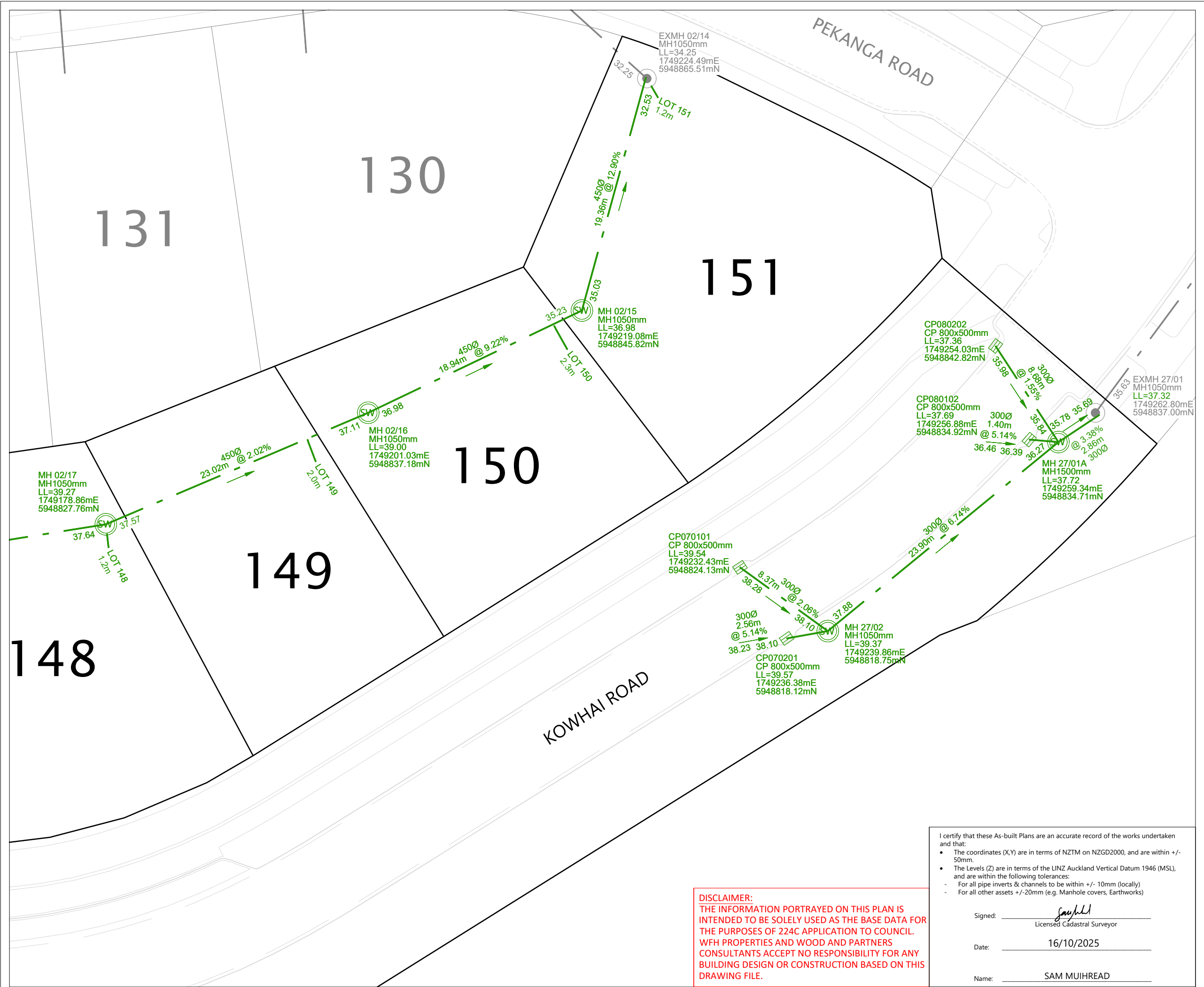
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Signed:
Licensed Cadastral Surveyor

Date: 16/10/2025

Name: SAM MUIHREAD



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LEGEND

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

REVISION DETAILS	BY	DATE
1 ISSUED FOR INFORMATION	HD	16/10/25

SURVEYED	HD	BUILDING B, LEVEL 1 8 NUGENT STREET GRAFTON AUCKLAND 1023
DESIGNED	WOODS	
DRAWN	HD	
CHECKED	FS	
APPROVED	SM	
		WOODS.CO.NZ

MILLWATER OREWA WEST
PRECINCT 6 - STAGE 4

STORMWATER ASBUILT PLAN
SHEET 5 OF 6

STATUS	ASBUILT	REV
SCALE	1:300 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P22-437-04-3004-AB	

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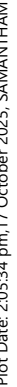
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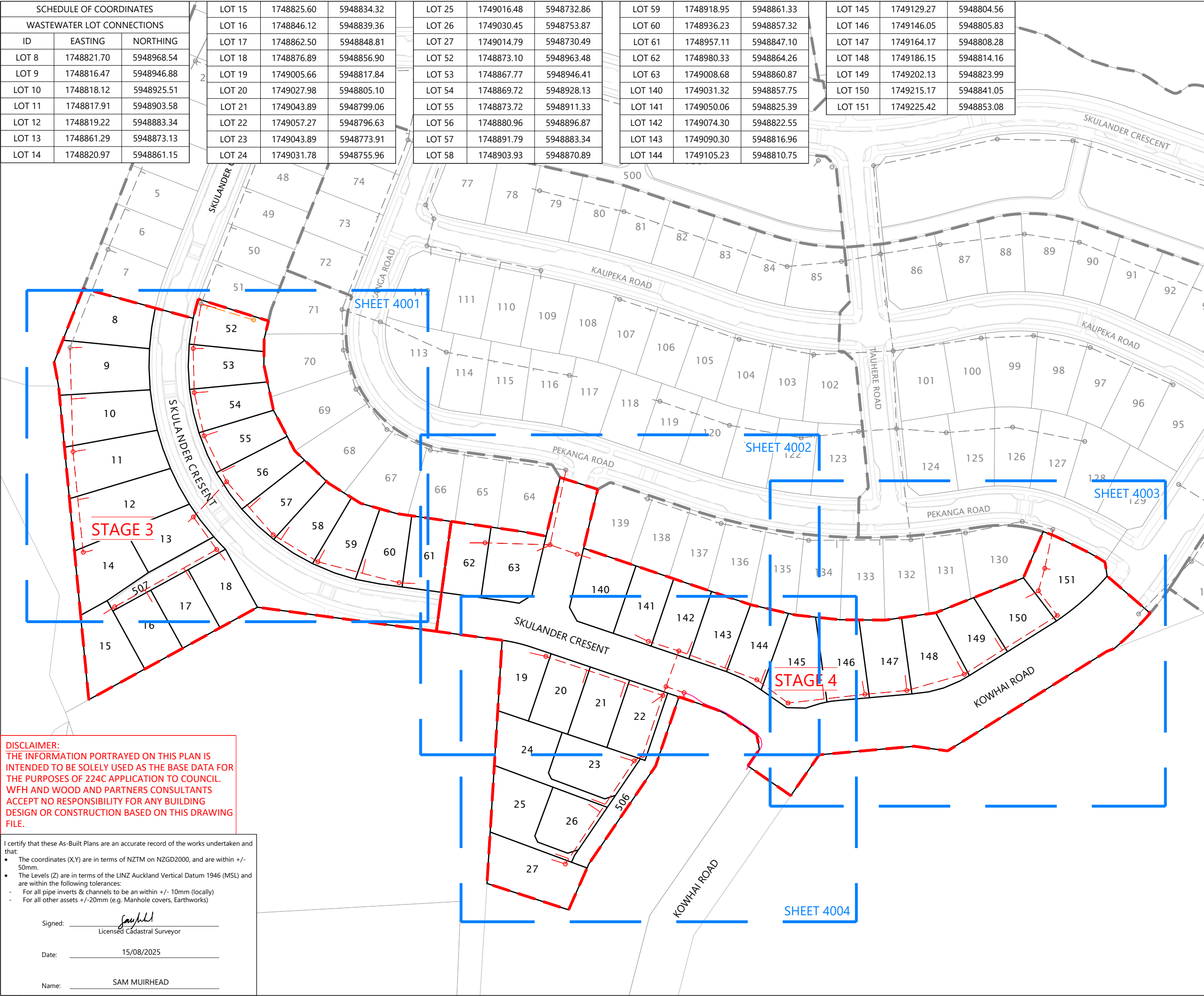
Signed: Licensed Cadastral Surveyor

Date: 16/10/2025

Name: SAM MUIHREAD



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WFWF PROPERTIES AND WOOD AND PARTNERS
CONSULTANTS ACCEPT NO RESPONSIBILITY FOR ANY
BUILDING DESIGN OR CONSTRUCTION BASED ON THIS
DRAWING FILE.



SCHEDULE OF COORDINATES		
WASTEWATER LOT CONNECTIONS		
ID	EASTING	NORTHING
LOT 8	1748821.70	5948968.54
LOT 9	1748816.47	5948946.88
LOT 10	1748818.12	5948925.51
LOT 11	1748817.91	5948903.58
LOT 12	1748819.22	5948883.34
LOT 13	1748861.29	5948873.13
LOT 14	1748820.97	5948861.15

LOT 15	1748825.60	5948834.32
LOT 16	1748846.12	5948839.36
LOT 17	1748862.50	5948848.81
LOT 18	1748876.89	5948856.90
LOT 19	1749005.66	5948817.84
LOT 20	1749027.98	5948805.10
LOT 21	1749043.89	5948799.06
LOT 22	1749057.27	5948796.63
LOT 23	1749043.89	5948773.91
LOT 24	1749031.78	5948755.96

LOT 25	1749016.48	5948732.86
LOT 26	1749030.45	5948753.87
LOT 27	1749014.79	5948730.49
LOT 52	1748873.10	5948963.48
LOT 53	1748867.77	5948946.41
LOT 54	1748869.72	5948928.13
LOT 55	1748873.72	5948911.33
LOT 56	1748880.96	5948896.87
LOT 57	1748891.79	5948883.34
LOT 58	1748903.93	5948870.89

LOT 59	1748918.95	5948861.33
LOT 60	1748936.23	5948857.32
LOT 61	1748957.11	5948847.10
LOT 62	1748980.33	5948864.26
LOT 63	1749008.68	5948860.87
LOT 140	1749031.32	5948857.75
LOT 141	1749050.06	5948825.39
LOT 142	1749074.30	5948822.55
LOT 143	1749090.30	5948816.96
LOT 144	1749105.23	5948810.75

LOT 145	1749129.27	5948804.56
LOT 146	1749146.05	5948805.83
LOT 147	1749164.17	5948808.28
LOT 148	1749186.15	5948814.16
LOT 149	1749202.13	5948823.99
LOT 150	1749215.17	5948841.05
LOT 151	1749225.42	5948853.08

LEGEND

NEW SANITARY SEWER MANHOLE

NEW SANITARY SEWER

NEW RISING MAIN

NEW OUTLET CARBON FILTER VENT

EXISTING SANITARY SEWER MANHOLE

EXISTING SANITARY SEWER

EXISTING SANITARY SEWER REMOVED

LOT BOUNDARIES

FUTURE LOT BOUNDARIES

STAGE BOUNDARY

DROP-PROTECTION STRUCTURE (DPS)

UPDATED EXISTING LID LEVEL (UDLL)

- NOTES
1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.
- APPROVED EPA NUMBER: ENG60362263

ORIGIN OF COORDINATES ALP 10 DP 537959 SOURCED FROM LINZ DATABASE ~ 5948844.96mN 1749267.16mE

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ALL MANHOLES ARE REINFORCED CONCRETE UNLESS OTHERWISE SPECIFIED.

MANHOLE COORDINATES SHOWN ARE TO CENTRE OF CONCRETE MANHOLE CHAMBER.

REVISION DETAILS		BY	DATE
1	ISSUED FOR INFORMATION	SM	15/08/25

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT STREET GRAFTON AUCKLAND 1023 WOODS.CO.NZ
DESIGNED	RV	
DRAWN	HD	
CHECKED	FS	
APPROVED	SM	

N

WFH

PROPERTIES

MILLWATER OREWA WEST
PRECINCT 6 - STAGE 3
AND 4

WASTEWATER ASBUILT PLAN
SHEET 1 OF 5

STATUS	AS BUILT	REV
SCALE	1:1500 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P22-437-00-4000-AB	

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Signed:

Licensed Cadastral Surveyor

Date: 15/08/2025

Name: SAM MUIRHEAD



Plot Date: 3:46:04 pm, 15 August 2025, SAMANTHAM

File: C:\12DSYNERGYDATA\WP-PEN-APP-01\P22-437 - P6 STAGE 3 AND 4_21253\CAD\SURV\4853\P22-437-00-4000-AB WASTEWATER.DWG

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LEGEND

NEW SANITARY SEWER MANHOLE	
NEW SANITARY SEWER	
NEW RISING MAIN	
NEW OUTLET CARBON FILTER VENT	
EXISTING SANITARY SEWER MANHOLE	
EXISTING SANITARY SEWER	
EXISTING SANITARY SEWER REMOVED	
LOT BOUNDARIES	
FUTURE LOT BOUNDARIES	
STAGE BOUNDARY	
DROP-PROTECTION STRUCTURE	(DPS)
UPDATED EXISTING LID LEVEL	UDLL

- NOTES**
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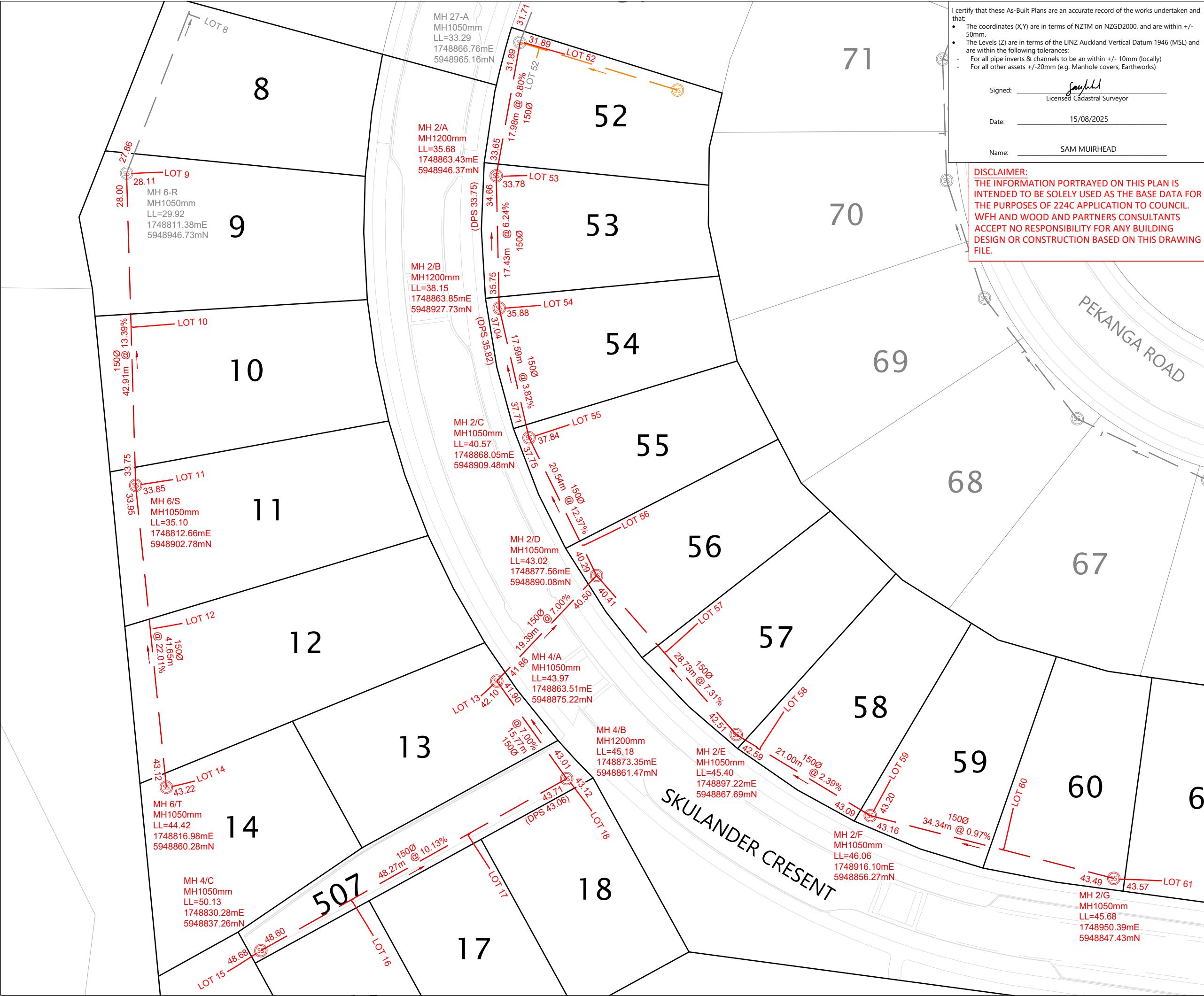
REVISION DETAILS		BY	DATE
1	ISSUED FOR INFORMATION	SM	15/08/25

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT STREET GRAFTON AUCKLAND 1023
DESIGNED	RV	
DRAWN	HD	
CHECKED	FS	
APPROVED	SM	
		WOODS.CO.NZ

MILLWATER OREWA WEST
PRECINCT 6 - STAGE 3
AND 4

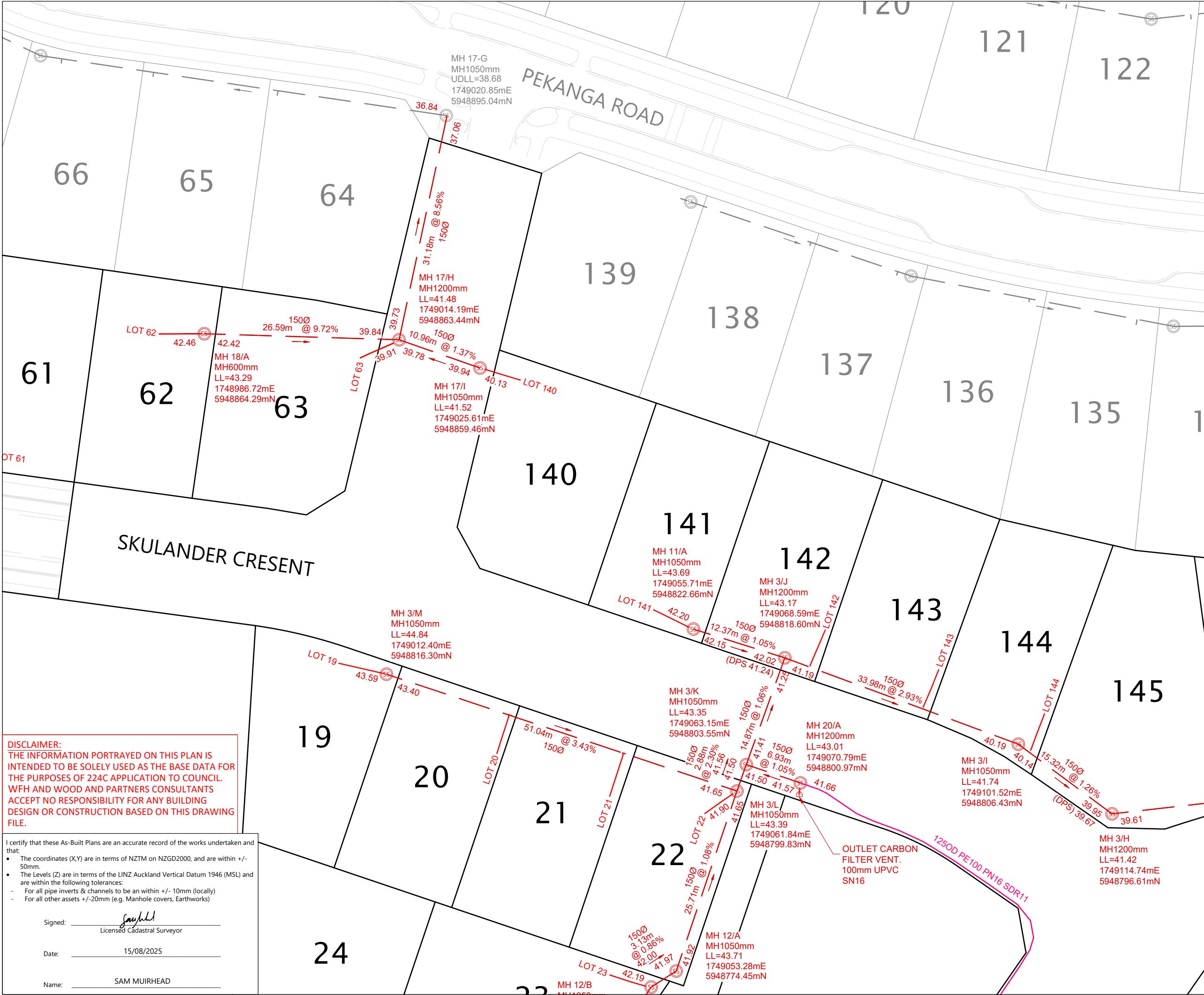
WASTEWATER ASBUILT PLAN
SHEET 2 OF 5

STATUS	AS BUILT	REV
SCALE	1:500 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P22-437-00-4001-AB	





Plot Date: 3:46:04 pm, 15 August 2025, SAMANTHAM



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Signed: [Signature]
Licensed Cadastral Surveyor

Date: 15/08/2025

Name: SAM MUIRHEAD

LEGEND	
NEW SANITARY SEWER MANHOLE	SS
NEW SANITARY SEWER	---
NEW RISING MAIN	---
NEW OUTLET CARBON FILTER VENT	VF
EXISTING SANITARY SEWER MANHOLE	SS
EXISTING SANITARY SEWER	---
EXISTING SANITARY SEWER REMOVED	---
LOT BOUNDARIES	---
FUTURE LOT BOUNDARIES	---
STAGE BOUNDARY	---
DROP-PROTECTION STRUCTURE	(DPS)
UPDATED EXISTING LID LEVEL	UDLL

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REVISION DETAILS		BY	DATE
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DRAWN	HD	
CHECKED	FS	
APPROVED	SM	
		WOODS.CO.NZ

MILLWATER OREWA WEST
PRECINCT 6 - STAGE 3
AND 4

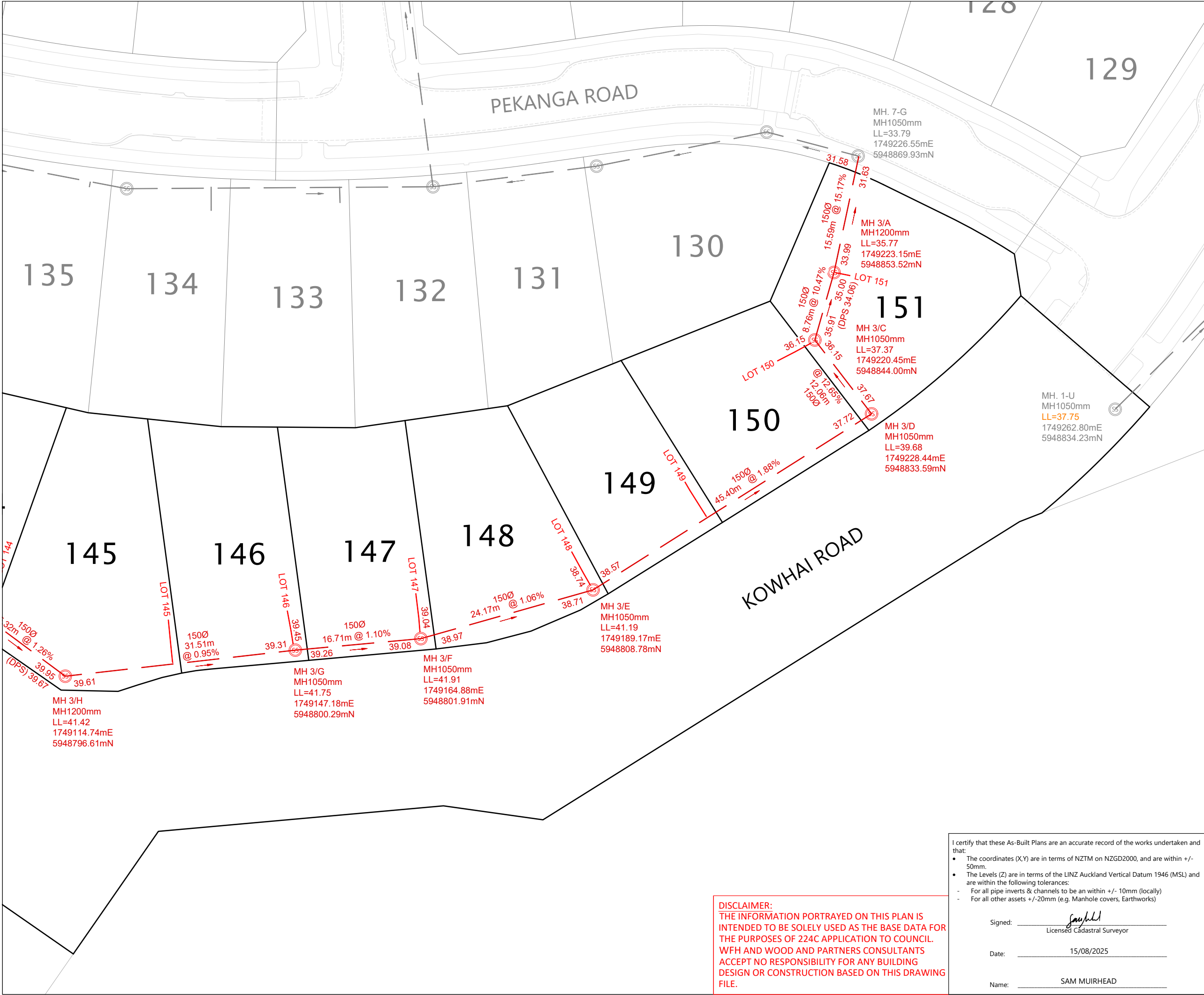
WASTEWATER ASBUILT PLAN
SHEET 3 OF 5

STATUS	AS BUILT	REV
SCALE	1:500 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P22-437-00-4002-AB	

File: C:\125\ENERGY\DATA\WP-PEN-APP-01\P22-437-P6 STAGE 3 AND 4_21253\CAD\SURV\A853\P22-437-00-4002-AB WASTEWATER.DWG



Plot Date: 3:46:04 pm, 15 August 2025, SAMANTHAM



LEGEND

NEW SANITARY SEWER MANHOLE (SS)

NEW SANITARY SEWER (---)

NEW RISING MAIN (---)

NEW OUTLET CARBON FILTER VENT (V)

EXISTING SANITARY SEWER MANHOLE (SS)

EXISTING SANITARY SEWER (---)

EXISTING SANITARY SEWER REMOVED (---)

LOT BOUNDARIES (---)

FUTURE LOT BOUNDARIES (---)

STAGE BOUNDARY (---)

DROP-PROTECTION STRUCTURE (DPS)

UPDATED EXISTING LID LEVEL (UDLL)

- NOTES**
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REVISION DETAILS		BY	DATE
1	ISSUED FOR INFORMATION	SM	15/08/25

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT STREET GRAFTON AUCKLAND 1023
DESIGNED	RV	
DRAWN	HD	
CHECKED	FS	
APPROVED	SM	

**MILLWATER OREWA WEST
PRECINCT 6 - STAGE 3
AND 4**

**WASTEWATER ASBUILT PLAN
SHEET 4 OF 5**

STATUS	AS BUILT	REV
SCALE	1:500 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P22-437-00-4003-AB	

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Date: 15/08/2025

Name: SAM MUIRHEAD

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File: C:\12DSYNERGYDATA\WP-PEN-APP-01\P22-437 - P6 STAGE 3 AND 4_21253\CAD\SURV\4853\P22-437-00-4003-AB WASTEWATER.DWG



Plot Date: 3:46:04 pm, 15 August 2025, SAMANTHAM

LEGEND

NEW SANITARY SEWER MANHOLE

NEW SANITARY SEWER

NEW RISING MAIN

NEW OUTLET CARBON FILTER VENT

EXISTING SANITARY SEWER MANHOLE

EXISTING SANITARY SEWER

EXISTING SANITARY SEWER REMOVED

LOT BOUNDARIES

FUTURE LOT BOUNDARIES

STAGE BOUNDARY

DROP-PROTECTION STRUCTURE

UPDATED EXISTING LID LEVEL

- NOTES
1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.
- APPROVED EPA NUMBER: ENG60362263

ORIGIN OF COORDINATES ALP 10 DP 537959 SOURCED FROM LINZ DATABASE ~ 5948844.96mN 1749267.16mE

ORIGIN OF LEVELS IS CA 15 (GD CODE B3BQ), RL = 24.82m, SOURCED FROM LINZ DATABASE.

CONVERSION FACTOR FROM AVD46 TO NZVD16 IS -310mm. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY AND LINZ APPROVAL.

ASBUILT DATA HAS BEEN SOURCED FROM A COMBINATION OF WOODS SURVEY DATA AND CONTRACTOR RECEIVED DATA.

ALL PIPES ARE uPVC SN16 UNLESS OTHERWISE SPECIFIED.

ALL PRIVATE LOT CONNECTIONS ARE 100mmØ uPVC SN16.

ALL PIPE AND MH DIAMETERS ARE INTERNAL AND SHOWN IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

ALL MANHOLES ARE REINFORCED CONCRETE UNLESS OTHERWISE SPECIFIED.

MANHOLE COORDINATES SHOWN ARE TO CENTRE OF CONCRETE MANHOLE CHAMBER.

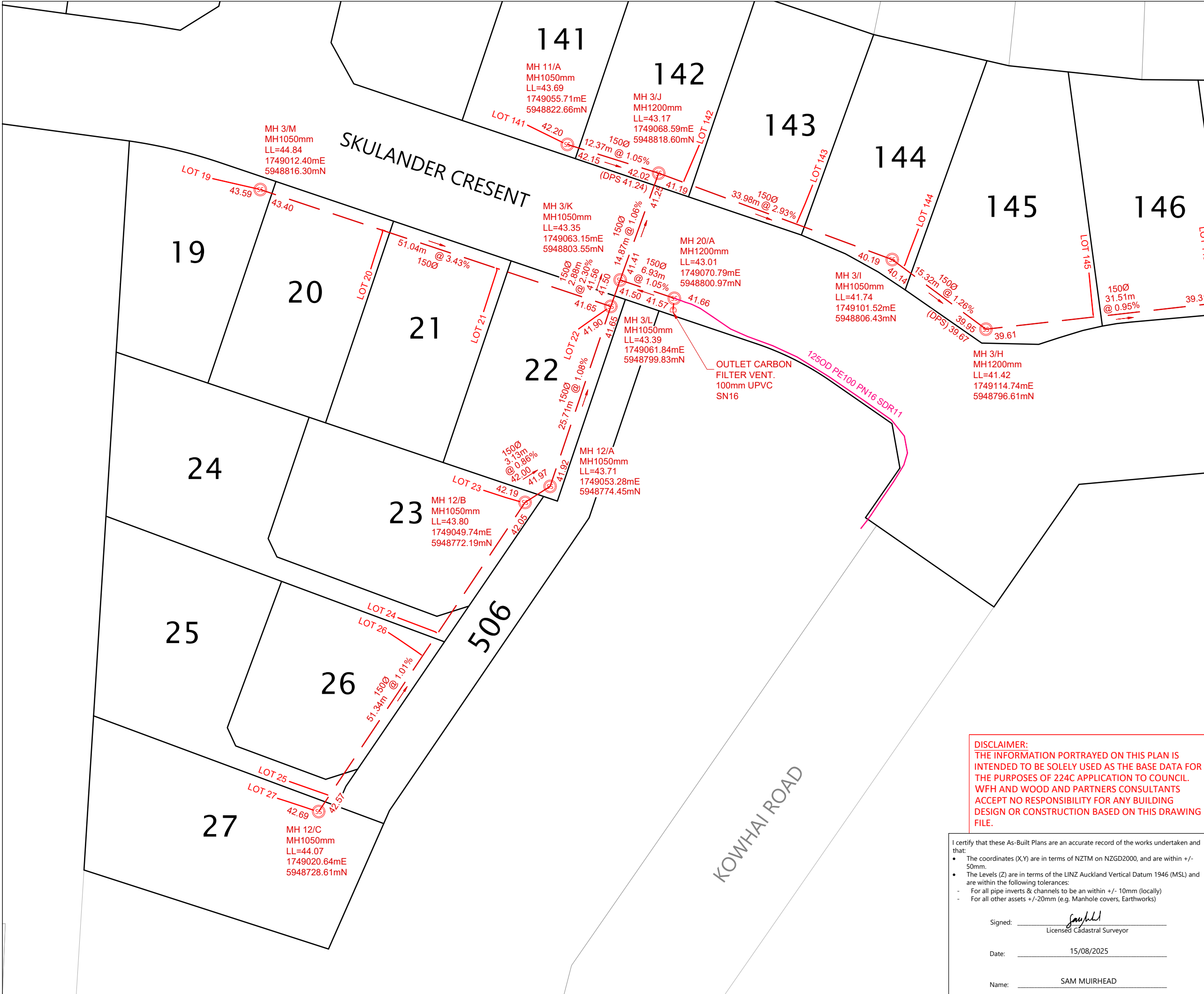
REVISION DETAILS		BY	DATE
1	ISSUED FOR INFORMATION	SM	15/08/25

SURVEYED	WOODS	BUILDING B, LEVEL 1 8 NUGENT STREET GRAFTON AUCKLAND 1023
DESIGNED	RV	
DRAWN	HD	
CHECKED	FS	
APPROVED	SM	
		WOODS.CO.NZ

MILLWATER OREWA WEST
PRECINCT 6 - STAGE 3
AND 4

WASTEWATER ASBUILT PLAN
SHEET 5 OF 5

STATUS	AS BUILT	REV
SCALE	1:500 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P22-437-00-4004-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 AND WOOD AND PARTNERS CONSULTANTS ACCEPT NO RESPONSIBILITY FOR ANY BUILDING DESIGN OR CONSTRUCTION BASED ON THIS DRAWING FILE.

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, and are within +/- 50mm.
- The Levels (Z) are in terms of the LINZ Auckland Vertical Datum 1946 (MSL) and are within the following tolerances:
 - For all pipe inverts & channels to be an within +/- 10mm (locally)
 - For all other assets +/-20mm (e.g. Manhole covers, Earthworks)

Signed:

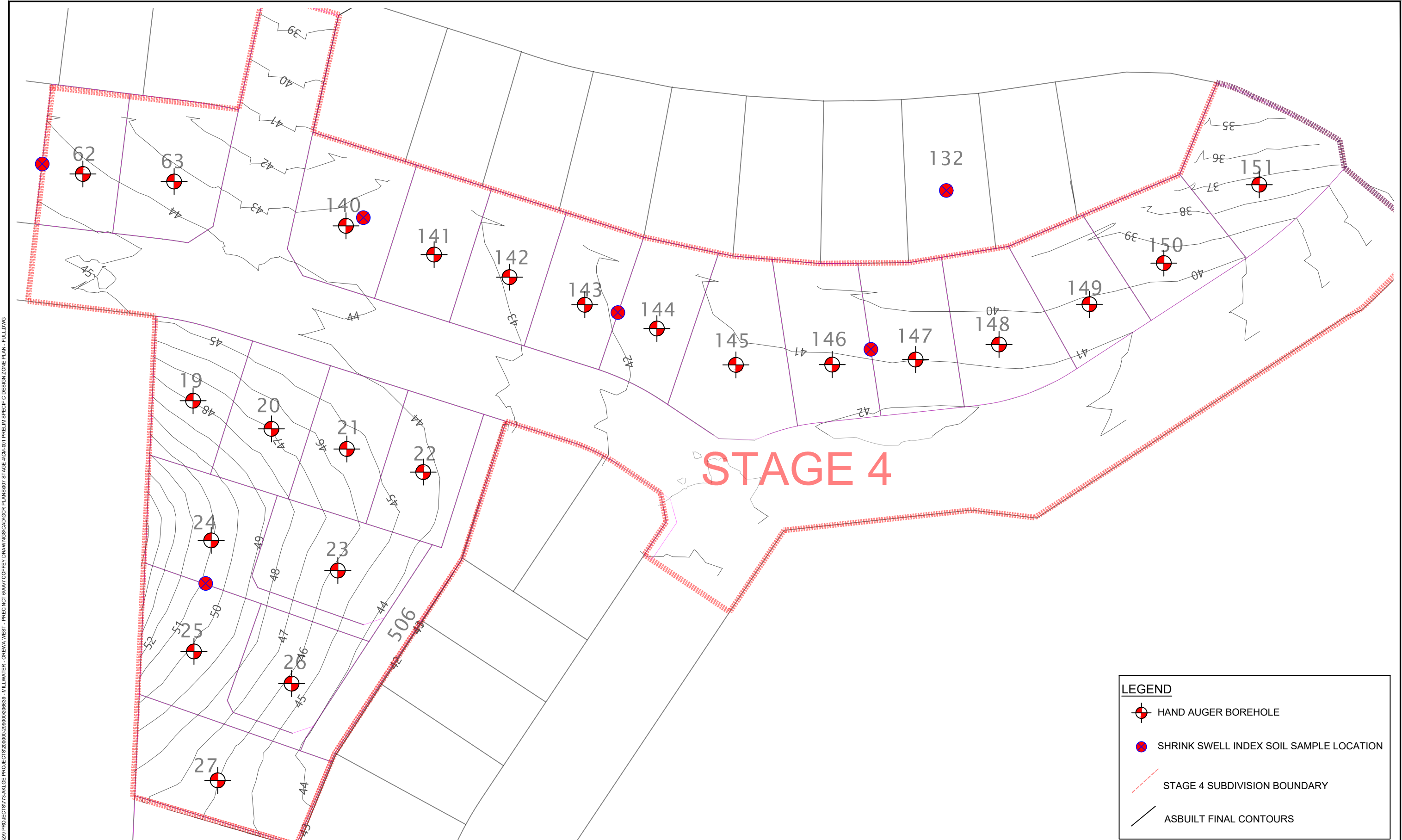
Licensed Cadastral Surveyor

Date: 15/08/2025

Name: SAM MUIRHEAD

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P22-437 - P6 STAGE 3 AND 4_21253\CAD\SURV\AB53\P22-437-00-4004-AB WASTEWATER.DWG

APPENDIX B: REFERENCE DRAWINGS



LEGEND

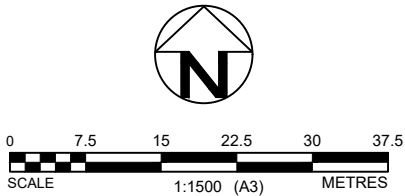
 HAND AUGER BOREHOLE

 SHRINK SWELL INDEX SOIL SAMPLE LOCATION

 STAGE 4 SUBDIVISION BOUNDARY

 ASBUILT FINAL CONTOURS

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	FS	SP	29/10/2025



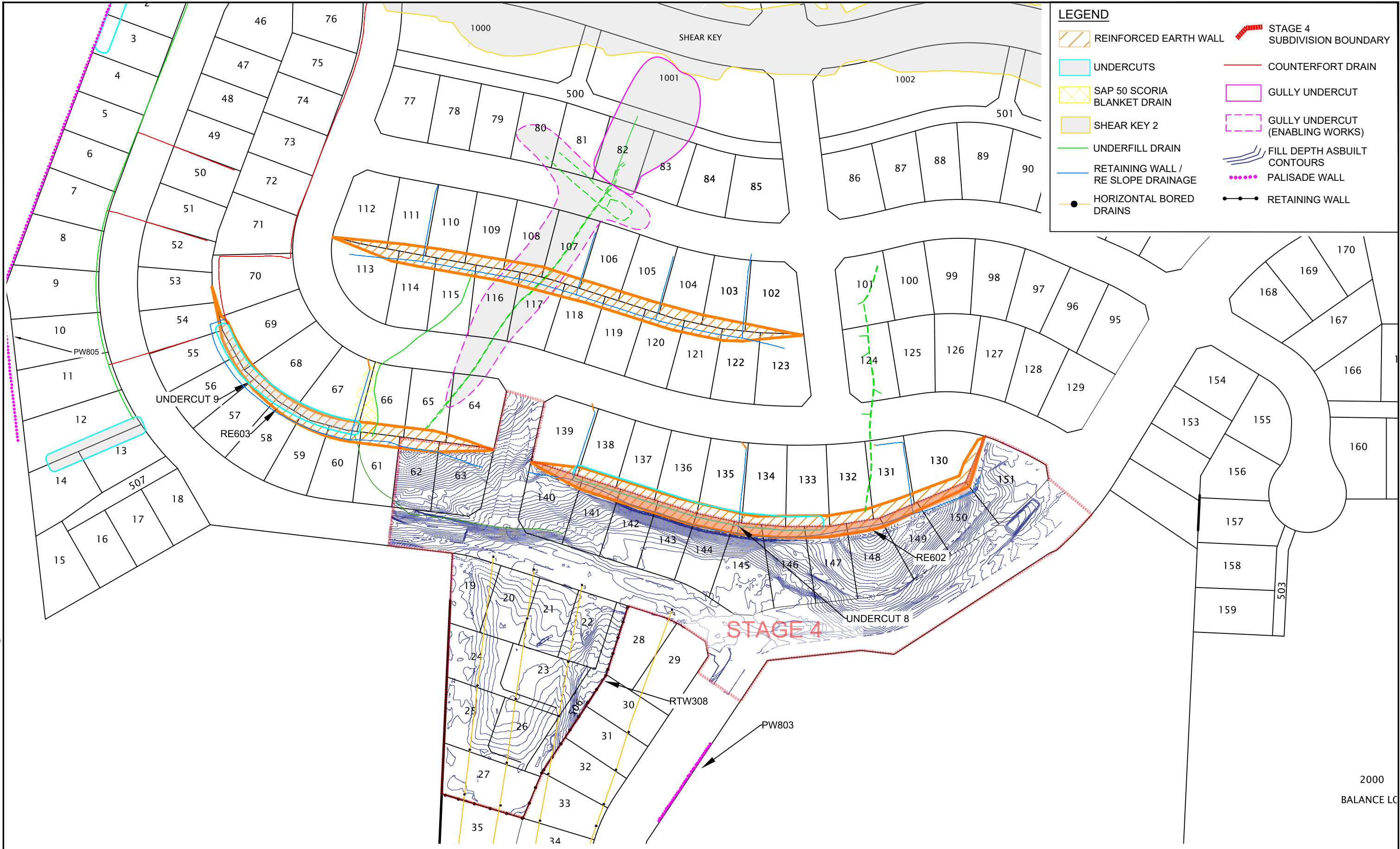
drawn	FS
approved	SP
date	30/10/2025
scale	1:1500
original size	A3



client:	WFH PROPERTIES LIMITED		
project:	MILLWATER ARRAN HILLS PRECINCT 6 - STAGE 4		
title:	GEOTECHNICAL INVESTIGATION PLAN		
project no:	773-AKLGE206639	figure no:	CM/002
		rev:	A

