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06 January 2025

31 Schoolside Road, Huapai

GEOTECHNICAL COMPLETION REPORT

Cabra Developments Limited

Job No. AKL2018-0018AL | Version Rev 0

Auckland

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Version Control

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Job number	AKL2018-0018AL
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Reviewed and Authorised by	Richard Knowles, Principal Geotechnical Engineer 

For and on behalf of CMW Geosciences

Review and Update History

Version	Date	Comments
A	06 January 2025	Initial draft for internal review
0	14 January 2025	Final Issue

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Appendices

1.0 INTRODUCTION

In accordance with our instructions, this Geotechnical Completion Report has been prepared for Cabra Developments Limited as part of the documentation to be submitted to Auckland Council following earthworks to form the 31 Schoolside Road development in Huapai.

This report covers the construction period commencing in February 2018 to December 2024 and is intended to be used for certification purposes for new lots (listed below) created from Lots 300 and 500 DP 541544 as follows:

- 43 new residential lots numbered 1 to 8, 10 to 25, 27 to 29, 31 to 46;
- 4 new Superlots numbered Lots 300 to 303,
- 2 new roads numbered Lots 400 and 401, covering three new sections of road named Croatia Ave, Podgora Ave and Vintry Drive.

This development is located off Schoolside Road in Huapai. As can be seen from the as-built plans, 27 of the lots have been affected by filling as part of the general earthworks operations to a maximum depth of approximately 6 metres, with other areas across the site also affected by minor filling as part of silt pond construction and dis-establishment during the works.

Construction of this subdivision has been undertaken in general accordance with;

- Auckland Council's Resource Consents numbered:
  - LAN-66247 and REG-66251, dated 15 November 2016, and
  - BUN60413067, SUB60413068, LUC60413069, dated 20 June 2023 and Engineering Plan Approval ENG60422861.
- Auckland Council's Building Consent BCO10372060 (and amendments A and B) for cantilever timber pole / steel pile retaining walls and segmental block retaining walls, numbered 1, 7 to 14, 17, 20, 24 and 25,
- NZS4431:1989 and NZS4431:2022, as appropriate, as most of the earthworks was completed on this subdivision prior to the issue of NZS4431:2022.
- Auckland Council's Code of Practice for Land Development and Subdivision, Chapter 2 - Earthworks and Geotechnical, Version 1.6, September 2013. The earlier version of this document has been referenced due to the majority of fills in this subdivision being placed prior to the introduction of Version 2.0 in May 2023.
- Cato Bolam consented drawing sets referenced 34745, dated 05/09/2016, 40352, dated 21/07/2021, and 46565, dated 10/03/2023.
- The reports listed in Table 1.

Table 1: Project Geotechnical Documents

Report Type	Reference and/or Comments
Coffey Geotechnics (NZ) Limited, Geotechnical Constraints Report for Huapai Triangle Special Housing Area, Kumeu	GENZAUCK16252AA-Rev01, dated 10 September 2014
CMW Geosciences' Geotechnical Scheme Plan Letter Report	AKL2018-0018AA Rev 0, dated 3 April 2018
CMW Geosciences' Groundwater Level Memo	AKL2018-0018AB, Rev 0, dated 14 August 2018
CMW Geosciences' Geotechnical Design Report	AKL2018-0018AC, Rev 0, dated 23 May 2022
CMW Geosciences' Geotechnical Construction Review (PS4) for Walls 1 to 6	AKL2018-0018AE, Rev 0, dated 8 December 2022

Report Type	Reference and/or Comments
CMW Geosciences' Retaining Wall Design Report	AKL2018-0018AG, Rev 0, dated 10 August 2023

For the construction of the development, the following roles were fulfilled as defined in NZS 4431:2022 and the Ministry for the Environment Contaminated Land Management Guidelines:

- Geotechnical Designer: CMW Geotechnical NZ Limited
- Certifier: CMW Geotechnical NZ Limited
- Recognised Laboratory: CMW Geotechnical NZ Limited
- Contractor: Opie Contractors Ltd
- Sub-contractor (earthworks): Bob Hicks Earthmoving
- Sub-contractor (retaining walls): ICB Retaining and Construction
- Sub-contractor (retaining walls 12 & 13): Ruiterman Contracting Limited

As CMW has fulfilled the roles of both earth fills Certifier and Geotechnical Designer, this report has been prepared as a combined report covering both of these aspects of the project work.

2.0 DESCRIPTION OF WORKS

Works within the 31 Schoolside Road area commenced in early 2017, with a silt pond being formed along the eastern margins of this area, facilitating topsoil stripping/stockpiling and subsequent cutting across parts of the site to generate fill materials for the Stage 1 earthworks, to the south of Schoolside Road.

Demolition of the Nobilo Winery began in February 2018 and included removal of the existing warehouses, office buildings and storage tanks. Once demolition was completed in early April 2018, Opie Contractors 2014 Ltd, and their earthmoving subcontractor Bob Hick Earthmoving, mobilised to site. Earthworks were carried out in conjunction with neighbouring earthworks sites, all of which were being observed by CMW Geosciences.

Works began with the removal of existing uncertified fill, associated subsoil drainage and soft, slightly organic material from existing gully areas which were uncovered as part of the demolition works. Once these were completely removed, filling operations began. Subsoil drainage was placed within the base of gully alignments, with fill materials generally sourced from the neighbouring earthworks sites and blended with available cut materials from across the Huapai Triangle.

Earthworks continued through the 2018/2019 earthworks season, with bulk earthworks levels being generally achieved by the end of the season, leaving batters in place for future retaining wall construction and all areas topsoiled and grassed.

The contractor returned to the Stage 2 area of site (adjacent to the western arm of Vintry Drive, comprising Lots 133 to 144) in May 2022 to begin civil works and roading. This included construction of Walls 01 (part) to 06, with the partial section of Wall 01 being located along the southern boundary of Lot 300 in the 31 Schoolside Road part of the development. Works were completed across the Stage 2 site in August 2022.

Works recommenced across the 31 Schoolside Rd site in November 2023, initially comprising stripping of topsoil and cuts/fills to form final design levels. Retaining wall construction was undertaken across the site from late January 2024 through to October 2024. Following construction of the retaining walls the lots were progressively cut to grade and topsoiled, including backfilling of silt ponds that had been formed within Lots 301 and 302, with all earthworks essentially complete by the end of December 2024. As platforms were cut to finished subgrade, isolated areas of softer/sensitive soil were identified, undercut and replaced with compacted, engineered fill, predominantly within Lots 2 and 300.

Civil constructions works for the roading and services installation commenced in early March 2024 and continued through to the end of December 2024.

3.0 GEOTECHNICAL QUALITY CONTROL

3.1 Site Observations

During the works, site visits were typically undertaken several times each week to assess compliance with NZS 4431 and project 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;
- Installation of subsoil drains and underfill drains but excluding road under-channel drains;
- Construction of cantilever timber pole and UC Steel pile retaining walls, including ground conditions, pile size, spacing and depth, subsoil drainage placement, and lagging;
- Construction of segmental block retaining walls, including ground conditions and no-fines concrete widths; and
- Placement and compaction of engineered fills.

4.0 QUALITY ASSURANCE TESTING

Quality assurance testing of materials was completed as works progressed, with test results presented in ***Appendix D***.

Table 2: Compaction Test Criteria for Cohesive Soil Engineered Filling

Fill Type	Air Voids [1]		Vane Shear Strength [2]		Moisture Content [3]	Dry Density [3]
	Average	Maximum Single Value	Average	Minimum Single Value	Maximum (Indicative)	Minimum (Indicative)
General Fill	10%	12%	140 kPa	110 kPa	40%	1.25 t/m^3

[1] Air Voids Percentage (as defined in NZS 4402:1986)

[2] Undrained Shear Strength (Measured by hand shear vane – calibrated using NZGS 2001 method)

[3] Moisture content and minimum dry density non-compliance may be accepted on site by the Geotechnical Engineer on a case-by-case basis depending on the nature of the material and the other criteria results.

While these tests showed on occasions that the contractor was struggling to achieve the required compaction standards with the prevailing site and soil conditions, to the best of our knowledge, all areas of fill were re-worked as necessary. Subsequent testing confirmed compliance with the specification.

5.0 EVALUATION OF COMPLETED EARTHWORKS

5.1 Natural Hazards

The appended as-built drawings depict the extents 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.

Full descriptions of the restrictions associated with each of these zones are presented in our Opinion on Suitability in ***Appendix A***. Additional information is also provided in some of the following sections.

5.2 Liquefaction

The liquefaction risk for the lots on this development has been assessed as follows:

- Review of Auckland Council GIS maps confirms the damage category to be: Unlikely
- In accordance with MBIE/NZGS guidance[1] the liquefaction susceptibility of the soils at this site was assessed with respect to geological age and compositional (soil fabric and density) criteria based on investigation results presented in the initial Coffey investigation report, as well as subsequent retaining wall investigations. Deep investigations undertaken for the nearby M1 to M3 apartment blocks in the Country Club and the recently constructed walkway across the railway lines (to the northeast of this site) were also reviewed as part of this assessment. Our assessment indicates the site to be a low risk for liquefaction.

5.3 Land Stability and Erosion

The subdivision scheme layout includes a series of batter slopes to form level terraces for building platforms. The batters include portions of the residential lots with maximum gradients of 1(v) in 2.5(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 these stages, including the batters, has led to the construction of various cantilever pole (timber and UC steel) and segmental block 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.

[1] Earthquake Geotechnical Engineering Practice, Module 3: Identification, assessment and mitigation of liquefaction hazards", (November 2021)

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 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.

5.4 Retaining Walls

Cantilever pole (timber and steel UC) and segmental block retaining walls have been constructed in the locations shown on the appended As-built Plans. These walls reach a maximum height of approximately 2.95 metres and were designed by CMW, who also observed the construction. A copy of the Producer Statement - Construction Review is provided in ***Appendix F***.

Descriptions of the building and earthworks restrictions within the vicinity of these walls (Specific Design Zones – retaining) are contained in our Opinion on Suitability in ***Appendix A***, with Zone dimensions shown on the drawings presented in ***Appendix C*** (Capture drawings ASB-200 to ASB-205).

Subsoil drains from behind the retaining walls have been brought forward into field catchpits across the development, as shown on the As-Built Stormwater Reticulation plans in ***Appendix C*** (Capture drawings ASB-400 to ASB-405). It is intended that these catchpits will be connected to the private stormwater connections as part of future Lot specific development.

5.5 Fill Induced Settlement

The majority of the filling on this stage of the development was placed prior to April 2019.

On the basis of the time that has elapsed since fill placement, and only minor depths of more recent lot recontouring and silt pond filling, we are satisfied that fill induced settlement does not pose a hazard to NZS 3604-type building development.

5.6 Service Line Trenches

As part of the civil works, stormwater and wastewater services were trenched throughout the development as shown on the appended Stormwater Reticulation and Wastewater 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 C***, 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 stormwater service trenches within the lots as shown on the appended stormwater as-built plans, while the wastewater lines are located within the road reserves. The resulting restrictions are presented in our Opinion on Suitability in ***Appendix A***, with indicative zones of influence presented on the appended As-Built Plans (Capture drawings ASB-420 to ASB-425) in ***Appendix C***.

5.7 Subsoil Drains and Groundwater

The appended As-Built Cut to Fill Layout plans (Capture drawings ASB-210 to ASB-215) show the positions of subsoil drains that were installed during the earthworks as described in the following sub-sections, with outlets located beyond the development boundaries in prior subdivision stages to the east.

These drains were installed at the bases of the original gully alignments to assist with the earthworks operations by capturing seepages at the cleared ground level. They require no specific maintenance and while their ongoing function is not critical to stability conditions, they provide ongoing control of groundwater levels and pore water pressure relief so their ongoing function should not be compromised by future works.

Typically, these drains comprise punched draincoils surrounded by drainage gravel. Spot levels showing drainpipe invert depths from finished ground level are presented on the As-Built Cut to Fill Layout plans in ***Appendix C*** (Capture drawings ASB-210 to ASB-215).

Descriptions of restrictions associated with these drains are contained in our appended Opinion on Suitability in ***Appendix A***.

5.7.1 Groundwater

Groundwater levels beneath the engineered fills can be expected to be controlled by the underfill drains and should therefore typically be deeper than 2m, subject to seasonal variations.

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 Capture. All road subgrade areas were subsequently lime/ cement stabilised. Where soft ground with low equivalent CBR values was subsequently identified, it was generally undercut and replaced with compacted GAP65 on top of a layer of Bidim A19 geotextile cloth, as presented on the As-Built Roading plans in ***Appendix C***.

5.9 Design of Shallow Foundations

5.9.1 Bearing Capacity

Once bulk earthworks and topsoiling of the building platforms had been completed, our staff drilled hand auger boreholes to 2m depth on platforms across the development 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 our Opinion on Suitability in ***Appendix A.***

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

5.9.2 Foundation Settlements and Stability

At the bearing pressures specified in ***Appendix A*** 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.

Where low height batters are present, as sometimes occurs on inter-lot boundaries where terraced houses are planned or elsewhere, even if Specific Design Zones (slope) have not been identified due to the low and stable nature of the batters, designers must also consider the NZS 3604 Figure 3.1 geometry requirements for foundations adjacent to sloping ground. In some cases, low retaining walls may be desirable.

5.9.3 Soil Expansiveness Classification

Seasonal soil moisture variations within most clay-rich soils typically result in the soil swelling during winter months and then shrinking during summer months. These seasonal movements can cause issues such as cracking of concrete floors, brittle cladding and masonry walls or distortion of building frames causing doors and windows to jam from differential settlement. The effects are further compounded by local influences that worsen differential movements. These may include growth of high demand trees and shrubs that cause localised soil drying or either leaking pipes or tree root removal, leading to localised wetting.

The potential effects need to be managed in a combination of appropriate:

- classification of the level of risk
- design of foundations
- management of soil moisture conditions by contractors during construction
- management of landscaping and plantings by homeowners throughout a building's lifetime

Testing on 16 samples was completed in accordance with the requirements of NZS 3604 and ACCoPs. All testing was completed by RoadTest Limited, a testing laboratory accredited by IANZ for the tests undertaken. Results are provided in ***Appendix E***.

The testing confirms that:

- All of the soils tested were expansive in terms of the NZS 3604 definition and were therefore outside the definition of "good ground".
- The samples tested demonstrated a range of expansivity characteristics.

Results of our assessment of the maximum characteristic surface movement (ys) for each lot are contained in our Statement of Opinion on Suitability of Land in ***Appendix A.***

5.9.4 Site (Seismic) Class

Our assessments of NZS 1170.5 site Class(es) is provided in our Opinion of Suitability and the Summary Table, both in ***Appendix A***.

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 100 and 300mm across the development.

Site specific findings are contained in our Opinion on Suitability Summary in ***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.

5.11 Site Preparation During Construction

Foundation contractors need to be aware of the extreme damage potentially caused by expansive soils and the imperativeness of maintaining optimum moisture contents in all footing excavations and across building platform subgrades between the time of excavation and the pouring of concrete. Pouring foundations on dry, desiccated ground in summer months can lead to heaving and cracking, requiring extensive repairs or even complete house re-builds. Similarly, where perimeter foundations have been treated but floor slabs have been poured on dry ground, infiltration of moisture via pipe bedding can lead to localised heave, uplift and significant slab damage.

Remedial actions that may be appropriate include combinations of 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. However, over-use of sprinklers, ponding of excessive surface water and/ or trafficking of wet soils could also lead to dramatic strength loss and subgrade degradation, so careful management of site surface conditions is always required.

5.12 Site Maintenance and Landscaping

Due to soil expansivity, landowners must be mindful of the potential impacts of 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), these actions can lead to significant settlement or heave damage.

For a comprehensive understanding of the potential effects of expansive soils, maintenance recommendations and vegetation management information, we strongly recommend that landowners obtain a copy of CSIRO publication BTF 18 (Foundation Maintenance and Footing Performance – A Homeowners Guide) that is available online.

6.0 CLOSURE

This report, its appended statement(s) of opinion and suitability and the associated as-built plans must be read and/ or reproduced together in their entirety for a full understanding of the condition of the land.

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

This report has been prepared for use by Cabra Developments Limited in relation to the 31 Schoolside Road, Huapai project, in accordance with the scope, proposed uses and limitations described in the report. Should you have further questions relating to the use of your report please do not hesitate to contact us.

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 Opinion on Suitability in ***Appendix A*** and our Suitability Statement in ***Appendix B*** also rely 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, they assume 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.

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

USING YOUR CMW GEOTECHNICAL REPORT

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

Preparation of your report

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

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

Your geotechnical report is based on your project's requirements

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

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

Interpretation of geotechnical data

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

Subsurface conditions can change

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

Interpretation and use by other design professionals

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

Your report's recommendations require confirmation during construction

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

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

Environmental matters are not covered

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

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

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APPENDIX A

Statement of Professional Opinion on Suitability of Land for Building Construction

STATEMENT OF PROFESSIONAL OPINION ON SUITABILITY OF LAND FOR BUILDING CONSTRUCTION

Development: 31 Schoolside Road
Developer: Cabra Developments Limited
Location: 31 Schoolside Road, Huapai

I, who, of CMW Geotechnical NZ Limited, 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 Clause 1.2.2 of NZS 4404:2010 and was retained by the Developer as the geo-professional on the above development.
2. The extent of preliminary investigations carried out to date are described in the following reports:
   a. Coffey Geotechnics Geotechnical Constraints Report referenced GENZAUCK16252AA-Rev 01, dated 10 September 2014.
   b. CMW Geosciences Geotechnical Design Report referenced AKS2018-0018AC Rev 0, dated 23 May 2022.
   c. CMW Geosciences Retaining Wall Design Report referenced AKL2018-0018AG Rev 0, dated 10 August 2023.

   The conclusions and recommendations of those documents have been re-evaluated in the preparation of this report. The extent of my inspections during construction, and the results of all tests and/ or evaluations carried out are as described in my Geotechnical Completion Report referenced AKL2018-0018AL Rev 0, dated 14 January 2025.
3. My certification of the earth fills placed on this site is contained in ***Appendix B***.
4. In my professional opinion, not to be construed as a guarantee, I consider that:
   a. The completed earthworks take into account land slope and foundation stability considerations on the building platform areas, but as shown on the appended building restriction zones plans, areas on Lots 13 to 24 inclusive have gradients steeper than 1(v) in 4 (h) (and generally up to 1(v) in 2.5(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.

      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, the interaction with existing retaining walls, control of surface water, construction sequencing, timing and temporary support requirements for the 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.

   b. **Specific Design Zone (Retaining) areas** have been applied on Lots 1 to 8, 10 to 13, 24, 25, 27 to 29, 31 to 37, 46, 300, 301 and 302 inclusive for the protection of the function of the retaining walls as depicted on the as-built plans. The retaining walls on this stage of the development were designed for a variety of conditions, including a maximum of 12 kPa surcharge load, up to 27° surcharge slope and 0° toe slope, as presented in the wall design drawings in ***Appendix C***.

No building construction and no earthworks (i.e. cut or fills) should take place within these Specific Design Zones 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.

c. The function of the subsoil drains installed beneath Lots 4, 17, 18, 23, 24, 27, 32, 33, 34, 38, 39, 40, 46, 302 and 303 inclusive, as shown on the as-built plans, must not be impaired by any building development or landscaping works. Although the drains are not required for stability purposes, any bored or driven piles must be positioned to avoid damaging the draincoils nonetheless. 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.

d. A geotechnical ultimate bearing capacity of 300 kPa may be assumed for shallow foundation design on the building platforms of Lots 1 to 8, 10 to 25, 27 to 29, 31 to 46 and 300 to 303 inclusive.

e. The site (seismic) subsoil class for each lot has been assessed in accordance with NZS1170.5:2004 Clause 3.1.3 from borelogs that included measurements of geotechnical properties. Our assessment is that all lots are Class C- shallow soil.

f.

Table 3: Assessment of Characteristic Surface Movements and Design Classes for NZS 3604 Compliant Buildings

Lots	Assessed AS2870 Site Class / 300 Year Design Characteristic Surface Movement (Ys)	Anticipated Equivalent NZBC B1/AS1 Expansivity Class for Design / 500 Year Design Characteristic Surface Movement(Ys)
1 to 6, 10 to 25, 27, 32 to 46 & 300 to 303	M (moderately reactive) / 40mm	M / 44mm
28, 29 & 31	H1 (highly reactive) / 60mm	H / 78mm
7 & 8	H2 (highly reactive) / 75mm	H / 78mm

B1/AS1 provides an Acceptable Solution through NZS 3604 for foundation design applying to a limited range of compliant building sizes, shapes and materials and only for concrete floor design with strip footings. In all other cases, NZS 3604 directs the use of AS2870 or a specific design.

If AS2870 is used for the design solution, it must be noted that the characteristic surface movements in that code apply to a (less conservative) 300 year return period drought while B1/AS1 provides for a 500 year return period drought.

Prior to the introduction of the B1/AS1 design information in November 2019, minimum foundation depths recommended as appropriate by geotechnical consultants in Auckland for shallow footing design under AS2870 were typically in the order of 600mm for Class M, 750mm for Class H1 and 900mm for Class H2.

g. No building development should take place within the 45-degree zone of influence of stormwater pipe or manhole 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 pipes and trench backfills. A copy of drawing SW22, extracted from Chapter 4 of the Auckland Council Code of Practice for Land development, is provided in

Appendix C for clarification. Details for water and wastewater pipes are available in the Watercare COP1 - General Requirements and Procedures.

h. On the basis of the earth fill certification and subject to the geotechnical limitations, restrictions and recommendations contained in clauses 4(a), 4(b), 4(c), 4(d), 4(e), 4(f) and 4(g) above:
   - The filled and natural ground is generally suitable for buildings constructed in accordance with NZS 3604 and the requirements of either NZBC Clause B1/AS1 where appropriate, or AS2870 for the expansive soil class associated with the characteristic surface movement. Alternatively, a specific foundation and structural design may be undertaken by a Chartered Professional Engineer.

