27 October 2022

STAGE 2

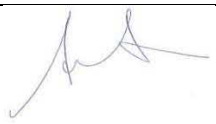
3 BELGIUM ROAD, PUKEKOHE

GEOTECHNICAL COMPLETION REPORT

Cabra Pukekohe JV

AKS2021-0009AK Rev 0

AKS2021-0009AK		
Date	**Revision**	**Comments**
24 August 2022	A	Initial draft for internal review
27 October 2022	0	Final issue to client

	Name	**Signature**	**Position**
Prepared by	Shane Forrest		Project Engineering Geologist
Reviewed by	Andrew Linton		Principal Geotechnical Engineer CMEngNZ, CPEng
Authorised by	Sam Gibb		Principal Geotechnical Engineer CMEngNZ, CPEng

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Appendices

1. INTRODUCTION

In accordance with our instructions, this Geotechnical Completion Report has been prepared for Cabra Pukekohe JV as part of the documentation to be submitted to Auckland Council following earthworks to form Stage 2 of the 3 Belgium Road development. Construction of this residential subdivision has been undertaken in accordance with the Auckland Council Resource Consent number BUN60326339, Subdivision Consent number SUB60358839, and Engineering Approval 60373650. Specific structures constructed during the civil works to create the subdivision include timber pole retaining walls, a reinforced earth slope, and a segmental block retaining wall.

This report contains our Suitability Statement, specific comments related to items raised in the Resource Consent, relevant test data and the Mackenzie and Co as-built plan set as provided in Appendix B.

This report covers the construction period commencing 5 March 2021 through to June 2022 and is intended to be used for certification purposes for new lots (listed below) created from existing Lot 129 DP 551433:

- 30 new residential lots numbered 1 to 11, 13 to 26, and 86 to 90 inclusive; and
- 3 new roads numbered 1, 2 & 3.

This stage of the 3 Belgium Road Development is located off Belgium Road in Pukekohe East. As can be seen from the as-built plans, all 30 of the lots have been affected by filling as part of the earthworks operations to a maximum depth of approximately 4.5 metres.

2. PROJECT BACKGROUND

The geotechnical investigations and design were undertaken by Ground Consulting Limited, CMW Geosciences, and Haigh Workman Ltd as presented in the following reports:

- Ground Consulting Limited, Preliminary Site Assessment Report for a Proposed Subdivision, Ref: R2242-1A, dated 9 March 2016.
- CMW Geosciences, Stage 2, 3 Belgium Road, Pukekohe, Geotechnical Investigation Report, referenced AKS2021-0009AC Rev. 0, dated 15 March 2021.
- CMW Geosciences, Stage 2, 3 Belgium Road, Reinforced Earth Slope Design, referenced AKS2021-0009AD Rev. 0, dated 11 August 2021.
- CMW Geosciences, Stage 2, 3 Belgium Road, Pukekohe, Works Beyond Settlement Areas letter, referenced AKS2021-0009AG Rev. 0, dated 1 June 2021.
- CMW Geosciences, Stage 2, 3 Belgium Road, Pukekohe, Commencement of Civils within Settlement Restricted Area letter, referenced AKS2021-0009AH Rev. 0, dated 13 August 2021.
- Haigh Workman Ltd, Stage 2 Belgium Road Proposed Retaining Walls, Structural Drawings and PS1, referenced 21-005, dated March 2021.

3. DESCRIPTION OF EARTHWORKS

<u>March 2021</u>

West City Construction Limited mobilised to site in March 2021. During this period, erosion and sediment controls were installed, including construction of a temporary sediment retention pond on Lots 23 and 24.

Subgrade inspections and proof rolling using a fully loaded scoop were undertaken after topsoil stripping to identify soft ground. No excessive weaving was observed during these inspections and filling commenced.

<u>April/May 2021</u>

In April and May, bulk earthworks across the stage including filling operations were under way with the majority of the fill placed during this time.

During stripping of topsoil a natural spring was uncovered below future Road 2. A subsoil drain coil was positioned and constructed during this time to take the water from the spring/ well and outlet it at the stream so that filling in the area could take place.

The construction of the reinforced earth slope along the stream edge started in April and involved the undercutting of weak material along the toe to create a key. Counterfort drains, a drainage blanket and lateral drain coils were installed and backfilling with engineered clay and installing geo grids at the batter face.

The installation of the settlement markers, and the start of monitoring, occurred in May 2021 and continued until 30 September 2021.

June 2021

During the month of June, construction of the reinforced batter continued along with the gulleting of roads. The construction of the timber pole retaining walls also started at this time.

July to November 2021

During this period construction of the timber pole retaining walls, and keystone block wall, was carried out across the whole stage.

December 2021

The preparation of roading subgrade was undertaken at this time and construction of the road basecourse started.

February 2022

Cleaning out and backfilling of the sediment pond within Lots 23 and 24 with engineered clay fill.

March to June 2022

Landscaping, finishing the final roading surface, installing rain gardens, and street lights.

The main items of plant used by the contractor, West City Construction Limited, included:

- 825 Compactor
- Bulldozers and Scoops
- Tractor and Discs
- 5 to 30 tonne Excavators
- Loaders and 6 Wheel Dump Trucks
- Graders; and
- Water Trucks.

4. GEOTECHNICAL QUALITY CONTROL

4.1. Site Observations

During the earthworks, site visits were typically undertaken several times each week to assess compliance with NZS 4431 and specific design recommendations and specifications.

Site visits were carried out to observe and confirm compliance relating to:

- Adequate topsoil stripping;

- Fill areas prior to the placement of fill materials to ascertain that all mullock and soft inorganic subsoils had been removed;
- Reinforced earth slope subgrade excavation to confirm ground conditions and appropriateness of the ground model and design;
- Installation of subsoil drains including counterfort drains, underfill drains and reinforced slope drainage but excluding road under-channel drains;
- Backfilling of subsoil drains;
- Installation of reinforcing grids within the reinforced earth slope;
- Excavation and backfilling of sewer and stormwater trenches;
- Subsoil drain outlets at the completion of the works;
- Construction of cantilever pole retaining walls including ground conditions, pile size, spacing and depth;
- Construction of the block retaining wall including ground conditions, construction materials, height and width of no fines concrete backfill; and
- Placement and compaction of engineered fills.

4.2. Compaction Control

Compaction of engineered earth fills was controlled by undrained shear strength measured by handheld shear vane calibrated using the NZGS 2001 method and by air voids as defined by NZS4402.

The criteria for undrained shear strength were a minimum single value of 110 kPa and minimum average of any 10 consecutive tests of 140 kPa.

The criteria for air voids were a maximum single value of 12% and maximum average of any 10 consecutive tests of 10%.

Vane shear strength, water content and in situ density tests were carried out on all areas of the engineered filling to at least the frequency recommended by NZS 4431.

5. EVALUATION OF COMPLETED EARTHWORKS

5.1. Natural Hazards

The appended as-built drawings depict the extent of a series of zones that contain limitations intended to ensure that future building and/ or earthworks on the lots is undertaken in a manner that does not lead to buildings being subject to any of the natural hazards described in Section 71(3) of the Building Act, i.e. erosion, falling debris, subsidence, slippage, and inundation. Consideration of the inundation hazard was outside the scope of CMW's brief and has been assessed by others. The applied zones include:

- **Specific Design Zones (retaining)** - intended to protect the retaining walls from overloading at the crest, or undermining at the toe, that could lead to instability;
- **Specific Design Zones (slope)** – intended to protect building development from long term creep effects on or adjacent to steep slopes, and to protect the slopes from inappropriate loading or undermining;
- **Specific Design Zones (services)** - intended to protect building development excessive loading on the service pipes, and to protect against any future maintenance of these services.

Full descriptions of the restrictions associated with each of these zones are presented in the Suitability Statement (Appendix A). Additional information is also provided in some of the following sections.

5.2. Land Stability and Erosion Control

The subdivision scheme layout includes batter slopes to form level building platforms. The batters include portions of the residential Lots 15 – 21, with maximum gradients of 1(v) in 2(h) as depicted on the as-built drawings.

Design of the works to provide appropriate stability conditions that meet regulatory requirements for the land within this stage, including the batters, has led to the construction of a reinforced earth slope, deep subsoil drainage, and cantilever pole retaining walls.

Stability conditions for finished ground profiles have been assessed under a range of groundwater conditions which satisfy ultimate limit state design criteria. The soil parameters for the analyses were selected from extensive investigation undertaken at the site and from experience in this terrain. We consider that the stability results are satisfactory for all building platform areas, and we are therefore satisfied that these areas are not subject to the natural stability hazards described in the Building Act.

On all steep land, including on engineered batter slopes, surface stability can be compromised by indiscriminate disposal of stormwater onto the ground surface and/ or by removal of vegetation.

Building and landscape designers must ensure that all runoff from solid surfaces is directed into the stormwater system. It is also important that care is paid to the disposal of stormwater during construction so that concentrated discharges (e.g. from unconnected spouting) are not directed towards steep ground.

Depths of mulch and topsoil applied to sloping areas should be limited to less than 150mm to minimise the risks of saturation leading to localised slumping on the batter face. Wherever practical on such land, and particularly on steep batters, existing vegetation and grass cover should be well maintained. Any vegetation cleared beyond the immediate area of building platforms for temporary construction purposes should be replanted or replaced as soon as possible. The roots of an established vegetation cover can serve to bind the surface soils while the foliage can reduce rain infiltration and soil saturation, resulting in better resistance to erosion and shallow slumping.

5.3. Retaining Walls

Cantilever timber pole retaining walls have been constructed in the locations shown on the appended As-built Retaining Wall Plan. Only a part of Wall 3 which was adjacent to Road 2 comprised of keystone block construction. These walls reach a maximum height of 3.0 metres and were designed by Haigh Workman Limited, while the construction was observed by this consultancy. The Producer Statement - Construction Review is provided in Appendix E.

Descriptions of the building and earthworks restrictions within the vicinity of these walls (Specific Design Zones – retaining) are contained in the Suitability Statement in Appendix A. Lots containing these zones include Lots 2 to 11, 13 to 15, 21, 22, and 86 to 90 inclusive.

The As-Built plan also shows the location of subsoil drains, installed during wall construction, that will require connection into the private lot drainage in Lots 2, 11, 14, 86, 89 and 90 inclusive.

5.4. Fill Induced Settlement

The majority of the filling on this stage of the development was placed prior to March 2022. A series of settlement markers were installed in areas of deep fill at its completion and have been periodically monitored for both horizontal and vertical movements.

On the basis of the results, we are satisfied that t_{90} primary consolidation settlement has been achieved and that fill induced settlement does not pose a hazard to future NZS 3604 type building development.

5.5. Service Line Trenches

As part of the civil works, sanitary sewer and stormwater services were trenched throughout the development as shown on the appended Stormwater and Sanitary Sewer As-built Plans.

As is normal on all subdivisions, building developments involving foundations within a 45 degree zone of influence from 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 depicts their requirements for stormwater pipes. Details for water and wastewater pipes are available in the Watercare COP1 - General Requirements and Procedures. The majority of lots are known to have service trenches within the lots as shown on the appended stormwater and wastewater as-built plans. The resulting restrictions are presented in the Suitability Statement below.

5.6. Subsoil Drains

The appended Stage 2 Earthworks Underfill Drainage as-built plan shows the positions of counterfort drains and back of grid drainage which were constructed in the natural ground during the earthworks operations as part of the formation of the reinforced earth slope embankment. The drains were installed to help control groundwater levels and are extended to formed outlets adjacent to the stream. The ongoing operation of these drains is important to the overall stability conditions of the site.

The plan also shows a subsoil drain that was installed from an existing spring that was encountered below Road 2 during earthworks. This subsoil drain was extended to a formed outlet near the existing stream, northwest of Lot 14.

Also shown on the plan is a network of underfill drains that were installed as part of the retaining wall construction to eventually be outlet to the public stormwater system via the private lot connections in Lots 7, 8 & 9.

Typical trench excavations were a minimum of 1.0m into the natural ground beneath the filling. Accordingly, they are predominantly beyond the depths of anticipated foundations.

Descriptions of the restrictions are contained in the appended Suitability Statement.

5.7. Subsoil Drain Outlets

On lots where subsoil or retaining wall drainage discharges, it is important that the function of these outlets is maintained. Details of the outlet structures and locations are shown on the Underfill Drainage as-built plan. Lots where subsoil drain outlets are located on the adjacent stream slopes to the north, include lots 14, 15, 18 and 20.

As noted in Section 5.3 above, lots where outlets are to be connected to the public stormwater system via the private lot connections include Lots 2, 7, 8, 9, 11, 14, 86, 89 and 90 inclusive.

5.8. Road Subgrades

Penetration resistance testing was carried out on the road subgrades during construction and the results of this testing were forwarded to Mackenzie and Co Limited and the contractor for any necessary remedial pavement design.

5.9. Design of Shallow Foundations

5.9.1. Bearing Capacity

Once bulk earthworks and top-soiling of the building platforms had been completed, our staff drilled hand auger boreholes on platforms in natural ground to determine representative finished ground conditions and hence evaluate likely foundation options for future building development. Our assessments of bearing

capacity for the design of shallow foundations on each building platform are contained in the appended Suitability Statement.

At current subgrade levels, all lots in Stage 2 have been assessed as having a geotechnical ultimate bearing capacity of 300 kPa within the influence of conventional shallow residential building foundation loads.

If higher geotechnical ultimate bearing capacities are required, further specific site investigation and design of foundations should be carried out prior to Building Consent application.

5.9.2. Foundation Settlements

At the bearing pressures specified above, and subject to the design requirements for soil expansiveness provided below, differential settlement of shallow foundations for buildings designed in accordance with NZS 3604 (including the 600mm subfloor fill depth limit) should be within code limits.

5.9.3. Soil Expansiveness Classification

Seasonal shrinking and swelling results in vertical surface ground movement which can cause significant cracking of floor slabs and walls. NZS 3604:2011[1] excludes from the definition of 'good ground', soils with a liquid limit of more than 50% and a linear shrinkage of more than 15% due to their potential to shrink and swell as a result of seasonal fluctuations in water content. For soils exceeding these limits, NZS 3604 has historically referenced AS 2870[2]. for foundation design advice. However, the November 2019 update of Acceptable Solution B1/AS1[3] provides amendments to NZS 3604 that define a method for testing and classifying the soils and provides foundation designs for specific, simple house configurations across the range of expansive soil conditions.

Nevertheless, there is evidence[4] indicating that the use of the B1/AS1 method of assessment of expansiveness may be inaccurate.

Six sets of soil tests were carried out on samples taken from likely foundation level on lots within this stage of the development. Testing was carried out in accordance with NZS 4402, "Methods of Testing Soils for Civil Engineering Purposes" test 2.2 and 2.6 and were used in conjunction with visual-tactile assessment of the site soils and BRANZ Report SR120A[5] to determine expansive site Classes as defined in AS 2870, "Residential Slabs and Footings – Construction". All test results are appended.

The expansive soil hazard is addressed by a combination of appropriate foundation design, careful site preparation and diligent maintenance of plantings near the foundations.

<u>Foundation Design</u>

We have assessed the AS 2870 Site Class for all lots in Stage 2 of the development to be H2 (Highly, Class 2). Details of foundation options for this Class are contained in the appended Suitability Statement.

<u>Site Preparation</u>

There have been instances of concrete floors and/ or foundations that have been poured on dry, desiccated subgrades in summer months on expansive soils and have undergone heaving and cracking requiring extensive repairs or re-building once the soil moisture contents have returned to higher levels. In some instances, perimeter foundations have been appropriately treated but floor slabs have been poured on dry ground. Infiltration of moisture via pipe bedding has then occurred.

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[1] Standards New Zealand (2011) Timber-framed buildings, NZS 3604:2011, NZ Standard

[2] Standards Australia Limited (2011) *Residential slabs and footings*, AS 2870-2011, Australian Standard, NSW

[3] Ministry of Business, Innovation and Employment (2019) *Acceptable Solutions and Verification Methods for NZ Building Code Clause B1 Structure,* B1/AS1, Amendment 19

[4] Rogers, N., McDougall, N., Twose, G., Teal, J. & Smith, T. (2020) The Shrink Swell Test: A Critical Analysis, *NZ Geomechanics News,* Issue 99, pages 66-80.

[5] Fraser Thomas Limited (2008) - Addendum Study Report (BRANZ SR120A), Soil Expansivity in the Auckland Region – Final Report

Foundation contractors need to be made aware of the extreme damage potentially caused by these circumstances and the need to maintain appropriate moisture contents in the footings and building platform subgrade between the time of excavation and the pouring of concrete.

Remedial actions that may be appropriate include platform protection with a hard fill layer, pouring of a blinding layer of concrete in footing bases and soaking of the building platform with sprinklers for an extended period.

Site Maintenance

Landowners must be mindful that either the planting or removal of high-water demand plants where their roots may extend close to footings (i.e. within a lateral distance of 1.5 times the mature tree height) can cause settlement or heave damage.

5.10. Topsoil Depths

Topsoil depths have been checked by the drilling of a borehole in the approximate centre of the building platform on each lot. The results are considered indicative for each Lot but may be subject to variations. Topsoil depths are between 100mm and 300mm on this stage of the development.

Site specific findings are contained in the appended Suitability Statement Summary (Appendix A). However, it is possible that further levelling works have been undertaken since our investigations, and accordingly we strongly recommend that lot purchasers complete their own checks of topsoil depths.

6. CLOSURE

The appended Statement of Professional Opinion is provided to the Auckland Council and Cabra Pukekohe JV for their purposes alone on the express condition that it will not be relied upon by any other person. It is important that prospective purchasers satisfy themselves as to any specific conditions pertaining to their particular land interest.

Although regular site visits have been undertaken for observation, for providing guidance and instruction and for testing purposes, the geotechnical services scope did not include full time site presence. To this end, our appended Suitability Statement also relies on the Contractors' work practices and assumes that when we have not been present to observe the work, it has been completed to high standards and in accordance with the drawings, instructions and consent conditions provided to them.

Similarly, it assumes that all as-built information and other details provided to the Client and/ or CMW by other members of the project team are accurate and correct in all respects.

Appendix A: Statement of Professional Opinion as to the Suitability of Land for Building Development

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

I, Andrew Linton, of CMW Geosciences (NZ) Limited Partnership, Auckland, hereby confirm that:

1. As a Chartered Professional Engineer experienced in the field of geotechnical engineering, I am a Geo-professional as defined in Section 1.2.2 of NZS 4404 and was retained by the Developer as the Geotechnical Engineer on Stage 2 of the 3 Belgium Road Development.

2. The extent of preliminary investigations carried out to date are described in the CMW Geosciences Geotechnical Investigation Report referenced AKS2021-0009AC Rev 0, dated 15 March 2021. The conclusions and recommendations of that document have been re-evaluated in the preparation of this report. The results of all tests carried out are also appended.

3. In my professional opinion, not to be construed as a guarantee, I consider that:

   (a) The earth fills shown on the appended Cut to Fill Earthworks As-built Plan have been placed in compliance with NZS 4431, the Auckland Council Unitary Plan and related documents.

   (b) The completed earthworks give due regard to land slope and foundation stability considerations on the building platform areas, but as shown on the appended building restriction zone plans, areas on Lots 15 – 21 inclusive have gradients steeper than 1(v) in 4 (h) (and generally up to 1(v) in 2(h)), or are adjacent to land having such gradients. Accordingly, restrictions incorporating Specific Design Zones (Slope) have been applied as depicted on the as-built plans as follows:

      - **Specific Design Zone (Slope) areas** set back 2.5m from slope crests**,** have been applied on Lots 15 – 21 inclusive. No building construction and no earthworks (i.e. cut or fills of any depth) should take place within the designated **Specific Design Zone (Slope) areas** unless endorsed by a Chartered Professional Engineer experienced in geomechanics and familiar with the contents of this report. The endorsement will need to consider the implications of the proposals on both global stability conditions and soil creep on the buildings, in particular the interaction with the installed geogrids and critical subsoil drainage and counterfort drains as part of the formation of the 1(v) in 2(h) fill embankment adjacent the stream, the interaction with service pipes and associated trench backfills, control of surface water, construction sequencing, timing and temporary support requirements, construction of all earthworks, foundations and retaining walls and if necessary, comment on what aspects require engineering inspections and certification.

        This limitation also applies to long-term landscaping works, including any proposed minor cuts either on or near batter toes to be retained by new landscaping walls that might not normally require engineering, and to landscaping fills on or immediately above the batter slopes.

   (c) **Specific Design Zone (Services) areas** have been applied to Lots 1 – 9, 11, 15 – 19 and 21 – 26, inclusive in areas with underlying public stormwater or wastewater service lines and/or manhole chambers.

      The backfilling and compaction of the storm water and sanitary sewer trenches on this subdivision has been carried out to appropriate standards having regard for the prevailing ground conditions and associated compaction induced pipe loadings. However, no building development should take place within the 45-degree zone of influence of drain inverts unless endorsed by specific design and by construction inspections undertaken by a Chartered Professional Engineer experienced in geomechanics to ensure that lateral stability and differential settlement issues are addressed and

that building loads are transferred beyond the influence of the pipe and trench backfill. A copy of drawing SW22 extracted from Chapter 4 of the Auckland Council Code of Practice for Land development and Subdivision this document is provided in Appendix B for clarification. Details for water and wastewater pipes are available in the Watercare COP1 - General Requirements and Procedures.

(d) **Specific Design Zone (Retaining) areas** have been applied (for a distance of 1.5 x wall height from the back of the wall and 1.0 x wall height from the front of the wall) on Lots 2 to 11, 13 to 15, 21, 22, and 86 to 90 inclusive for the protection of the function of the retaining walls. No building construction and no earthworks (i.e. cut or fills) should take place that exceed these design limits on the walls unless endorsed by a Chartered Professional Engineer experienced in geomechanics and familiar with the contents of this report who consider the stability implications of the earthworks and/ or building proposals on the retaining walls.
Reference should be made to the appended Haigh Workman design package for confirmation of the applicable design assumptions (i.e. surcharges and/or slope angles).

(e) The function of the subsoil drains installed beneath Lots 7 to 9 & 13 to 20 inclusive must not be impaired by any building development or landscaping works. Any bored or driven piles must be positioned to avoid damaging the draincoils. Where any subsoil drain is intercepted by building works, it must be reinstated under the direction of a Chartered Professional Engineer to ensure the integrity of the subsoil drainage system.

(f) The drainage outlets on the stream bank to the north-east of Lots 14, 15, 18 and 20 must be kept free of debris and otherwise maintained as necessary to ensure their ongoing function.

(g) A geotechnical ultimate bearing capacity of 300 kPa may be assumed for shallow foundation design on the building platforms of Lots 1 to 11, 13 to 26, and 86 to 90 inclusive.

If for any reason higher geotechnical bearing capacities are required, further specific site investigation and design of foundations should be carried out prior to Building Consent application.

(h) The expansive site Class for all lots has been assessed as AS2870 Class H2 (Highly Class 2). We recommend that building designers note on the Building Consent drawings the need to maintain appropriate moisture levels across building subgrades and in footing excavations (as described in Section 5.9.3 of the Geotechnical Completion Report) for reference by foundation contractors.

(i) Subject to the geotechnical limitations, restrictions and recommendations contained in clauses 3(a), 3(b), 3(c), 3(d), 3(e) 3(f), 3(g) and 3(h) above:

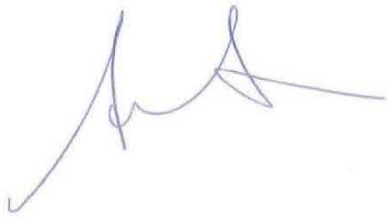
(i) The filled and natural ground is generally suitable for residential buildings constructed in accordance with NZS 3604 and the requirements of AS2870 for the appropriate expansive soil class.

(ii) Where shallow foundations are appropriate, design may be carried out in accordance with AS 2870 (Class H2) or alternately, a specific foundation and structural design may be undertaken by a Chartered Professional Engineer.

4. Road subgrades have been formed with appropriate regard for slope stability and settlement risks.

The following table summarises the conditions on each of the residential lots.

For and on behalf of CMW Geosciences



Andrew Linton

Principal Geotechnical Engineer CMEngNZ, CPEng

Table 1: GCR SUMMARY TABLE								
Condition	**Specific Design Zone (slope)**	**Specific Design Zone (services)**	**Specific Design Zone (retaining)**	**Subsoil Drains Present**	**On-site Drainage Outlet Present**	**Geotechnical Ultimate Bearing Capacity (kPa)**	**AS2870 Expansive Class**	**Indicative Topsoil Depth (mm)**
GCR SOPO Clause	**3(b)**	**3(c)**	**3(d)**	**3(e)**	**3(f)**	**3(g)**	**3(h)**	
Lot number								
1		●				300	H2	100
2		●	●			300	H2	100
3		●	●			300	H2	150
4		●	●			300	H2	200
5		●	●			300	H2	100
6		●	●			300	H2	150
7		●	●	●	●	300	H2	200
8		●	●	●	●	300	H2	250
9		●	●	●	●	300	H2	250
10			●			300	H2	200
11		●	●			300	H2	100
13			●	●		300	H2	100
14	●		●	●	●	300	H2	100
15	●	●	●	●	●	300	H2	200
16	●	●		●		300	H2	200
17	●	●		●		300	H2	300
18	●	●		●	●	300	H2	100
19	●	●		●		300	H2	200
20	●			●	●	300	H2	200
21	●	●	●			300	H2	200

Table 1: GCR SUMMARY TABLE								
Condition	**Specific Design Zone (slope)**	**Specific Design Zone (services)**	**Specific Design Zone (retaining)**	**Subsoil Drains Present**	**On-site Drainage Outlet Present**	**Geotechnical Ultimate Bearing Capacity (kPa)**	**AS2870 Expansive Class**	**Indicative Topsoil Depth (mm)**
GCR SOPO Clause	**3(b)**	**3(c)**	**3(d)**	**3(e)**	**3(f)**	**3(g)**	**3(h)**	
22		●				300	H2	200
23		●				300	H2	300
24		●				300	H2	250
25		●				300	H2	100
26		●				300	H2	200
86			●			300	H2	200
87			●			300	H2	200
88			●			300	H2	300
89			●			300	H2	250
90			●			300	H2	200

Appendix B: Drawings

Title	Reference No.	Date	Revision
Asbuilt Stage 2 Earthworks Finished Contours Plan	2398-2-2200	26 April 2022	A
Asbuilt Stage 2 Earthworks Lowest Cut Contours	2398-2-2201	26 April 2022	A
Asbuilt Stage 2 Earthworks Cut to Fill Plan	2398-2-2210	27 April 2022	A
Asbuilt Stage 2 Earthworks Underfill Drainage Plan	2398-2-2220	01 August 2022	B
Asbuilt Stage 2 Earthworks Geogrid Plan	2398-2-2221	01 August 2022	A
Asbuilt Stage 2 Retaining Wall Plan	2398-2-2250-2252	01 August 2022	A
Stage 2 Stormwater As-Built Plan	2398-2-2400-2405	07 October 2022	A
Stage 2 Wastewater As-Built Plan	2398-2-2500-2502	13 September 2022	A
CMW Dwg 10 - Specific Design Zones (Slopes)	Drawing 10	27 October 2022	0
Asbuilt Stage 2 Earthworks SW and WW Zone Influence Plan	2398-2-2240-2242	01 August 2022	A
CMW Dwg 11 & 12 Specific Design Zones (Retaining)	Drawing 11 & 12	27 October 2022	0
Haigh Workman – Retaining Wall Design Drawings	21005, S01-S03, S05-S07	March 2021	
Stormwater Pipe and Manhole Construction Clearance Requirements	ACSD-SW22	30/09/2013	A3

NOTES:

1. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946 (MSL).
2. ALL AS-BUILT INFORMATION HAS BEEN COLLECTED AND SUPPLIED BY WEST CITY CONSTRUCTION LTD.