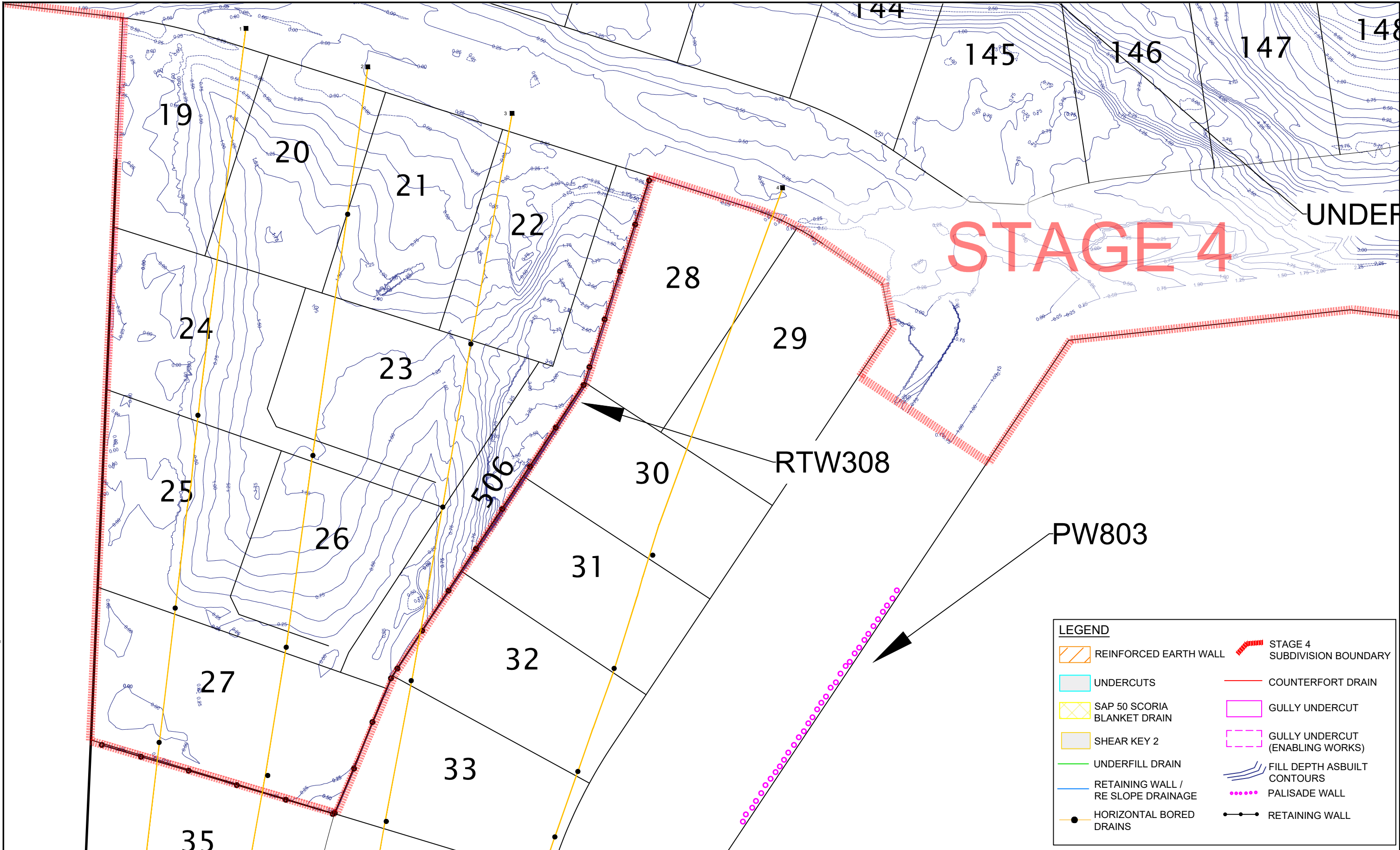
PLOT DATE: 30/10/2025 11:03:21 am DWG FILE: F:\GEN2\0 PROJECTS\773-AKLGE PROJECT\9\200000-399000\206639 - MILLWATER - OREWA WEST - PRECINCT 6\AAVT COFFEY DRAWINGS\CAD\GCR PLANS\07 STAGE 4\CM-001 PRELIM SPECIFIC DESIGN ZONE PLAN - FULL.DWG

PLOT DATE: 31/10/2025 2:01:05 pm DWG FILE: C:\USERS\FERNANDA.SOTO\DESKTOP\PM04\01 PRELIM SPECIFIC DESIGN ZONE PLAN - FULL 3.DWG



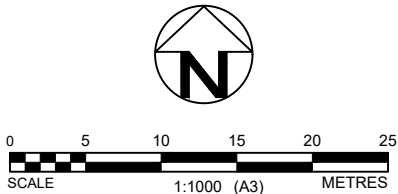
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	A	ORIGINAL ISSUE	FS	SP	31/10/2025		approved	SP		project: MILLWATER ARRAN HILLS PRECINCT 6 - STAGE 4		
							date	31/10/2025		title: GEOTECHNICAL WORKS PLAN 1/3		
							scale	1:3000		project no: 773-AKLGE206639	figure no: CM-003.1	rev: A
							original size	A3				

PLOT DATE: 31/10/2025 2:03:03 pm DWG FILE: C:\USERS\FERNANDA.SOTO\DESKTOP\PCMA.001 PRELIM SPECIFIC DESIGN ZONE PLAN - FULL 3.DWG



LEGEND	
	REINFORCED EARTH WALL
	UNDERCUTS
	SAP 50 SCORIA BLANKET DRAIN
	SHEAR KEY 2
	UNDERFILL DRAIN
	RETAINING WALL / RE SLOPE DRAINAGE
	HORIZONTAL BORED DRAINS
	STAGE 4 SUBDIVISION BOUNDARY
	COUNTERFORT DRAIN
	GULLY UNDERCUT
	GULLY UNDERCUT (ENABLING WORKS)
	FILL DEPTH ASBUILT CONTOURS
	PALISADE WALL
	RETAINING WALL

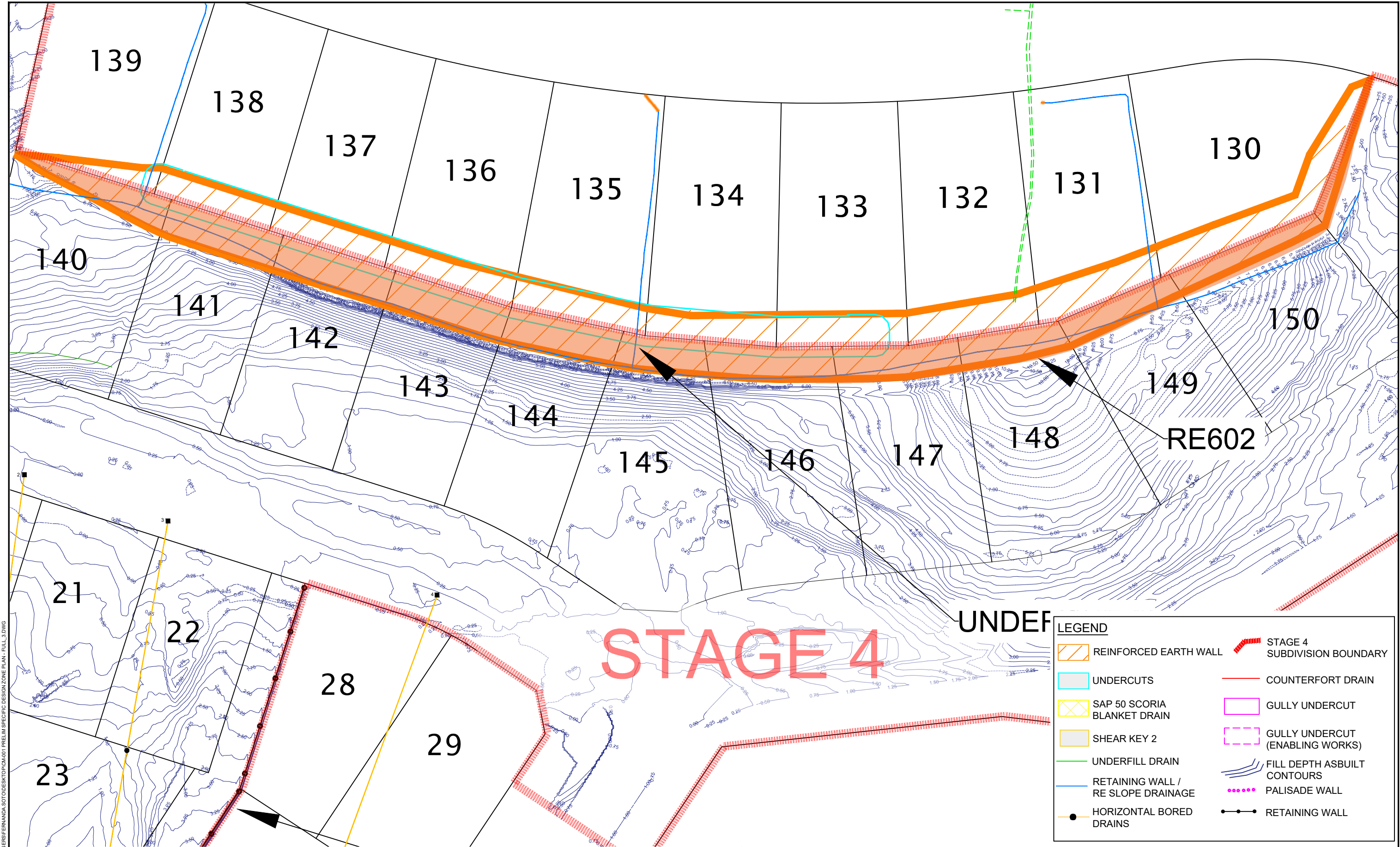
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	A	ORIGINAL ISSUE		FS	SP	31/10/2025



drawn	FS
approved	SP
date	31/10/2025
scale	1:1000
original size	A3

TETRA TECH
COFFEY

client:	WFH PROPERTIES LIMITED		
project:	MILLWATER ARRAN HILLS PRECINCT 6 - STAGE 4		
title:	GEOTECHNICAL WORKS PLAN 2/3		
project no:	773-AKLGE206639	figure no:	CM 003.2
		rev:	A



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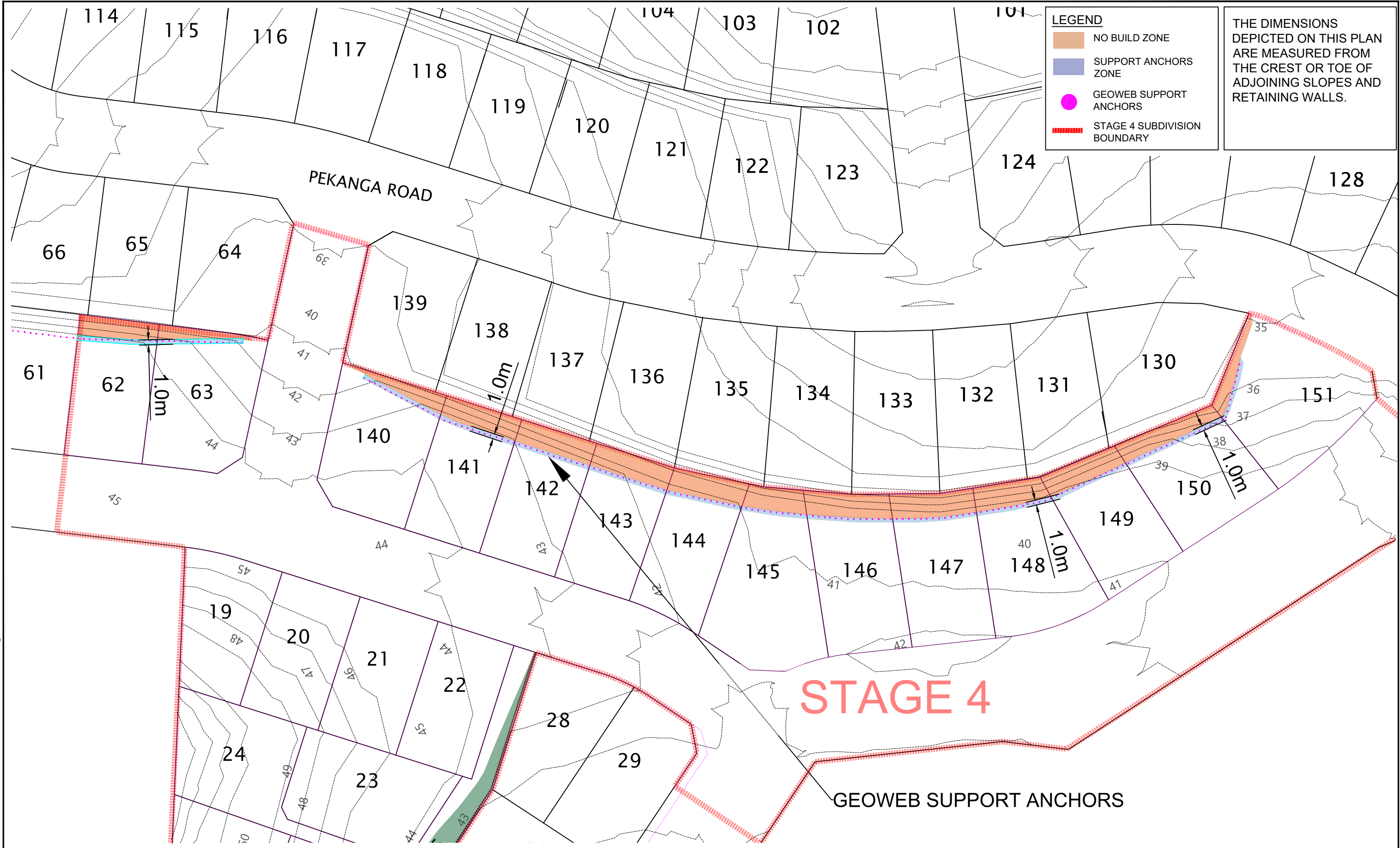
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	A	ORIGINAL ISSUE		FS	SP	31/10/2025


SCALE 0 5 10 15 20 25
1:1000 (A3) METRES

drawn	FS
approved	SP
date	31/10/2025
scale	1:1000
original size	A3


TETRA TECH
COFFEY

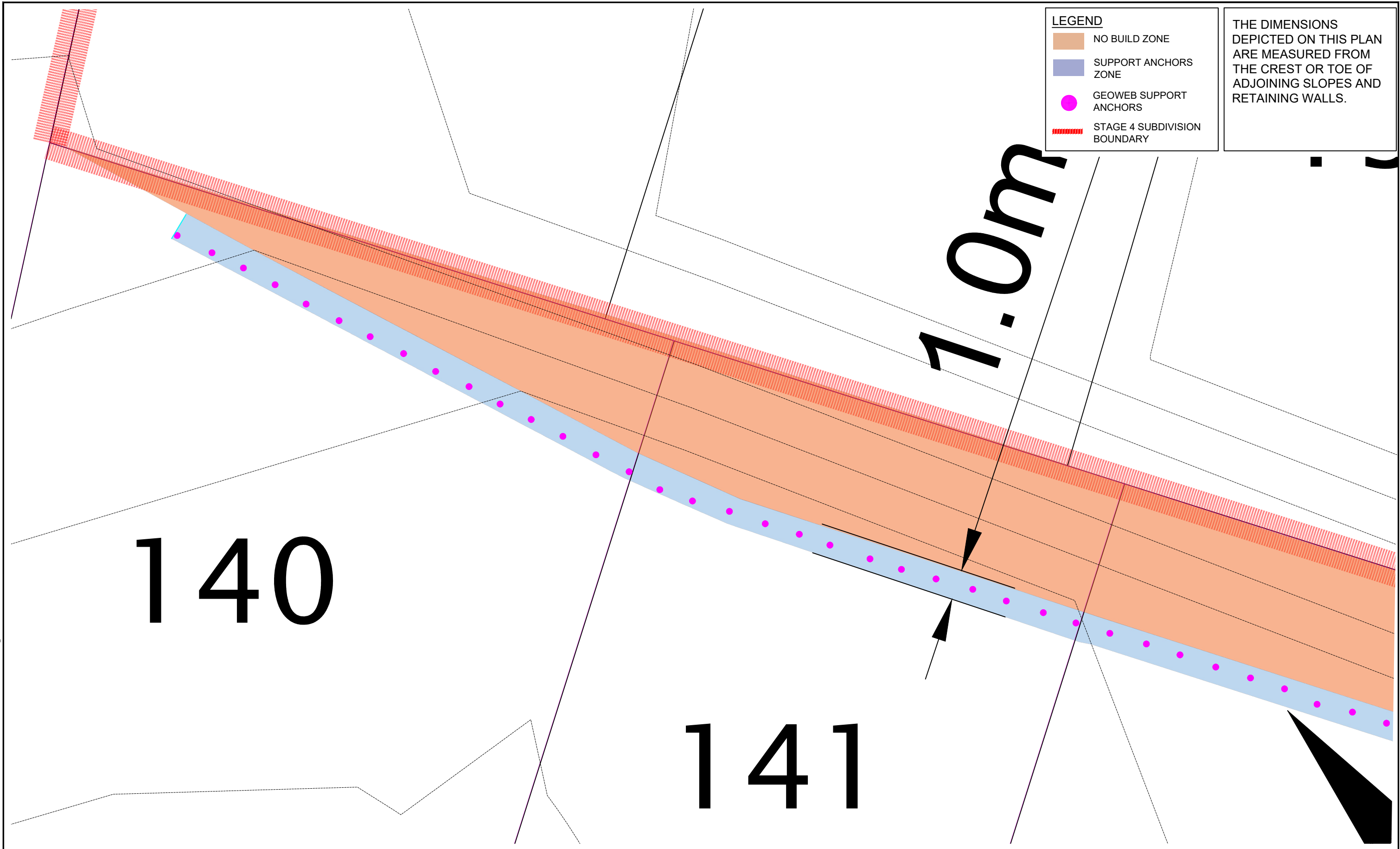
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project:	MILLWATER ARRAN HILLS PRECINCT 6 - STAGE 4		
title:	GEOTECHNICAL WORKS PLAN 3/3		
project no:	773-AKLGE206639	figure no:	CM 003.3
		rev:	A



revision	no.	description			drawn	approved	date	07.51522.53037.5 SCALE1:1500 (A3)METRES			drawn	FS	TETRA TECH COFFEY			client:	WFH PROPERTIES LIMITED		
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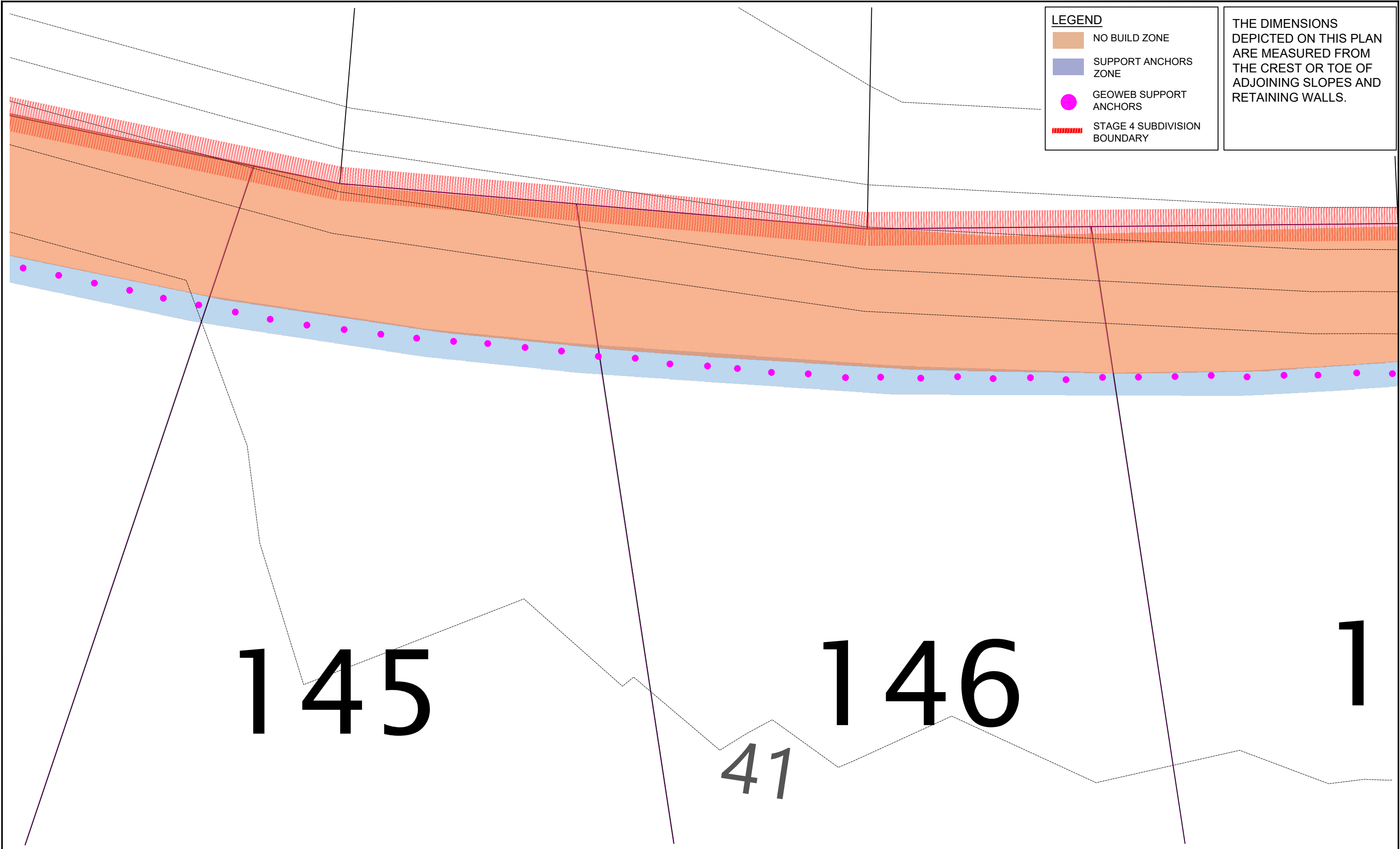
PLOT DATE: 30/10/2025 5:20:09 pm DWG FILE: C:\USERS\VERANDA\SOTODESKTOP\PC\01 PRELIM SPECIFIC DESIGN ZONE PLAN - FULL 3.DWG

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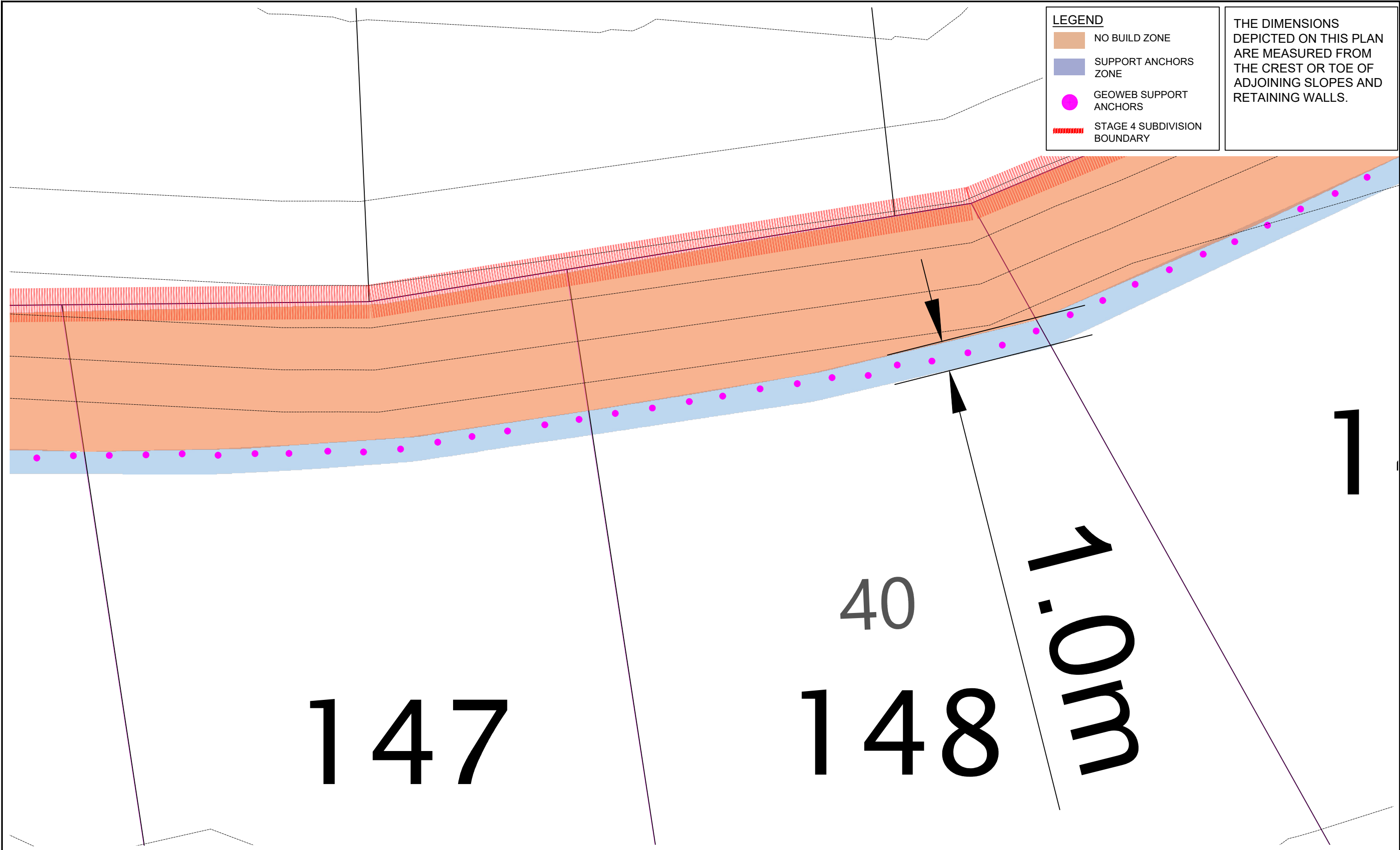
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									date	30/10/2025			title: GEOWEB SUPPORT ANCHORS 3/8		
									scale	1:750			project no: 773-AKLGE206639		
									original size	A3			figure no: CM004.3		
													rev: A		

PLOT DATE: 30/10/2025 5:25:45 pm DWG FILE: C:\USERS\FERNANDA.SOTO\DESKTOP\PCMA\001 PRELIM SPECIFIC DESIGN ZONE PLAN - FULL_3.DWG



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									date	30/10/2025		title: GEOWEB SUPPORT ANCHORS 5/8		
									scale	1:750		project no: 773-AKLGE206639		
									original size	A3		figure no: CM004.5		
												rev: A		

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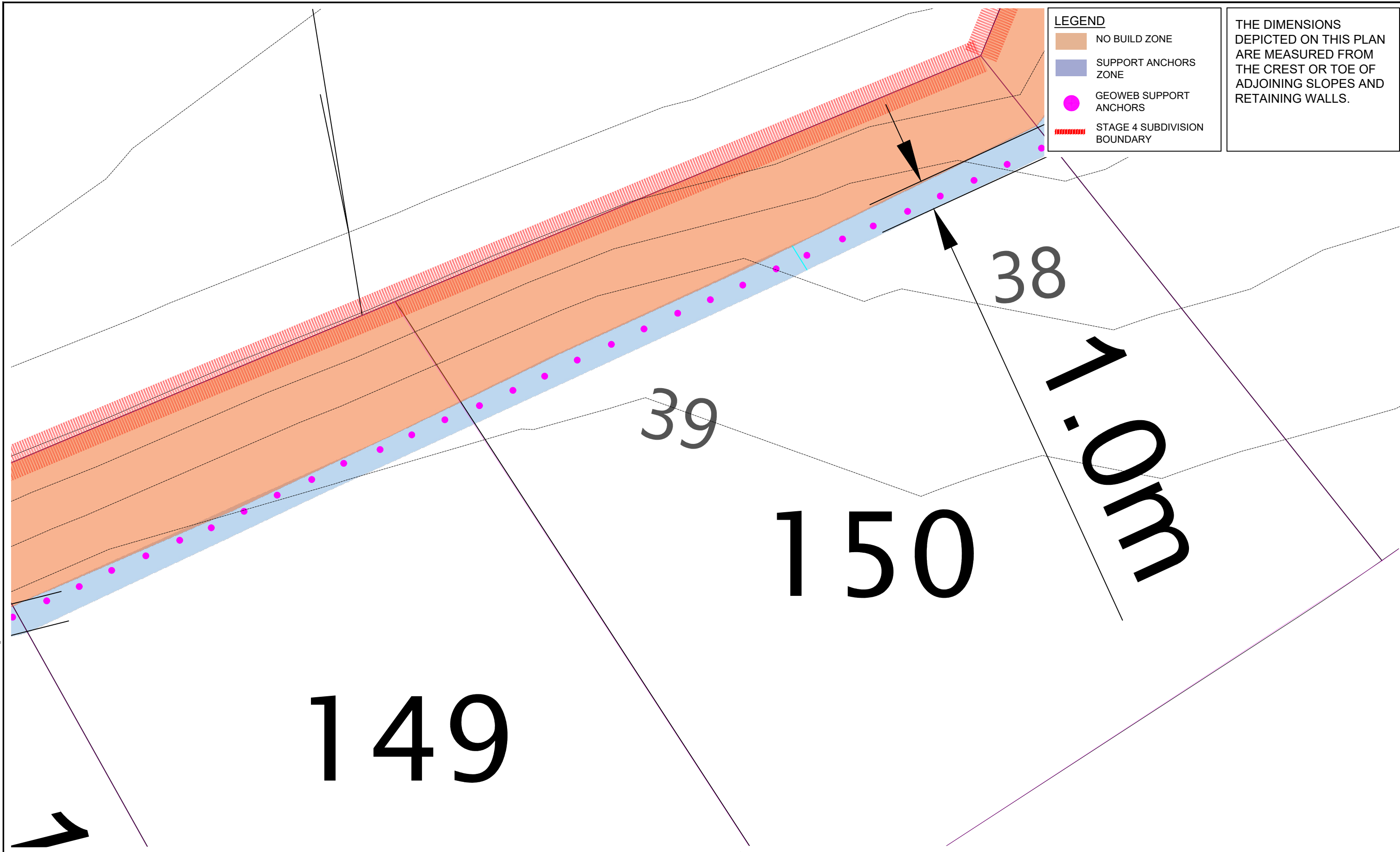


LEGEND

- NO BUILD ZONE
- SUPPORT ANCHORS ZONE
- GEOWEB SUPPORT ANCHORS
- STAGE 4 SUBDIVISION BOUNDARY

THE DIMENSIONS
DEPICTED ON THIS PLAN
ARE MEASURED FROM
THE CREST OR TOE OF
ADJOINING SLOPES AND
RETAINING WALLS.

revision	no.	description	drawn	approved	date	 	drawn	FS		client: WFH PROPERTIES LIMITED			
	A	ORIGINAL ISSUE	FS	SP	30.10.25		approved	SP		project: MILLWATER ARRAN HILLS PRECINCT 6 - STAGE 4			
							date	30/10/2025		title: GEOWEB SUPPORT ANCHORS 6/8			
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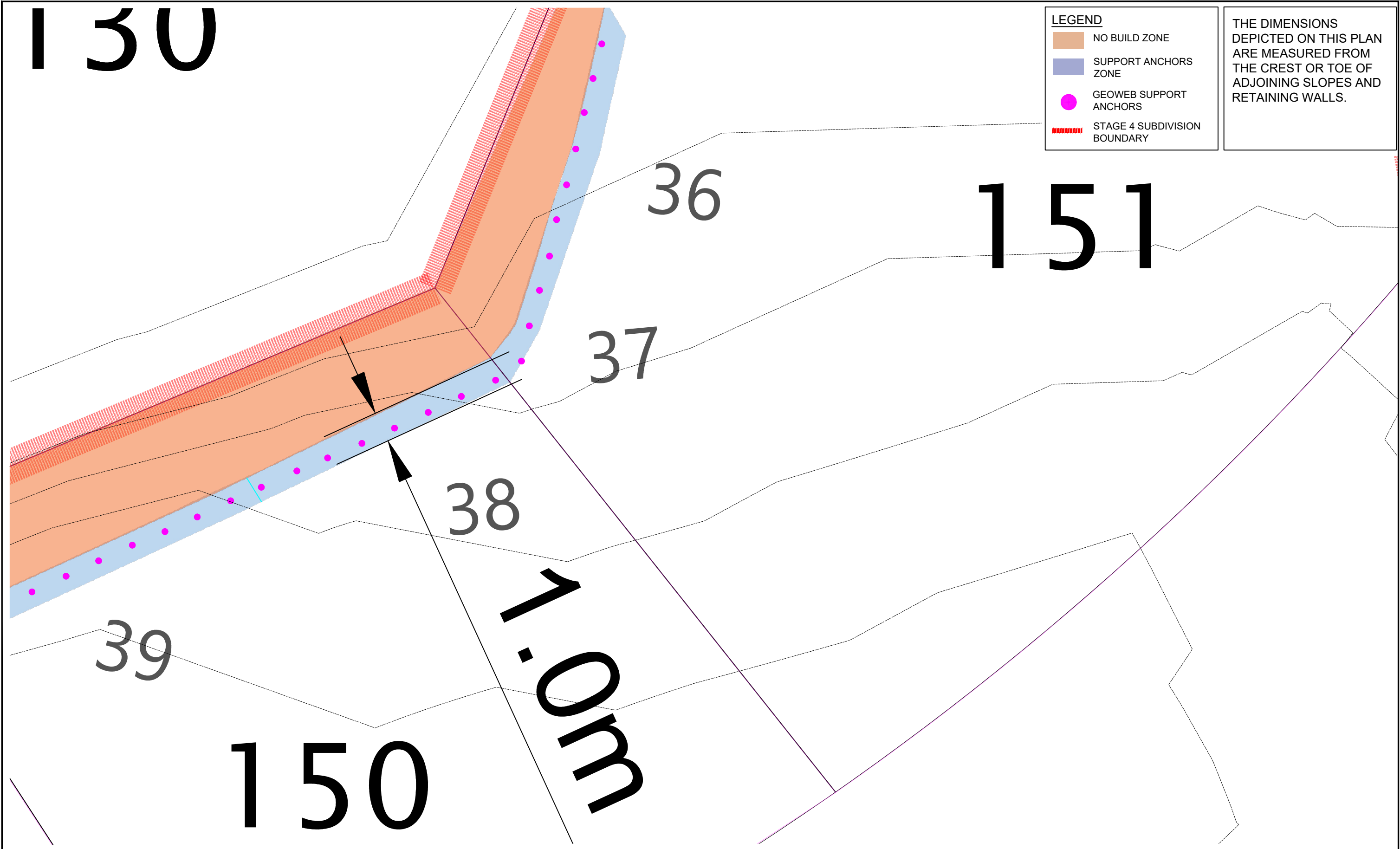
LEGEND

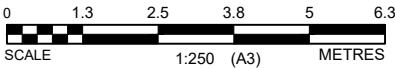
- NO BUILD ZONE
- SUPPORT ANCHORS ZONE
- GEOWEB SUPPORT ANCHORS
- STAGE 4 SUBDIVISION BOUNDARY

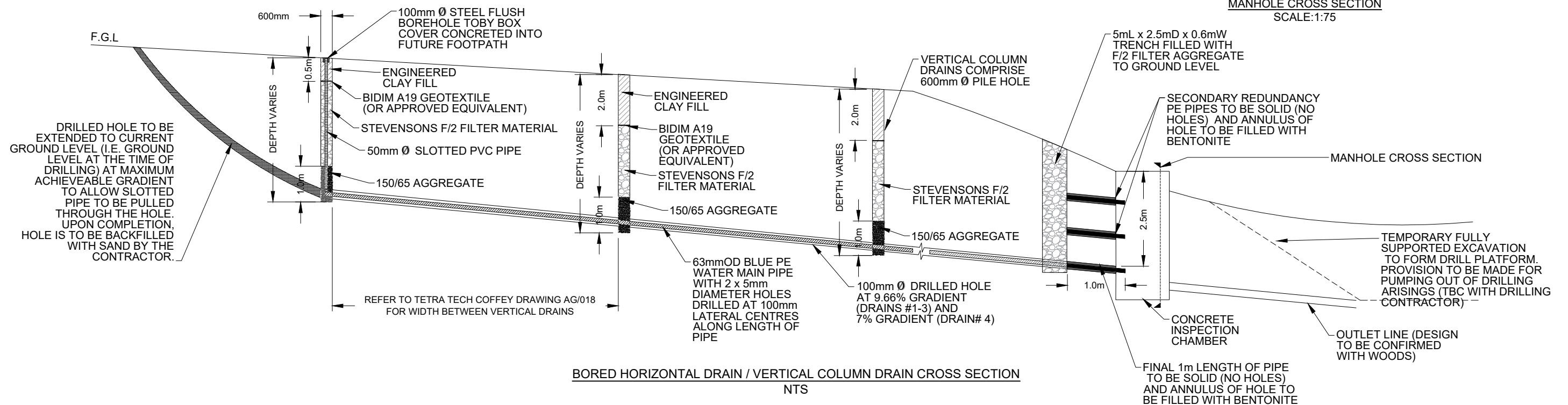
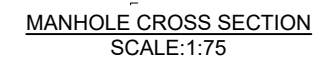
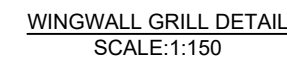
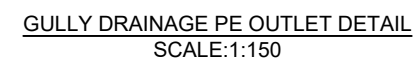
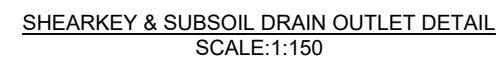
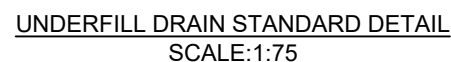
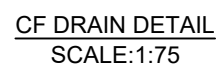
THE DIMENSIONS
DEPICTED ON THIS PLAN
ARE MEASURED FROM
THE CREST OR TOE OF
ADJOINING SLOPES AND
RETAINING WALLS.

revision	no.	description			drawn	approved	date	 0 1.3 2.5 3.8 5 6.3 SCALE1:250 (A3)METRES	drawn	FS		client:	WFH PROPERTIES LIMITED		
	A	ORIGINAL ISSUE			FS	SP	30.10.25		approved	SP		project:	MILLWATER ARRAN HILLS PRECINCT 6 - STAGE 4		
									date	30/10/2025		title:	GEOWEB SUPPORT ANCHORS 7/8		
									scale	1:750		project no:	773-AKLGE206639	figure no:	CM004.7
									original size	A3		rev: A			

PLOT DATE: 30/10/2025 5:28:59 pm DWG FILE: C:\USERS\FERNANDA.SOTO\DESKTOP\PCMA001 PRELIM SPECIFIC DESIGN ZONE PLAN - FULL 3.DWG

