20 February 2025

PROPOSED RESIDENTIAL SUBDIVISION

MILLDALE STAGE 4C, MILLDALE, WAINUI

GEOTECHNICAL ASSESSMENT REPORT

Fulton Hogan Land Development Limited

AKL2024-0257AD Rev. 1

AKL2024-0257AD		
Date	Revision	Comments
17 February 2025	A	Initial draft for internal review
18 February 2025	0	Draft for client review
20 February 2025	1	Final for Consent

	Name	Signature	Position
Prepared by	Melissa Campbell		Senior Engineering Geologist
Reviewed by	Chris Ritchie		Principal Engineering Geologist CMEngNZ, PEngGeol
Authorised by	Richard Knowles		Principal Geotechnical Engineer CMEngNZ, CPEng

For and on behalf of CMW Geosciences

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STATEMENTS OF QUALIFICATIONS AND EXPERIENCE

Melissa Campbell

I am a Senior Engineering Geologist at CMW Geotechnical NZ Limited, trading as CMW Geosciences. CMW Geosciences is a specialist geotechnical engineering and geological sciences services consultancy with offices in New Zealand and Australia. I have been employed at CMW Geosciences since March 2017.

I hold the qualification of Bachelor of Science (Geology) from The University of Auckland, which I completed in 1999.

I have 16 years of professional experience in engineering geology and geotechnical engineering, primarily in the North Auckland region, frequently in the Northland Allochthon geology. My experience has been primarily in land development, including as CMW's project manager for the wider Milldale project since 2017.

I confirm that, in my capacity as author of this report, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

Chris Ritchie

I am a Principal Engineering Geologist at CMW Geotechnical NZ Limited, trading as CMW Geosciences. CMW Geosciences is a specialist geotechnical engineering and geological sciences services consultancy with offices in New Zealand and Australia. I have been employed at CMW Geosciences since July 2019.

I hold the qualifications of MSc (Engineering Geology) from The University of Auckland, which I completed in 2010. I am a Chartered Professional Engineering Geologist and Chartered Member of Engineering New Zealand.

I have 15 years of professional experience in engineering geology and geotechnical engineering in the Auckland region. My experience has been primarily in land and building development and linear infrastructure, the last 12 years has been focussed in the North Auckland area. Large portions of my work in this time have been focussed on development of land and the investigation and assessment of roading corridors in Northland Allochthon terrain.

I confirm that, in my capacity as CMW's internal reviewer of this report, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

Richard Knowles

I am a Principal Geotechnical Engineer at CMW Geotechnical NZ Limited, trading as CMW Geosciences. CMW Geosciences is a specialist geotechnical engineering and geological sciences services consultancy with offices in New Zealand and Australia. I have been employed at CMW Geosciences since March 2014.

I hold the qualifications of BE (civil) from the University of Auckland, which I completed in 1992. I am a Chartered Professional Engineer (Geotechnical) and Chartered Member of Engineering New Zealand.

I have 32 years of professional experience in geotechnical engineering in the Auckland region. My experience has primarily been in land and building development and for the last 20 years has been focussed in the North Auckland area while I have been based in offices in Orewa, Silverdale or Albany. Large portions of my work in this time have been focussed on development of land in Northland Allochthon terrain in Red Beach and Silverdale.

I confirm that, in my capacity as CMW's internal reviewer of this report, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

1 INTRODUCTION

This report has been prepared in support of the application by Fulton Hogan Land Development (FHLD) for a resource consent to the Environmental Protection Authority (EPA) under the Fast-Track Approvals Act 2024 (FTAA). The scope of work and associated terms and conditions of our engagement were detailed in our services proposal letter referenced AKL2024-0257AA, Rev.0 dated 30 October 2024 and subsequent variation referenced AKL2024-0257AC, Rev.0 dated 13 February 2025.

The application seeks approval to authorise comprehensive residential development and subdivision across Milldale Stages 4C-2 – 4C-5 (inclusive), the establishment of 21 superlots, one balance lot, three roads to vest, 13 jointly owned access lots (JOALs), one accessway to vest and associated earthworks and infrastructure in accordance with the Milldale Masterplan.

The staged works will enable residential development to progress in accordance with the Auckland Unitary Plan Operative in Part (AUP(OP)) planning framework and Wainui Precinct Plan. This involves the creation of 21 superlots to support urban housing typologies and subsequent subdivision to create individual fee simple lots. The development will provide housing supply and choice to the residential market and provide a high amenity urban residential form with well-planned connectivity to key amenities and services in Milldale.

CMW have previously provided investigation and earthworks reporting relevant to Stage 4C. The purpose of this report is to summarise the previous investigations completed, the ground conditions encountered, identify and quantify geotechnical risks to the proposed development and to provide recommendations with respect to geotechnical aspects of the development, including settlement predictions as detailed in our proposal letter.

2 SITE DETAILS

The site subject to this application is located within the Milldale development and referred to as Stage 4C subdivision area (the Site). The 5.1251ha site extent is comprised of the three balance lots created by the subdivision of Stage 4C-1. Formal titles have not yet been issued for these balance lots which are identified as Lot 9100 (2 Honohono Avenue), Lot 9101 (1 Honohono Avenue), and Lot 9102 (50 Honohono Avenue) on the approved scheme plan. As such, the current legal title for the site which applies to the entirety of Stage 4C (including approved Stage 4C-1) is Lot 9001, DP 586972 (6.75 ha), 21 Karapapa Road, Milldale, Wainui.

Under the AUP(OP), the site is split zoned Terraced House and Apartment Building zone (THAB) and Open Space Conservation (OSC) zone and is subject to the Wainui Precinct Plan. Located within the heart of the Milldale development, the Site is bordered by Parish Drive to the north, Papakiri Road to the west, Karapapa Road to the east and Dendro Ring Road to the south.

The original south-east sloping landform of the Site has been modified by previous bulk earthworks, (Earthworks 2 and Earthworks 3A) cutting the ridge which occupied the northern portion and placing fills on the lower slopes. The current landform gently slopes in an easterly direction between the elevated intersection of Parish Drive and Papakiri Road, to the intersection of Karapapa and Dendro Ring Roads.

The Site extent is bisected north-south by the recently constructed vested road Honohono Avenue and east-west by a vested pedestrian accessway. These elements along with Lots 5700 and 5701 have been approved by Stage 4C-1 and do not form part of this application.

A full description of the Site and surrounds is provided in the application AEE.

Figure 1: Site Location Plan (AC GeoMaps)

Figure 2: Original (2016) Site Contour Plan (AC GeoMaps)

FACTUAL

3 PROPOSED DEVELOPMENT

The proposed comprehensive residential development and subdivision will be delivered in two phases:

Phase 1: Civil Works & Subdivision

The civil works and subdivision phase of the development will carry out the preliminary site establishment works and subsequent subdivision of three parent lots to create superlots across Stages 4C-2 – 4C-5 (inclusive). This phase of the development will create a total of 21 superlots, one balance lot, 13 JOALs, three roads to vest, one pedestrian accessway to vest and associated infrastructure and servicing. The civil works and subdivision phase will be constructed and completed by the applicant, FHLD.

During this first phase of works, the current landform is to be modified with cuts and fills of up to 0.5m and 1.5m respectively. The construction of six retaining walls is proposed, with retained heights up to approximately 2m.

These works will be the subject of a Geotechnical Completion Report once completed and prior to the commencement of Phase 2.

Phase 2: Comprehensive Residential Land Use & Subdivision

Following the completion of the civil works subdivision, comprehensive residential development and subdivision will be carried out across all 21 new superlots. The development will provide for a total of 168 dwellings on 168 fee simple residential lots. Each dwelling will be serviced and have direct vehicle access to a JOAL or road created through the civil works subdivision.

The superlots created during Phase 1 vary in size with the smallest superlot providing for four residential units, with the largest superlot providing for 15 residential units. All dwellings are architecturally designed two level terraced units, with varying typologies ranging from two to four-bedroom units. The dwellings are supported by comprehensive landscaping schemes, outdoor living areas, storage provision, parking, pedestrian access, waste management, and functional service areas.

During Phase 2 the landform is to be further modified, so that the combined final cuts and fills are up to approximately 0.5m and 2.0m respectively. Remaining proposed retaining walls will be constructed, again with retained heights up to 2m.

A full description of the project is provided in the application AEE.

These works will be the subject of a Geotechnical Completion Report once completed.

4 RELATED DOCUMENTS

The following documents were reviewed during preparation of this report:

Report	Reference and/or Comments
Geotechnical Investigation Report – Stages 2 & 3	AKL2017_0069AC Rev.3, dated 18/09/2017
Stability Assessment	Appendix D to report AKL2017_0069AC Rev.3
Settlement Assessment	Appendix E to report AKL2017_0069AC Rev.3
Liquefaction Assessment	Appendix F to report AKL2017_0069AC Rev.3
Earthfill Completion Report – Earthworks 2 & 2A	AKL2017_0069BY Rev.0, dated 4/11/2019
Geotechnical Investigation Report – Earthworks 3A	AKL2019-0081AD Rev.1, dated 20/11/2019
Earthfills Completion Report – Earthworks 3A	AKL2019-0161CI Rev.0, dated 5/04/2022
Geotechnical Investigation Report – Subdivision Stage 4	AKL2019-0238AD Rev.0, dated 3/08/2020
Geotechnical Letter – Stage 4C-1 Earthworks Consent	AKL2019-0161DJ Rev.1, dated 12/05/2023

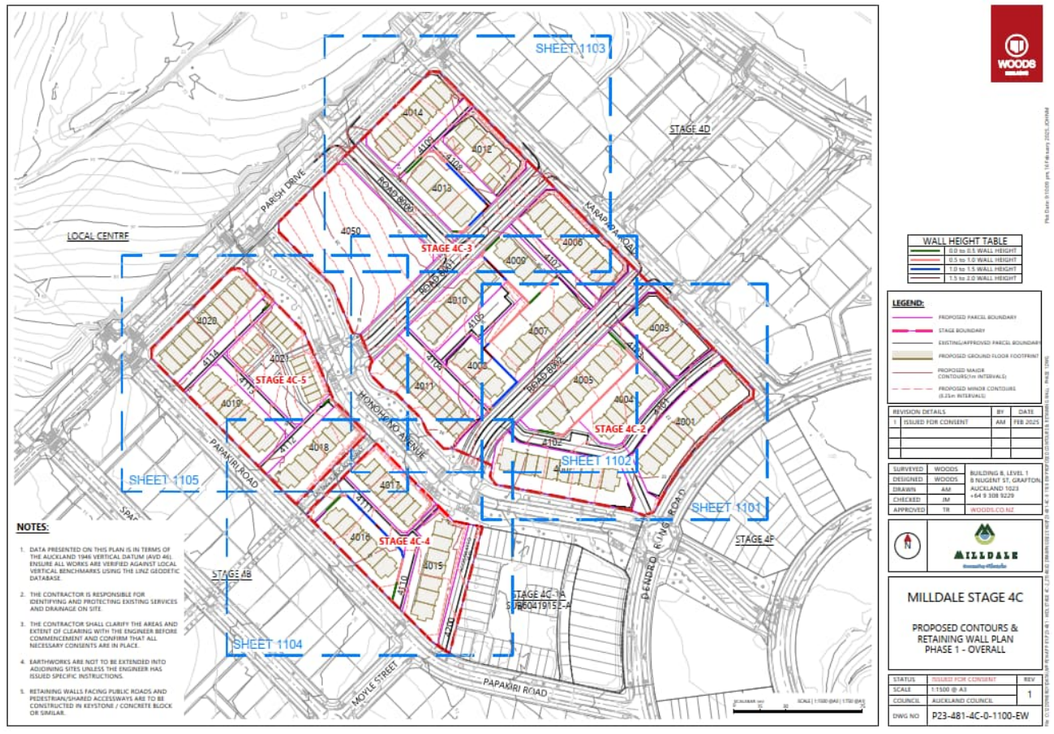


Figure 3: Proposed Contour Plan

5 PREVIOUS FIELD INVESTIGATION & LABORATORY TESTING

5.1 Field Investigation

No site investigation has been undertaken specific to this report. Approximate locations of existing site investigation data for this and adjacent sites from those reports listed in *Section 4* is shown on the Site Investigation Plan in *Appendix A*.