LEGEND:

FINAL CONTOURS – MAJOR 1.0m INTERVALS — 1.0

FINAL CONTOURS – MINOR 0.5m INTERVALS

EXISTING TREE REMAINING ON SITE.

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

I certify that these Asbuilt Plans are an accurate record of the works undertaken and that:

- The Coordinates (X,Y) are in terms of NZTM on NZGD (2000), and are within±50mm.
- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
Registered Professional Surveyor

Date: 19/05/2022

Name: Luke Hermanson
Phone: +64 9 320 5707 / 021 0744413
Email: luke.hermanson@mckenzieandco.co.nz

MCKENZIE & CO.

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: AS BUILT STAGE 2 EARTHWORKS FINISHED CONTOURS PLAN

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:1000m
DO NOT SCALE

DRAWING NO: 2398-2-2200

REV: A

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	WZ	LH	LH	26/04/22

NOTES:

1. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946 (MSL).
2. ALL AS-BUILT INFORMATION HAS BEEN COLLECTED AND SUPPLIED BY WEST CITY CONSTRUCTION LTD.

LEGEND:

LOWEST CUT CONTOUR – MAJOR 1.0m INTERVALS — 1.0 —

LOWEST CUT CONTOUR – MINOR 0.5m INTERVALS ———

EXISTING TREE REMAINING ON SITE.

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

I certify that these Asbuilt Plans are an accurate record of the works undertaken and that:

- The Coordinates (X,Y) are in terms of NZTM on NZGD (2000), and are within±50mm.
- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
Registered Professional Surveyor

Date: 19/05/2022

Name: Luke Hermanson
Phone: +64 9 320 5707 / 021 0744413
Email: luke.hermanson@mckenzieandco.co.nz

MCKENZIE & CO.

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: AS BUILT STAGE 2 EARTHWORKS LOWEST CUT CONTOURS PLAN

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:1000m DO NOT SCALE

DRAWING NO: 2398-2-2201 REV: A

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	WZ	LH	LH	26/04/22

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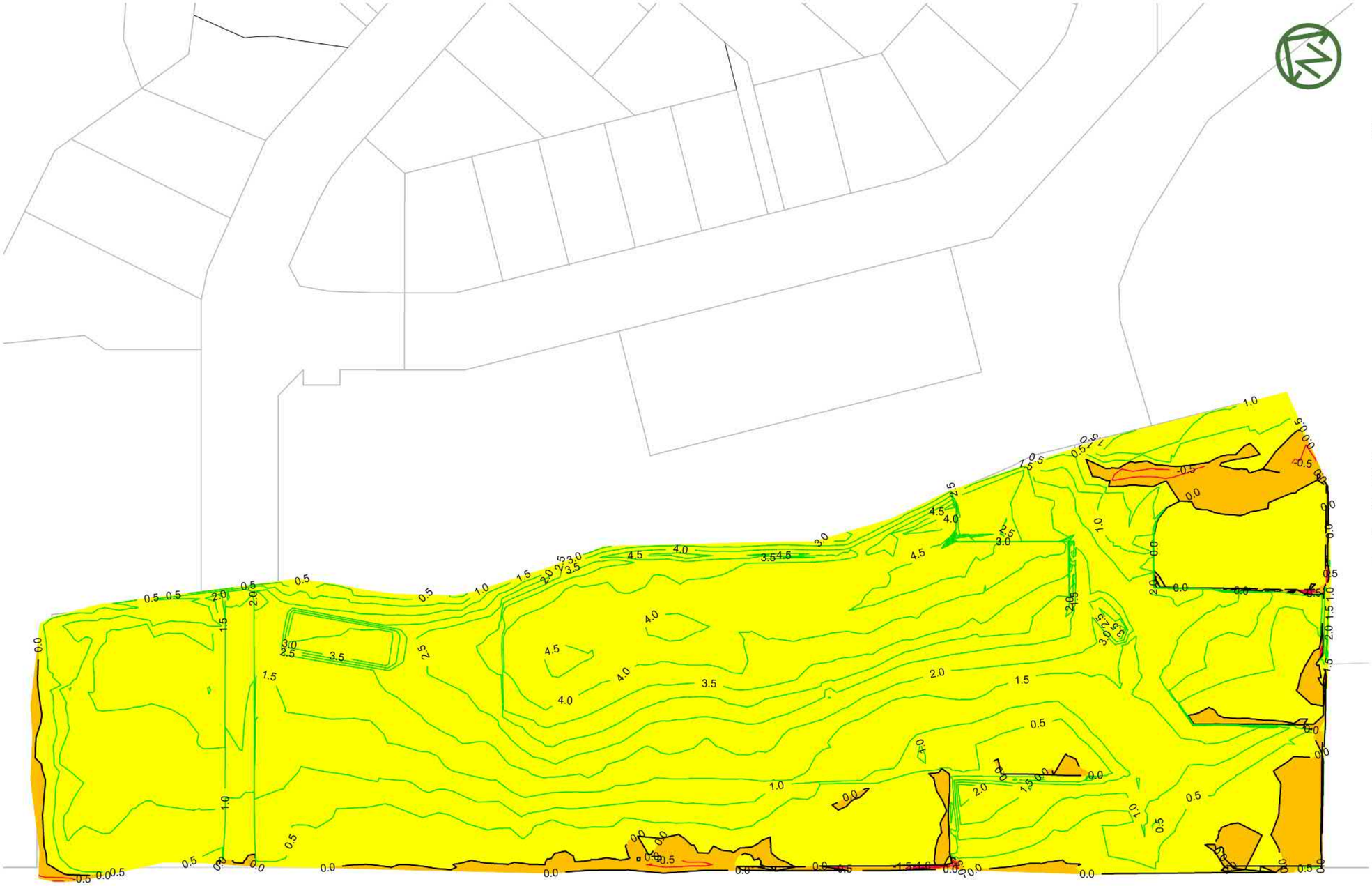

NOTES:

1. ALL AS-BUILT INFORMATION HAS BEEN COLLECTED AND SUPPLIED BY WEST CITY CONSTRUCTION LTD.
2. CUT FILL CONTOURS ARE A CAPARISON BETWEEN LOWEST CUT SURFACE AND FINISHED SUBGRADE SURFACE.

LEGEND:

FILL AREA

CUT AREA

FILL CONTOURS 0.5

CUT CONTOURS 0.5

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

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- The Coordinates (X,Y) are in terms of NZTM on NZGD (2000), and are within±50mm.
- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
Registered Professional Surveyor

Date: 19/05/2022

Name: Luke Hermanson
Phone: +64 9 320 5707 / 021 0744413
Email: luke.hermanson@mckenzieandco.co.nz

MCKENZIE & CO.

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

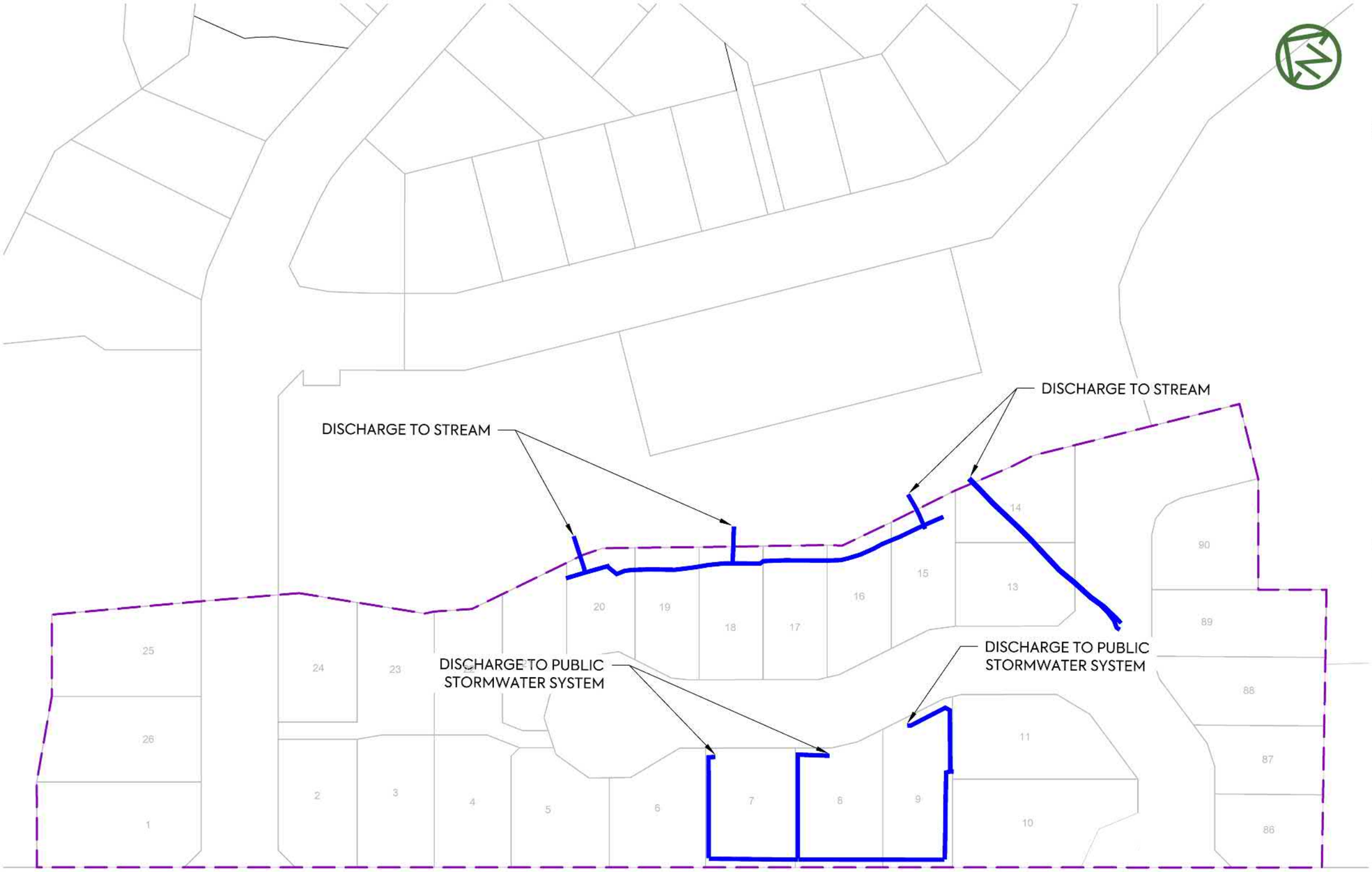
TITLE: AS BUILT STAGE 2 EARTHWORKS CUT TO FILL PLAN

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:1000 DO NOT SCALE

DRAWING NO: 2398-2-2210 REV: A

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	WZ	LH	LH	27/04/22



NOTES:

1. ALL AS-BUILT INFORMATION HAS BEEN COLLECTED AND SUPPLIED BY WEST CITY CONSTRUCTION LTD.
2. CUT FILL CONTOURS ARE A CAPARISON BETWEEN LOWEST CUT SURFACE AND FINISHED SUBGRADE SURFACE.

LEGEND:

STAGE BOUNDARY

UNDERFILL DRAINAGE LOCATION

LOT BOUNDARY

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

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- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
Registered Professional Surveyor

Date: 01/08/2022

Name: Luke Hermanson
Phone: +64 9 320 5707 / 021 0744413
Email: luke.hermanson@mckenzieandco.co.nz

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
B	Added underfill drainage	LH			1/08/2022
A	FIRST ISSUE	WZ	LH	LH	27/04/22

MCKENZIE & CO.

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: AS BUILT STAGE 2 EARTHWORKS UNDERFILL DRAINAGE PLAN

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:1000 DO NOT SCALE

DRAWING NO: 2398-2-2220

REV: B

NOTES:

1. ALL AS-BUILT INFORMATION HAS BEEN COLLECTED AND SUPPLIED BY WEST CITY CONSTRUCTION LTD.
2. CUT FILL CONTOURS ARE A CAPARISON BETWEEN LOWEST CUT SURFACE AND FINISHED SUBGRADE SURFACE.

LEGEND:

STAGE BOUNDARY

GEO GRID LOCATION

DIMENSIONS BETWEEN GEO GRID TO THE LOT BOUNDARY — 0.5m

LOT BOUNDARY

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

I certify that these Asbuilt Plans are an accurate record of the works undertaken and that:

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- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
Registered Professional Surveyor

Date: 01/08/2022

Name: Luke Hermanson
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Email: luke.hermanson@mckenzieandco.co.nz

MCKENZIE & CO.

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: AS BUILT STAGE 2 EARTHWORKS GEO GRID PLAN

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:1000 DO NOT SCALE

DRAWING NO: 2398-2-2221

REV: A

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	WZ	LH	LH	16/06/22

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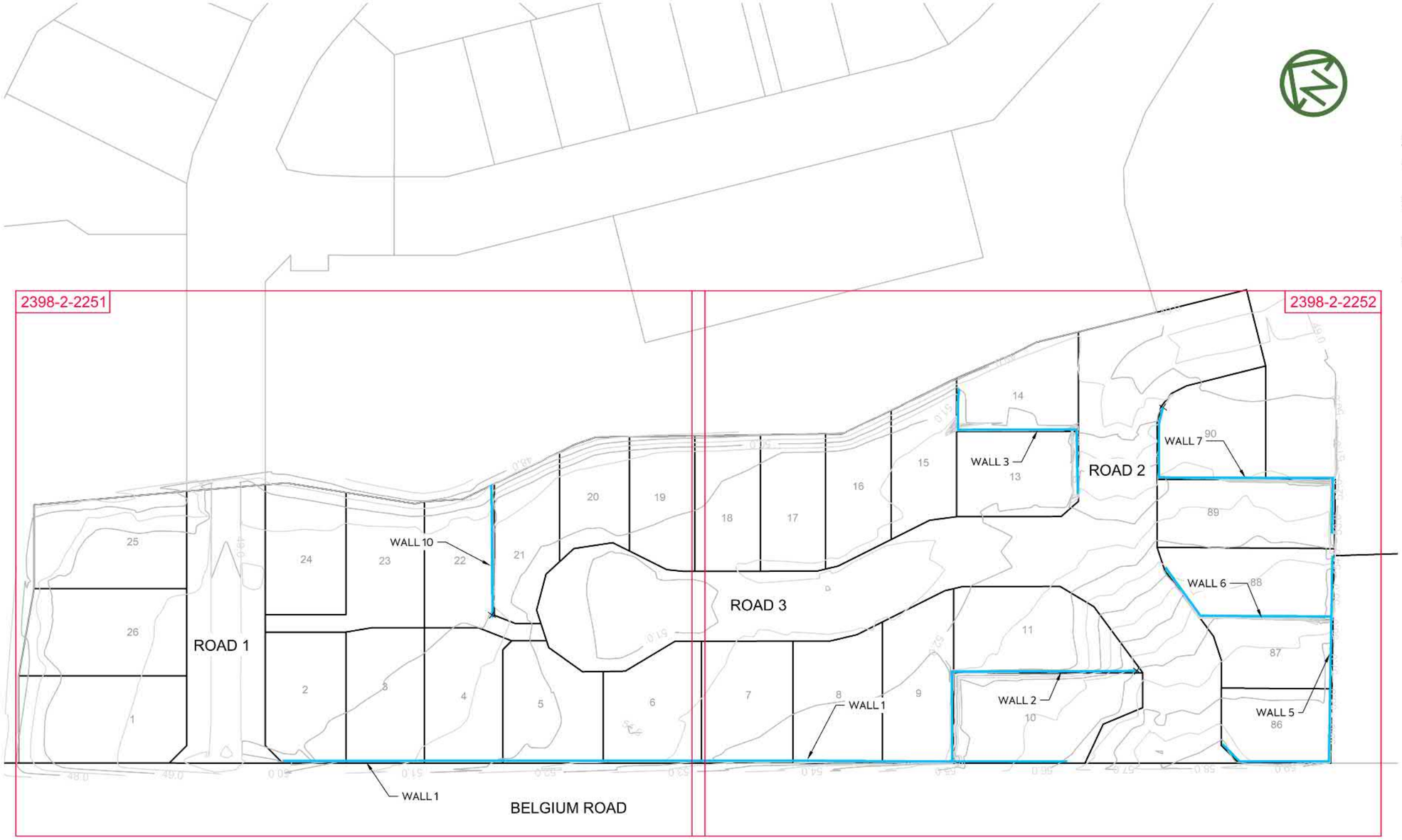

NOTES:

1. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946 (MSL).
2. ALL AS-BUILT INFORMATION HAS BEEN COLLECTED AND SUPPLIED BY WEST CITY CONSTRUCTION LTD.
3. THE RETAINED HEIGHT IS DIFFERENCE IN HEIGHT BETWEEN TOP AND BOTTOM OF THE WALL.
4. AT THE TIME OF CONSTRUCTION, THE BACK OF WALL DRAINAGE WAS NOT CONNECTED DIRECTLY TO THE STORMWATER SYSTEM. TO BE CONNECTED TO FUTURE PRIVATE DRAINAGE DURING THE BUILDING CONSTRUCTION

LEGEND:

FINAL CONTOURS - MAJOR 1.0m INTERVALS	1.0
FINAL CONTOURS - MINOR 0.5m INTERVALS	
RETAINING WALL	
CHAINAGE AND RETAINED HEIGHT	100.00 H 1.01m
DIMENSIONS BETWEEN THE WALL AND THE BOUNDARY	0.5m
LOT BOUNDARY	
RETAINING WALL DRAIN OUTLET LOCATION	

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

I certify that these Asbuilt Plans are an accurate record of the works undertaken and that:

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- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

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Registered Professional Surveyor

Date: 01/08/2022

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MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	WZ	LH	LH	07/06/22

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

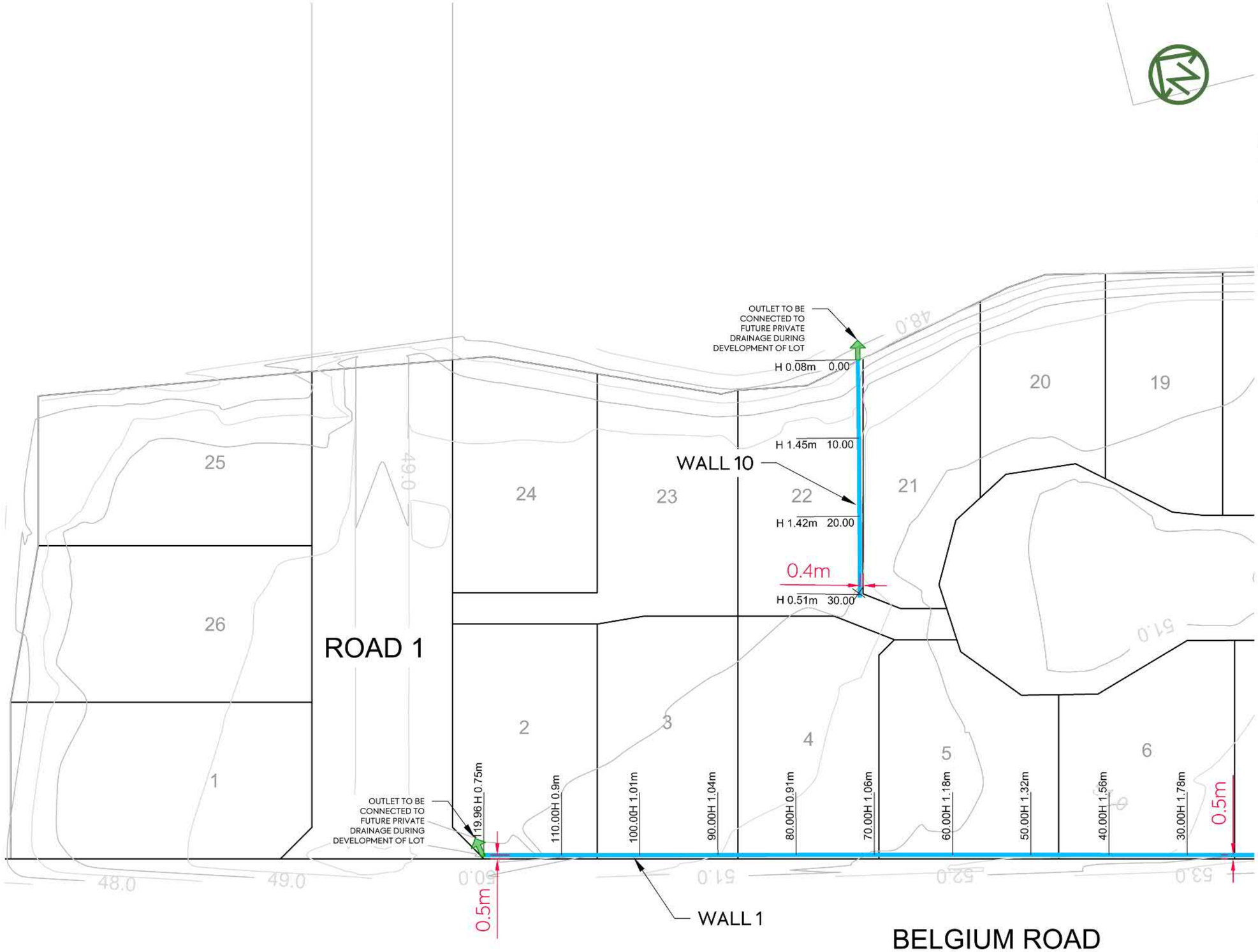
TITLE: AS BUILT STAGE 2 RETAINING WALL PLAN OVERALL PLAN

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:1000m DO NOT SCALE

DRAWING NO: 2398-2-2250 REV: A

C:\12D\S\DATA\MCKFS01\2398 3 BELGIUM ROAD_1178\DRAWINGS\STAGE 2\STAGE 2 AS BUILT\2398-2-2250.DWG



NOTES:

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3. THE RETAINED HEIGHT IS DIFFERENCE IN HEIGHT BETWEEN TOP AND BOTTOM OF THE WALL.
4. AT THE TIME OF CONSTRUCTION, THE BACK OF WALL DRAINAGE WAS NOT CONNECTED DIRECTLY TO THE STORMWATER SYSTEM. TO BE CONNECTED TO FUTURE PRIVATE DRAINAGE DURING THE BUILDING CONSTRUCTION

LEGEND:

- FINAL CONTOURS – MAJOR 1.0m INTERVALS
- FINAL CONTOURS – MINOR 0.5m INTERVALS
- RETAINING WALL
- CHAINAGE AND RETAINED HEIGHT — 100.00 H 1.01m
- DIMENSIONS BETWEEN THE WALL AND THE BOUNDARY — 0.5m
- LOT BOUNDARY
- RETAINING WALL DRAIN OUTLET LOCATION

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

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- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

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MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	WZ	LH	LH	07/06/22

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: AS BUILT STAGE 2 RETAINING WALL PLAN SHEET 1