5. 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 4: GCR Summary Table

GCR SOPO Clause								
Lot Number	4(a)	4(b)	4(c)	4(d)	4(e)	4(f)	4(g)	
	Specific Design Zone (slope)	Specific Design Zone (retaining)	Subsoil Drains Present	Geotechnical Ultimate Bearing Capacity (kPa)	NZS 1170.5 Site (seismic) Class	AS2870 Expansive Class	Service Lines Restrictions	Indicative Topsoil Depth (mm)
1		X		300	C	M	X	200
2		X		300	C	M	X	200
3		X		300	C	M	X	200
4		X	X	300	C	M	X	200
5		X		300	C	M	X	200
6		X		300	C	M	X	200
7		X		300	C	H2/H	X	175
8		X		300	C	H2/H	X	200
10		X		300	C	M	X	200
11		X		300	C	M	X	200
12		X		300	C	M	X	100
13	X	X		300	C	M	X	300
14	X			300	C	M	X	150
15	X			300	C	M	X	200
16	X			300	C	M	X	300
17	X		X	300	C	M	X	200
18	X		X	300	C	M	X	250
19	X			300	C	M	X	150

GCR SOPO Clause								
Lot Number	4(a)	4(b)	4(c)	4(d)	4(e)	4(f)	4(g)	
	Specific Design Zone (slope)	Specific Design Zone (retaining)	Subsoil Drains Present	Geotechnical Ultimate Bearing Capacity (kPa)	NZS 1170.5 Site (seismic) Class	AS2870 Expansive Class	Service Lines Restrictions	Indicative Topsoil Depth (mm)
20	X			300	C	M	X	250
21	X			300	C	M	X	200
22	X			300	C	M	X	200
23	X		X	300	C	M	X	200
24	X	X	X	300	C	M	X	200
25		X		300	C	M	X	150
27		X	X	300	C	M	X	250
28		X		300	C	H1/H	X	200
29		X		300	C	H1/H	X	200
31		X		300	C	H1/H	X	200
32		X	X	300	C	M	X	200
33		X	X	300	C	M	X	200
34		X		300	C	M	X	200
35		X		300	C	M	X	200
36		X		300	C	M	X	200
37		X		300	C	M	X	300
38			X	300	C	M	X	250
39			X	300	C	M	X	150
40			X	300	C	M	X	200

GCR SOPO Clause								
Lot Number	4(a)	4(b)	4(c)	4(d)	4(e)	4(f)	4(g)	
	Specific Design Zone (slope)	Specific Design Zone (retaining)	Subsoil Drains Present	Geotechnical Ultimate Bearing Capacity (kPa)	NZS 1170.5 Site (seismic) Class	AS2870 Expansive Class	Service Lines Restrictions	Indicative Topsoil Depth (mm)
41				300	C	M	X	100
42				300	C	M	X	200
43				300	C	M	X	150
44				300	C	M	X	200
45				300	C	M	X	200
46		X	X	300	C	M	X	Gravel
300		X		300	C	M	X	200
301		X		300	C	M	X	100-200
302		X	X	300	C	M	X	100-150
303			X	300	C	M	X	Gravel

CMW Geosciences
Great People | Practical Solutions

APPENDIX B

Statement of Suitability of Engineered Fill for Lightweight Structures

STATEMENT OF SUITABILITY OF ENGINEERED FILLS FOR LIGHTWEIGHT STRUCTURES

To:	Auckland Council
Development:	31 Schoolside Road, Huapai Development
Land Title(s):	Lots 300 and 500, DP 541544
Location:	31 Schoolside Road, Huapai
Resource Consent Nos:	LAN-66247 and LUC60413069
Developer:	Cabra Developments Limited
Geotechnical Designer:	Andrew Linton of CMW Geotechnical NZ Limited
Certifier:	Andrew Linton of CMW Geotechnical NZ Limited

This Statement of Suitability is provided as an appendix to the CMW Geosciences Geotechnical Completion Report referenced in the page footer below, that also contains all as-built plans and test results relevant to the work completed.

1. I, Andrew Linton, confirm that I am qualified as a certifier as defined in NZS4431:2022.
2. During this work, I was retained as certifier and I or my certifier's representative undertook inspections and testing as documented in the Geotechnical Completion Report.
3. I am satisfied that the engineered fill shown in the attached as-built survey was placed, compacted and tested in accordance with the attached specification and that all variations and non-compliances have been documented in the Geotechnical Completion report.
4. Based on the information available, I certify that, to the best of my knowledge, the intent of the geotechnical designer has been achieved.
5. The fill areas shown on the Capture Land Development Consultants as-built cut and fill plans attached are considered suitable for development as per NZS 3604 subject to any other restrictions described in the Geotechnical Completion Report by the Geotechnical Designer.
6. This certification does not remove the necessity for normal inspection and design of foundations as would be made in natural ground.

For and on behalf of CMW Geosciences

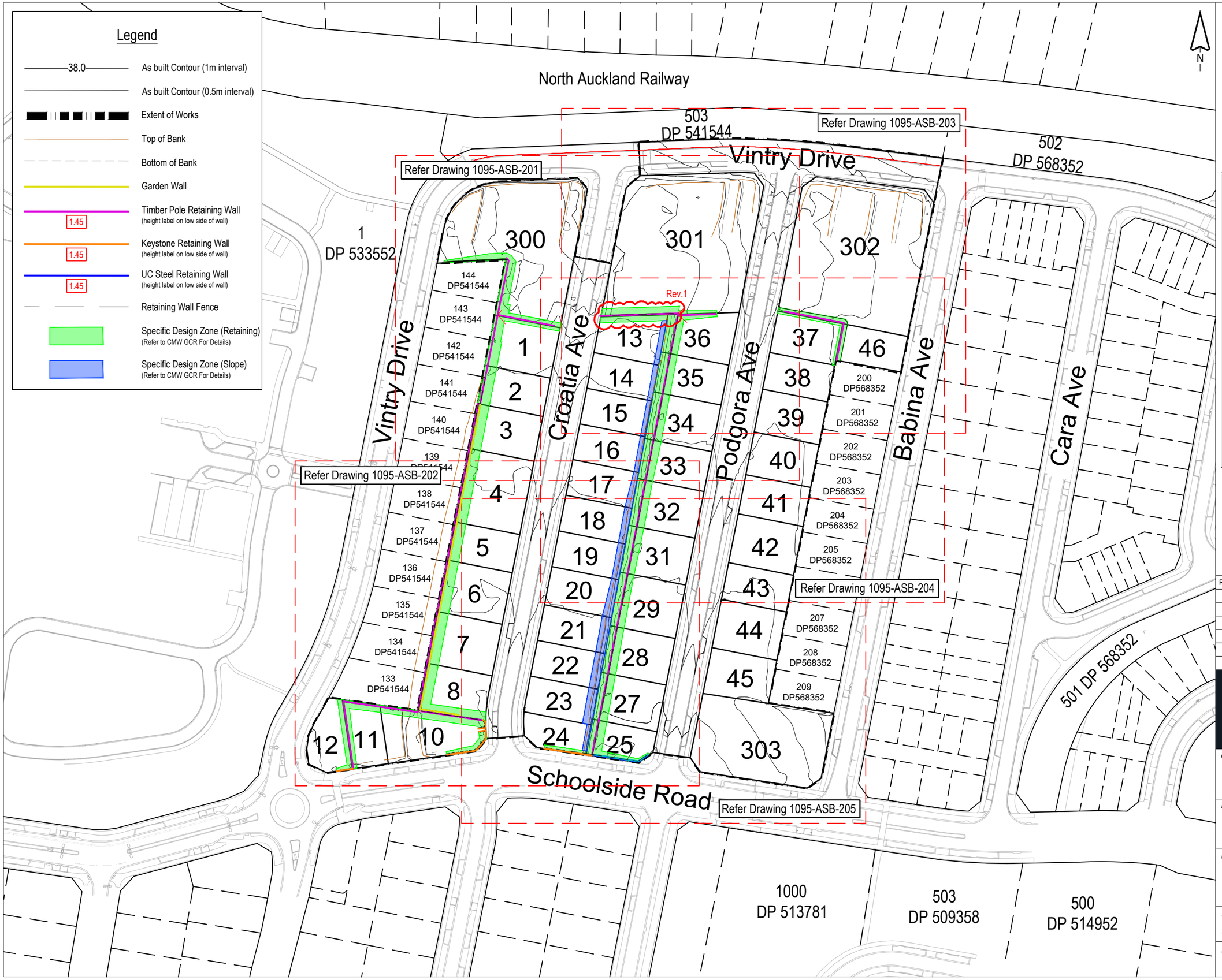
Andrew Linton

Principal Geotechnical Engineer CMEngNZ, CPEng

APPENDIX C
Drawings

Title	Reference No.	Date	Revision
Capture As-Built Plans			
As-Built Final Contours & Retaining Walls – Sheet 1	1095 – ASB-200	19/12/24	1
As-Built Final Contours & Retaining Walls – Sheet 2 - 6	1095 – ASB-201 - 205	19/12/24	1
As-Built Cut to Fill Layout – Sheet 1	1095 – ASB-210	19/12/24	0
As-Built Cut to Fill Layout – Sheets 2 - 6	1095 – ASB-211 - 215	19/12/24	0
As-Built Roading – Sheet 1	1095 – ASB-300	19/12/24	0
As-Built Roading – Sheets 2 - 6	1095 – ASB-301 - 305	19/12/24	0
As-Built Stormwater Reticulation – Sheet 1	1095 – ASB-400	19/12/24	0
As-Built Stormwater Reticulation – Sheets 2 - 6	1095 – ASB-401 - 405	19/12/24	0
As-Built Stormwater Raingarden Details	1095 – ASB-406	19/12/24	0
As-Built Stormwater Zone of Influence – Sheet 1	1095 – ASB-420	19/12/24	0
As-Built Stormwater Zone of Influence – Sheets 2 - 6	1095 – ASB-421 - 425	19/12/24	0
As-Built Wastewater – Sheet 1	1095 – ASB-500	19/12/24	1
As-Built Wastewater – Sheets 2 - 6	1095 – ASB-501 - 505	19/12/24	1
Auckland Council Code of Practice for Land Development and Subdivision – SW22	SW22	1/11/2015	-

Title	Reference No.	Date	Revision
Relevant Retaining Wall Drawings			
Site Investigation Plan & Retaining Wall Layout Plan	AKL2018-0018 Dwg 13	03/08/2023	0
Site Investigation Plan & Retaining Wall Layout Plan	AKL2018-0018 Dwg 13	05/09/2024	1
Timber Pole Retaining Wall Design Details & Specification	AKL2018-0018 Dwg 14	03/08/2023	0
UC Steel Pole Retaining Wall Design Details & Specification	AKL2018-0018 Dwg 15	03/08/2023	0
Segmental Block Walls (Types E, F, G) Design Details & Specification	AKL2018-0018 Dwg 16	05/09/2024	1
Retaining Wall Summary Tables (1 of 2)	AKL2018-0018 Dwg 17	03/08/2023	0
Retaining Wall Summary Tables (2 of 2)	AKL2018-0018 Dwg 18	05/09/2024	1
Wall 1 Typical Section Detail	AKL2018-0018 Dwg 20	07/02/2024	0
Retaining Wall 07 Bridging Detail	AKL2018-0018 Dwg 24	19/02/2024	0
Wall 17 Typical Square Post Wall Detail	AKL2018-0018 Dwg 25	19/02/2024	0
Retaining Wall 07 Bridging Detail	AKL2018-0018 Dwg 24	19/02/2024	0
CMW Mark-ups Showing Amended Sections Of Walls 01, 07 and 17 – 6 Sheets (Amendment A)		Feb 2024	0
Mark-ups Showing Amended Sections of Walls 10, 11, 12 & 13 – 2 Sheets (Amendment B)	EWKS-202 & 206	30/08/2024	B & A



CABRA
LAND & PROPERTY DEVELOPMENT

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  - -For all pipe inverts & roadside channels to be within +/- 10mm (local circuit i.e internal/relative consistency required only)
  - -For all other assets +/-20mm (e.g Manhole covers, Earthworks)

Name : Tom Lemon

Signed : _____
Registered Professional Surveyor

Registration Number : 1500

Date: 13/01/2025

Contact Number: 09 906 3856

Email: Tom@captureland.nz

ENG60422861 / LUC60413069 / SUB60413068

REV	DATE	REVISION DETAILS	ISSUED
0	19/12/24	FOR COMPLETION	KM
1	13/01/25	Added ZOI behind RW11	KM

CAPTURE
Land Development Consultants

CLIENT
CABRA DEVELOPMENTS LIMITED

PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
FINAL CONTOURS & RETAINING WALLS
SHEET 1

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:1500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-200	1

1095-ASB-200-205 Final Contours & RW As-Built.dwg

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Legend

- 38.0 — As built Contour (1m interval)
- As built Contour (0.5m interval)
- Extent of Works
- Top of Bank
- Bottom of Bank
- Garden Wall
- 1.45 — Timber Pole Retaining Wall (height label on low side of wall)
- 1.45 — Keystone Retaining Wall (height label on low side of wall)
- 1.45 — UC Steel Retaining Wall (height label on low side of wall)
- Retaining Wall Fence
- Specific Design Zone (Retaining) (Refer to CMW GCR For Details)
- Specific Design Zone (Slope) (Refer to CMW GCR For Details)

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Land Development Consultants

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CABRA DEVELOPMENTS LIMITED

PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
FINAL CONTOURS & RETAINING WALLS
SHEET 2

STATUS	SCALE	SIZE
AS-BUILT	1:500	A3

PROJECT	DRAWING NO	REVISION
1095	ASB-201	1

1095-ASB-200-205 Final Contours & RW As-Built.dwg

Legend

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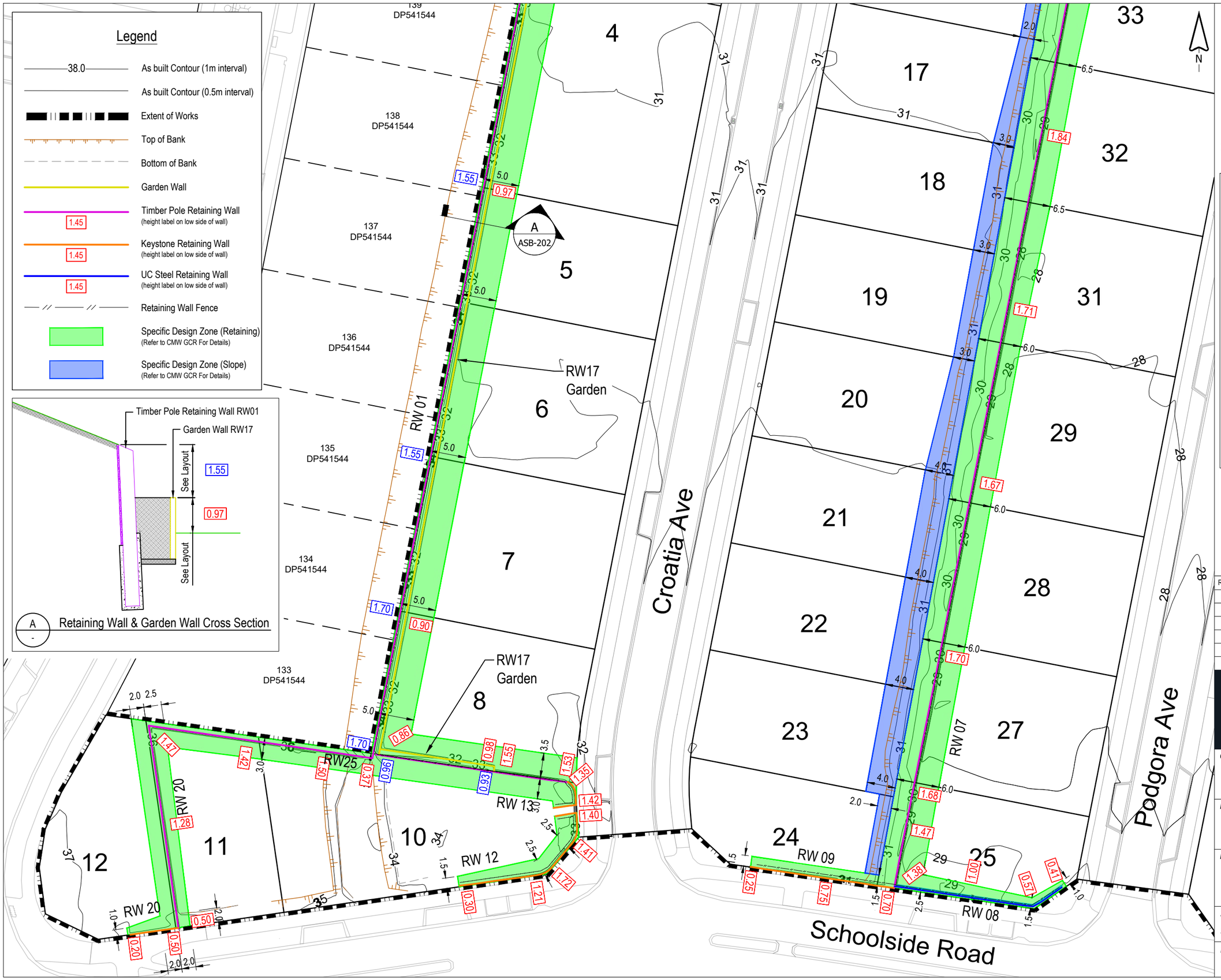
- Retaining Wall Fence
- Specific Design Zone (Retaining) (Refer to CMW GCR For Details)
- Specific Design Zone (Slope) (Refer to CMW GCR For Details)

A — Retaining Wall & Garden Wall Cross Section



CABRA
LAND & PROPERTY DEVELOPMENT

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REV	DATE	REVISION DETAILS	ISSUED
0	19/12/24	FOR COMPLETION	KM

CAPTURE
Land Development Consultants

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CABRA DEVELOPMENTS LIMITED

PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
FINAL CONTOURS & RETAINING WALLS
SHEET 3

STATUS	SCALE	SIZE
AS-BUILT	1:500	A3

PROJECT	DRAWING NO	REVISION
1095	ASB-202	0

1095-ASB-200-205 Final Contours & RW As-Built.dwg

503
DP 541544

Vintry Drive

Minimum finished floor level = R.L. of the top of kerb
on northern side of Vintry Drive
adjacent to the Green Finger +600mm
(Kerb referred to is show in Red on plan)

Minimum finished floor level = R.L. of the top of kerb
on northern side of Vintry Drive
adjacent to the Green Finger +600mm
(Kerb referred to is show in Red on plan)

301

302

Rev.1

RW 11

RW 24

RW 07

RW 10

13

14

15

34

35

36

37

38

39

46

200
DP568352

201
DP568352

Croatia Ave

Podgora Ave

Ina Ave

Legend

- As built Contour (1m interval)
- As built Contour (0.5m interval)
- Extent of Works
- Top of Bank
- Bottom of Bank
- Garden Wall
- Timber Pole Retaining Wall (height label on low side of wall)
- Keystone Retaining Wall (height label on low side of wall)
- UC Steel Retaining Wall (height label on low side of wall)
- Retaining Wall Fence
- Specific Design Zone (Retaining) (Refer to CMW GCR For Details)
- Specific Design Zone (Slope) (Refer to CMW GCR For Details)

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REV	DATE	REVISION DETAILS	ISSUED
0	19/12/24	FOR COMPLETION	KM
1	13/01/25	Added ZOI behind RW11	KM

CAPTURE
Land Development Consultants

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CABRA DEVELOPMENTS LIMITED

PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
FINAL CONTOURS &
RETAINING WALLS
SHEET 4

STATUS	SCALE	SIZE
AS-BUILT	1:500	A3

PROJECT	DRAWING NO	REVISION
1095	ASB-203	1

1095-ASB-200-205 Final Contours & RW As-Built.dwg

Legend

- As built Contour (1m interval)
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- Extent of Works
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1	13/01/25	Added ZOI behind RW11	KM

CAPTURE
Land Development Consultants

CLIENT
CABRA DEVELOPMENTS LIMITED

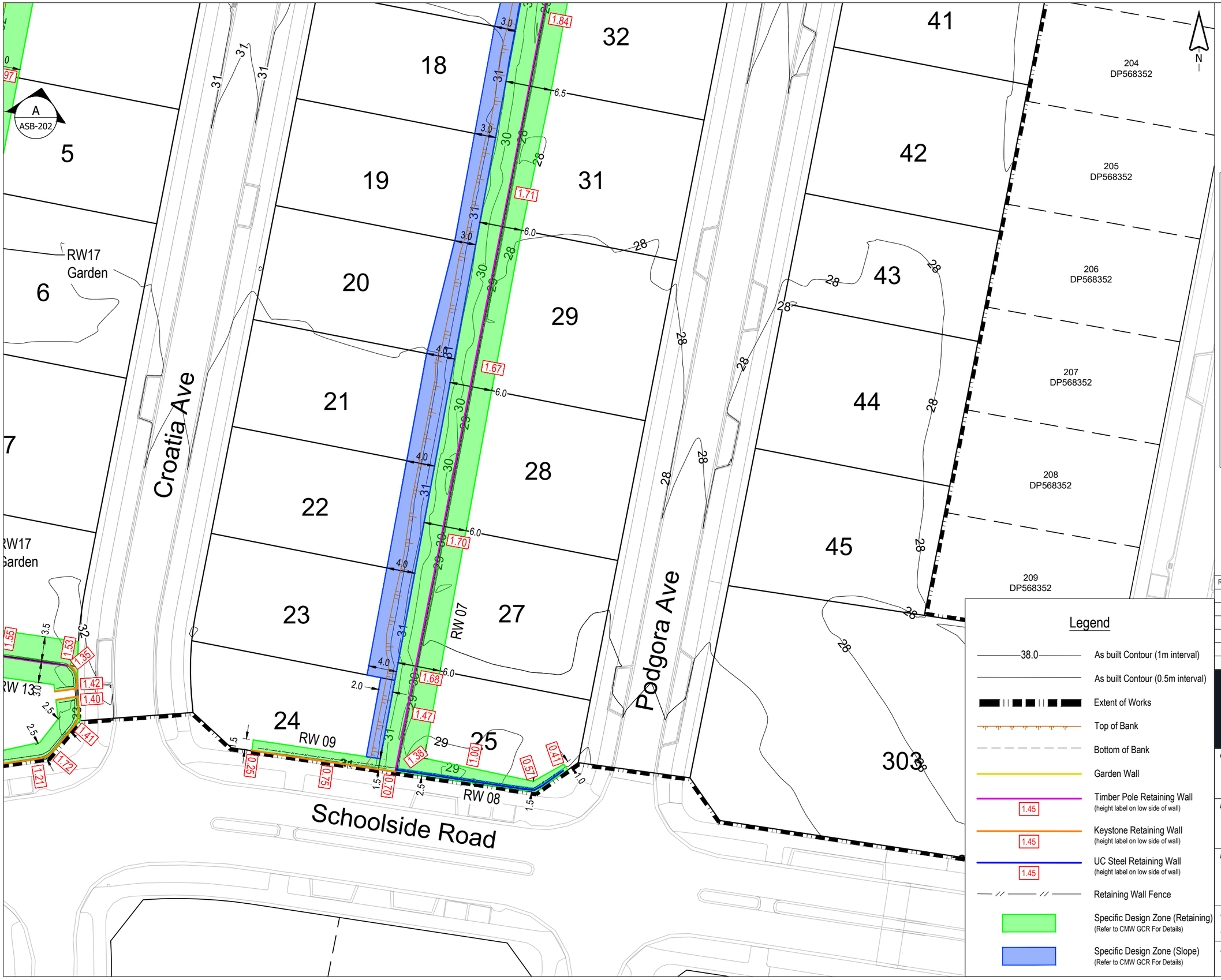
PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
FINAL CONTOURS & RETAINING WALLS
SHEET 5