5.2 Laboratory Testing

No laboratory testing has been undertaken specific to this report. However, laboratory testing has been undertaken as part of those investigation reports listed in *Section 4* above, as well as across the wider Milldale development since 2017. All testing was scheduled by CMW and carried out by an IANZ registered Testing Authority. Certificates for test results are presented in the relevant reports.

6 GEOTECHNICAL MODEL

6.1 Published and Interpreted Geology & Groundwater

Published geological maps[1] for the area depict the geology of the upper portion of the site as comprising Hukerenui Mudstone (Kkh, a unit of the Mangakahia Complex of the Northland Allochthon) as illustrated in *Figure 5*. This unit typically comprises deeply weathered clays in green, black, brown and purple.

However, our investigations encountered Mangakahia Complex (Kk) of the Northland Allochthon, with Hukerenui Mudstone only found further west of the site. This unit comprises extremely weak to very weak grey siltstone which has a highly shattered but tightly interlocking fabric. It typically weathers to dark grey clay, initially on the surfaces of defects.

These strata are part of an allochthonous (meaning removed from its formation location) mass of continental crust that was peeled from the subduction zone north of New Zealand and emplaced through low angle thrust faulting onto areas of Northland and the Silverdale area. Due to the nature of emplacement, materials are typically highly fractured or even shattered and variably weathered.

The lower portion of the site comprised Tauranga Group alluvial and colluvial deposits, with similar extents to those mapped.

Groundwater levels were shallow in the lower portion of the site, typically 0.5 to 1m depth below original ground surface near Waterloo Creek.

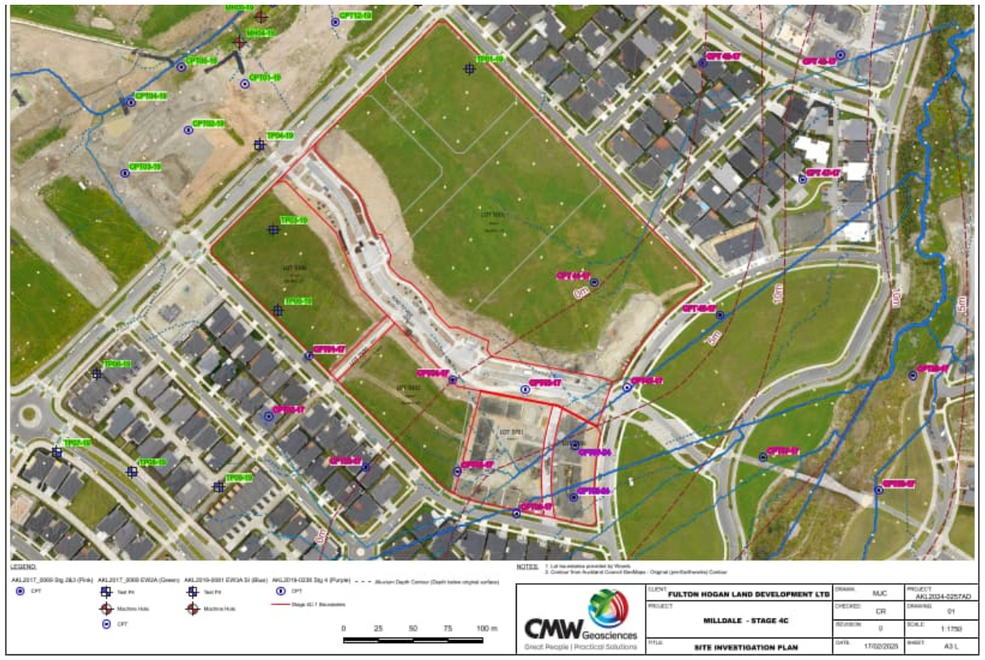


Figure 4: Site Investigation Plan

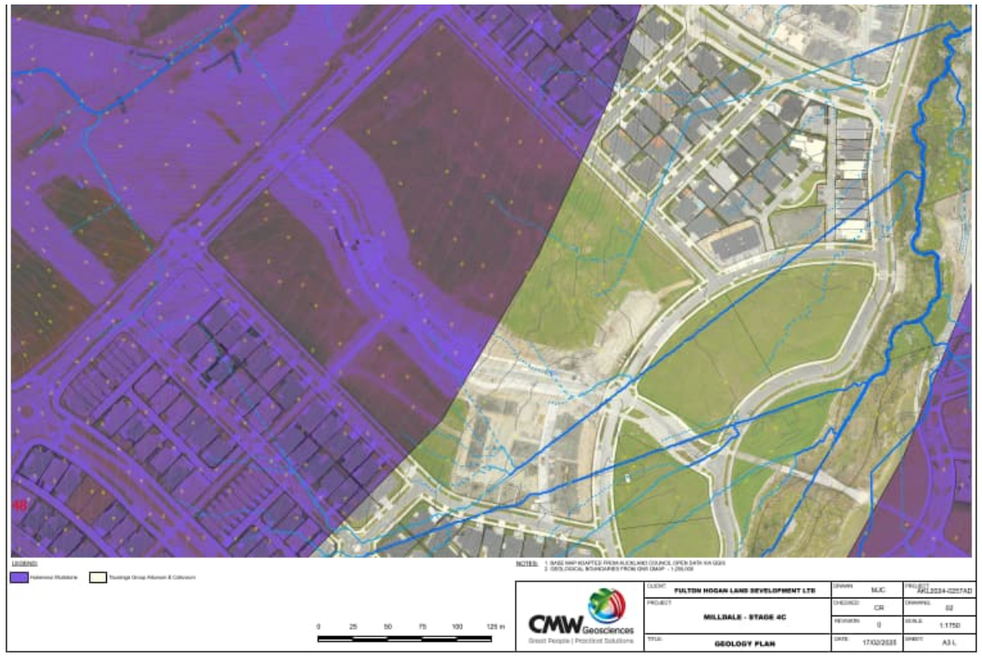


Figure 5: Geology Plan

[1] Edbrooke, S.W. (compiler) 2001: Geology of the Auckland area. Institute of Geological and Nuclear Sciences 1:250 000 geological map 3. 1 sheet + 74 p. Lower Hutt, New Zealand. GNS Science.

FACTUAL

6.2 Stratigraphic Units & Recommended Geotechnical Parameters

Our assessment of the distribution of the stratigraphic layers at specific investigation locations is illustrated on the Geological Sections appended to the relevant investigation reports, and the interpreted depth of alluvial soils is shown on the Site Investigation Plan in *Appendix A*.

CMW has undertaken a body of shear box testing on Undifferentiated Mangakahia Complex samples across a range of projects in the Silverdale area. That body of testing is being supplemented as time progresses and has been used to assess lower quartile conservative parameters for design in this unit. Cross-checking has occurred with back analysis of slope failures and has in some instances led to significant further reductions in parameters, particularly cohesion values.

Although parameters below differ slightly from those adopted in earlier Milldale projects, we have assessed that these changes will have no impact on our assessment of slope stability for Stage 4C. Earlier reporting did not require stability assessment due to the gentle slope of the site being further eased by cuts from the ridge and the placement of fills at the toe. The proposed works do not alter this assessment. Parameters are provided here for future design purposes.

Geotechnical Design Parameters				
Unit Description	γ (kN/m^3)	c´ (kPa)	ϕ´ (deg)	S_u (kPa)
Engineered Fill	18	8	28	100
Tauranga Group Alluvium (Firm - Stiff) Described as light grey, green and blue clays and silts with limonite staining and some organic inclusions such as decomposing roots. Groundwater is typically shallow.	17	5	26	60
Residual Northland Allochthon Soils Orange-brown to grey clays and silty clays, firm to very stiff, moist and highly plastic. Typically 1 to 4m thick.	18	5	28	60
Transitional Undifferentiated Mangakahia Complex Grey, highly fractured but interlocking angular siltstone Typically weathers to dark grey clay, initially on the surfaces of defects. Groundwater surface is commonly between 3 and 5 metres depth, at the transition zone between soil and rock.	18	8	21	55*
Undifferentiated Mangakahia rock mass Grey, moderately weathered, highly fractured but interlocking angular siltstone. Extremely weak to very weak.	21	20	28	150

Notes: γ = soil unit weight (conservative value determined from typical published values for similar soil types)
c´ = effective cohesion (conservative value developed from previous Milldale stages shear box testing and back analysis).
ϕ´ = effective friction angle (conservative value developed from previous Milldale stages shear box testing and back analysis).
S_u = undrained shear strength (lower bound value determined from vane shear testing and CPT correlations).
* Lower value than the typical range assumed due to the potential for degradation on unloading and exposure. The adopted value resembles remoulded values and strengths taken from back analysis of pile driving data nearby.

7 GEOHAZARDS ASSESSMENT

Assessment of Geohazards for the site has been undertaken during previous reporting. We assess settlement as being the primary geotechnical hazard relevant to the development. Remaining hazards have been assessed and addressed in previous relevant reporting. A summary of the most applicable hazards is provided in the table below.

Geotechnical Assessment Summary											
Item	Geotechnical Hazard	Description	Area Assessed	Assessment Outcome	Existing Risk of Damage to Land / Structures			Mitigation Measure	Residual Risk of Damage to Land / Structures		
					Likelihood	Consequence	Risk Rating		Likelihood	Consequence	Risk Rating
1	Earthquake	Liquefaction	Entire site	Plasticity index testing was carried out on alluvium soils obtained near the Waterloo Creek; all of these tests demonstrated Plasticity Index values in excess of 12, which in accordance with MBIE Module 3 are not susceptible to liquefaction.	1	5	5	Mitigation not required.	1	5	5
2	Slope Instability / Landslide	Global Instability	Entire site	Due to the gently sloping landform being further eased by previous works, slope instability is not anticipated.	1	5	5	Mitigation not required.	1	5	5
3	Problematic Soils	Rock mass Exposure	Areas of cuts	Minimal proposed cuts will not significantly impact thickness of capping materials previously placed during bulk earthworks. Proposed raingardens may encounter natural rock mass in the excavation, particularly at higher elevations.	2	4	8	Where natural rock mass is encountered within 0.5m of any surface of the raingarden excavation, it should be undercut and replaced with clay-rich engineered fill, subject to geotechnical inspection.	1	4	4
		Expansive Soils	Entire Site	Testing on previous stages of the development in these soils and engineered fills created from these soils indicates that they are typically moderately to highly expansive (AS2870).	4	5	20	Testing to be carried out on Phase 1 final surface prior to submission of the Geotechnical Completion Report (to be submitted on completion of Phase 1). On completion of Phase 2, further expansive testing should be undertaken to assess any additional fills placed. Specific foundation design to be undertaken by structural engineer in accordance with AS2870 or NZBC B1/AS1 (site class to be determined on a lot-by-lot basis).	2	5	10