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:500m

DO NOT SCALE

DRAWING NO: 2398-2-2251

REV: A

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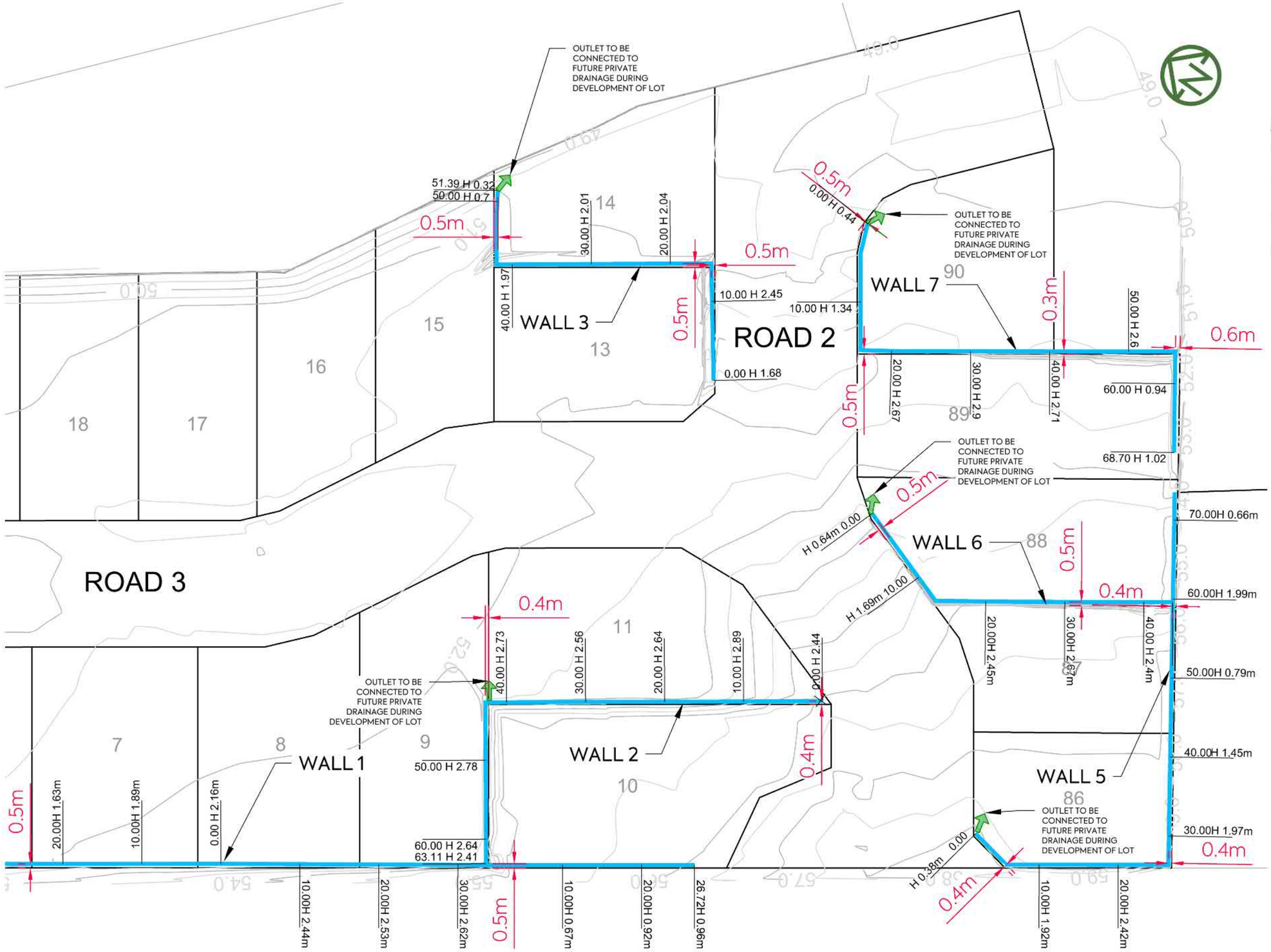

NOTES:

1. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946 (MSL).
2. ALL AS-BUILT INFORMATION HAS BEEN COLLECTED AND SUPPLIED BY WEST CITY CONSTRUCTION LTD.
3. THE RETAINED HEIGHT IS DIFFERENCE IN HEIGHT BETWEEN TOP AND BOTTOM OF THE WALL.
4. AT THE TIME OF CONSTRUCTION, THE BACK OF WALL DRAINAGE WAS NOT CONNECTED DIRECTLY TO THE STORMWATER SYSTEM. TO BE CONNECTED TO FUTURE PRIVATE DRAINAGE DURING THE BUILDING CONSTRUCTION

LEGEND:

FINAL CONTOURS – MAJOR 1.0m INTERVALS	1.0
FINAL CONTOURS – MINOR 0.5m INTERVALS	
RETAINING WALL	
CHAINAGE AND RETAINED HEIGHT	100.00 H 1.01m
DIMENSIONS BETWEEN THE WALL AND THE BOUNDARY	0.5m
LOT BOUNDARY	
RETAINING WALL DRAIN OUTLET LOCATION	

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

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- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
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MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	WZ	LH	LH	07/06/22

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: AS BUILT STAGE 2 RETAINING WALL PLAN SHEET 2

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:500m

DO NOT SCALE

DRAWING NO: 2398-2-2252

REV: A

C:\12DS\DATA\MCKFS01\2398 3 BELGIUM ROAD_1178\DRAWINGS\STAGE 2\STAGE 2 AS BUILT\2398-2-2250.DWG

NOTES:

1. ALL STORMWATER LINES ARE NEW PUBLIC LINE TO BE CLASS 2 REINFORCED CONCRETE RUBBER RING JOINTED (RCRRJ) UNLESS SHOWN OTHERWISE.
2. ALL CESSPITS AND MH IN PLANS ARE NEW PUBLIC LINES UNLESS SHOWN OTHERWISE.
3. ALL PIPE CROSSINGS UNDER CARRIAGEWAYS /TRAFFIC AREAS ARE NEW PUBLIC LINE CLASS 4 REINFORCED CONCRETE RUBBER RING JOINTED (RCRRJ)
4. ALL LOT CONNECTIONS ARE 100mmØ uPVC.
5. BEDDING FOR STORMWATER PIPES COMPLIES WITH AUCKLAND COUNCIL ENGINEERING QUALITY STANDARDS.
6. THE LOT NUMBER AND THE DISTANCE TO THE DOWN STREAM MANHOLE IS SHOWN ON THE LOT CONNECTIONS.

LEGEND

- NEW STORMWATER LINE
- NEW LOT CONNECTION
- NEW STORMWATER MANHOLE
- NEW CATCHPIT
- NEW STORMWATER WINGWALL OUTLET
- NEW STORMWATER PIPE OUTLET
- NEW DOUBLE CATCHPIT
- RAINGARDEN (ROADSIDE)
- NEW STORMWATER LINE (VESTED STAGE 3)
- NEW STORMWATER ROCK RIPWRAP APPRON
- STAGE 2 BOUNDARY
- WORKS BOUNDARY
- EXISTING WATERCOURSE STREAM
- EXISTING / NEW WASTEWATER LINE

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

I certify that these Asbuilt Plans are an accurate record of the works undertaken and that:

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- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
Registered Professional Surveyor

Date: 7/10/2022

Name: Luke Hermanson
Phone: +64 9 320 5707 / 021 0744413
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MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	LH	TDW	LH	07/10/22

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: STAGE 2 STORMWATER AS BUILT PLAN OVERALL

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:1500
DO NOT SCALE

DRAWING NO: 2398-2-AB-2400

REV: A

NOTES:

1. ALL STORMWATER LINES ARE NEW PUBLIC LINE TO BE CLASS 2 REINFORCED CONCRETE RUBBER RING JOINTED (RCRRJ) UNLESS SHOWN OTHERWISE.
2. ALL CESSPITS AND MH IN PLANS ARE NEW PUBLIC LINES UNLESS SHOWN OTHERWISE.
3. ALL PIPE CROSSINGS UNDER CARRIAGEWAYS /TRAFFIC AREAS ARE NEW PUBLIC LINE CLASS 4 REINFORCED CONCRETE RUBBER RING JOINTED (RCRRJ)
4. ALL LOT CONNECTIONS ARE 100mmØ uPVC.
5. BEDDING FOR STORMWATER PIPES COMPLIES WITH AUCKLAND COUNCIL ENGINEERING QUALITY STANDARDS.
6. THE LOT NUMBER AND THE DISTANCE TO THE DOWN STREAM MANHOLE IS SHOWN ON THE LOT CONNECTIONS.

LEGEND

- NEW STORMWATER LINE
- NEW LOT CONNECTION
- NEW STORMWATER MANHOLE
- NEW CATCHPIT
- NEW STORMWATER WINGWALL OUTLET
- NEW STORMWATER PIPE OUTLET
- NEW DOUBLE CATCHPIT
- RAINGARDEN (ROADSIDE)
- NEW STORMWATER LINE (VESTED STAGE 3)
- NEW STORMWATER ROCK RIPWRAP APPRON
- STAGE 2 BOUNDARY
- WORKS BOUNDARY
- EXISTING WATERCOURSE STREAM
- EXISTING / NEW WASTEWATER LINE

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

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- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
Registered Professional Surveyor

Date: 7/10/2022

Name: Luke Hermanson
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MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	LH	TDW	LH	07/10/22

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: STAGE 2 STORMWATER AS BUILT PLAN SHEET 1 OF 3

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:500 DO NOT SCALE

DRAWING NO: 2398-2-AB-2401

REV: A

C:\12DS\DATA\MCKFS01\23981 3 BELGIUM ROAD_11781\DRAWINGS\STAGE 2\STAGE 2 AS BUILT\2398-2-2400.DWG

NOTES:

1. ALL STORMWATER LINES ARE NEW PUBLIC LINE TO BE CLASS 2 REINFORCED CONCRETE RUBBER RING JOINTED (RCRRJ) UNLESS SHOWN OTHERWISE.
2. ALL CESSPITS AND MH IN PLANS ARE NEW PUBLIC LINES UNLESS SHOWN OTHERWISE.
3. ALL PIPE CROSSINGS UNDER CARRIAGEWAYS /TRAFFIC AREAS ARE NEW PUBLIC LINE CLASS 4 REINFORCED CONCRETE RUBBER RING JOINTED (RCRRJ)
4. ALL LOT CONNECTIONS ARE 100mmØ uPVC.
5. BEDDING FOR STORMWATER PIPES COMPLIES WITH AUCKLAND COUNCIL ENGINEERING QUALITY STANDARDS.
6. THE LOT NUMBER AND THE DISTANCE TO THE DOWN STREAM MANHOLE IS SHOWN ON THE LOT CONNECTIONS.

LEGEND

- NEW STORMWATER LINE
- NEW LOT CONNECTION
- NEW STORMWATER MANHOLE
- NEW CATCHPIT
- NEW STORMWATER WINGWALL OUTLET
- NEW STORMWATER PIPE OUTLET
- NEW DOUBLE CATCHPIT
- RAINGARDEN (ROADSIDE)
- NEW STORMWATER LINE (VESTED STAGE 3)
- NEW STORMWATER ROCK RIPWRAP APPRON
- STAGE 2 BOUNDARY
- WORKS BOUNDARY
- EXISTING WATERCOURSE STREAM
- EXISTING / NEW WASTEWATER LINE

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

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Registered Professional Surveyor

Date: 7/10/2022

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MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	LH	TDW	LH	07/10/22

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: STAGE 2 STORMWATER AS BUILT PLAN SHEET 3 OF 3

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:500

DO NOT SCALE

DRAWING NO: 2398-2-AB-2402

REV: A

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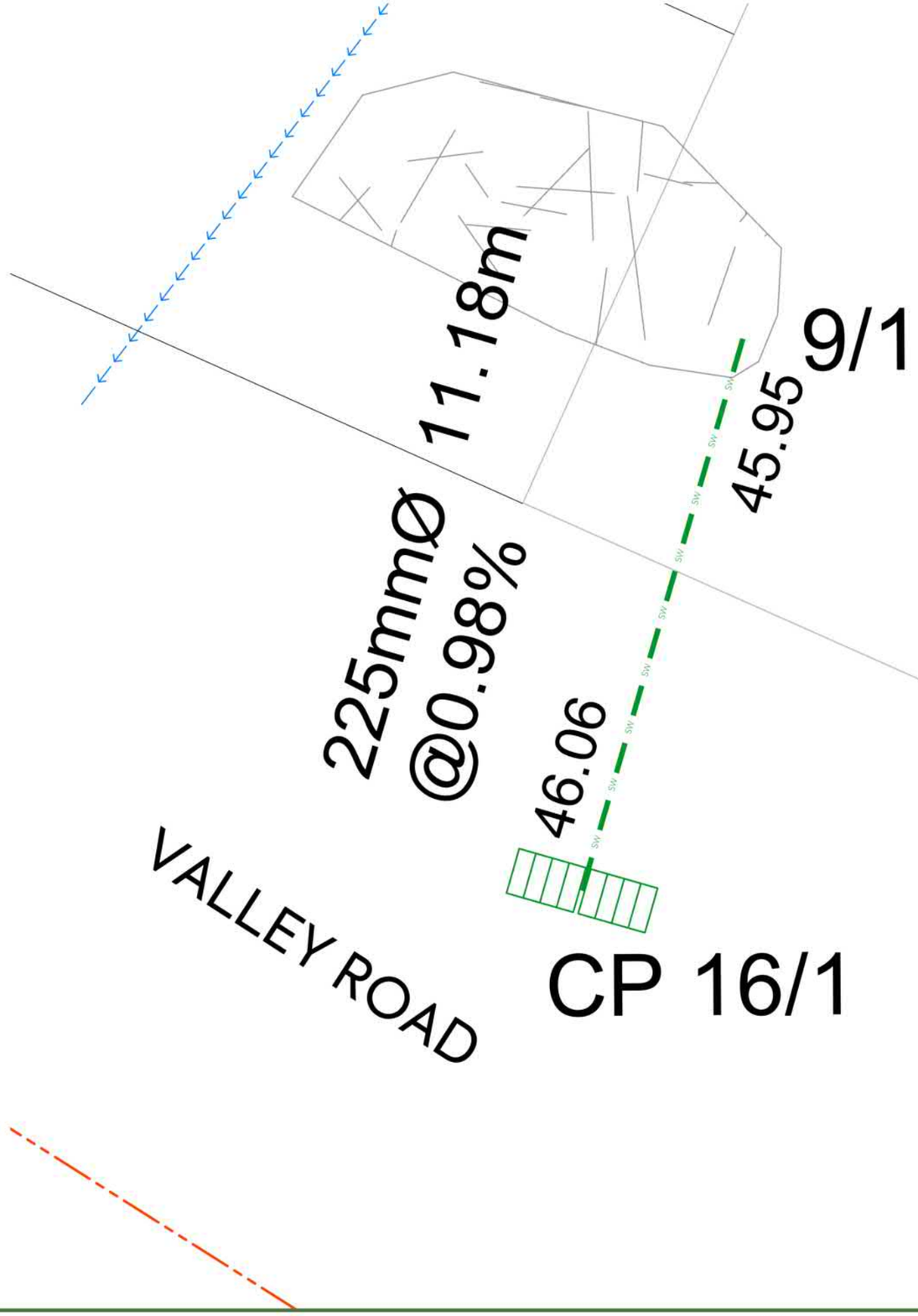

NOTES:

1. ALL STORMWATER LINES ARE NEW PUBLIC LINE TO BE CLASS 2 REINFORCED CONCRETE RUBBER RING JOINTED (RCRRJ) UNLESS SHOWN OTHERWISE.
2. ALL CESSPITS AND MH IN PLANS ARE NEW PUBLIC LINES UNLESS SHOWN OTHERWISE.
3. ALL PIPE CROSSINGS UNDER CARRIAGEWAYS /TRAFFIC AREAS ARE NEW PUBLIC LINE CLASS 4 REINFORCED CONCRETE RUBBER RING JOINTED (RCRRJ)
4. ALL LOT CONNECTIONS ARE 100mmØ uPVC.
5. BEDDING FOR STORMWATER PIPES COMPLIES WITH AUCKLAND COUNCIL ENGINEERING QUALITY STANDARDS.
6. THE LOT NUMBER AND THE DISTANCE TO THE DOWN STREAM MANHOLE IS SHOWN ON THE LOT CONNECTIONS.

LEGEND

- NEW STORMWATER LINE
- NEW LOT CONNECTION
- NEW STORMWATER MANHOLE
- NEW CATCHPIT
- NEW STORMWATER WINGWALL OUTLET
- NEW STORMWATER PIPE OUTLET
- NEW DOUBLE CATCHPIT
- RAINGARDEN (ROADSIDE)
- NEW STORMWATER LINE (VESTED STAGE 3)
- NEW STORMWATER ROCK RIPWRAP APPRON
- STAGE 2 BOUNDARY
- WORKS BOUNDARY
- EXISTING WATERCOURSE STREAM
- EXISTING / NEW WASTEWATER LINE

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

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- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
Registered Professional Surveyor

Date: 7/10/2022

Name: Luke Hermanson
Phone: +64 9 320 5707 / 021 0744413
Email: luke.hermanson@mckenzieandco.co.nz

MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	LH	TDW	LH	07/10/22

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: STAGE 2 STORMWATER AS BUILT PLAN SHEET 3 OF 3

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:100 DO NOT SCALE

DRAWING NO: 2398-2-AB-2403

REV: A

C:\12DS\DATA\MCKFS01\23981 3 BELGIUM ROAD_11781\DRAWINGS\STAGE 2\STAGE 2 AS BUILT\2398-2-2400.DWG

Upstream Manhole					Downstream Manhole		Stormwater Pipe (As-Built Data)							
Manhole Name	As-built Dia.(mm)	Easting	Northing	Lid Level	Manhole Name	As-built Dia.(mm)	Upstream Outlet (m)	Downstream Inlet (m)	Downstream Outlet (m)	Pipe Dia. (mm)	Pipe Length (m)	Pipe Material	Pipe Class	Constructed Grade (%)
HW 1/1	-	1770479.59	5881862.23	-	-	-	47.90	-	-	-	-	-	-	-
MH 1/2	1050	1770477.15	5881856.72	49.47	HW 1/1	-	47.98	47.90	47.90	300	5.45	RCRRJ	CLASS 2	1.47%
MH 1/3	1050	1770461.18	5881852.64	49.83	MH 1/2	1050	48.13	48.04	47.98	300	15.43	RCRRJ	CLASS 2	0.58%
MH 1/4	1050	1770436.74	5881836.48	52.49	MH 1/3	1050	49.89	48.20	48.13	225	28.24	RCRRJ	CLASS 2	5.98%
MH 1/5	1050	1770423.10	5881827.12	48.81	MH 1/4	1050	50.78	49.95	49.89	225	15.12	RCRRJ	CLASS 4	5.46%
MH 1/6	1200	1770414.96	5881804.61	56.52	MH 1/5	1050	53.48	52.10	50.78	225	22.89	RCRRJ	CLASS 2	6.02%
MH 1/7	1050	1770420.04	5881795.03	56.72	MH 1/6	1050	54.95	54.37	53.48	225	9.78	RCRRJ	CLASS 4	5.93%
MH 1/8	1050	1770420.02	5881795.02	56.75	MH1/7	1050	56.08	55.02	54.95	225	17.37	RCRRJ	CLASS 5	6.10%
MH 2/1	1050	1770406.67	5881782.35	53.10	MH 1/4	1050	50.08	49.95	49.89	225	11.91	RCRRJ	CLASS 4	1.09%
HW 3/1	-	1770327.79	5882015.45	-	-	-	46.97	-	-	-	-	-	-	-
MH 3/2	1050	1770329.32	5882011.16	49.18	HW 3/1	1050	47.00	46.97	-	450	4.03	RCRRJ	CLASS 2	0.74%
MH 3/3	1050	1770336.72	5882000.82	49.10	MH 3/2	1050	47.08	47.02	47.00	450	11.67	RCRRJ	CLASS 4	0.51%
MH 3/4	1050	1770309.86	5881982.53	49.74	MH 3/3	1050	47.27	47.11	47.08	450	31.45	RCRRJ	CLASS 2	0.51%
MH 3/5	1200	1770346.27	5881925.18	51.36	MH 3/4	1050	47.67	47.33	47.27	450	67.25	RCRRJ	CLASS 4	0.51%
MH 3/6	1200	1770358.09	5881905.65	51.22	MH 3/5	1050	48.07	47.79	47.67	300	21.77	RCRRJ	CLASS 4	1.29%
MH 3/7	1050	1770364.20	5881897.20	51.19	MH 3/6	1050	49.10	48.99	48.07	300	9.39	RCRRJ	CLASS 2	1.17%
MH 3/8	1050	1770381.40	5881872.06	51.65	MH 3/7	1050	49.45	49.29	49.10	300	29.78	RCRRJ	CLASS 2	0.54%
MH 3/9	1050	1770385.86	5881868.26	51.66	MH 3/8	1050	49.59	49.52	49.45	225	4.81	RCRRJ	CLASS 2	1.46%
MH 3/10	1050	1770396.63	5881861.60	51.62	MH 3/9	1050	49.72	49.65	49.59	225	11.61	RCRRJ	CLASS 2	0.60%
MH 4/1	1050	1770369.83	5881910.57	51.21	MH 3/6	1050	48.83	48.12	48.07	225	11.68	RCRRJ	CLASS 2	6.08%
MH 4/2	1050	1770374.30	5881904.62	51.19	MH 4/1	1050	49.10	48.85	48.83	225	6.39	RCRRJ	CLASS 2	3.91%
MH 4/3	1050	1770391.56	5881878.83	51.63	MH 4/2	1050	49.32	49.13	49.10	225	29.98	RCRRJ	CLASS 2	0.63%
MH 4/4	1050	1770402.72	5881873.01	51.61	MH 4/3	1050	49.44	49.38	49.32	225	11.54	RCRRJ	CLASS 2	0.52%
MH 4/5	1050	1770411.37	5881868.13	51.79	MH 4/4	1050	49.57	49.49	49.44	225	9.86	RCRRJ	CLASS 2	0.81%
MH 5/1	1050	1770280.87	5881962.77	50.42	MH 3/4	1050	48.46	48.16	47.27	225	33.93	RCRRJ	CLASS 4	0.87%
MH 5/2	1050	1770341.04	5881874.39	53.92	MH 5/1	1050	51.88	48.53	48.46	225	106.01	RCRRJ	CLASS 2	3.16%
HW 6/1	-	1770307.01	5882038.94	-	-	-	47.10	-	-	-	-	-	-	-
MH 6/2	1050	1770250.27	5882004.81	49.07	MH 6/1	1050	47.44	47.10	47.10	225	66.01	RCRRJ	CLASS 2	0.52%
MH 7/1	1050	1770309.90	5881982.56	49.75	MH 3/5	1050	49.11	48.42	47.67	225	11.410	RCRRJ	CLASS 4	6.05%
HW 8/1	-	1770496.96	5881845.27	-	-	-	46.96	-	-	-	-	-	-	-
MH 8/2	1050	1770493.12	5881838.34	49.49	HW 8/1	-	47.10	46.96	46.96	300	7.33	RCRRJ	CLASS 2	1.91%
MH 8/3	1050	1770485.14	5881829.65	48.73	MH 8/2	1050	47.17	47.13	47.10	225	10.75	RCRRJ	CLASS 4	0.37%
HW 9/1	-	5523435.84	2115290.24	-	-	-	45.950	-	-	-	-	RCRRJ	CLASS 4	-

MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	LH	TDW	LH	07/10/22

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: STAGE 2 STORMWATER AS BUILT PLAN SCHEDULE OF MANHOLES

PURPOSE OF ISSUE: AS BUILT

SCALE: N/A DO NOT SCALE

DRAWING NO: 2398-2-AB-2404 REV: A

C:\1205\DATA\MCKFS01\23911 3 BELGIUM ROAD_11711\DRAWINGS\STAGE 2\STAGE 2 AS BUILT\2398-2-2400.DWG

CATCHPITS				
Catchpit Name	**TYPE**	**Easting**	**Northing**	**Lid Level**
CP 1/1	DCP	1770371.104	5881903.366	50.94
CP 2/1	DCP	1770400.457	5881870.464	51.39
CP 3/1	DCP	1770398.482	5881864.517	51.36
CP 4/1	CP	1770247.465	5882003.098	49.04
CP 5/1	CP	1770339.217	5881869.220	53.80
CP 6/1	DCP	1770366.446	5881899.317	50.95
CP 7/1	CP	1770405.003	5881775.053	59.19
CP 8/1	CP	1770430.044	5881815.817	54.13
CP 9/1	CP	1770310.546	5881979.692	49.74
CP 10/1	DCP	2115042.173	5523715.915	48.57
CP 11/1	CP	1770284.229	5881951.062	50.76
CP 12/1	DCP	1770485.663	5881834.329	48.58
CP 13/1	BEING VESTED IN STAGE 3			
CP 14/1	CP	1770425.538	5881820.902	53.90
CP 15/1	BEING VESTED IN STAGE 3			
CP 16/1	DCP	1770209.366	5882093.688	47.13

MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	LH	TDW	LH	07/10/22

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: STAGE 2 STORMWATER AS BUILT PLAN SCHEDULE OF CATCHPITS

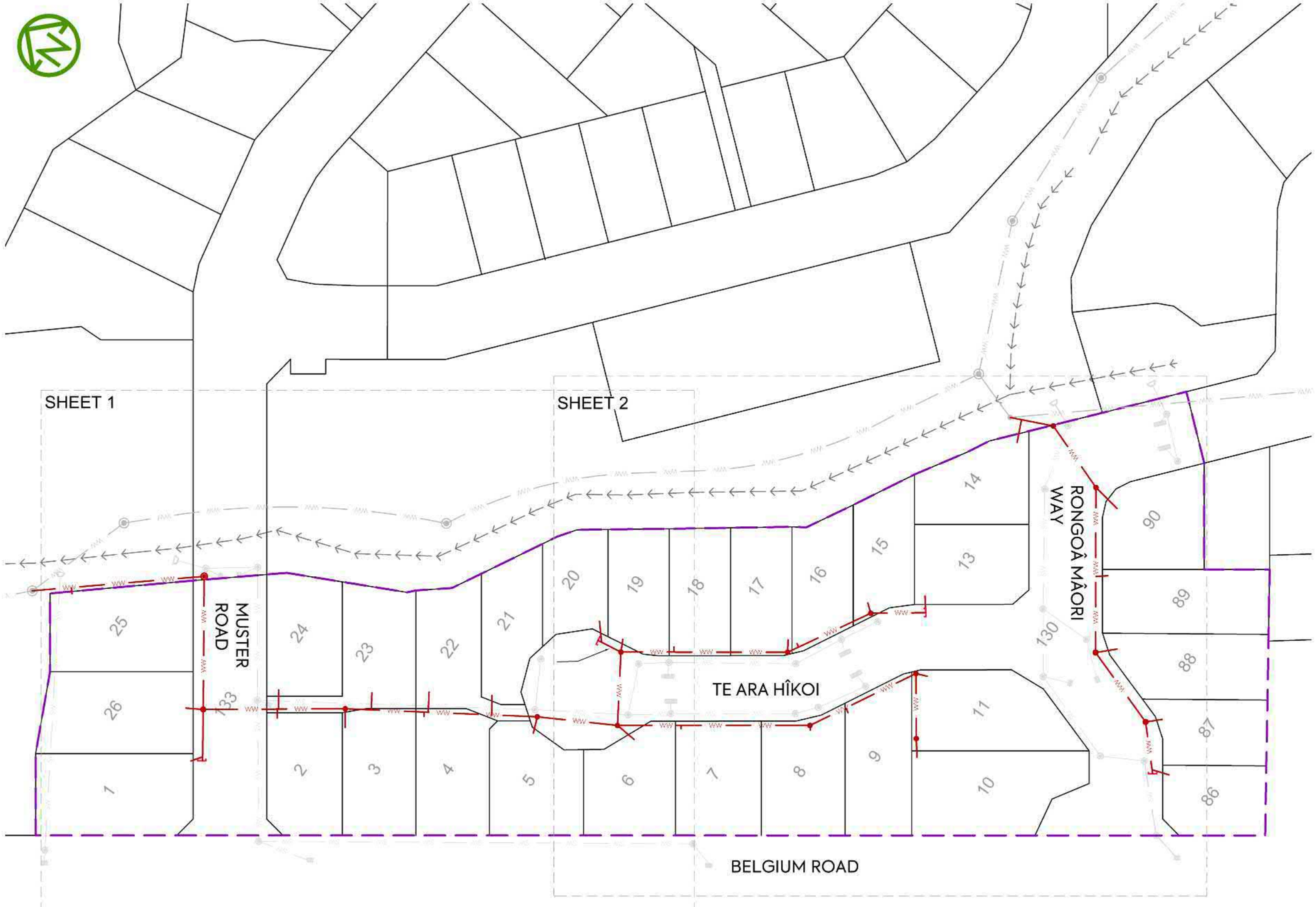
PURPOSE OF ISSUE: AS BUILT

SCALE: N/A DO NOT SCALE

DRAWING NO: 2398-2-AB-2405

REV: A

C:\12DS\DATA\MCKFS01\2398 3 BELGIUM ROAD_11719\DRAWINGS\STAGE 2\STAGE 2 AS BUILT\2398-2-2400.DWG



NOTES:

1. ORIGIN OF COORDINATES
   MARK: AP 7 DP 428848
   5893419.526 mN
   1772539.372mE
   (NZTM)

2. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946 (MSL).
   ORIGIN OF LEVELS
   MARK: RM 7739 SO 68698 (C631)
   R.L.: 5.69m

3. ALL LOT CONNECTIONS ARE 100mm DIAMETER uPVC SN16. ALL LOT CONNECTION TERMINATE 1.0m BELOW FINISHED GROUND LEVEL AND STAKED.