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-204	1

1095-ASB-200-205 Final Contours & RW As-Built.dwg



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LAND & PROPERTY DEVELOPMENT

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Legend

- As built Contour (1m interval) — 38.0
- As built Contour (0.5m interval)
- Extent of Works
- Top of Bank
- Bottom of Bank
- Garden Wall
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ENG60422861 / LUC60413069 / SUB60413068

REV	DATE	REVISION DETAILS	ISSUED
0	19/12/24	FOR COMPLETION	KM

CAPTURE
Land Development Consultants

CLIENT
CABRA DEVELOPMENTS LIMITED

PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
FINAL CONTOURS & RETAINING WALLS
SHEET 6

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-205	0

1095-ASB-200-205 Final Contours & RW As-Built.dwg

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ENG60422861 / LUC60413069 / SUB60413068

REV	DATE	REVISION DETAILS	ISSUED
0	19/12/24	FOR COMPLETION	KM

CAPTURE
Land Development Consultants

CLIENT
CABRA DEVELOPMENTS LIMITED

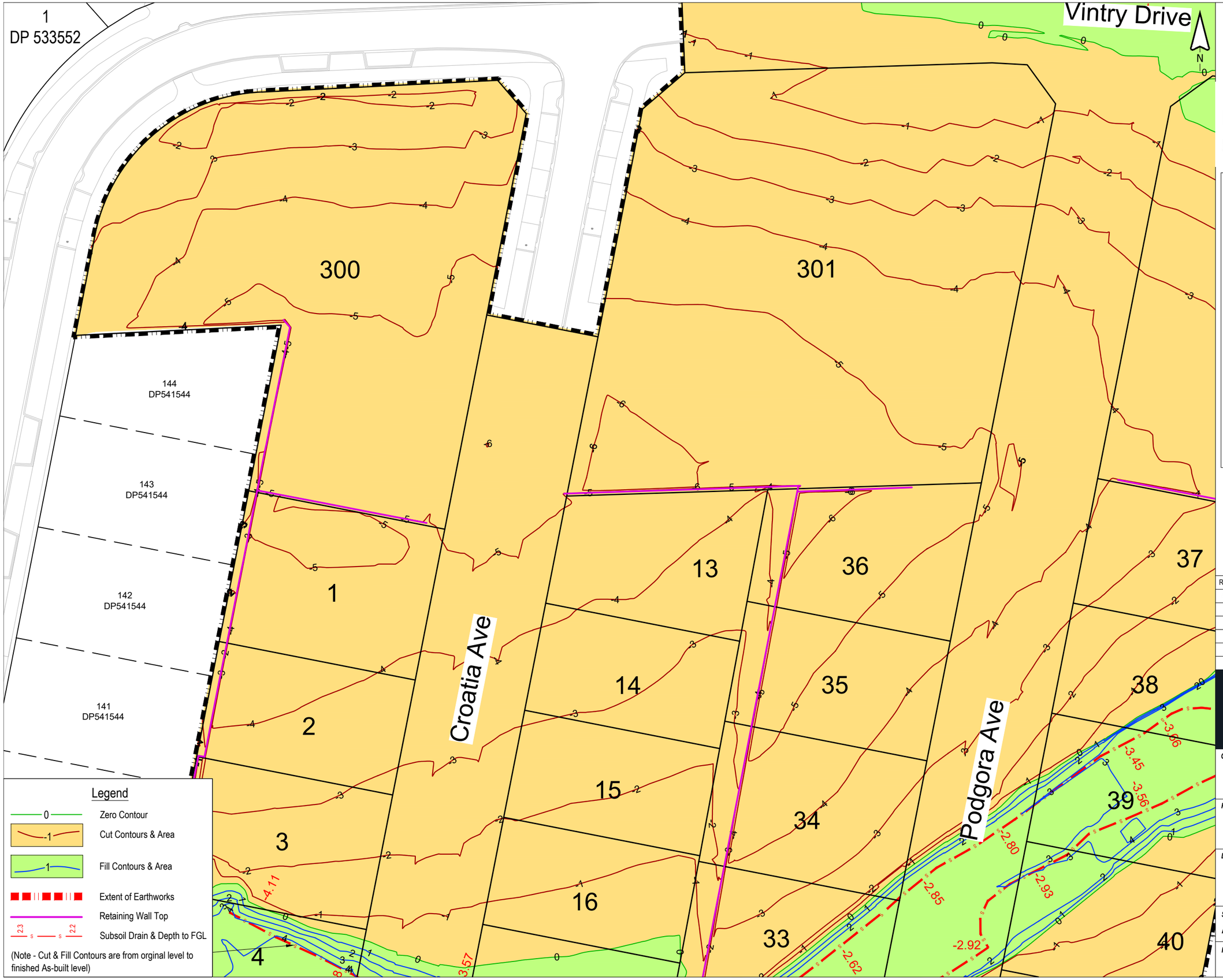
PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
CUT TO FILL LAYOUT
SHEET 1

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:1500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-210	0

1095-ASB-210-215 Cut to Fill As-Built.dwg



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Registration Number : 1500

Date: 19/12/24

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ENG60422861 / LUC60413069 / SUB60413068

REV	DATE	REVISION DETAILS	ISSUED
0	19/12/24	FOR COMPLETION	KM

CAPTURE
Land Development Consultants

CLIENT
CABRA DEVELOPMENTS LIMITED

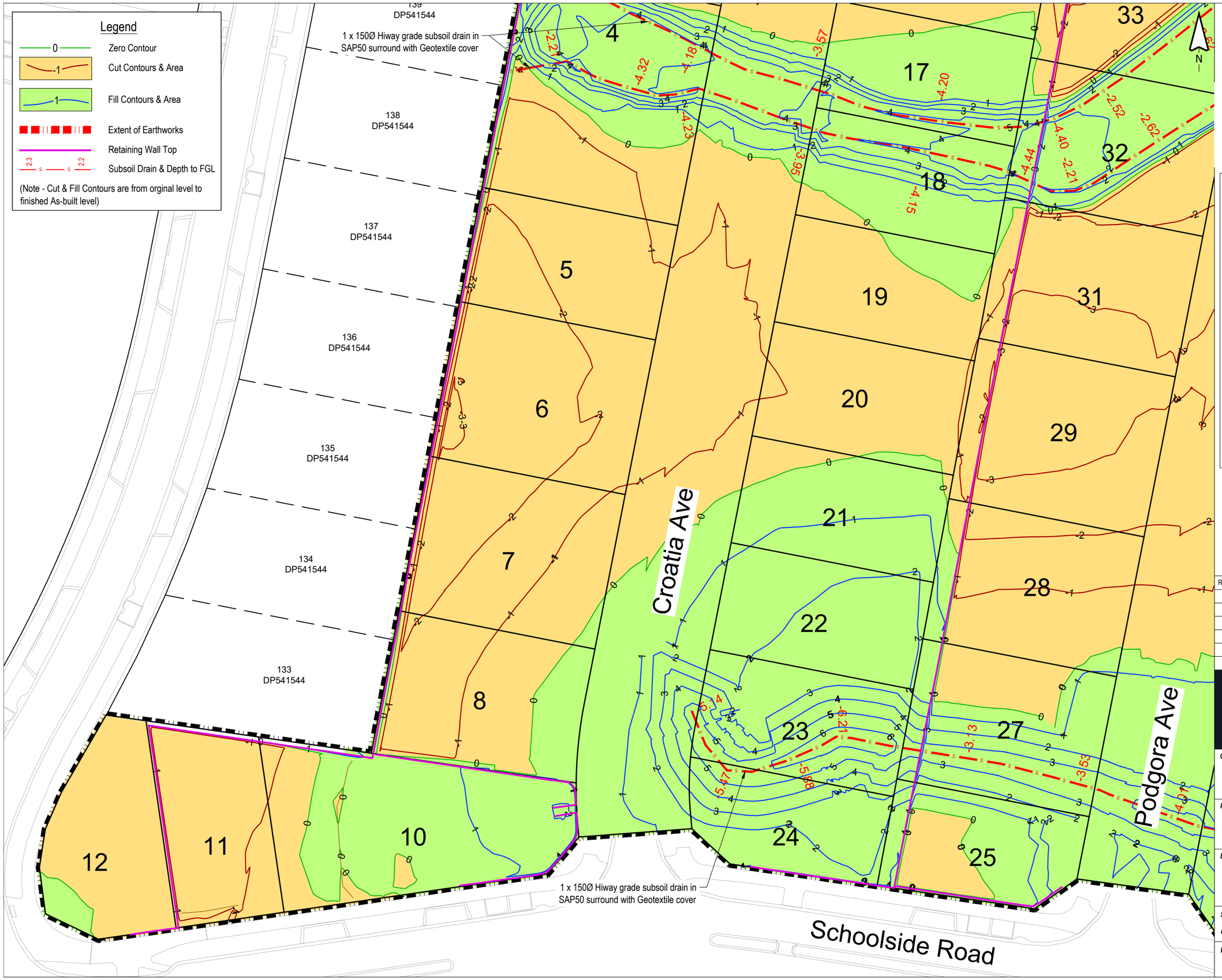
PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
CUT TO FILL LAYOUT
SHEET 2

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-211	0

1095-ASB-210-215 Cut to Fill As-Built.dwg



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LAND & PROPERTY DEVELOPMENT

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Name : Tom Lemon

Signed : _____

Registered Professional Surveyor

Registration Number : 1500

Date: 19/12/24

Contact Number: 09 906 3856

Email: Tom@captureland.nz

ENG60422861 / LUC60413069 / SUB60413068

REV	DATE	REVISION DETAILS	ISSUED
0	19/12/24	FOR COMPLETION	KM

CAPTURE
Land Development Consultants

CLIENT
CABRA DEVELOPMENTS LIMITED

PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
CUT TO FILL LAYOUT
SHEET 3

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-212	0

1095-ASB-210-215 Cut to Fill As-Built.dwg

503
DP 541544

1 x 150Ø Hiway grade subsoil drain in SAP50 surround with Geotextile cover

Subsoil connection to adjacent subdivision vested under SUB60036097-A

Vintry Drive

301

302

13

36

37

14

35

38

15

34

39

46

Croatia Ave

Podgora Ave

Babina Ave

2 x 150Ø Hiway grade subsoil drain in SAP50 surround with Geotextile cover

200
DP568352

1 x 150Ø Hiway grade subsoil drain in SAP50 surround with Geotextile cover

201
DP568352

Legend

- Zero Contour
- Cut Contours & Area
- Fill Contours & Area
- Extent of Earthworks
- Retaining Wall Top
- Subsoil Drain & Depth to FGL

(Note - Cut & Fill Contours are from orginal level to finished As-built level)

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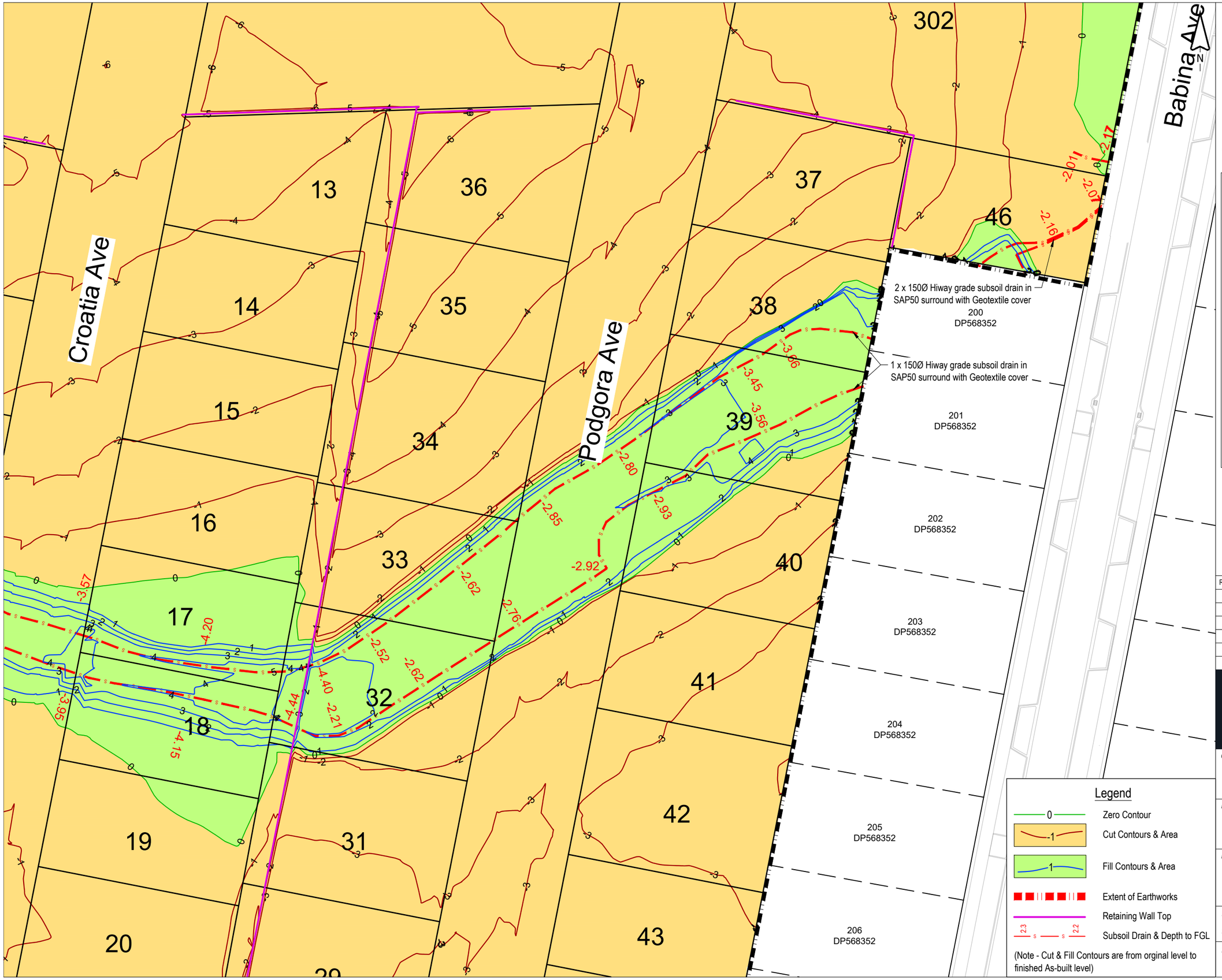
PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
CUT TO FILL LAYOUT
SHEET 4

STATUS	SCALE	SIZE
AS-BUILT	1:500	A3

PROJECT	DRAWING NO	REVISION
1095	ASB-213	0

1095-ASB-210-215 Cut to Fill As-Built.dwg



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PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
CUT TO FILL LAYOUT
SHEET 5

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-214	0

Legend

- 0 — Zero Contour
- -1 — Cut Contours & Area
- 1 — Fill Contours & Area
- Extent of Earthworks
- Retaining Wall Top
- 2.3 s s 2.2 — Subsoil Drain & Depth to FGL

(Note - Cut & Fill Contours are from orginal level to finished As-built level)

1095-ASB-210-215 Cut to Fill As-Built.dwg

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CABRA DEVELOPMENTS LIMITED

PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
CUT TO FILL LAYOUT
SHEET 6

STATUS	SCALE	SIZE
AS-BUILT	1:500	A3

PROJECT	DRAWING NO	REVISION
1095	ASB-215	0

1095-ASB-210-215 Cut to Fill As-Built.dwg

Legend

- Zero Contour
- Cut Contours & Area
- Fill Contours & Area
- Extent of Earthworks
- Retaining Wall Top
- Subsoil Drain & Depth to FGL

(Note - Cut & Fill Contours are from orginal level to finished As-built level)

N

Croatia Ave

Podgora Ave

Schoolside Road

1 x 150Ø Hiway grade subsoil drain in SAP50 surround with Geotextile cover

1 x 150Ø Hiway grade subsoil drain in SAP50 surround with Geotextile cover

204 DP568352

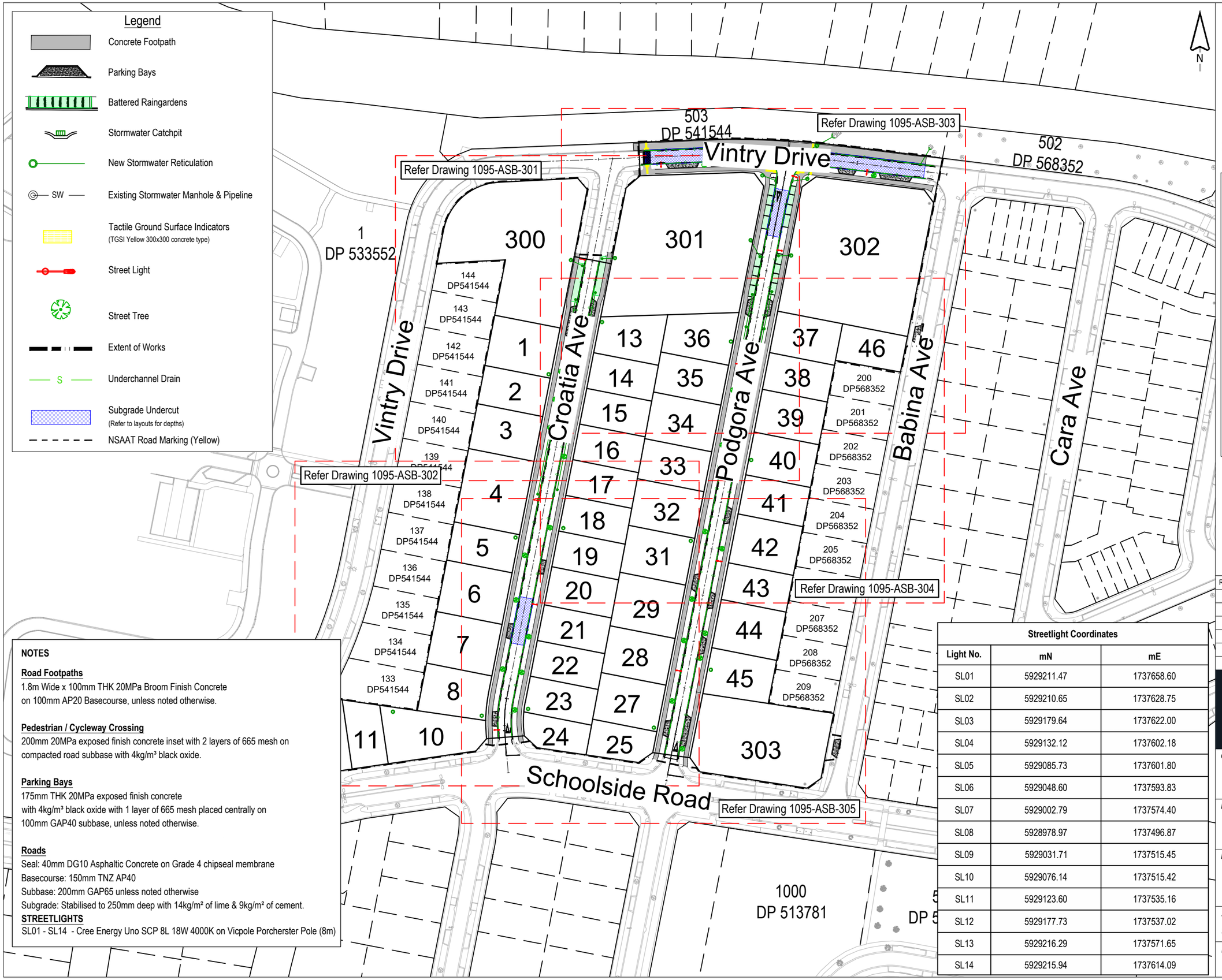
205 DP568352

206 DP568352

207 DP568352

208 DP568352

209 DP568352



NOTES

Road Footpaths
1.8m Wide x 100mm THK 20MPa Broom Finish Concrete
on 100mm AP20 Basecourse, unless noted otherwise.

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100mm GAP40 subbase, unless noted otherwise.

Roads
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Basecourse: 150mm TNZ AP40
Subbase: 200mm GAP65 unless noted otherwise
Subgrade: Stabilised to 250mm deep with 14kg/m² of lime & 9kg/m² of cement.