4	Settlement	Compressible Soils	Stage 4C-2 Remainder of site assessed as low risk of load induced settlement due to shallow rock present.	Portions of the site were previously assessed as being susceptible to load induced settlements. These were surcharged up to 2.5m above the proposed subgrade at that time and monitored for 7 months. Additional fills up to 2m are now proposed (combined Phase 1 and 2) and therefore there is a risk of load induced settlement for the combined additional fills and future development loads. A review of the existing settlement analysis considering additional proposed fills has been carried out. It was found that post construction settlements can be limited to less than 50mm if the future development load is limited to 10kPa.	2	4	8	Provided fills do not exceed those proposed in total for Phases 1 and 2, the following options may be considered for future building loads at Building Consent: - limit to 10kPa - The use of lightweight fill materials such as polyrock, with or without undercutting to load compensate for the additional fills placed. - Further investigation and re-analysis leading to increased allowable loads, piled foundations or ground improvement.	1	4	4
		Bearing Capacity	Entire site	Following each phase of development, expect geotechnical ultimate bearing capacity (GUBC) of 300kPa for shallow foundations.	1	5	5	A preliminary geotechnical ultimate bearing capacity (GUBC) of 300kPa should be available for shallow strip and pad foundations constructed within both the natural cut ground and engineered fill areas, subject to the short axis of those footings measuring no greater than 2.5m in plan.	1	5	5

8 RECOMMENDATIONS

8.1 Earthworks

All earthwork activities must be carried out in general accordance with the requirements of NZS 4431:2022[2] and the requirements of the Auckland Council Infrastructure Development Code under the guidance of a Chartered Geotechnical Professional. These works should be carried out following the Geotechnical Works Specification produced for Stage 4 (appended to AKL2019-0238AD Rev.0).

8.2 Settlement Mitigation

Settlement mitigation in the form of preload surcharging was carried out during Earthworks 2 (for detail refer to the Civil Infrastructure Report submitted with the FT Application) in accordance with recommendations made in the GIR (AKL2017_0069AC Rev.3). This is shown on *Figure 6*, with surcharge being placed above proposed finished level in areas where alluvium was present and post construction settlements were estimated at greater than 50mm. This was largely in the area noted as Stage 4C-2, together with a portion of Stage 4C-4. Settlement monitoring occurred over a period of 8 – 9 months until a target of t90 was achieved, following which the stockpiles were removed. The surcharge was designed for a future development load of 10kPa, considering typical NZS3604:2011 residential dwellings, allowing for up to 50mm of post construction settlement.

The current proposal is to fill above previous finished level within the surcharge area and therefore a reassessment for the additional fills and proposed residential construction is required.

Back analysis of settlement monitoring data across several settlement monitoring points within Earthworks 2 including SM17 within the proposed area of additional fills was carried out to obtain consolidation parameters (Cc) to forward analyse the settlement magnitude of additional fills placed in the settlement hazard area (up to 1.25m).

Results of this analysis suggest that the post construction settlements of less than 50mm may still be achieved if the future development load is limited to 10kPa. In order to increase this future development load further, options during Phase 1 works include:

- undertaking further investigation to characterise depth of alluvium and/or optimise consolidation parameters; and/ or
- undertake further surcharging above the proposed finished level with settlement monitoring.

If no further settlement mitigation is carried out during Phase 1, it is likely that future two-storey townhouse dwellings together with additional fills will exceed this 10kPa, therefore this will need to be considered at Building Consent application for future dwellings in the affected areas of Stages aC-2 and 4C-4. There are various forms of settlement mitigation that can be used as part of structural design – these include:

- Further investigation to characterise settlement risk across the site for the proposed development loads.
- the use of lightweight fill materials such as polyrock, with or without undercutting to load compensate for the additional fills placed.
- Ground improvement or piled foundations.

Figure 6: Extent of preload surcharge placed during previous earthworks

[2] Standards New Zealand (2022) Engineered fill construction for lightweight structures, NZS 4431:2022

8.3 Civil Works

Key Civil Inputs		
Item	Value	Comment
Subgrade CBR	5 – 6%	Within engineered fills
Stormwater Soakage (permeability)	-	No soakage to ground available
Retaining Wall Parameters	Refer Section 6.2	Geotechnical design parameters provided in Section 6.2.

Where natural rock mass is encountered within 0.5m of any surface of a raingarden excavation, it should be undercut and replaced with clay-rich engineered fill, subject to geotechnical inspection.

Excavations into transitional Undifferentiated Mangakahia deposits to form sediment retention ponds can be expected to experience significant softening and degradation and are expected to require undercutting of softened deposits prior to backfilling.

8.4 Foundations

Our expectation is that provided the additional earthworks are completed in accordance with the standards and recommendations described herein, the following will apply:

Anticipated Foundation Details			
Item	Methodology	Value	Comment
Geotechnical Ultimate Bearing Capacity (GUBC) for shallow foundations		300kPa	Available within engineered fill areas. Short axis of footing measuring no greater than 2.5m in plan
Expansive Soil Site Class	AS2870	M (moderate) / H1 (high)	Anticipated characteristic surface movement of up to 40mm (M) / 60mm (H1). Needs to be confirmed as part of additional testing prior to issue of Completion Reporting.
Strength reduction factors	B1/VM4[3]	0.8 0.5	Load combinations involving earthquake overstrength All other load combinations
Seismic Site Class(es)	NZS1170	C	Based on previous reporting and depth of alluvial soils

8.5 Further Work and Certifications

During Phase 1 construction, regular inspections and testing will be required as outlined in the Geotechnical Works Specification. At the completion of the Phase 1 works, a Geotechnical Completion Report (GCR) will be prepared. The GCR will:

- report on the works undertaken
- confirm foundation design parameters for the Phase 1 surface
- describe future building and/ or earthworks limitations
- apply any restrictions that require further engineering investigation and/ or design on individual lots to avoid future building works exacerbating a natural hazard

For Phase 2 works, inspections and testing will be required at the discretion of the engineer specific to each superlot. Following these works updated certification will be required and is expected to be in the form of new Geotechnical Completion Reporting for each subdivided superlot.

9 CLOSURE

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

This report has been prepared for use by Fulton Hogan Land Development Limited in relation to the Proposed Residential Subdivision, Milldale Stage 4C, Milldale, Wainui project in accordance with the scope, proposed uses and limitations described in the report. Should you have further questions relating to the use of your report please do not hesitate to contact us.

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

[3] Ministry of Business, Innovation and Employment (2019) *Acceptable Solutions and Verification Methods for NZ Building Code Clause B1 Structure,* B1/VM4, Amendment 19

USING YOUR CMW GEOTECHNICAL REPORT

Geotechnical reporting relies on interpretation of facts and collected information using experience, professional judgement, and opinion. As such it generally has a level of uncertainty attached to it, which is often far less exact than other engineering design disciplines. The notes below provide general advice on what can be reasonably expected from your report and the inherent limitations of a geotechnical report.

Preparation of your report

Your geotechnical report has been written for your use on your project. The contents of your report may not meet the needs of others who may have different objectives or requirements. The report has been prepared using generally accepted Geotechnical Engineering and Engineering Geology practices and procedures. The opinions and conclusions reached in your report are made in accordance with these accepted principles. Specific items of geotechnical or geological importance are highlighted in the report.

In producing your report, we have relied on the information which is referenced or summarised in the report. If further information becomes available or the nature of your project changes, then the findings in this report may no longer be appropriate. In such cases the report must be reviewed, and any necessary changes must be made by us.

Your geotechnical report is based on your project's requirements

Your geotechnical report has been developed based on your specific project requirements and only applies to the site in this report. Project requirements could include the type of works being undertaken; project locality, size and configuration; the location of any structures on or around the site; the presence of underground utilities; proposed design methodology; the duration or design life of the works; and construction method and/or sequencing.

The information or advice in your geotechnical report should not be applied to any other project given the intrinsic differences between different projects and site locations. Similarly geotechnical information, data and conclusions from other sites and projects may not be relevant or appropriate for your project.

Interpretation of geotechnical data

Site investigations identify subsurface conditions at discrete locations. Additional geotechnical information (e.g. literature and external data source review, laboratory testing etc) are interpreted by Geologists or Engineers to provide an opinion about a site specific ground models, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist due to the variability of geological environments. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. Interpretation of factual data can be influenced by design and/or construction methods. Where these methods change review of the interpretation in the report may be required.

Subsurface conditions can change

Subsurface conditions are created by natural processes and then can be altered anthropically or over time. For example, groundwater levels can vary with time or activities adjacent to your site, fill may be placed on a site, or the consistency of near surface conditions might be susceptible to seasonal changes. The report is based on conditions which existed at the time of investigation. It is important to confirm whether conditions may have changed, particularly when large periods of time have elapsed since the investigations were performed.

Interpretation and use by other design professionals

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a geotechnical report. To help avoid misinterpretations, it is important to retain the assistance of CMW to work with other project design professionals who are affected by the contents of your report. CMW staff can explain the report implications to design professionals and then review design plans and specifications to see that they have correctly incorporated the findings of this report.

Your report's recommendations require confirmation during construction

Your report is based on site conditions as revealed through selective point sampling. Engineering judgement is then applied to assess how indicative of actual conditions throughout an area the point sampling might be. Any assumptions made cannot be substantiated until construction is complete. For this reason, you should retain geotechnical services throughout the construction stage, to identify variances from previous assumption, conduct additional tests if required and recommend solutions to problems encountered on site.

A Geotechnical Engineer, who is fully familiar with the site and the background information, can assess whether the report's recommendations remain valid and whether changes should be considered as the project develops. An unfamiliar party using this report increases the risk that the report will be misinterpreted.