4. ALL NEW PUBLIC LINES ARE 150mm DIAMETER uPVC SN16.

5. FOR PIT INFORMATION REFER TO DRAWING 2398-2-2503.

6. LOT CONNECTION AND BLACK CAP POSITIONS AND DEPTHS PROVIDED BY WEST CITY CONTRACTORS LTD SURVEYORS.

7. ALL MANHOLES ARE 1050mmØ UNLESS STATED ON THE PLANS

LEGEND:

- STAGE 2 BOUNDARY
- LOT BOUNDARIES
- NEW WASTEWATER LINE — WW
- NEW LOT CONNECTION
- NEW WASTEWATER MANHOLE
- NEW WASTEWATER BLANK CAP
- NEW STORMWATER LINE — SW
- EXISTING WASTEWATER LINE — WW

I certify that these Asbuilt Plans are an accurate record of the works undertaken and that:

- The Coordinates (X,Y) are in terms of NZTM on NZGD (2000), and are within±50mm.
- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
Registered Professional Surveyor

Date: 13/09/2022

Name: Luke Hermanson
Phone: +64 9 320 5707 / 021 0744413
Email: luke.hermanson@mckenzieandco.co.nz

MCKENZIE & CO.

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: STAGE 2 WASTEWATER OVERALL AS BUILT PLAN

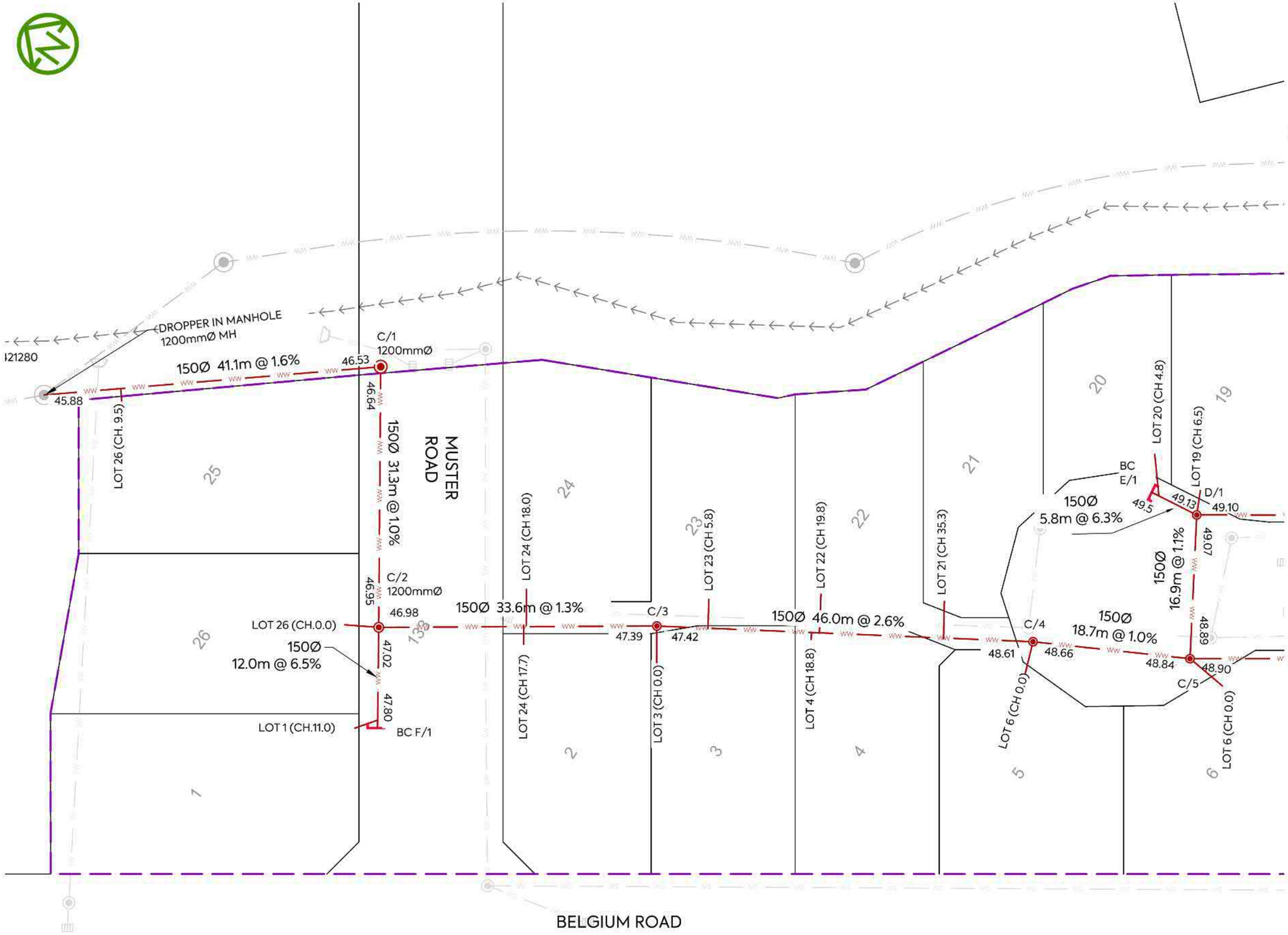
PURPOSE OF ISSUE: AS BUILT

SCALE: 1:1000
DO NOT SCALE

DRAWING NO: 2398-2-AB-2500

REV: A

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	JS	LH	LH	06/09/22



NOTES:

1. ORIGIN OF COORDINATES
   MARK: AP 7 DP 428848
   5893419.526 mN
   1772539.372mE
   (NZTM)
2. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946 (MSL).
   ORIGIN OF LEVELS
   MARK: RM 7739 SO 68698 (C631)
   R.L.: 5.69m
3. ALL LOT CONNECTIONS ARE 100mm DIAMETER uPVC SN16. ALL LOT CONNECTION TERMINATE 1.0m BELOW FINISHED GROUND LEVEL AND STAKED.
4. ALL NEW PUBLIC LINES ARE 150mm DIAMETER uPVC SN16.
5. FOR PIT INFORMATION REFER TO DRAWING 2398-2-2503.
6. LOT CONNECTION AND BLACK CAP POSITIONS AND DEPTHS PROVIDED BY WEST CITY CONTRACTORS LTD SURVEYORS.
7. ALL MANHOLES ARE 1050mmØ UNLESS STATED ON THE PLANS

LEGEND:

- STAGE 2 BOUNDARY
- LOT BOUNDARIES
- NEW WASTEWATER LINE — WW
- NEW LOT CONNECTION
- NEW WASTEWATER MANHOLE
- NEW WASTEWATER BLANK CAP
- NEW STORMWATER LINE — SW
- EXISTING WASTEWATER LINE — WW

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- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
Registered Professional Surveyor

Date: 13/09/2022

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MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	JS	LH	LH	06/09/22

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

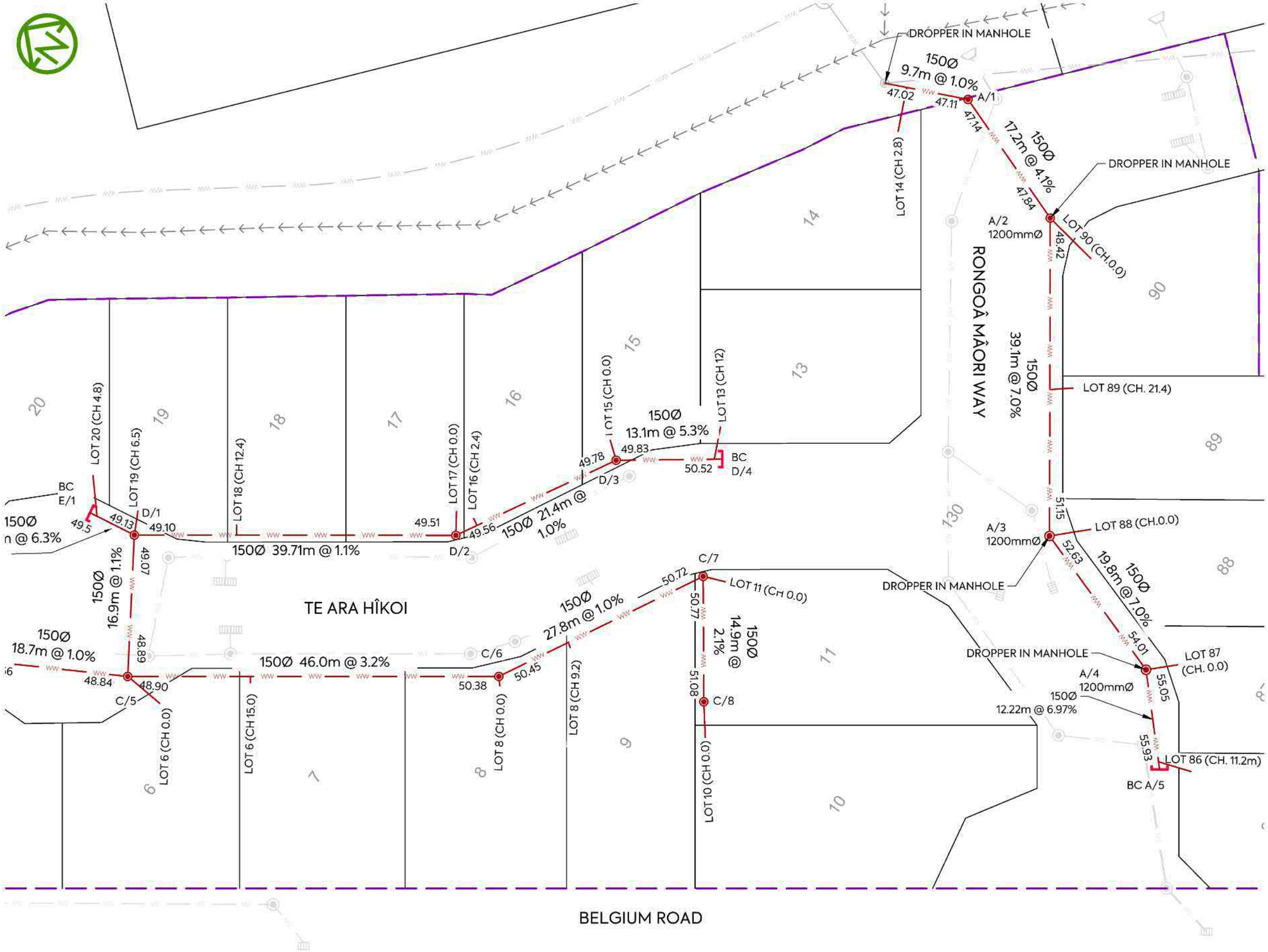
TITLE: STAGE 2 WASTEWATER AS BUILT PLAN SHEET 1 OF 3

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:500
DO NOT SCALE

DRAWING NO: 2398-2-AB-2501

REV: A



NOTES:

1. ORIGIN OF COORDINATES
   MARK: AP 7 DP 428848
   5893419.526 mN
   1772539.372mE
   (NZTM)
2. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946 (MSL).
   ORIGIN OF LEVELS
   MARK: RM 7739 SO 68698 (C631)
   R.L.: 5.69m
3. ALL LOT CONNECTIONS ARE 100mm DIAMETER uPVC SN16. ALL LOT CONNECTION TERMINATE 1.0m BELOW FINISHED GROUND LEVEL AND STAKED.
4. ALL NEW PUBLIC LINES ARE 150mm DIAMETER uPVC SN16.
5. FOR PIT INFORMATION REFER TO DRAWING 2398-2-2503.
6. LOT CONNECTION AND BLACK CAP POSITIONS AND DEPTHS PROVIDED BY WEST CITY CONTRACTORS LTD SURVEYORS.
7. ALL MANHOLES ARE 1050mmØ UNLESS STATED ON THE PLANS

LEGEND:

- STAGE 2 BOUNDARY
- LOT BOUNDARIES
- NEW WASTEWATER LINE — WW
- NEW LOT CONNECTION
- NEW WASTEWATER MANHOLE
- NEW WASTEWATER BLANK CAP
- NEW STORMWATER LINE — SW
- EXISTING WASTEWATER LINE — WW

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Signed: .....
Registered Professional Surveyor

Date: 13/09/2022

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MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	JS	LH	LH	06/09/22

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: STAGE 2 WASTEWATER AS BUILT PLAN SHEET 3 OF 3

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:500
DO NOT SCALE

DRAWING NO: 2398-2-AB-2502

REV: A

I certify that these Asbuilt Plans are an accurate record of the works undertaken and that:

- The Coordinates (X,Y) are in terms of NZTM on NZGD (2000), and are within±50mm.
- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
Registered Professional Surveyor

Date: 13/09/2022

Name: Luke Hermanson
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Email: luke.hermanson@mckenzieandco.co.nz

Line ID	Manhole Type	Manhole ID (US)	Manhole ID (DS)	Northing (mN)	Easting (mE)	Lid Level (mRL)	Depth to Inv. Out (m)	Invert Out (m)	PIPE Dia. (m)	Pipe Type	Invert In (m)	Pipe Dia. (m)	Invert In (m)	Pipe Dia. (m)
Line A	Public	MH A/1	EX MH (GIS ID.4827058)	5881859.68	1770475.46	49.62	2.510	47.11	150	uPVC SN16	47.14	150	-	-
	Public	MH A/2	MH A/1	5881842.46	1770468.76	49.55	1.710	47.84	150	uPVC SN16	48.11	100	48.42	150
	Public	MH A/3	MH A/2	5881819.77	1770435.59	53.72	2.580	51.14	150	uPVC SN16	51.30	100	52.63	150
	Public	MH A/4	MH A/3	5881800.11	1770428.31	56.23	2.220	54.01	150	uPVC SN16	54.11	100	55.05	150
	Public	BC A/5	MH 1/1	5881791.58	1770418.61			55.93	150	uPVC SN16	-	-	-	-
Line C	Public	MH C/1	EX MH (GIS ID.421280)	5882010.61	1770327.32	49.71	3.180	46.53	150	uPVC SN16	46.63	150	-	-
	Public	MH C/2	MH C/1	5881992.54	1770300.66	49.80	2.850	46.95	150	uPVC SN16	46.97	150	47.02	150
	Public	MH C/3	MH C/2	5881963.76	1770320.07	49.93	2.535	47.39	150	uPVC SN16	47.42	150	47.56	100
	Public	MH C/4	MH C/3	5881923.67	1770345.11	51.36	2.742	48.61	150	uPVC SN16	48.66	150	-	-
	Public	MH C/5	MH C/4	5881906.36	1770354.74	51.21	2.374	48.84	150	uPVC SN16	48.89	150	48.9	150
	Public	MH C/6	MH C/5	5881867.27	1770381.11	51.78	1.402	50.38	150	uPVC SN16	50.45	150	50.47	100
	Public	MH C/7	MH C/6	5881853.24	1770406.13	52.06	1.340	50.72	150	uPVC SN16	50.78	100	50.77	150
	Public	MH C/8	MH C/7	5881844.15	1770393.03	52.26	1.180	51.08	150	uPVC SN16	51.18	150	-	-
	Public	BC F/1	MH C/2	5881985.24	1770290.03			47.80	150	uPVC SN16	-	-	-	-
Line D	Public	MH D/1	MH C/5	5881915.73	1770369.96	51.26	2.193	49.07	150	uPVC SN16	49.13	150	49.10	150
	Public	MH D/2	MH D/1	5881882.29	1770392.88	51.69	2.180	49.51	150	uPVC SN16	49.56	100	49.56	150
	Public	MH D/3	MH D/2	5881859.63	1770419.80	51.83	2.052	49.78	150	uPVC SN16	49.90	100	49.83	150
	Public	BC D/4	MH D/3	5881859.63	1770419.80			50.52	150	uPVC SN16	-	-	-	-
	Public	BC E/1	MH D/1	5881922.02	1770368.91			49.50	150	uPVC SN16	-	-	-	-

MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	LH	JX	LH	06/09/22

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: STAGE 2 WASTEWATER MANHOLE DETAILS AS-BUILT

PURPOSE OF ISSUE: AS BUILT

SCALE: NTS DO NOT SCALE

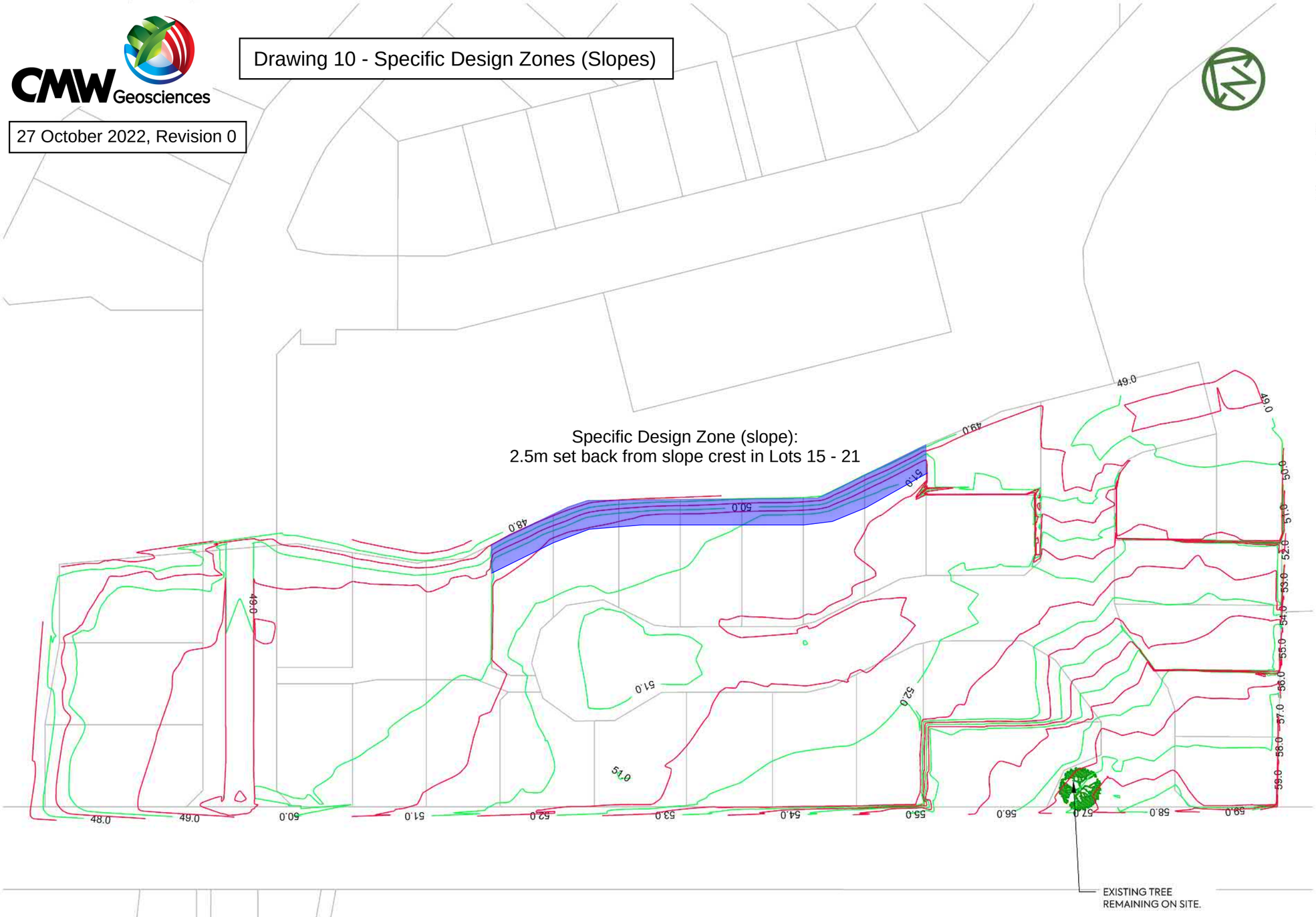
DRAWING NO: 2398-2-AB-2503

REV: A

CMW Geosciences

Drawing 10 - Specific Design Zones (Slopes)

27 October 2022, Revision 0



NOTES:

1. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946 (MSL).
2. ALL AS-BUILT INFORMATION HAS BEEN COLLECTED AND SUPPLIED BY WEST CITY CONSTRUCTION LTD.

LEGEND:

FINAL CONTOURS – MAJOR 1.0m INTERVALS — 1.0

FINAL CONTOURS – MINOR 0.5m INTERVALS

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

I certify that these Asbuilt Plans are an accurate record of the works undertaken and that:

- The Coordinates (X,Y) are in terms of NZTM on NZGD (2000), and are within±50mm.
- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
Registered Professional Surveyor

Date: 19/05/2022

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MCKENZIE & CO.

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: AS BUILT STAGE 2 EARTHWORKS FINISHED CONTOURS PLAN

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:1000m
DO NOT SCALE

DRAWING NO: 2398-2-2200

REV: A

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	WZ	LH	LH	26/04/22

NOTES:

1. ALL AS-BUILT INFORMATION HAS BEEN COLLECTED AND SUPPLIED BY WEST CITY CONSTRUCTION LTD.
2. CUT FILL CONTOURS ARE A CAPARISON BETWEEN LOWEST CUT SURFACE AND FINISHED SUBGRADE SURFACE.

LEGEND:

DRAINAGE ZONE INFLUENCE AREA

DIMENSIONS BETWEEN THE ZONE INFLUENCE TO THE BOUNDARY — 0.5m

LOT BOUNDARY

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

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- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
Registered Professional Surveyor

Date: 01/08/2022

Name: Luke Hermanson
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MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	WZ	LH	LH	16/06/22

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: AS BUILT STAGE 2 EARTHWORKS SW & WW ZONE INFLUENCE PLAN

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:1000 DO NOT SCALE

DRAWING NO: 2398-2-2240

REV: A

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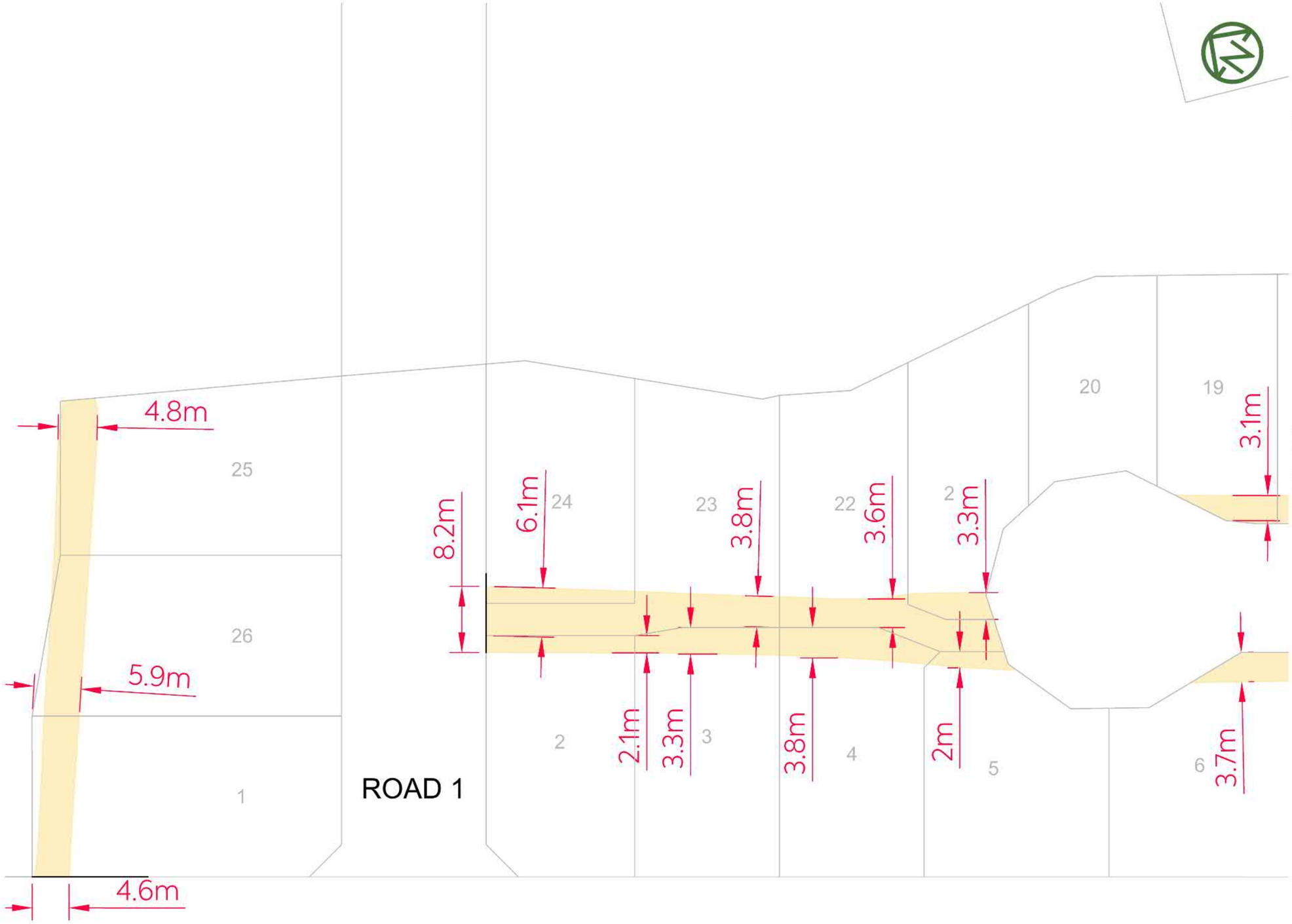

NOTES:

1. ALL AS-BUILT INFORMATION HAS BEEN COLLECTED AND SUPPLIED BY WEST CITY CONSTRUCTION LTD.
2. CUT FILL CONTOURS ARE A CAPARISON BETWEEN LOWEST CUT SURFACE AND FINISHED SUBGRADE SURFACE.