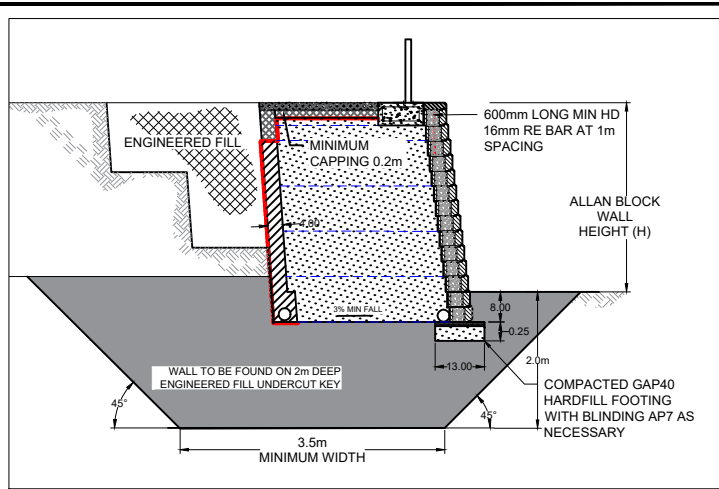


revision	no.	description			drawn	approved	date	 			drawn	FS				client: WFH PROPERTIES LIMITED		
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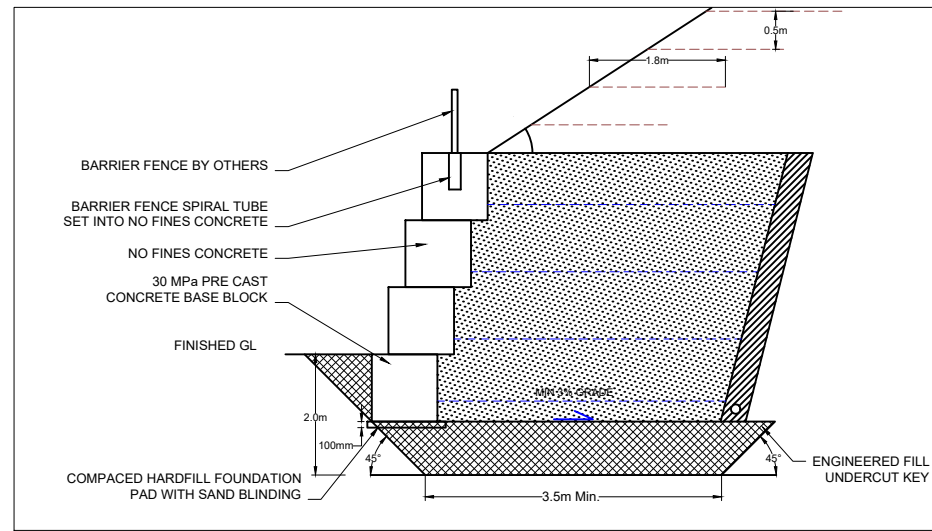


revision	no.	description	drawn	approved	date		drawn	SP		client: WFH PROPERTIES LTD		
	A	ORIGINAL ISSUE (FOR EW GDR)	RZ	SP	04/12/2019		approved	SP		project: MILLWATER - OREWA WEST - PRECINCT 6		
	B	UPDAT TO CF DRAIN LAYOUT	RZ	SP	20/07/2020		date	15/05/2023		title: SUBSOIL DRAINAGE STANDARD DETAILS		
	C	UPDATED AS OF END OF 2020/2021 EARTHWORKS SEASON	RZ	SP	18/06/2021		scale	AS SHOWN		project no: 773-AKLGE206639 figure no: AG/007 rev: G		
	D	UPDATED FOR START OF 2022/2023 EARTHWORKS SEASON	SP	SP	22/09/2022		original size	A3				
	E	UPDATED CF DRAIN LAYOUT	EP	SP	13/01/2023							
	F	UPDATED DESIGN FOR PRICING	SP	SP	08/03/2023							
	G	FOR CONSTRUCTION	SP	SP	15/05/2023							

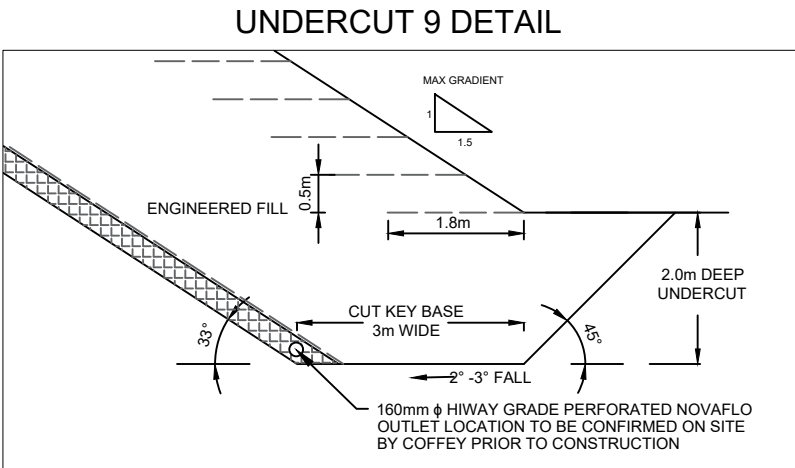
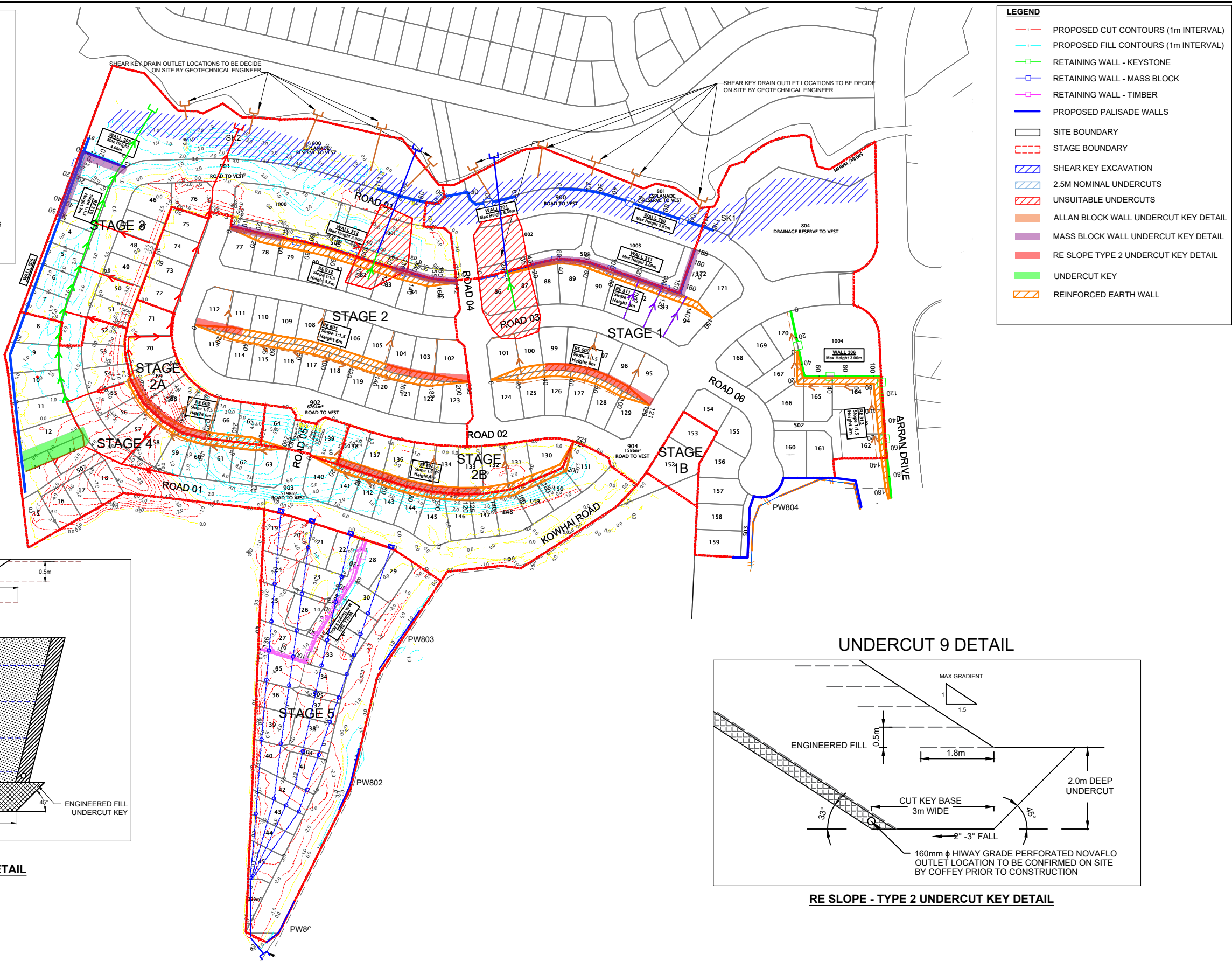
PLOT DATE: 27/09/2022 4:55:59 pm DWG FILE: F:\GEN29 PROJECTS\773-AKLGE PROJECTS\200000-290000\006639 - MILLWATER - OREWA WEST - PRECINCT 67 COFFEY DRAWINGS\CAD\STEPHEN\773-AKLGE\206639-AG - V9773-AKLGE206639-AG.DWG



ALLAN BLOCK WALL UNDERCUT KEY DETAIL

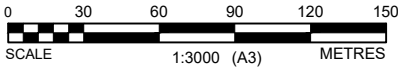


MASS BLOCK WALL UNDERCUT KEY DETAIL



RE SLOPE - TYPE 2 UNDERCUT KEY DETAIL

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 2022/2023 EARTHWORKS SEASON	SP	SP	14/06/2022
	D	AMENDED FOR START OF 2022 - 2023 EARTHWORKS SEASON	SP	SP	27/09/2022



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



client:	WFH PROPERTIES LTD
project:	MILLWATER - OREWA WEST - PRECINCT 6
title:	UNDERCUT DETAIL PLAN
project no:	773-AKLGE206639
figure no:	AG/008
rev:	D

IN-GROUND PILE WALL CONSTRUCTION OBSERVATIONS AND MONITORING

OBSERVATIONS OF ALL ASPECTS OF THE RETAINING WALL CONSTRUCTION ARE REQUIRED BY COFFEY TO CONFIRM THAT THE DESIGN REQUIREMENTS ARE SATISFIED AND TO ENABLE CERTIFICATION OF THE COMPLETED WORKS. THIS LEVEL OF CONSTRUCTION MONITORING IS CONSISTENT WITH IPENZ MONITORING LEVEL CM4. THESE INCLUDE, BUT MAY NOT BE LIMITED TO OBSERVATIONS AT THE FOLLOWING **HOLD POINTS**:

- REVIEW OF SET OUT OF PILE POSITIONS/ WALL ALIGNMENT.
- OBSERVATIONS ARE REQUIRED BY COFFEY DURING CONSTRUCTION TO CONFIRM EXPECTED GROUND CONDITIONS. COFFEY NEEDS TO OBSERVE THE DRILLING OF ALL PILE HOLES FROM EXISTING GROUND LEVELS TO LOG AND TEST UNDERLYING SOILS SO AS TO CONFIRM ASSUMED SOIL CONDITIONS.
- COFFEY SHALL OBSERVE AND APPROVE THE FOUNDING DEPTH AND CONDITION OF ALL PILE HOLES PRIOR TO INSTALLATION OF THE PILES AND POURING OF CONCRETE.
- REVIEW OF ALL CONCRETE BATCHING PLANT RECEIPTS
- FINAL WALK OVER/SITE VISIT UPON COMPLETION.

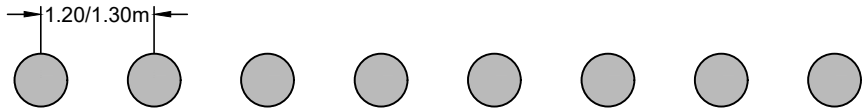
UPON SATISFACTORY COMPLETION OF THE ABOVE WORKS, COFFEY WOULD THEN BE IN A POSITION TO ISSUE THE APPROPRIATE PRODUCER STATEMENT - CONSTRUCTION REVIEW (PS4) AS REQUIRED BY COUNCIL.

CONSTRUCTION NOTES:

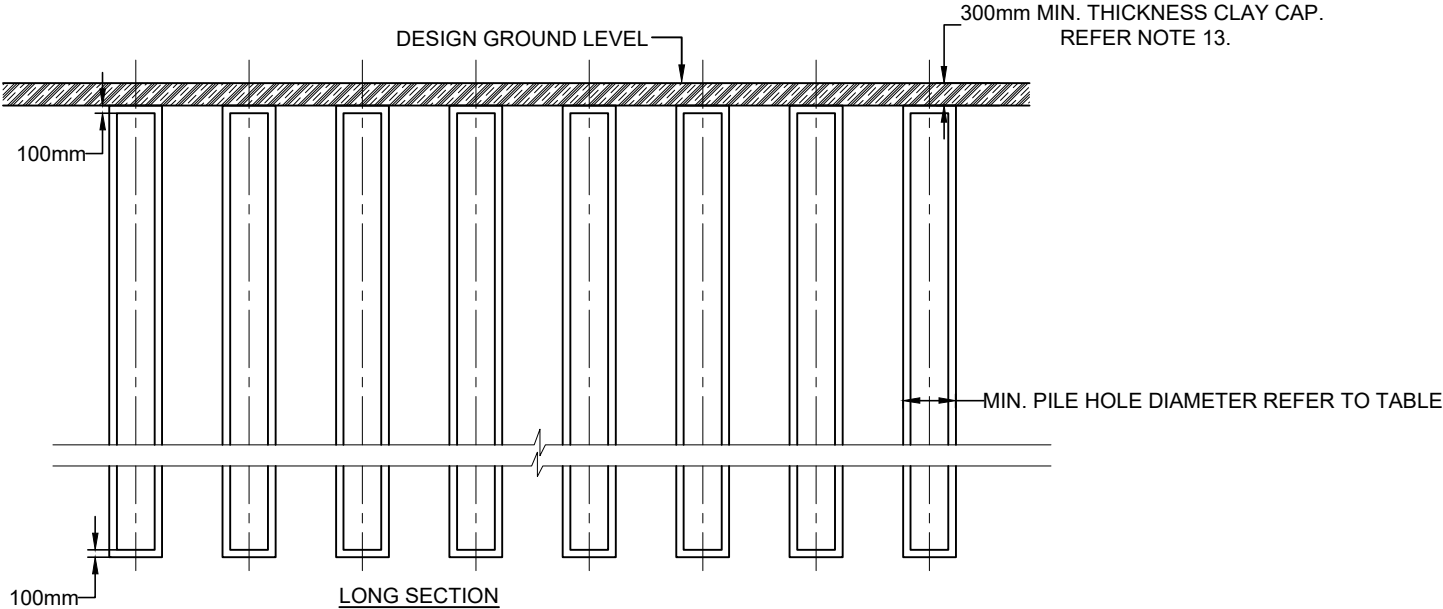
- THIS DRAWING AND ASSOCIATED NOTES ARE TO BE READ IN CONJUNCTION WITH THE COFFEY DESIGN REPORT, REFERENCED 773-AKLGE206639-AP.
1. ALL EXISTING AND PROPOSED SERVICES SHOULD BE LOCATED AND PROTECTED DURING CONSTRUCTION WORKS BY THE CONTRACTOR.
 2. CONSTRUCTION OF IN-GROUND PILE WALLS SHALL BE IN ACCORDANCE WITH THESE DRAWINGS AND RELEVANT RETAINING WALL DESIGN REPORT UNLESS OTHERWISE APPROVED BY COFFEY.
 3. REFER TO SITE PLAN FOR THE GENERAL LOCATION AND EXTENT OF IN-GROUND PILE WALL. SET OUT LOCATIONS TO BE PROVIDED BY OTHERS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. LOCATIONS SHALL BE CONFIRMED BY COFFEY PRIOR TO DRILLING.
 4. ALL STEEL PILES SHALL BE CONCRETE ENCASED WITH A MINIMUM OF 75mm SIDE COVER AND MINIMUM 100MM BASE AND TOP COVER.
 5. THE CHARACTERISTIC COMPRESSIVE STRENGTH OF CONCRETE SHALL BE F'C = 25 MPA UNLESS OTHERWISE NOTED.
 6. THE CONCRETE ENCASEMENT SHALL BE ADEQUATELY VIBRATED WITH A PENCIL VIBRATOR TO AVOID "HONEY COMBING".

7. EXCAVATION FOR FOUNDATIONS SHALL BE TAKEN OUT BY AUGERING TO THE DIMENSIONS DETAILED WITH ALL SURPLUS SOIL BEING DISPOSED OF AWAY FROM THE WALL LOCATIONS. ALLOWANCE SHALL BE MADE IN POSITIONING AUGERED HOLES FOR CONCRETE SURROUND TO POLES. DRIVING OF PILES IS NOT ACCEPTABLE AS AN ALTERNATIVE TO AUGERING. THE CONTRACTOR SHALL VERIFY THE POSITION OF ALL UNDERGROUND SERVICES AND CONFIRM THAT THERE ARE NO CLASHES PRIOR TO CONSTRUCTION.
8. IF SIGNIFICANT OVERLAND FLOW IS PRESENT ABOVE WALL SURFACE CUT-OFF DRAINAGE MUST BE INSTALLED.
9. THE CONTRACTOR SHALL REFER TO THE COFFEY DESIGN ENGINEER AS SOON AS POSSIBLE FOR FURTHER INSTRUCTION SHOULD ANY UNFORESEEN CIRCUMSTANCE OR ABNORMAL SITE CONDITION BE ENCOUNTERED DURING CONSTRUCTION.
10. THE CONTRACTOR SHALL BE RESPONSIBLE AT ALL TIMES FOR ENSURING THE TEMPORARY STABILITY OF THE WORKS.
11. IF THERE IS POTENTIAL FOR HOLE COLLAPSE E.G. DUE TO WEAK GROUND CONDITIONS OR GROUND WATER INGRESS IT IS RECOMMENDED THAT ALTERNATE HOLES BE DRILLED INITIALLY INCLUDING PILING AND CONCRETE POURING PRIOR TO THE DRILLING OF THE REMAINING HOLES. TEMPORARY CASING MAY BE REQUIRED.
12. IN-GROUND PILE WALL IS TO CAPPED TO THE FINISHED DESIGN LEVEL WITH A MINIMUM THICKNESS 300MM CLAY CAP OF MINIMUM SHEAR VANE UNDRAINED SHEAR STRENGTH 100 KPa UNLESS OTHERWISE SPECIFIED.
13. PILE WALL TO EXTEND AS SHOWN ON CIVIL DRAWING. THE LOCATION AND EXTENT ARE TO BE CONFIRMED ON SITE BY COFFEY DESIGN ENGINEER

Wall I.D.	Wall Length (m)	Pile Diameter (mm)	Pile Spacings (m)	Steel Member	Minimum Pile Depth (m)	Minimum Rock Embedment (m)	Approx. Rock Elevation (mRL)
801	25	600	1.2	410 UB 59.7	8.00	2.50	7.0
802	40	650	1.2	460 UB 82.1	9.00	3.00	19.5
803	40	650	1.2	460 UB 82.1	10.00	4.25	33.0



PLAN
1:100 (A3)
(SHOWING GENERAL PILE ARRANGEMENT)

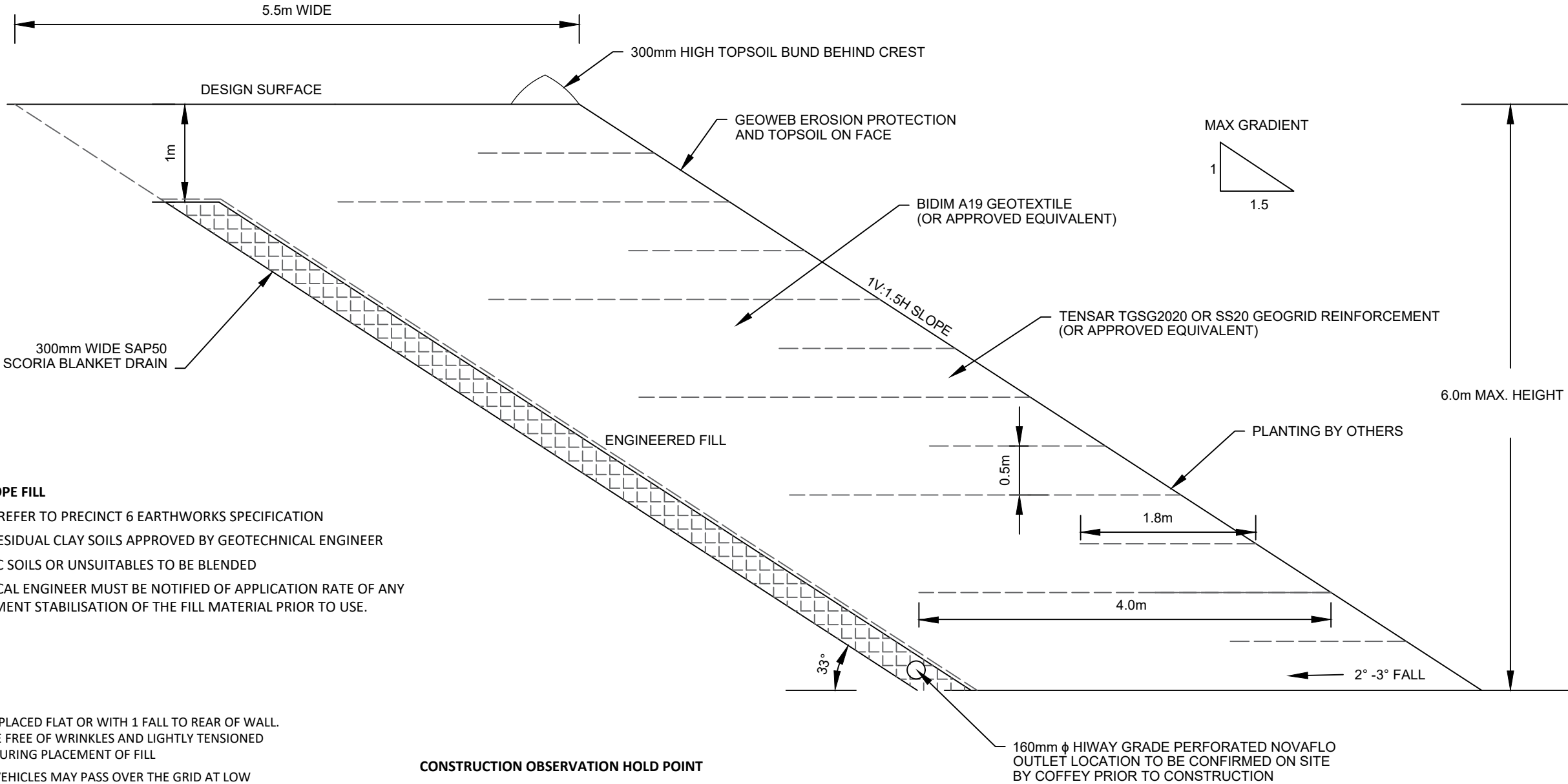


LONG SECTION
1:100 (A3)
(SHOWING GENERAL ARRANGEMENT ALONG PILE WALL ALIGNMENT)



revision	no.	description	drawn	approved	date	drawn RZ approved AC date 09/04/2020 scale 1:100 original size A3	coffey A TETRA TECH COMPANY	client: WFH PROPERTIES LTD.		
	A	FOR BUILDING CONSENT	RZ	AC	05/12/2019			project: MILLWATER PRECINCT 6 STAGE 5		
	B	UPDATE TO DESIGN FOLLOWING PEER RESPONSE PRR012	RZ	AC	09/04/2020			title: IN-GROUND PALISADE WALL DETAIL		
								project no: 773-AKLGE206639	drawing no: AP/003	rev: B

PLOT DATE: 14/06/2022 6:50:40 pm DWG FILE: F:\GEN209 PROJECTS\73-AKLGE PROJECTS\73-AKLGE DRAWINGS\CAD\TO\NYAF\73-AKLGE206639-AF01.DWG



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		drawn	SP		client: WFH PROPERTY LTD.		
	A	ORIGINAL ISSUE	RZ	SP	18/07/2019		approved	SP		project: MILLWATER PRECINCT 6		
	B	UPDATED AFTER AMENDMENTS TO DESIGN	RZ	AC	26/02/2020		date	14/06/2022		title: REINFORCED EARTH SLOPE - FILL BATTER DETAIL		
	C	FOR CONSTRUCTION	RZ	SP	18/06/2020		scale	AS SHOWN		project no: 773-AKLGE206639	figure no: AF/001	rev: D
	D	DESIGN CHANGE	SP	SP	14/06/2022		original size	A3				

PLOT DATE: 10/02/2019 5:15:10 PM DWG FILE: \\TTS808F524808GENZ9 PROJECTS\\773-AKLGE PROJECTS\\06639 - MILLWATER - OREWA WEST - PRECINCT 6\\7 COFFEY DRAWINGS\\CAD\\773-AKLGE206639-RETAINING WALL.DWG

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH TETRA TECH COFFEY REPORT REFERENCED 773-AKLGE206639AK.
2. THE RETAINING WALL DESIGN HAS NOT CONSIDERED ANY TRENCH EXCAVATIONS (FOR SERVICES ETC) IN FRONT OF THE RETAINING WALL. EXCAVATION FOR TRENCHES IN FRONT OF THE RETAINING WALL CANNOT BE UNDERTAKEN UNDER ANY CIRCUMSTANCES WITHOUT PRIOR WRITTEN APPROVAL FROM COFFEY.
3. TOTAL STEEL UB SECTION LENGTHS TO BE ROUNDED UP TO NEXT AVAILABLE LENGTHS IF SECTIONS ARE NOT AVAILABLE FOR THE RECOMMENDED MINIMUM EMBEDMENT.
4. THE MAXIMUM RETAINED HEIGHT SHALL BE AS SPECIFIED ON THE DRAWING AND SHALL NOT BE EXCEEDED UNLESS APPROVED BY COFFEY IN WRITING.
5. FENCING / BARRIER POSTS REQUIRED WHERE WALL HEIGHT EXCEEDS 1.0m AS PER NZ BUILDING CODE.

MATERIAL SPECIFICATIONS: WALL TYPE 1

1. ALL STEEL UB MEMBERS SHALL BE GRADE 300.
2. ALL STEEL UB MEMBERS ARE TO BE HOT DIP GALVANIZED HDG900 TO AS/NZS 2312:2002. ALL GALVANIZING IS TO BE IN ACCORDANCE WITH AS/NZS 4680:2006 - MINIMUM COATING MASS 900 g/m².
3. CERTIFICATES MUST BE PROVIDED WITH THE UB STEEL PROVIDED ATTESTING TO THE STEEL GRADE AND GALVANISING SUITABILITY.
4. BORED / AUGERED PILE HOLES TO BE BACKFILLED WITH CONCRETE GROUT MIX WITH A MINIMUM UNIAXIAL COMPRESSIVE STRENGTH (UCS) OF 20 MPa. TESTING CERTIFICATES VERIFYING SUITABILITY OF GROUT MIX MUST BE PROVIDED.
5. TIMBER LAGGING AND PACKERS SHALL BE H5 TREATED NORMAL DENSITY, IN ACCORDANCE WITH NZS 3603.
6. A MALTHOID DAMP PROOF COURSE/ DPC SHALL BE INSTALLED TO THE STEEL PILES TO SEPARATE THE TANALISED TIMBER FROM STEEL UB MEMBERS.
7. ALL STEEL FIXINGS AND FASTENINGS ARE TO BE CONFIRMED BY THE STRUCTURAL DESIGNER.

CONSTRUCTION NOTES:

1. ALL EXISTING AND PROPOSED SERVICES SHOULD BE LOCATED PRIOR TO CONSTRUCTION WORKS AND PROTECTED DURING CONSTRUCTION WORKS.
2. THE EXTENT OF EXCAVATIONS REQUIRED SHOULD BE MARKED OUT ON THE GROUND HAVING REGARD TO THE POSITIONS OF PILES, WORKING SPACE FOR CONSTRUCTION, BACKFILL AND DRAINAGE PROVISIONS.
3. TEMPORARY BENCHING REQUIREMENTS FOR ALL CUT/EXCAVATED FACES WILL NEED TO BE AGREED BETWEEN THE CONTRACTOR AND COFFEY PRIOR TO CONSTRUCTION.
4. SURFACE CUT-OFF DRAINAGE SHALL BE INSTALLED IF SIGNIFICANT OVERLAND FLOW IS PRESENT UPSLOPE. AT THE DISCRETION OF THE CIVIL DESIGNER, THE SURFACE CUT-OFF MAY COMPRISE EITHER A SHALLOW SWALE AND CLAY BUND OR A STORMWATER RETICULATION SYSTEM.
5. ANY GROUNDWAER AND ASSOCIATED LOOSE OR SOFT SEDIEMNT MATERIAL WITHIN THE PILE HOLES SHOULD BE REMOVED PRIOR TO INSTALLATION OF THE UB-STEEL UPRIGHTS AND POURING OF CONCRETE.
6. SPOIL FROM AUGERING AND EXCAVATIONS SHALL BE DISPOSED AT A SUITABLE LOCATION.
7. THE CONCRETE ENCASEMENT SHALL BE PLACED WITH A TERMMIE AND ADEQUATELY VIBRATED WITH A PENCIL VIBRATOR.
8. FOR WALL TYPE 1: DRAINAGE MATERIAL AT THE BACK OF THE WALL SHALL COMPRISE FREE DRAINING MATERIAL LIGHTLY TAMPED. ONLY HAND-HELD COMPACTION EQUIPMENT SHOULD BE USED FOR FILL COMPACTION WITHIN THE ZONE BEHIND THE WALL EQUAL TO THE WALL HEIGHT. NO HEAVY COMPACTION EQUIPMENT SHOULD BE USED IN THIS ZONE.
9. FOR WALL TYPE 1: DAMAGE TO GALVINISING ON STEEL UB MEMBERS DURING CONSTRUCTION MUST BE KEPT TO A MINIMUM. ANY DAMAGE TO THE GALAVANISING SHALL BE MADE GOOD BY THE CONTRACTOR.
10. FOR WALL TYPE 1: TIMBER LAGGING RAILS SHOULD HAVE MINIMUM 10mm VERTICAL GAP BETWEEN EACH RAIL TO PERMIT WATER PRESSURE RELEIF DURING HEAVY RAINFALL CONDITIONS. TOP RAILS SHALL BE BOLTED/SCREWED TO UPRIGHT.

CONSTRUCTION MONIOTRING & PRODUCER STATEMENTS:

1. FOR WALL TYPE 1: TETRA TECH COFFEY SHALL INSPECT ALL CRITICAL ASPECTS OF CONSTRUCTION, INCLUDING EXCAVATION, COMPLETED STEEL UB INSTALLATION (INCLUDING MALTHOID PLACEMENT), LAGGING INSTALLATION, BACKFILLING, FILL COMPACTION AND DRAINAGE PLACEMENT / OUTLETS. COFFEY REQUEST AT LEAST 24 HOURS NOTICE PRIOR TO INSPECTIONS.
2. THE CONTRACTOR SHALL NOTIFY COFFEY AS SOON AS POSSIBLE SHOULD ANY UNFORSEEN OR ABNORMAL CONDITIONS (GEOTECHNNICAL-RELATED) BE ENCOUNTERED DURING CONSTRUCTION.
3. UPON SATISFACTORY COMPLETION OF THE WORKS:

• THE CONTRACTOR SHALL PROVIDE PRODUCER STATEMENT - CONSTRUCTION (PS3).

• COFFEY WOULD BE IN A POSITION TO ISSUE A PRODUCER STATEMENT - CONSTRUCTION REVIEW (PS4), AS REQUIRED BY COUNCIL.

FOR BUILDING CONSENT

AUCKLAND COUNCIL PRODUCER STATEMENT AUTHOR: STEHEN PARKES 126553

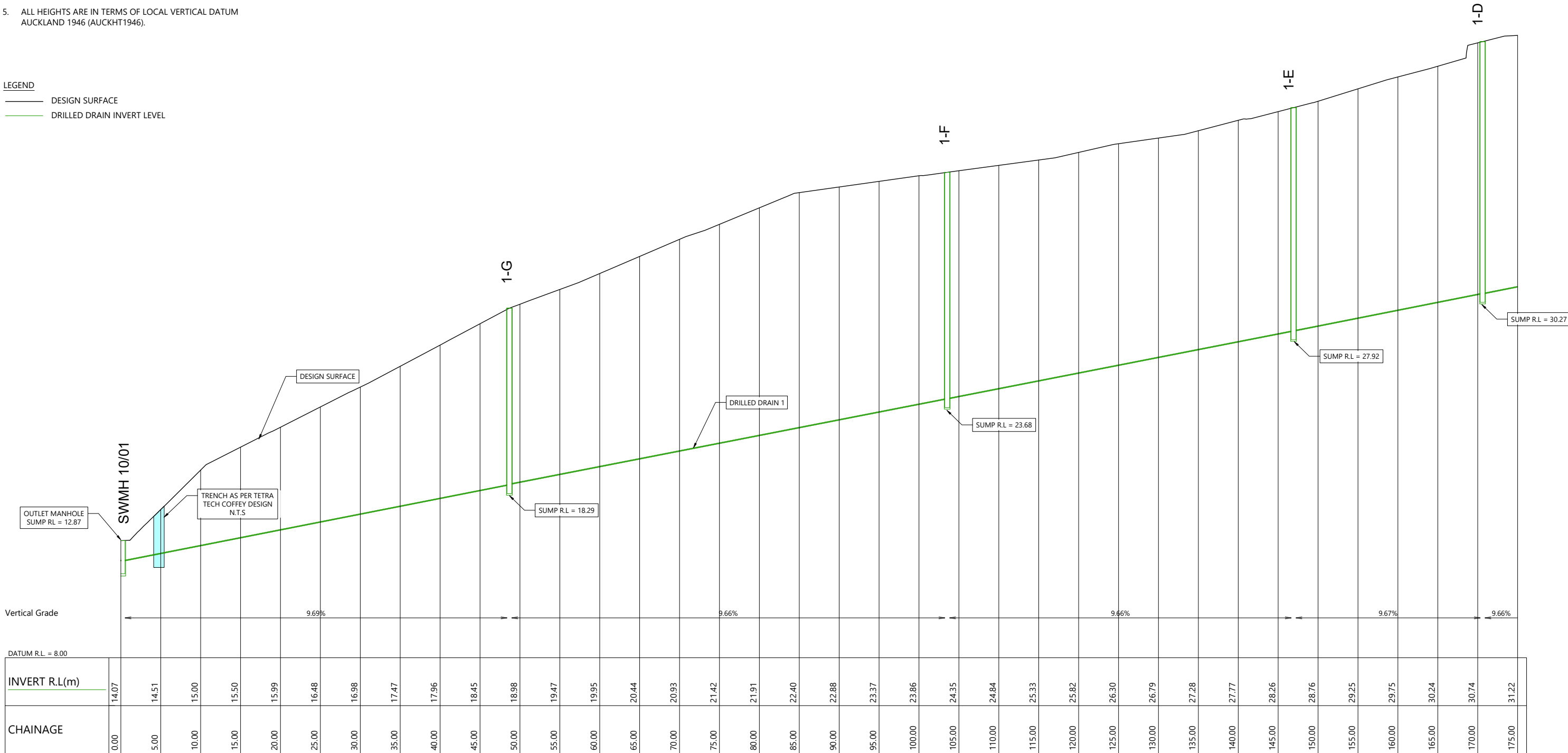
revision	no.	description	drawn	approved	date		drawn	RZ		client:	WFH PROPERTIES LIMITED		
	A	ORIGINAL ISSUE	RZ	AA	01/08/2019		approved	AA		project:	MILLWATER - OREWA WEST - PRECINCT 6 101 KOWHAI ROAD, UPPER OREWA 0992 LOT 1 DP537871		
	B	FOR BUILDING CONSENT	RZ	SP	02/12/2021		date	02/12/2021		title:	DESIGN NOTES AND SPECIFICATIONS		
							scale	NTS		project no:	773-AKLGE206639	Drawing no:	03
							original size	A3				rev:	B

NOTES

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2. ALL MATERIALS TO COMPLY WITH DRAWINGS COMPILED BY TETRA TECH COFFEYS.
3. REDUCED LEVELS ARE TO THE INVERT OF THE PE PIPE.
4. SUMP LEVELS OF VERTICAL COLUMN DRAINS ARE TYPICALLY 0.5M BELOW THE INVERT OF THE BORED DRAIN
5. ALL HEIGHTS ARE IN TERMS OF LOCAL VERTICAL DATUM AUCKLAND 1946 (AUCKHT1946).

LEGEND

- DESIGN SURFACE
- DRILLED DRAIN INVERT LEVEL



BORED DRAIN (1) LONG SECTION
1:250 @A1 1:500 @A3



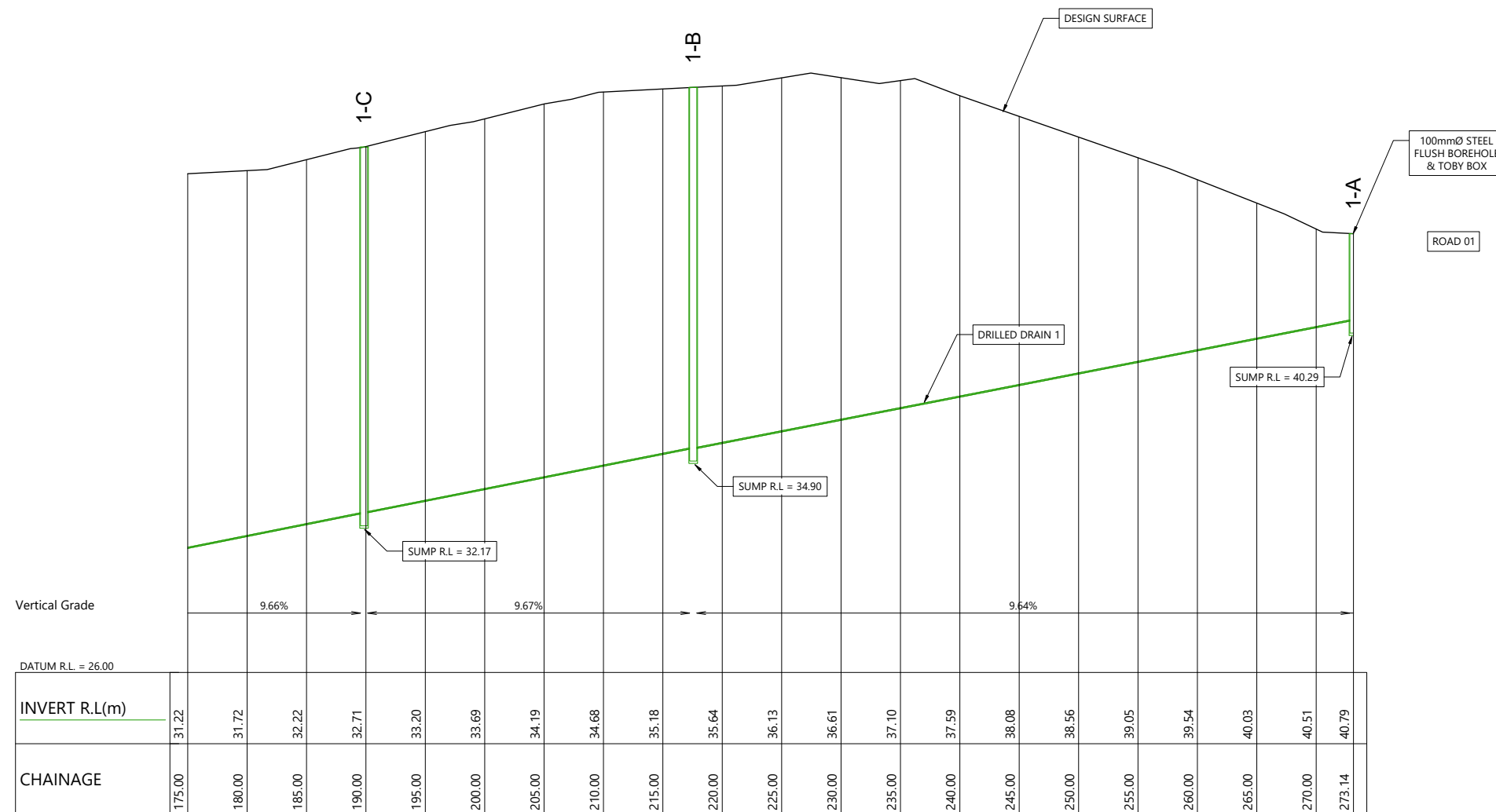
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A	FOR CONSTRUCTION	JM	FEB 2024	DESIGNED	TT COFFEY			SCALE	1:500 @ A3	A
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				CHECKED	NC			DWG NO	37600-03-180-EW	
				APPROVED	TR			WOODS.CO.NZ		

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LEGEND

- DESIGN SURFACE
 DRILLED DRAIN INVERT LEVEL



BORED DRAIN (1) LONG SECTION
1:250 @A1 1:500 @A3



REVISION DETAILS		INT	DATE	SURVEYED	-	ARRAN DRIVE OREWA AUCKLAND		MILLWATER - PRECINCT 6 OREWA WEST DRILLED DRAIN 1			STATUS	ISSUED FOR CONSTRUCTION	REV
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				DRAWN	JM								COUNCIL AUCKLAND COUNCIL
				CHECKED	NC								
				APPROVED	TR								
						WOODS.CO.NZ							

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3.