STREETLIGHTS
SL01 - SL14 - Cree Energy Uno SCP 8L 18W 4000K on Vicpole Porcherster Pole (8m)

Streetlight Coordinates

Light No.	mN	mE
SL01	5929211.47	1737658.60
SL02	5929210.65	1737628.75
SL03	5929179.64	1737622.00
SL04	5929132.12	1737602.18
SL05	5929085.73	1737601.80
SL06	5929048.60	1737593.83
SL07	5929002.79	1737574.40
SL08	5928978.97	1737496.87
SL09	5929031.71	1737515.45
SL10	5929076.14	1737515.42
SL11	5929123.60	1737535.16
SL12	5929177.73	1737537.02
SL13	5929216.29	1737571.65
SL14	5929215.94	1737614.09

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REV	DATE	REVISION DETAILS	ISSUED
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CAPTURE
Land Development Consultants

CLIENT
CABRA DEVELOPMENTS LIMITED

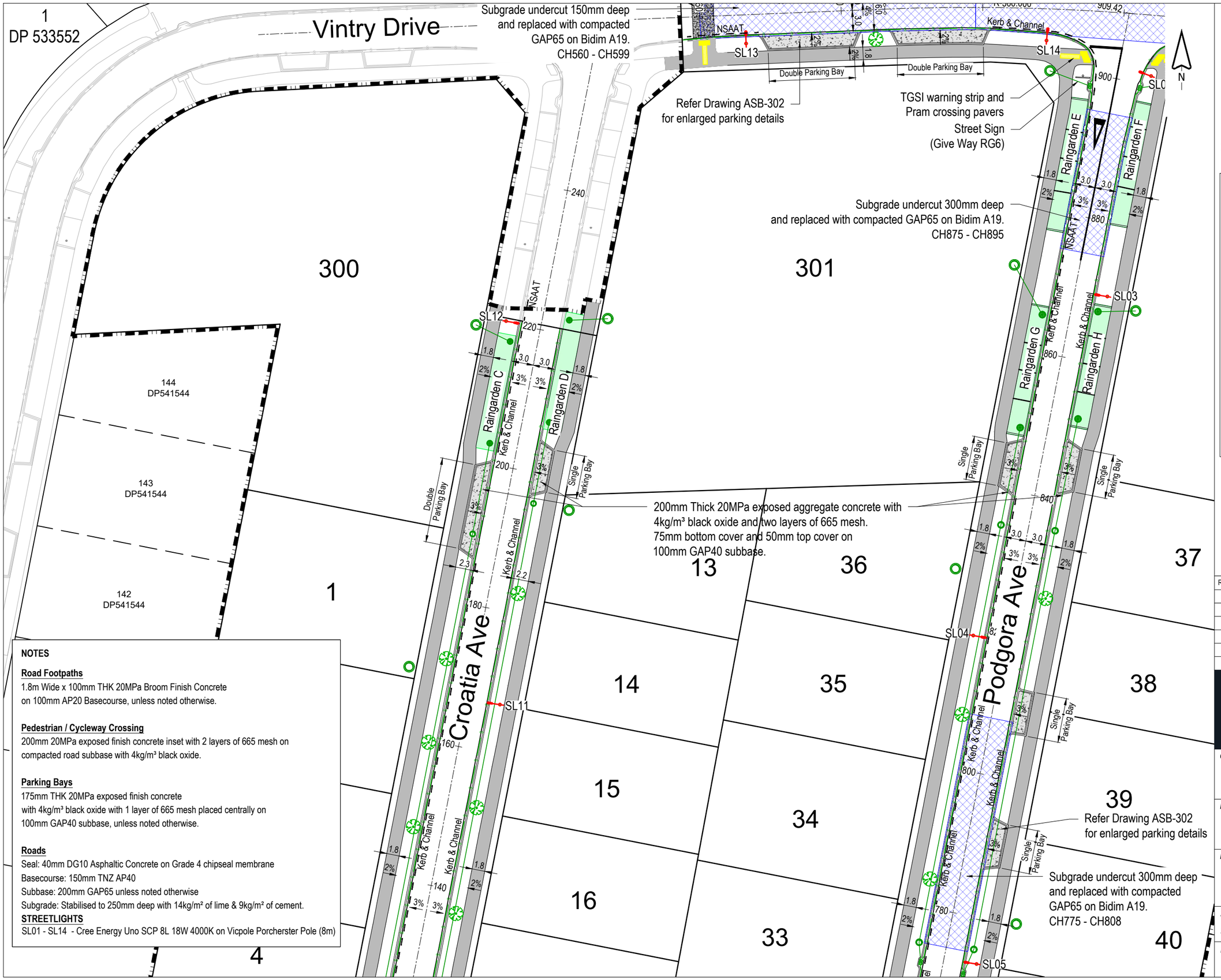
PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
ROADING
SHEET 1

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-300	0

1095-ASB-300-305 Roading As-Built.dwg



NOTES

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Roads
Seal: 40mm DG10 Asphaltic Concrete on Grade 4 chipseal membrane
Basecourse: 150mm TNZ AP40
Subbase: 200mm GAP65 unless noted otherwise
Subgrade: Stabilised to 250mm deep with 14kg/m² of lime & 9kg/m² of cement.

STREETLIGHTS
SL01 - SL14 - Cree Energy Uno SCP 8L 18W 4000K on Vicpole Porcherster Pole (8m)

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NOTE:
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ENG60422861 / LUC60413069 / SUB60413068

REV	DATE	REVISION DETAILS	ISSUED
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CAPTURE
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CABRA DEVELOPMENTS LIMITED

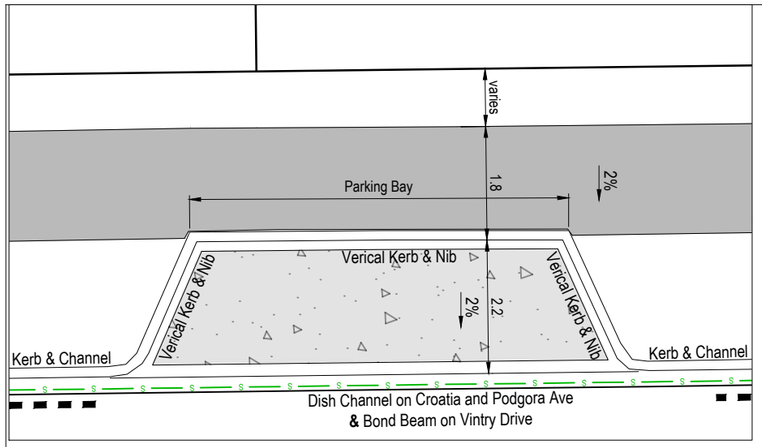
PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
ROADING
SHEET 2

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-301	0

1095-ASB-300-305 Roading As-Built.dwg



1 / - ENLARGED PARKING DETAIL

Scale: 1:100

136 DP541544

135 DP541544

134 DP541544

4 5 6 7 8 10

17 18 19 20 21 22 23 24 25

33 32 31 29 28 27

SL10 SL09 SL08 SL07

120 100 80 60 40 20 0.0

NSAAT Kerb & Channel

Single Parking Bay

3% 2% 1.8 3.0 3.0

Subgrade undercut by 250mm
and replaced with compacted GAP65 on Bidim A19.

TP31.492 TP17.898

R50.050

Croatia Ave

Podgora Ave

Schoolside Road

700 680 660 640

N

NOTES

Road Footpaths
1.8m Wide x 100mm THK 20MPa Broom Finish Concrete
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STREETLIGHTS
SL01 - SL14 - Cree Energy Uno SCP 8L 18W 4000K on Vicpole Porcherster Pole (8m)

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LAND & PROPERTY DEVELOPMENT

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NOTE:
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ENG60422861 / LUC60413069 / SUB60413068

REV	DATE	REVISION DETAILS	ISSUED
0	19/12/24	FOR COMPLETION	KM

CAPTURE
Land Development Consultants

CLIENT
CABRA DEVELOPMENTS LIMITED

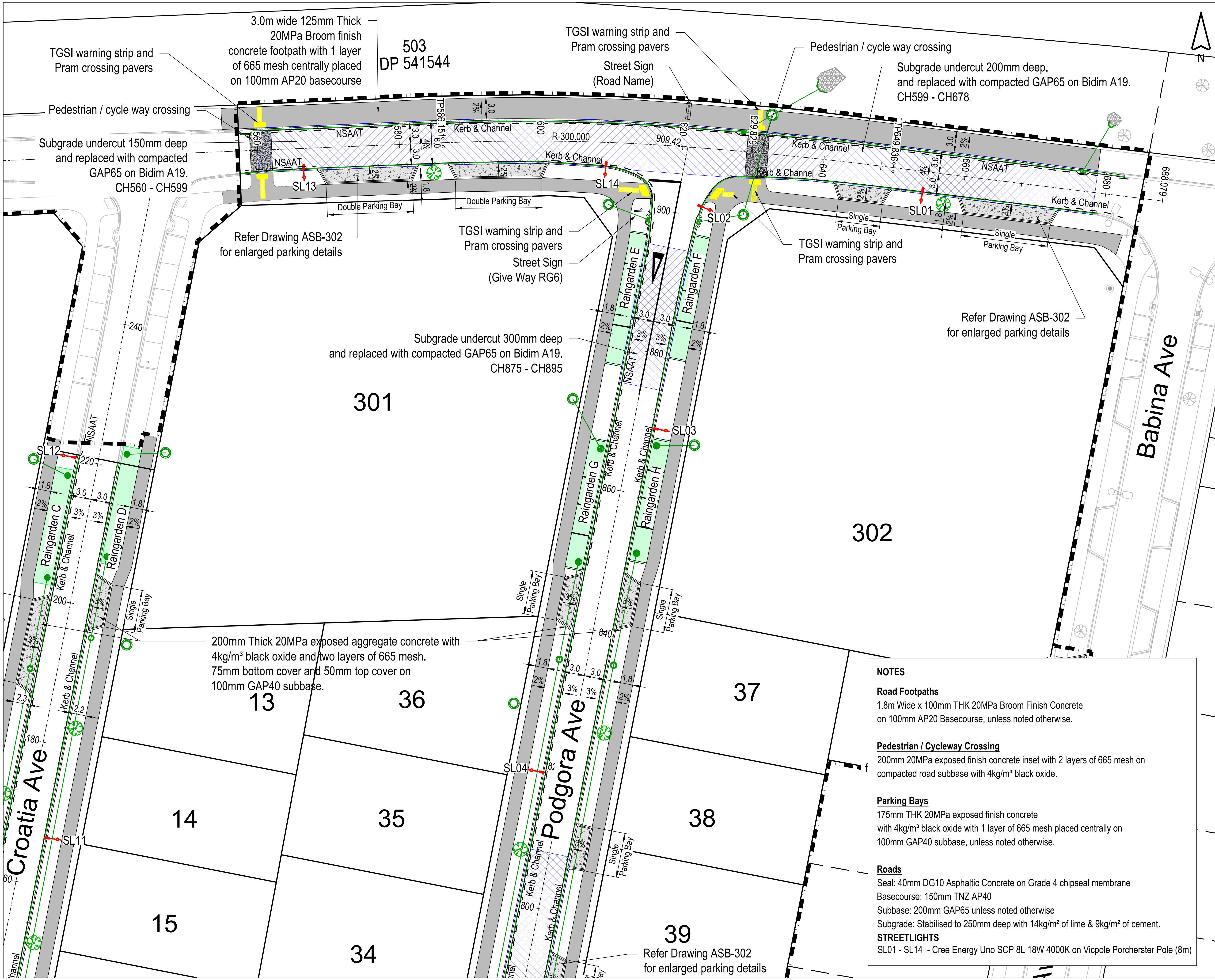
PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
ROADING
SHEET 3

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-302	0

1095-ASB-300-305 Roading As-Built.dwg



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NOTES

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1.8m Wide x 100mm THK 20MPa Broom Finish Concrete on 100mm AP20 Basecourse, unless noted otherwise.

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Roads
Seal: 40mm DG10 Asphaltic Concrete on Grade 4 chipseal membrane
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Subbase: 200mm GAP65 unless noted otherwise
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STREETLIGHTS
SL01 - SL14 - Cree Energy Uno SCP 8L 18W 4000K on Vicpole Porcherster Pole (8m)

REV	DATE	REVISION DETAILS	ISSUED
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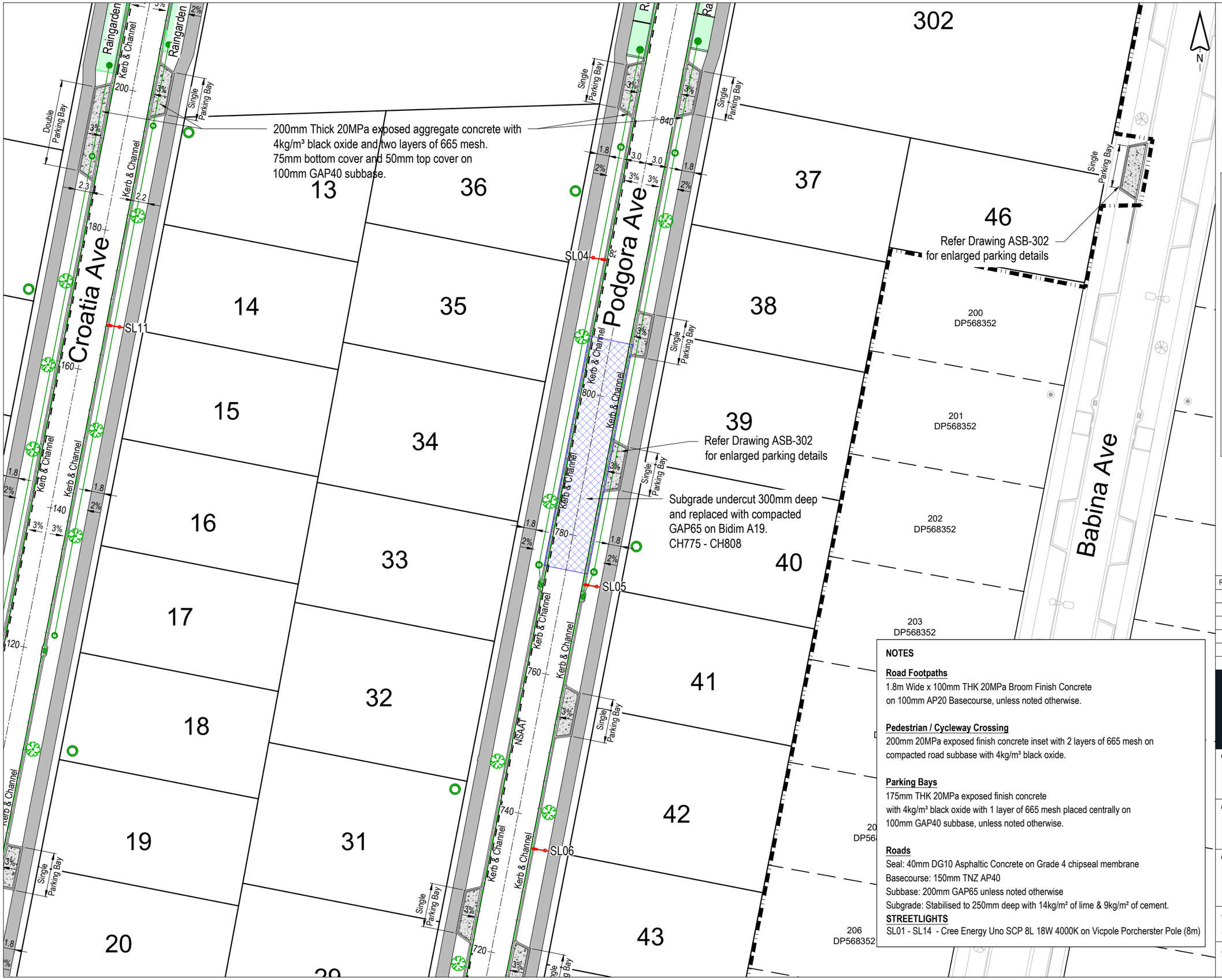
CLIENT: CABRA DEVELOPMENTS LIMITED

PROJECT: 31 SCHOOLSIDE ROAD HUAPAI

DRAWING TITLE: AS-BUILT ROADING SHEET 4

STATUS	SCALE	SIZE
AS-BUILT	1:500	A3

PROJECT	DRAWING NO	REVISION
1095	ASB-303	0



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REV	DATE	REVISION DETAILS	ISSUED
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1.8m Wide x 100mm THK 20MPa Broom Finish Concrete on 100mm AP20 Basecourse, unless noted otherwise.

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STREETLIGHTS
SL01 - SL14 - Cree Energy Uno SCP 8L 18W 4000K on Vicpole Porcherster Pole (8m)

CAPTURE
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CABRA DEVELOPMENTS LIMITED

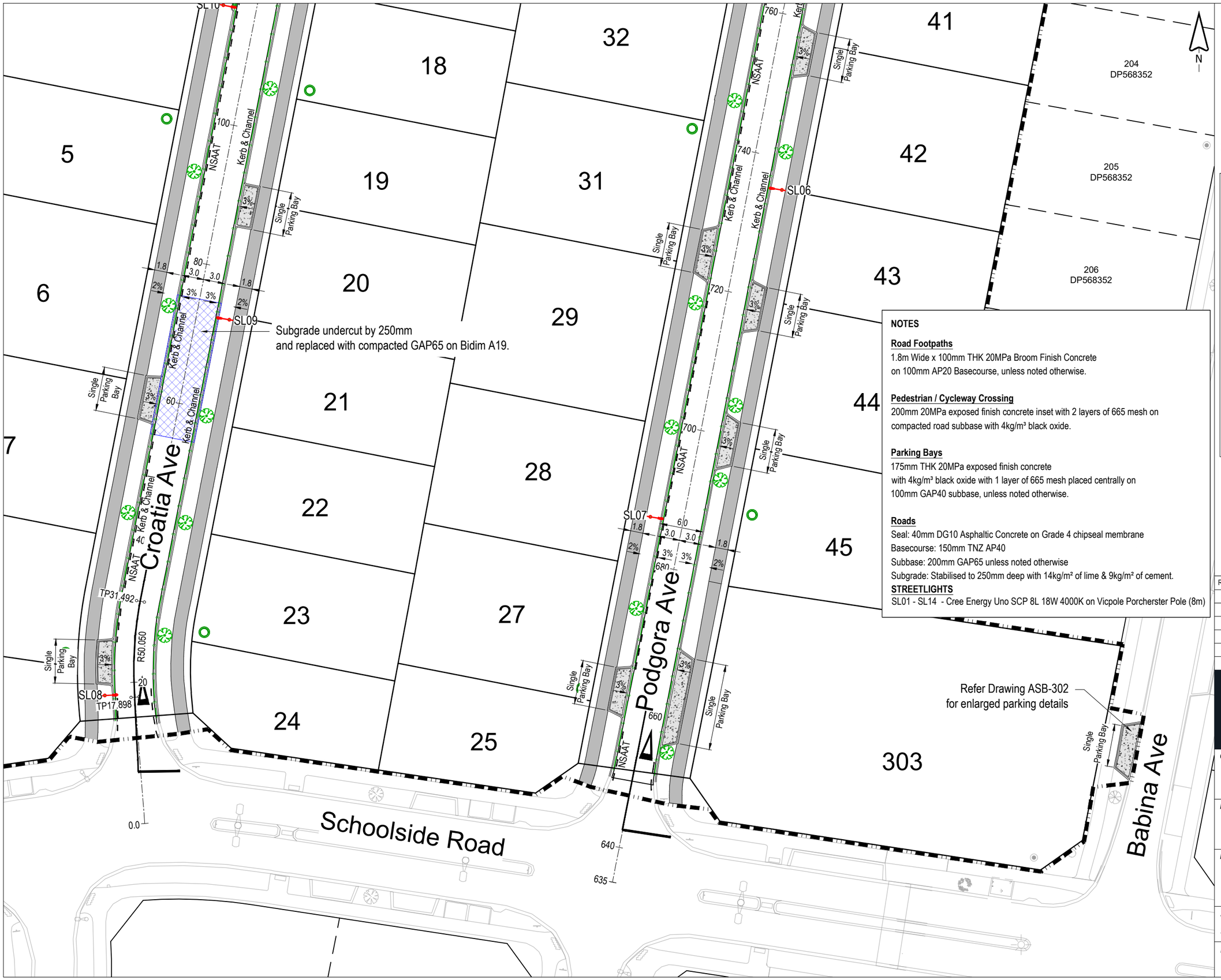
PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
ROADING
SHEET 5

STATUS	SCALE	SIZE
AS-BUILT	1:500	A3

PROJECT	DRAWING NO	REVISION
1095	ASB-304	0

1095-ASB-300-305 Roading As-Built.dwg



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STREETLIGHTS
SL01 - SL14 - Cree Energy Uno SCP 8L 18W 4000K on Vicpole Porcherster Pole (8m)

NOTE:
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PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
ROADING
SHEET 6

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-305	0

1095-ASB-300-305 Roading As-Built.dwg

Legend

- Battered Raingardens (Public)
- Stormwater Catchpit
- New Stormwater Manhole & Pipeline (Public)
- Scruffy Dome Manhole
- U — Raingarden Drainage
- SW — Existing Stormwater Manhole & Pipeline
- Street Tree
- Extent of Works
- S — Underchannel Drain
- R — Retaining Wall Drainage (Private)
- Retaining Wall Ø300 Catchpit (Private)
- Rock Rip Rap
- Lot Connection