LEGEND:

DRAINAGE ZONE INFLUENCE AREA

DIMENSIONS BETWEEN THE ZONE INFLUENCE TO THE BOUNDARY

0.5m

LOT BOUNDARY

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

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- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
Registered Professional Surveyor

Date: 01/08/2022

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Phone: +64 9 320 5707 / 021 0744413
Email: luke.hermanson@mckenzieandco.co.nz

MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	WZ	LH	LH	16/06/22

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

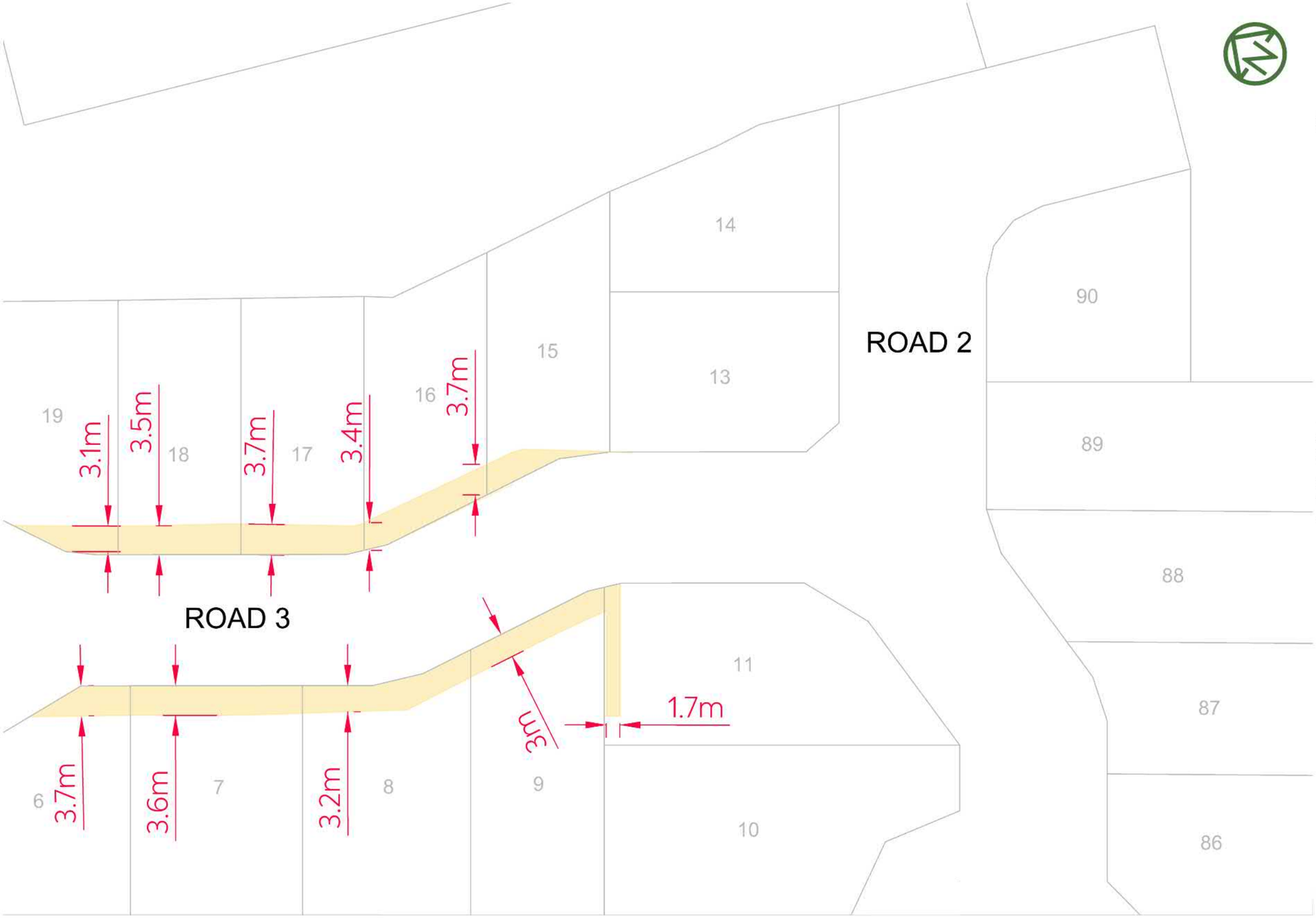
TITLE: AS BUILT STAGE 2 EARTHWORKS SW & WW ZONE INFLUENCE PLAN

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:500 DO NOT SCALE

DRAWING NO: 2398-2-2241

REV: A



NOTES:

1. ALL AS-BUILT INFORMATION HAS BEEN COLLECTED AND SUPPLIED BY WEST CITY CONSTRUCTION LTD.
2. CUT FILL CONTOURS ARE A CAPARISON BETWEEN LOWEST CUT SURFACE AND FINISHED SUBGRADE SURFACE.

LEGEND:

DRAINAGE ZONE INFLUENCE AREA

DIMENSIONS BETWEEN THE ZONE INFLUENCE TO THE BOUNDARY — 0.5m

LOT BOUNDARY

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

I certify that these Asbuilt Plans are an accurate record of the works undertaken and that:

- The Coordinates (X,Y) are in terms of NZTM on NZGD (2000), and are within±50mm.
- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
Registered Professional Surveyor

Date: 01/08/2022

Name: Luke Hermanson
Phone: +64 9 320 5707 / 021 0744413
Email: luke.hermanson@mckenzieandco.co.nz

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	WZ	LH	LH	16/06/22

MCKENZIE & CO.

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: AS BUILT STAGE 2 EARTHWORKS SW & WW ZONE INFLUENCE PLAN

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:500 DO NOT SCALE

DRAWING NO: 2398-2-2242

REV: A

Drawing 11 - Specific Design Zones (Retaining)

Specific Design Zone - Retaining Wall - In Front of Wall

Specific Design Zone - Retaining Wall - Above Wall

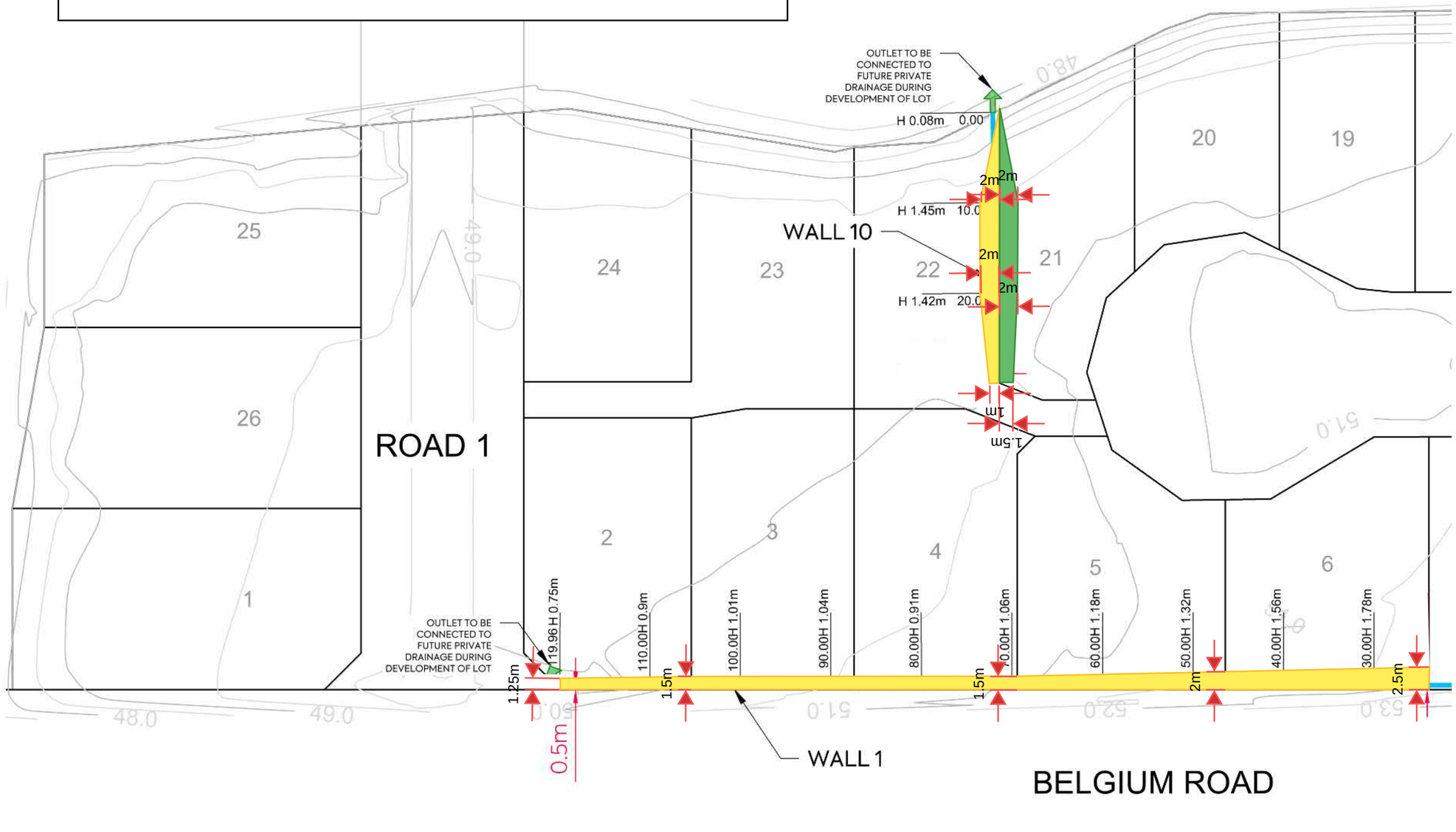
Note: Dimensions are measured from Boundary

CMW Geosciences

27 October 2022, Revision 0

NOTES:

1. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946 (MSL).
2. ALL AS-BUILT INFORMATION HAS BEEN COLLECTED AND SUPPLIED BY WEST CITY CONSTRUCTION LTD.
3. THE RETAINED HEIGHT IS DIFFERENCE IN HEIGHT BETWEEN TOP AND BOTTOM OF THE WALL.
4. AT THE TIME OF CONSTRUCTION, THE BACK OF WALL DRAINAGE WAS NOT CONNECTED DIRECTLY TO THE STORMWATER SYSTEM. TO BE CONNECTED TO FUTURE PRIVATE DRAINAGE DURING THE BUILDING CONSTRUCTION



LEGEND:

- FINAL CONTOURS – MAJOR 1.0m INTERVALS
- FINAL CONTOURS – MINOR 0.5m INTERVALS
- RETAINING WALL
- CHAINAGE AND RETAINED HEIGHT — 100.00 H 1.01m
- DIMENSIONS BETWEEN THE WALL AND THE BOUNDARY — 0.5m
- LOT BOUNDARY
- RETAINING WALL DRAIN OUTLET LOCATION

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

I certify that these Asbuilt Plans are an accurate record of the works undertaken and that:

- The Coordinates (X,Y) are in terms of NZTM on NZGD (2000), and are within±50mm.
- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
Registered Professional Surveyor

Date: 01/08/2022

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Phone: +64 9 320 5707 / 021 0744413
Email: luke.hermanson@mckenzieandco.co.nz

MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	WZ	LH	LH	07/06/22

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: AS BUILT STAGE 2 RETAINING WALL PLAN SHEET 1

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:500m
DO NOT SCALE

DRAWING NO: 2398-2-2251

REV: A

Drawing 12 - Specific Design Zones (Retaining)

Specific Design Zone - Retaining Wall - In Front of Wall

Specific Design Zone - Retaining Wall - Above Wall

Note: Dimensions are measured from Boundary

CMW Geosciences

27 October 2022, Revision 0

NOTES:

1. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946 (MSL).
2. ALL AS-BUILT INFORMATION HAS BEEN COLLECTED AND SUPPLIED BY WEST CITY CONSTRUCTION LTD.
3. THE RETAINED HEIGHT IS DIFFERENCE IN HEIGHT BETWEEN TOP AND BOTTOM OF THE WALL.
4. AT THE TIME OF CONSTRUCTION, THE BACK OF WALL DRAINAGE WAS NOT CONNECTED DIRECTLY TO THE STORMWATER SYSTEM. TO BE CONNECTED TO FUTURE PRIVATE DRAINAGE DURING THE BUILDING CONSTRUCTION

LEGEND:

- FINAL CONTOURS – MAJOR 1.0m INTERVALS
- FINAL CONTOURS – MINOR 0.5m INTERVALS
- RETAINING WALL
- CHAINAGE AND RETAINED HEIGHT — 100.00 H 1.01m
- DIMENSIONS BETWEEN THE WALL AND THE BOUNDARY — 0.5m
- LOT BOUNDARY
- RETAINING WALL DRAIN OUTLET LOCATION

ROAD 2

ROAD 3

WALL 1

WALL 2

WALL 3

WALL 5

WALL 6

WALL 7

OUTLET TO BE CONNECTED TO FUTURE PRIVATE DRAINAGE DURING DEVELOPMENT OF LOT

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

I certify that these Asbuilt Plans are an accurate record of the works undertaken and that:

- The Coordinates (X,Y) are in terms of NZTM on NZGD (2000), and are within±50mm.
- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
Registered Professional Surveyor

Date: 01/08/2022

Name: Luke Hermanson
Phone: +64 9 320 5707 / 021 0744413
Email: luke.hermanson@mckenzieandco.co.nz

MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	WZ	LH	LH	07/06/22

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: AS BUILT STAGE 2 RETAINING WALL PLAN SHEET 2

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:500m DO NOT SCALE

DRAWING NO: 2398-2-2252 REV: A

C:\12DS\DATA\MCKFS01\2398 3 BELGIUM ROAD_11781\DRAWINGS\STAGE 2\STAGE 2 AS BUILT\2398-2-2250.DWG

04/05/2021

NOTES:

FOR RETAINING WALL HEIGHTS, REFER TO LONG SECTION DRAWINGS 251 TO 255.

LEGEND:

- STAGE BOUNDARY
- WORKS BOUNDARY
- PROPOSED CONTOURS – MAJOR 1.0m INTERVALS (55.0)
- PROPOSED CONTOURS – MINOR 0.5m INTERVALS
- WALL 1
- WALL 2
- WALL 3
- WALL 4
- WALL 5
- WALL 6
- WALL 7
- WALL 8
- WALL 9
- WALL 10

BELGIUM ROAD

EXISTING TREE TO REMAIN

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
C	FOR ENGINEERING PLAN APPROVAL	TDW	NC	MFT	24/02/21
B	FOR S127	HM	TDW	MFT	20/01/21
A	FIRST ISSUE	TDW	MFT	MFT	18/12/20

MCKENZIE & CO.

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: STAGE 2 EARTHWORKS RETAINING WALL PLAN

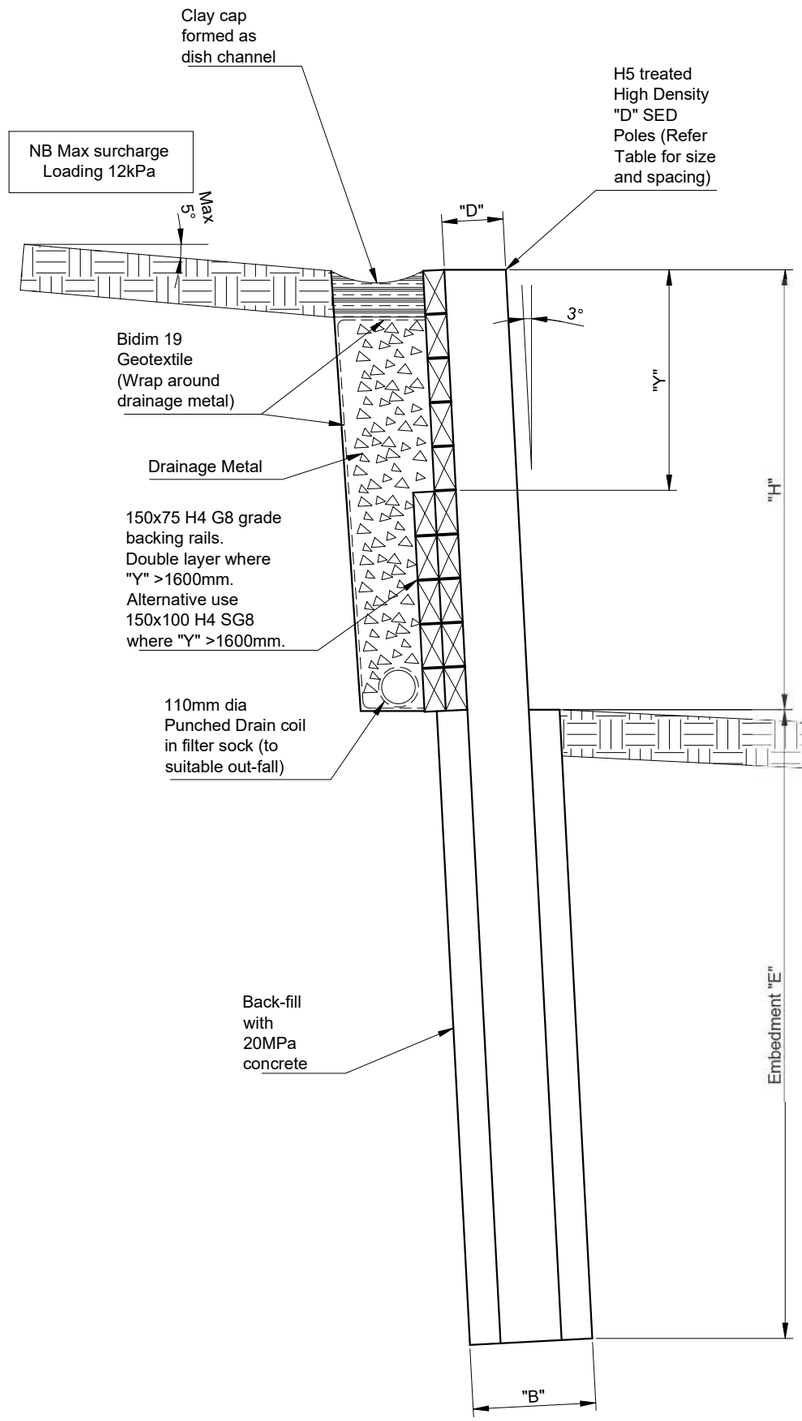
PURPOSE OF ISSUE: FOR APPROVAL

SCALE: 1:1250 @ A3

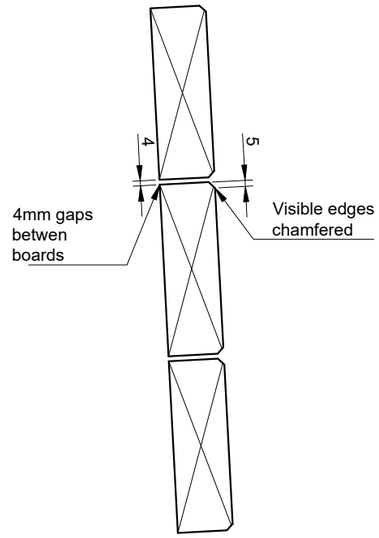
DO NOT SCALE

DRAWING NO: 2398-2-250

REV: B



Retaining Wall 1 (Typical Section)



Section through Backing Timbers

Timber Pole Wall Table

Height Retained "H"	Embedment Depth "E"	Borehole Diameter "B"	Pole Diameter "D"	Pole Spacing (M)
3300	4700	750	500	1200
3000	4400	750	475	1200
2700	4100	750	425	1200
2400	3700	600	400	1200
2100	3400	600	375	1200
1800	3100	600	325	1200
1500	2700	600	300	1200
1200	2400	450	250	1200
900	2100	450	200	1200
600	1700	300	175	1200
300	1300	300	150	1200

Notes and Brief Specification

1 Where wall is 1m or over 1m in height, Barrier from Falling (To NZBC requirements) will probably be required.
2 All work shall comply with the New Zealand Building Code.
3 Check all dimensions on site.
4 Timber Poles shall be H5 treated High Density timber.
5 All cut ends shall be saturated with a generous coating of Metalex or similar preservative.
6 Backing rails shall be continuous over at least 3 x spans.
7 Backing rails shall be H4 treated SG8 grade.
8 Supporting ground shall have an undrained shear strength (as measured by shear vane) of at least 100kPa, with: Cohesion C'=5 and Friction Angle $\phi'=30°$.
9 Concrete back-fill shall be 20MPa.
10 Holes shall be thoroughly cleaned and free of water before pouring concrete. Inspection required by Engineer before pouring.
11 Poles shall be adequately braced and held in position during construction. Ensure poles do not float out of concrete during pouring.

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CLIENT: Cabra Pukekohe JV

PROJECT: Proposed Retaining Walls Stage 2
LOCATION: Belgium Road

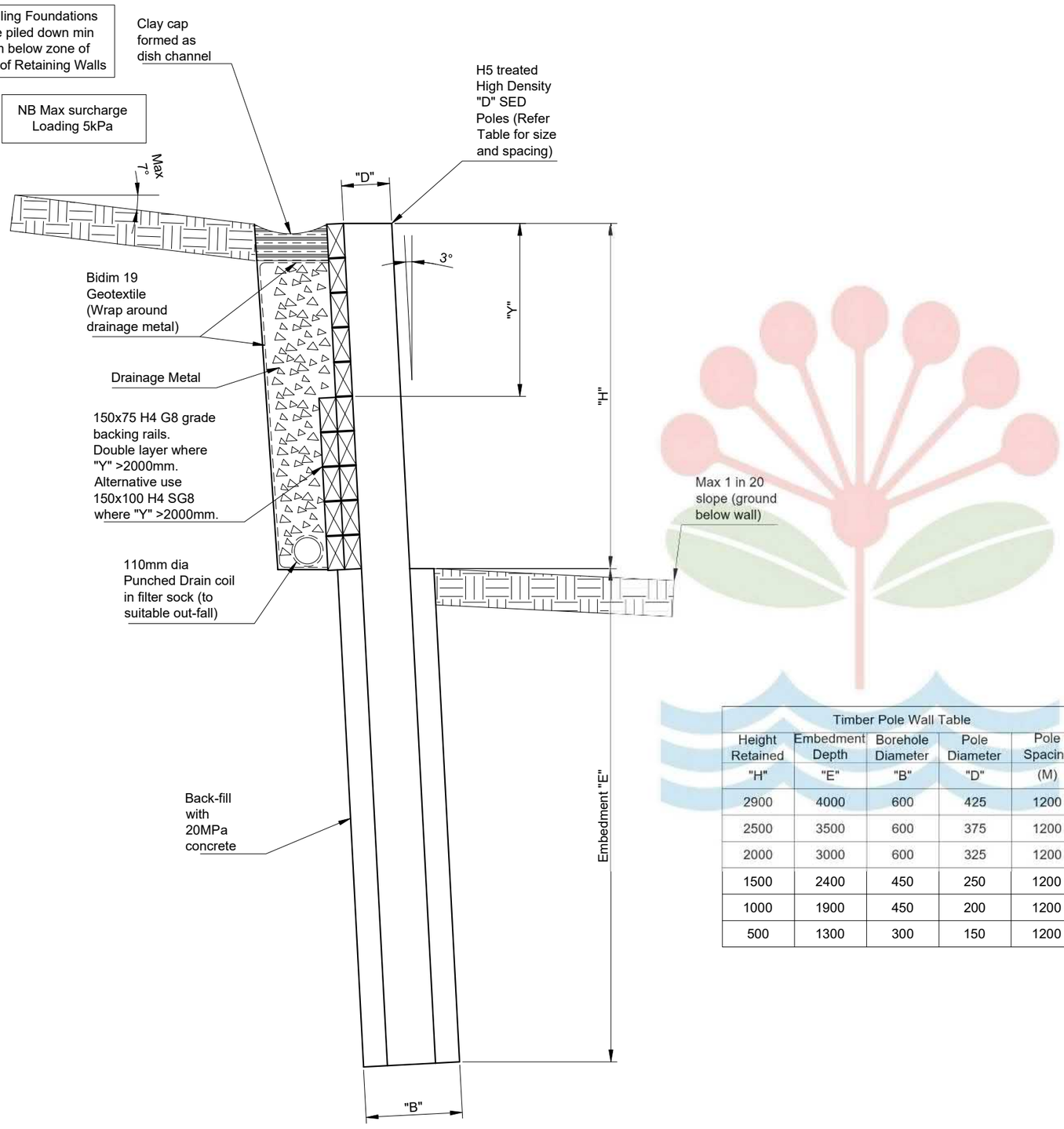
DRAWING: Structural Drawings
SCALE: NTS 1:5 | DRAWN: DM | CHECKED: TP | DATE: Mar 2021

NO.	DATE:	REVISION DESCRIPTION:
A		
B		
C		

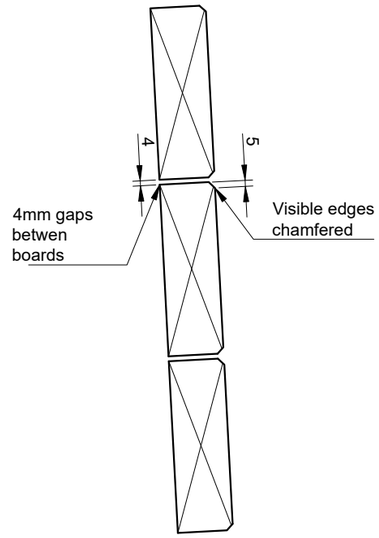
JOB NO.: 21 005
SHEET: S01 REV: SERIES OF:

All Dwelling Foundations shall be piled down min 600mm below zone of influence of Retaining Walls

NB Max surcharge Loading 5kPa



Retaining Wall 2
(Typical Section)



Section through Backing Timbers

Timber Pole Wall Table				
Height Retained	Embedment Depth	Borehole Diameter	Pole Diameter	Pole Spacing
"H"	"E"	"B"	"D"	(M)
2900	4000	600	425	1200
2500	3500	600	375	1200
2000	3000	600	325	1200
1500	2400	450	250	1200
1000	1900	450	200	1200
500	1300	300	150	1200

Notes and Brief Specification

1 Where wall is 1m or over 1m in height, Barrier from Falling (To NZBC requirements) will probably be required.
2 All work shall comply with the New Zealand Building Code.
3 Check all dimensions on site.
4 Timber Poles shall be H5 treated High Density timber.
5 All cut ends shall be saturated with a generous coating of Metalex or similar preservative.
6 Backing rails shall be continuous over at least 3 x spans.
7 Backing rails shall be H4 treated SG8 grade.
8 Supporting ground shall have an undrained shear strength (as measured by shear vane) of at least 100kPa, with: Cohesion C'=5 and Friction Angle ϕ'=30°.
9 Concrete back-fill shall be 20MPa.
10 Holes shall be thoroughly cleaned and free of water before pouring concrete. Inspection required by Engineer before pouring.
11 Poles shall be adequately braced and held in position during construction. Ensure poles do not float out of concrete during pouring.