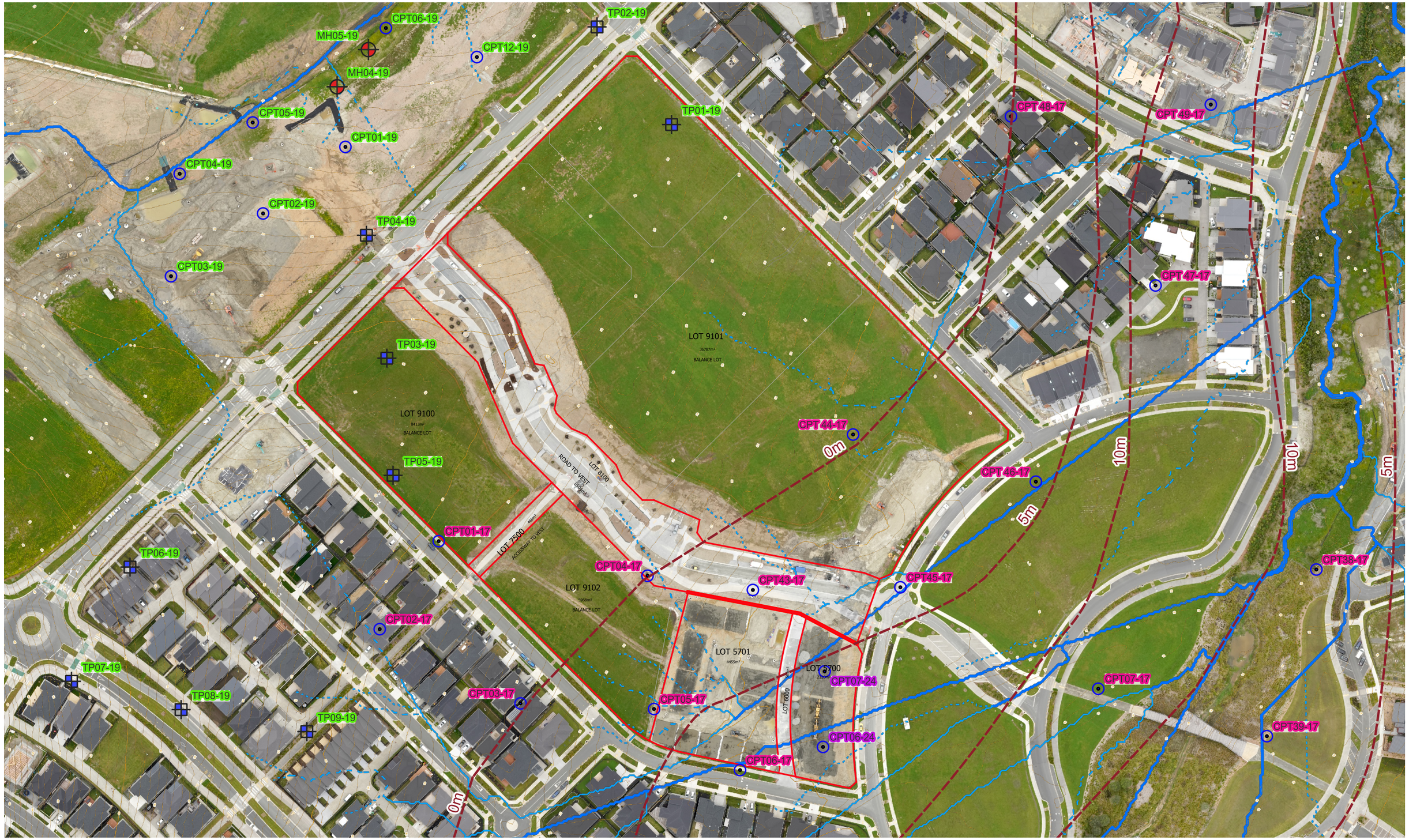
Environmental Matters Are Not Covered

Unless specifically discussed in your report environmental matters are not covered by a CMW Geotechnical Report. Environmental matters might include the level of contaminants present of the site covered by this report, potential uses or treatment of contaminated materials or the disposal of contaminated materials. These matters can be complex and are often governed by specific legislation.

The personnel, equipment, and techniques used to perform an environmental study can differ significantly from those used in this report. For that reason, our report does not provide environmental recommendations. Unanticipated subsurface environmental problems can have large consequences for your site. If you have not obtained your own environmental information about the project site, ask your CMW contact about how to find environmental risk-management guidance.

Appendix A: Drawings

Title	Reference No.	Date	Revision
Site Investigation Plan	AD 01	17/02/2025	0
Geology Plan	AD 02	17/02/2025	0



LEGEND:

AKL2017_0069 Stg 2&3 (Pink)
- CPT

AKL2017_0069 EW2A (Green)
- Test Pit
- Machine Hole
- CPT

AKL2019-0081 EW3A SI (Blue)
- Test Pit
- Machine Hole

AKL2019-0238 Stg 4 (Purple)
- CPT
- Stage 4C-1 Boundaries

Alluvium Depth Contour (Depth below original surface)

0 25 50 75 100 m

NOTES:
1. Lot boundaries provided by Woods
2. Contour from Auckland Council GeoMaps - Original (pre-Earthworks) Contour

CMW Geosciences
Great People | Practical Solutions

CLIENT: FULTON HOGAN LAND DEVELOPMENT LTD	DRAWN: MJC	PROJECT: AKL2024-0257AD	
PROJECT: MILLDALE - STAGE 4C	CHECKED: CR	DRAWING: 01	
	REVISION: 0	SCALE: 1:1750	
TITLE: SITE INVESTIGATION PLAN	DATE: 17/02/2025	SHEET: A3 L	

LEGEND:

- Hukerenui Mudstone
- Tauranga Group Alluvium & Colluvium

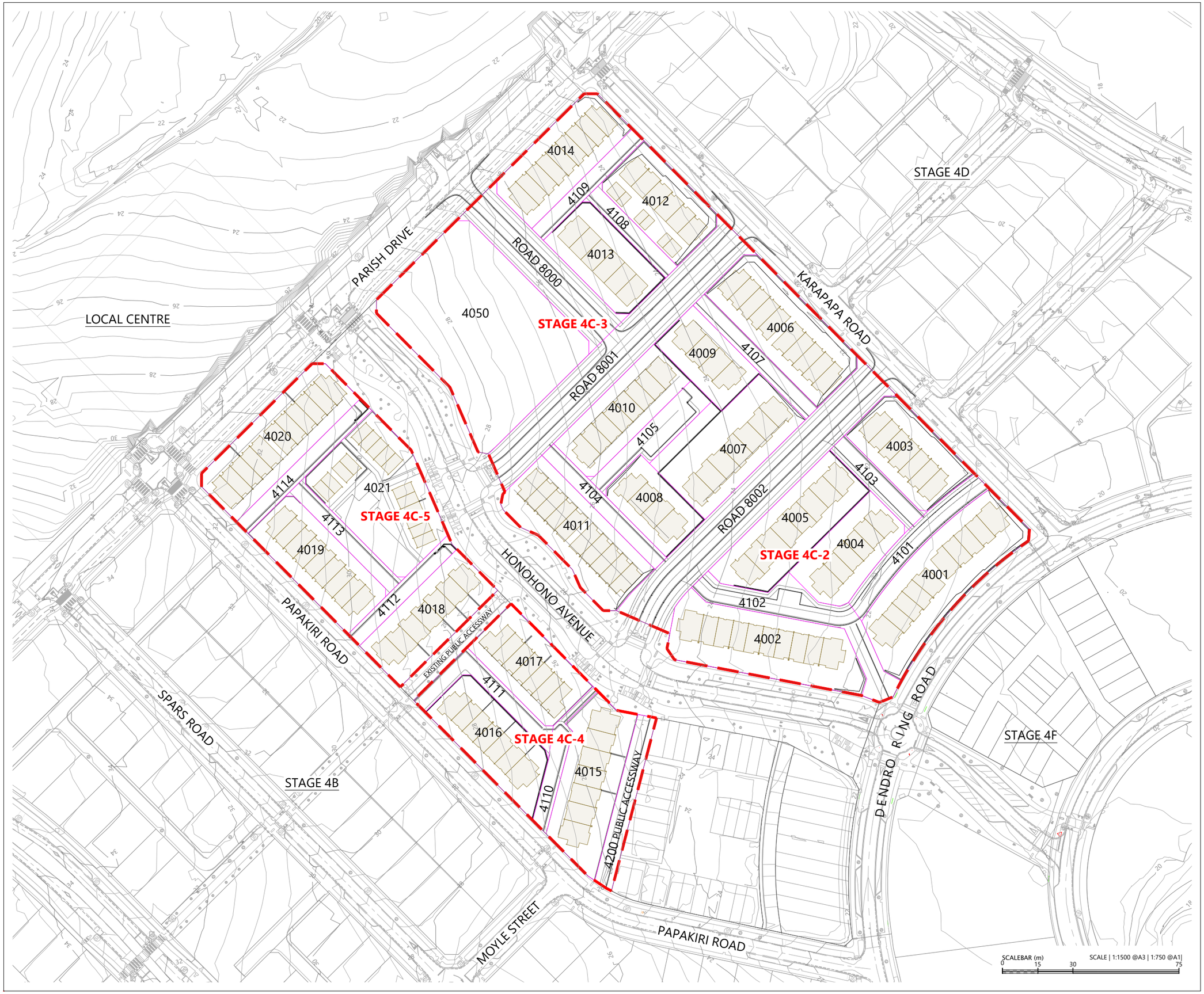
NOTES:
1. BASE MAP ADAPTED FROM AUCKLAND COUNCIL OPEN DATA VIA QGIS
2. GEOLOGICAL BOUNDARIES FROM GNS QMAP - 1:250,000

0 25 50 75 100 125 m

CMW Geosciences
Great People | Practical Solutions

CLIENT: FULTON HOGAN LAND DEVELOPMENT LTD		DRAWN: MJC	PROJECT: AKL2024-0257AD
PROJECT: MILLDALE - STAGE 4C		CHECKED: CR	DRAWING: 02
		REVISION: 0	SCALE: 1:1750
TITLE: GEOLOGY PLAN		DATE: 17/02/2025	SHEET: A3 L

Appendix B: Woods Civil Drawings



WOODS
Est.1970

Plot Date: 5:09:17 pm,25 February 2025, JOHNM

NOTES:

1. DATA PRESENTED ON THIS PLAN IS IN TERMS OF THE AUCKLAND 1946 VERTICAL DATUM (AVD 46). ENSURE ALL WORKS ARE VERIFIED AGAINST LOCAL VERTICAL BENCHMARKS USING THE LINZ GEODETIC DATABASE.
2. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING AND PROTECTING EXISTING SERVICES AND DRAINAGE ON SITE.
3. THE CONTRACTOR SHALL CLARIFY THE AREAS AND EXTENT OF CLEARING WITH THE ENGINEER BEFORE COMMENCEMENT AND CONFIRM THAT ALL NECESSARY CONSENTS ARE IN PLACE.
4. SURFACE LEVELS OUTSIDE THE DEVLOPMENT ARE A COMBINATION OF ASBUILT LEVELS CONSTRUCTED UNDER STAGE 4B,4F AND DESIGN LEVELS APPROVED UNDER CONSENT NO. BUN60419151-A.

LEGEND:

- PROPOSED PARCEL BOUNDARY
- STAGE BOUNDARY
- EXISTING PARCEL BOUNDARY
- PROPOSED GROUND FLOOR FOOTPRINT
- 24 EXISTING CONTOURS 0.50m INCREMENTS