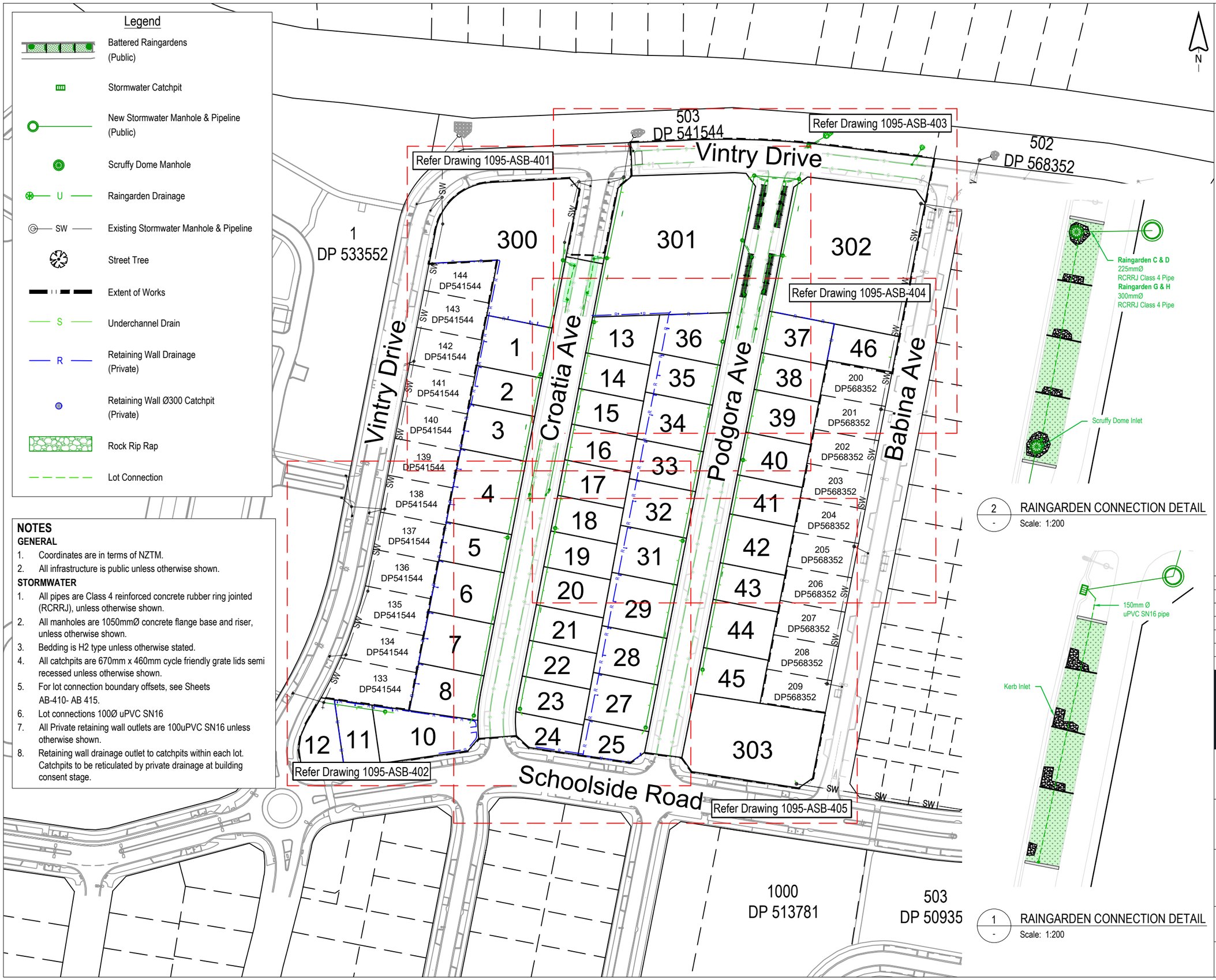
NOTES

GENERAL

1. Coordinates are in terms of NZTM.
2. All infrastructure is public unless otherwise shown.

STORMWATER

1. All pipes are Class 4 reinforced concrete rubber ring jointed (RCRRJ), unless otherwise shown.
2. All manholes are 1050mmØ concrete flange base and riser, unless otherwise shown.
3. Bedding is H2 type unless otherwise stated.
4. All catchpits are 670mm x 460mm cycle friendly grate lids semi recessed unless otherwise shown.
5. For lot connection boundary offsets, see Sheets AB-410- AB 415.
6. Lot connections 100Ø uPVC SN16
7. All Private retaining wall outlets are 100uPVC SN16 unless otherwise shown.
8. Retaining wall drainage outlet to catchpits within each lot. Catchpits to be reticulated by private drainage at building consent stage.



2 - RAINGARDEN CONNECTION DETAIL
Scale: 1:200

1 - RAINGARDEN CONNECTION DETAIL
Scale: 1:200

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LAND & PROPERTY DEVELOPMENT

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Signed : _____
Registered Professional Surveyor

Registration Number : 1500

Date: 19/12/2024

Contact Number: 09 906 3856

Email: Tom@captureland.nz

ENG60422861 / LUC60413069 / SUB60413068

REV	DATE	REVISION DETAILS	ISSUED
0	19/12/24	FOR COMPLETION	KM

CAPTURE
Land Development Consultants

CLIENT
CABRA DEVELOPMENTS LIMITED

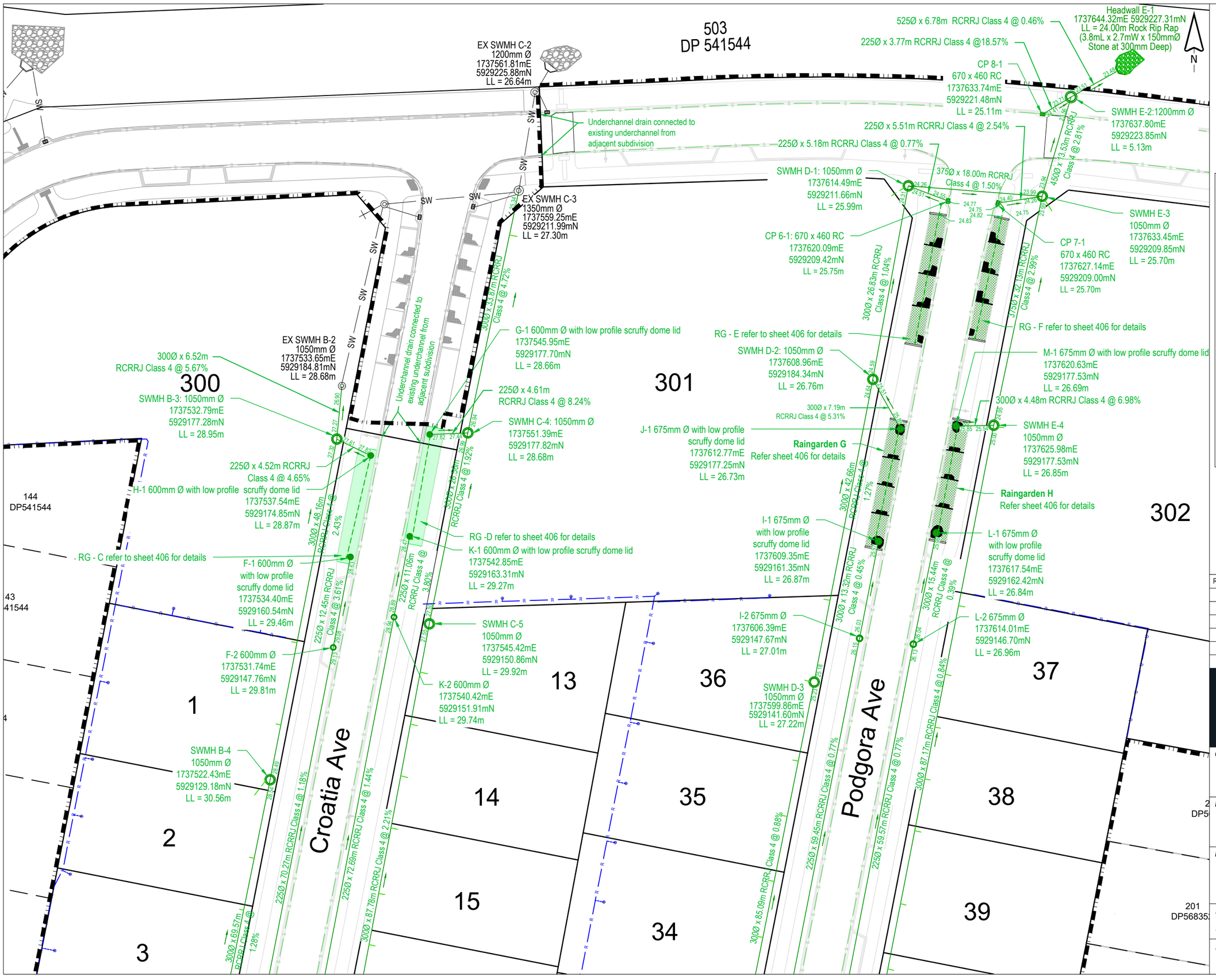
PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
STORMWATER RETICULATION
SHEET 1

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:1500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-400	0

1095-ASB-400-406 Stormwater As-Built.dwg



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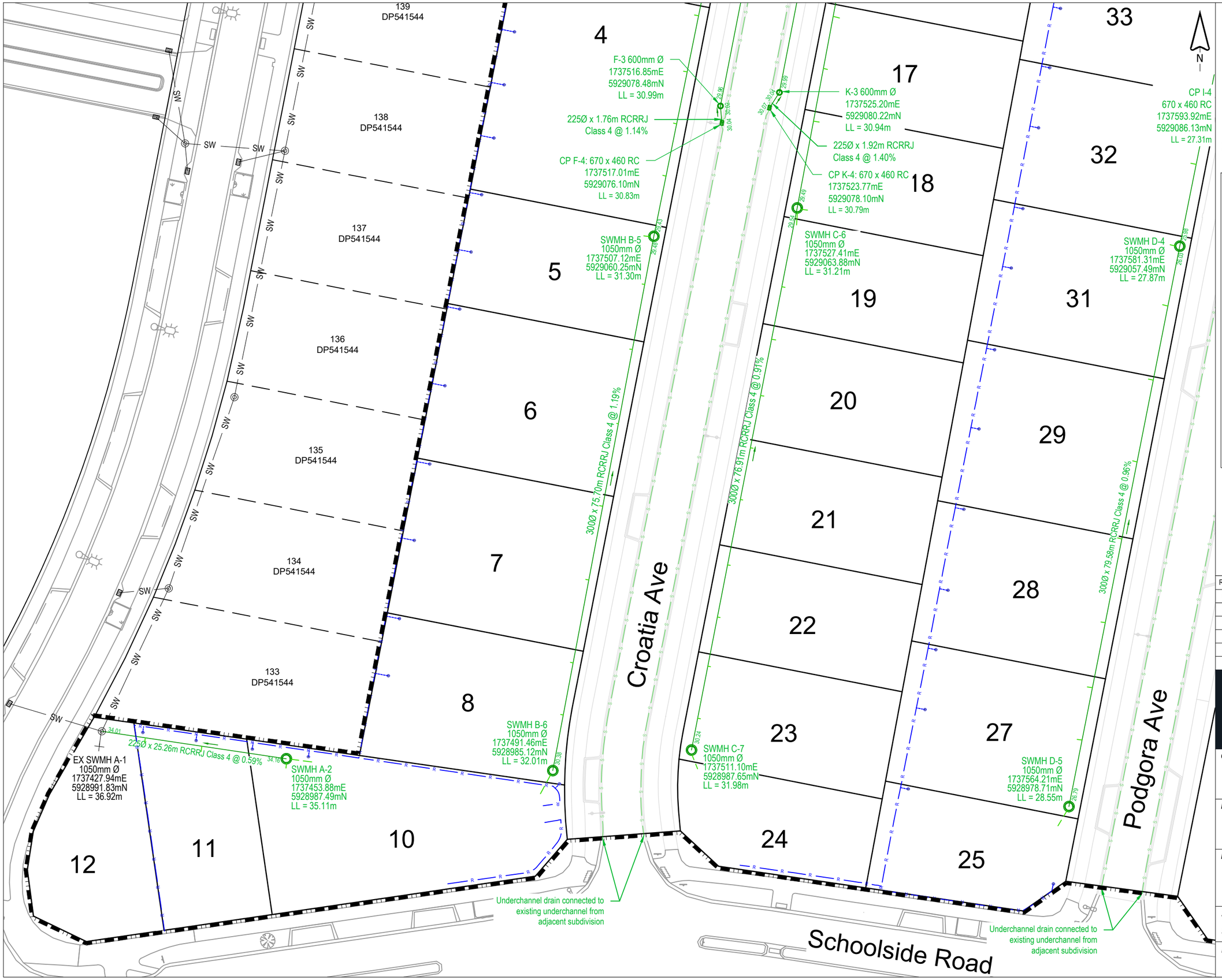
PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
STORMWATER RETICULATION
SHEET 2

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-401	0

1095-ASB-400-406 Stormwater As-Built.dwg



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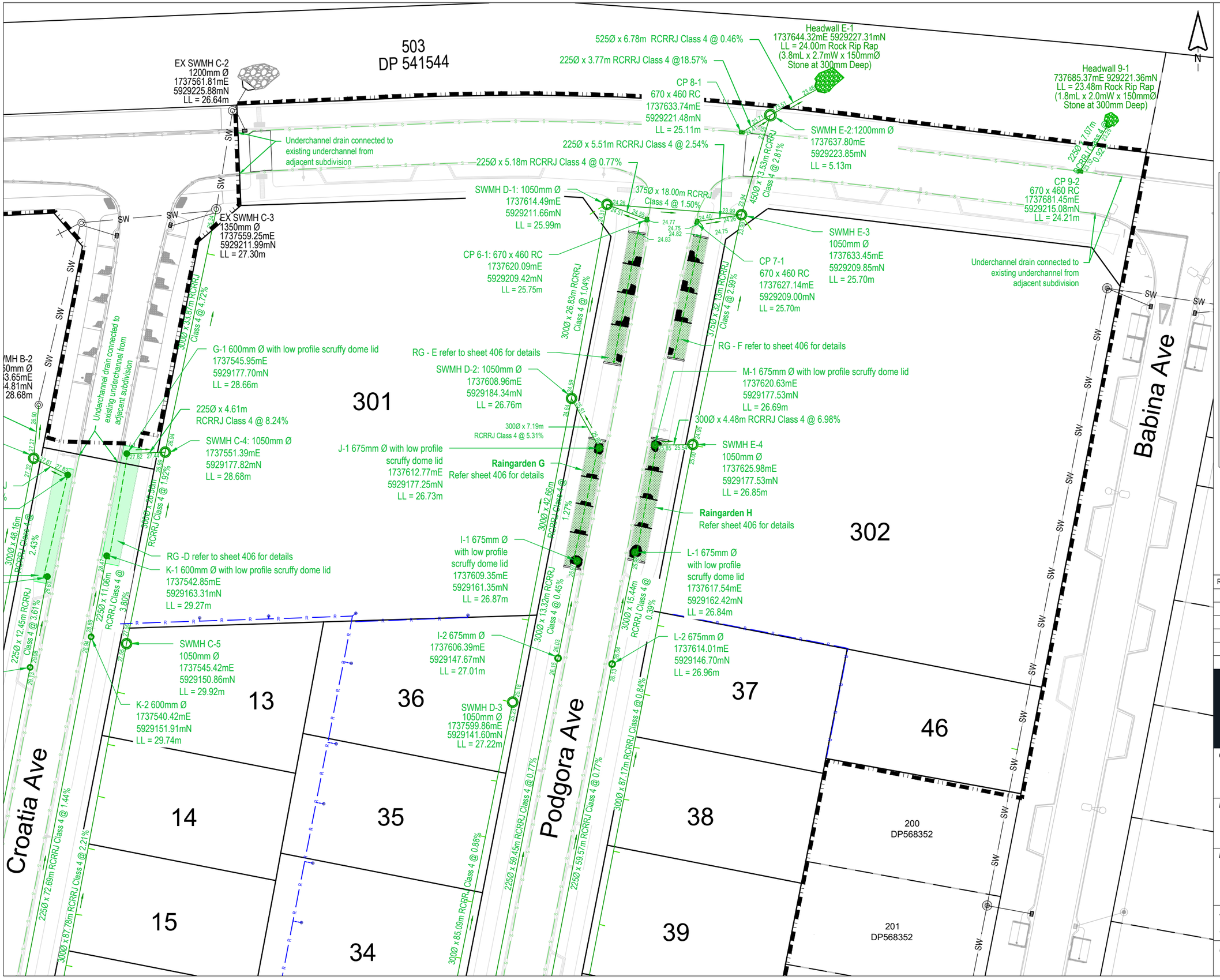
HUAPAI

DRAWING TITLE
AS-BUILT
STORMWATER RETICULATION
SHEET 3

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-402	0

1095-ASB-400-406 Stormwater As-Built.dwg



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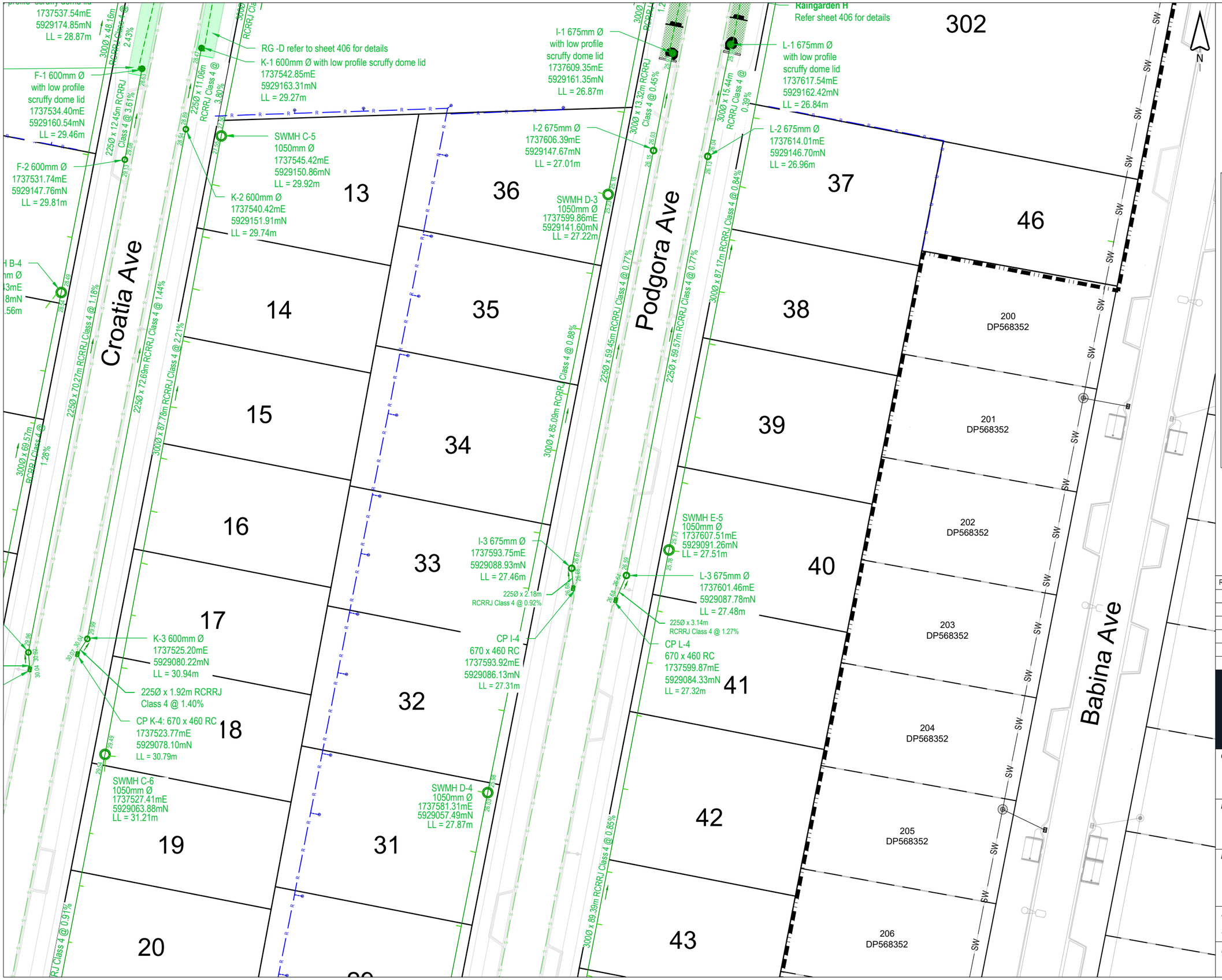
HUAPAI

DRAWING TITLE
AS-BUILT
STORMWATER RETICULATION
SHEET 4

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-403	0

1095-ASB-400-406 Stormwater As-Built.dwg



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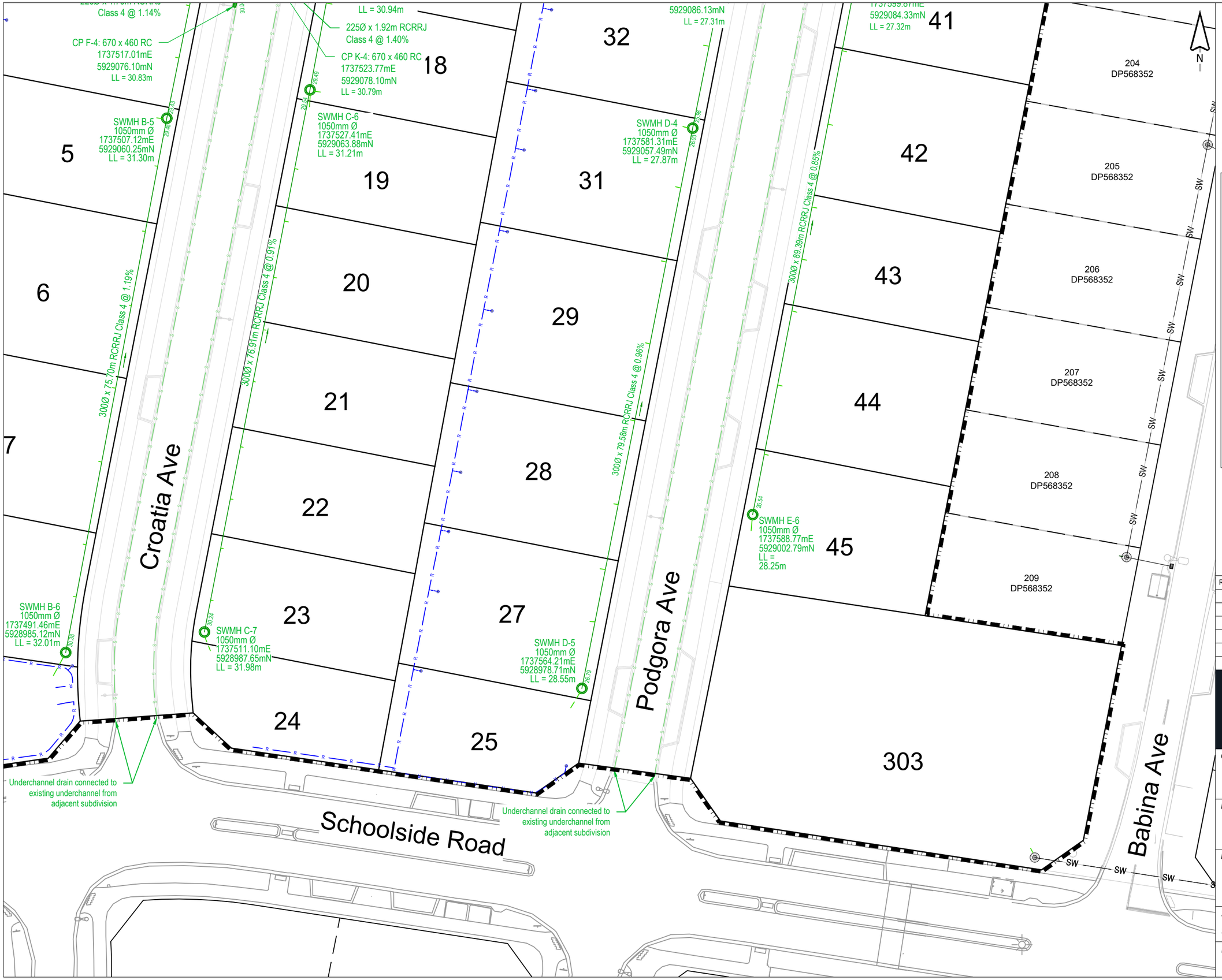
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
STORMWATER RETICULATION
SHEET 5