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CLIENT: Cabra Pukekohe JV

PROJECT: Proposed Retaining Walls Stage 2
LOCATION: Belgium Road

DRAWING: Structural Drawings

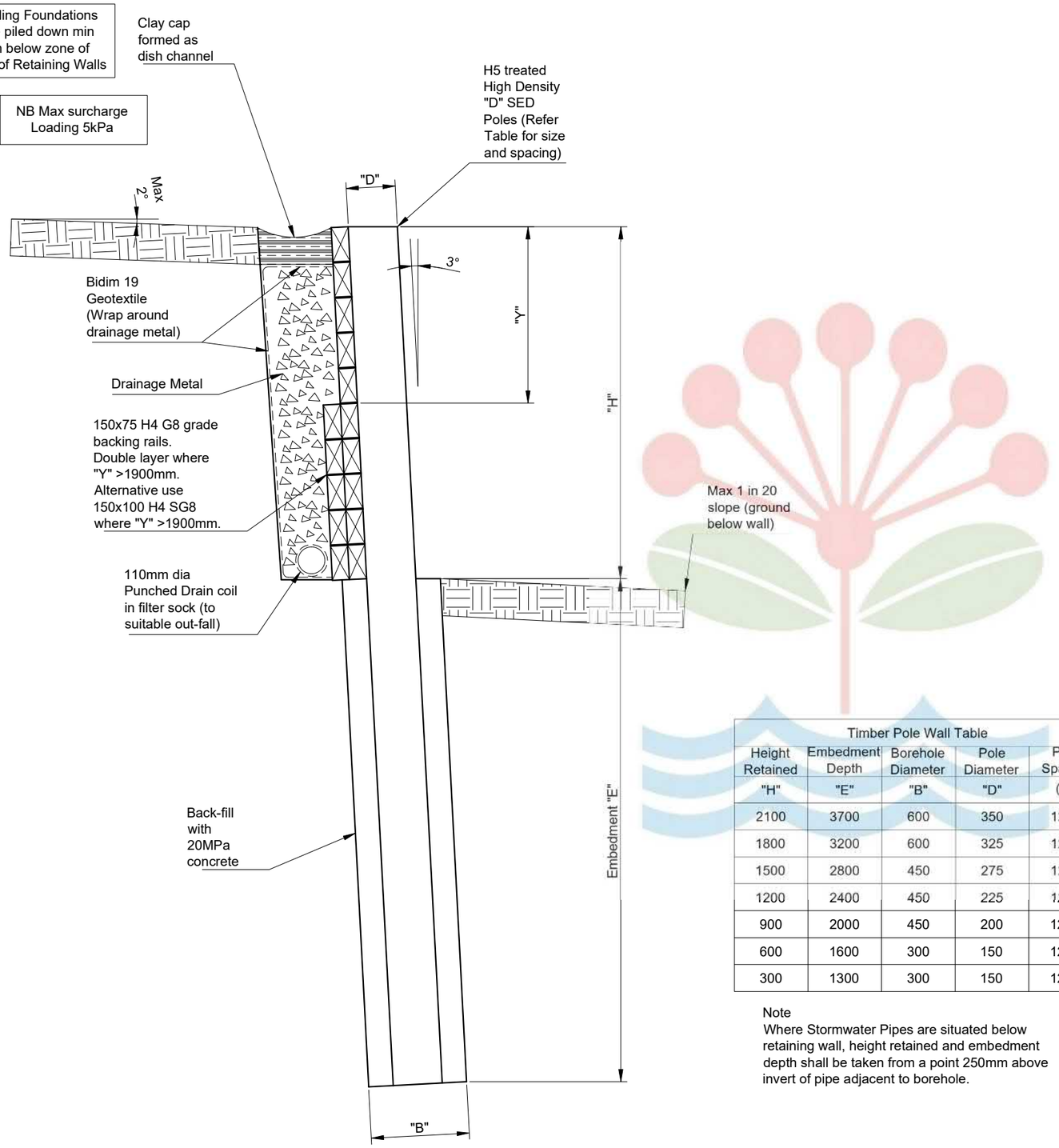
SCALE: NTS 1:5 | DRAWN: DM | CHECKED: TP | DATE: Mar 2021

NO.	DATE:	REVISION DESCRIPTION:
A		
B		
C		

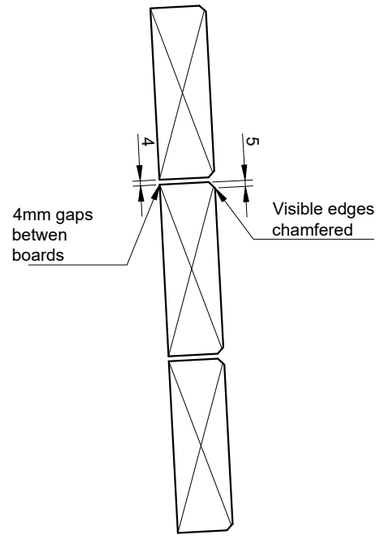
JOB NO.: 21 005
SHEET: S02 REV:
SERIES OF:

All Dwelling Foundations shall be piled down min 600mm below zone of influence of Retaining Walls

NB Max surcharge Loading 5kPa



Retaining Wall 3
(Typical Section)



Section through Backing Timbers

Timber Pole Wall Table

Height Retained "H"	Embedment Depth "E"	Borehole Diameter "B"	Pole Diameter "D"	Pole Spacing (M)
2100	3700	600	350	1200
1800	3200	600	325	1200
1500	2800	450	275	1200
1200	2400	450	225	1200
900	2000	450	200	1200
600	1600	300	150	1200
300	1300	300	150	1200

Note
Where Stormwater Pipes are situated below retaining wall, height retained and embedment depth shall be taken from a point 250mm above invert of pipe adjacent to borehole.

Notes and Brief Specification
1 Where wall is 1m or over 1m in height, Barrier from Falling (To NZBC requirements) will probably be required.
2 All work shall comply with the New Zealand Building Code.
3 Check all dimensions on site.
4 Timber Poles shall be H5 treated High Density timber.
5 All cut ends shall be saturated with a generous coating of Metalex or similar preservative.
6 Backing rails shall be continuous over at least 3 x spans.
7 Backing rails shall be H4 treated SG8 grade.
8 Supporting ground shall have an undrained shear strength (as measured by shear vane) of at least 70kPa, with: Cohesion C'=2 and Friction Angle ϕ'=26°.
9 Concrete back-fill shall be 20MPa.
10 Holes shall be thoroughly cleaned and free of water before pouring concrete. Inspection required by Engineer before pouring.
11 Poles shall be adequately braced and held in position during construction. Ensure poles do not float out of concrete during pouring.

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CLIENT: Cabra Pukekohe JV

PROJECT: Proposed Retaining Walls Stage 2
LOCATION: Belgium Road

DRAWING: Structural Drawings
SCALE: NTS 1:5 | DRAWN: DM | CHECKED: TP | DATE: Mar 2021

NO.	DATE:	REVISION DESCRIPTION:
A		
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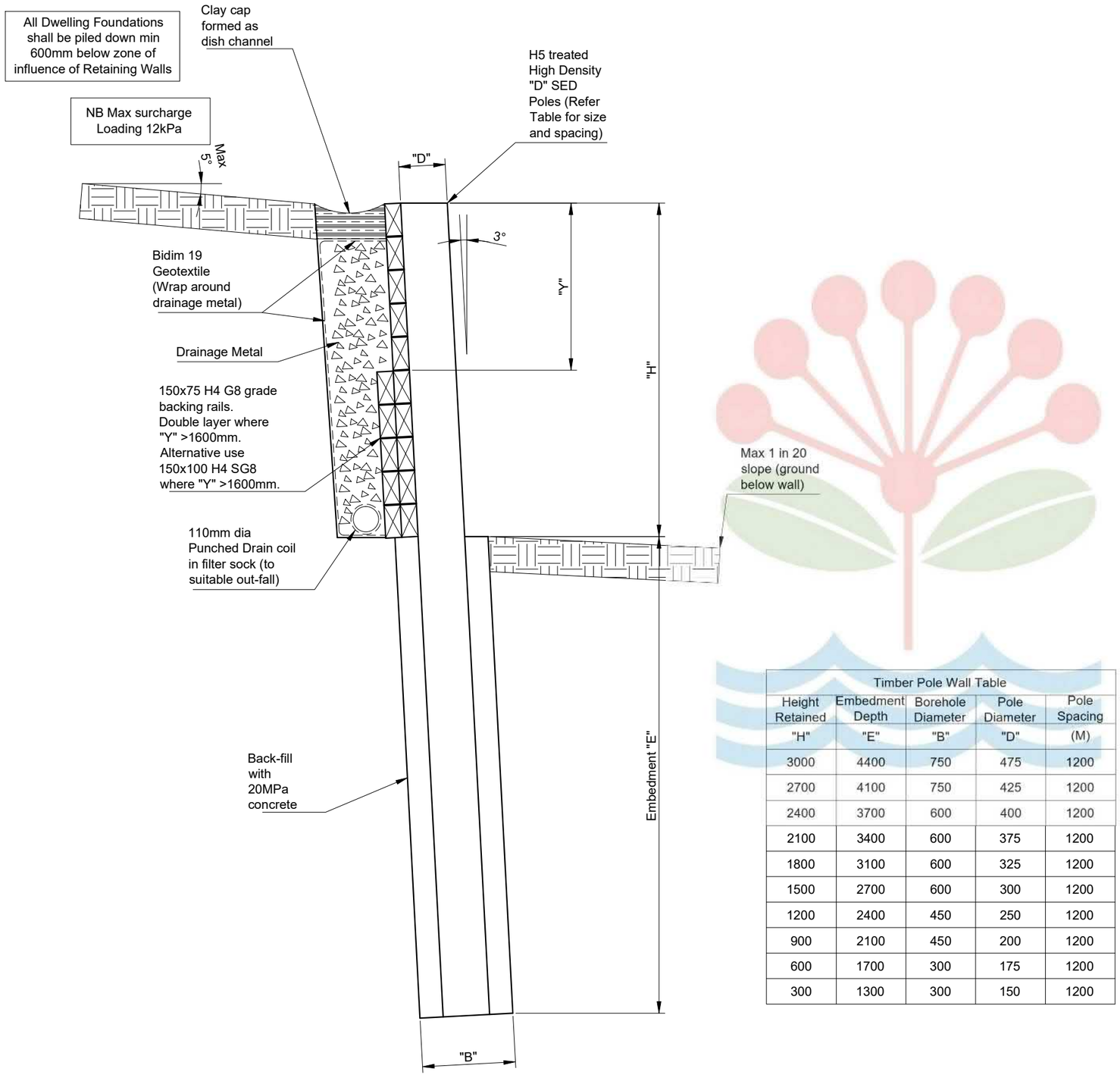
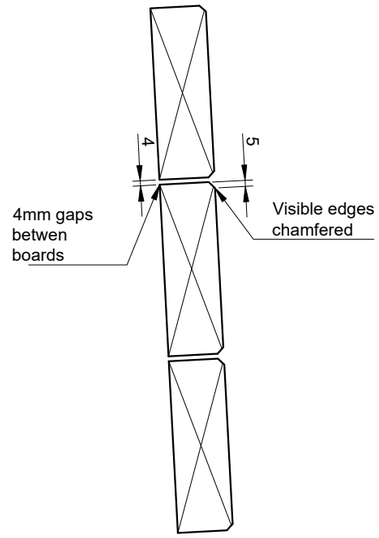
JOB NO.: 21 005
SHEET: S03 REV:
SERIES OF:



Retaining Wall 5+6 (Typical Section)



Section through Backing Timbers

Timber Pole Wall Table				
Height Retained "H"	Embedment Depth "E"	Borehole Diameter "B"	Pole Diameter "D"	Pole Spacing (M)
3000	4400	750	475	1200
2700	4100	750	425	1200
2400	3700	600	400	1200
2100	3400	600	375	1200
1800	3100	600	325	1200
1500	2700	600	300	1200
1200	2400	450	250	1200
900	2100	450	200	1200
600	1700	300	175	1200
300	1300	300	150	1200

Notes and Brief Specification

1 Where wall is 1m or over 1m in height, Barrier from Falling (To NZBC requirements) will probably be required.
2 All work shall comply with the New Zealand Building Code.
3 Check all dimensions on site.
4 Timber Poles shall be H5 treated High Density timber.
5 All cut ends shall be saturated with a generous coating of Metalex or similar preservative.
6 Backing rails shall be continuous over at least 3 x spans.
7 Backing rails shall be H4 treated SG8 grade.
8 Supporting ground shall have an undrained shear strength (as measured by shear vane) of at least 100kPa, with: Cohesion C'=5 and Friction Angle ϕ'=30°.
9 Concrete back-fill shall be 20MPa.
10 Holes shall be thoroughly cleaned and free of water before pouring concrete. Inspection required by Engineer before pouring.
11 Poles shall be adequately braced and held in position during construction. Ensure poles do not float out of concrete during pouring.

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CLIENT: Cabra Pukekohe JV

PROJECT: Proposed Retaining Walls Stage 2
LOCATION: Belgium Road

DRAWING: Structural Drawings

SCALE: NTS 1:5 | DRAWN: DM | CHECKED: TP | DATE: Mar 2021

NO.	DATE:	REVISION DESCRIPTION:
A		
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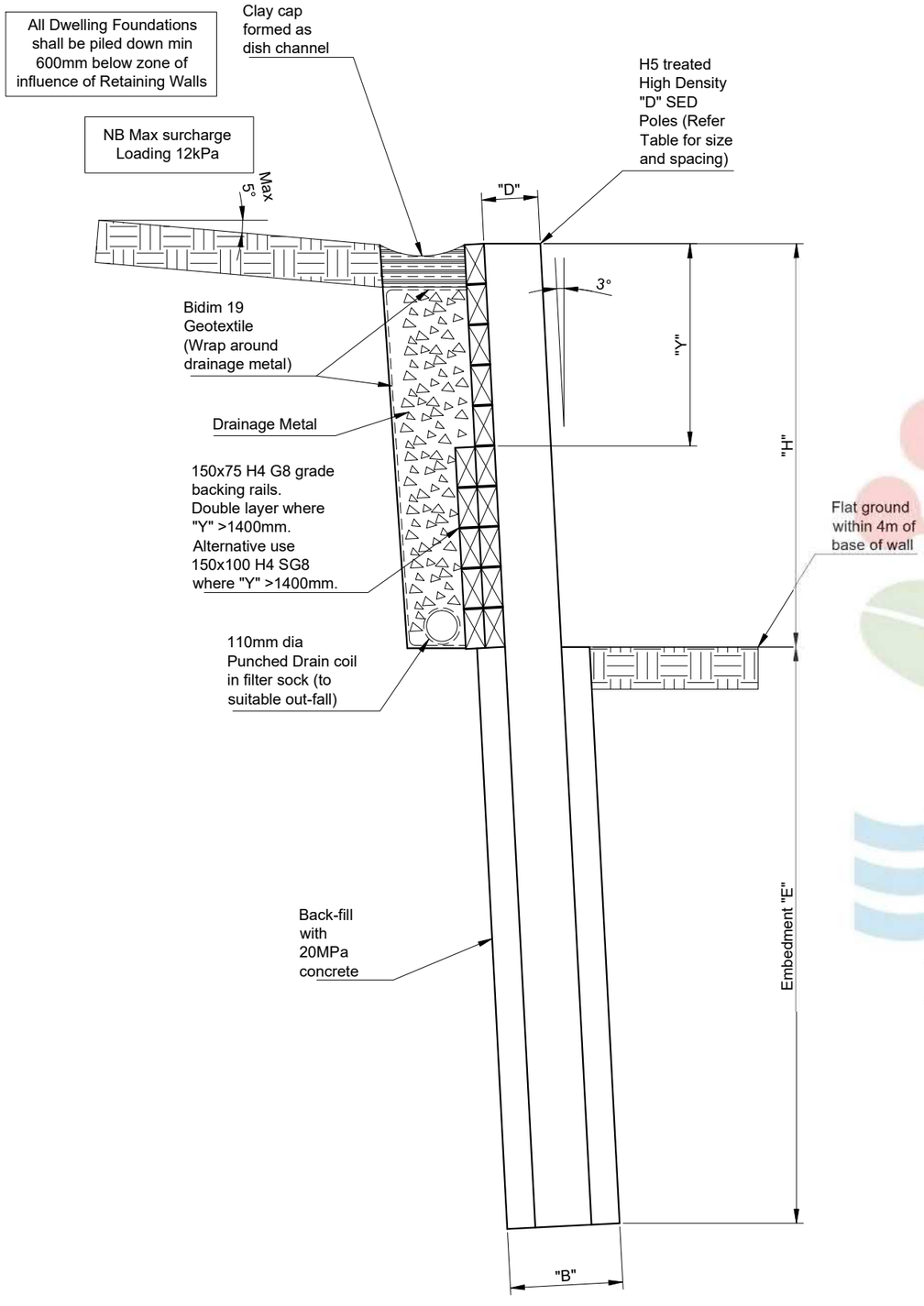
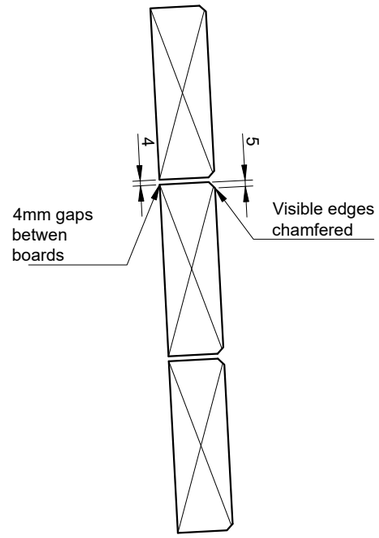
JOB NO.: 21 005
SHEET: S05 REV:
SERIES OF:



Retaining Wall 7+8
(Typical Section)



Section through Backing Timbers

Timber Pole Wall Table

Height Retained "H"	Embedment Depth "E"	Borehole Diameter "B"	Pole Diameter "D"	Pole Spacing (M)
3100	5300	750	500	1200
2700	4600	750	450	1200
2400	4200	750	400	1200
2100	3700	600	375	1200
1800	3300	600	325	1200
1500	2800	450	275	1200
1200	2400	450	250	1200
900	2000	450	200	1200
600	1500	300	150	1200
300	1000	300	150	1200

Notes and Brief Specification

1 Where wall is 1m or over 1m in height, Barrier from Falling (To NZBC requirements) will probably be required.
2 All work shall comply with the New Zealand Building Code.
3 Check all dimensions on site.
4 Timber Poles shall be H5 treated High Density timber.
5 All cut ends shall be saturated with a generous coating of Metalex or similar preservative.
6 Backing rails shall be continuous over at least 3 x spans.
7 Backing rails shall be H4 treated SG8 grade.
8 Supporting ground shall have an undrained shear strength (as measured by shear vane) of at least 70kPa, with: Cohesion C'=2 and Friction Angle ϕ'=26°.
9 Concrete back-fill shall be 20MPa.
10 Holes shall be thoroughly cleaned and free of water before pouring concrete. Inspection required by Engineer before pouring.
11 Poles shall be adequately braced and held in position during construction. Ensure poles do not float out of concrete during pouring.