REVISION DETAILS		BY	DATE
1	ISSUED FOR CONSENT	TR	FEB 2025

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

N

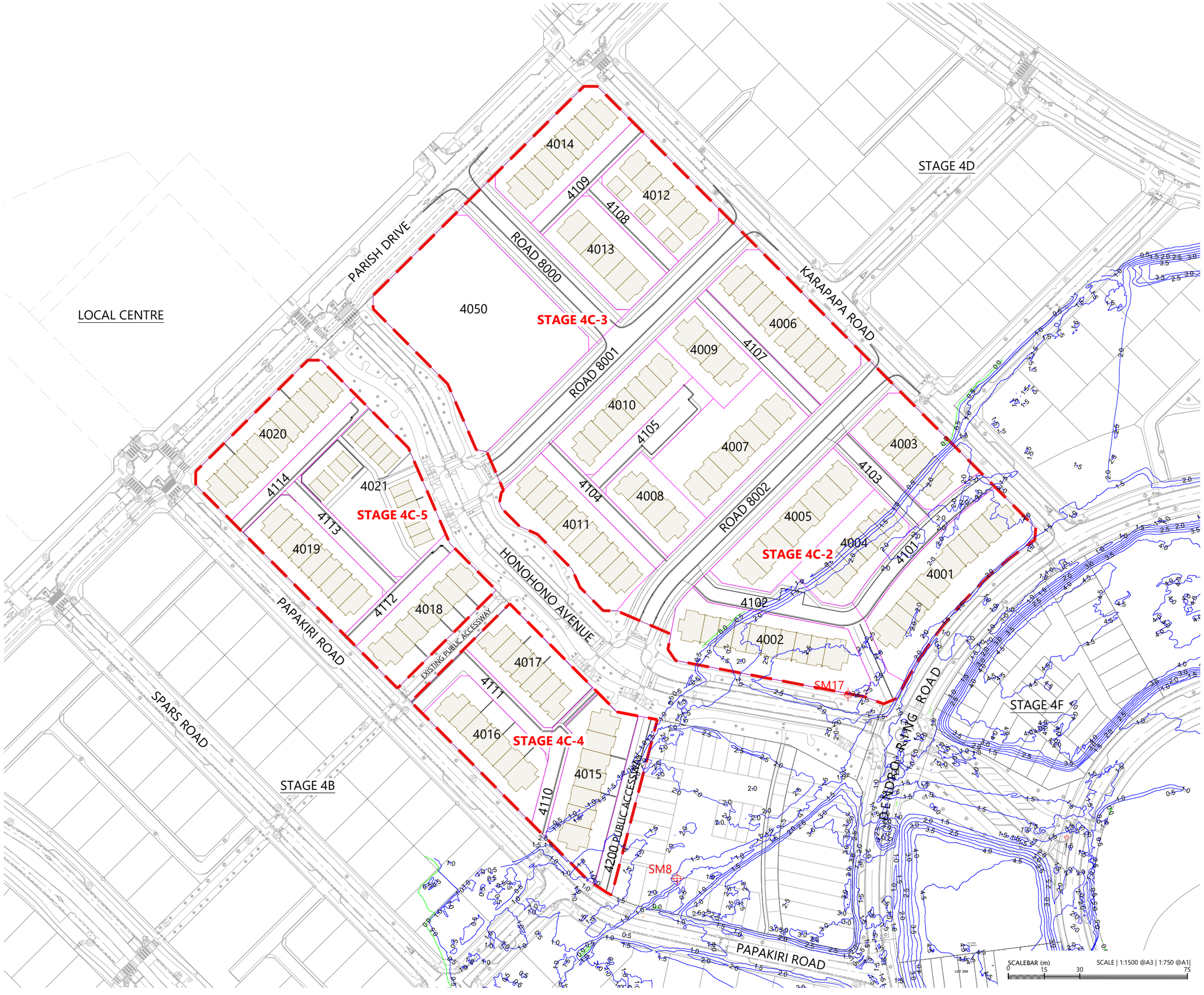
MILLDALE
Connecting Lifestyles

MILLDALE STAGE 4C

EXISTING CONTOURS PLAN

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:1500 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P23-481-4C-0-1000-EW	

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P23-481 - MDL STAGE 4C-2_215461\02 DRAWINGS\02 ENG\P23-481-4C-0-1000-EW EXISTING CONTOURS.DWG



NOTES:

1. DEPTH CONTOURS ARE BETWEEN EARTHWORKS SUBGRADE AND PRELOAD SURFACES AND AT 0.5m INTERVALS.
2. PLAN SHOULD BE READ IN CONJUNCTION WITH GEOTECHNICAL REPORT.
3. PRELOAD CONTOURS SHOWN ON THIS PLAN ARE COMPLETED, AND SHOW THE PRELOAD UNDERTAKEN DURING EARTHWORKS CONSENT STAGE 2 (BUN60303878).

LEGEND:

- PROPOSED PARCEL BOUNDARY
- STAGE BOUNDARY
- EXISTING PARCEL BOUNDARY
- PROPOSED GROUND FLOOR FOOTPRINT
- ZERO CONTOUR
- 2.0 FILL CONTOUR (0.50m INTERVAL)
- SM10 SETTLEMENT MONITORING ROD

REVISION DETAILS		BY	DATE
1	ISSUED FOR CONSENT	TR	FEB 2025

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

N

MILLDALE
Connecting Lifestyles

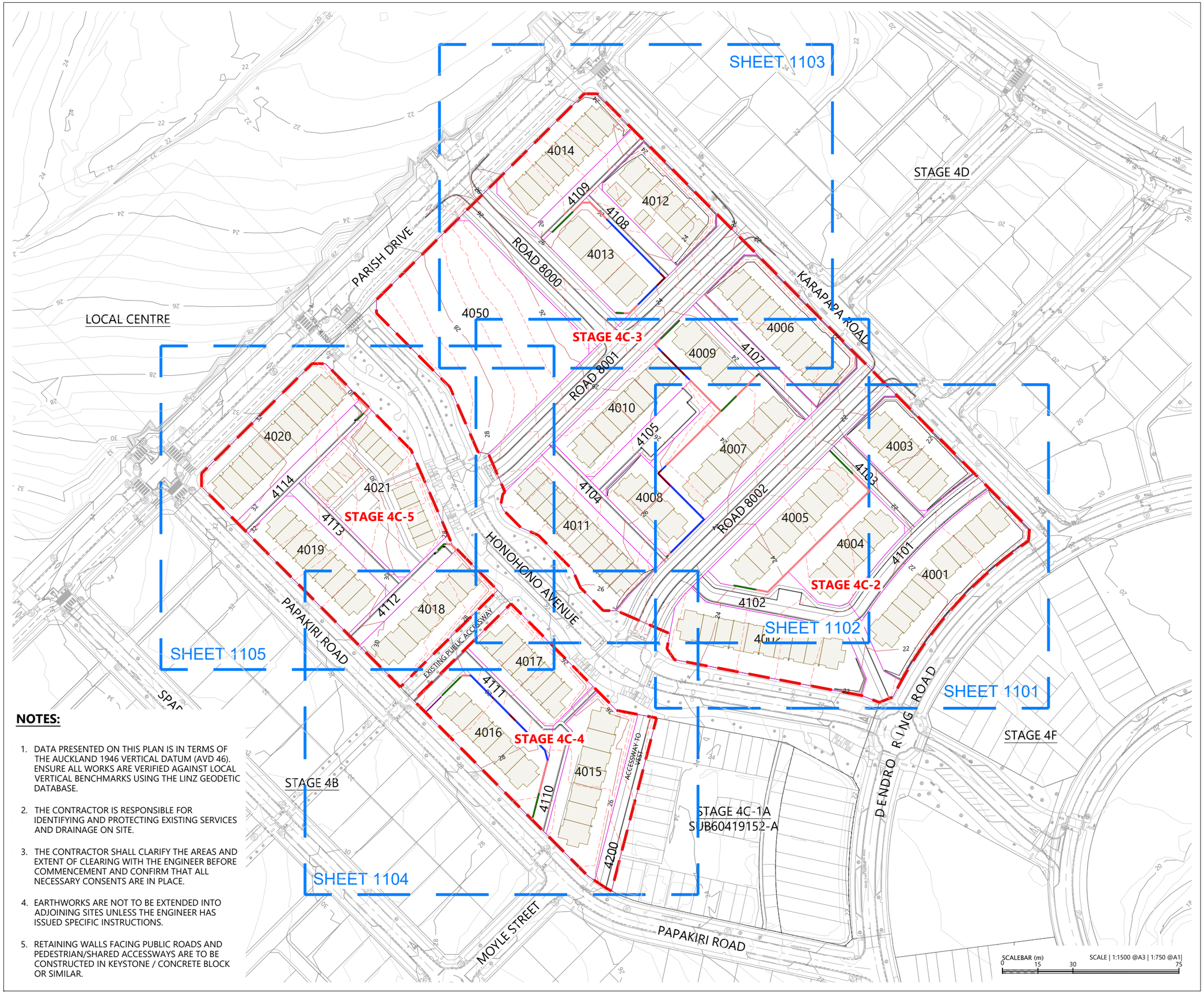
MILLDALE STAGE 4C

COMPLETED PRELOAD PLAN

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:1500 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P23-481-4C-0-1020-EW	

Plot Date: 4:09:32 pm,25 February 2025, ERICY

File: C:\12DS\DATA\WP-PEN-APP-01\P23-481 - MDL STAGE 4C-2_21546\02 DRAWINGS\02 ENG\P23-481-4C-0-1020-EW PRELOAD CONTOURS.DWG



NOTES:

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3. THE CONTRACTOR SHALL CLARIFY THE AREAS AND EXTENT OF CLEARING WITH THE ENGINEER BEFORE COMMENCEMENT AND CONFIRM THAT ALL NECESSARY CONSENTS ARE IN PLACE.
4. EARTHWORKS ARE NOT TO BE EXTENDED INTO ADJOINING SITES UNLESS THE ENGINEER HAS ISSUED SPECIFIC INSTRUCTIONS.
5. RETAINING WALLS FACING PUBLIC ROADS AND PEDESTRIAN/SHARED ACCESSWAYS ARE TO BE CONSTRUCTED IN KEYSTONE / CONCRETE BLOCK OR SIMILAR.

WOODS
EST.1970

WALL HEIGHT TABLE	
	0.0 to 0.5 WALL HEIGHT
	0.5 to 1.0 WALL HEIGHT
	1.0 to 1.5 WALL HEIGHT
	1.5 to 2.0 WALL HEIGHT

LEGEND:

- PROPOSED PARCEL BOUNDARY
- STAGE BOUNDARY
- EXISTING/APPROVED PARCEL BOUNDARY
- PROPOSED GROUND FLOOR FOOTPRINT
- PROPOSED MAJOR CONTOURS(1m INTERVALS)
- PROPOSED MINOR CONTOURS (0.25m INTERVALS)

REVISION DETAILS		BY	DATE
1	ISSUED FOR CONSENT	AM	FEB 2025

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

N

MILLDALE
Connecting Lifestyles

MILLDALE STAGE 4C

PROPOSED CONTOURS & RETAINING WALL PLAN PHASE 1 - OVERALL

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:1500 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P23-481-4C-0-1100-EW	

Plot Date: 5:01:23 pm,25 February 2025, JOHNM

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P23-481 - MDL STAGE 4C-2_215461\02 DRAWINGS\02 ENG\P23-481-4C-0-1100-EW PROPOSED CONTOURS & RETAINING WALL - PHASE 1.DWG

NOTES:

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LOCALITY PLAN
N.T.S

WOODS
Est.1970

WALL HEIGHT TABLE	
	0.0 to 0.5 WALL HEIGHT
	0.5 to 1.0 WALL HEIGHT
	1.0 to 1.5 WALL HEIGHT
	1.5 to 2.0 WALL HEIGHT

LEGEND:

- PROPOSED PARCEL BOUNDARY
- STAGE BOUNDARY
- EXISTING/APPROVED PARCEL BOUNDARY
- PROPOSED GROUND FLOOR FOOTPRINT
- PROPOSED MAJOR CONTOURS(1m INTERVALS)
- PROPOSED MINOR CONTOURS (0.25m INTERVALS)

REVISION DETAILS		BY	DATE
1	ISSUED FOR CONSENT	AM	FEB 2025

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

N

MILLDALE
Connecting Lifestyles

MILLDALE STAGE 4C

PROPOSED CONTOURS &
RETAINING WALL PLAN
PHASE 1 - SHEET 1

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:500 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P23-481-4C-0-1101-EW	

SCALEBAR (m) 0 5 10 25
SCALE | 1:500 @A3 | 1:250 @A1|

Plot Date: 5:01:24 pm,25 February 2025, JOHNM

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P23-481 - MDL STAGE 4C-2_21546\02 DRAWINGS\02 ENG\P23-481-4C-0-1100-EW PROPOSED CONTOURS & RETAINING WALL - PHASE 1.DWG

NOTES:

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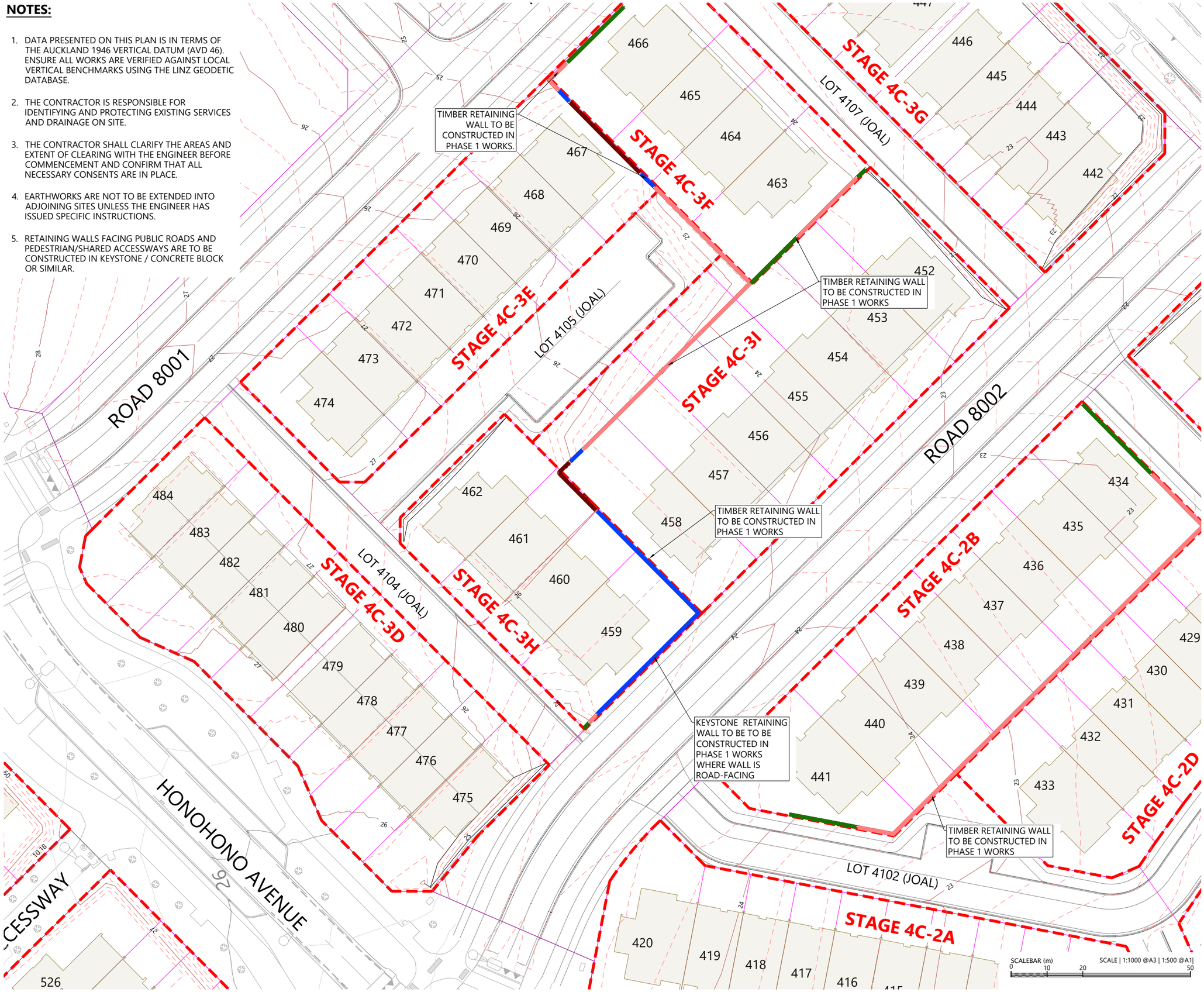


LOCALITY PLAN
N.T.S

WALL HEIGHT TABLE	
	0.0 to 0.5 WALL HEIGHT
	0.5 to 1.0 WALL HEIGHT
	1.0 to 1.5 WALL HEIGHT
	1.5 to 2.0 WALL HEIGHT

LEGEND:

- PROPOSED PARCEL BOUNDARY
- STAGE BOUNDARY
- EXISTING/APPROVED PARCEL BOUNDARY
- PROPOSED GROUND FLOOR FOOTPRINT
- PROPOSED MAJOR CONTOURS(1m INTERVALS)
- PROPOSED MINOR CONTOURS (0.25m INTERVALS)

REVISION DETAILS		BY	DATE
1	ISSUED FOR CONSENT	AM	FEB 2025

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

N

MILLDALE
Connecting Lifestyles

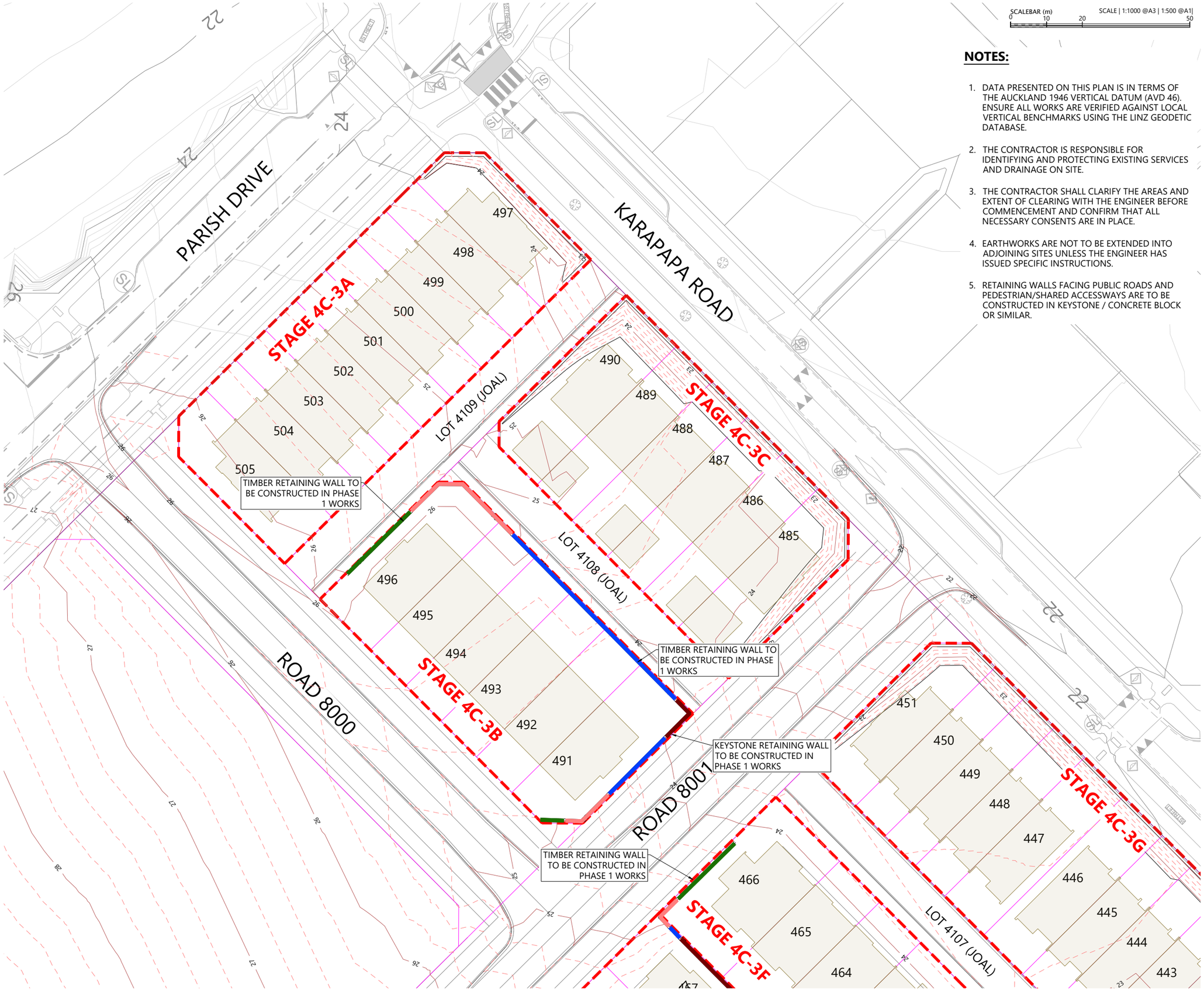
MILLDALE STAGE 4C

PROPOSED CONTOURS & RETAINING WALL PLAN
PHASE 1 - SHEET 2

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:500 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P23-481-4C-0-1102-EW	

Plot Date: 5:01:25 pm,25 February 2025, JOHNM

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P23-481 - MDL STAGE 4C-2_21540\02 DRAWINGS\02 ENG\P23-481-4C-0-1100-EW PROPOSED CONTOURS & RETAINING WALL - PHASE 1.DWG



SCALEBAR (m) 0 10 20 50

SCALE | 1:1000 @A3 | 1:500 @A1

NOTES:

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5. RETAINING WALLS FACING PUBLIC ROADS AND PEDESTRIAN/SHARED ACCESSWAYS ARE TO BE CONSTRUCTED IN KEYSTONE / CONCRETE BLOCK OR SIMILAR.

LOCALITY PLAN
N.T.S

WOODS
Est.1970

WALL HEIGHT TABLE	
	0.0 to 0.5 WALL HEIGHT
	0.5 to 1.0 WALL HEIGHT
	1.0 to 1.5 WALL HEIGHT
	1.5 to 2.0 WALL HEIGHT

LEGEND:

- PROPOSED PARCEL BOUNDARY
- STAGE BOUNDARY
- EXISTING/APPROVED PARCEL BOUNDARY
- PROPOSED GROUND FLOOR FOOTPRINT
- PROPOSED MAJOR CONTOURS(1m INTERVALS)
- PROPOSED MINOR CONTOURS (0.25m INTERVALS)