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-404	0

1095-ASB-400-406 Stormwater As-Built.dwg



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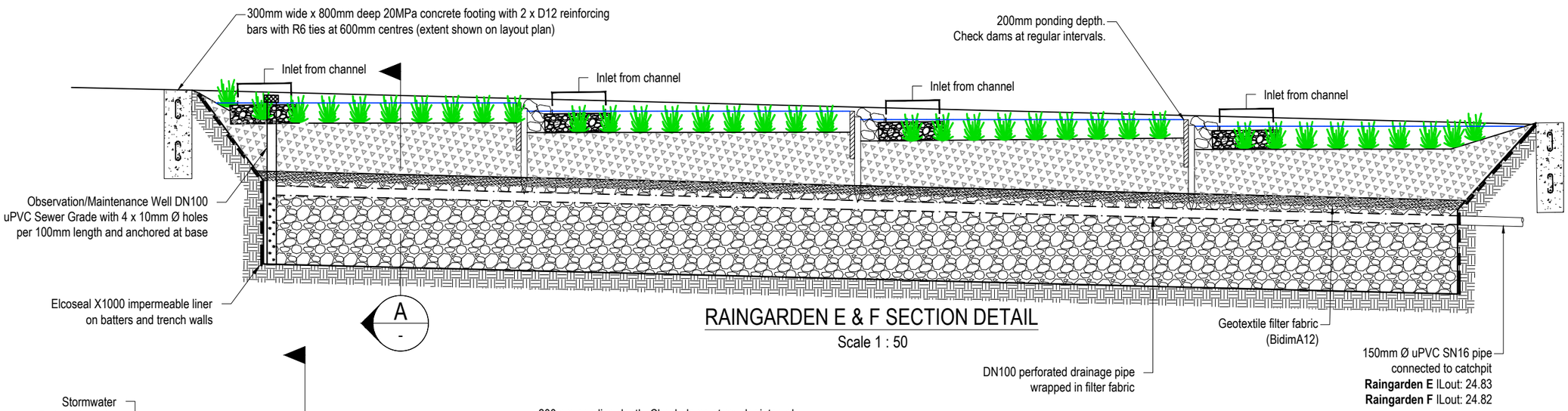
PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
STORMWATER RETICULATION
SHEET 6

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

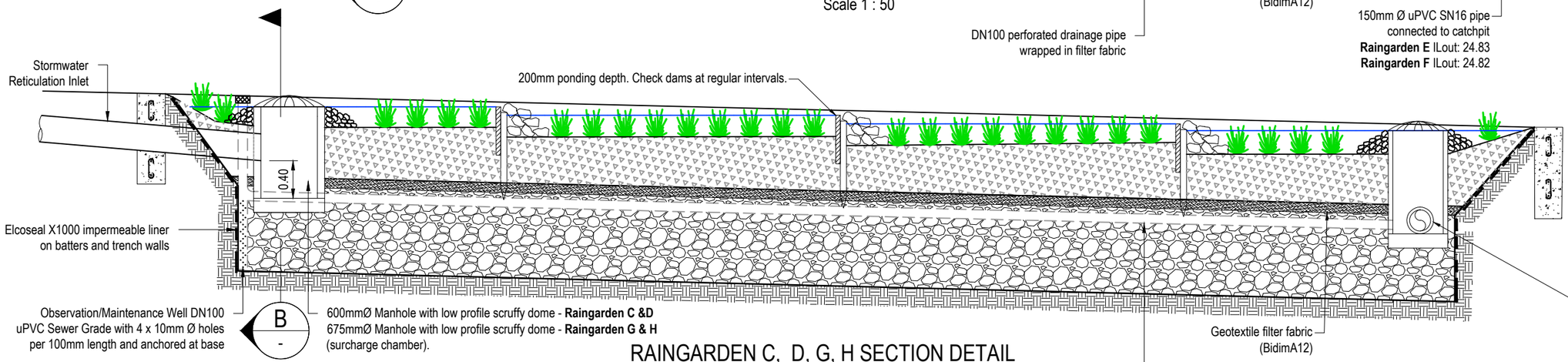
PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-405	0

1095-ASB-400-406 Stormwater As-Built.dwg



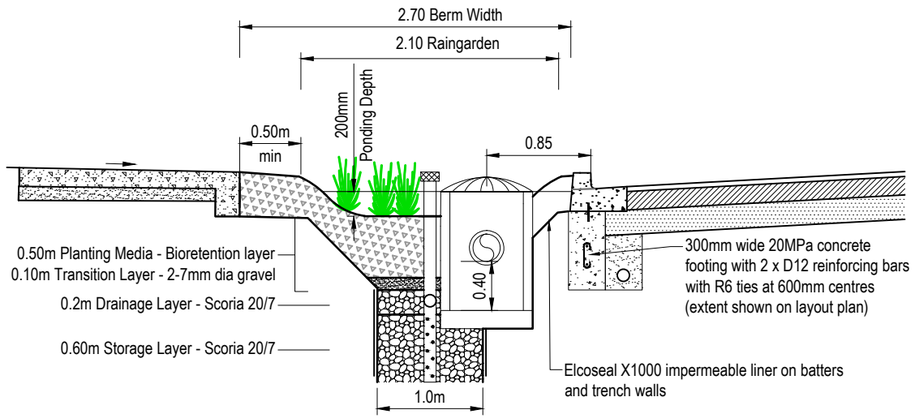
RAINGARDEN E & F SECTION DETAIL

Scale 1 : 50



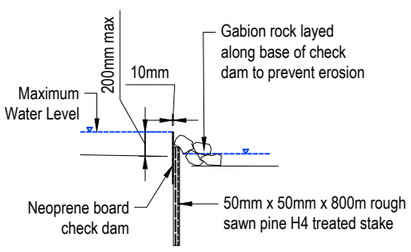
RAINGARDEN C, D, G, H SECTION DETAIL

Scale 1 : 50



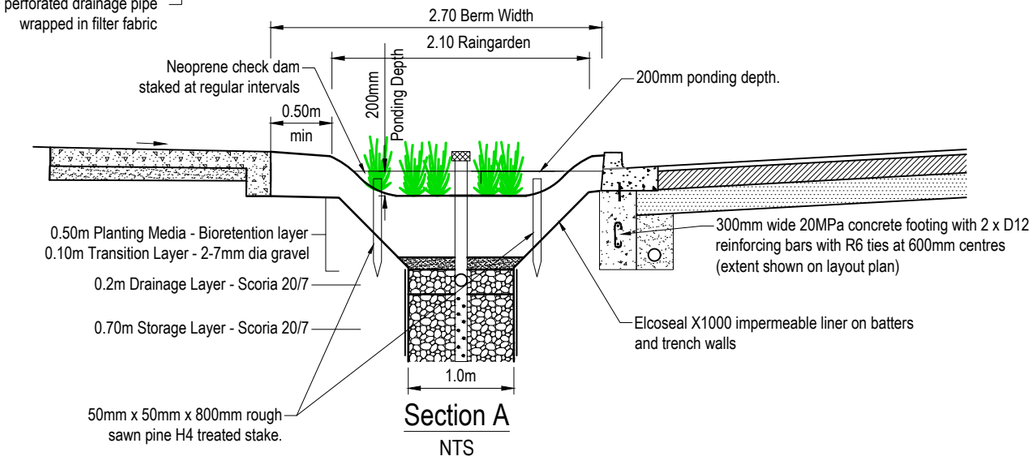
Section B

NTS



Check Dam Detail

Scale 1:50



Section A

NTS

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CLIENT: CABRA LAND & PROPERTY DEVELOPMENT

CABRA DEVELOPMENTS LIMITED

PROJECT: 31 SCHOOLSIDE ROAD HUAPAI

CAPTURE Land Development Consultants

REV	DATE	REVISION DETAILS	ISSUED
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DRAWING TITLE: AS-BUILT STORMWATER RAINGARDEN DETAILS

STATUS	SCALE	SIZE
AS-BUILT	1:50	A3

PROJECT NO	DRAWING NO	REVISION
1095	ASB-406	0

1095-ASB-400-406 Stormwater As-Built.dwg

Legend

- Stormwater Catchpit
- New Stormwater Manhole & Pipeline (Public)
- SW — Existing Stormwater Manhole & Pipeline
- Extent of Works
- Stormwater Zone of Influence (see CMW Geotechnical Completion Report for details)

North Auckland Railway

503 DP 541544

Refer Drawing 1095-ASB-421

Refer Drawing 1095-ASB-423

Vintry Drive

502 DP 568352

1 DP 533552

300

301

302

Refer Drawing 1095-ASB-424

144 DP541544
143 DP541544
142 DP541544
141 DP541544
140 DP541544
139 DP541544
138 DP541544
137 DP541544
136 DP541544
135 DP541544
134 DP541544
133 DP541544

1
2
3
4
5
6
7
8
10
11
12

Vintry Drive

Croatia Ave

13
14
15
16
17
18
19
20
21
22
23
24
25

36
35
34
33
32
31
29
28
27

Podgora Ave

37
38
39
40
41
42
43
44
45

46

200 DP568352
201 DP568352
202 DP568352
203 DP568352
204 DP568352
205 DP568352
206 DP568352
207 DP568352
208 DP568352
209 DP568352

Babina Ave

Cara Ave

303

501 DP 568352

Refer Drawing 1095-ASB-422

Schoolside Road

Refer Drawing 1095-ASB-425

1000 DP 513781

503 DP 509358

500 DP 514952

SW

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PROJECT
31 SCHOOLSIDE ROAD HUAPAI

DRAWING TITLE
AS-BUILT STORMWATER ZONE OF INFLUENCE SHEET 1

STATUS	SCALE	SIZE
AS-BUILT	1:1500	A3

PROJECT	DRAWING NO	REVISION
1095	ASB-420	0

1095-ASB-420-425 Stormwater ZOI As-Built.dwg

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31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
STORMWATER ZONE OF INFLUENCE
SHEET 2

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-421	0

1095-ASB-420-425 Stormwater ZOI As-Built.dwg

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DRAWING TITLE
AS-BUILT
STORMWATER ZONE OF INFLUENCE
SHEET 3

STATUS	SCALE	SIZE
AS-BUILT	1:500	A3

PROJECT	DRAWING NO	REVISION
1095	ASB-422	0

1095-ASB-420-425 Stormwater ZOI As-Built.dwg

503
DP 541544

Vintry Drive

301

302

13

36

14

35

15

34

37

38

39

46

200
DP568352

201
DP568352

Croatia Ave

Podgora Ave

Babina Ave

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Legend

- Stormwater Catchpit
- New Stormwater Manhole & Pipeline (Public)
- SW — Existing Stormwater Manhole & Pipeline
- Extent of Works
- Stormwater Zone of Influence (see CMW Geotechnical Completion Report for details)

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31 SCHOOLSIDE ROAD
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DRAWING TITLE
AS-BUILT
STORMWATER ZONE OF INFLUENCE
SHEET 4

STATUS	SCALE	SIZE
AS-BUILT	1:500	A3

PROJECT	DRAWING NO	REVISION
1095	ASB-423	0

1095-ASB-420-425 Stormwater ZOI As-Built.dwg

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DRAWING TITLE
AS-BUILT
STORMWATER ZONE OF INFLUENCE
SHEET 5

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-424	0

1095-ASB-420-425 Stormwater ZOI As-Built.dwg

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DRAWING TITLE
AS-BUILT
STORMWATER ZONE OF INFLUENCE
SHEET 6

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-425	0

1095-ASB-420-425 Stormwater ZOI As-Built.dwg

Legend

	Existing	As Built
PWC Pipe (Ø)	63	63
Reducer		
Flushing Pit	FP	FP
Isolation Valve		
Boundary Kit		
Manifold Box		

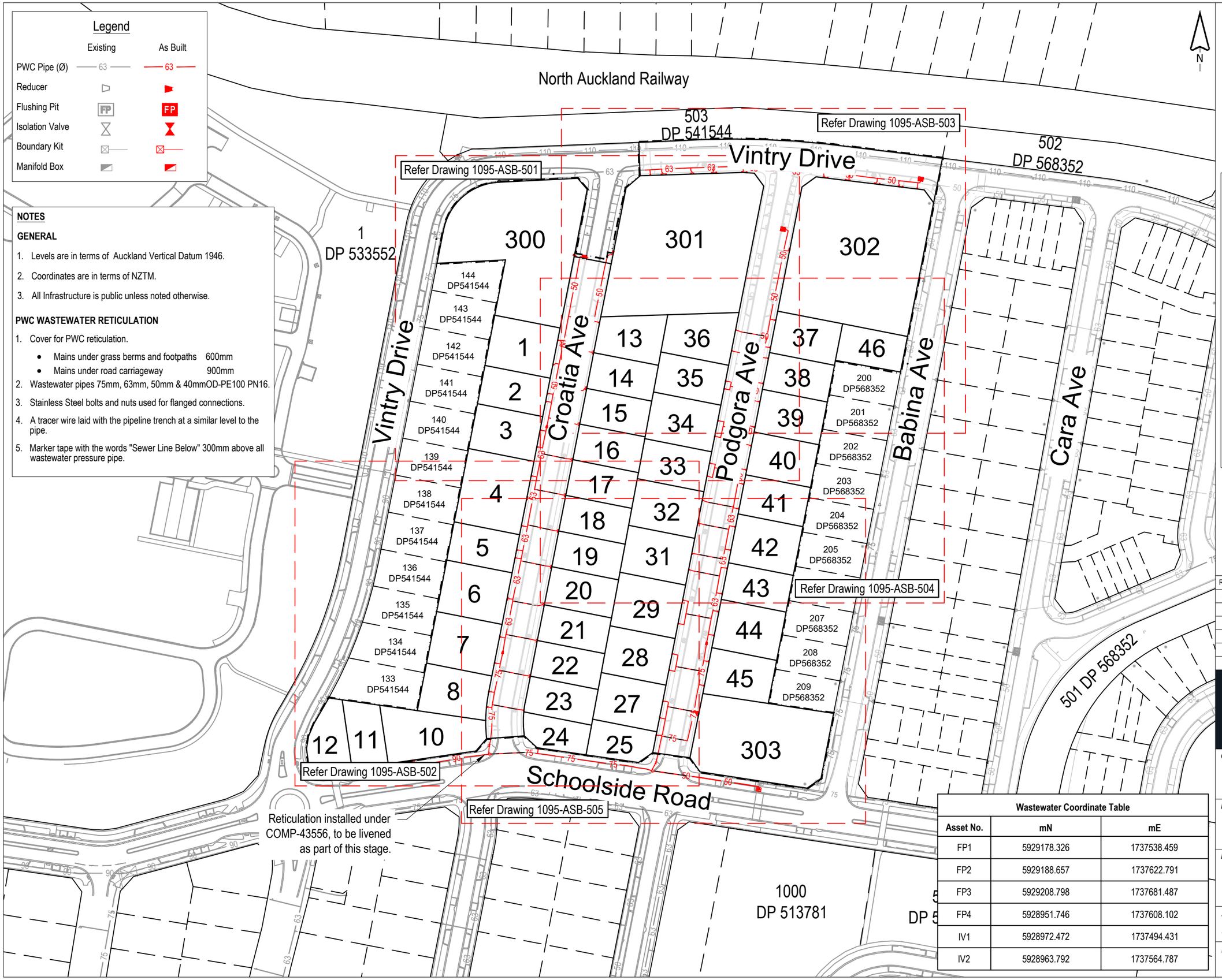
NOTES

GENERAL

1. Levels are in terms of Auckland Vertical Datum 1946.
2. Coordinates are in terms of NZTM.
3. All Infrastructure is public unless noted otherwise.

PWC WASTEWATER RETICULATION

1. Cover for PWC reticulation.
   - Mains under grass berms and footpaths 600mm
   - Mains under road carriageway 900mm
2. Wastewater pipes 75mm, 63mm, 50mm & 40mmOD-PE100 PN16.
3. Stainless Steel bolts and nuts used for flanged connections.
4. A tracer wire laid with the pipeline trench at a similar level to the pipe.
5. Marker tape with the words "Sewer Line Below" 300mm above all wastewater pressure pipe.



Wastewater Coordinate Table		
Asset No.	**mN**	**mE**
FP1	5929178.326	1737538.459
FP2	5929188.657	1737622.791
FP3	5929208.798	1737681.487
FP4	5928951.746	1737608.102
IV1	5928972.472	1737494.431
IV2	5928963.792	1737564.787

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Contact Number: 09 906 3856

Email: Tom@captureland.nz

ENG60422861 / LUC60413069 / SUB60413068

REV	DATE	REVISION DETAILS	ISSUED
0	26/08/24	FOR COMPLETION	KM
1	19/12/24	FOR COMPLETION	KM

CAPTURE
Land Development Consultants

CLIENT
CABRA DEVELOPMENTS LIMITED

PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
WASTEWATER
SHEET 1

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:1500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-500	1

1095-ASB-500-505 Wastewater As-Built.dwg

Legend

	Existing	As Built
PWC Pipe (Ø)	63	63
Reducer		
Flushing Pit	FP	FP
Isolation Valve		
Boundary Kit		
Manifold Box		

Vintry Drive

139 DP541544
138 DP541544
137 DP541544
136 DP541544
135 DP541544
134 DP541544
133 DP541544

4 5 6 7 8 10 11 12

17 18 19 20 21 22 23 24 25 27 28 29 31 32 33

Croatia Ave

Podgora Ave

Schoolside Road

100mm Duct

2.53 2.62 2.59 2.45 2.42 2.33

Reducer 75/63

IV1 IV2

Existing Air Release Valve and Carbon Odour filter.