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CLIENT: Cabra Pukekohe JV

PROJECT: Proposed Retaining Walls Stage 2
LOCATION: Belgium Road

DRAWING: Structural Drawings

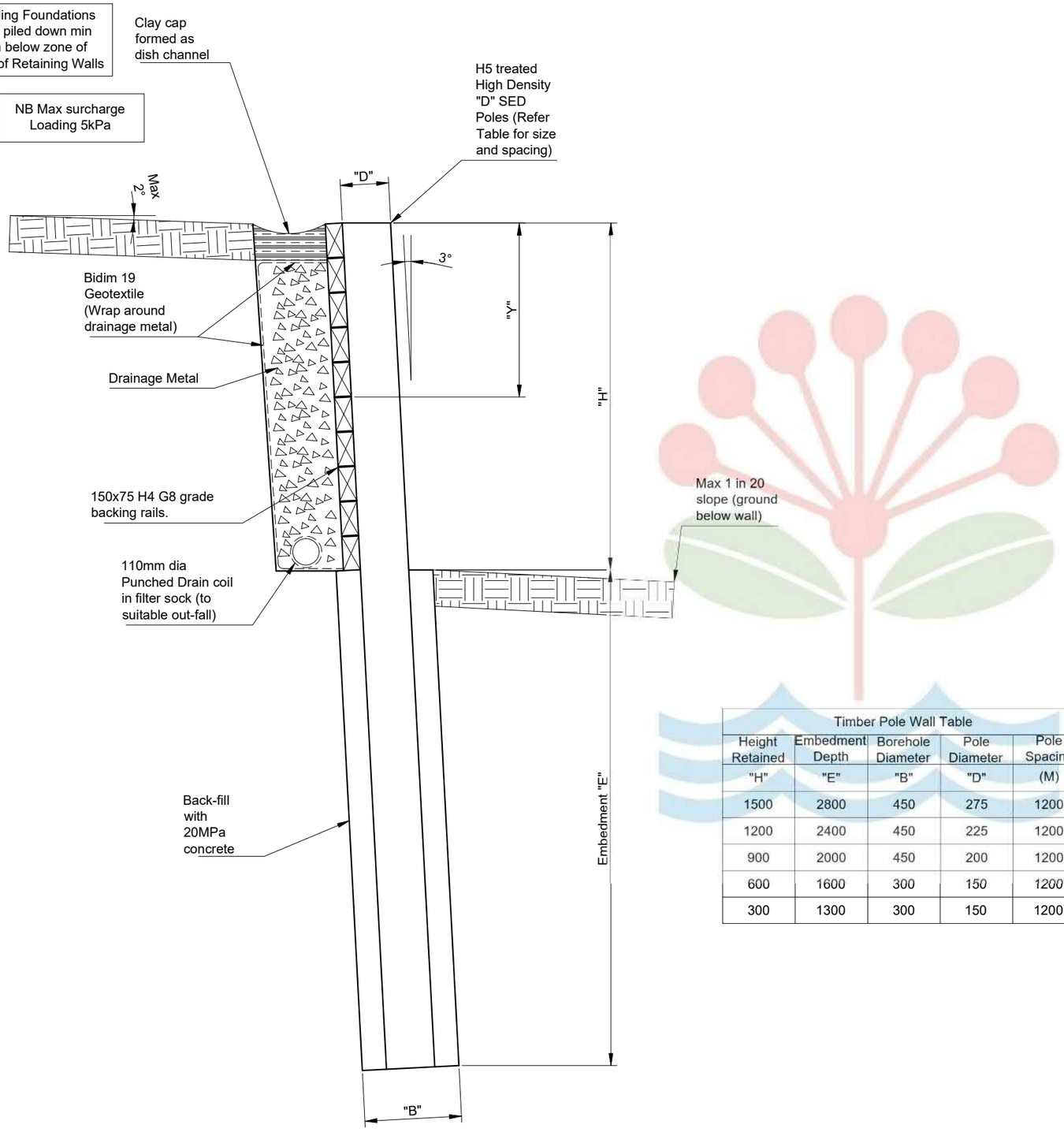
SCALE: NTS 1:5 | DRAWN: DM | CHECKED: TP | DATE: Mar 2021

NO.	DATE:	REVISION DESCRIPTION:
A		
B		
C		

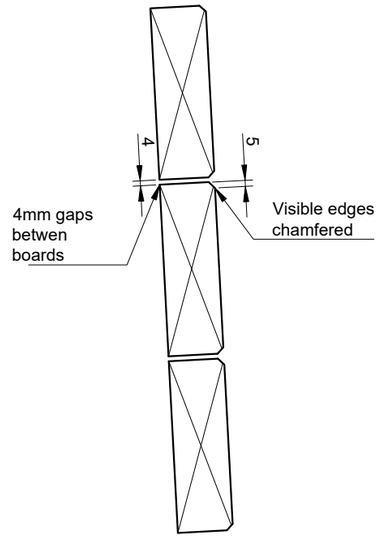
JOB NO.: 21 005
SHEET: S06 REV:
SERIES OF:

All Dwelling Foundations shall be piled down min 600mm below zone of influence of Retaining Walls

NB Max surcharge Loading 5kPa



Retaining Wall 9+10 (Typical Section)



Section through Backing Timbers

Timber Pole Wall Table

Height Retained	Embedment Depth	Borehole Diameter	Pole Diameter	Pole Spacing
"H"	"E"	"B"	"D"	(M)
1500	2800	450	275	1200
1200	2400	450	225	1200
900	2000	450	200	1200
600	1600	300	150	1200
300	1300	300	150	1200

Notes and Brief Specification

1 Where wall is 1m or over 1m in height, Barrier from Falling (To NZBC requirements) will probably be required.
2 All work shall comply with the New Zealand Building Code.
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CLIENT: Cabra Pukekohe JV

PROJECT: Proposed Retaining Walls Stage 2

LOCATION: Belgium Road

DRAWING: Structural Drawings

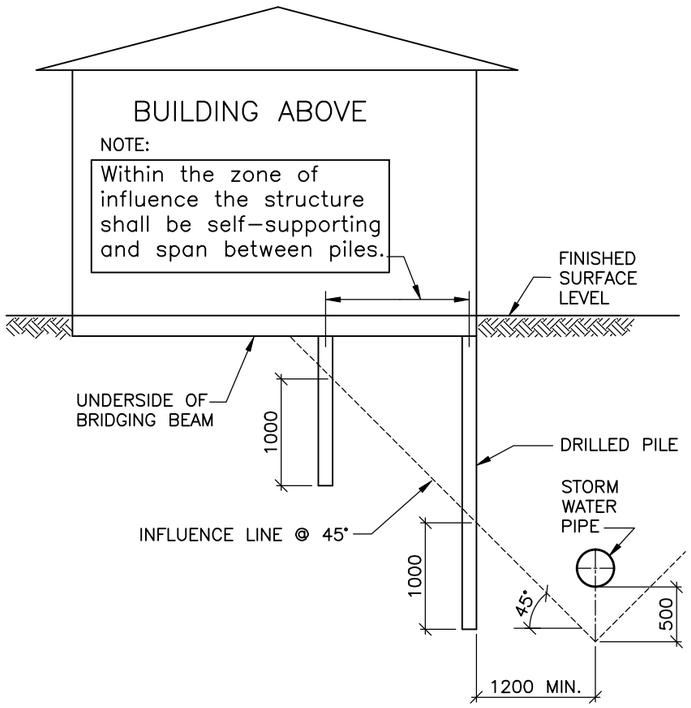
SCALE: NTS 1:5 | DRAWN: DM | CHECKED: TP | DATE: Mar 2021

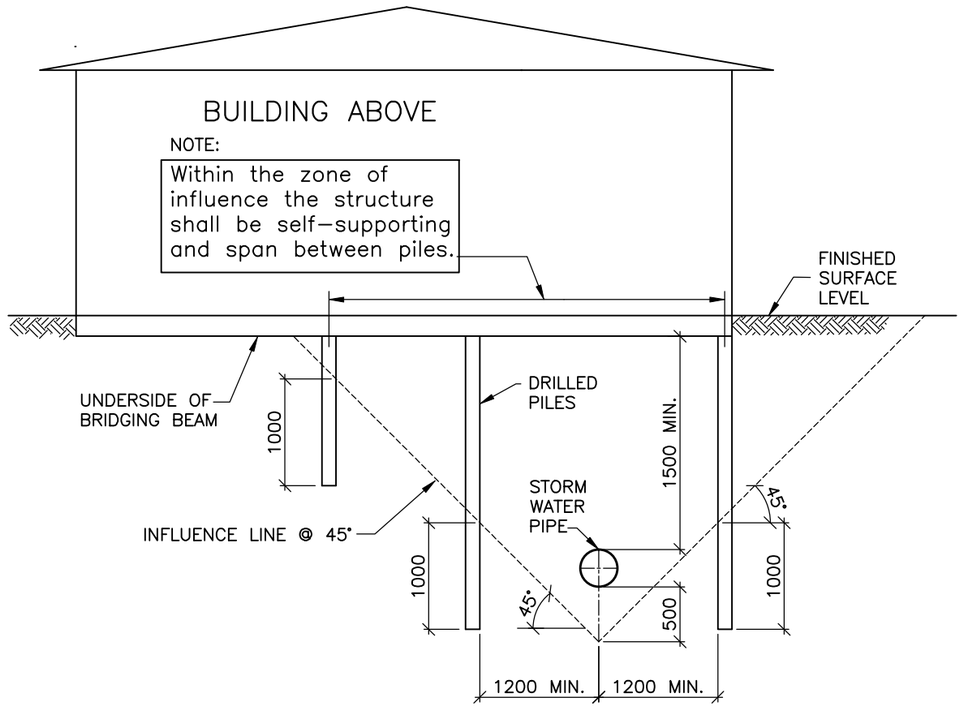
NO.	DATE:	REVISION DESCRIPTION:
A		
B		
C		

JOB NO.: 21 005

SHEET: S07 REV:

SERIES OF:





NOTES

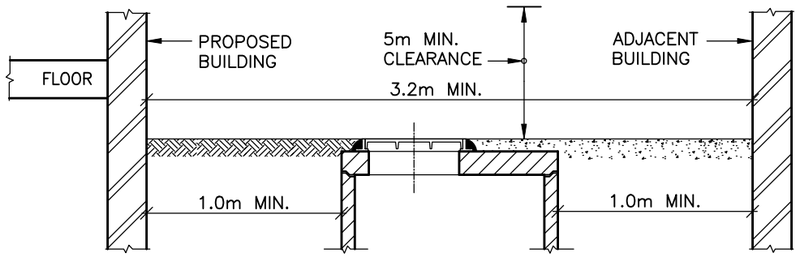
1. The information on this page is intended to show examples of typical scenarios and should be used for general guidance purposes only. Significant variations on a site by site basis are to be expected and it is in no way implied that meeting any of the above will guarantee approval.
2. Requirements for foundation design etc apply to both sides of pipe.
3. No driven piles are permitted within 10m of brick Stormwater Structures, or within 5m of all other Stormwater Structures.
4. Specific approval is required from Auckland Council for driven piles in partially drilled holes, within the 5m/10m zone.
5. Piles that may be required to resist horizontal forces will require specific design.
6. Pile/Footing location point must be below 45° "Zone of Influence".
7. All Manholes shall have 24 hours unobstructed access.
8. Manholes in basements, or where sufficient clearance is unavailable, are not permitted.
9. All pipe buildovers will require approval by Auckland Council.
10. Refer to section 4.3.21 for pipe buildover requirements.

"BUILD CLOSE" NOTES:

1. Specific approval is required from Auckland Council if building adjacent to pipes, larger than 375mm internal diameter, or greater than 3.0m of depth.
2. Building to be outside all overland flow paths and floodplains.
3. Pile constructed to a depth of 1.0m below influence line.
4. Outside zone of influence, normal foundation requirements apply.

"BUILD OVER" NOTES:

1. Applies to stormwater pipes 375mm nominal diameter or less.
2. Bridging over pipes larger than 375mm nominal diameter is NOT allowed under any circumstances.
3. Pile constructed to a depth of 1.0m below influence line.
4. Outside zone of influence, normal foundation requirements apply.
5. Bridging is NOT allowed over pipes where clear vertical seperation distance from top of pipe to underside of bridging beam is less than 1.5m



MANHOLE CONSTRUCTION CLEARANCE

STORMWATER ENGINEERING STANDARD DETAILS ISSUE/REVISION: 1 DATE: 30 September 2013 CAD FILE: AC–STD–SW22	AUCKLAND COUNCIL STORMWATER PIPE AND MANHOLE CONSTRUCTION CLEARANCE REQUIREMENTS MANHOLES NEAR BUILDINGS AND BUILDING CLOSE OR OVER PIPES	ENVIRONMENTAL–SW Auckland Council	ORIGINAL SCALE: AS NOTED Sht 1 OF 1 Shts DRAWING No. ACSD SW22 REV A3

Appendix C: Laboratory Test Data

ROADTEST LTD

Revision: 1

DETERMINATION OF THE WATER CONTENT, CONE PENETRATION LIMIT & LINEAR SHRINKAGE
TEST METHOD NZS 4402 : 1986 TEST 2.1, 2.5 & 2.6

Project Name :	**3 Belgium Road**		
		Project No :	22 0001 27
Client :	CMW Geosciences	Page :	1 of 1
Address :	PO Box 300206 Albany, Auckland 0754	Date of Order :	22.03.22
		Sample Method :	Hand auger
Attention :	Shane Forrest	Sample Date :	22.03.22
		Sampled By :	CMW Geosciences

Test Details :

Test performed on :	Whole Sample
History :	Natural

Sample No.	Location	Depth (m)	Cone Penetration (CPL)	Linear Shrinkage (LS)	Natural Water Content (%)
941M	Lot 14	0.4 to 0.8	100	23	52.4
942M	Lot 17	0.4 to 0.8	97	23	44.9
943M	Lot 20	0.4 to 0.8	96	22	52.6
944M	Lot 23	0.4 to 0.8	104	26	46.0
945M	Lot 26	0.4 to 0.8	111	25	54.1
946M	Lot 90	0.4 to 0.8	127	29	74.8

Comments :

Tested By:	AS	Date :	23 to 30.03.22
Calculated By :	AS	Date :	06.04.22
Checked By :	ZH	Date :	07.04.22

Appendix D: Field Test Data

ROADTEST LTD

15B Foundry Road, Silverdale 0932

FILL CONTROL SUMMARY SHEET

TEST STANDARD - NUCLEAR DENSOMETER, NZS 4407:2015 TEST 4.2; WATER CONTENT, NZS 4402 TEST 2.1; SHEAR VANE, NZ GEOTECHNICAL SOCIETY GUIDELINES INC. 2001

(Please note Air Void calculations are not IANZ endorsed as part of this report)

Job Name : **Belgium Road Stage 2**
Client : CMW Geosciences Ltd
Address : PO Box 300206
Albany, Auckland 0754
Attention : Richard Tichborne

Project No. : 21 0055 00
Date of Order : 15.03.21

ACCREDITED IANZ TESTING LABORATORY
Test results indicated as not accredited are outside the scope of the laboratory's accreditation
Approved Signatory - Zach Hooton

TEST NUMBER	TESTED BY	DATE TESTED	TEST LOCATION	TEST DEPTH (mm)	WET DENSITY (t/m^3)	OVEN WATER CONTENT (%)	DRY DENSITY (t/m^3)	SOLID DENSITY (t/m^3) Assumed	AIR VOIDS %	FIELD SHEAR STRENGTH in kPa				RL (m)	NOTES
1	DW	17.03.21	See Plan	150	1.76	48.3	1.19	2.7	0.0	173	170	173+	173+	-	
2	AS	19.03.21	See Plan	150	1.68	50.3	1.12	2.7	2.3	164	188	202	212++	-	
3	AS	19.03.21	See Plan	150	1.65	51.1	1.09	2.7	3.5	185	185	199	212+	-	
4	DW	22.03.21	See Plan	150	1.69	49.9	1.13	2.7	2.0	173+	173+	173+	173+	48.30	
5	DW	22.03.21	See Plan	150	1.68	56.4	1.07	2.7	0.0	146	152	157	157	48.80	
6	DW	22.03.21	See Plan	150	1.66	63.4	1.02	2.7	0.0	173	172	149	157	48.90	
7	DW	23.03.21	See Plan	150	1.67	50.2	1.11	2.7	2.8	173+	173+	173+	173+	-	
8	DW	23.03.21	See Plan	150	1.67	53.8	1.08	2.7	1.6	173+	173+	173+	161	-	
9	DW	24.03.21	See Plan	150	1.73	44.0	1.20	2.7	2.9	173+	173+	173+	173+	-	
10	DW	24.03.21	See Plan	150	1.69	43.8	1.17	2.7	5.2	173+	173+	173+	173+	-	
11	AS	26.03.21	See Plan	150	1.69	51.5	1.12	2.7	1.0	167	185	212+	212+	-	
12	AS	26.03.21	See Plan	150	1.69	49.1	1.13	2.7	2.3	170	192	212+	212+	-	
13	AS	07.04.21	See Plan	150	1.60	52.7	1.05	2.7	5.9	162	175	187	190	-	
14	AS	07.04.21	See Plan	150	1.65	45.8	1.13	2.7	6.2	175	159	131	171	-	
15	AS	07.04.21	See Plan	150	1.73	45.1	1.19	2.7	1.9	222++	222++	222++	222++	-	
16	AS	07.04.21	See Plan	150	1.72	48.7	1.16	2.7	0.8	209	222++	222++	222++	-	
17	AS	09.04.21	See Plan	150	1.66	52.2	1.09	2.7	2.9	143	149	175	206	-	
18	AS	09.04.21	See Plan	150	1.59	59.5	1.00	2.7	3.7	146	171	178	175	-	
19	AAA	19.04.21	See Plan	150	1.76	52.8	1.15	2.7	0.0	193+	193+	193+	193+	-	
20	AAA	19.04.21	See Plan	150	1.72	52.1	1.13	2.7	0.0	193+	193+	193+	193+	-	
21	AAA	19.04.21	See Plan	150	1.76	45.6	1.21	2.7	0.1	193+	193+	193+	193+	-	

Checked By: ZH
Date: 09.05.22

NT = Not Tested

ROADTEST LTD

15B Foundry Road, Silverdale 0932

FILL CONTROL SUMMARY SHEET

TEST STANDARD - NUCLEAR DENSOMETER, NZS 4407:2015 TEST 4.2; WATER CONTENT, NZS 4402 TEST 2.1; SHEAR VANE, NZ GEOTECHNICAL SOCIETY GUIDELINES INC. 2001

(Please note Air Void calculations are not IANZ endorsed as part of this report)

ACCREDITED IANZ TESTING LABORATORY
Test results indicated as not accredited are outside the scope of the laboratory's accreditation
Approved Signatory - Zach Hooton

Job Name : **Belgium Road Stage 2**
Client : CMW Geosciences Ltd
Address : PO Box 300206
Albany, Auckland 0754
Attention : Richard Tichborne

Project No. : 21 0055 00
Date of Order : 15.03.21

TEST NUMBER	TESTED BY	DATE TESTED	TEST LOCATION	TEST DEPTH (mm)	WET DENSITY (t/m^3)	OVEN WATER CONTENT (%)	DRY DENSITY (t/m^3)	SOLID DENSITY (t/m^3) Assumed	AIR VOIDS %	FIELD SHEAR STRENGTH in kPa				RL (m)	NOTES
22	AAA	19.04.21	See Plan	150	1.69	53.9	1.10	2.7	0.5	163	163	180	188	-	
23	DW	23.04.21	See Plan	150	1.66	53.0	1.08	2.7	2.3	146	146	146	153	-	
24	DW	23.04.21	See Plan	150	1.69	55.5	1.09	2.7	0.0	163	156	167	180	-	
25	AAA	28.04.21	See Plan	150	1.63	58.5	1.03	2.7	1.7	146	163	193+	146	-	
26	AAA	28.04.21	See Plan	150	1.65	49.6	1.10	2.7	4.3	193+	193+	193+	193+	-	
27	AAA	03.05.21	See Plan	150	1.59	50.9	1.05	2.7	7.3	193+	193+	193+	193+	50.58	
28	AAA	03.05.21	See Plan	150	1.68	45.6	1.15	2.7	4.8	180	180	180	193+	51.50	
29	AAA	05.05.21	See Plan	150	1.68	55.6	1.08	2.7	0.0	193+	193+	193+	193+	-	
30	AAA	07.05.21	See Plan	150	1.66	49.6	1.11	2.7	3.9	193+	193+	193+	193+	56.13	
31	AAA	07.05.21	See Plan	150	1.70	50.5	1.13	2.7	1.3	180	193+	180	180	52.18	
32	AAA	07.05.21	See Plan	150	1.70	49.2	1.14	2.7	1.6	193+	154	180	193+	52.51	
33	AAA	07.05.21	See Plan	150	1.68	52.3	1.10	2.7	1.3	163	180	154	163	51.07	
34	AAA	07.05.21	See Plan	150	1.70	53.2	1.11	2.7	0.0	163	180	154	163	51.04	
35	AAA	07.05.21	See Plan	150	1.63	51.8	1.07	2.7	4.7	146	146	146	193+	-	
36	AS	27.05.21	See Plan	150	1.66	53.4	1.08	2.7	2.1	156	140	159	162	-	
37	AS	27.05.21	See Plan	150	1.70	49.5	1.14	2.7	1.6	171	149	143	159	-	
38	AS	02.06.21	See Plan	150	1.59	49.2	1.06	2.7	8.4	146	171	175	222+	-	
39	AS	04.06.21	See Plan	150	1.66	54.0	1.08	2.7	1.8	200	222++	222++	222++	-	
40	AAA	05.11.21	See Plan	150	1.71	48.5	1.15	2.7	1.7	155	170	202	170	-	
41	AAA	05.11.21	See Plan	150	1.74	48.4	1.17	2.7	0.0	155	148	170	152	-	
42	AAA	05.11.21	See Plan	150	1.73	49.0	1.16	2.7	0.1	185	185	170	170	-	
43	AAA	18.11.21	See Plan	150	1.74	41.6	1.23	2.7	3.2	212+	212+	212+	212+	49.21	

Checked By: ZH
Date: 09.05.22

NT = Not Tested

ROADTEST LTD

15B Foundry Road, Silverdale 0932

FILL CONTROL SUMMARY SHEET

TEST STANDARD - NUCLEAR DENSOMETER, NZS 4407:2015 TEST 4.2; WATER CONTENT, NZS 4402 TEST 2.1; SHEAR VANE, NZ GEOTECHNICAL SOCIETY GUIDELINES INC. 2001

(Please note Air Void calculations are not IANZ endorsed as part of this report)

Job Name : **Belgium Road Stage 2**
Client : CMW Geosciences Ltd
Address : PO Box 300206
Albany, Auckland 0754
Attention : Richard Tichborne

Project No. : 21 0055 00
Date of Order : 15.03.21

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44	AAA	18.11.21	See Plan	150	1.77	48.6	1.19	2.7	0.0	155	155	170	170	48.52	
45	AAA	18.11.21	See Plan	150	1.71	56.0	1.10	2.7	0.0	141	155	155	170	48.36	
46	AS	30.11.21	See Plan	150	1.72	49.0	1.15	2.7	0.9	222++	222++	222++	222++	49.10	
47	AS	30.11.21	See Plan	150	1.71	46.1	1.17	2.7	2.9	175	184	222++	222++	50.00	
48	AS	30.11.21	See Plan	150	1.77	44.7	1.23	2.7	0.0	168	190	222++	222++	50.40	
49	AAA	07.12.21	See Plan	150	1.70	44.2	1.18	2.7	4.4	141	152	163	155	48.50	
50	AS	09.12.21	See Plan	150	1.75	48.3	1.18	2.7	0.0	222++	222++	222++	222++	-	0.2m below FL
51	AS	09.12.21	See Plan	150	1.73	46.6	1.18	2.7	1.4	178	187	222+	222+	-	0.2m below FL
52	AS	09.12.21	See Plan	150	1.75	38.2	1.27	2.7	4.5	222++	222++	222++	222++	-	0.2m below FL
53	AAA	11.01.22	See Plan	150	1.77	41.8	1.25	2.7	1.6	212+	212+	212+	212+	-	
54	AS	19.01.22	See Plan	150	1.76	40.0	1.26	2.7	3.2	222++	222++	222++	222++	51.18	
55	AS	19.01.22	See Plan	150	1.80	38.6	1.29	2.7	2.0	222++	222++	222++	222++	49.70	
56	CL	26.01.22	See Plan	150	1.79	36.3	1.31	2.7	3.6	212+	212+	212+	212+	-	Lot 76 - Finished level
57	CL	26.01.22	See Plan	150	1.72	40.8	1.22	2.7	5.2	212+	212+	212+	212+	-	Lot 500 - Finished level
58	AS	28.01.22	See Plan	150	1.73	47.3	1.17	2.7	1.0	190	222++	222++	222++	-	
59	AS	28.01.22	See Plan	150	1.74	44.1	1.21	2.7	2.0	222++	222++	222++	222++	-	
60	AS	28.01.22	See Plan	150	1.79	36.5	1.31	2.7	3.5	222++	222++	222++	222++	-	
61	AAA	08.02.22	See Plan	150	1.74	47.4	1.18	2.7	0.5	212+	212+	212+	212+	-	Finished Level
62	AAA	10.02.22	See Plan	150	1.72	39.8	1.23	2.7	5.7	204	202	212+	212+	-	On grade
63	CL	15.02.22	See Plan	150	1.69	42.0	1.19	2.7	6.2	212++	212++	212++	212++	-	
64	CL	15.02.22	See Plan	150	1.66	46.3	1.14	2.7	5.3	212++	212++	212++	212++	-	
65	CL	16.02.22	See Plan	150	1.57	52.8	1.03	2.7	7.5	133	180	152	141	-	

Checked By: ZH
Date: 09.05.22

NT = Not Tested

ROADTEST LTD

15B Foundry Road, Silverdale 0932

FILL CONTROL SUMMARY SHEET

TEST STANDARD - NUCLEAR DENSOMETER, NZS 4407:2015 TEST 4.2; WATER CONTENT, NZS 4402 TEST 2.1; SHEAR VANE, NZ GEOTECHNICAL SOCIETY GUIDELINES INC. 2001

(Please note Air Void calculations are not IANZ endorsed as part of this report)

Job Name : **Belgium Road Stage 2**
Client : CMW Geosciences Ltd
Address : PO Box 300206
Albany, Auckland 0754
Attention : Richard Tichborne

Project No. : 21 0055 00
Date of Order : 15.03.21

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Approved Signatory - Zach Hooton

TEST NUMBER	TESTED BY	DATE TESTED	TEST LOCATION	TEST DEPTH (mm)	WET DENSITY (t/m^3)	OVEN WATER CONTENT (%)	DRY DENSITY (t/m^3)	SOLID DENSITY (t/m^3) Assumed	AIR VOIDS %	FIELD SHEAR STRENGTH in kPa				RL (m)	NOTES
66	CL	16.02.22	See Plan	150	1.62	52.6	1.06	2.7	4.8	152	195	212+	170	-	
67	AS	18.02.22	See Plan	150	1.76	34.0	1.32	2.7	6.5	222++	222++	222++	222++	-	Lot 71 - 1.5m below finished level
68	AAA	21.02.22	See Plan	150	1.74	45.8	1.19	2.7	1.2	185	202	202	212+	-	Lot 69
69	AAA	21.02.22	See Plan	150	1.62	54.5	1.05	2.7	3.8	212+	212+	212+	212+	-	Lot 71 - 1.5m below finished level
70	AAA	23.02.22	See Plan	150	1.69	53.5	1.10	2.7	0.5	202	205	212+	202	57.72	Lot 69
71	AAA	25.02.22	See Plan	150	1.68	52.2	1.11	2.7	1.3	141	185	202	170	-	1.1m below finished level
72	AAA	02.03.22	See Plan	150	1.74	46.1	1.19	2.7	0.8	212+	212+	212+	212+	-	Lot 68
73	AAA	01.04.22	See Plan	150	1.66	51.1	1.10	2.7	3.5	212+	212+	212+	170	-	Lot 99
74	AS	05.04.22	See Plan	150	1.67	50.5	1.11	2.7	3.1	222++	222++	222++	222++	-	Lot 99
75	AS	05.04.22	See Plan	150	1.64	54.0	1.06	2.7	3.3	222++	222++	222++	222++	-	Lot 110
76	AS	11.04.22	See Plan	150	1.72	46.1	1.18	2.7	2.1	222++	222++	222++	222++	-	Lot 111
77	AS	11.04.22	See Plan	150	1.69	48.6	1.14	2.7	2.4	159	175	222+	222+	-	Lot 110

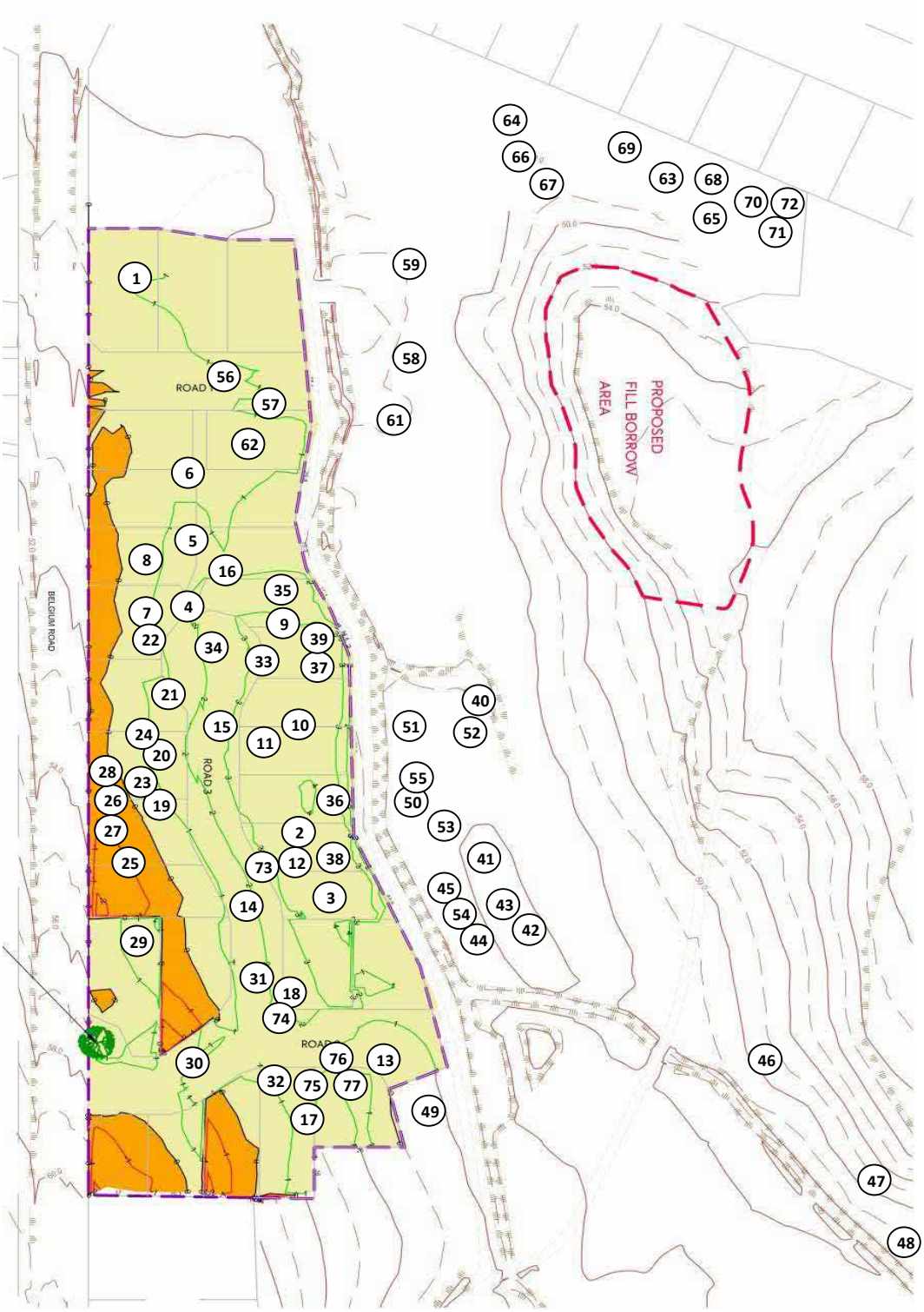
Checked By: ZH
Date: 09.05.22

NT = Not Tested

Report No : 21 0055 00
Page : 5 of 5

Job Name : **Belgium Road Stage 2**
Location : **-**

Site Plan - Not to scale



Tested By :	AA, AS, CL, & DW	Date :	17.03.21 to 11.04.22
Checked By :	ZH	Date :	09.05.22

Appendix E: Retaining Wall Producer Statement

2 August 2022 Document Ref: AKS2021-0009AL Rev. 0

Cabra Pukekohe JV
P.O. Box 197
Orewa, Auckland 0946

Dear Will

RE: CERTIFICATION OF ASPECTS OF THE CONSTRUCTION OF RETAINING WALLS ON STAGE 2 OF THE 3 BELGIUM ROAD, PUKEKOHE DEVELOPMENT – BCO10325242 & BCO10325242-A.