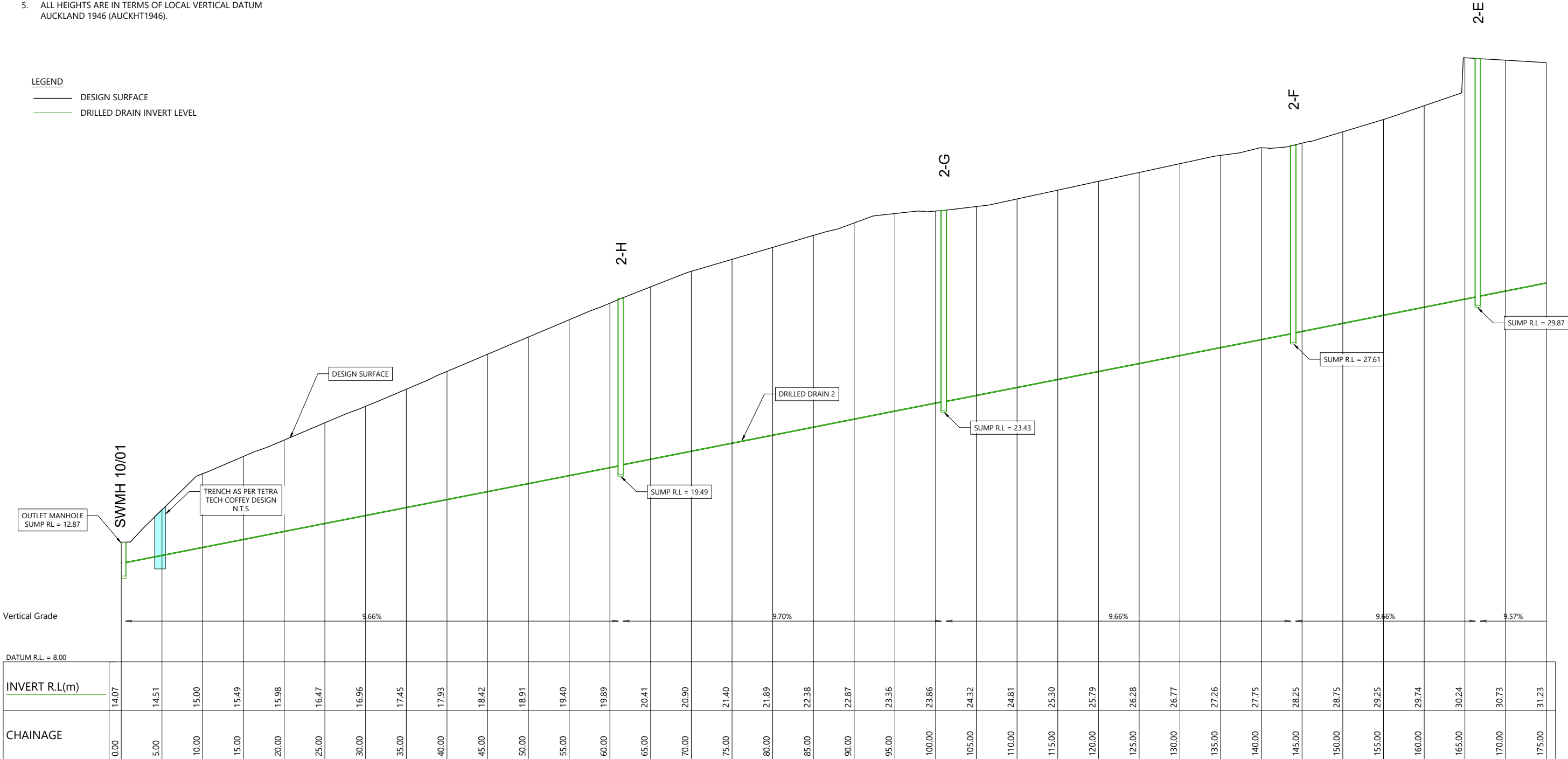
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5.

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LEGEND

- DESIGN SURFACE
- DRILLED DRAIN INVERT LEVEL



BORED DRAIN (2) LONG SECTION
1:250 @A1 1:500 @A3



REVISION DETAILS		INT	DATE	SURVEYED			MILLWATER - PRECINCT 6 OREWA WEST DRILLED DRAIN 2	STATUS	ISSUED FOR CONSTRUCTION	REV
A	FOR CONSTRUCTION	JM	FEB 2024	DESIGNED	TT COFFEY			SCALE	1:500 @ A3	A
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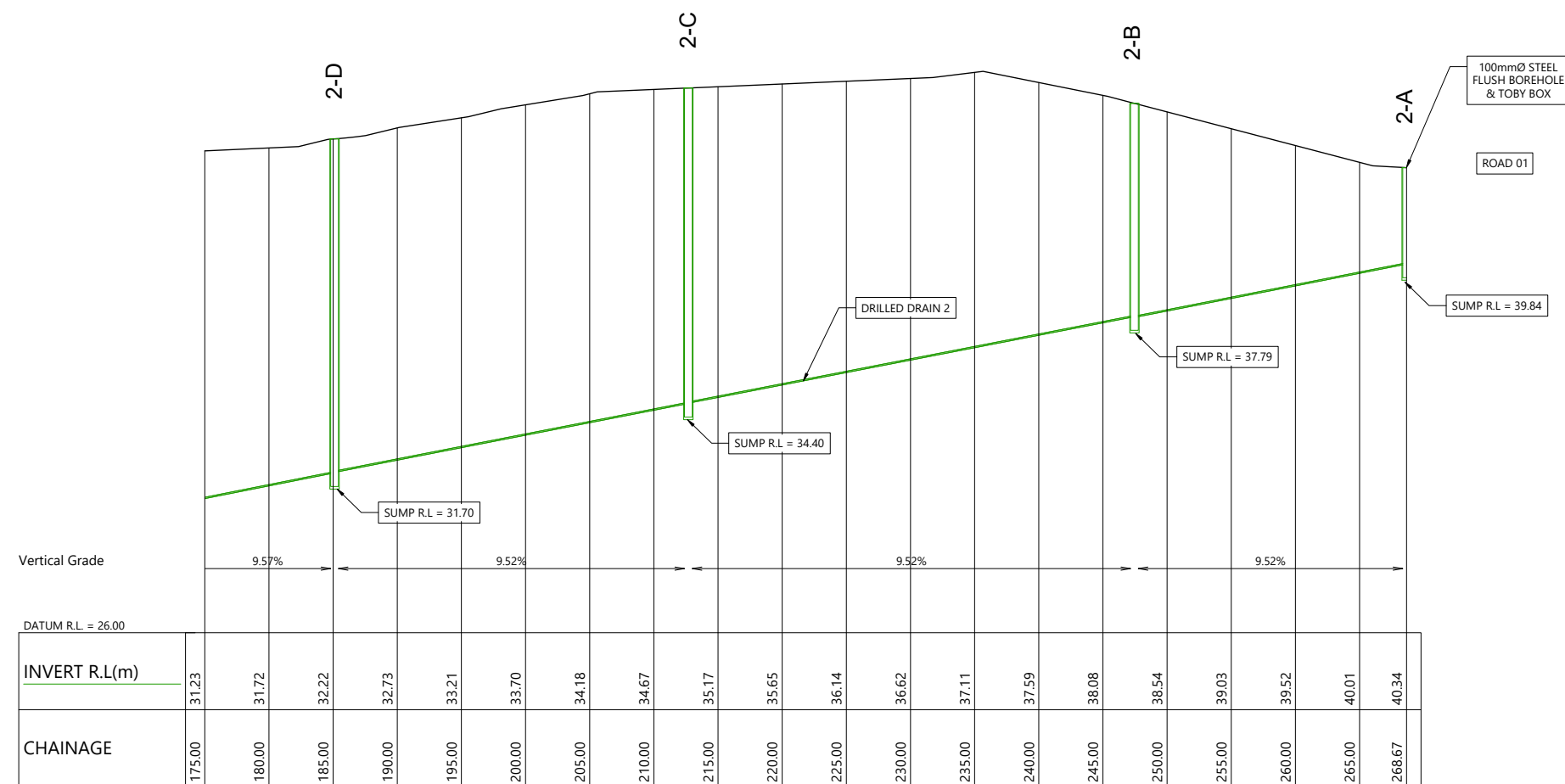


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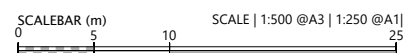
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LEGEND

- DESIGN SURFACE
— DRILLED DRAIN INVERT LEVEL



BORED DRAIN (2) LONG SECTION
1:250 @A1 1:500 @A3



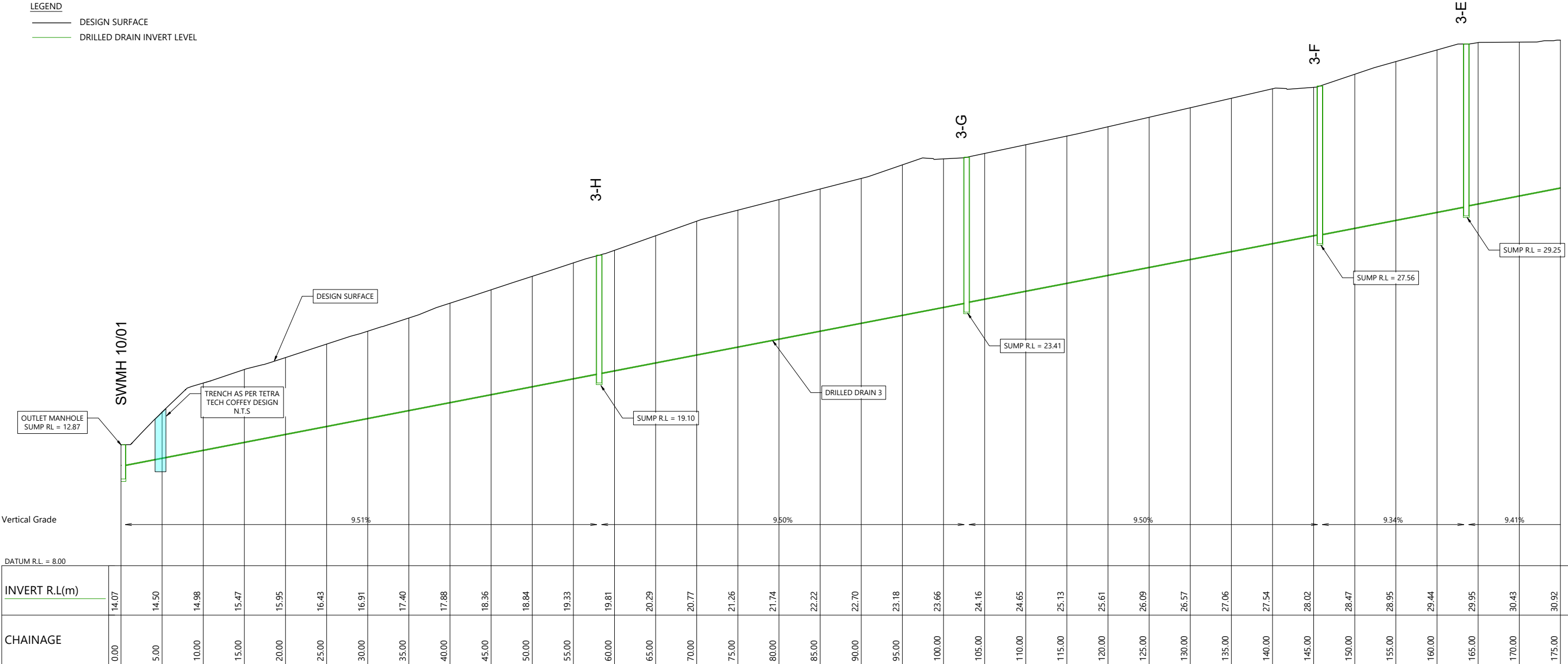
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- NOTES
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LEGEND

DESIGN SURFACE

DRILLED DRAIN INVERT LEVEL



BORED DRAIN (3) LONG SECTION
1:250 @A1 1:500 @A3



REVISION DETAILS		INT	DATE	SURVEYED		WFH PROPERTIES 	MILLWATER - PRECINCT 6 OREWA WEST DRILLED DRAIN 3			STATUS	ISSUED FOR CONSTRUCTION	REV
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				APPROVED	TR					WOODS.CO.NZ		

NOTES

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3.

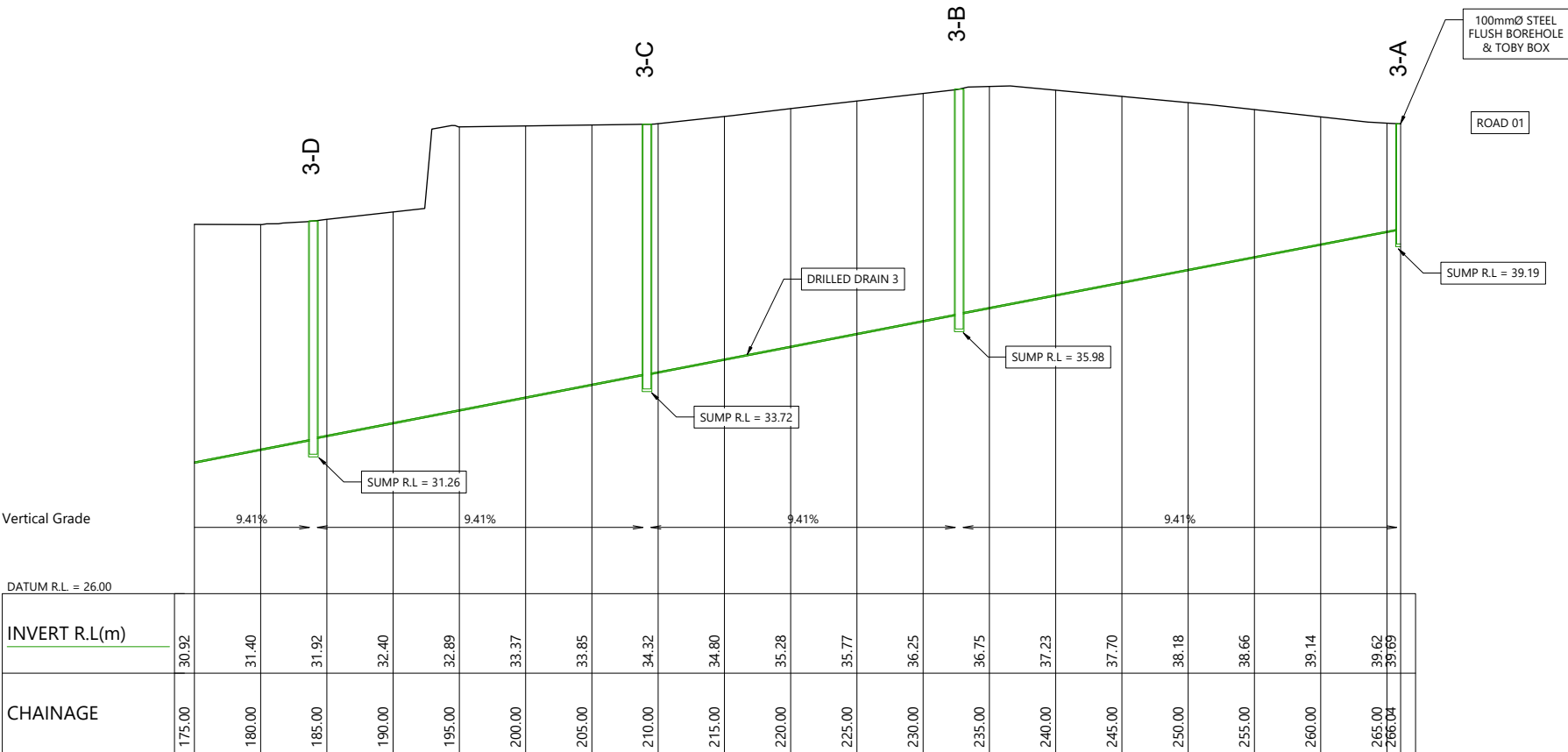
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4.

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5.

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LEGEND

- DESIGN SURFACE
- DRILLED DRAIN INVERT LEVEL



BORED DRAIN (3) LONG SECTION
1:250 @A1 1:500 @A3



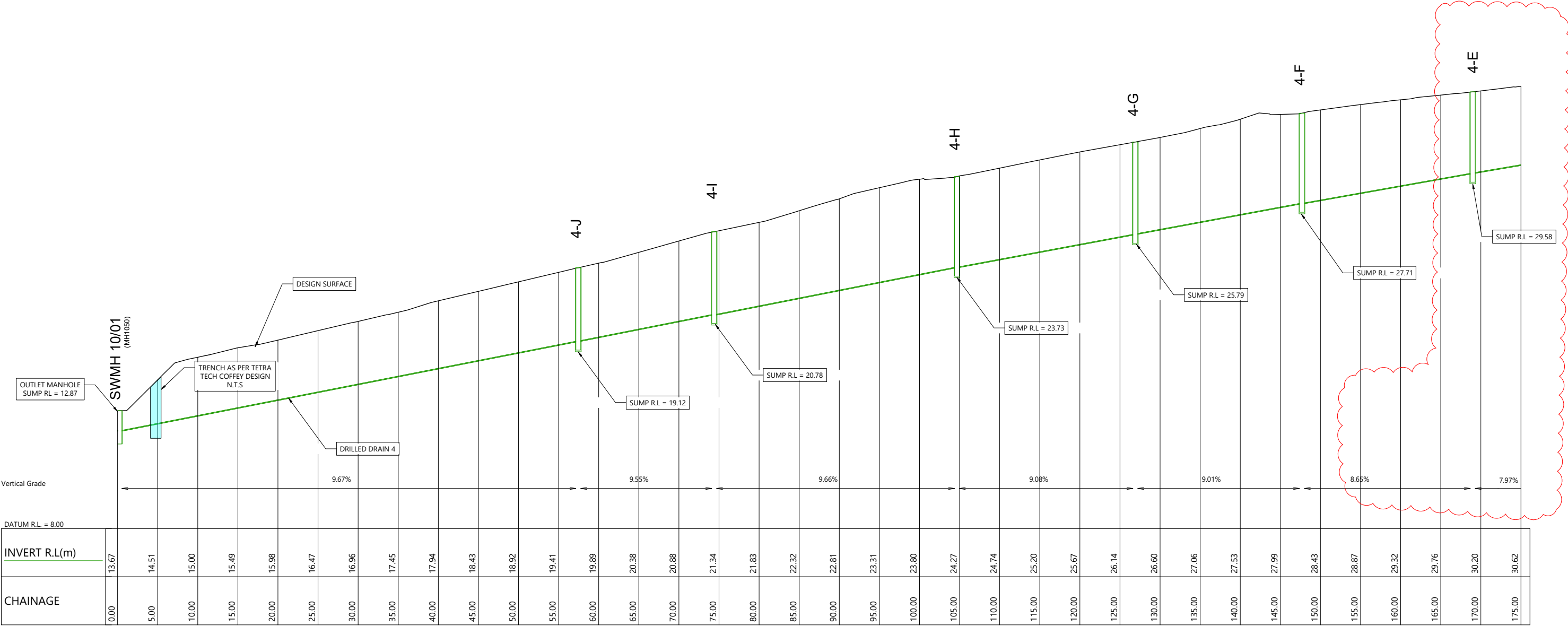
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				APPROVED	TR							

- NOTES
- 1. ALL WORK AND MATERIALS TO COMPLY WITH AUCKLAND COUNCIL STANDARDS. ANY AMBIGUITY BETWEEN DRAWINGS AND COUNCIL STANDARDS TO BE REPORTED TO THE ENGINEER FOR CLARIFICATION.
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LEGEND

DESIGN SURFACE

DRILLED DRAIN INVERT LEVEL



BORED DRAIN (4) LONG SECTION
1:250 @A1 1:500 @A3



REVISION DETAILS		INT	DATE	SURVEYED		WFH PROPERTIES	MILLWATER - PRECINCT 6 OREWA WEST DRILLED DRAIN 4	STATUS	ISSUED FOR CONSTRUCTION	REV
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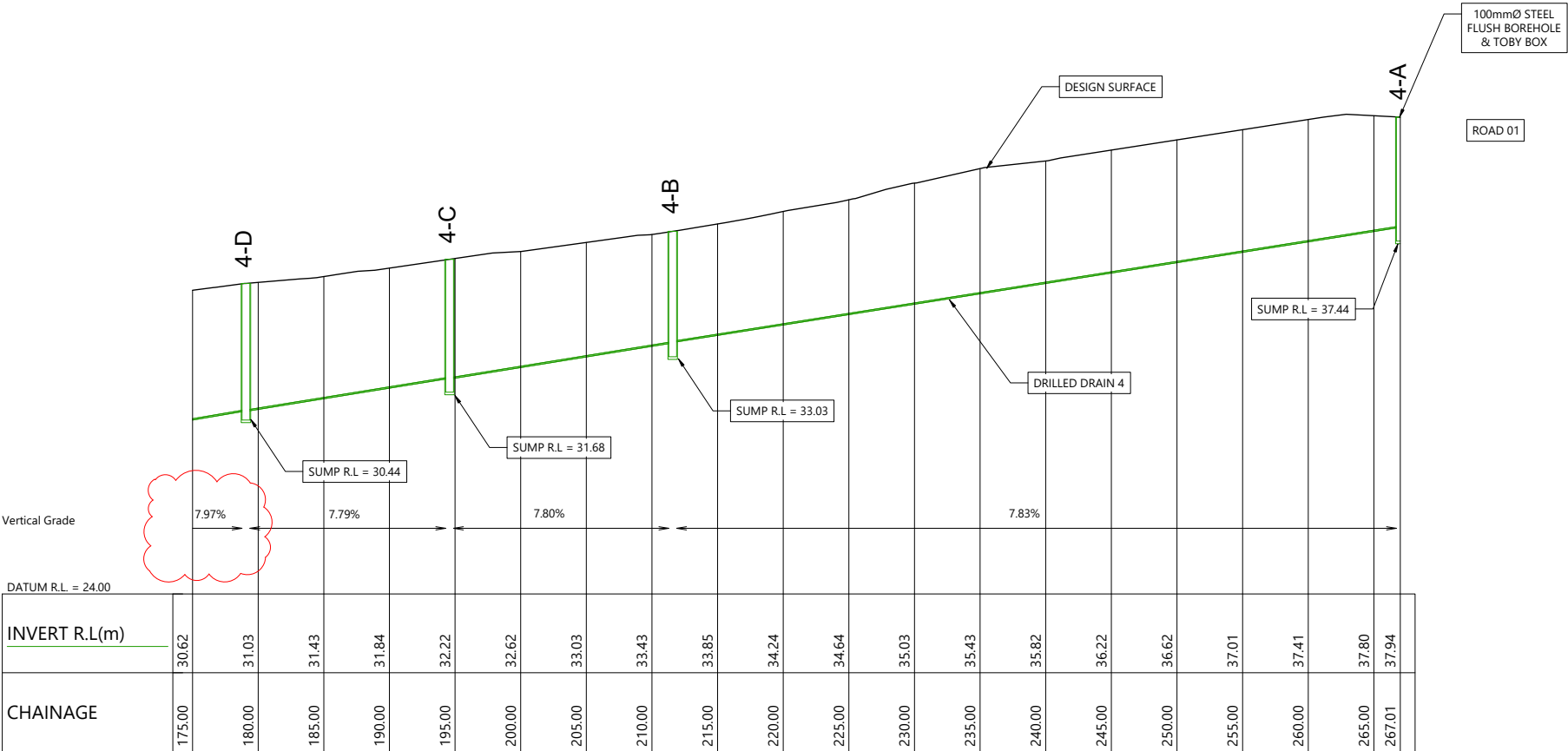


NOTES

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LEGEND

- DESIGN SURFACE
- DRILLED DRAIN INVERT LEVEL



REVISION DETAILS		INT	DATE	SURVEYED	-	ARRAN DRIVE OREWA AUCKLAND	WFH PROPERTIES	MILLWATER - PRECINCT 6 OREWA WEST DRILLED DRAIN 4			STATUS	ISSUED FOR CONSTRUCTION	REV
A	FOR CONSTRUCTION	JM	FEB 2024	DESIGNED	TT COFFEY						SCALE	1:500 @ A3	B
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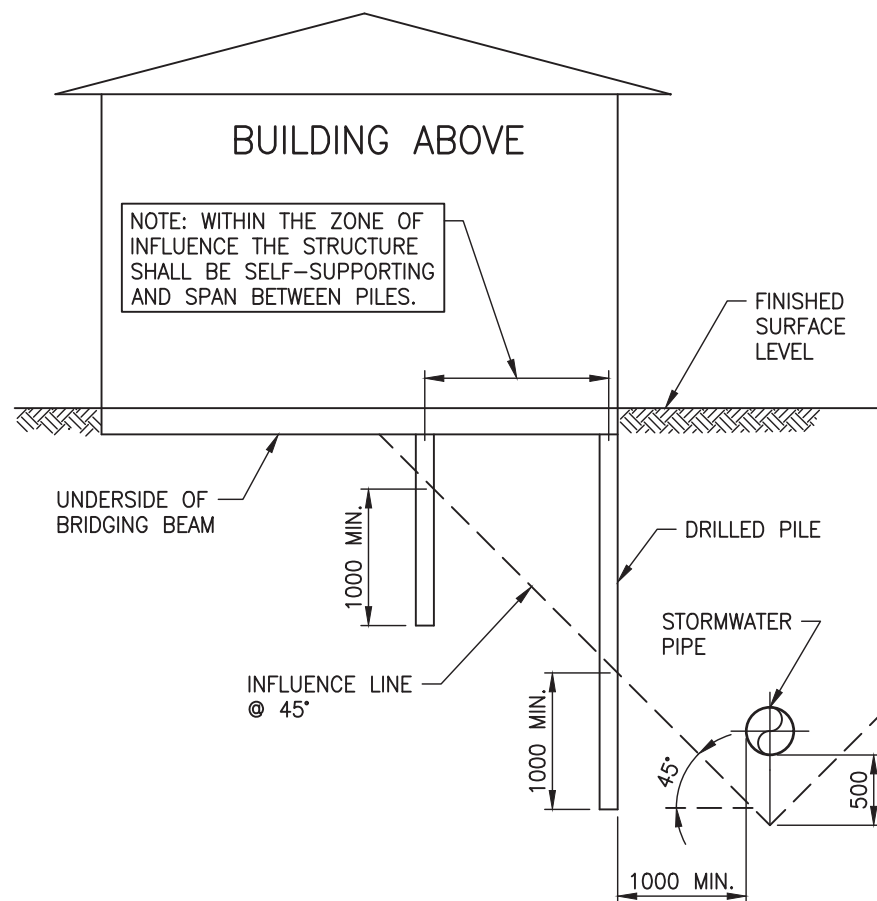
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- LEGEND
- BORED DRAINS
 - VERTICAL COLUMN DRAINS
 - FLUSH BOREHOLE
 - TIN DESIGN 18 CONTOUR



REVISION DETAILS		INT	DATE	SURVEYED	-	ARRAN DRIVE OREWA AUCKLAND		MILLWATER - PRECINCT 6 OREWA WEST HORIZONTAL BORED DRAINS PLAN		STATUS	ISSUED FOR CONSTRUCTION	REV
A	FOR CONSTRUCTION	JM	FEB 2024	DESIGNED	TT COFFEY					SCALE	1:1500 @ A3	A
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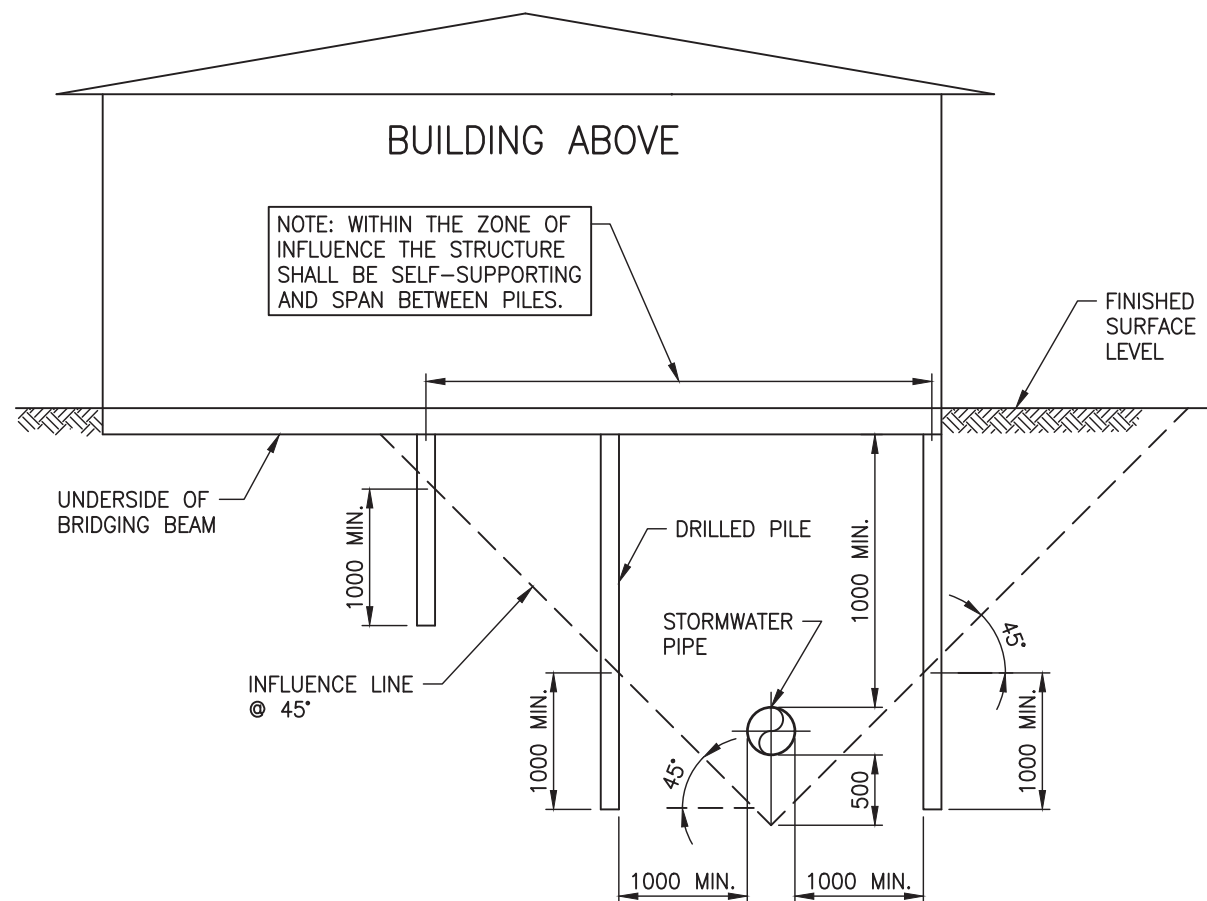
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BUILD CLOSE

'WORKS CLOSE' NOTES:

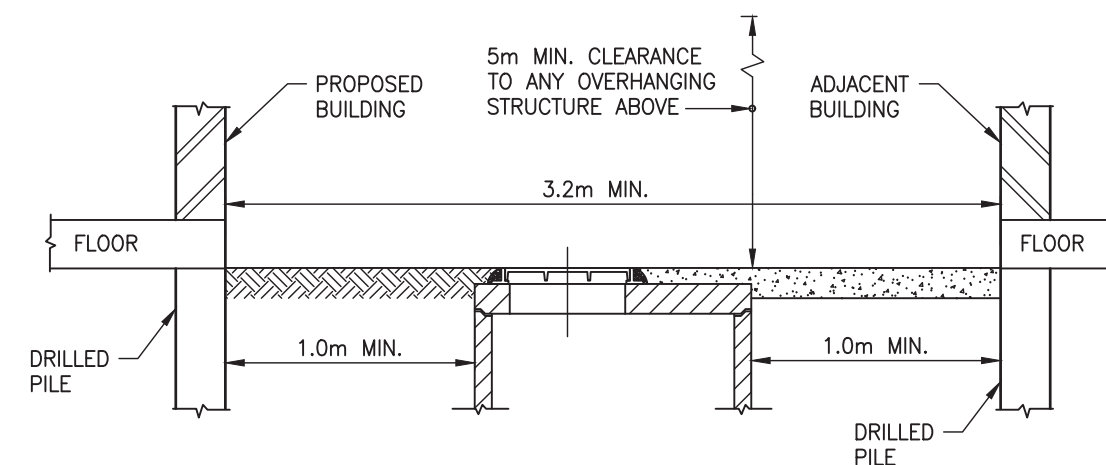
1. OUTSIDE ZONE OF INFLUENCE, NORMAL FOUNDATION REQUIREMENTS APPLY.
2. SPECIFIC APPROVAL IS REQUIRED FROM AUCKLAND COUNCIL IF WORKS ARE ADJACENT TO PIPES LARGER THAN 375mm INTERNAL DIAMETER, OR GREATER THAN 2.0m DEEP.
3. BUILDING SHALL BE OUTSIDE ALL OVERLAND FLOW PATHS AND FLOODPLAINS. SEE SECTION 4.3.5.6 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 ≤ 375 mm NOMINAL DIAMETER AND ≤ 2.0 m 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.



MANHOLE CONSTRUCTION CLEARANCE

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.

STORMWATER CODE OF PRACTICE
STANDARD DETAILS

REVISION: 3
REV DATE: 17 JANUARY 2022
CAD FILENAME: AC-STD-SW22.DWG

AUCKLAND COUNCIL

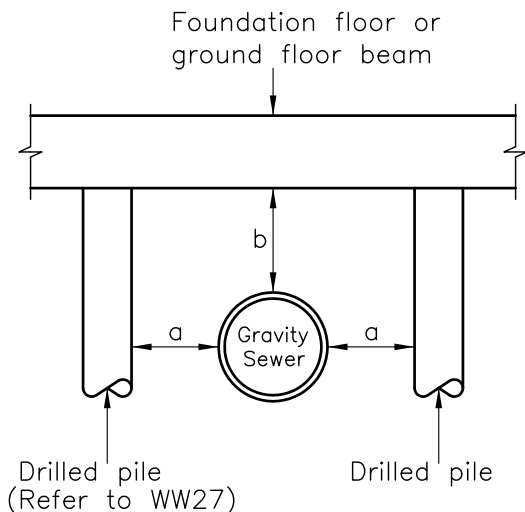
STORMWATER PIPE AND MANHOLE CONSTRUCTION CLEARANCE REQUIREMENTS
MANHOLES NEAR WORKS AND WORKS CLOSE TO, OR OVER, PIPES

ENVIRONMENTAL-SW



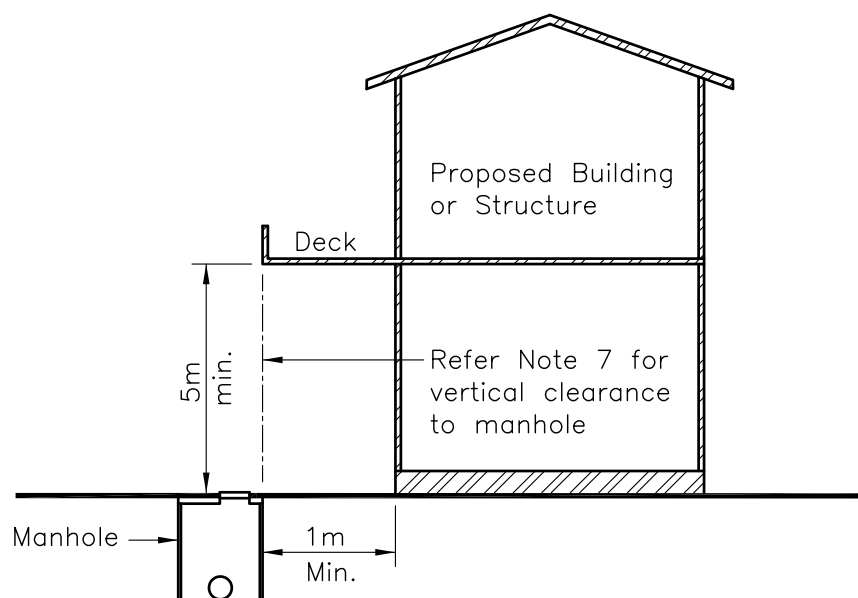
ORIGINAL SCALE A3
SCALE: N.T.S.

DRAWING SET SHEET
SWCoP 1 OF 1
DRAWING No. REV
SW22 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.

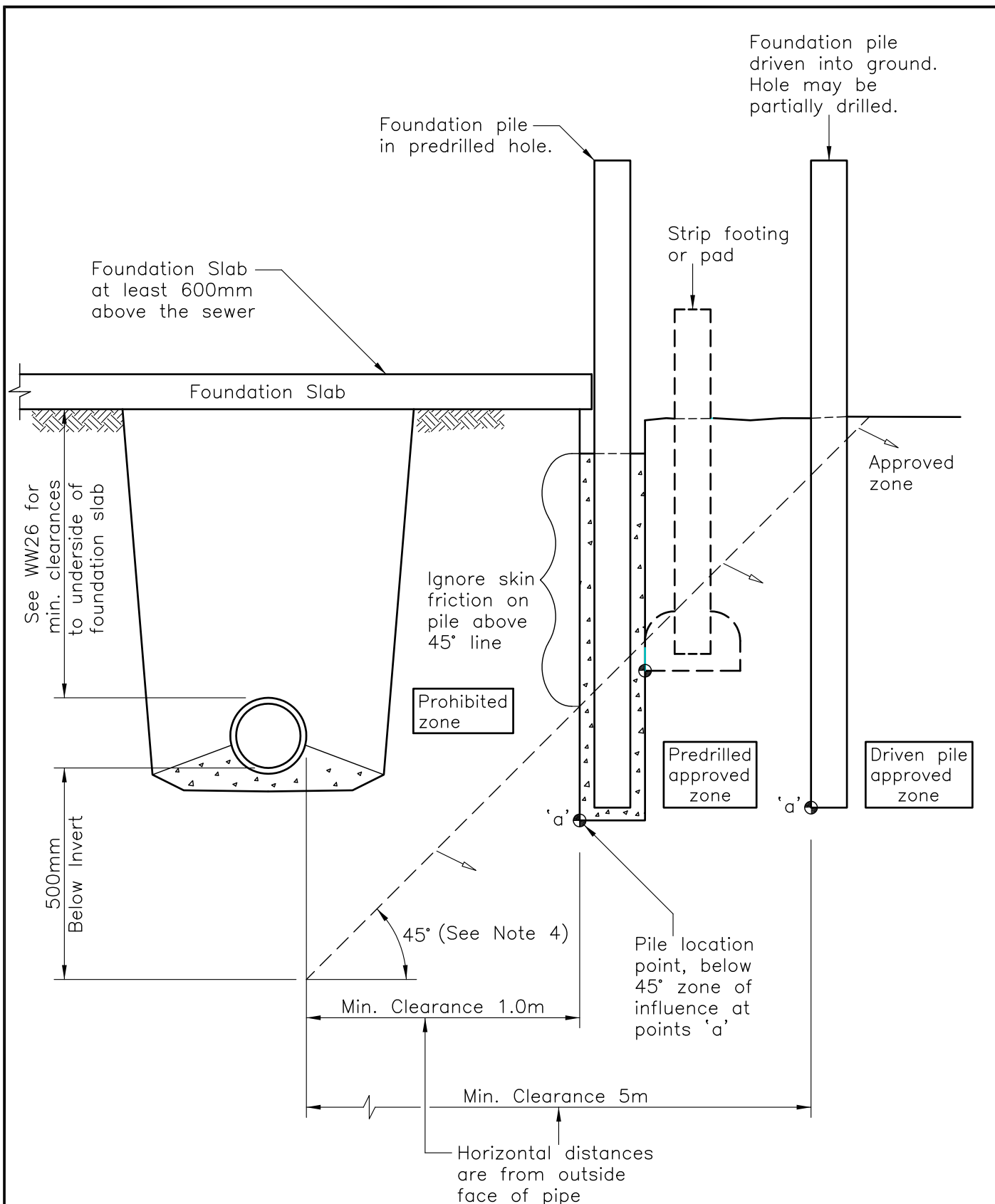
O:\---\ EGCADFI \ 2017 \ WATER & WASTEWATER NETWORK STD DWGS \ 2010070.044D .DWG



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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.