Connection to existing line made by Watercare approved contractor

Reticulation installed under COMP-43556. To be vested and livened in as part of this stage

N

CABRA
LAND & PROPERTY DEVELOPMENT

I certify that these as-built plans are an accurate record of 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 the following tolerances:
  - -For all pipe inverts & roadside channels to be within +/- 10mm (local circuit i.e internal/relative consistency required only)
  - -For all other assets +/-20mm (e.g Manhole covers, Earthworks)

Name : Tom Lemon

Signed : _____
Registered Professional Surveyor

Registration Number : 1500

Date: 19/12/2024

Contact Number: 09 906 3856

Email: Tom@captureland.nz

NOTE:
Refer to drawing 1095-ASB-500 for all notes & asset coordinates tables

ENG60422861 / LUC60413069 / SUB60413068

REV	DATE	REVISION DETAILS	ISSUED
0	26/08/24	FOR COMPLETION	KM
1	19/12/24	FOR COMPLETION	KM

CAPTURE
Land Development Consultants

CLIENT
CABRA DEVELOPMENTS LIMITED

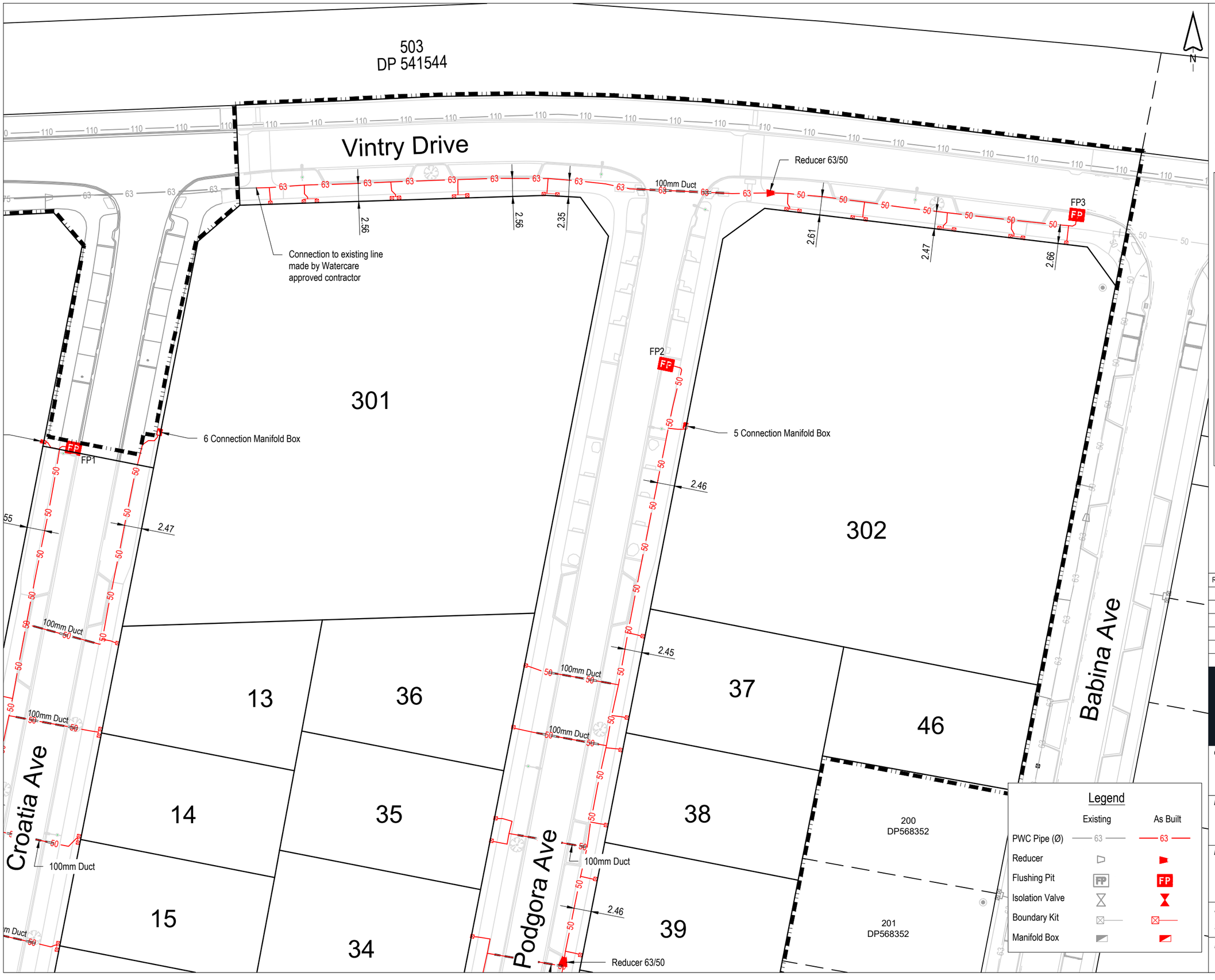
PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
WASTEWATER
SHEET 3

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-502	1

1095-ASB-500-505 Wastewater As-Built.dwg



CABRA
LAND & PROPERTY DEVELOPMENT

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  -For all pipe inverts & roadside channels to be within +/- 10mm (local circuit i.e internal/relative consistency required only)
  -For all other assets +/-20mm (e.g Manhole covers, Earthworks)

Name : Tom Lemon

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Registered Professional Surveyor

Registration Number : 1500

Date: 19/12/2024

Contact Number: 09 906 3856

Email: Tom@captureland.nz

NOTE:
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ENG60422861 / LUC60413069 / SUB60413068

REV	DATE	REVISION DETAILS	ISSUED
0	26/08/24	FOR COMPLETION	KM
1	19/12/24	FOR COMPLETION	KM

CAPTURE
Land Development Consultants

CLIENT
CABRA DEVELOPMENTS LIMITED

PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
WASTEWATER
SHEET 4

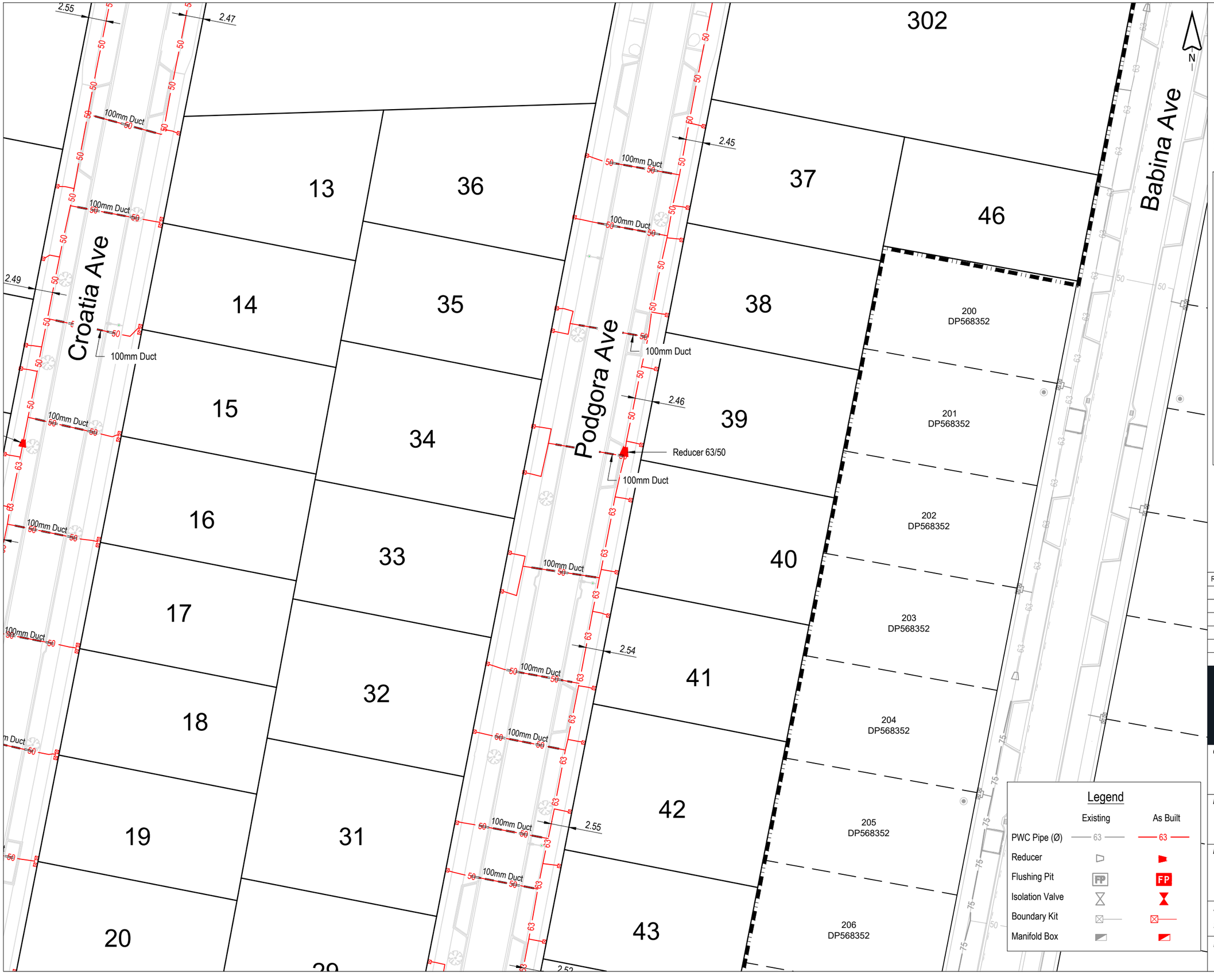
STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-503	1

Legend

	Existing	As Built
PWC Pipe (Ø)	63	63
Reducer		
Flushing Pit	FP	FP
Isolation Valve		
Boundary Kit		
Manifold Box		

1095-ASB-500-505 Wastewater As-Built.dwg



CABRA
LAND & PROPERTY DEVELOPMENT

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- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within the following tolerances:
  -For all pipe inverts & roadside channels to be within +/- 10mm (local circuit i.e internal/relative consistency required only)
  -For all other assets +/-20mm
  (e.g Manhole covers, Earthworks)

Name : Tom Lemon

Signed : _____
Registered Professional Surveyor

Registration Number : 1500

Date: 19/12/2024

Contact Number: 09 906 3856

Email: Tom@captureland.nz

NOTE:
Refer to drawing
1095-ASB-500 for all notes
& asset coordinates tables

ENG60422861 / LUC60413069 / SUB60413068

REV	DATE	REVISION DETAILS	ISSUED
0	26/08/24	FOR COMPLETION	KM
1	19/12/24	FOR COMPLETION	KM

CAPTURE
Land Development Consultants

CLIENT
CABRA DEVELOPMENTS LIMITED

PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
WASTEWATER
SHEET 5

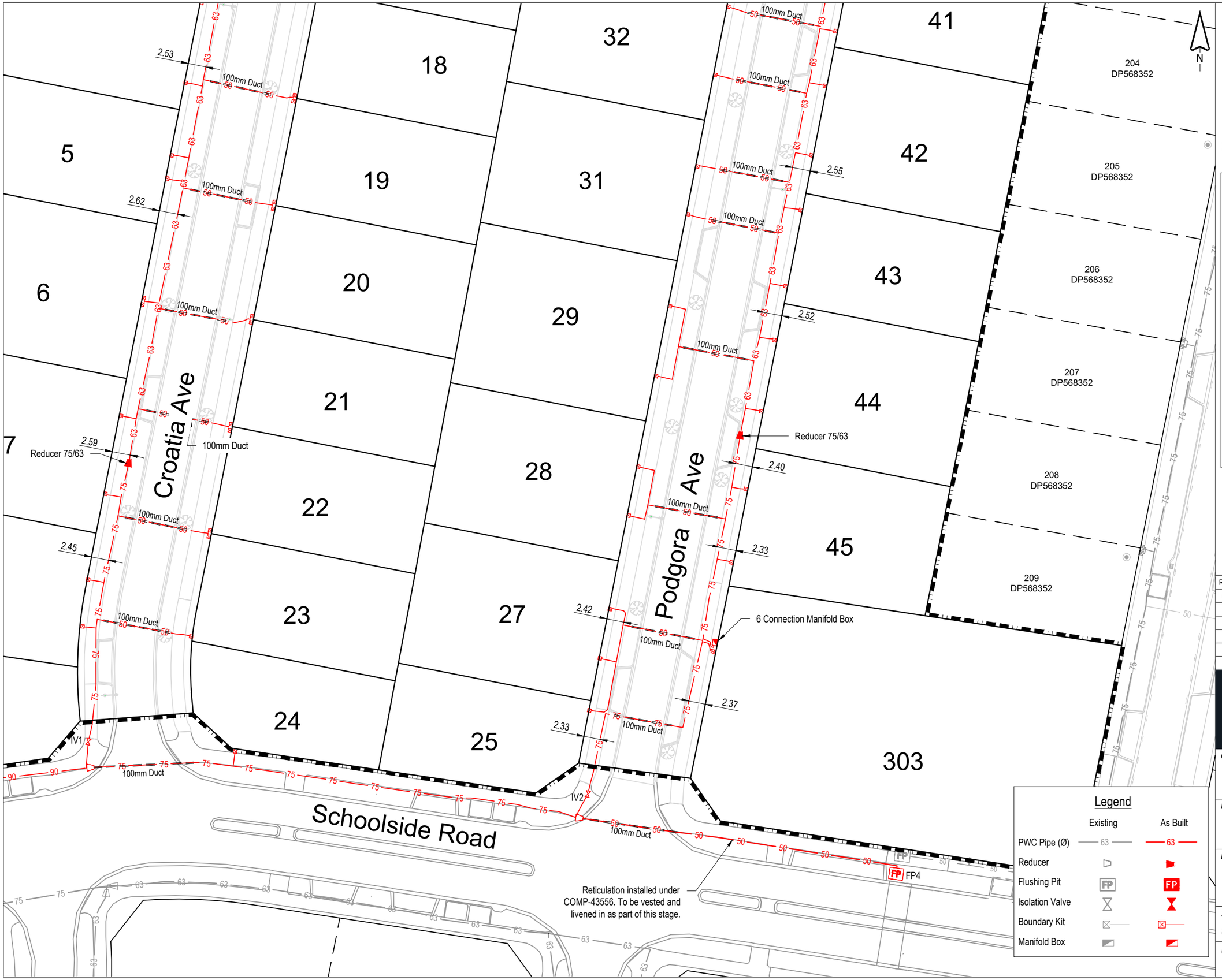
STATUS	SCALE	SIZE
AS-BUILT	1:500	A3

PROJECT	DRAWING NO	REVISION
1095	ASB-504	1

Legend

	Existing	As Built
PWC Pipe (Ø)	63	63
Reducer		
Flushing Pit	FP	FP
Isolation Valve		
Boundary Kit		
Manifold Box		

1095-ASB-500-505 Wastewater As-Built.dwg



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- The Levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within the following tolerances:
  - -For all pipe inverts & roadside channels to be within +/- 10mm (local circuit i.e internal/relative consistency required only)
  - -For all other assets +/-20mm (e.g Manhole covers, Earthworks)

Name : Tom Lemon

Signed : _____
Registered Professional Surveyor

Registration Number : 1500

Date: 19/12/2024

Contact Number: 09 906 3856

Email: Tom@captureland.nz

NOTE:
Refer to drawing 1095-ASB-500 for all notes & asset coordinates tables

ENG60422861 / LUC60413069 / SUB60413068

REV	DATE	REVISION DETAILS	ISSUED
0	26/08/24	FOR COMPLETION	KM
1	19/12/24	FOR COMPLETION	KM

Legend

	Existing	As Built
PWC Pipe (Ø)	63	63
Reducer		
Flushing Pit	FP	FP
Isolation Valve		
Boundary Kit		
Manifold Box		

CAPTURE
Land Development Consultants

CLIENT
CABRA DEVELOPMENTS LIMITED

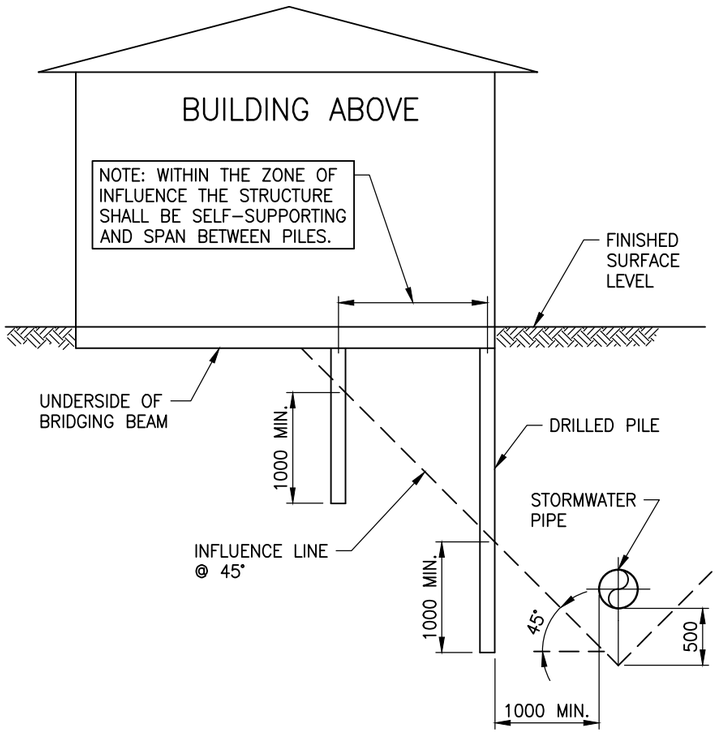
PROJECT
31 SCHOOLSIDE ROAD HUAPAI

DRAWING TITLE
AS-BUILT WASTEWATER SHEET 6

STATUS	*SCALE*	*SIZE*
AS-BUILT	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1095	ASB-505	1

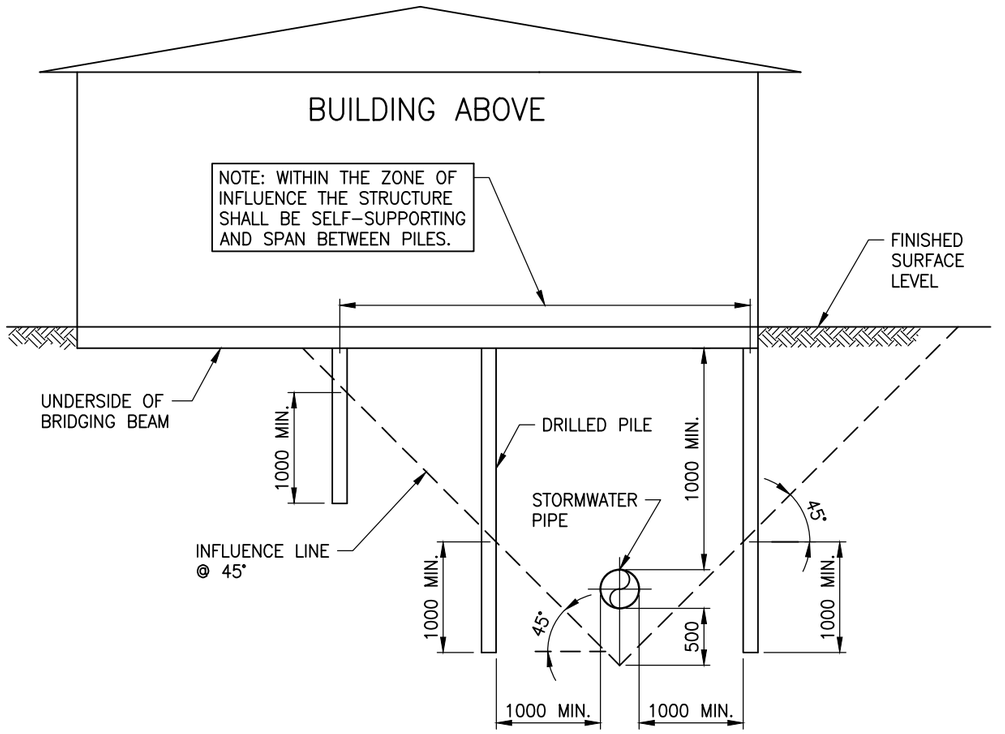
1095-ASB-500-505 Wastewater As-Built.dwg



BUILD CLOSE

"BUILD CLOSE" NOTES:

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



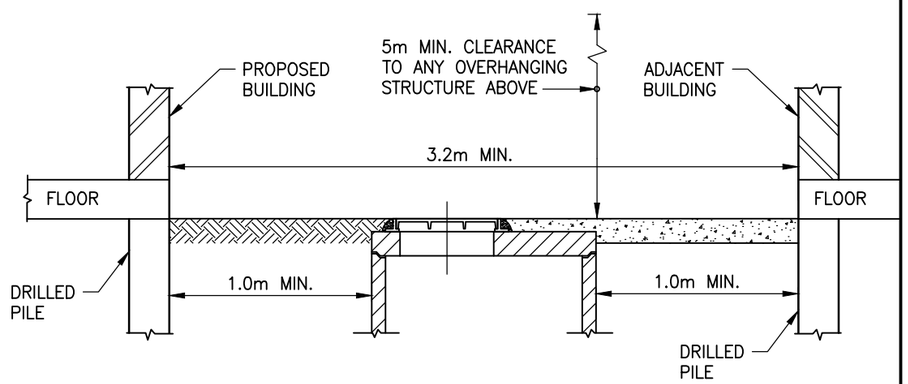
BUILD OVER

"BUILD OVER" NOTES:

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

GENERAL NOTES:

1. THE INFORMATION ON THIS PAGE IS INTENDED TO SHOW EXAMPLES OF TYPICAL SCENARIOS AND SHALL BE USED FOR GENERAL GUIDANCE PURPOSES ONLY. SIGNIFICANT VARIATIONS ON A SITE-BY-SITE BASIS ARE TO BE EXPECTED AND IT IS IN NO WAY IMPLIED THAT MEETING ANY OF THESE REQUIREMENTS WILL GUARANTEE APPROVAL.
2. REQUIREMENTS FOR FOUNDATION DESIGN, ETC. APPLY TO BOTH SIDES OF THE 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 IN LOCATIONS WHERE SUFFICIENT CLEARANCE IS UNAVAILABLE, ARE NOT PERMITTED.
9. ALL PIPE BUILDOVERS WILL REQUIRE APPROVAL BY AUCKLAND COUNCIL.
10. REFER TO SECTION 4.3.23 OF THE SWCoP FOR PIPE BUILDOVER REQUIREMENTS.
11. FOR MANHOLES GREATER THAN 4m DEEP OR LARGER THAN 1200mm DIA. SPECIFIC DESIGN (INCLUDING CLEARANCE REQUIREMENTS) IS REQUIRED.