3 BELGIUM ROAD, PUKEKOHE

CMW Geosciences (CMW) visited the site at 3 Belgium Road, Pukekohe, legally described as Lot 129 DP 551433 on multiple occasions from June 2021 to November 2021 to observe the site works for the construction of Retaining Walls.

Our work has included review of the following documents and drawings:

- Conditions of Auckland Council Building Consent referenced BCO10325242 issued 4 May 2021;
- Conditions of Auckland Council Amended Building Consent referenced BCO10325242-A issued 17 September 2021;
- Consented construction drawings and PS1 – Design, for proposed Stage 2 Retaining Walls (1-10), prepared by Haigh Workman Ltd, referenced Job number 21 005 dated 5 March 2021.
- Consented construction drawings and PS1 – Design, for Variation to Wall 3 – proposed Stage 2 Retaining Walls, prepared by Haigh Workman Ltd dated 2 August 2021,
- Geotechnical Investigation Report for Stage 2, 3 Belgium Road, Pukekohe prepared by CMW, referenced AKS2021-0009AC, dated 15 March 2021.

The site works observed and/or tested by CMW staff incorporated conditions as follows for walls numbered 1 to 3, 5 to 8 and 10 in the design and on the appended drawings:

- assessment of soil strengths in the exposed retaining wall pile excavations.
- assessment of soil strengths at subgrade level and in the retained ground.
- assessment of soil strengths in the exposed segmental block retaining wall foundation.
- measurements of retaining wall dimensions (depth, spacing and diameter/gauge), and rail dimensions; and
- observation of drainage placement behind walls.

Ground conditions within the retaining wall excavations, subgrade level and retained ground were either very stiff natural volcanic soils or engineered fill. Vane shear strengths ranged from 102 kPa to UTP (Unable to penetrate) for the timber pole walls and 91 kPa to greater than 206 kPa for the segmental block wall.

All retaining wall pile dimensions (depth, spacing and diameter/gauge), and rail dimensions matched the consented plans, and the segmental block retaining wall was completed to design requirements.

As per the amended building consent referenced BCO10325242-A, Retaining Wall 4 was changed from originally being a timber pole wall to a segmental block wall.

The southern 3.0m portion of Wall 10 was not built due to changes in lot levels.

At the time of construction, the back of wall drainage was not connected directly to the stormwater system and as shown in the attached as built plans there is a requirement for the back of wall drainage coil for each wall to be connect to the future private drainage during the building construction.

On the basis of our observations and testing, we consider that the site works observed and/ or tested have been completed in accordance with the approved Building Consent and related approved documentation described above, are in accordance with the requirements and/or recommendations of the geotechnical report and provide the basis for our attached PS4 Construction Review producer statement.

CMW's site presence during construction for this project included periodic observations of specific elements of work as described herein. As we were not on site at all times during construction, we have relied on the Contractor's attached PS3 certification, diligence and their construction observations to ensure that the works have been carried out in accordance with:

a) The approved Contract drawings and design details.

b) The approved Contract specifications.

c) Authorised Variations to (a) and (b) during the execution of the works.

d) The conditions of Resource and Building Consents where applicable.

e) The relevant Geotechnical Investigation reports, recommendations, and site instructions.

and that all as-built information and other details provided to the Client and/or CMW are accurate and correct in all respects.

For and on behalf of CMW Geosciences

Richard Knowles

Principal Geotechnical Engineer

Distribution: 1 electronic copy to Will Stone via email
Original held at CMW Geosciences

Attachments: Producer Statement - Construction Review

Producer Statement – Construction (PS3)

As Built Drawings

PRODUCER STATEMENT – PS4
CONSTRUCTION REVIEW

BUILDING CODE CLAUSE(S): B1 **JOB NUMBER:** AKS2021-0009

ISSUED BY: CMW GEOSCIENCES (NZ) LIMITED PARTNERSHIP
(Construction Monitoring Firm)
TO: Cabra Pukekohe JV
(Owner/Developer)
TO BE SUPPLIED TO: Auckland Council
(Building Consent Authority)
IN RESPECT OF: Construction of Retaining Walls on Stage 2 of 3 Belgium Road Development
(Description of Building Work)
AT: 3 Belgium Road, Pukekohe
(Address, Town/City)
LEGAL DESCRIPTION: Lot 129 DP 551433 **N/A** ☐

We have been engaged by the owner/developer referred to above to provide CM 3 **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 Haigh Workman LTD (*Engineering Design Firm*) and which is described in the documents relating to the Building Consent No. BCO10325242 and those relating to Building Consent Amendment(s) No. BCO10325242-A 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 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)* Richard Knowles (AC Author #2342) , am:

- CPEng number 160049
- I hold the following qualifications BE (Civil), CMEngNZ, CPEng ,

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)*: Richard Knowles (AC Author #2342)
(Signature below):

ON BEHALF OF *(Construction Monitoring Firm)*: CMW GEOSCIENCES (NZ) LIMITED PARTNERSHIP Date: 16/6/22

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.

SCHEDULE to PS4

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

AKS2021-0009AL Rev. 0 Certification of the Construction of Retaining Walls on Stage 2 of the 3 Belgium Road, Pukekohe Development

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 2011[2]

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 engineers[3]). 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

www.acenz.org.nz
www.engineeringnz.org

Producer statement construction (PS3)
General construction work

Auckland Council
Te Kaunihera o Tāmaki Makaurau

All sections of this form must be completed

TO BE COMPLETED BY THE PERSON WHO HAS UNDERTAKEN THE BUILDING WORK

Author name:	Gary Cooke	Building consent No:	BC0103259242
Author company:	ICB Retaining and Piling Limited	Author Registration No:	
Description of building work:	Supply and installation of Timber Pole and Block Retaining Walls		
Performance standard for maintenance and inspection, if applicable	■ N/A		
Legal description:	Lot 129 DP 551433		
Site address:	3 Belgium Road, Pukekohe, Auckland		

NZBC clauses: (select as applicable)

B1 ✔	B2	C1	C2	C3	C4	C5	C6	D1	D2	E1	E2	E3
F1	F2	F3	F4	F5	F6	F7	F8	G1	G2	G3	G4	G5
G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	H1		

I have sighted the above building consent and read the attached conditions of consent and confirm that I have undertaken the building work described above in accordance with the consented plans and specifications.

I understand that Council will rely upon this producer statement, for the purposes of establishing compliance with the above building consent.

Signature: [signature] Date: 10/05/2022

Tradesperson's contact details:

Address:	13 Volkner Place, Rosedale Postcode: 0632		
Business:	0800 422 925	Fax:	
Mobile:	027 441 7132	Email	gary@icb.co.nz

COUNCIL USE ONLY

☐ Central ☐ Henderson ☐ Manukau ☐ Orewa ☐ Papakura ☐ Pukekohe ☐ Takapuna

☐ Accepted in support of inspection ☐ Accepted instead of inspection

Register checked: Council ☐ LBP ☐ N/A ☐

Name: Date:

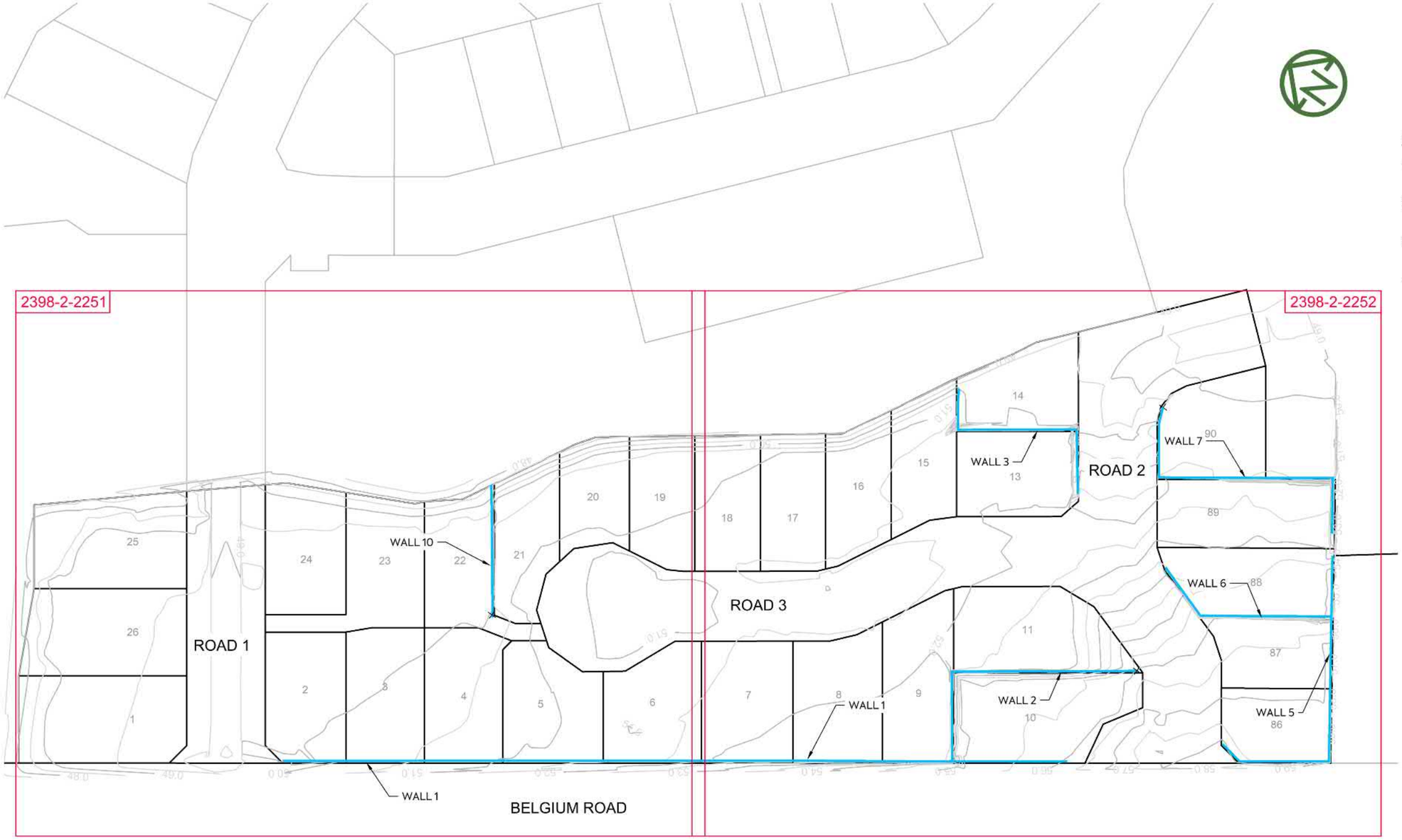
Producer statement accepted as establishing compliance with the consented plans: YES ☐ NO ☐

Producer statements are accepted solely at Auckland Council's discretion; please refer to the Producer Statement Policy which can be found on Councils website for further details

http://www.aucklandcouncil.govt.nz/EN/ratesbuildingproperty/consents/Consent%20documents/ac2301producerstatementpolicy.pdf

7626

BC0103259242



NOTES:

1. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946 (MSL).
2. ALL AS-BUILT INFORMATION HAS BEEN COLLECTED AND SUPPLIED BY WEST CITY CONSTRUCTION LTD.
3. THE RETAINED HEIGHT IS DIFFERENCE IN HEIGHT BETWEEN TOP AND BOTTOM OF THE WALL.
4. AT THE TIME OF CONSTRUCTION, THE BACK OF WALL DRAINAGE WAS NOT CONNECTED DIRECTLY TO THE STORMWATER SYSTEM. TO BE CONNECTED TO FUTURE PRIVATE DRAINAGE DURING THE BUILDING CONSTRUCTION

LEGEND:

FINAL CONTOURS - MAJOR 1.0m INTERVALS	1.0
FINAL CONTOURS - MINOR 0.5m INTERVALS	
RETAINING WALL	
CHAINAGE AND RETAINED HEIGHT	100.00 H 1.01m
DIMENSIONS BETWEEN THE WALL AND THE BOUNDARY	0.5m
LOT BOUNDARY	
RETAINING WALL DRAIN OUTLET LOCATION	

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

I certify that these Asbuilt Plans are an accurate record of the works undertaken and that:

- The Coordinates (X,Y) are in terms of NZTM on NZGD (2000), and are within±50mm.
- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
Registered Professional Surveyor

Date: 01/08/2022

Name: Luke Hermanson
Phone: +64 9 320 5707 / 021 0744413
Email: luke.hermanson@mckenzieandco.co.nz

MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	WZ	LH	LH	07/06/22

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

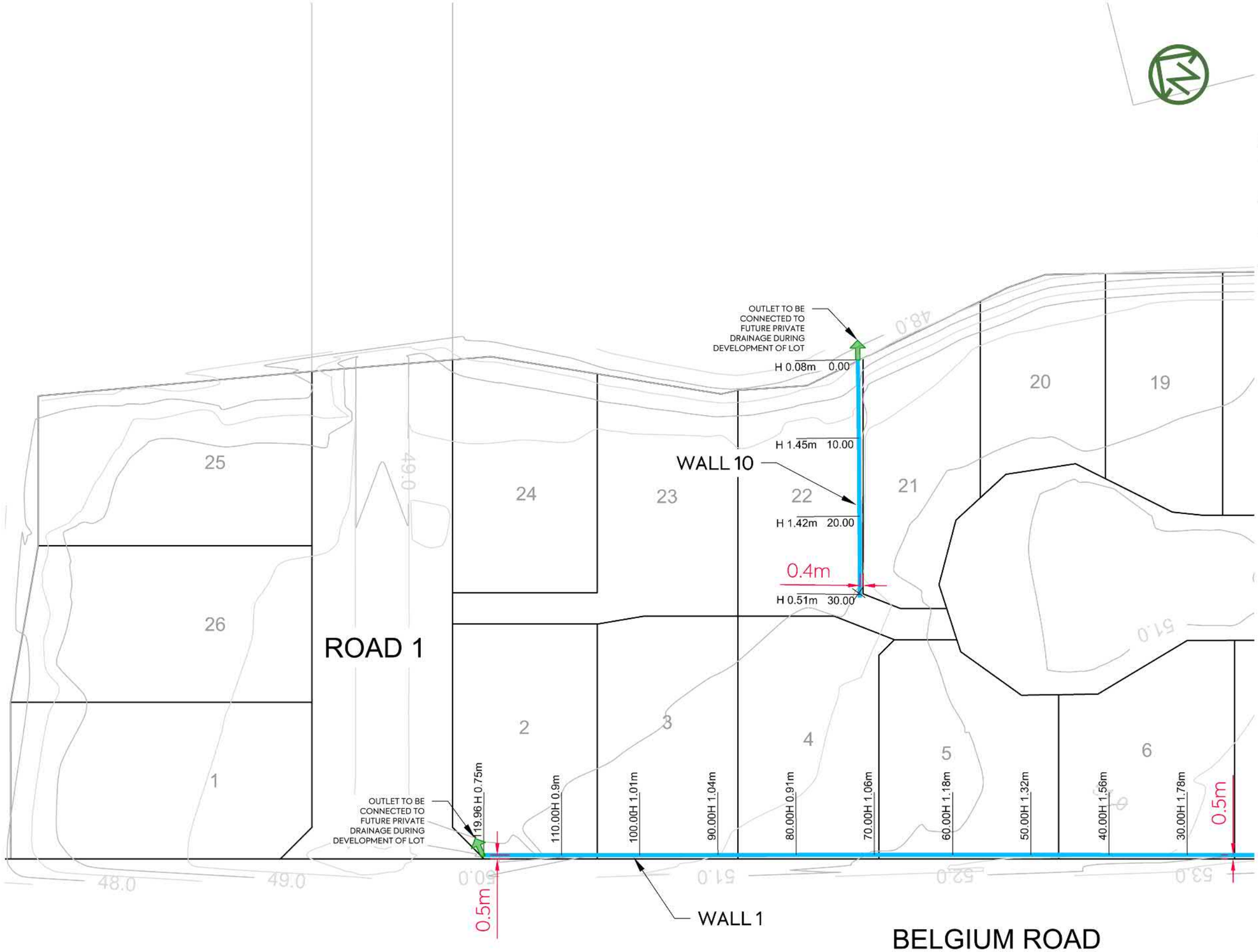
TITLE: AS BUILT STAGE 2 RETAINING WALL PLAN OVERALL PLAN

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:1000m DO NOT SCALE

DRAWING NO: 2398-2-2250 REV: A

C:\12D\S\DATA\MCKFS01\2398 3 BELGIUM ROAD_1178\DRAWINGS\STAGE 2\STAGE 2 AS BUILT\2398-2-2250.DWG



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LEGEND:

- FINAL CONTOURS – MAJOR 1.0m INTERVALS
- FINAL CONTOURS – MINOR 0.5m INTERVALS
- RETAINING WALL
- CHAINAGE AND RETAINED HEIGHT — 100.00 H 1.01m
- DIMENSIONS BETWEEN THE WALL AND THE BOUNDARY — 0.5m
- LOT BOUNDARY
- RETAINING WALL DRAIN OUTLET LOCATION

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

I certify that these Asbuilt Plans are an accurate record of the works undertaken and that:

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Signed: .....
Registered Professional Surveyor

Date: 01/08/2022

Name: Luke Hermanson
Phone: +64 9 320 5707 / 021 0744413
Email: luke.hermanson@mckenzieandco.co.nz

MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	WZ	LH	LH	07/06/22

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: AS BUILT STAGE 2 RETAINING WALL PLAN SHEET 1

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:500m

DO NOT SCALE

DRAWING NO: 2398-2-2251

REV: A

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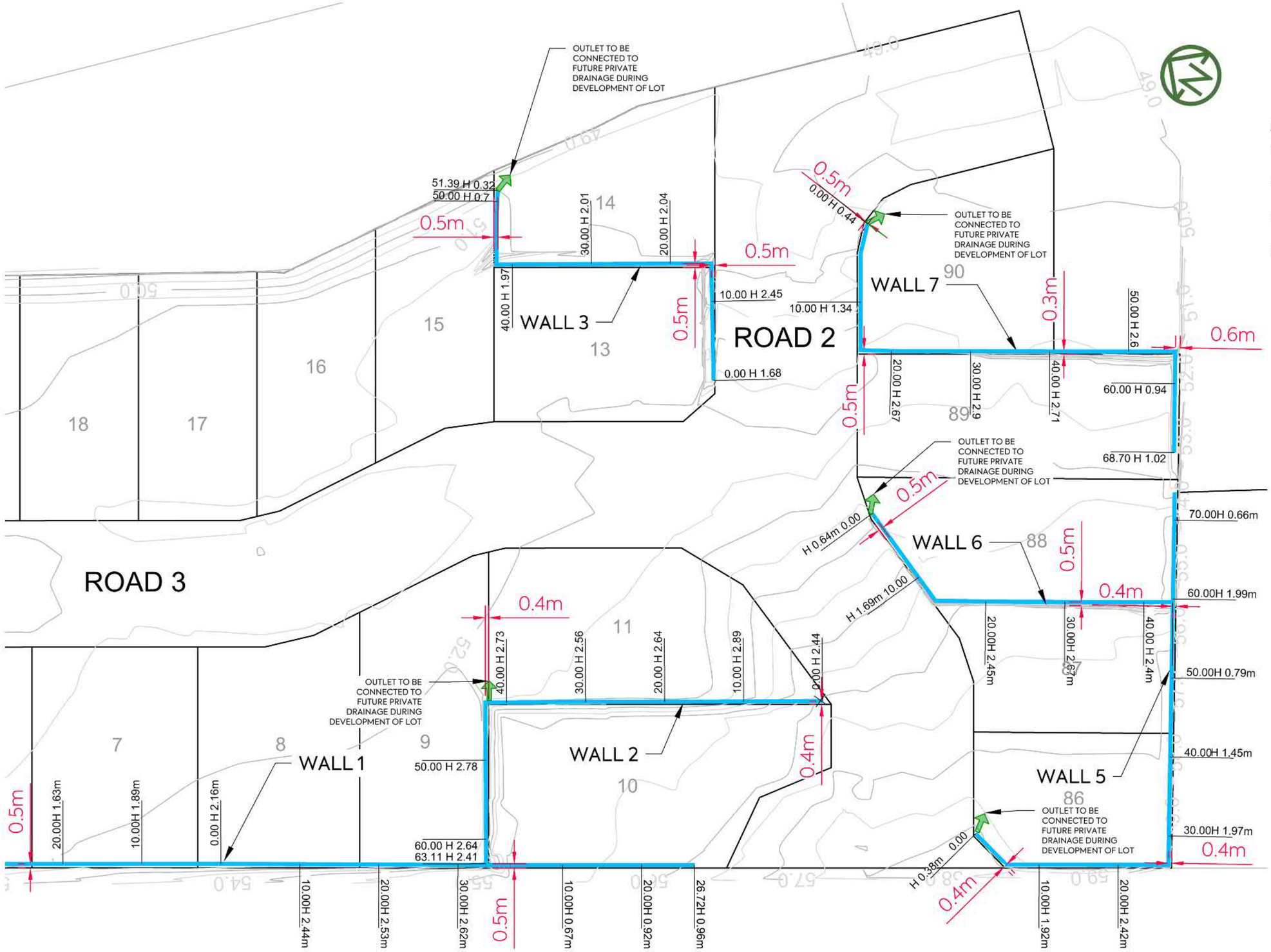

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LEGEND:

FINAL CONTOURS – MAJOR 1.0m INTERVALS	1.0
FINAL CONTOURS – MINOR 0.5m INTERVALS	
RETAINING WALL	
CHAINAGE AND RETAINED HEIGHT	100.00 H 1.01m
DIMENSIONS BETWEEN THE WALL AND THE BOUNDARY	0.5m
LOT BOUNDARY	
RETAINING WALL DRAIN OUTLET LOCATION	

EPA NUMBER: 60373650

RESOURCE CONSENT NUMBER: BUN60326339

I certify that these Asbuilt Plans are an accurate record of the works undertaken and that:

- The Coordinates (X,Y) are in terms of NZTM on NZGD (2000), and are within±50mm.
- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within±10mm.

Signed: .....
Registered Professional Surveyor

Date: 01/08/2022

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Phone: +64 9 320 5707 / 021 0744413
Email: luke.hermanson@mckenzieandco.co.nz

MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	WZ	LH	LH	07/06/22

CLIENT: CABRA PUKEKOHE JV

PROJECT: 3 BELGIUM ROAD PUKEKOHE

TITLE: AS BUILT STAGE 2 RETAINING WALL PLAN SHEET 2

PURPOSE OF ISSUE: AS BUILT

SCALE: 1:500m

DO NOT SCALE

DRAWING NO: 2398-2-2252

REV: A

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