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



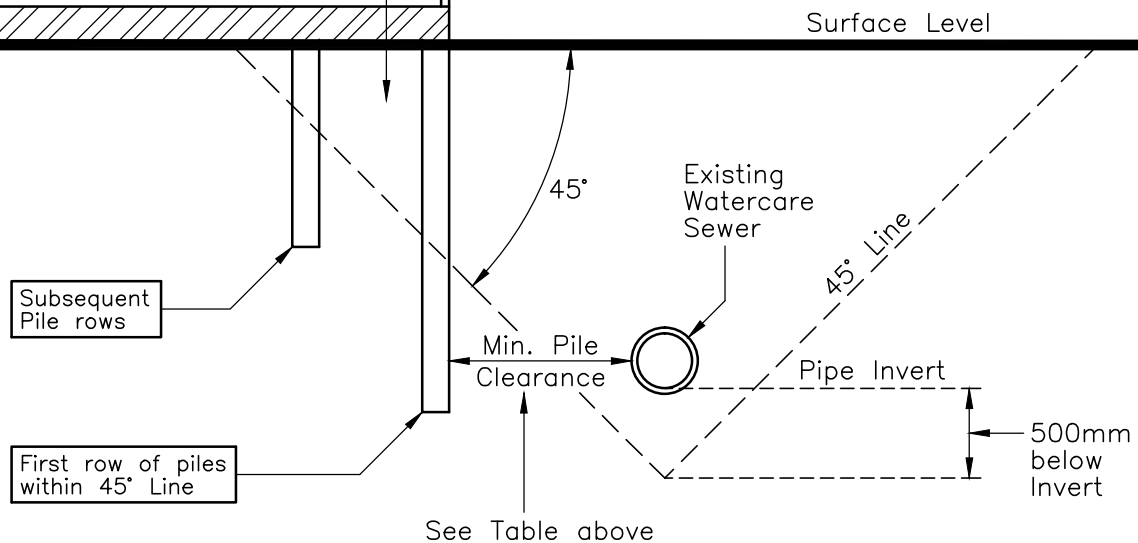
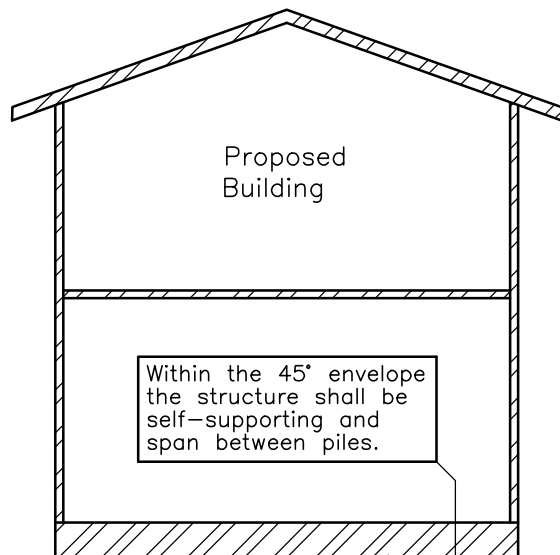
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BUILDING CLOSE TO OR OVER LOCAL NETWORK WASTEWATER

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° envelope, 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:\---\ EGCADF1 \ 2017 \ WATER & WASTEWATER NETWORK STD.DWGS \ 2010070.051C .DWG



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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

Shrink Swell Index Report

Report No: SSI:ETAM25S-04189

Issue No: 1

Client: Tetra Tech Coffey (NZ) Limited- Auckland
Level 2, 88 Broadway
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.}



James McKelvey

Approved Signatory: James McKelvey
(Senior Technician)
IANZ Accredited Laboratory Number:105
Date of Issue: 6/08/2025

Sample Details

Sample ID: ETAM25S-04189

Date Sampled: 24/07/2025

Date Submitted: 25/07/2025

Date Tested: 25/07/2025

Project Location: 117 Kowhai Road, Orewa

Sample Location: Lot 24/25, 0.3 - 0.6 m

Borehole Number: -

Borehole Depth (m): 0.3 - 0.6

Sampling Method: Unknown (Not IANZ Endorsed)

Material: Undisturbed Soil

Source: In-Situ

Swell Test

AS 1289.7.1.1

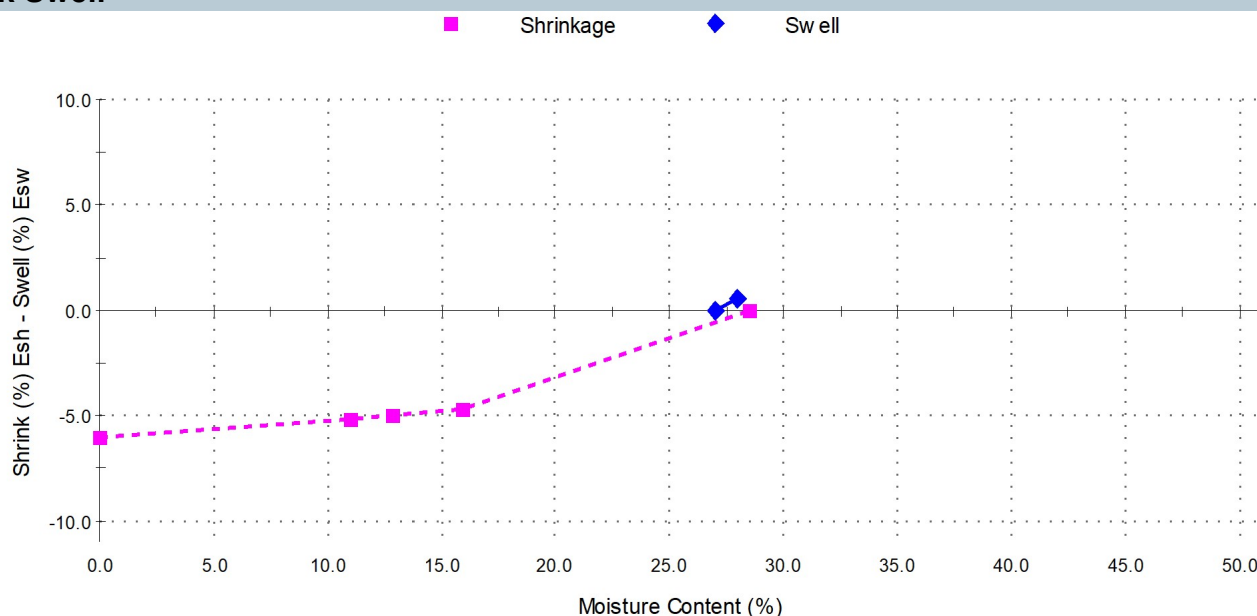
Swell on Saturation (%): 0.5
Moisture Content before (%): 27.0
Moisture Content after (%): 28.0
Est. Unc. Comp. Strength before (kPa): 325
Est. Unc. Comp. Strength after (kPa): 450+

Shrink Test

AS 1289.7.1.1

Shrink on drying (%): 6.0
Shrinkage Moisture Content (%): 28.5
Est. inert material (%): 3%
Crumbling during shrinkage: 0%
Cracking during shrinkage: 1%

Shrink Swell



Shrink Swell Index - Iss (%): 3.5

Comments

Not accredited
Est. Unc. Comp. Strength readings are not IANZ Endorsed as part of this Report.
Work Order No : ETAM25W01209
Tested By: JM

Shrink Swell Index Report

Report No: SSI:ETAM25S-02925

Issue No: 1

Client: Tetra Tech Coffey (NZ) Limited- Auckland
Level 2, 88 Broadway
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.}



James McKelvey

Approved Signatory: James McKelvey
(Senior Technician)
IANZ Accredited Laboratory Number:105
Date of Issue: 28/05/2025

Sample Details

Sample ID: ETAM25S-02925

Date Sampled: 14/05/2025

Date Submitted: 14/05/2025

Date Tested: 20/05/2025

Project Location: 117 Kowhai Road, Orewa

Sample Location: Lot 61 / 62, 0.2 - 0.4 m

Borehole Number: Lot 61/62

Borehole Depth (m): 0.2 - 0.4

Sampling Method: Unknown (Not IANZ Endorsed)

Material: Undisturbed Soil

Source: In-Situ

Swell Test

AS 1289.7.1.1

Swell on Saturation (%): -0.1

Moisture Content before (%): 26.0

Moisture Content after (%): 27.6

Est. Unc. Comp. Strength before (kPa): 225

Est. Unc. Comp. Strength after (kPa): 200

Shrink Test

AS 1289.7.1.1

Shrink on drying (%): 6.5

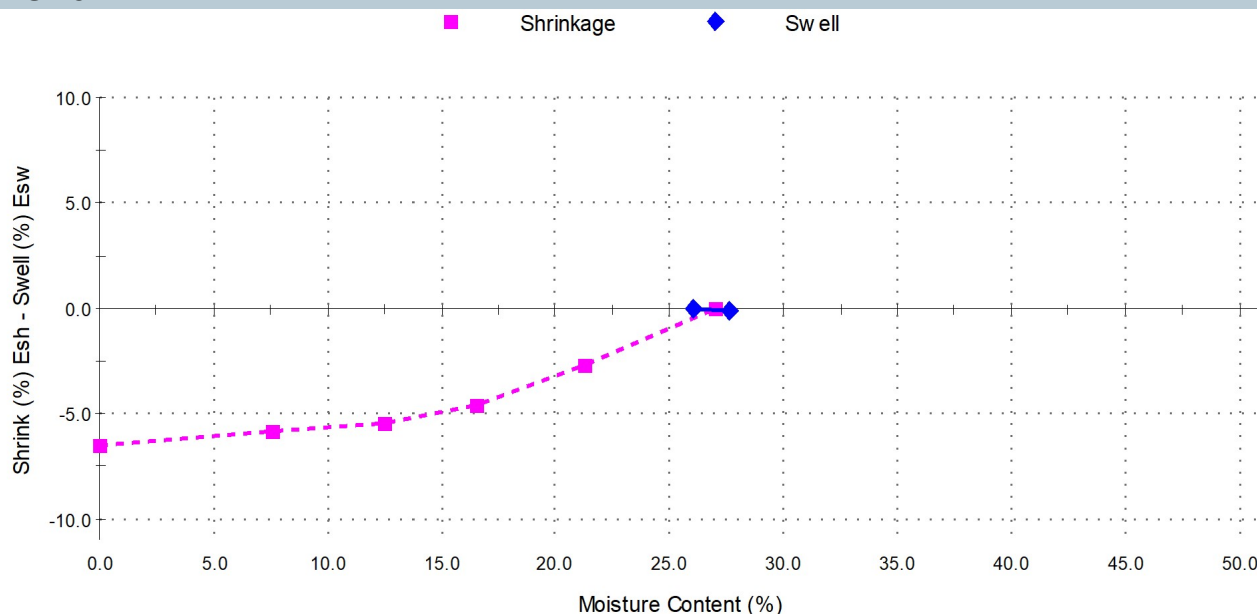
Shrinkage Moisture Content (%): 27.0

Est. inert material (%): 3%

Crumbling during shrinkage: 0%

Cracking during shrinkage: 0.5%

Shrink Swell



Shrink Swell Index - Iss (%): 3.6

Comments

Not accredited

Est. Unc. Comp. Strength readings are not IANZ Endorsed as part of this Report.

Work Order No : ETAM25W00892

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:ETAM25S-04190**Issue No: 1**

Client: Tetra Tech Coffey (NZ) Limited- Auckland
Level 2, 88 Broadway
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)

Date of Issue: 6/08/2025

Sample Details

Sample ID:	ETAM25S-04190	Sampling Method:	Unknown (Not IANZ Endorsed)
Date Sampled:	24/07/2025	Material:	Undisturbed Soil
Date Submitted:	25/07/2025	Source:	In-Situ
Date Tested:	25/07/2025		
Project Location:	117 Kowhai Road, Orewa		
Sample Location:	Lot 140, 0.2 - 1.0 m		
Borehole Number:	-		
Borehole Depth (m):	0.2 - 1.0		

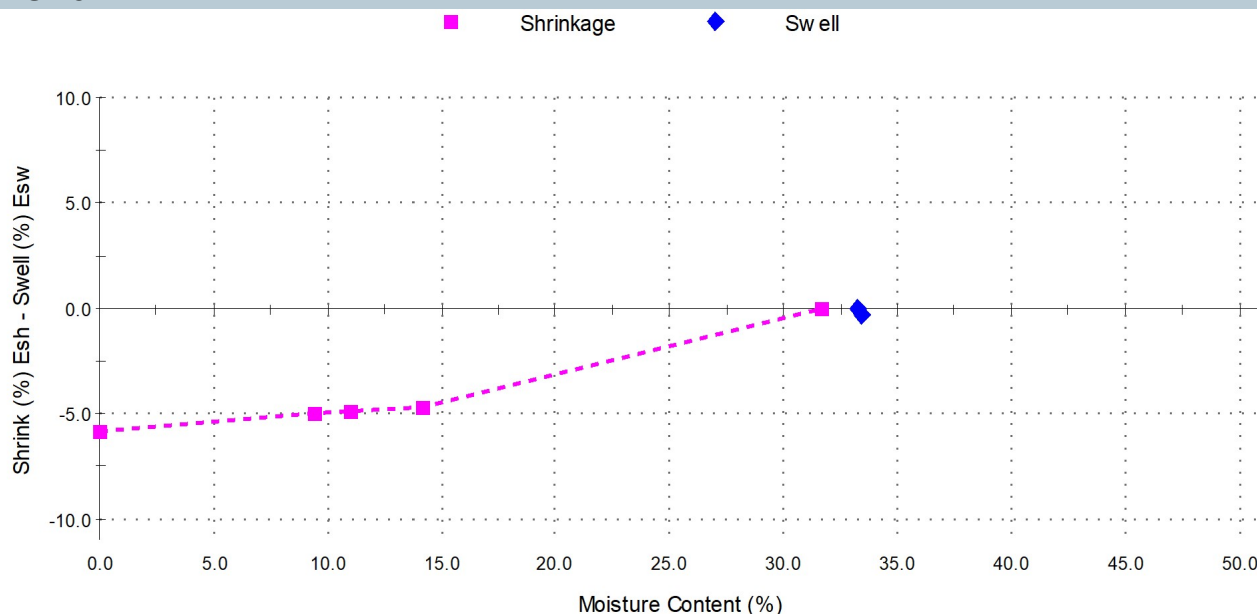
Swell Test AS 1289.7.1.1

Swell on Saturation (%):	-0.3
Moisture Content before (%):	33.3
Moisture Content after (%):	33.4
Est. Unc. Comp. Strength before (kPa):	200
Est. Unc. Comp. Strength after (kPa):	150

Shrink Test AS 1289.7.1.1

Shrink on drying (%):	5.8
Shrinkage Moisture Content (%):	31.7
Est. inert material (%):	3%
Crumbling during shrinkage:	0%
Cracking during shrinkage:	1%

Shrink Swell

**Shrink Swell Index - Iss (%): 3.2**

Comments

Not accredited
Results not IANZ Endorsed because shrinkage specimen was less than required 1.5x length to diameter ratio.
Work Order No : ETAM25W01209
Tested By: JM

Shrink Swell Index Report

Report No: SSI:ETAM25S-04191

Issue No: 1

Client: Tetra Tech Coffey (NZ) Limited- Auckland
Level 2, 88 Broadway
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.}



James McKelvey

Approved Signatory: James McKelvey
(Senior Technician)
IANZ Accredited Laboratory Number:105
Date of Issue: 6/08/2025

Sample Details

Sample ID: ETAM25S-04191

Date Sampled: 24/07/2025

Date Submitted: 25/07/2025

Date Tested: 28/07/2025

Project Location: 117 Kowhai Road, Orewa

Sample Location: Lot 143/144, 0.25 - 0.55 m

Borehole Number: -

Borehole Depth (m): 0.25 - 0.55

Sampling Method: Unknown (Not IANZ Endorsed)

Material: Undisturbed Soil

Source: In-Situ

Swell Test AS 1289.7.1.1

Swell on Saturation (%): 0.1

Moisture Content before (%): 32.3

Moisture Content after (%): 32.7

Est. Unc. Comp. Strength before (kPa): 300

Est. Unc. Comp. Strength after (kPa): 325

Shrink Test AS 1289.7.1.1

Shrink on drying (%): 6.5

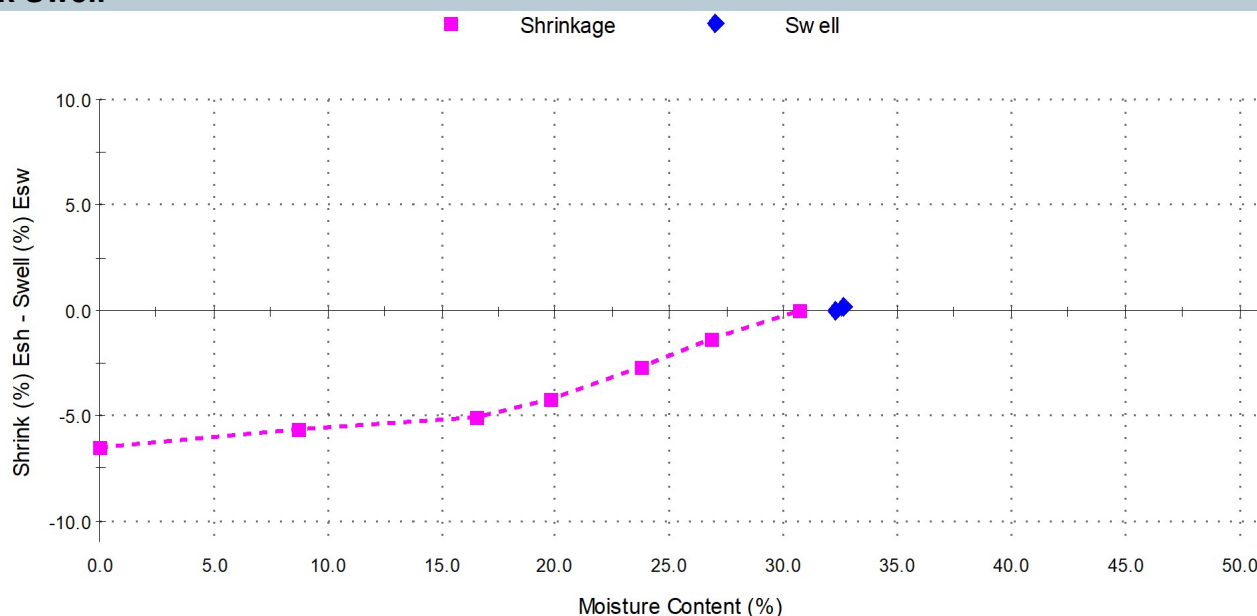
Shrinkage Moisture Content (%): 30.7

Est. inert material (%): 3%

Crumbling during shrinkage: 0%

Cracking during shrinkage: 0.5%

Shrink Swell



Shrink Swell Index - Iss (%): 3.7

Comments

Not accredited

Est. Unc. Comp. Strength readings are not IANZ Endorsed as part of this Report.

Work Order No : ETAM25W01209

Tested By: JM

Shrink Swell Index Report

Report No: SSI:ETAM25S-04192

Issue No: 1

Client: Tetra Tech Coffey (NZ) Limited- Auckland
Level 2, 88 Broadway
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.}



James McKelvey

Approved Signatory: James McKelvey
(Senior Technician)
IANZ Accredited Laboratory Number:105
Date of Issue: 6/08/2025

Sample Details

Sample ID: ETAM25S-04192

Date Sampled: 24/07/2025

Date Submitted: 25/07/2025

Date Tested: 28/07/2025

Project Location: 117 Kowhai Road, Orewa

Sample Location: Lot 146/147, 0.2 - 0.5 m

Borehole Number: -

Borehole Depth (m): 0.2 - 0.5

Sampling Method: Unknown (Not IANZ Endorsed)

Material: Undisturbed Soil

Source: In-Situ

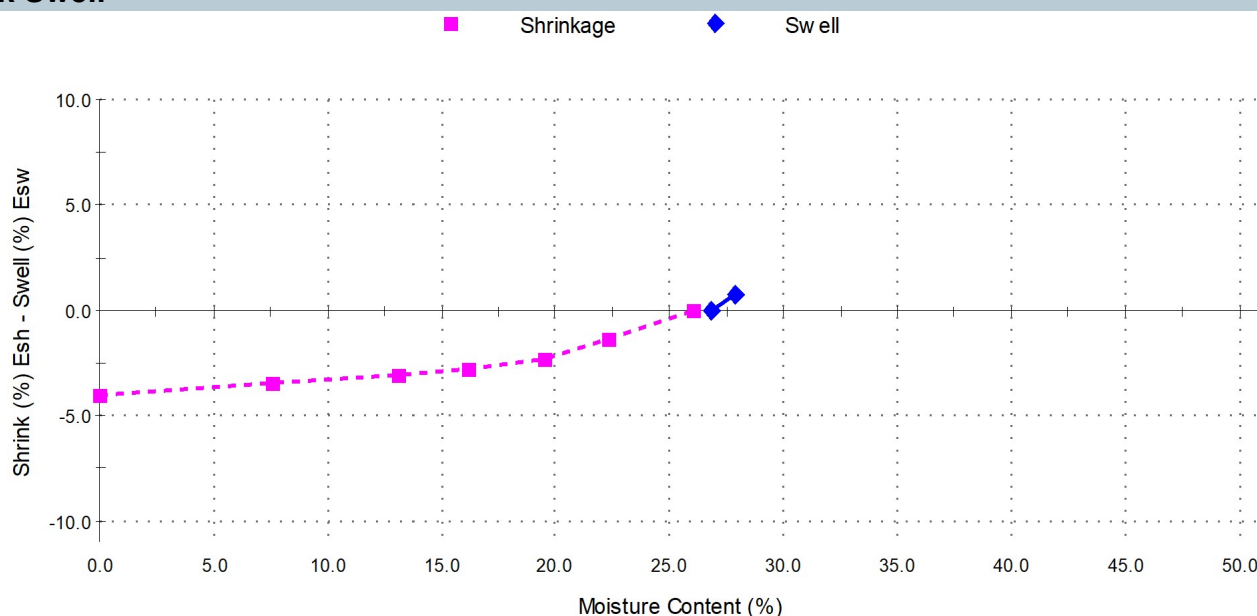
Swell Test AS 1289.7.1.1

Swell on Saturation (%): 0.7
Moisture Content before (%): 26.8
Moisture Content after (%): 27.9
Est. Unc. Comp. Strength before (kPa): 450+
Est. Unc. Comp. Strength after (kPa): 425

Shrink Test AS 1289.7.1.1

Shrink on drying (%): 4.0
Shrinkage Moisture Content (%): 26.0
Est. inert material (%): 2%
Crumbling during shrinkage: 0%
Cracking during shrinkage: 1%

Shrink Swell



Shrink Swell Index - Iss (%): 2.4

Comments

Not accredited
Est. Unc. Comp. Strength readings are not IANZ Endorsed as part of this Report.
Work Order No : ETAM25W01209
Tested By: JM

APPENDIX D: EARTHWORKS FIELD DENSITY SUMMARY SHEETS

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.
{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: 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:

Earthworks Fill Report

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

Report No: EFIL:ETAM23W00321

Issue No: 1

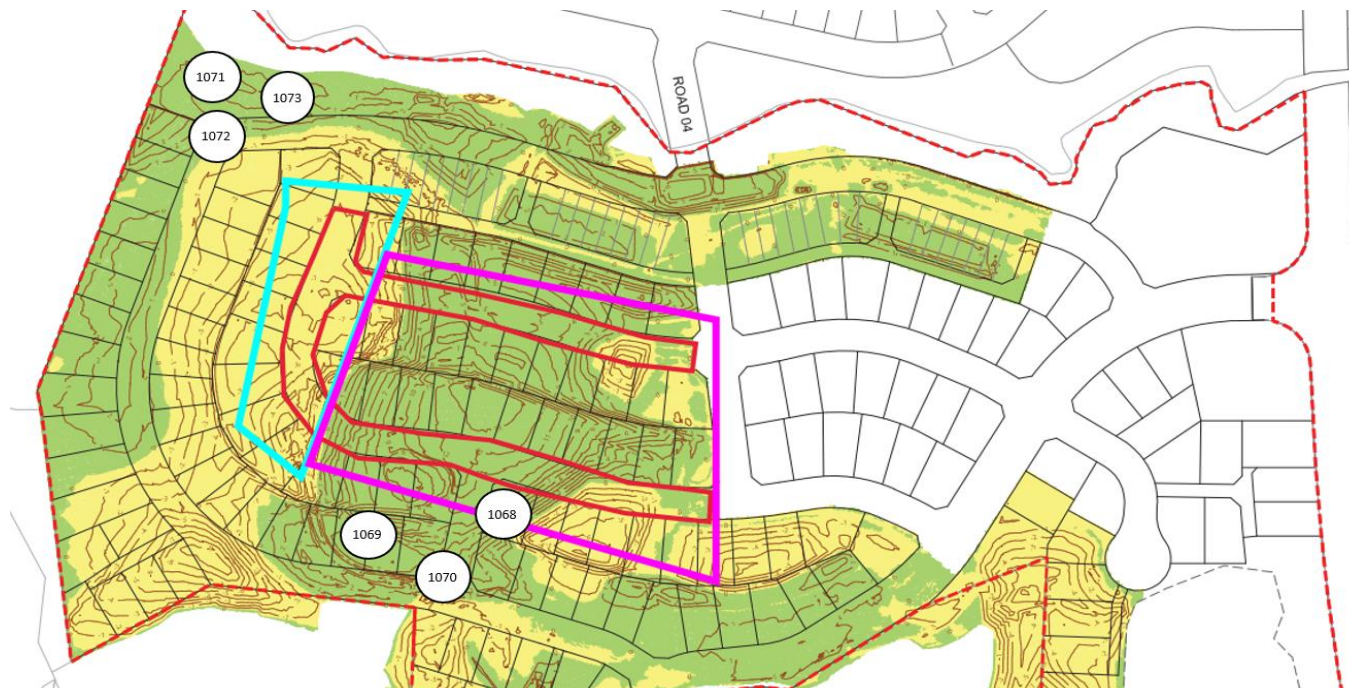
This report replaces all previous issues of report no. EFIL:ETAM23W00321



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.}

Liam Walker

Approved Signatory: Liam Walker
Assistant Manager
IANZ Site Number: 105
Date of Issue: 10/03/2023



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.
{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

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:

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



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: 17/03/2023

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:

Earthworks Fill Report

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

Report No: EFIL:ETAM23W00417

Issue No: 1

This report replaces all previous issues of report no. EFIL:ETAM23W00417



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.}

E. Paton

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 17/03/2023



SITE PLAN (NOT TO SCALE)

Earthworks Fill Report

Report No: EFIL:ETAM23W02071
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W02071

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
Laboratory Supervisor
IANZ Site Number: 105
Date of Issue: 15/12/2023

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
12/12/2023	ETAM23W02071	RP	1219	1.93	27.1	1.52	2.65	2	UTP	UTP	UTP	UTP	Western Fill Area	1748845	5948963	30.5	Silty CLAY	-
12/12/2023	ETAM23W02071	RP	1220	1.88	28.1	1.47	2.65	3	197+	197+	197+	171	Western Fill Area	1748853	5948989	27.5	Silty CLAY	-
12/12/2023	ETAM23W02071	RP	1221	1.88	28.4	1.47	2.65	3	197+	197+	197+	175	Fill Area	1749019	5948879	36.7	Silty CLAY	-
12/12/2023	ETAM23W02071	RP	1222	1.85	26.4	1.47	2.65	6	UTP	UTP	UTP	UTP	Fill Area	1748996	5948877	35.6	Silty CLAY	-

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.

Earthworks Fill Test Report NZ

Auckland Laboratory

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

Report No: EFIL:ETAM23W02071

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.}

[Signature]

Approved Signatory: Cesar Pura
(Laboratory Supervisor)
IANZ Accredited Laboratory Number:105
Date of Issue: 15/12/2023

SITE PLAN

* NOT TO SCALE *

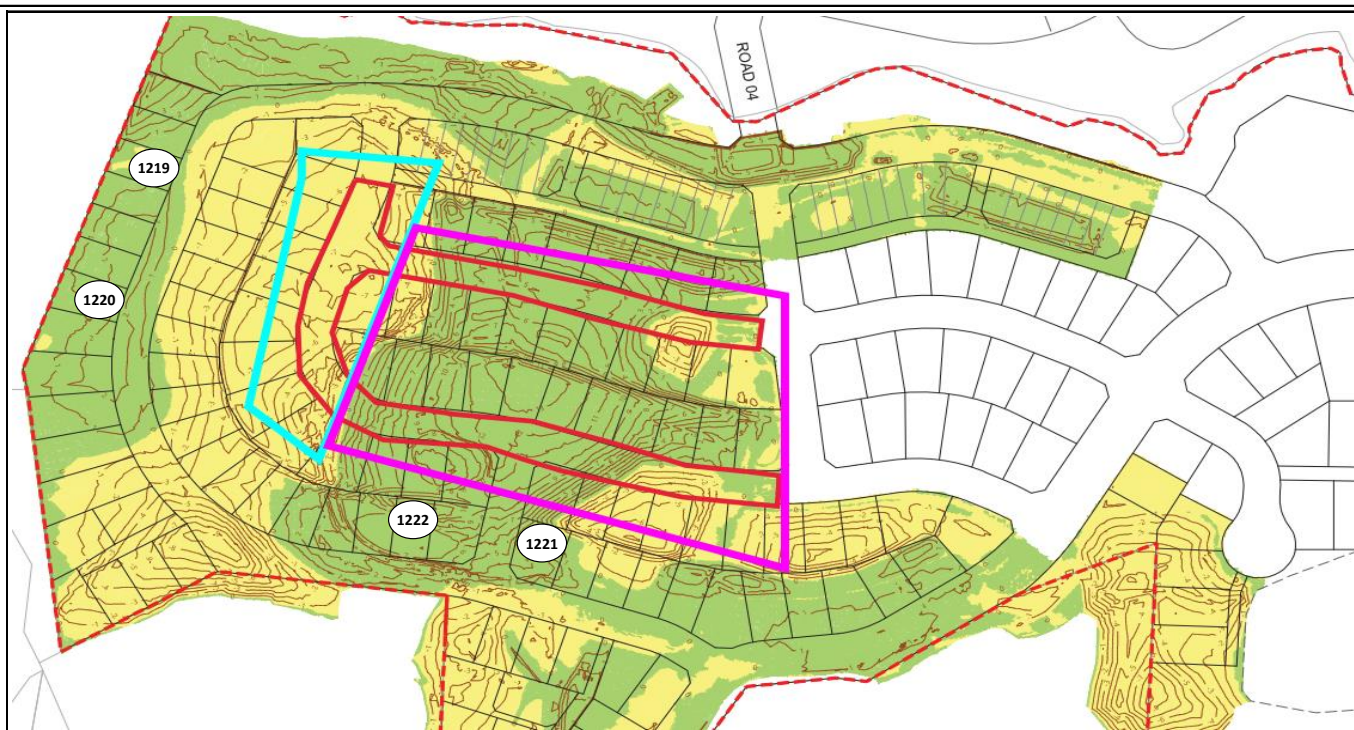
Work Order No: ETAMW02071

Page No: 2 of 2

Location: Western Area + Gully (see below)

Tested by: RP

Date Tested: 12/12/2023



SITE PLAN * NOT TO SCALE *

Earthworks Fill Report

Report No: EFIL:ETAM23W02091
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W02091

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: 20/12/2023

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
14/12/2023	ETAM23W02091	RP	1223	1.87	29.6	1.44	2.65	2.8	UTP	UTP	UTP	162	Western Fill Area	1748870	5949017	-	Silty CLAY	RL not available
14/12/2023	ETAM23W02091	RP	1224	1.88	28.0	1.47	2.65	3.4	UTP	UTP	UTP	UTP	Western Fill Area	1748848	5948980	-	Silty CLAY	RL not available
14/12/2023	ETAM23W02091	RP	1225	1.85	32.7	1.39	2.65	1.9	175	188	UTP	UTP	Road Undercut	1748923	5948841	-	Silty CLAY	RL not available
14/12/2023	ETAM23W02091	RP	1226	1.86	30.7	1.42	2.65	2.7	UTP	UTP	UTP	UTP	Road Undercut	1748900	5948852	-	Silty CLAY	RL not available
14/12/2023	ETAM23W02091	RP	1227	1.85	32.6	1.40	2.65	1.9	UTP	UTP	UTP	UTP	Road Undercut	1748877	5948870	-	Silty CLAY	RL not available
14/12/2023	ETAM23W02091	RP	1228	1.91	33.4	1.43	2.65	0.0	UTP	UTP	UTP	196	Gully	1749004	5948881	-	Silty CLAY	RL not available
14/12/2023	ETAM23W02091	RP	1229	1.86	33.7	1.39	2.65	0.5	UTP	UTP	UTP	UTP	Gully	1749028	5948857	-	Silty CLAY	RL not available

Comments:

Earthworks Fill Test Report NZ

Auckland Laboratory

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

Report No: EFIL:ETAM23W02091

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.}

Liam Walker

Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 20/12/2023

SITE PLAN

* NOT TO SCALE *

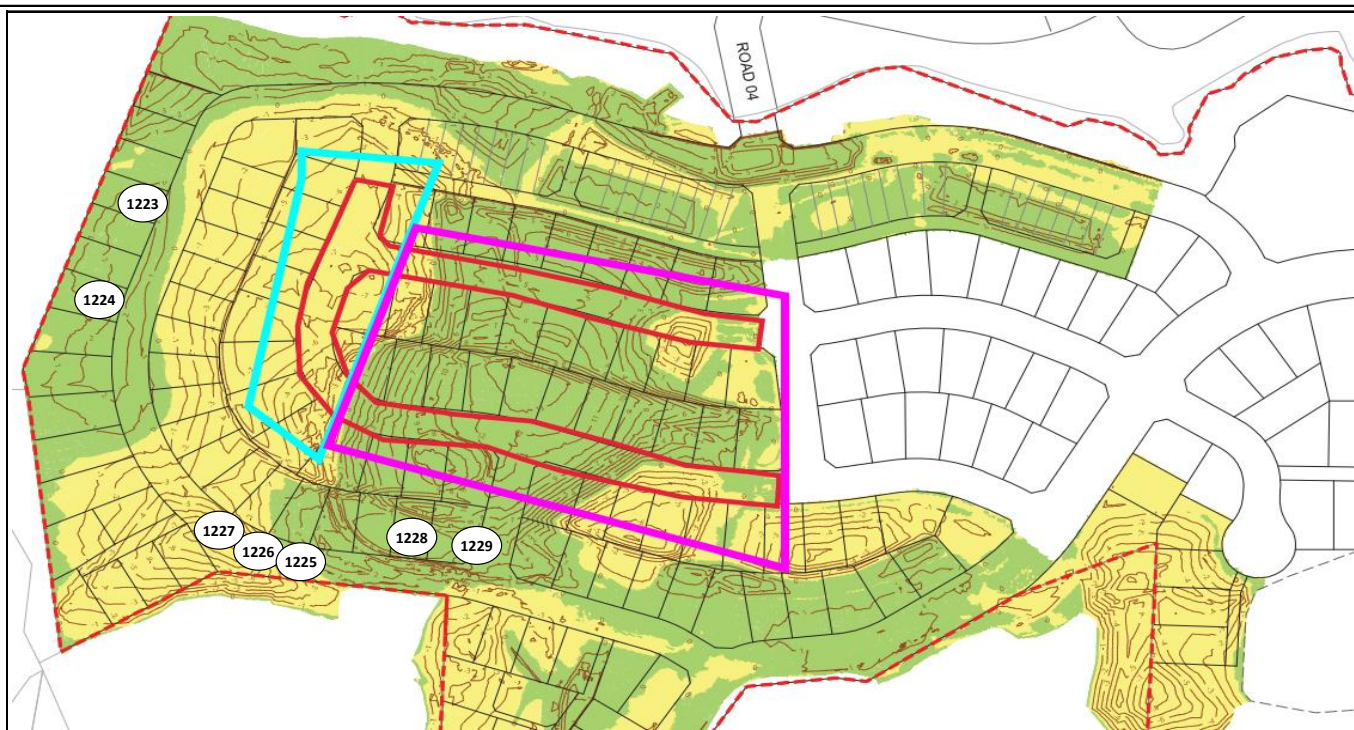
Work Order No: ETAMW02091

Page No: 2 of 2

Location: Western Area + Gully (see below)

Tested by: RP

Date Tested: 14/12/2023



SITE PLAN * NOT TO SCALE *

Earthworks Fill Report

Report No: EFIL:ETAM24W00027
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00027

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: 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
12/01/2024	ETAM24W00027	RP	1251	1.83	28.3	1.42	2.65	5.9	UTP	UTP	UTP	UTP	Fill Area (refer to plan)	1748977	5948869	-	Silty CLAY	RL not available
12/01/2024	ETAM24W00027	RP	1252	1.86	28.1	1.45	2.65	4.4	168	198+	198+	198+	Fill Area (refer to plan)	1749020	5948839	-	Silty CLAY	RL not available
12/01/2024	ETAM24W00027	RP	1253	1.81	35.7	1.34	2.65	1.8	UTP	UTP	UTP	UTP	Fill Area (refer to plan)	1749017	5948873	-	Silty CLAY	RL not available

Comments:



Earthworks Fill Test Report NZ

Auckland Laboratory

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

Report No: EFIL:ETAM24W00027

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: 19/01/2024

SITE PLAN

* NOT TO SCALE *

Work Order No: ETAM24W00027

Page No: 2 of 2

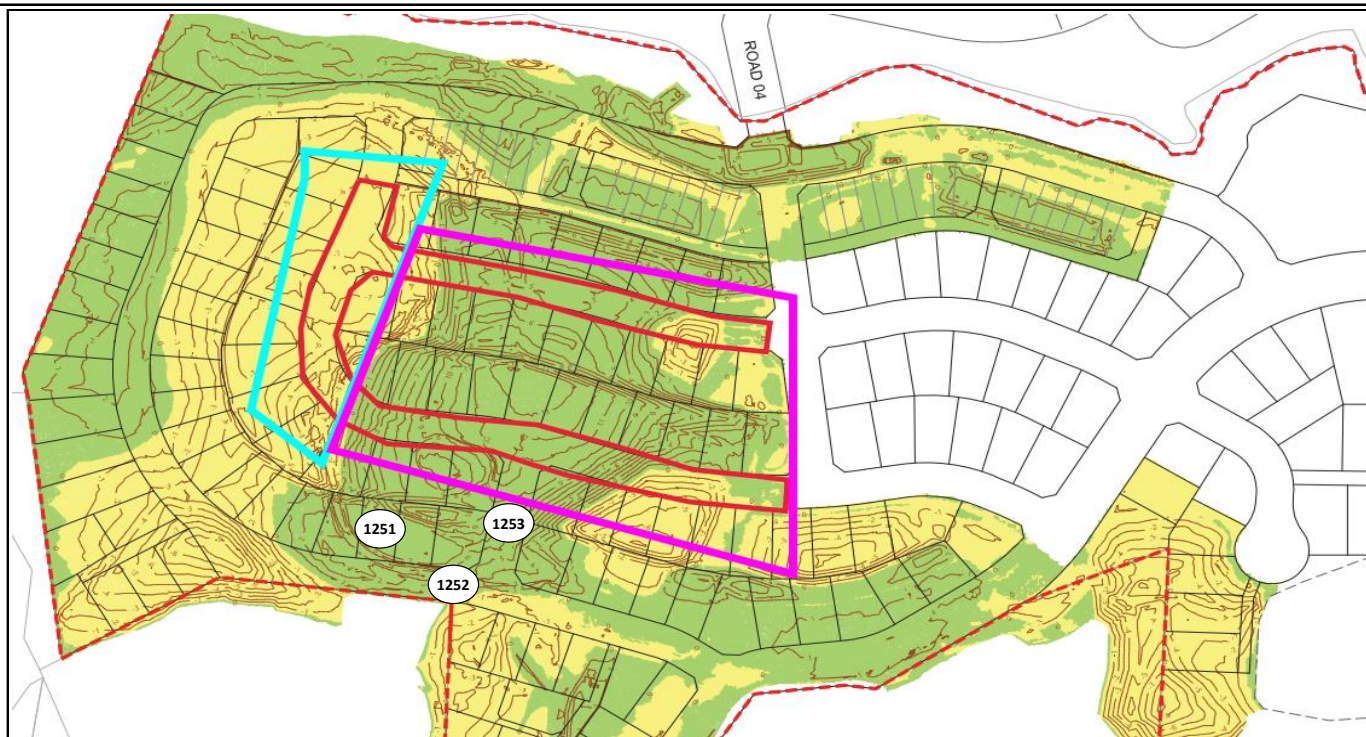
Location: Gully 2

Tested by:

RP

Date Tested:

11/01/2024



SITE PLAN * NOT TO SCALE *

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



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: 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:



Earthworks Fill Test Report NZ

Auckland Laboratory

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

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:**



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: 19/01/2024

SITE PLAN

* NOT TO SCALE *

Work Order No: ETAM24W00042

Page No: 2 of 2

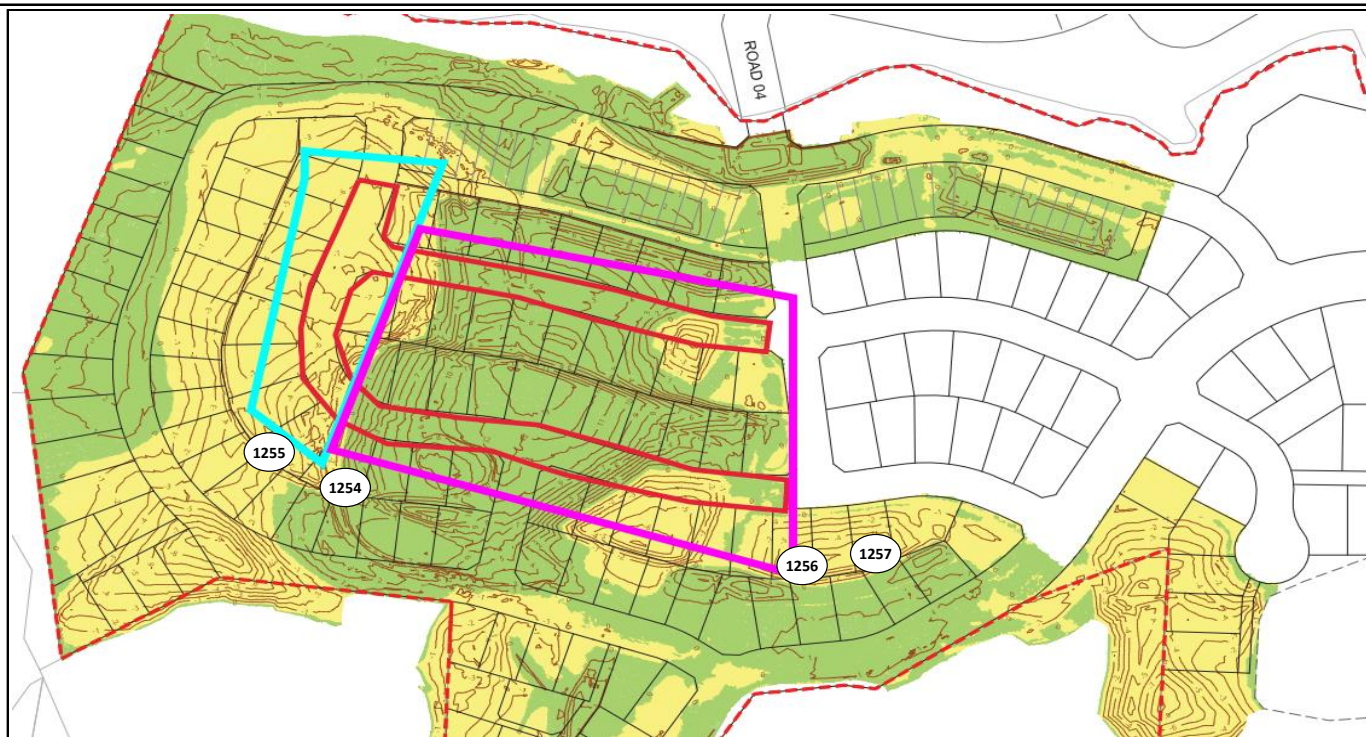
Location: RE Wall 603 - 602

Tested by:

RP

Date Tested:

15/01/2024



SITE PLAN * NOT TO SCALE *

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



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: 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:



Earthworks Fill Test Report NZ

Auckland Laboratory

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

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:**



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: 19/01/2024

SITE PLAN

* NOT TO SCALE *

Work Order No: ETAM24W00044

Page No: 2 of 2

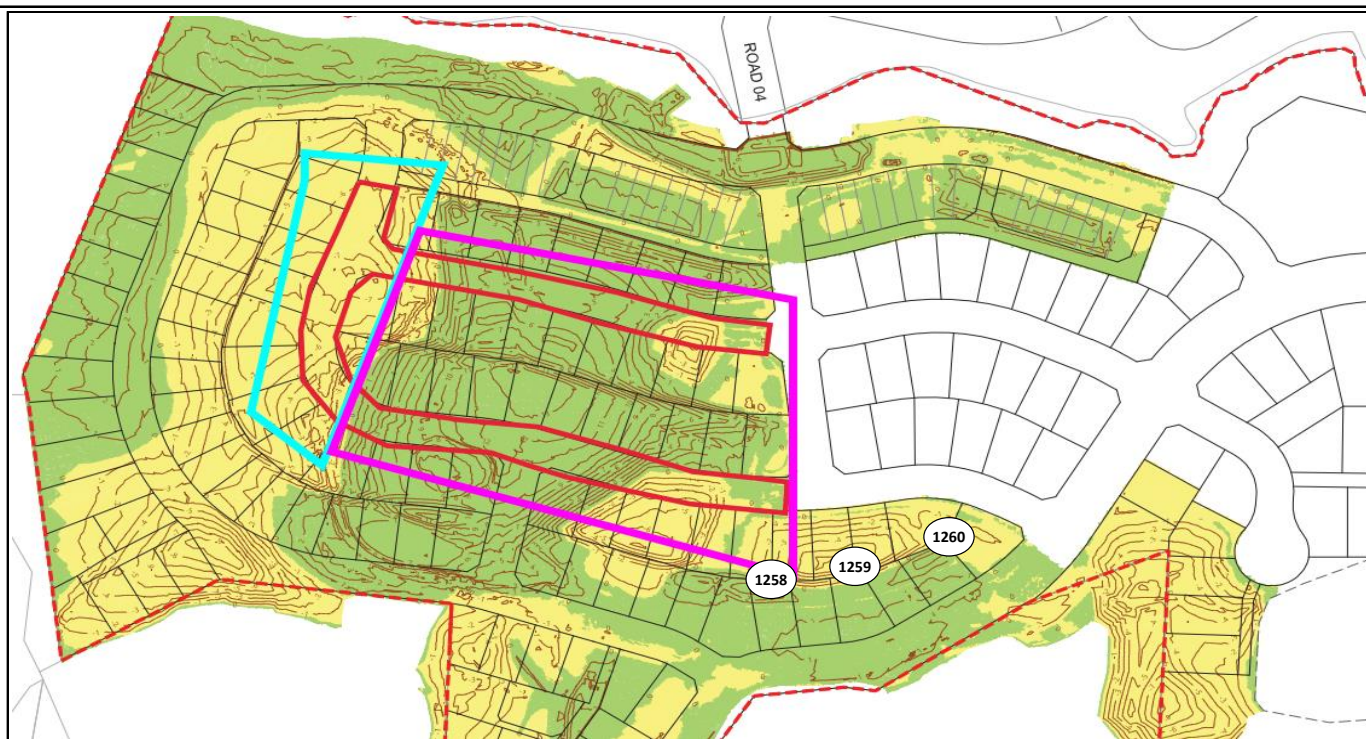
Location: RE Wall 602

Tested by:

RP

Date Tested:

16/01/2024



SITE PLAN * NOT TO SCALE *

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



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: 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:

Earthworks Fill Test Report NZ

Auckland Laboratory

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

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.}

Liam Walker

Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 25/01/2024

SITE PLAN

* NOT TO SCALE *

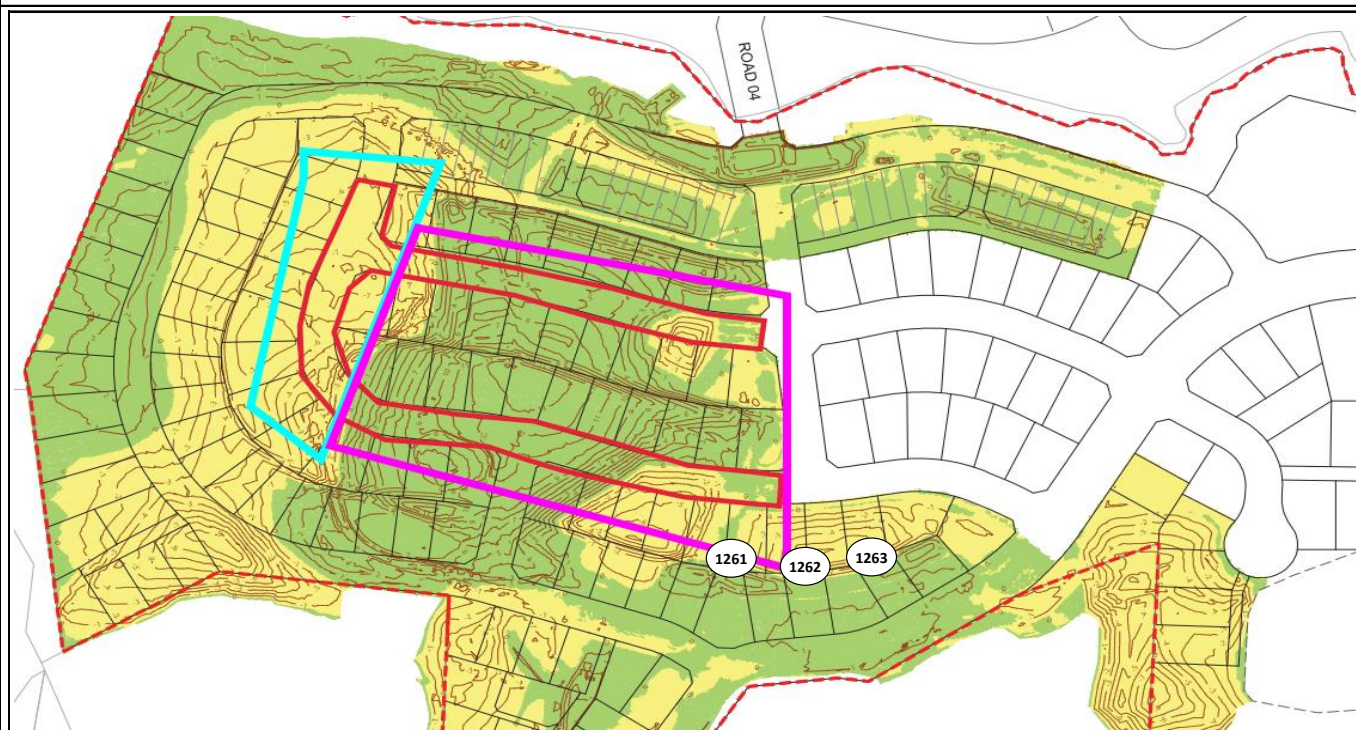
Work Order No: ETAM24W00049

Page No: 2 of 2

Location: RE Wall 602

Tested by: RP

Date Tested: 17/01/2024



SITE PLAN * NOT TO SCALE *

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



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: 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:



Earthworks Fill Test Report NZ

Auckland Laboratory

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

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:**



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 *

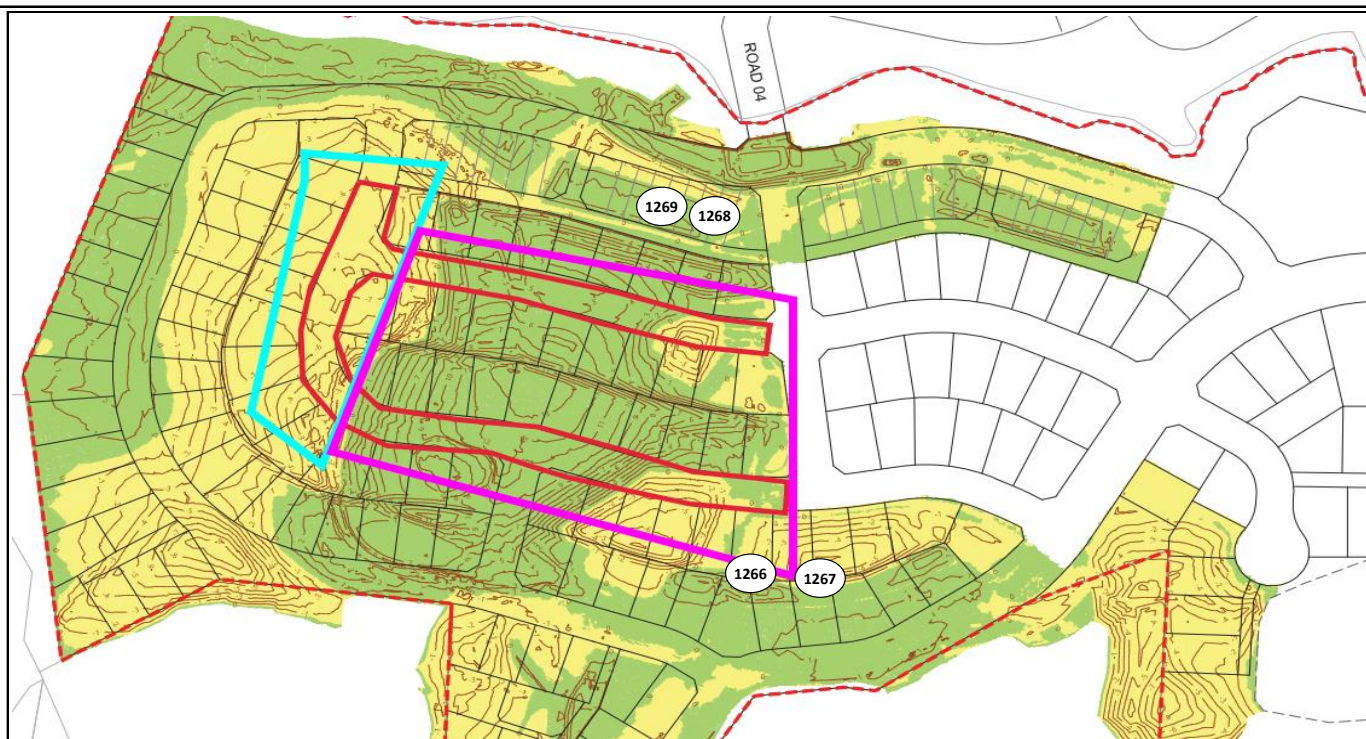
Work Order No: ETAM24W00067

Page No: 2 of 2

Location: RE Wall 602 + Silt Pond

Tested by: RP

Date Tested: 19/01/2024



SITE PLAN * NOT TO SCALE *

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



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: 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:



Earthworks Fill Test Report NZ

Auckland Laboratory

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

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.}



Liam Walker

Approved Signatory: Liam Walker
(Assistant Manager)

IANZ Accredited Laboratory Number:105
Date of Issue: 26/01/2024

SITE PLAN

* NOT TO SCALE *

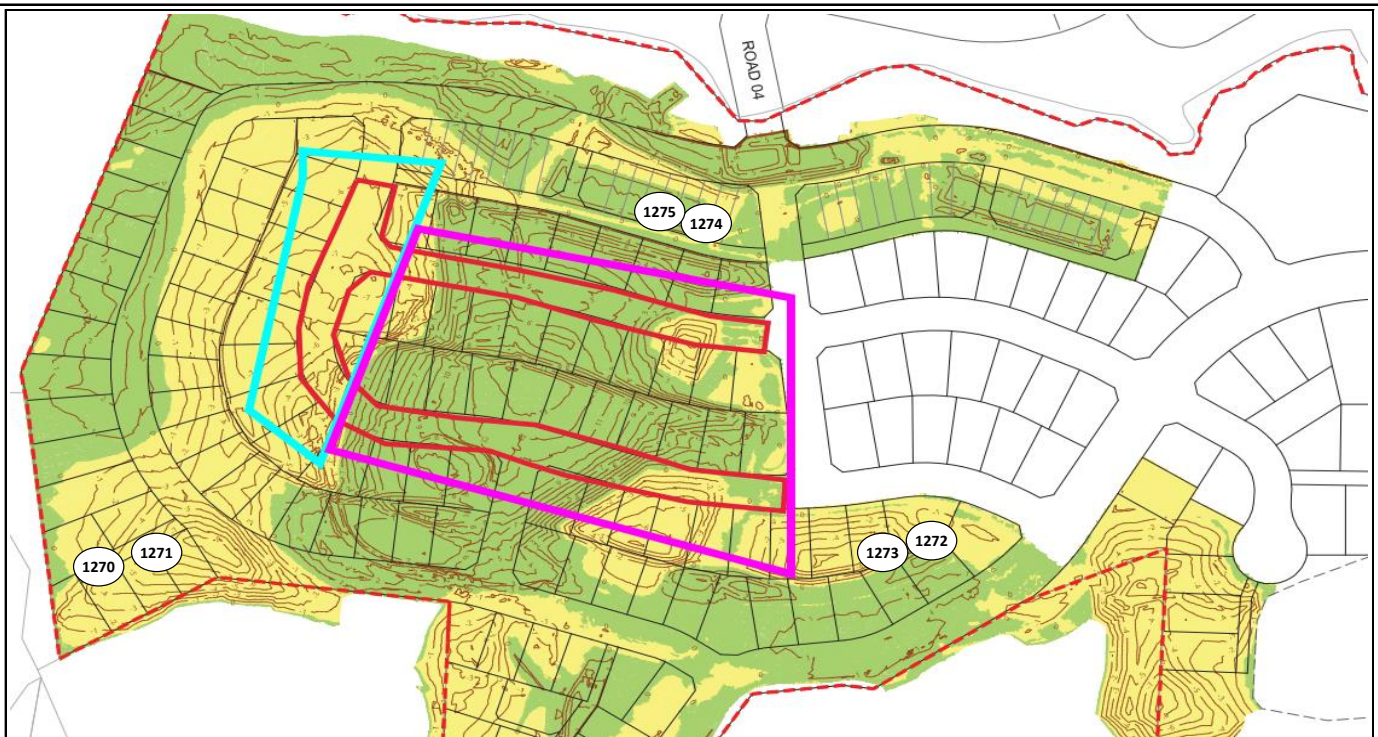
Work Order No: ETAM24W00074

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 *

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



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: 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 available
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 available

Comments:

Earthworks Fill Test Report NZ

Auckland Laboratory

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

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:**

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.}



Liam Walker

Approved Signatory: Liam Walker
(Assistant Manager)

IANZ Accredited Laboratory Number:105
Date of Issue: 26/01/2024

SITE PLAN

* NOT TO SCALE *

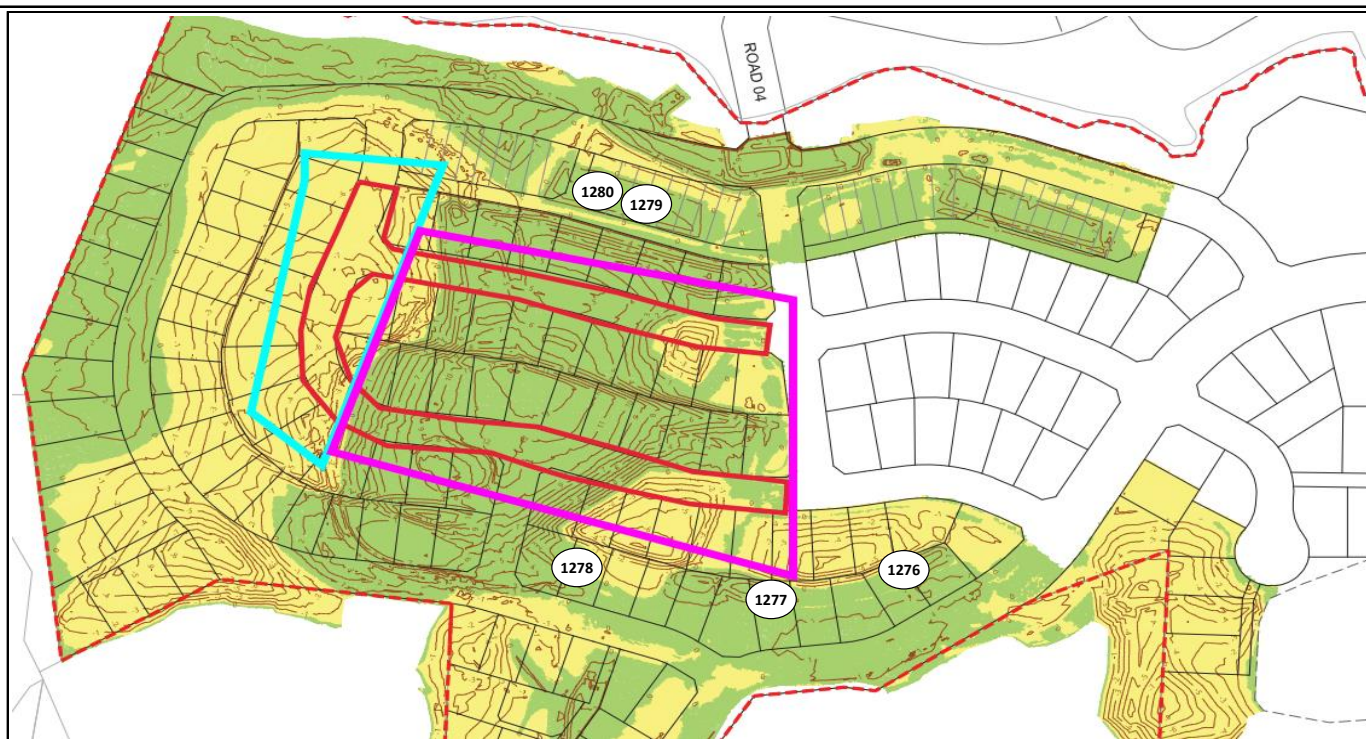
Work Order No: ETAM24W00083

Page No: 2 of 2

Location: Gully + Silt Pond

Tested by: SC

Date Tested: 23/01/2024



SITE PLAN * NOT TO SCALE *

Earthworks Fill Report

Report No: EFIL:ETAM24W00109
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00109

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: 7/02/2024

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
30/01/2024	ETAM24W00109	SC	1298	1.88	27.9	1.47	2.65	3.5	159	159	188	188	Fill Area (refer to plan)	1749041	5948844	-	Silty CLAY	RL not available
30/01/2024	ETAM24W00109	SC	1299	1.94	27.8	1.52	2.65	0.3	177	177	175	175	RE Wall 602	1749095	5948835	38.00	Silty CLAY	-
30/01/2024	ETAM24W00109	SC	1300	1.92	27.2	1.51	2.65	1.8	175	188	185	159	RE Wall 602	1749119	5948826	38.00	Silty CLAY	-
30/01/2024	ETAM24W00109	SC	1301	1.86	27.4	1.46	2.65	4.9	159	159	171	171	RE Wall 602	1749150	5948824	38.00	Silty CLAY	-
30/01/2024	ETAM24W00109	SC	1302	1.68	40.2	1.20	2.65	6.4	95	114	111	102	Wastewater Line K to L	1748925	5949061	18.69	Silty CLAY	-

Comments:



Earthworks Fill Test Report NZ

Auckland Laboratory

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

Report No: EFIL:ETAM24W00109

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.}



W. Walker

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: ETAM24W00109

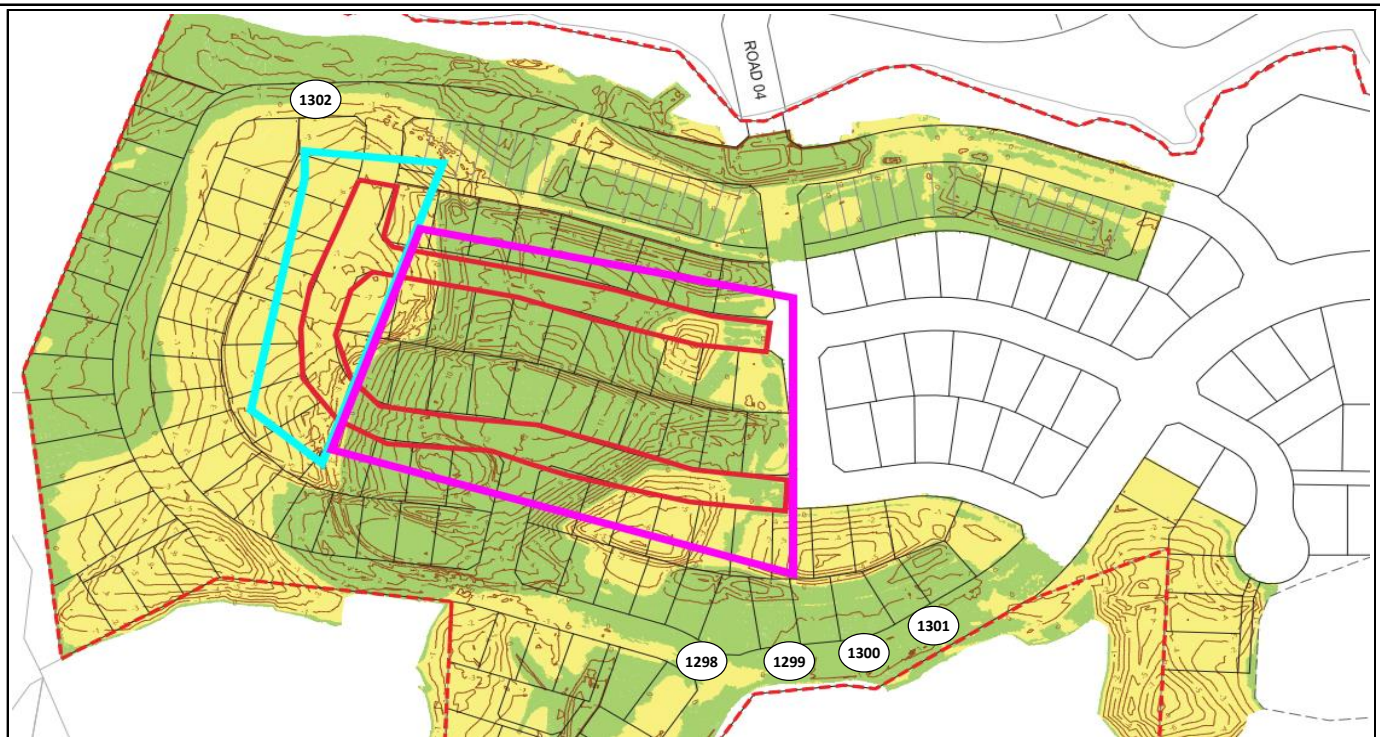
Page No:

2 of 2

Location: Fill Areas + RE Wall 602 + Wastewater Line K to L

Tested by: SC

Date Tested: 30/01/2024



SITE PLAN * NOT TO SCALE *

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



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: 7/02/2024

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:

Earthworks Fill Test Report NZ

Auckland Laboratory

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

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.}



Liam Walker

Approved Signatory: Liam Walker
(Assistant Manager)

IANZ Accredited Laboratory Number:105
Date of Issue: 7/02/2024

SITE PLAN

* NOT TO SCALE *

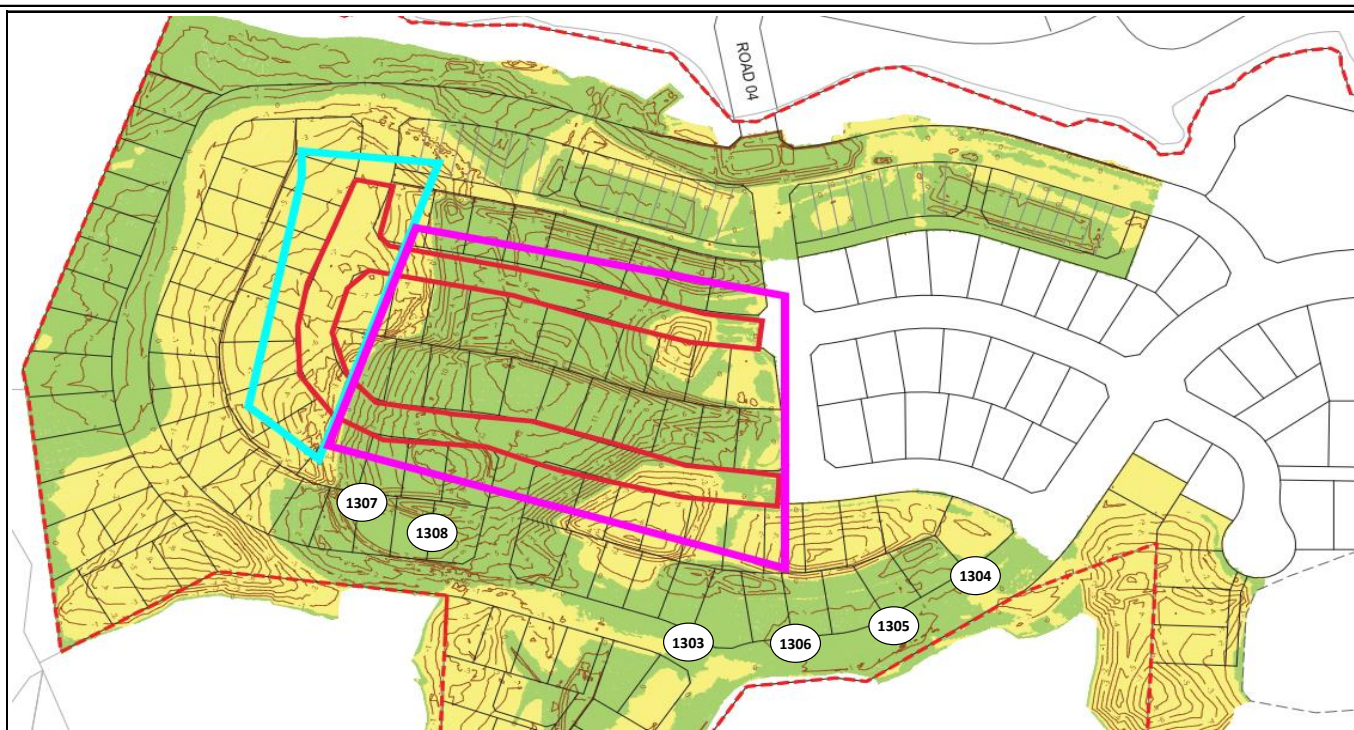
Work Order No: ETAM24W00127

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 *

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



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: 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	-

Comments:

Earthworks Fill Test Report NZ

Auckland Laboratory

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

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.}

Liam Walker

Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 12/02/2024

SITE PLAN

* NOT TO SCALE *

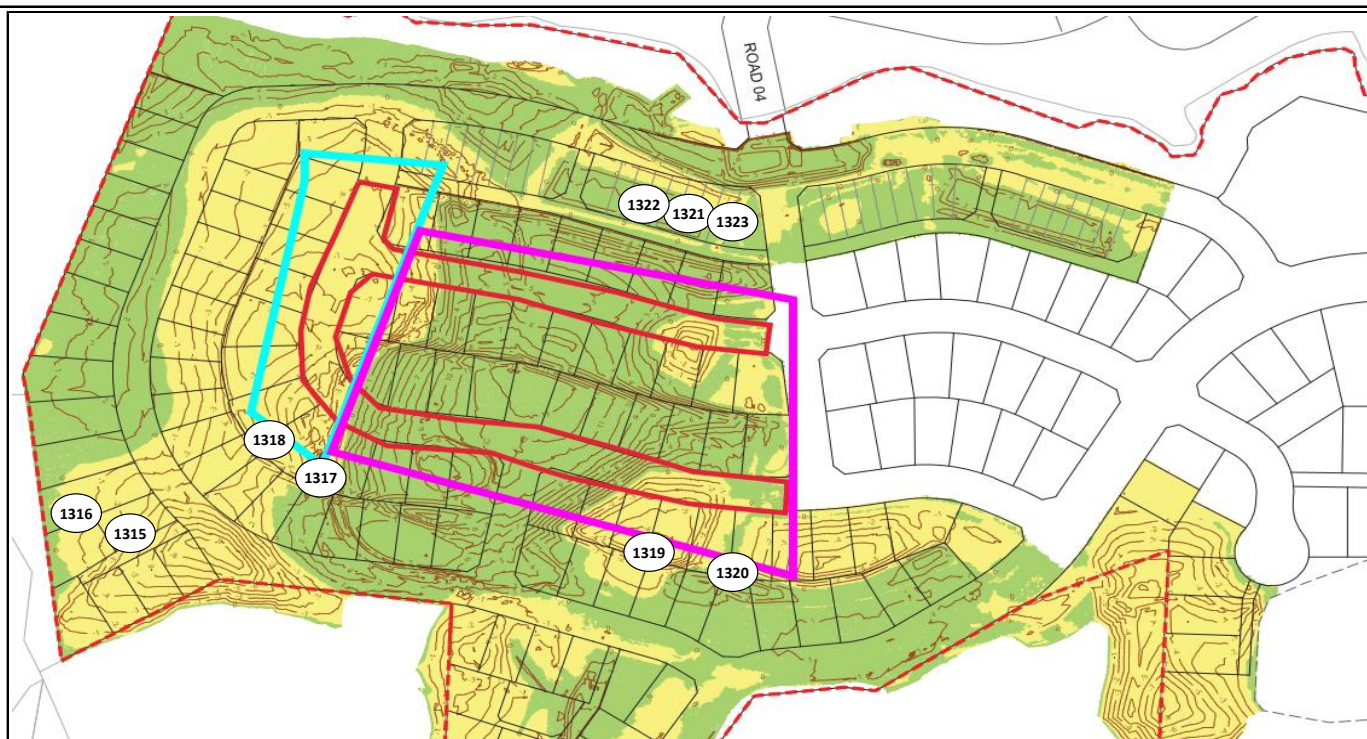
Work Order No: ETAM24W00146

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 *

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



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: 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:



Earthworks Fill Test Report NZ

Auckland Laboratory

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

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.}



W. Walker

Approved Signatory: Liam Walker
(Assistant Manager)

IANZ Accredited Laboratory Number:105
Date of Issue: 13/02/2024

SITE PLAN

* NOT TO SCALE *

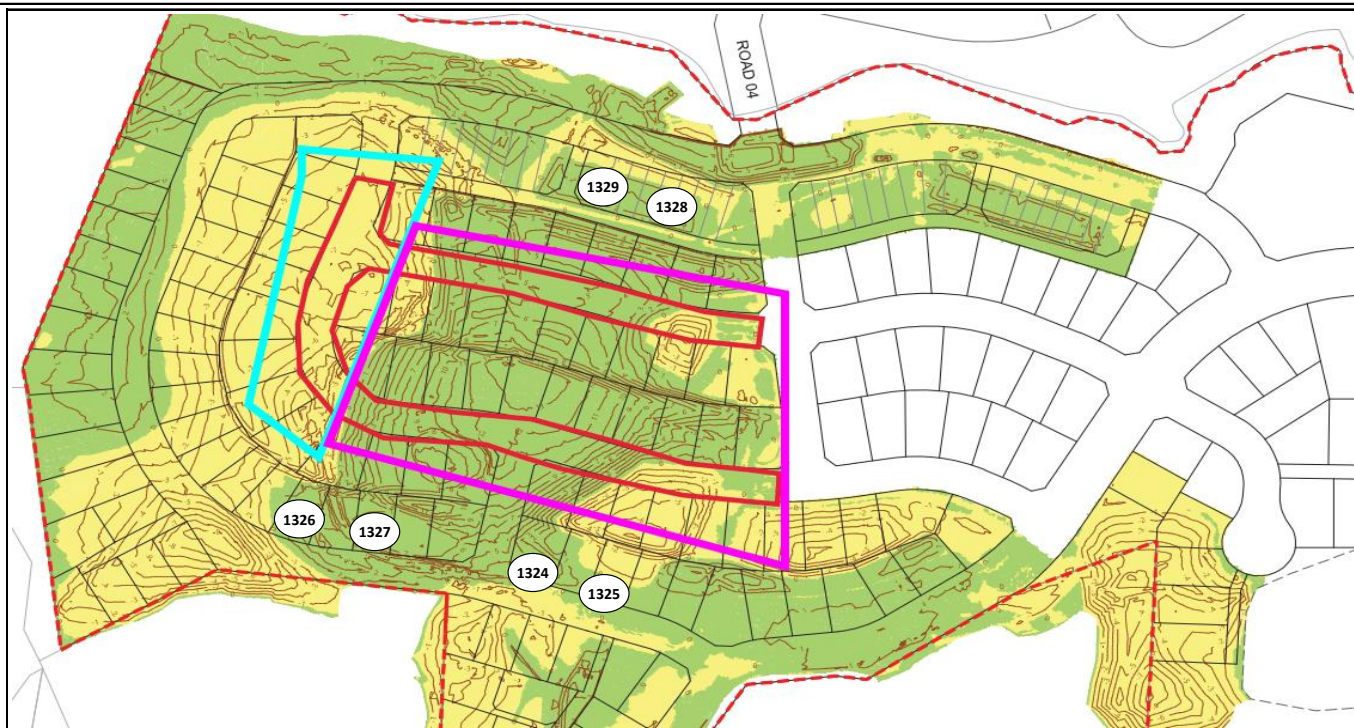
Work Order No: ETAM24W00172

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 *

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



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: 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:

Earthworks Fill Test Report NZ

Auckland Laboratory

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

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.}

W. Walker

Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 13/02/2024

SITE PLAN

* NOT TO SCALE *

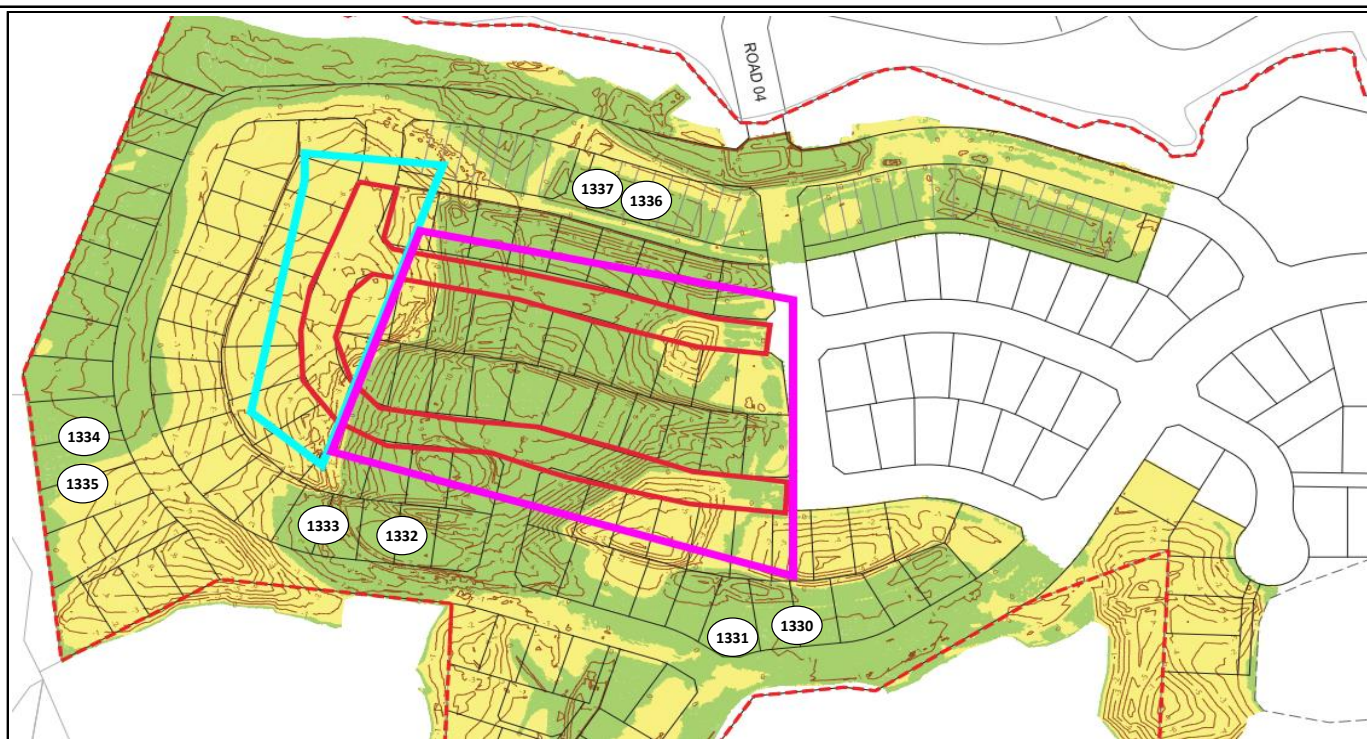
Work Order No: ETAM24W00179

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 *

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:



Earthworks Fill Test Report NZ

Auckland Laboratory

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

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:**



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.}

E. Paton

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

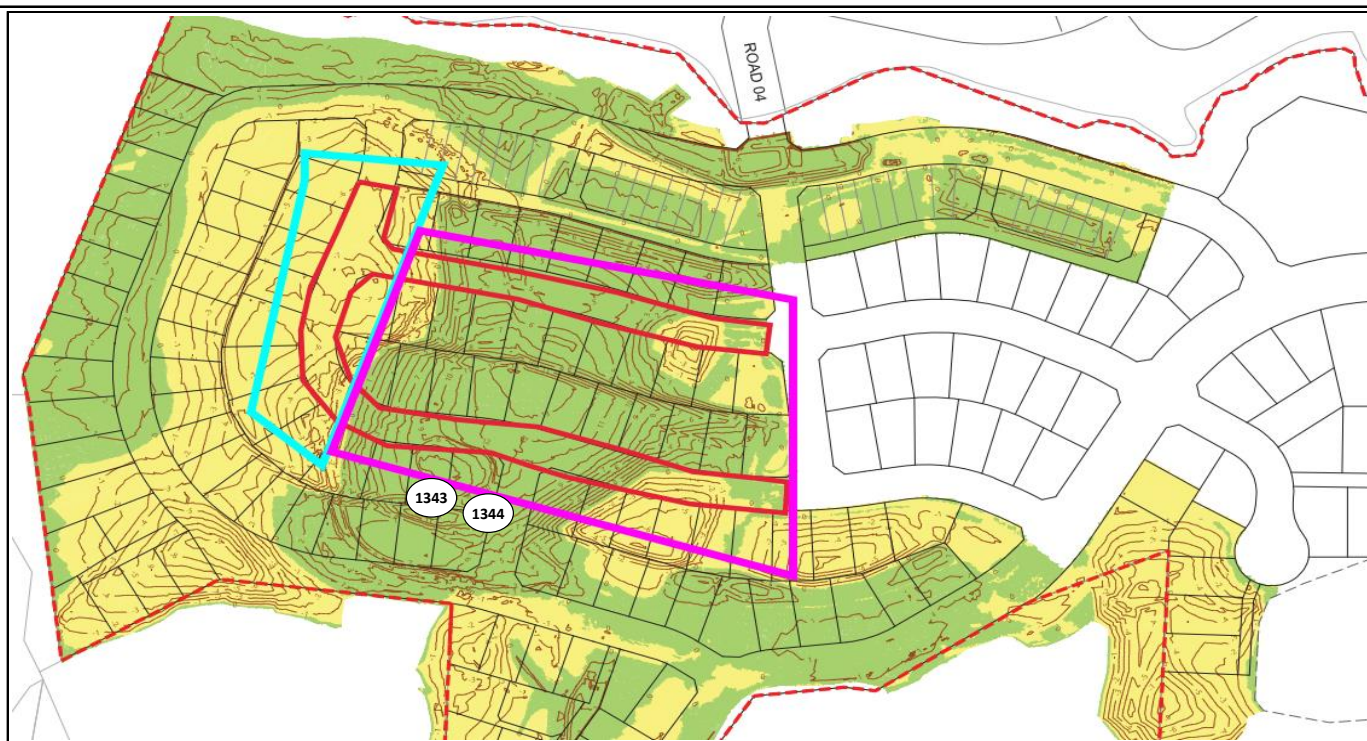
Location: Gully 2

Tested by:

LW

Date Tested:

12/02/2024



SITE PLAN * NOT TO SCALE *

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



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: 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:

Earthworks Fill Test Report NZ

Auckland Laboratory

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

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.
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

Liam Walker

Approved Signatory: Liam Walker
(Assistant Manager)
IANZ Accredited Laboratory Number:105
Date of Issue: 27/02/2024

SITE PLAN

* NOT TO SCALE *

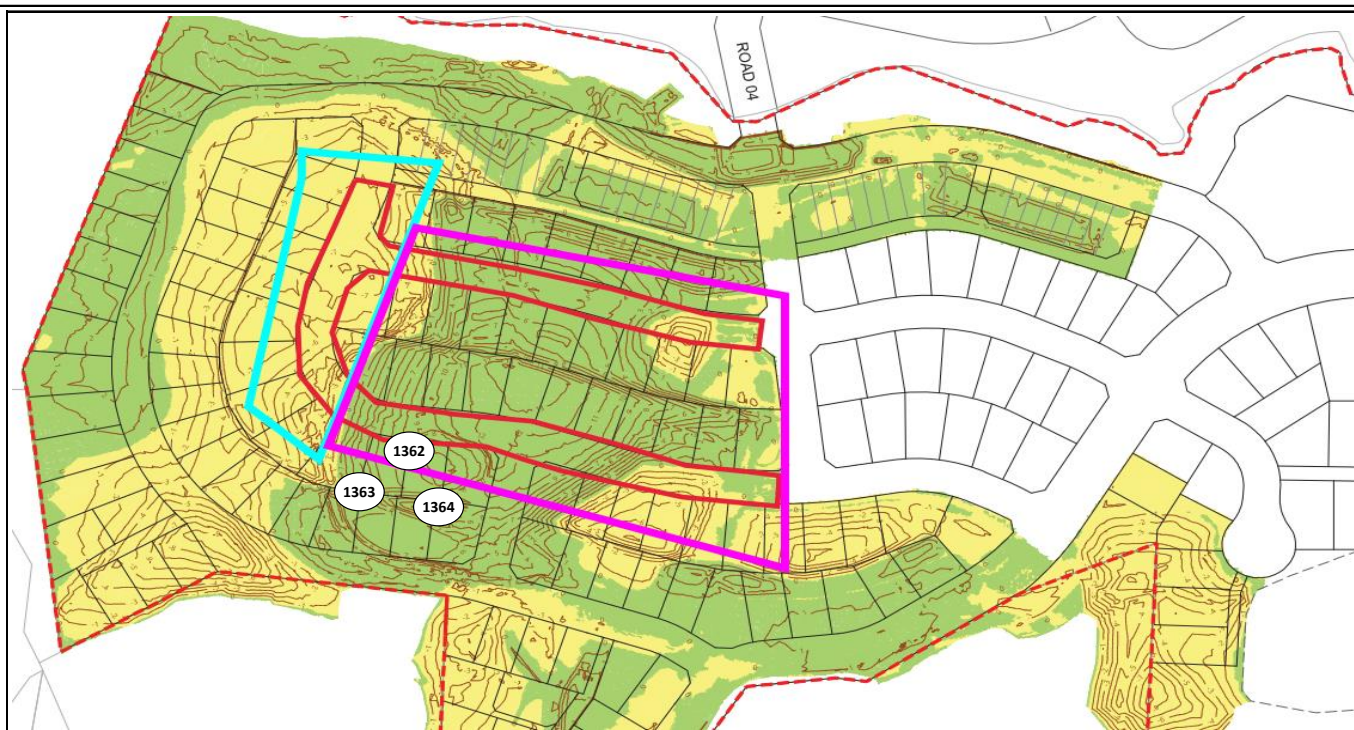
Work Order No: ETAM24W00301

Page No: 2 of 2

Location: Gully 2

Tested by: LW

Date Tested: 22/02/2024



SITE PLAN * NOT TO SCALE *



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



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: 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



Earthworks Fill Test Report NZ

Auckland Laboratory

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

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.}

E. Paton

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

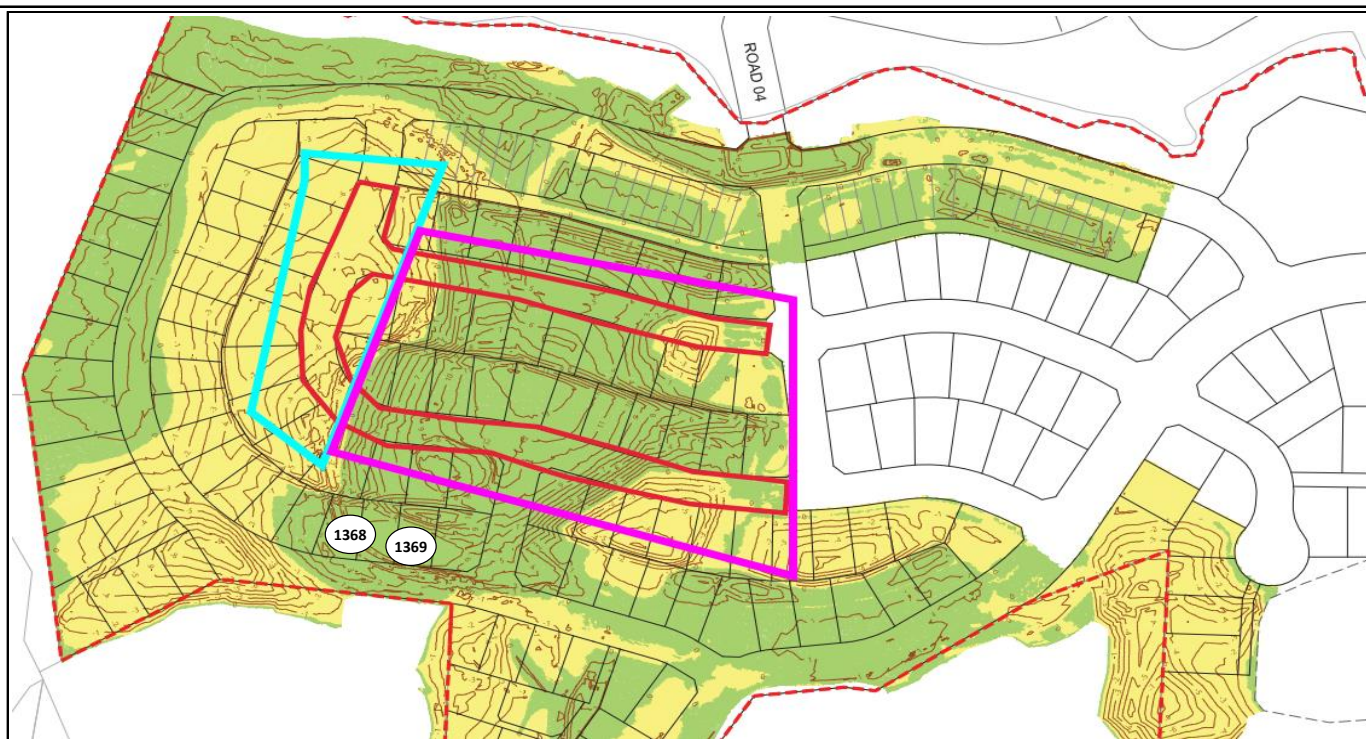
Location: Gully 2

Tested by:

LW

Date Tested:

7/03/2024



SITE PLAN * NOT TO SCALE *

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

Project Number: 773-ETAM01553

Project Name: 773-AKLGE206639 - MILLWATER PRECINCT 6K, OREWA

Test Location 117 Kowhai Road, Orewa

Lot No.: **TRN:**
Date Tested: 22/01/24
Tested by: Ramon Powell

Layer Tested:
Material Tested: Silty CLAY *
Sample Number: ETAM24S-00248
Work Order No.: ETAM24W00071

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

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.

Shear Vane Test Report NZ

Auckland Laboratory

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

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:**

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.}



Liam Walker

Approved Signatory: Liam Walker
(Assistant Manager)

IANZ Accredited Laboratory Number:105
Date of Issue: 25/01/2024

SITE PLAN

* NOT TO SCALE *

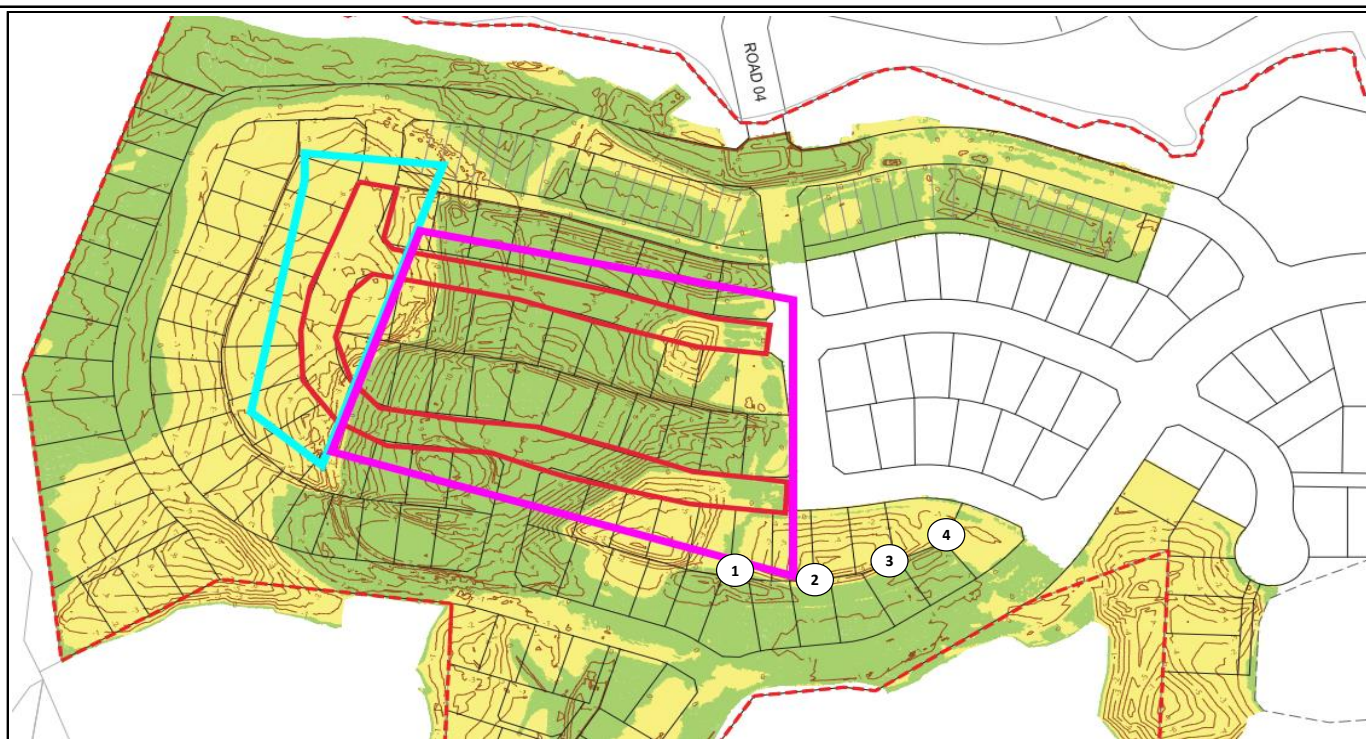
Work Order No: ETAM24W00071

Page No:

2 of 2

Location: RE Wall 602
(Shear Vanes)

Tested by: RP
Date Tested: 18/01/2024



SITE PLAN * NOT TO SCALE *

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 All tests reported herein have been performed in accordance with the laboratory's scope of accreditation Approved Signatory: Cesar Pura Issue date: 4/02/2020										
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 (%)
31/01/2020	20W00230	MP	108	Fill	CLAY	Shearkey	1749264	5949039	5.50	150		UTP	UTP	202+	202+	1.90	32.2	1.44	2.70	0
31/01/2020	20W00230	MP	109	Fill	CLAY	Shearkey	1749251	5949042	7.00	150		185	162	150	150	1.81	36.4	1.33	2.70	2
31/01/2020	20W00230	MP	110	Fill	CLAY	Gully 1	1749161	5948951	19.04	150		150	150	150	185	1.80	34.0	1.35	2.70	4
31/01/2020	20W00230	MP	111	Fill	CLAY	Gully 1	1749192	5948974	17.80	150		150	150	150	138	1.82	38.0	1.32	2.70	1
31/01/2020	20W00230	MP	112	Fill	CLAY	Undercut	1749450	5948854	20.00	150		202	202	202	202	1.83	30.6	1.40	2.70	5
31/01/2020	20W00230	MP	113	Fill	CLAY	Undercut	1749448	5948873	20.00	150		150	150	162	162	1.84	33.6	1.37	2.70	3

SITE PLAN

NOT TO SCALE

Project No: 773-ETAM00991AA

Work Order No: ETAM20W00230

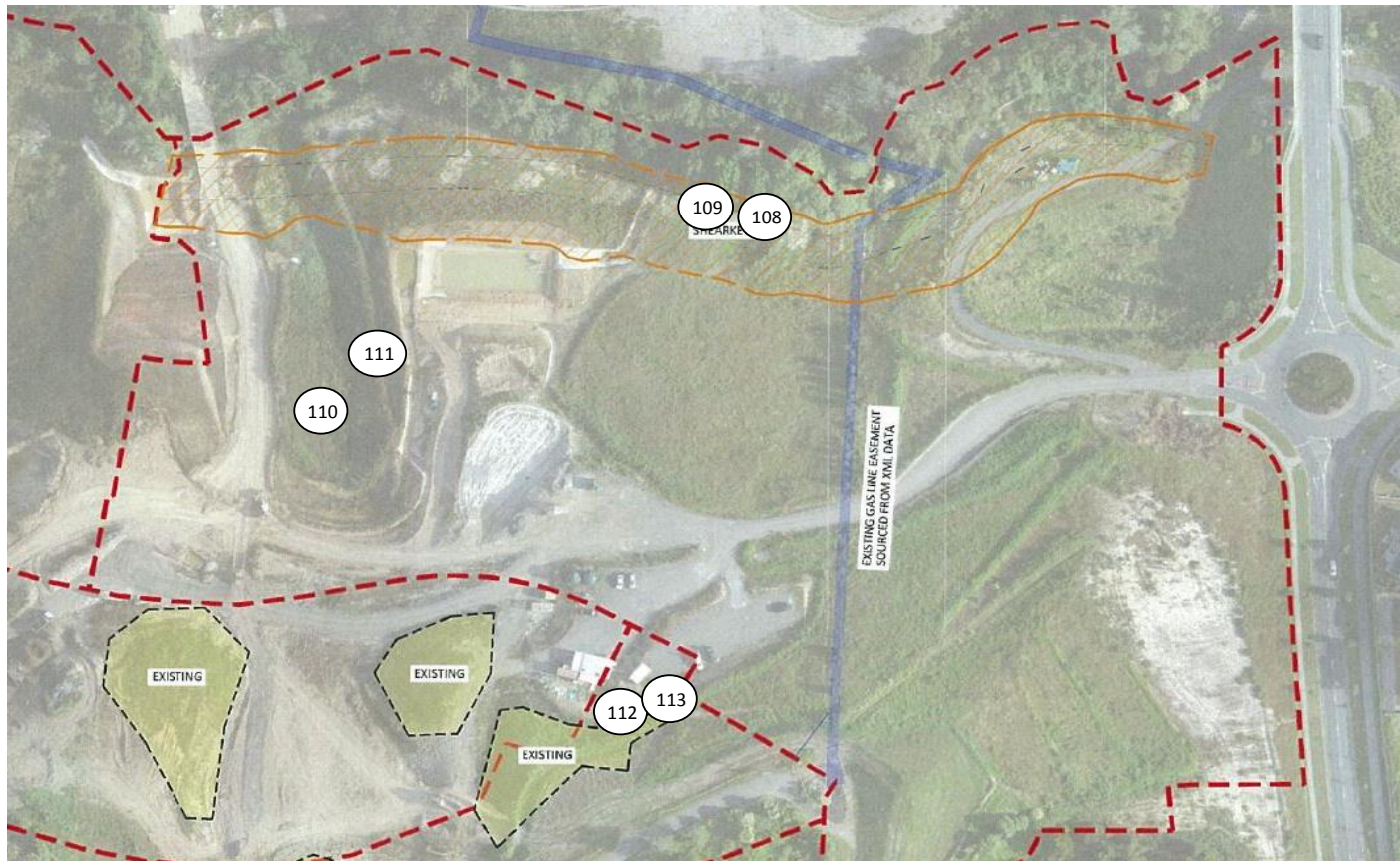
Page No: 2 of 2

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

Location: As below

Tested by: MP

Date tested: 31/01/2020



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										IANZ ACCREDITED LABORATORY All tests reported herein have been performed in accordance with the laboratory's scope of accreditation Approved Signatory: Issue date:  Cesar Pura 2/24/2020										
c.c.: -																				
Project: 773-AKLGE206639 - 773-Millwater-Orewa Precinct 6																				
Location: Access off Arran Drive, Orewa																				
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/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) 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

SITE PLAN

NOT TO SCALE

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



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 All tests reported herein have been performed in accordance with the laboratory's scope of accreditation Approved Signatory: Cesar Pura Issue date: 27/02/2020										
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 (%)
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

SITE PLAN

NOT TO SCALE

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



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 All tests reported herein have been performed in accordance with the laboratory's scope of accreditation Approved Signatory: Cesar Pura Issue date: 27/02/2020	
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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

SITE PLAN

NOT TO SCALE

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



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  All tests reported herein have been performed in accordance with the laboratory's scope of accreditation  Approved Signatory: Cesar Pura Issue date: 5/03/2020	
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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

SITE PLAN

NOT TO SCALE

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



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  All tests reported herein have been performed in accordance with the laboratory's scope of accreditation  Approved Signatory: Cesar Pura Issue date: 11/03/2020										
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 (%)	
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	

SITE PLAN

NOT TO SCALE

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



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



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: 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)

SITE PLAN

NOT TO SCALE

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



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



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

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



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
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Approved Signatory: James McKelvey
Senior Technician
IANZ Site Number: 105
Date of Issue: 13/05/2021

Site Plan - not to scale



Earthworks Fill Report

Report No: EFIL:ETAM21W00729
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W00729

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



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: 28/05/2021

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 (m)	Material Tested	Comments
27/05/2021	ETAM21W00729	LW	528	1.92	28.9	1.49	2.70	2	179+	179+	179+	179+	Slip Remedial Area	1749263	5948822	38.75	Clayey SILT	-
27/05/2021	ETAM21W00729	LW	529	1.86	28.8	1.44	2.70	5	179+	179+	179+	179+	MH 100/2 - 100/3 Drainline	1749354	5949044	-	Clayey SILT	At 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)

Earthworks Fill Report

Report No: EFIL:ETAM21W00729

Issue No:1

This report replaces all previous issues of report no. EFIL:ETAM21W00729

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



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
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Approved Signatory: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 28/05/2021



SITE PLAN (NOT TO SCALE)

Earthworks Fill Report

Report No: EFIL:ETAM21W00745
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W00745

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



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
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Approved Signatory: Cesar Pura
 Senior Technician
 IANZ Site Number: 105
 Date of Issue: 31/05/2021

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 (m)	Material Tested	Comments
28/05/2021	ETAM21W00745	LW	530	1.82	33.2	1.37	2.70	4	171	149	140	128	Slip Remedial Area	1749256	5948821	40.05	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)

Earthworks Fill Report

Report No: EFIL:ETAM21W00745

Issue No:1

This report replaces all previous issues of report no. EFIL:ETAM21W00745

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



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.
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Approved Signatory: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 31/05/2021



Earthworks Fill Report

Report No: EFIL:ETAM21W01400
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM21W01400

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: 23/11/2021

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
17/11/2021	ETAM21W01400	LW	552	1.86	30.7	1.42	2.70	4	164	179+	179+	149	Gully	1749005	5948875	31.80	Silty CLAY	
17/11/2021	ETAM21W01400	LW	553	1.87	28.7	1.46	2.70	4	179+	179+	179+	160	Gully	1748994	5948898	29.10	Silty CLAY	
17/11/2021	ETAM21W01400	LW	554	1.85	31.5	1.41	2.70	4	156	146	143	168	Gully	1749008	5948918	28.20	Silty CLAY	
17/11/2021	ETAM21W01400	LW	555	1.88	31.0	1.43	2.70	2	179+	179+	160	149	Gully	1749036	5948928	26.65	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)

Earthworks Fill Report

Report No: EFIL:ETAM21W01400

Issue No:1

This report replaces all previous issues of report no. EFIL:ETAM21W01400

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: Cesar Pura
Senior Technician
IANZ Site Number: 105
Date of Issue: 23/11/2021



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

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)

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)

Earthworks Fill Report

Report No: EFIL:ETAM22W00045
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM22W00045

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: 18/01/2022

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
17/01/2022	ETAM22W00045	LW	628	1.85	26.9	1.46	2.70	6.7	UTP	UTP	UTP	UTP	Gully	1748987	5948874	-	Clayey SILT	-
17/01/2022	ETAM22W00045	LW	629	1.97	23.4	1.59	2.70	3.6	UTP	UTP	UTP	UTP	Gully	1749019	5948877	-	Clayey SILT	-
17/01/2022	ETAM22W00045	LW	630	1.91	23.9	1.54	2.70	5.9	UTP	UTP	UTP	UTP	Gully	1748997	5948911	-	Clayey SILT	-
17/01/2022	ETAM22W00045	LW	631	1.88	26.8	1.48	2.70	5.3	UTP	UTP	UTP	UTP	Gully	1749045	5948908	-	Clayey SILT	-

Comments:

Earthworks Fill Report

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

Report No: EFIL:ETAM22W00045

Issue No:1

This report replaces all previous issues of report no. EFIL:ETAM22W00045



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.)

E. Paton

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 18/01/2022



SITE PLAN (NOT TO SCALE)

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

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:

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.)

E. Paton

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



SITE PLAN (NOT TO SCALE)

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

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:

Earthworks Fill Report

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

Report No: EFIL:ETAM22W00327

Issue No:1

This report replaces all previous issues of report no. EFIL:ETAM22W00327



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



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



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: 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:

Earthworks Fill Report

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

Report No: EFIL:ETAM22W00341

Issue No: 1

This report replaces all previous issues of report no. EFIL:ETAM22W00341



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: 9/03/2022



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

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:

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.)

E. Paton

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 11/03/2022



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



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: 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:

Earthworks Fill Report

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

Report No: EFIL:ETAM22W00378

Issue No:1

This report replaces all previous issues of report no. EFIL:ETAM22W00378



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.}

E. Paton

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 14/03/2022



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

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:

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



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

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:

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.}

E. Paton

Approved Signatory: Eric Paton
Director-Testing

IANZ Site Number: 105

Date of Issue: 17/03/2022



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

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:

Earthworks Fill Report

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

Report No: EFIL:ETAM22W00436

Issue No:1

This report replaces all previous issues of report no. EFIL:ETAM22W00436



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



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

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:

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



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

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:

Earthworks Fill Report

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

Report No: EFIL:ETAM22W00509

Issue No:1

This report replaces all previous issues of report no. EFIL:ETAM22W00509



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.}

E. Paton

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 30/03/2022



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



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: 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:

Earthworks Fill Report

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

Report No: EFIL:ETAM22W00530

Issue No:1

This report replaces all previous issues of report no. EFIL:ETAM22W00530



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.}

E. Paton

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 1/04/2022



SITE PLAN (NOT TO SCALE)

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

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:

Earthworks Fill Report

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

Report No: EFIL:ETAM22W00541

Issue No:1

This report replaces all previous issues of report no. EFIL:ETAM22W00541



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.}

E. Paton

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 4/04/2022



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

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:

Earthworks Fill Report

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

Report No: EFIL:ETAM22W00560

Issue No:1

This report replaces all previous issues of report no. EFIL:ETAM22W00560



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.}

E. Paton

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 5/04/2022



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



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: 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:

Earthworks Fill Report

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

Report No: EFIL:ETAM22W00594

Issue No:1

This report replaces all previous issues of report no. EFIL:ETAM22W00594



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.}

E. Paton

Approved Signatory: Eric Paton
Director-Testing
IANZ Site Number: 105
Date of Issue: 7/04/2022



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



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: 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:

Earthworks Fill Report

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

Report No: EFIL:ETAM22W00635

Issue No:1

This report replaces all previous issues of report no. EFIL:ETAM22W00635



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: 19/04/2022



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



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: 26/04/2023

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:

Earthworks Fill Report

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

Report No: EFIL:ETAM23W00726

Issue No:1

This report replaces all previous issues of report no. EFIL:ETAM23W00726



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

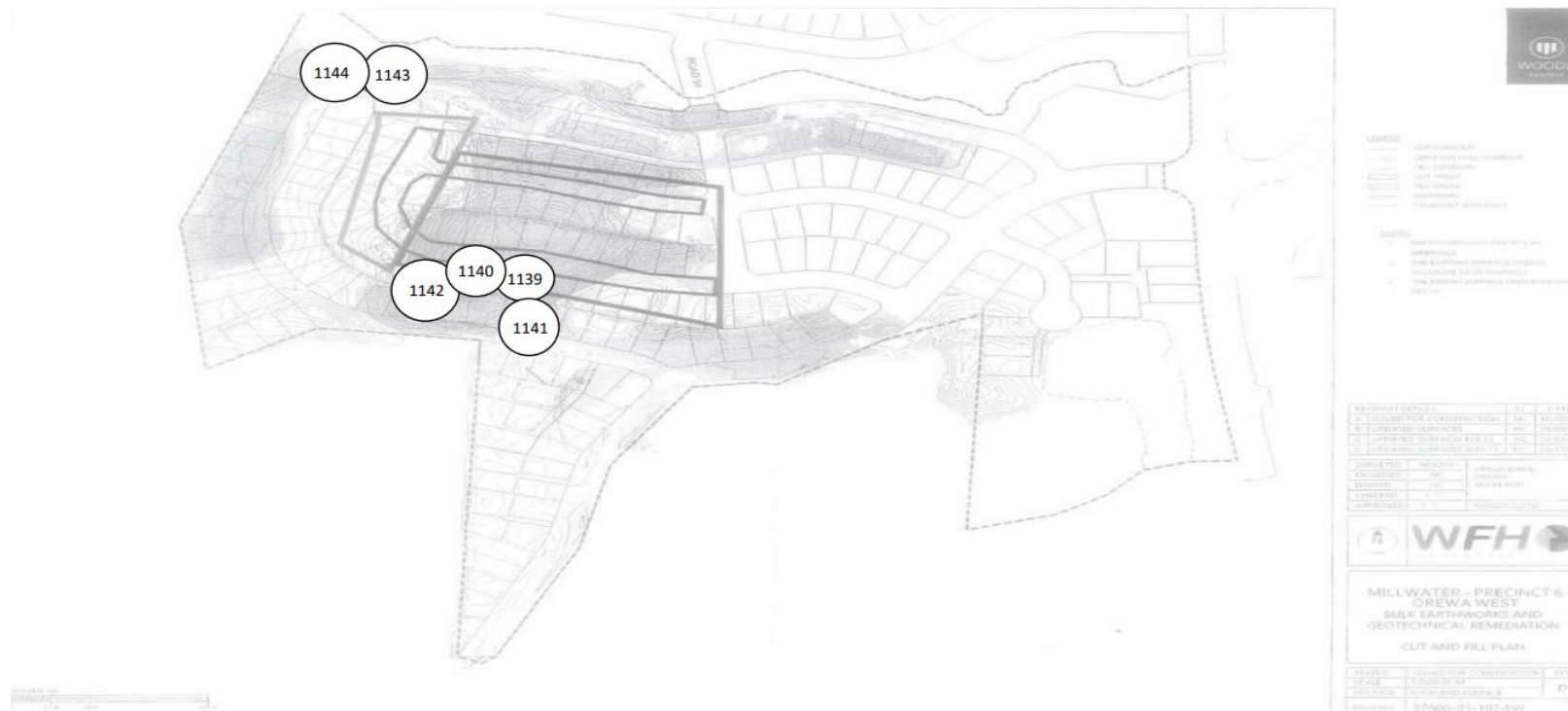
{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

E. P. Snow

Approved Signatory: Eric Paton
Director-Testing

IANZ Site Number: 105

Date of Issue: 26/04/2023



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



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: 26/10/2023

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:

Earthworks Fill Test Report NZ

Auckland Laboratory

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

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:**



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.}

E. Paton

Approved Signatory: Eric Paton
(Director-Testing)

IANZ Accredited Laboratory Number:105
Date of Issue: 26/10/2023

SITE PLAN

* NOT TO SCALE *

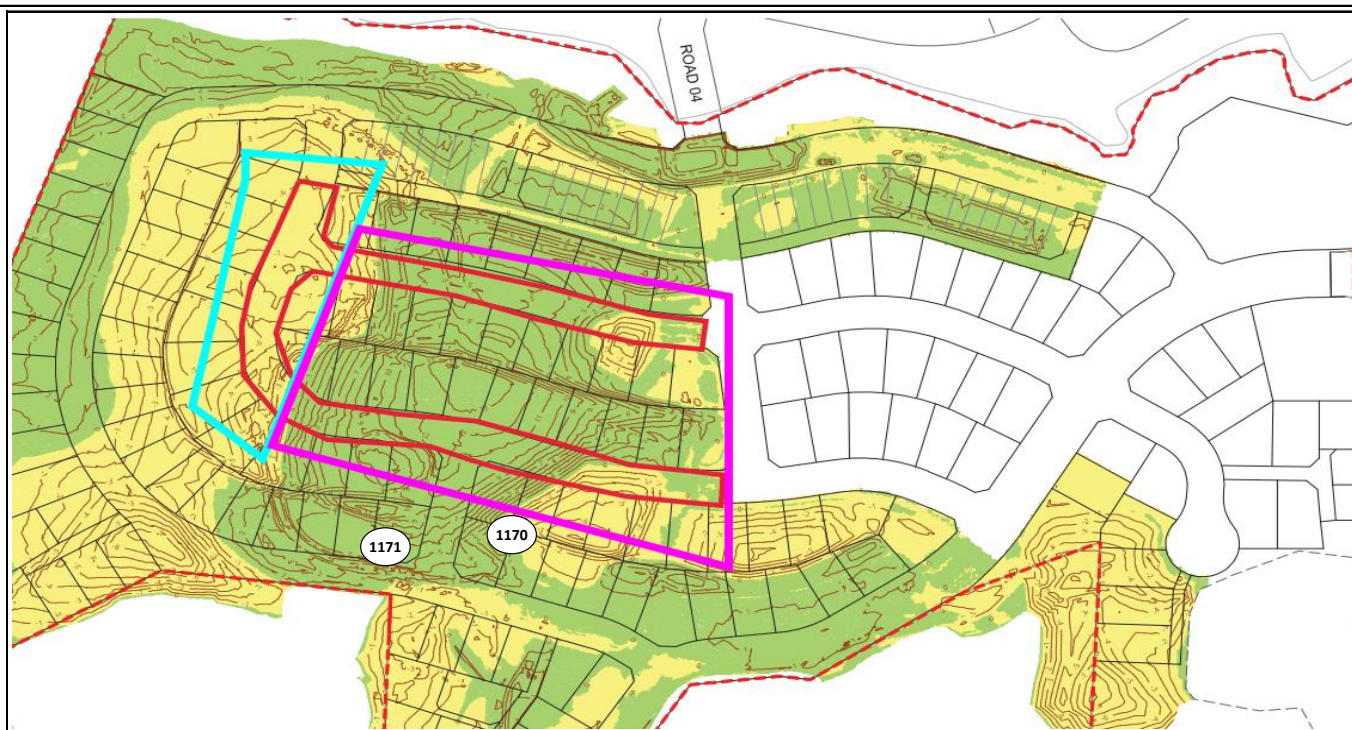
Project No: 773-ETAM01553

Work Order No: ETAM23W01814

Location Gully (See Below)

Tested by: SC

Date Tested: 17/10/2023



SITE PLAN * NOT TO SCALE *

Earthworks Fill Report

Report No: EFIL:ETAM23W01832
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM23W01832

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: 27/10/2023

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
20/10/2023	ETAM23W01832	LW	1172	1.90	29.1	1.47	2.65	1.7	140	146	153	137	Gully 2	1748890	5949070	36.60	Silty CLAY	-
20/10/2023	ETAM23W01832	LW	1173	1.90	28.7	1.47	2.65	2.1	140	149	164	172	Gully 2	1748872	5949062	36.70	Silty CLAY	-
20/10/2023	ETAM23W01832	LW	1174	1.89	29.5	1.46	2.65	2.0	137	143	137	140	Western Fill Area	1748833	5948917	36.40	Silty CLAY	-
20/10/2023	ETAM23W01832	LW	1175	1.88	30.4	1.44	2.65	1.9	149	160	137	160	Western Fill Area	1748865	5948908	40.00	Silty CLAY	-

Comments:

Earthworks Fill Test Report NZ

Auckland Laboratory

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

Report No: EFIL:ETAM23W01832

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.}

E. Paton

Approved Signatory: Eric Paton
(Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 27/10/2023

SITE PLAN

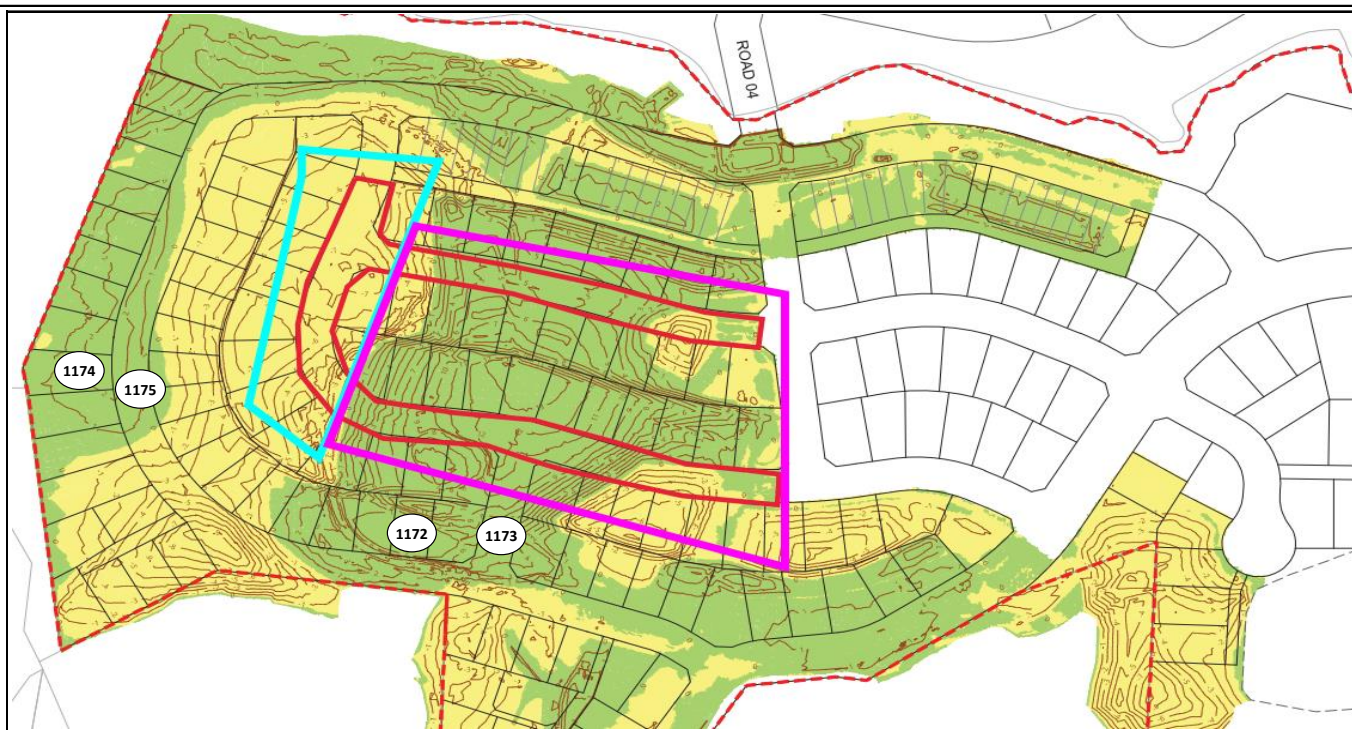
* NOT TO SCALE *

Project No: 773-ETAM01553

Work Order No: ETAM23W01832

Location Gully 2 and Western Fill area
(See Below)

Tested by: LW
Date Tested: 20/10/2023



SITE PLAN * NOT TO SCALE *

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



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: 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:

Earthworks Fill Test Report NZ

Auckland Laboratory

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

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:**



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.}

E. Paton

Approved Signatory: Eric Paton
(Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 21/12/2023

SITE PLAN

* NOT TO SCALE *

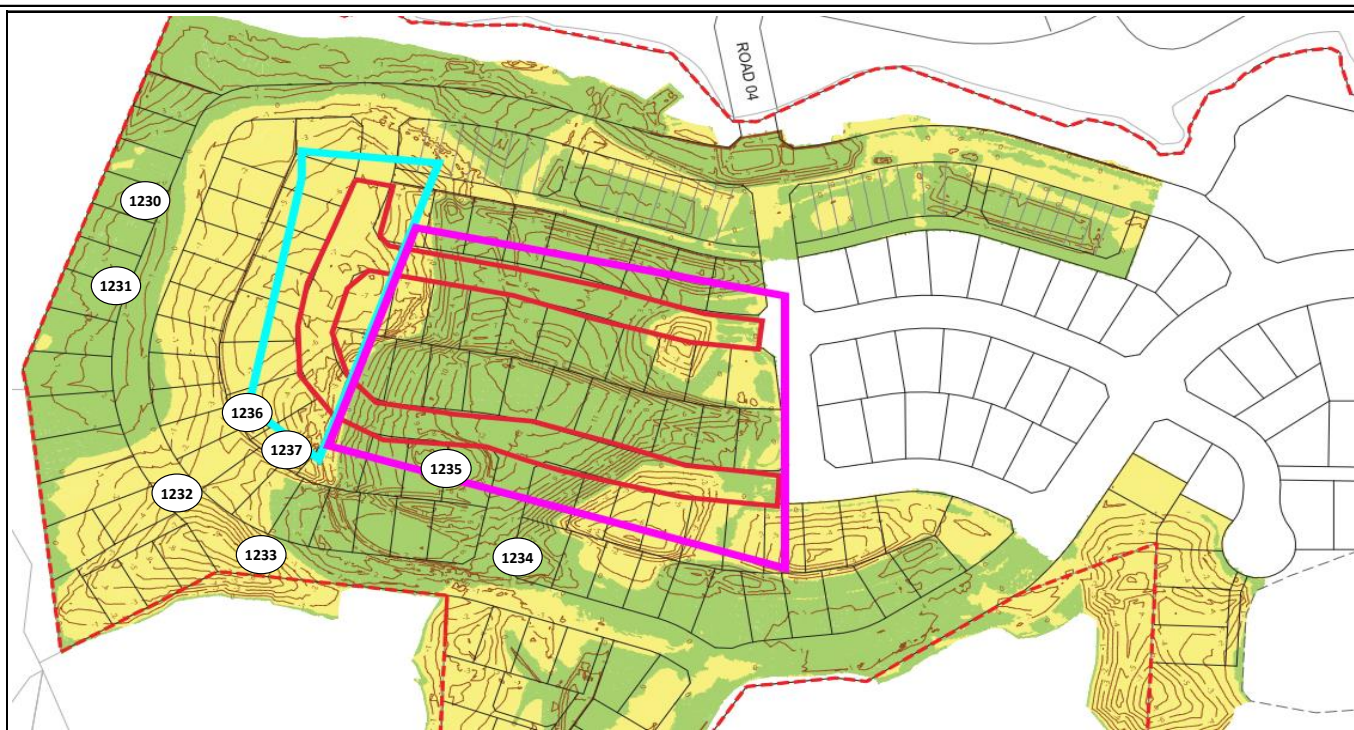
Work Order No: ETAMW02123

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 *

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



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: 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:



Earthworks Fill Test Report NZ

Auckland Laboratory

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

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:**

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.}



E. Paton

Approved Signatory: Eric Paton
(Director-Testing)

IANZ Accredited Laboratory Number:105
Date of Issue: 14/01/2024

SITE PLAN

* NOT TO SCALE *

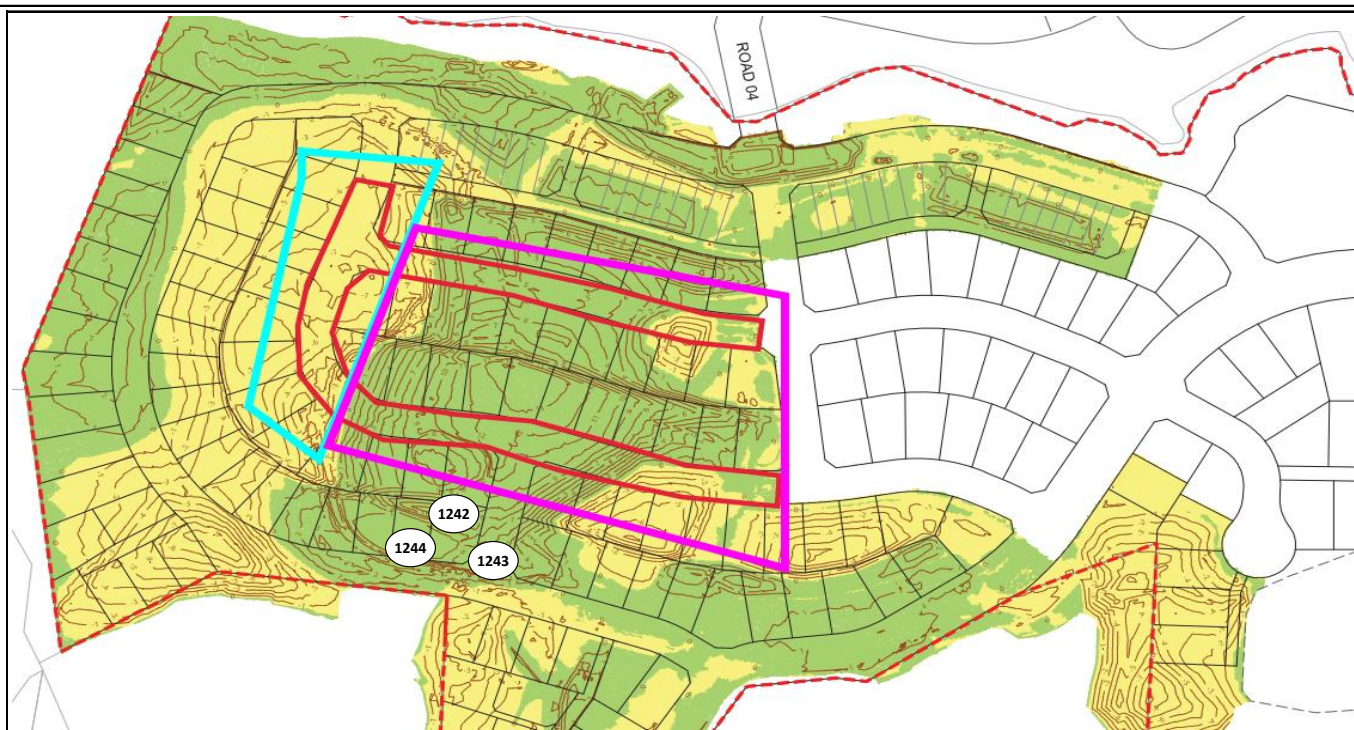
Work Order No: ETAM24W00012

Page No: 2 of 2

Location: Gully

Tested by: RP

Date Tested: 9/01/2024



SITE PLAN * NOT TO SCALE *

Earthworks Fill Report

Report No: EFIL:ETAM24W00013
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00013

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: 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
10/01/2024	ETAM24W00013	RP	1245	1.93	25.6	1.54	2.65	2.6	UTP	UTP	UTP	UTP	Gully	1748973	5948843	-	Silty CLAY	RL not available
10/01/2024	ETAM24W00013	RP	1246	1.93	27.1	1.52	2.65	1.5	159	175	UTP	UTP	Gully	1749007	5948876	-	Silty CLAY	RL not available
10/01/2024	ETAM24W00013	RP	1247	1.94	27.1	1.52	2.65	1.3	198+	198+	UTP	UTP	Gully	1749010	5948851	-	Silty CLAY	RL not available

Comments:



Earthworks Fill Test Report NZ

Auckland Laboratory

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

Report No: EFIL:ETAM24W00013

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.}



E. Paton

Approved Signatory: Eric Paton
(Director-Testing)

IANZ Accredited Laboratory Number:105
Date of Issue: 14/01/2024

SITE PLAN

* NOT TO SCALE *

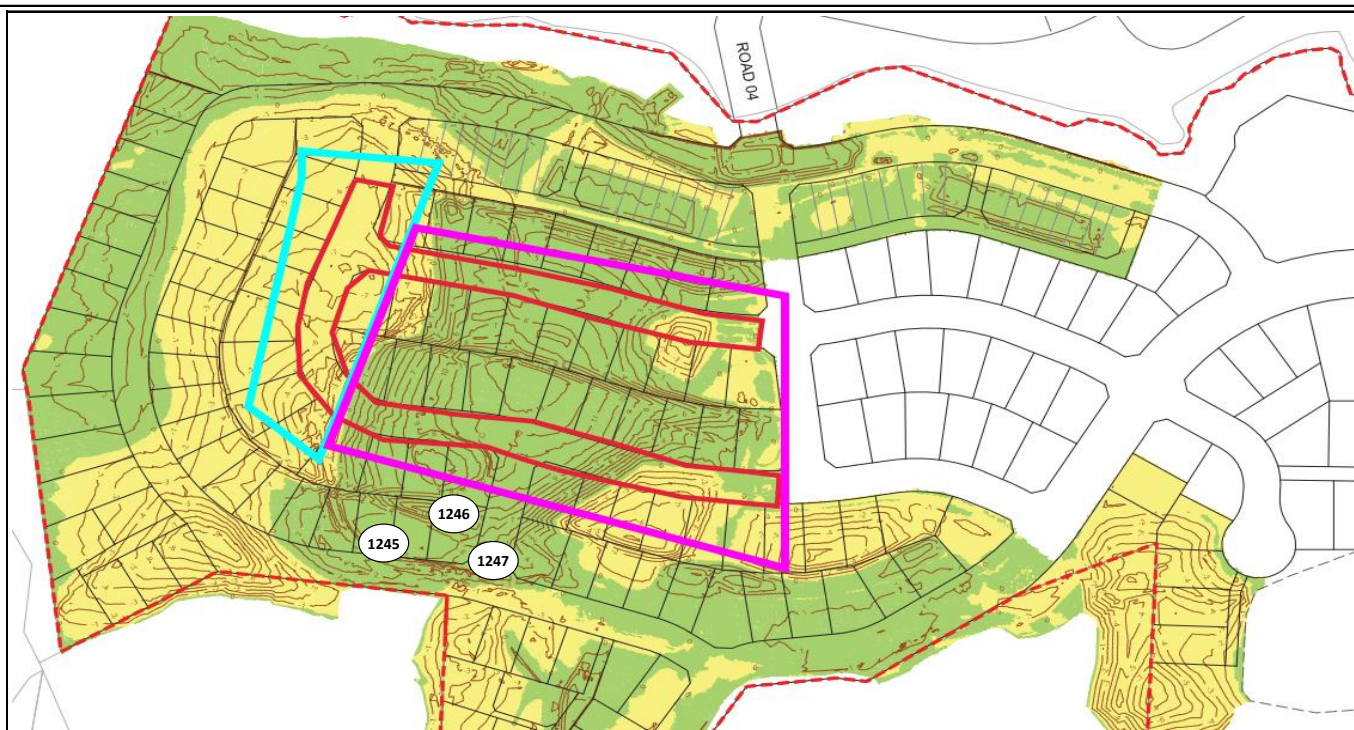
Work Order No: ETAM24W00013

Page No: 2 of 2

Location: Gully

Tested by: RP

Date Tested: 10/01/2024



SITE PLAN * NOT TO SCALE *

Earthworks Fill Report

Report No: EFIL:ETAM24W00018
Issue No:1
This report replaces all previous issues of report no. EFIL:ETAM24W00018

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: 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
11/01/2024	ETAM24W00018	RP	1248	1.91	27.3	1.50	2.65	2.3	175	198+	198+	198+	Gully 2	1748997	5948853	-	Silty CLAY	RL not available
11/01/2024	ETAM24W00018	RP	1249	1.83	30.8	1.40	2.65	3.9	UTP	UTP	UTP	UTP	Gully 2	1748942	5948893	-	Silty CLAY	RL not available
11/01/2024	ETAM24W00018	RP	1250	1.88	30.6	1.44	2.65	1.8	198+	165	UTP	UTP	Gully 2	1748969	5948840	-	Silty CLAY	RL not available

Comments:



Earthworks Fill Test Report NZ

Auckland Laboratory

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

Report No: EFIL:ETAM24W00018

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.}



E. Paton

Approved Signatory: Eric Paton
(Director-Testing)

IANZ Accredited Laboratory Number:105
Date of Issue: 14/01/2024

SITE PLAN

* NOT TO SCALE *

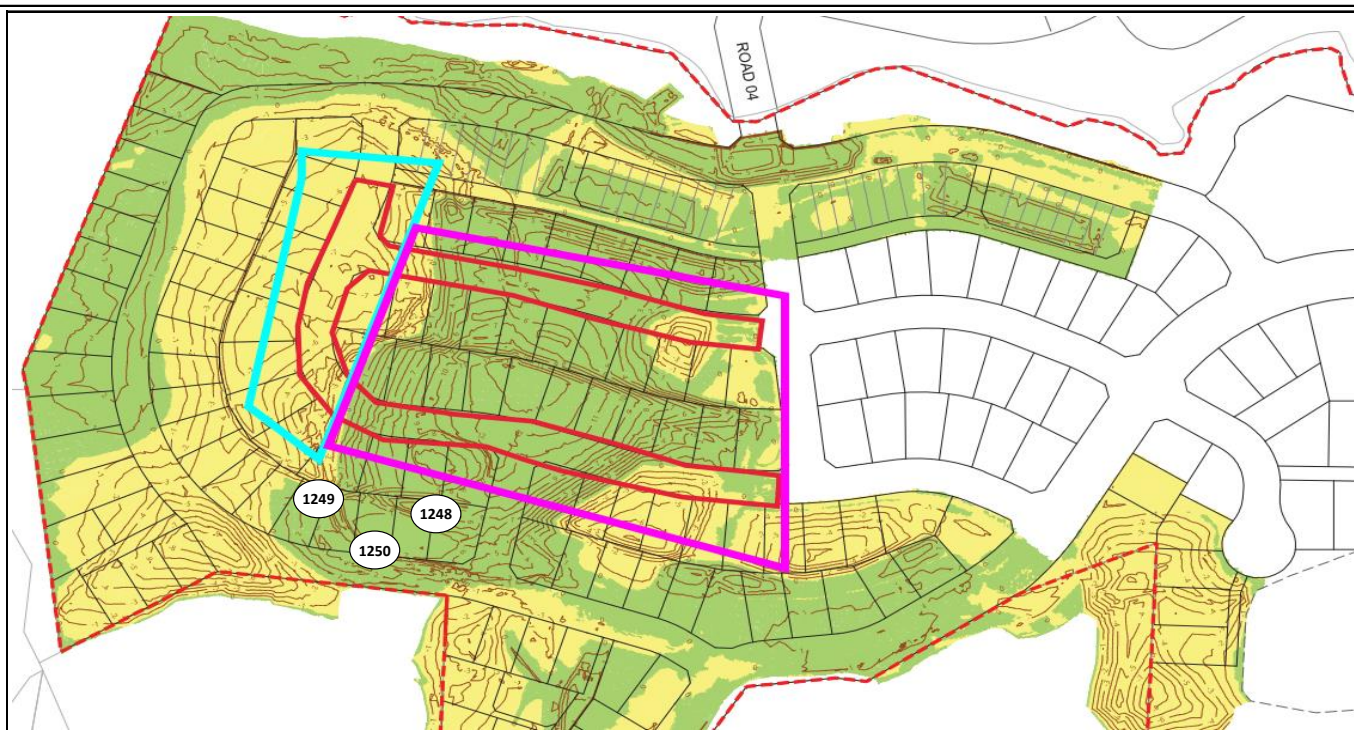
Work Order No: ETAM24W00018

Page No: 2 of 2

Location: Gully 2

Tested by: RP

Date Tested: 11/01/2024



SITE PLAN * NOT TO SCALE *

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



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: 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:

Earthworks Fill Test Report NZ

Auckland Laboratory

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

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.

{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}

E. Paton

Approved Signatory: Eric Paton
(Director-Testing)

IANZ Accredited Laboratory Number:105
Date of Issue: 28/01/2024

SITE PLAN

* NOT TO SCALE *

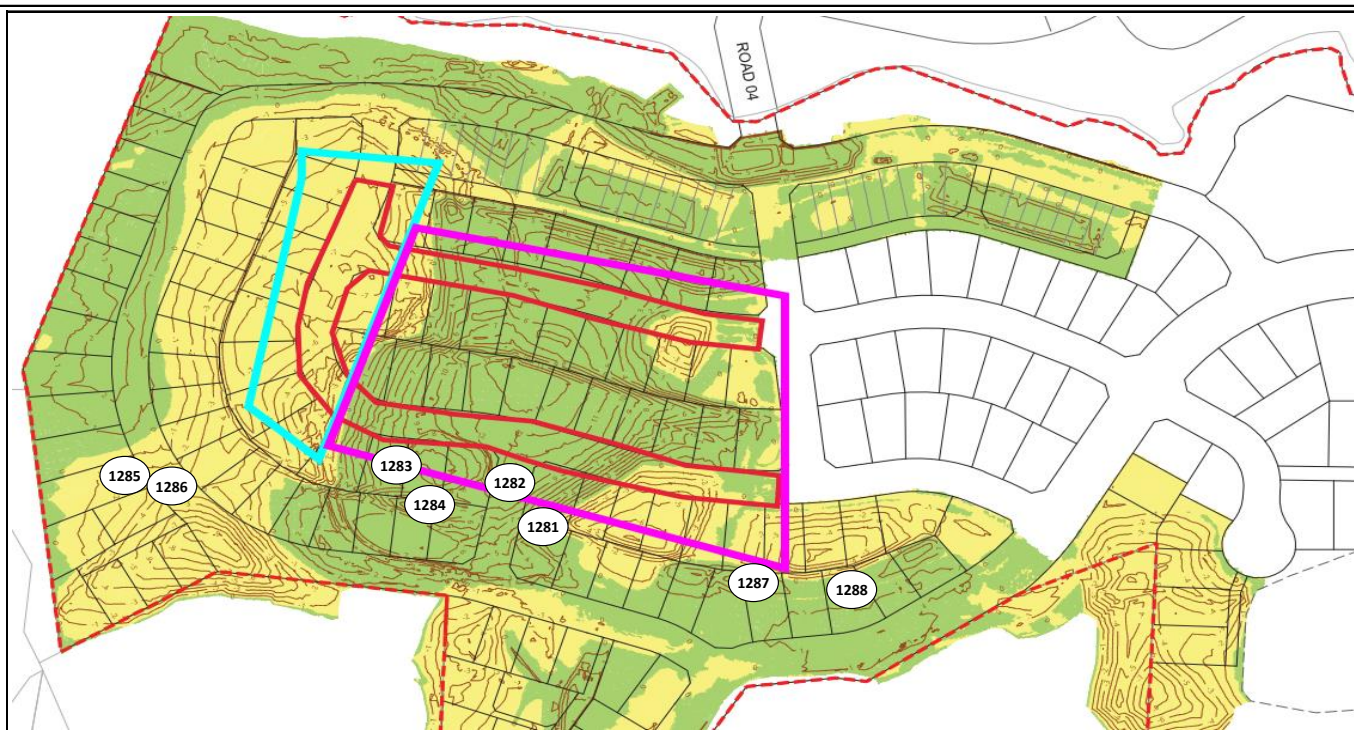
Work Order No: ETAM24W00094

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 *



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:



Earthworks Fill Test Report NZ

Auckland Laboratory

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

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:**



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.}

E. Paton

Approved Signatory: Eric Paton
(Managing Director-Testing)
IANZ Accredited Laboratory Number:105
Date of Issue: 20/02/2024

SITE PLAN

* NOT TO SCALE *

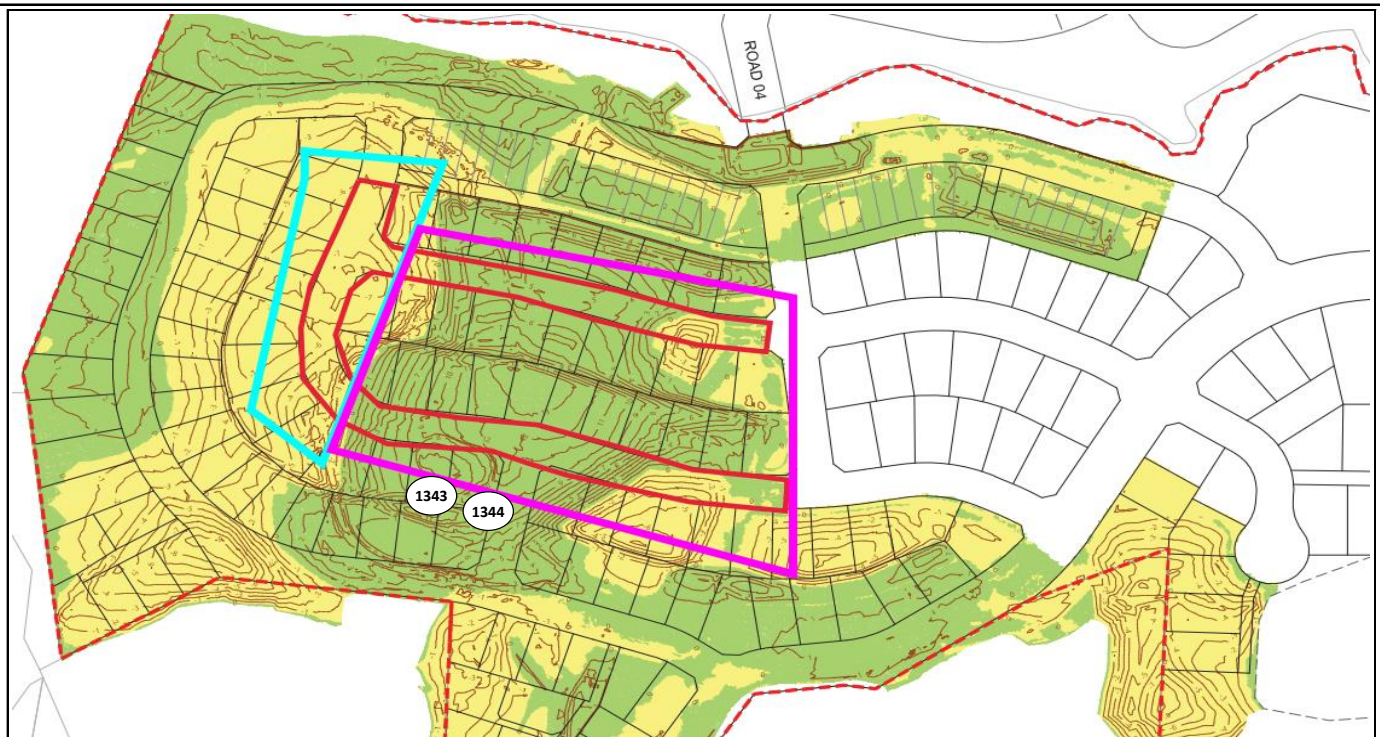
Work Order No: ETAM24W00198

Page No: 2 of 2

Location: Gully 2

Tested by: LW

Date Tested: 12/02/2024



SITE PLAN * NOT TO SCALE *



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

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: 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/m³	Oven Water Content %	Dry Density t/m³	Solid Density t/m³	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:



Earthworks Fill Test Report NZ

Auckland Laboratory

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

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.}

E. Paton

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

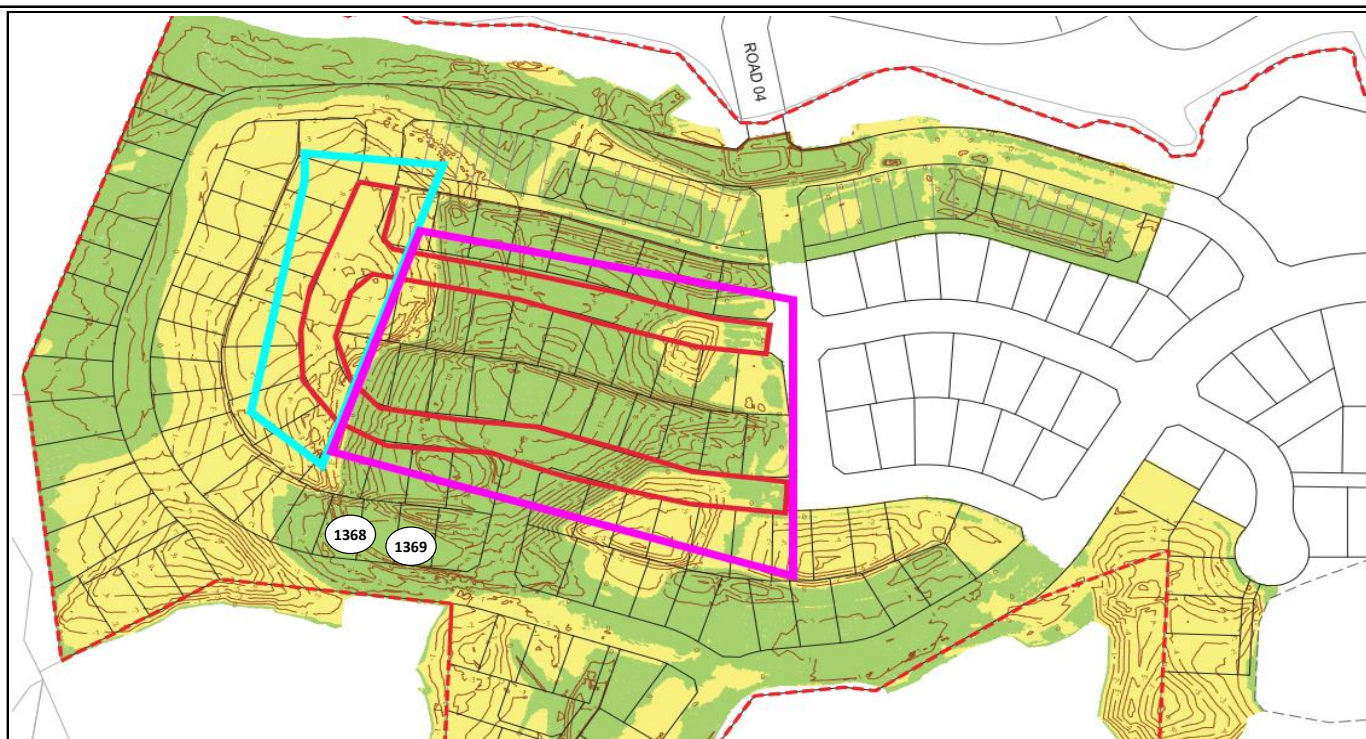
Location: Gully 2

Tested by:

LW

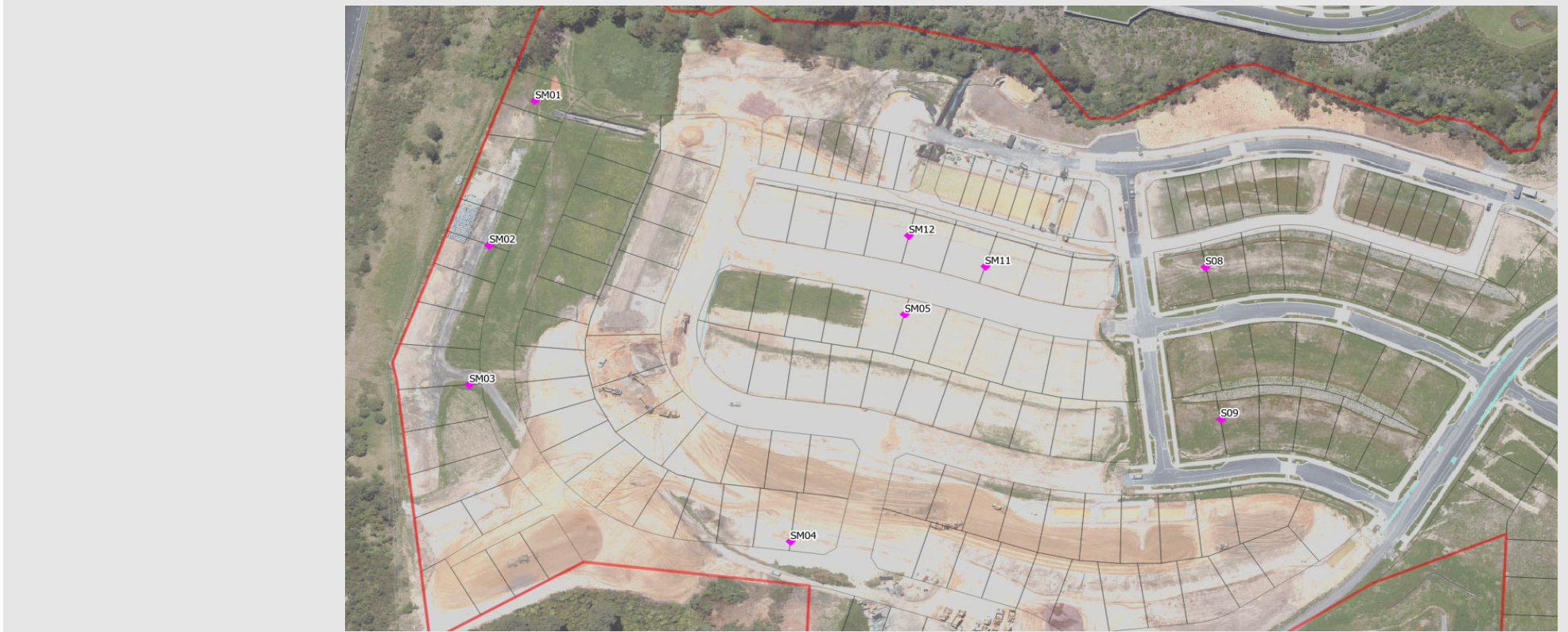
Date Tested:

7/03/2024

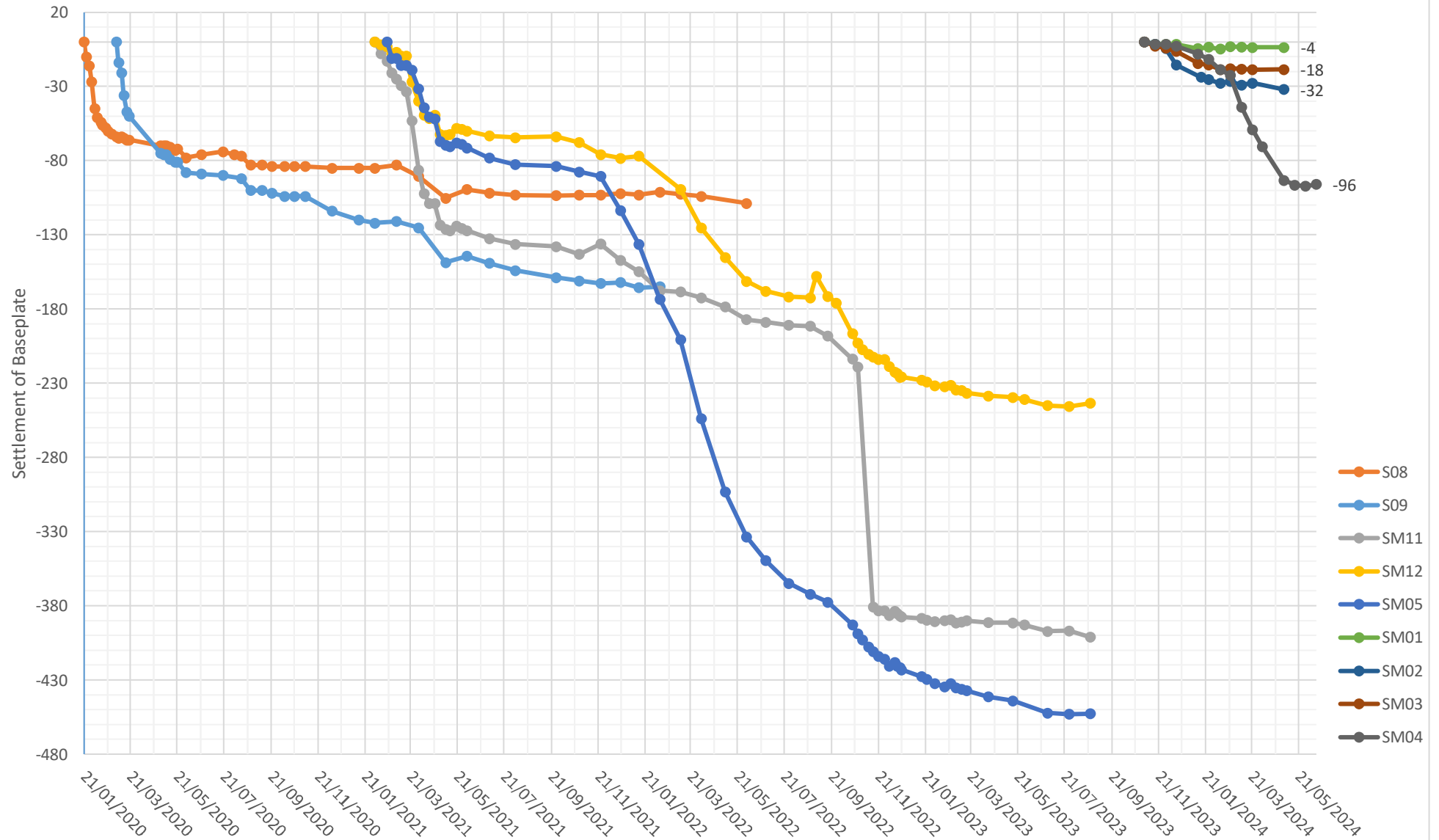


SITE PLAN * NOT TO SCALE *

APPENDIX E: MONITORING RESULTS



Arran Hill P6 - Settlement of Baseplates (mm)



APPENDIX F: PRODUCER STATEMENTS – CONSTRUCTION REVIEW (PS4)

24 October 2024

Our ref: 773-AKLGE206639-CG

Auckland Council
CCC Assessors

Attention: Ms. Lyn Gibson

Accompanying Letter for Producer Statement - Construction Review (PS4) – Construction of Retaining Wall 308, 101 Kowhai Road, Upper Orewa (Lot 1 DP 537871, SECT 2 SO 537746), BCO10379203

The purpose of this letter is to confirm the scope of work in relation to the attached Producer Statement - Construction Review (PS4) regarding geotechnical observations undertaken to satisfy the approved building consent conditions. This letter and accompanying PS4 document are intended to satisfy the following items of Section C of the Schedule of Inspections document:

- Producer Statement Construction Review (PS4) Excavation Near Boundary
- Producer Statement Construction Review (PS4) Steel UB Retaining Wall
- Producer Statement Construction Review (PS4) Structural Steel
- Producer Statement Construction Review (PS4) Geotechnical

Tetra Tech Coffey visited the site numerous times between July and September 2024. During these visits, we observed the pile set-out, drilled pile hole diameter and depth, pile centre-to-centre spacing, Steel Universal Beam (UB) upright type, exposed ground conditions within pile holes, lagging type and placement, wall drainage construction including drainage pipe placement, drainage aggregate type, geotextile placement and connection and placement of the drainage silt traps, concrete specification, placement of flashing tape onto beams and installation of the pedestrian barrier. All of the observations were in accordance with the approved stamped building consent drawings and Tetra Tech Coffey Geotechnical Design Report referenced 773-AKLGE206639-AK Rev. 3, dated 19 November 2021.

This is with the exception of the final location of silt traps, which were moved closer to the wall than the design, and placement of the flashing tape, which was changed from the original design of a DPC malthoid strip. Both of these aspects were certified as a minor variation.

The ground conditions exposed within the pile holes consisted of engineered clay fill, natural residual soils and rock of the East Coast Bays Formation.

Measured undrained shear strengths within the drilled pile holes were recorded and ranged between 108kPa to 171kPa at the base. On the side of the holes, undrained shear strength was recorded between 67 kPa and more than 234kPa.

On the basis of our site observations and in-situ soil testing, we are satisfied that the ground conditions exposed within the pile holes were generally consistent with the design parameters and recommendations contained in our Geotechnical Design Report (GDR), reference 773-AKLGE206639-AK Rev. 3.

For and on behalf of Tetra Tech Coffey

Prepared by:



Fernanda Soto
Geotechnical Engineer
MSc (Geology)

Reviewed and authorised by:



Stephen Parkes
Associate Engineering Geologist
PEngGeol, CMEngNZ

Attachments - Producer Statement - Construction Review (PS4)

PRODUCER STATEMENT – PS4

CONSTRUCTION REVIEW

BUILDING CODE CLAUSE(S): B1 Structure

JOB NUMBER: 773-AKLGE20663

ISSUED BY: Tetra Tech Coffey (NZ) Limited
(Construction Monitoring Firm)

TO: WFH Properties Limited
(Owner/Developer)

TO BE SUPPLIED TO: Auckland Council
(Building Consent Authority)

IN RESPECT OF: Construction of Retaining Wall 308
(Description of Building Work)

AT: 101 Kowhai Road, Upper Orewa 0992
(Address, Town/City)

LEGAL DESCRIPTION: LOT 1 DP537871, SECT 2 SO 537746

N/A ☐

We have been engaged by the owner/developer referred to above to provide CM 4 **level of construction monitoring** relating to the Clause(s) named above of the Building Code for the building work which is covered by PS1(s) issued by Tetra Tech Coffey (NZ) Limited (Engineering Design Firm) and which is described in the documents relating to the Building Consent No. BCO10379203 and those relating to Building Consent Amendment(s) No. BCO10379203-A and minor variation issued during the course of the works, .

We have sighted these Building Consents and the conditions attached to them.
If any of the fields above are too small, please write "refer the Schedule".

Authorised instructions/variation(s) detailed/listed in the Schedule have been issued during the course of the works.

On the basis of these review(s) and information supplied by the contractor during the course of the works and **on behalf of the engineering firm** undertaking this Construction Monitoring, **I believe on reasonable grounds** that the building works covered by the above-mentioned PS1(s) have been completed in accordance with the relevant requirements of the Building Consent and Building Consent Amendments identified above or in the Schedule on page 2, with respect to Clause(s) B1 - Structure of the Building Code. I also believe on reasonable grounds that the persons who have undertaken this construction review have the necessary competency to do so.

I, (Name of Construction Monitoring Professional) Stephen Parkes, am:

- CPEng number 1153826
- I hold the following qualifications BSc (Hons)

The Construction Monitoring Firm holds a current policy of Professional Indemnity Insurance no less than \$200,000 The Construction Monitoring Firm Is a member of ACE New Zealand.

SIGNED BY (Name of Construction Monitoring Professional): Stephen Parkes
(Signature below):



ON BEHALF OF (Construction Monitoring Firm): Tetra Tech Coffey (NZ) Limited

Date: 24/10/24

Note: This statement has been prepared solely for the Building Consent Authority named above and shall not be relied upon by any other person or entity. Any liability in relation to this statement accrues to the Construction Monitoring Firm only. As a condition of reliance on this statement, the Building Consent Authority accepts that the total maximum amount of liability of any kind arising from this statement and all other statements provided to the Building Consent Authority in relation to this building work, whether in tort or otherwise, is limited to the sum of \$200,000.

This form is to accompany **Forms 6 or 8 of the Building (Forms) Regulations 2004** for the issue of a Code Compliance Certificate.

THIS FORM AND ITS CONDITIONS ARE COPYRIGHT TO ACE NEW ZEALAND AND ENGINEERING NEW ZEALAND

SCHEDULE to PS4

Please include an itemised list of all referenced documents, drawings, or other supporting materials in relation to this producer statement below: |

Approved stamped building consent drawings as follows:

- Tetra Tech Coffey Drawing 01, Rev C, dated 28/02/2024, Cantilever Pile Retaining Wall (Type 1)
- Tetra Tech Coffey Drawing 03, Rev B, dated 02/12/2021, Design notes and Specifications
- WFH Properties Drawing 37600-03-150-EW, Rev D, dated 26/11/2021, Millwater - Precinct 6 Orewa West, Bulk Earthworks and Geotechnical Remediation, Retaining wall plan.
- WFH Properties Drawing 37600-03-162-EW, Rev B, dated 26/11/21, Wall 308 - Wall drainage layout plan
- WFH Properties Drawing 37600-03-162-EW, Rev B, dated 26/11/21, Wall 308 - Wall drainage layout plan Rev 2

Tetra Tech Coffey letter 773-AKLGE206639-CG, dated 24 October 2024: Accompanying letter for Producer Statement - Construction Review (PS4) - Construction of Retaining Wall 308, 101 Kowhai Road, Upper Orewa (Lot 1 DP 537871, SECT 2 SO 537746) BCO10379203.

Tetra Tech Coffey Geotechnical Design Report for Cantilever Retaining Wall 308 referenced 773-AKLGE206639AK Rev. 3, dated 19 November 2021.

GUIDANCE ON USE OF PRODUCER STATEMENTS

Information on the use of Producer Statements and Construction Monitoring Guidelines can be found on the Engineering New Zealand website

<https://www.engineeringnz.org/engineer-tools/engineering-documents/producer-statements/>

Producer statements were first introduced with the Building Act 1991. The producer statements were developed by a combined task committee consisting of members of the New Zealand Institute of Architects (NZIA), Institution of Professional Engineers New Zealand (now Engineering New Zealand), Association of Consulting and Engineering New Zealand (ACE NZ) in consultation with the Building Officials Institute of New Zealand (BOINZ). The original suite of producer statements has been revised at the date of this form to ensure standard use within the industry.

The producer statement system is intended to provide Building Consent Authorities (BCAs) with part of the reasonable grounds necessary for the issue of a Building Consent or a Code Compliance Certificate, without necessarily having to duplicate review of design or construction monitoring undertaken by others.

PS1 DESIGN Intended for use by a suitably qualified independent engineering design professional in circumstances where the BCA accepts a producer statement for establishing reasonable grounds to issue a Building Consent;

PS2 DESIGN REVIEW Intended for use by a suitably qualified independent engineering design review professional where the BCA accepts an independent design professional's review as the basis for establishing reasonable grounds to issue a Building Consent;

PS3 CONSTRUCTION Forms commonly used as a certificate of completion of building work are Schedule 6 of NZS 3910:2013 or Schedules E1/E2 of NZIA's SCC 2011²

PS4 CONSTRUCTION REVIEW Intended for use by a suitably qualified independent engineering construction monitoring professional who either undertakes or supervises construction monitoring of the building works where the BCA requests a producer statement prior to issuing a Code Compliance Certificate.

This must be accompanied by a statement of completion of building work (Schedule 6).

The following guidelines are provided by ACE New Zealand and Engineering New Zealand to interpret the Producer Statement.

Competence of Engineering Professional

This statement is made by an engineering firm that has undertaken a contract of services for the services named, and is signed by a person authorised by that firm to verify the processes within the firm and competence of its personnel.

The person signing the Producer Statement on behalf of the engineering firm will have a professional qualification and proven current competence through registration on a national competence-based register such as a Chartered Professional Engineer (CPEng).

Membership of a professional body, such as Engineering New Zealand provides additional assurance of the designer's standing within the profession. If the engineering firm is a member of ACE New Zealand, this provides additional assurance about the standing of the firm.

Persons or firms meeting these criteria satisfy the term "suitably qualified independent engineering professional".

Professional Indemnity Insurance

As part of membership requirements, ACE New Zealand requires all member firms to hold Professional Indemnity Insurance to a minimum level.

The PI Insurance minimum stated on the front of this form reflects standard practice for the relationship between the BCA and the engineering firm.

Professional Services during Construction Phase

There are several levels of service that an engineering firm may provide during the construction phase of a project (CM1-CM5 for engineers³). The building Consent Authority is encouraged to require that the service to be provided by the engineering firm is appropriate for the project concerned.

Requirement to provide Producer Statement PS4

Building Consent Authorities should ensure that the applicant is aware of any requirement for producer statements for the construction phase of building work at the time the building consent is issued as no design professional should be expected to provide a producer statement unless such a requirement forms part of the Design Firm's engagement.

Refer Also:

- ¹ Conditions of Contract for Building & Civil Engineering Construction NZS 3910: 2013
- ² NZIA Standard Conditions of Contract SCC 2011
- ³ Guideline on the Briefing & Engagement for Consulting Engineering Services (ACE New Zealand/Engineering New Zealand 2004)
- ⁴ PN01 Guidelines on Producer Statements

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www.engineeringnz.org