REVISION DETAILS		BY	DATE
1	ISSUED FOR CONSENT	AM	FEB 2025

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

N

MILLDALE
Connecting Lifestyles

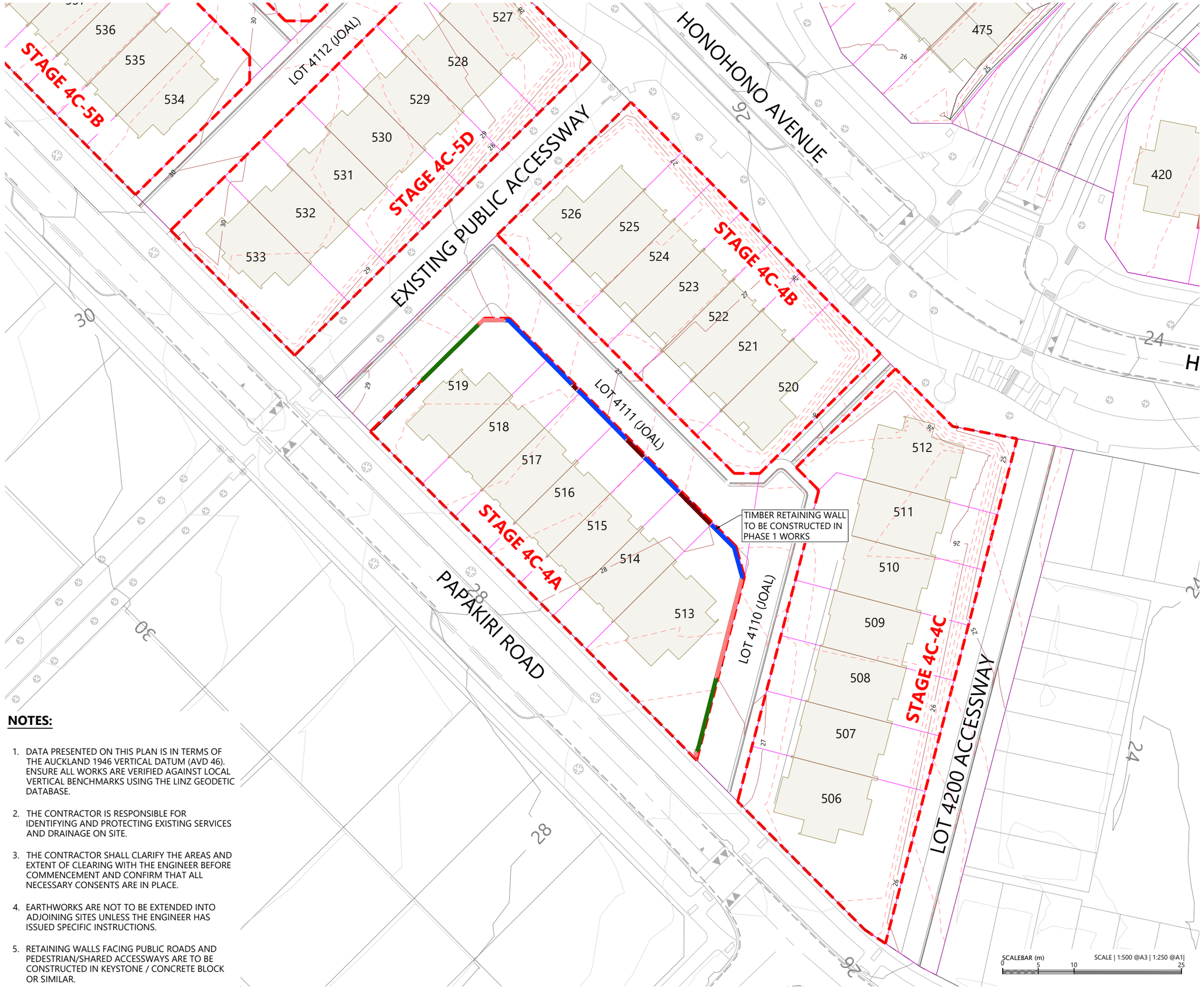
MILLDALE STAGE 4C

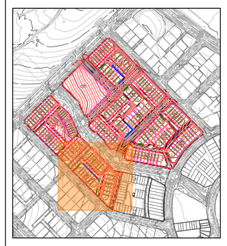
PROPOSED CONTOURS & RETAINING WALL PLAN
PHASE 1 - SHEET 3

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:500 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P23-481-4C-0-1103-EW	

Plot Date: 5:01:27 pm,25 February 2025, JOHNM

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P23-481 - MDL STAGE 4C-2_21546\02 DRAWINGS\02 ENG\P23-481-4C-0-1100-EW PROPOSED CONTOURS & RETAINING WALL - PHASE 1.DWG





LOCALITY PLAN
N.T.S

WOODS
Est.1970

Plot Date: 5:01:28 pm,25 February 2025, JOHNM

WALL HEIGHT TABLE	
	0.0 to 0.5 WALL HEIGHT
	0.5 to 1.0 WALL HEIGHT
	1.0 to 1.5 WALL HEIGHT
	1.5 to 2.0 WALL HEIGHT

LEGEND:

- PROPOSED PARCEL BOUNDARY
- STAGE BOUNDARY
- EXISTING/APPROVED PARCEL BOUNDARY
- PROPOSED GROUND FLOOR FOOTPRINT
- PROPOSED MAJOR CONTOURS(1m INTERVALS)
- PROPOSED MINOR CONTOURS (0.25m INTERVALS)

REVISION DETAILS		BY	DATE
1	ISSUED FOR CONSENT	AM	FEB 2025

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

N

MILLDALE
Connecting Lifestyles

MILLDALE STAGE 4C

PROPOSED CONTOURS & RETAINING WALL PLAN PHASE 1 - SHEET 4

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:500 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P23-481-4C-0-1104-EW	

NOTES:

1. DATA PRESENTED ON THIS PLAN IS IN TERMS OF THE AUCKLAND 1946 VERTICAL DATUM (AVD 46). ENSURE ALL WORKS ARE VERIFIED AGAINST LOCAL VERTICAL BENCHMARKS USING THE LINZ GEODETIC DATABASE.
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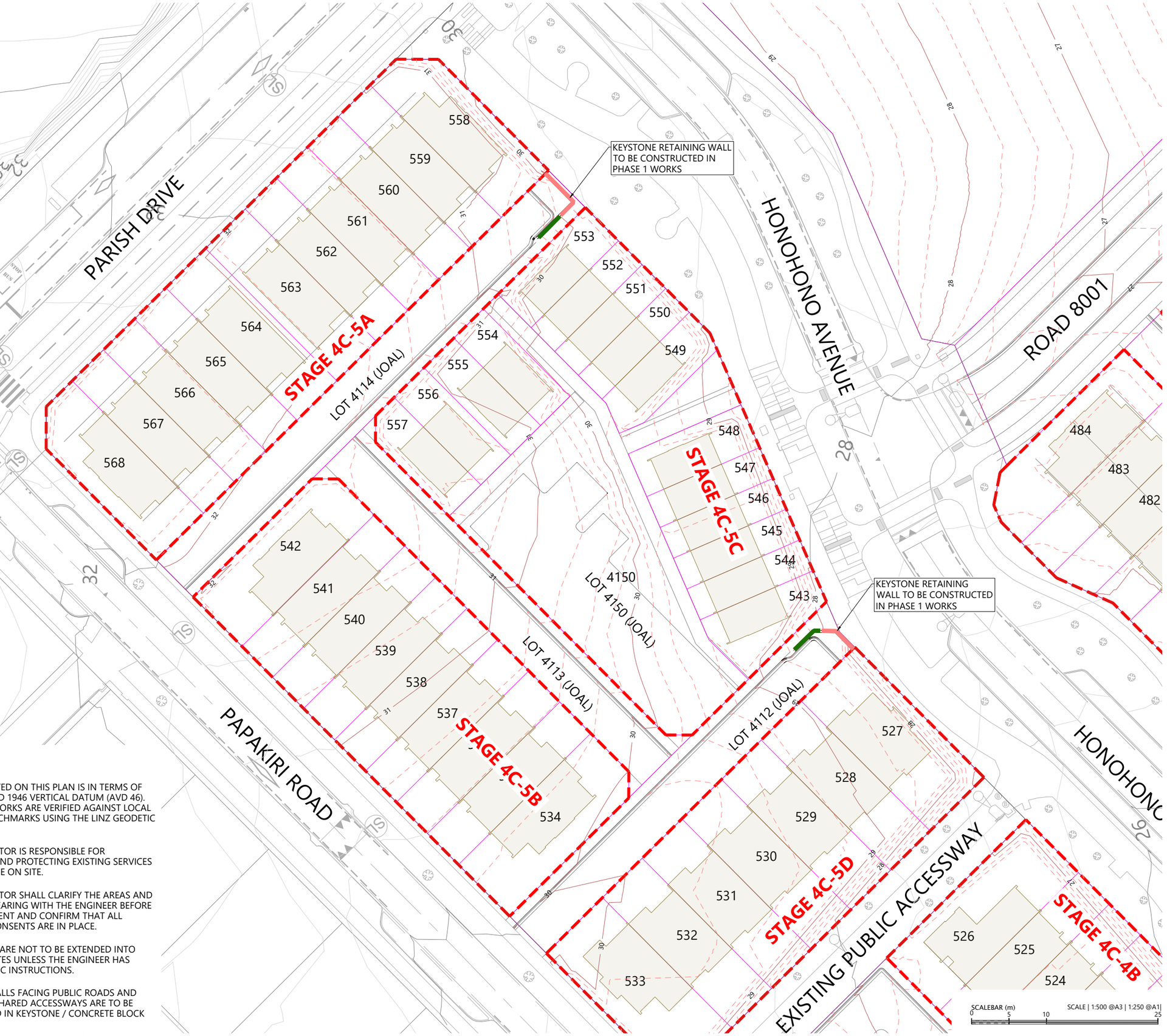
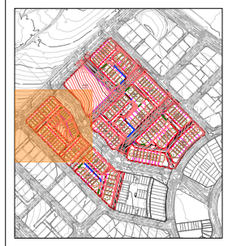
4. EARTHWORKS ARE NOT TO BE EXTENDED INTO ADJOINING SITES UNLESS THE ENGINEER HAS ISSUED SPECIFIC INSTRUCTIONS.
5. RETAINING WALLS FACING PUBLIC ROADS AND PEDESTRIAN/SHARED ACCESSWAYS ARE TO BE CONSTRUCTED IN KEYSTONE / CONCRETE BLOCK OR SIMILAR.

File: C:\12DSYNERGY\DATA\WP-PBN-APP-01\P23-481 - MDL STAGE 4C-2_21540\02 DRAWINGS\02 ENG\P23-481-4C-0-1100-EW PROPOSED CONTOURS & RETAINING WALL - PHASE 1.DWG





LOCALITY PLAN
N.T.S

WOODS
Est.1970

Plot Date: 5:01:29 pm,25 February 2025, JOHNM

WALL HEIGHT TABLE	
	0.0 to 0.5 WALL HEIGHT
	0.5 to 1.0 WALL HEIGHT
	1.0 to 1.5 WALL HEIGHT
	1.5 to 2.0 WALL HEIGHT

LEGEND:

- PROPOSED PARCEL BOUNDARY
- STAGE BOUNDARY
- EXISTING/APPROVED PARCEL BOUNDARY
- PROPOSED GROUND FLOOR FOOTPRINT
- PROPOSED MAJOR CONTOURS(1m INTERVALS)
- PROPOSED MINOR CONTOURS (0.25m INTERVALS)

REVISION DETAILS		BY	DATE
1	ISSUED FOR CONSENT	AM	FEB 2025

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

N

MILLDALE
Connecting Lifestyles

MILLDALE STAGE 4C

PROPOSED CONTOURS & RETAINING WALL PLAN PHASE 1 - SHEET 5

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:500 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P23-481-4C-0-1105-EW	

NOTES:

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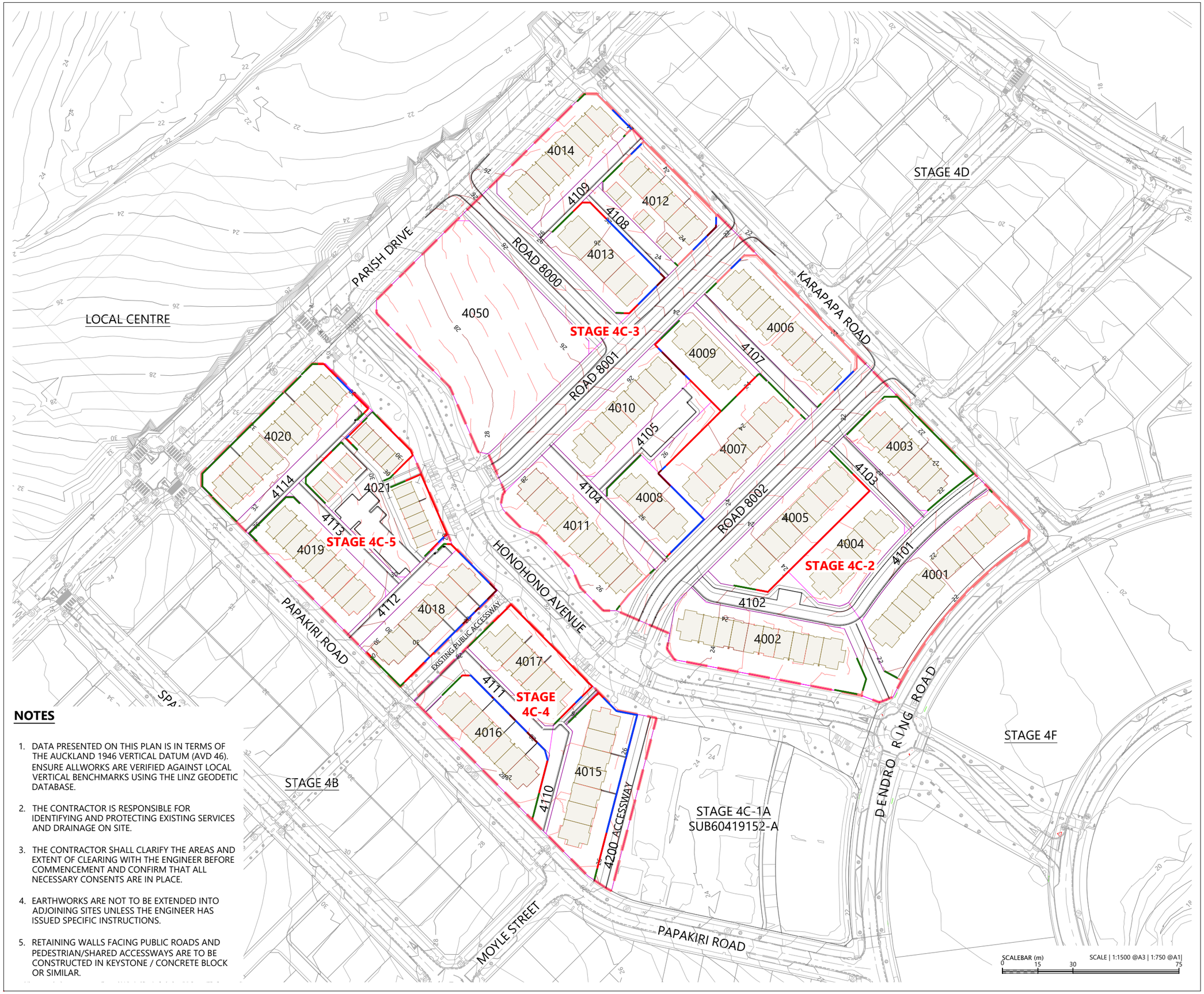
4. EARTHWORKS ARE NOT TO BE EXTENDED INTO ADJOINING SITES UNLESS THE ENGINEER HAS ISSUED SPECIFIC INSTRUCTIONS.
5. RETAINING WALLS FACING PUBLIC ROADS AND PEDESTRIAN/SHARED ACCESSWAYS ARE TO BE CONSTRUCTED IN KEYSTONE / CONCRETE BLOCK OR SIMILAR.

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P23-481 - MDL STAGE 4C-2_21546\02 DRAWINGS\02 ENG\P23-481-4C-0-1100-EW PROPOSED CONTOURS & RETAINING WALL - PHASE 1.DWG



NOTES

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5. RETAINING WALLS FACING PUBLIC ROADS AND PEDESTRIAN/SHARED ACCESSWAYS ARE TO BE CONSTRUCTED IN KEYSTONE / CONCRETE BLOCK OR SIMILAR.

WOODS
Est.1970

WALL HEIGHT TABLE	
	0.0 to 0.5 WALL HEIGHT
	0.5 to 1.0 WALL HEIGHT
	1.0 to 1.5 WALL HEIGHT
	1.5 to 2.0 WALL HEIGHT

LEGEND:

- PROPOSED PARCEL BOUNDARY
- STAGE BOUNDARY
- EXISTING PARCEL BOUNDARY
- PROPOSED GROUND FLOOR FOOTPRINT
- PROPOSED MAJOR CONTOURS(2m INTERVALS)
- PROPOSED MINOR CONTOURS (0.50m INTERVALS)

REVISION DETAILS		BY	DATE
1	ISSUED FOR CONSENT	AM	FEB 2025

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

N

MILLDALE
Connecting Lifestyles

MILLDALE STAGE 4C

PROPOSED CONTOURS & RETAINING WALL PLAN FINAL

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:1500 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P23-481-4C-0-1110-EW	

Plot Date: 12:43:09 pm,16 February 2025, JOHNM

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P23-481 - MDL STAGE 4C-2_21540\02 DRAWINGS\02 ENG\P23-481-4C-0-1110-EW PROPOSED CONTOURS & RETAINING WALL - FINAL.DWG

PHASE 1 EARTHWORKS VOLUMES
(DIFFERENCE BETWEEN EXISTING SURFACE AND PHASE 1 SURFACE, NO BULKING APPLIED)

STAGE	CUT	FILL	BALANCE	AREA
4C-2	500m³	3600m³	3100m³	13330m²
4C-3	1200m³	9300m³	8100m³	23450m²
4C-4	100m³	2500m³	2400m³	5970m²
4C-5	100m³	4700m³	4600m³	8410m²
TOTAL	1900m³	20100m³	18200m³	51160m²

CUT/FILL	
COLOUR	DEPTH
	>0m CUT
	0m CUT / FILL
	>0m FILL

LEGEND:

- PROPOSED PARCEL BOUNDARY
- STAGE BOUNDARY
- EXISTING PARCEL BOUNDARY
- PROPOSED GROUND FLOOR FOOTPRINT
- 0.50 EW CONTOURS 0.50m INCREMENTS

REVISION DETAILS		BY	DATE
1	ISSUED FOR CONSENT	TR	FEB 2025

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

N

MILLDALE STAGE 4C

PROPOSED DEPTH CONTOURS (CUT/FILL) PLAN
EXISTING TO PHASE 1

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:1500 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P23-481-4C-0-1200-EW	

Plot Date: 12:54:13 pm,16 February 2025, JOHNM

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P23-481 - MDL STAGE 4C-2_215460.2 DRAWINGS\02 ENG\P23-481-4C-0-1200-EW DEPTH CONTOURS (CUT - FILL) - EXISTING TO PHASE 1.DWG

WOODS
Est.1970

CUT/FILL	
COLOUR	DEPTH
	>0m CUT
	0m CUT / FILL
	0m-1m FILL
	1m-1.5m FILL
	>1.5m FILL

LEGEND:

- PROPOSED PARCEL BOUNDARY
- STAGE BOUNDARY
- EXISTING PARCEL BOUNDARY
- PROPOSED GROUND FLOOR FOOTPRINT
- 0.50 EW CONTOURS 0.50m INCREMENTS

REVISION DETAILS		BY	DATE
1	ISSUED FOR CONSENT	TR	FEB 2025

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

N

MILLDALE
Connecting Lifestyles

MILLDALE STAGE 4C

PROPOSED DEPTH CONTOURS
(CUT/FILL) PLAN
EXISTING TO FINAL

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:1500 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P23-481-4C-0-1210-EW	

Plot Date: 1:03:54 pm,16 February 2025, JOHNM

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P23-481 - MDL STAGE 4C-2_21546\02 DRAWINGS\02 ENG\P23-481-4C-0-1210-EW DEPTH CONTOURS (CUT - FILL) - EXISTING TO FINAL.DWG

NOTES :

1. ALL EROSION AND SEDIMENT CONTROL CONTROL IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE AUCKLAND COUNCIL'S GUIDELINE DOCUMENT 2016/005 (GD05).
2. BEFORE COMMENCING WORKS THE CONTRACTOR SHALL ENSURE THAT HE HAS A COPY OF THE ENGINEERING APPROVAL FROM THE ENGINEER.
3. ANY MODIFICATIONS TO THE CONSENTED EROSION AND SEDIMENT CONTROL DRAWING MUST BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.
4. THE EXTENT OF AREAS TO BE WORKED ARE TO BE CLEARLY IDENTIFIED PRIOR TO STRIPPING AND ALL EROSION AND SEDIMENT CONTROL MEASURES IN PLACE AND APPROVED BEFORE EARTHWORKS COMMENCE.
5. CONTOUR DRAINS TO BE FORMED AT 30m INTERVALS.
6. TEE BAR DECANTS ONLY ARE TO BE UTILISED.
7. ALL SEDIMENT LADEN WATER WILL ENTER THE PONDS VIA THE FOREBAY.
8. SRP SIZE AND VOLUMES HAVE BEEN CALCULATED USING THE AUCKLAND COUNCIL GD05 ONLINE DEVICE SIZING TOOL. TP108 RAINFALL LOCATION OREWA (90).

STABILISED METALED ENTRANCE FROM PARISH DRIVE

STABILISED METALED ENTRANCE FROM PARISH DRIVE

PARISH DRIVE

ROAD 8000

ROAD 8001

ROAD 8002

KARAPAPA ROAD

HONOHONO AVENUE

PAPAKIRI ROAD

SPARS ROAD

MOYLE STREET

DENDRO RING ROAD

EXISTING PUBLIC ACCESSWAY

STAGE 4D

STAGE 4C-1

STAGE 4C-2

STAGE 4C-3

STAGE 4C-4

STAGE 4C-5

STAGE 4B

STAGE 4F

STAGE 4C-1A
SUB60419152-A

4001 4002 4003 4004 4005 4006 4007 4008 4009 4010 4011 4012 4013 4014 4015 4016 4017 4018 4019 4020 4021 4050 4101 4102 4103 4104 4105 4107 4108 4109 4110 4111 4112 4113 4114 4200

SRP 1
CATCHMENT STAGE 4C-2 & 4C-3
CATCHMENT AREA 3.6786Ha
MINIMUM VOLUME 1104m³
DEAD STORAGE 331m³
LIVE STORAGE 773m³

SRP 2
CATCHMENT STAGE 4C-4
CATCHMENT AREA 0.5968Ha
MINIMUM VOLUME 119m³
DEAD STORAGE 36m³
LIVE STORAGE 84m³

SRP 3
CATCHMENT STAGE 4C-5
CATCHMENT AREA 0.8413Ha
MINIMUM VOLUME 168m³
DEAD STORAGE 50m³
LIVE STORAGE 118m³

STABILISED ACCESS BETWEEN STAGES 4C-4 AND 4C-5

SCALEBAR (m) 0 15 30 75

SCALE | 1:1500 @A3 | 1:750 @A1|

WOODS
Est.1970

LEGEND:

- PROPOSED PARCEL BOUNDARY
- STAGE BOUNDARY & EW EXTENTS
- EXISTING PARCEL BOUNDARY
- EXISTING RAIN GARDEN
- SEDIMENT POND OUTLET
- EARTH BUND
- CLEAN WATER FLOW DIRECTION
- RUNOFF FLOW DIRECTION
- CLEAN WATER DIVERSION
- EXISTING CONTOURS 0.50m INCREMENTS (0.50)
- EXISTING PUBLIC STORMWATER (SW)
- SEDIMENT RETENTION POND

REVISION DETAILS		BY	DATE
1	ISSUED FOR CONSENT	KF	FEB 2025

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

N

MILLDALE
Connecting Lifestyles

MILLDALE STAGE 4C

EROSION AND SEDIMENT CONTROL PLAN

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:1500 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P23-481-4C-0-1800-EW	

Plot Date: 11:16:48 am,16 February 2025, JOHNM

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P23-481 - MDL STAGE 4C-2_21546\02 DRAWINGS\02 ENG\P23-481-4C-0-1800-EW EROSION & SEDIMENT CONTROL OVERALL PLAN.DWG