MANHOLE CONSTRUCTION CLEARANCE

STORMWATER CODE OF PRACTICE
STANDARD DETAILS

REVISION: 2
REV DATE: 1 NOVEMBER 2015
CAD FILENAME: AC-STD-SW22.DWG

AUCKLAND COUNCIL

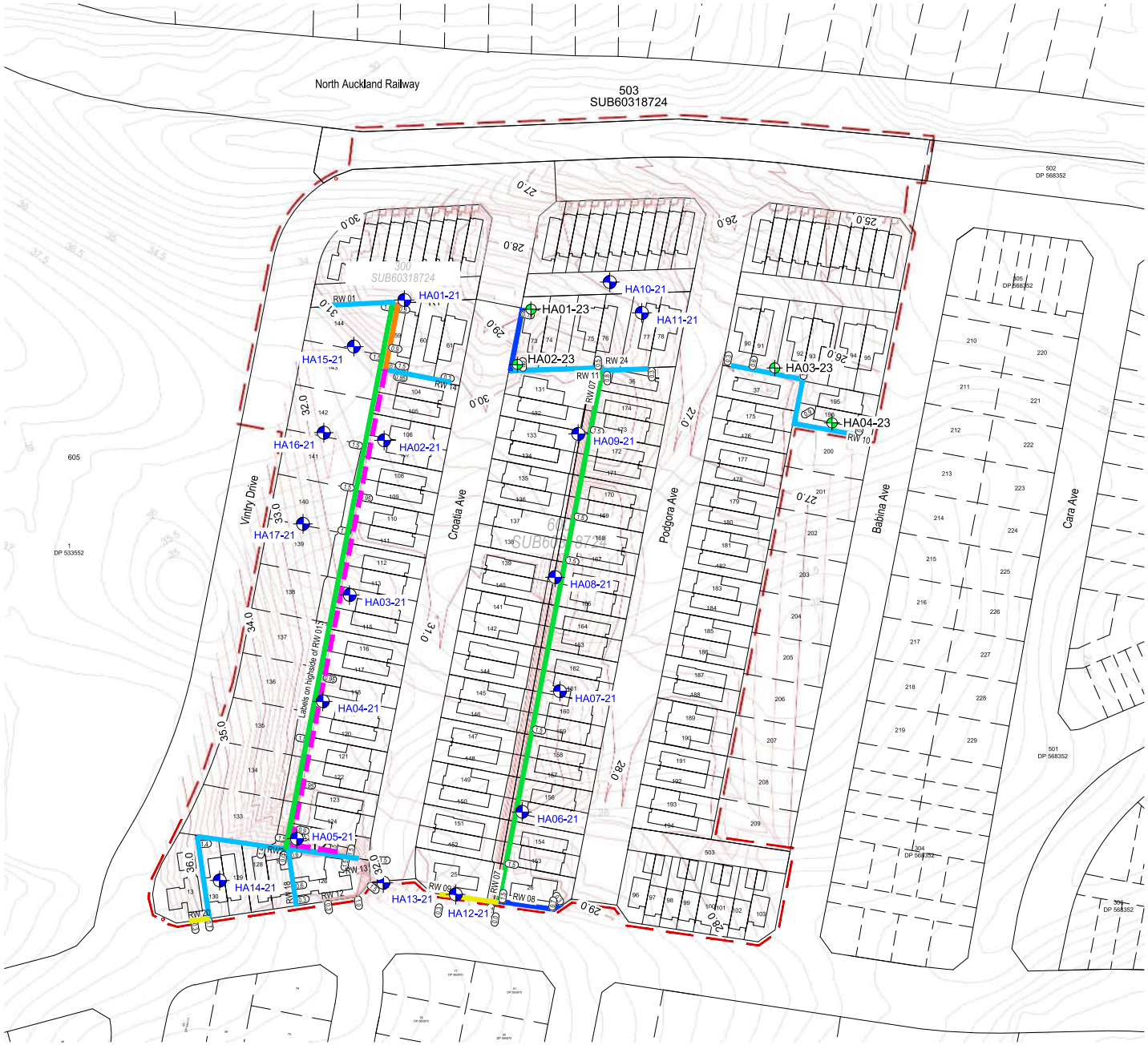
STORMWATER PIPE AND MANHOLE CONSTRUCTION CLEARANCE REQUIREMENTS

MANHOLES NEAR BUILDINGS AND BUILDING CLOSE OVER PIPES

ENVIRONMENTAL-SW

ORIGINAL SCALE A3
SCALE: N.T.S.
DRAWING SET SWCoP
SHEET 1 OF 1
DRAWING No. SW22
REV 2

PLOT DATE 12/8/2015 11:54 AM I:\AENW\Projects\AE04840 AC CoP Ch1\04 Deliverables\Drawings\AC-STD-SW22.dwg



LEGEND:

- HA01-21 HAND AUGER (HA) LOCATION - 2021
- HA01-23 HAND AUGER (HA) LOCATION - 2023
- EXTENT OF STAGE 2
- PROPOSED CONTOUR AT 1.0m MAJOR INTERVALS
- PROPOSED CONTOUR AT 0.2m MINOR INTERVALS
- EXISTING CONTOURS AT 0.5m INTERVALS
- WALL TYPE A
- WALL TYPE B
- WALL TYPE C
- WALL TYPE D
- WALL TYPE E
- WALL TYPE F

NOTES:

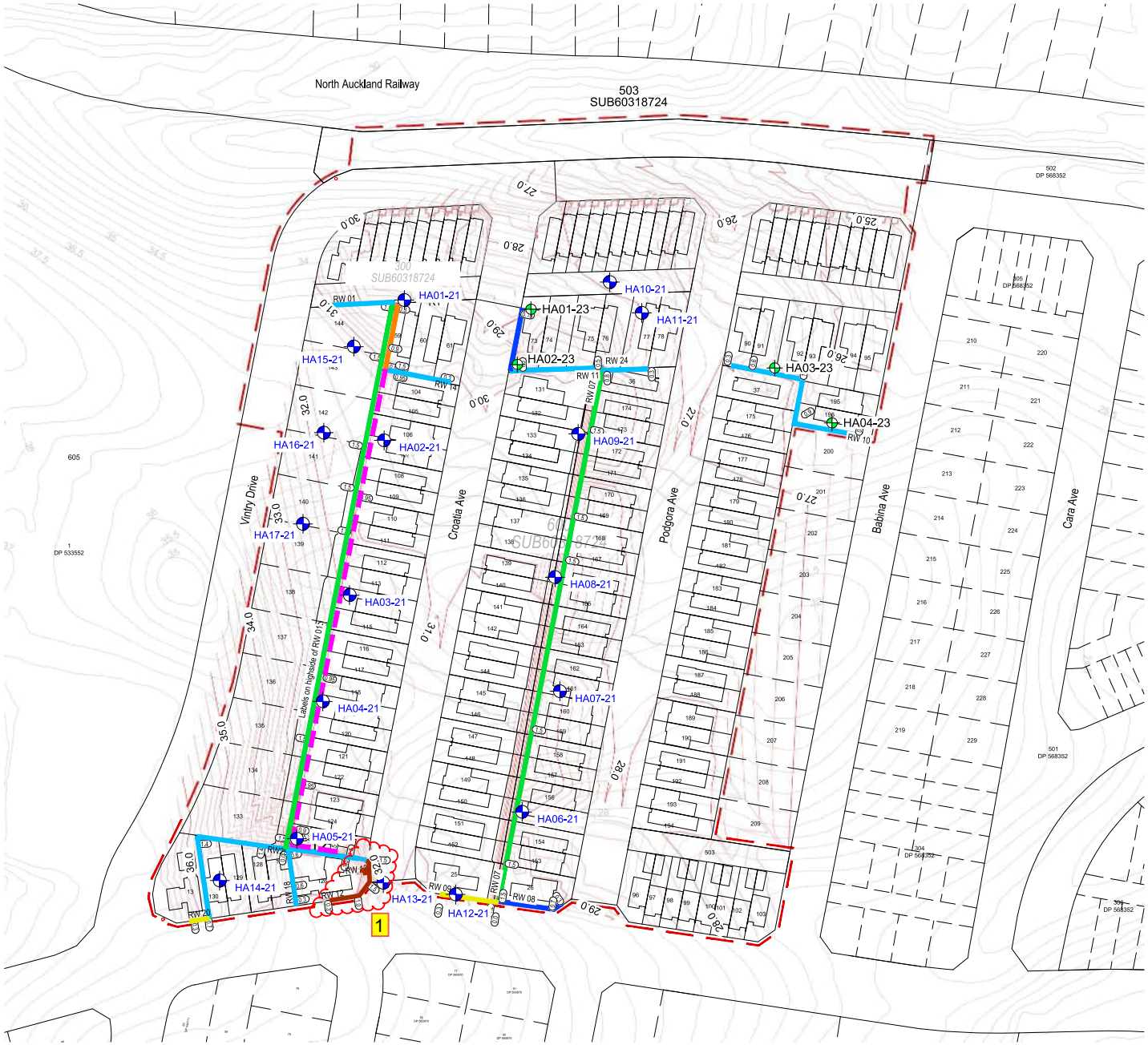
1. BASE PLAN PROVIDED BY CATO BOLAM, REF 46565-DR-C-2020.
2. REFER TO DRAWINGS 05-09 FOR RETAINING WALL DETAILS.

1:1500 0 15 30 45 60 75 m

CMW Geosciences

CLIENT: CABRA DEVELOPMENTS LIMITED		DRAWN: HV/IW	PROJECT: AKL2018-0018
PROJECT: 31 SCHOOLSIDE ROAD, HUAPAI		CHECKED: AL	DRAWING: 13
		REVISION: 0	SCALE: 1:1500
TITLE: SITE INVESTIGATION PLAN & RETAINING WALL LAYOUT PLAN		DATE: 03/08/2023	SHEET: A3 L

C:\USERS\IMOGENWEBB\CMW GEOSCIENCES PTY LTD\AUCKLAND OFFICE - AKL2018-0018 45 STATION ROAD STAGE 2\07 DRAWINGS\SLP\AKL2018-0018 SITE INV. & RETAIN. WALL LAYOUT PLAN_27.01.23.DWG



LEGEND:

- HA01-21 HAND AUGER (HA) LOCATION - 2021
- HA01-23 HAND AUGER (HA) LOCATION - 2023
- EXTENT OF STAGE 2
- PROPOSED CONTOUR AT 1.0m MAJOR INTERVALS
- PROPOSED CONTOUR AT 0.2m MINOR INTERVALS
- EXISTING CONTOURS AT 0.5m INTERVALS
- WALL TYPE A
- WALL TYPE B
- WALL TYPE C
- WALL TYPE D
- WALL TYPE E
- WALL TYPE F
- WALL TYPE G

NOTES:

1. BASE PLAN PROVIDED BY CATO BOLAM, REF 46565-DR-C-2020.
2. REFER TO DRAWINGS 05-09 FOR RETAINING WALL DETAILS.

1:1500 0 15 30 45 60 75 m

CMW Geosciences

CLIENT: CABRA DEVELOPMENTS LIMITED		DRAWN: HV/IW	PROJECT: AKL2018-0018
PROJECT: 31 SCHOOLSIDE ROAD, HUAPAI		CHECKED: AL	DRAWING: 13
		REVISION: 1	SCALE: 1:1500
TITLE: SITE INVESTIGATION PLAN & RETAINING WALL LAYOUT PLAN		DATE: 05/09/2024	SHEET: A3 L

C:\USERS\IMOGENWEBB\CMW GEOSCIENCES PTY LTD\AUCKLAND OFFICE - AKL2018-0018 45 STATION ROAD STAGE 2\07 DRAWINGS\SI PLAN\AKL2018-0018 SITE INV. & RETAIN. WALL LAYOUT PLAN_27,01,23.DWG

NOTES

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RETAINING WALL DESIGN REPORT REFERENCE: AKL2018-0018 AG REV 0.

SPECIFICATION OF TIMBER POLE OPTION

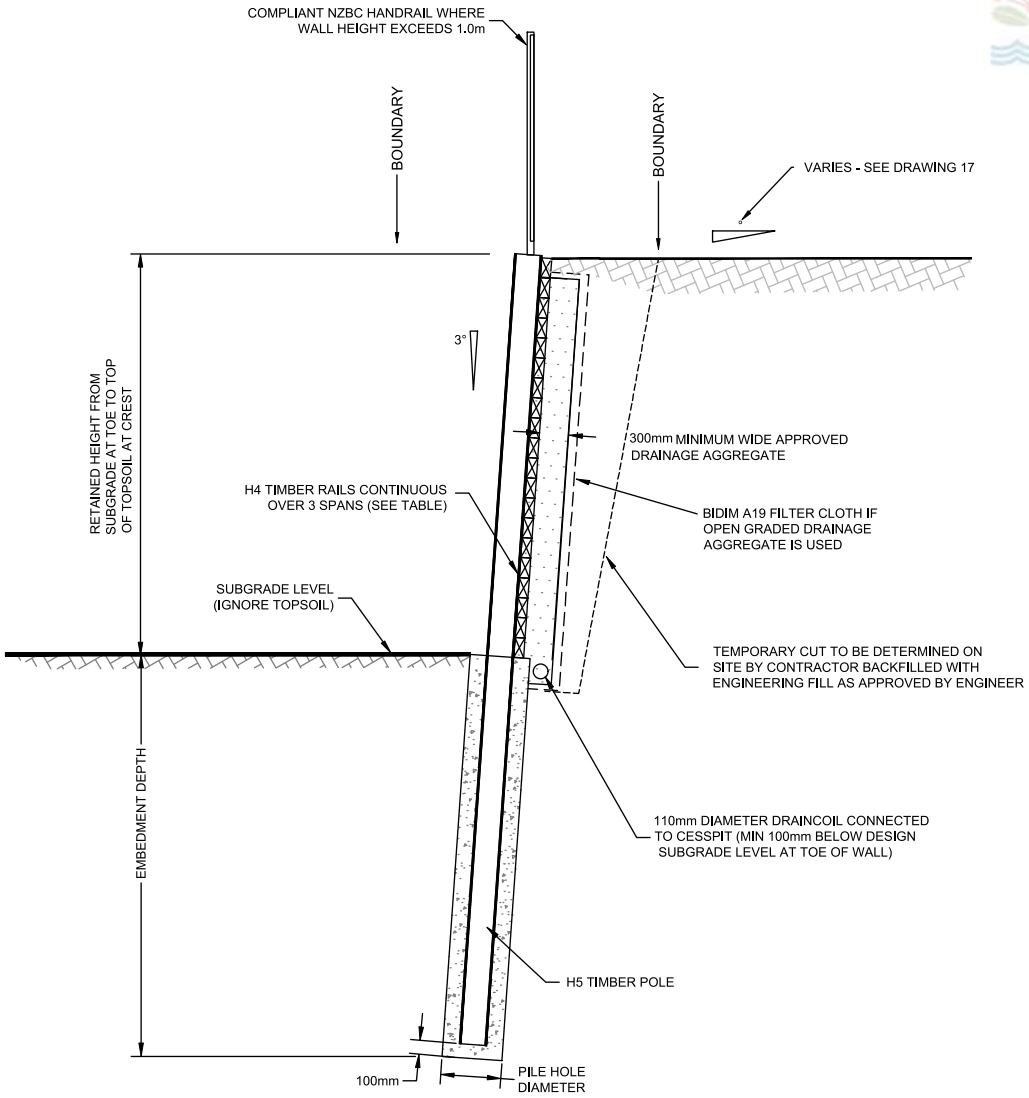
1. MATERIAL PROPERTIES

CONCRETE:	CHARACTERISTIC COMPRESSIVE STRENGTH F'C = 30 MPa UNLESS OTHERWISE NOTED.
TIMBER POLES:	H5 TREATED RADIATA PINE IN ACCORDANCE WITH NZS 3603 UNLESS OTHERWISE SPECIFIED.
TIMBER RAILINGS:	H4 TREATED RADIATA PINE
RAILING FIXINGS:	GALVANISED NAILS
DRAIN COIL:	110mm DIAMETER
DRAINAGE AGGREGATE:	APPROVED DRAINAGE-GRADED AGGREGATE OR SCORIA (USE OF COMPOSITE DRAINAGE PRODUCTS OR POLYSTYRENE NOT APPROVED)

2. FOR LOCATION AND EXTENT OF THE RETAINING WALL REFER TO PROJECT ENGINEERING DRAWINGS. SET OUT LOCATIONS TO BE PROVIDED BY OTHERS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
3. MINIMUM CONCRETE COVER TO TIMBER POLES IS 50mm WITH A MINIMUM COVER OF 100mm AT THE PILE BASE. THIS WILL REQUIRE EITHER A PACKER OR POURING OF A PUNCH PAD TO ACHIEVE DESIGN. POLE HOLE DIAMETER MAY ONLY BE VARIED BY DESIGNER IN WRITING.
4. RAILS SHOULD BE CONTINUOUS OVER 3 SPANS WITH STAGGERED JOINTS. CUTTING OF TIMBERS SHALL BE AVOIDED WHEREVER POSSIBLE. TONGUE AND GROOVE BOARDS ARE NOT TO BE USED FOR RAILS. USE A NAIL WIDTH GAP BETWEEN RAILS.
5. IF CUTTING OF POLES OR RAILS IS NECESSARY THE EXPOSED SURFACES SHALL BE FLOODED WITH A COPPER NAPTHENATE TYPE WOOD PRESERVATIVE.
6. THE MAXIMUM RETAINING HEIGHT, TOE SLOPE AND SURCHARGE SLOPE SHALL BE AS SPECIFIED ON THE DESIGN AND SHALL NOT BE EXCEEDED UNLESS APPROVED BY THE DESIGN ENGINEER IN WRITING. NOTE THAT RETAINED HEIGHT SHOWN ON THESE CMW DRAWINGS IGNORES TOPSOIL DEPTH AT THE TOE OF WALL.
7. THE EXTENT OF EXCAVATION REQUIRED SHALL BE MARKED OUT ON THE GROUND HAVING REGARD TO THE POSITIONS OF POLES, WORKING SPACE FOR CONSTRUCTION, BACKFILL AND DRAINAGE PROVISIONS.
8. ALL PILE HOLES TO BE AUGERED AND DRILLING SPOIL DISPOSED OF AWAY FROM THE RETAINING WALL.
9. A PERFORATED SUBSOIL DRAIN WITHOUT FILTER SOCK SHALL BE LAID AND SURROUNDED IN APPROVED DRAINAGE-GRADED AGGREGATE OR SCORIA WITH INVERT BELOW DESIGN TOE SUBGRADE LEVELS CONNECTED TO A FREE OUTLET AT A POINT OF SAFE DISCHARGE OR CONNECTED TO STORMWATER SYSTEM.
10. THE CONTRACTOR SHALL REFER TO THE DESIGN ENGINEER AS SOON AS POSSIBLE FOR FURTHER INSTRUCTION SHOULD ANY UNFORESEEN CIRCUMSTANCE OR ABNORMAL SITE CONDITION BE ENCOUNTERED DURING CONSTRUCTION.
11. A CUT-OFF DRAINAGE CHANNEL SHOULD BE INSTALLED ABOVE THE WALL.
12. WHERE EXCAVATIONS ARE UNDERTAKEN MORE THAN A FEW DAYS IN ADVANCE OF WALL CONSTRUCTION, THE CUT FACE MUST BE COVERED WITH POLYTHENE TO PREVENT IT DRYING OUT AND CRACKING, ESPECIALLY WHERE EXPANSIVE CLAY SOILS ARE PRESENT. SIMILARLY DURING PERIODS OF WET WEATHER THE EXCAVATION FACE SHOULD BE PROTECTED WITH POLYTHENE AND SURFACE WATER DIRECTED AWAY FROM THE CREST AND TOE OF THE EXCAVATION.
13. CONTRACTOR IS RESPONSIBLE FOR ENSURING EXCAVATIONS ARE STAGED SO THAT EXCAVATED FACES ARE NOT LEFT UNSUPPORTED FOR ANY SIGNIFICANT LENGTH OF TIME. THIS IS ESPECIALLY CRITICAL FOR BOUNDARY CUT FACES.

INSPECTION HOLD POINTS:

1. GROUND CONDITIONS IN PILE HOLES - PRIOR TO INSERTING POLES.
2. MEASUREMENT OF POLE AND RAIL SIZES AND CONFIRMATION OF TREATMENT.
3. DRAINCOIL PLACEMENT - PRIOR TO RAILING UP.
4. DRAINAGE AGGREGATE QUALITY AND RAILING - PRIOR TO BACKFILL WITH DRAINAGE AGGREGATE.
5. FINAL INSPECTION AND DRAINAGE CONNECTIONS.



TIMBER POLE RETAINING WALL DETAIL

REV	DATE	DESCRIPTION	BY
0	03/08/2023	FOR BUILDING CONSENT	AL

CMW Geosciences

CLIENT: CABRA DEVELOPMENT LIMITED		DRAWN: IW/JS	PROJECT: AKL2018-0018
PROJECT: 31 SCHOOLSIDE ROAD, HUAPAI		CHECKED: AL	DRAWING: 14
		REVISION: 0	SCALE: NTS
TITLE: TIMBER POLE RETAINING WALL DESIGN DETAILS AND SPECIFICATION		DATE: 03/08/2023	SHEET: A3

NOTES

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RETAINING WALL DESIGN REPORT REFERENCE: AKL2018-0018 AG REV 0.

SPECIFICATION OF STEEL POST OPTION

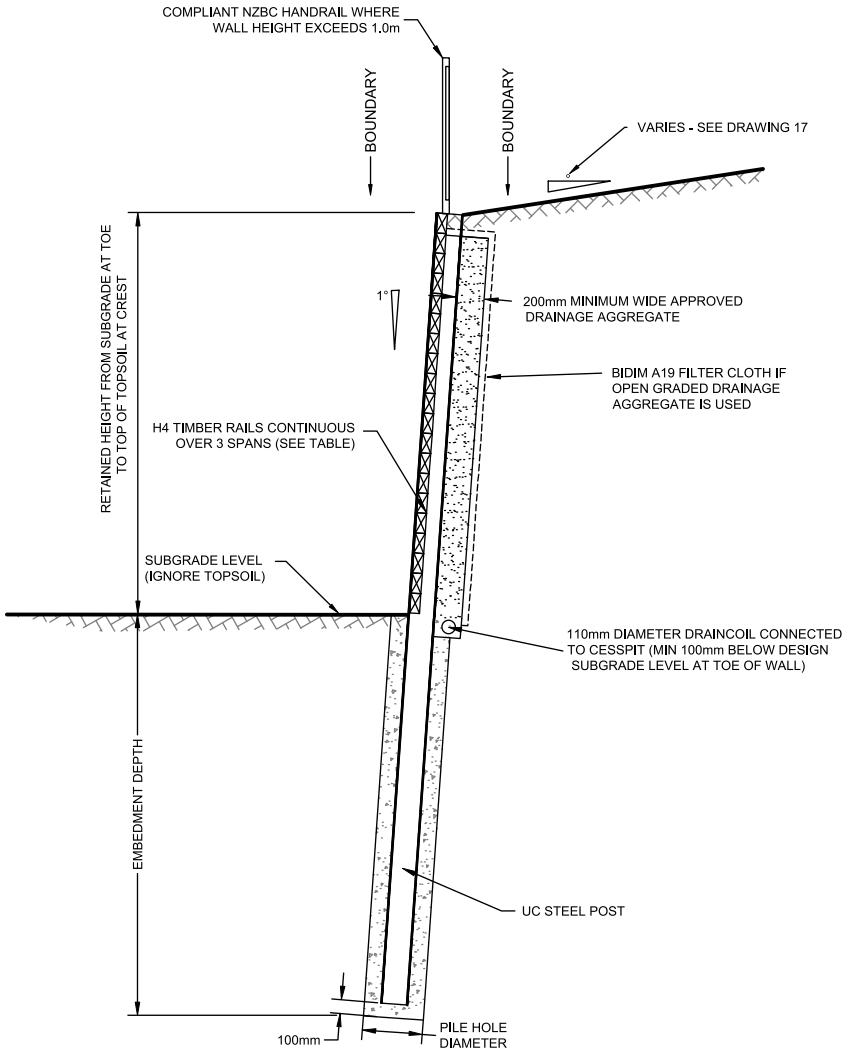
1. MATERIAL PROPERTIES

CONCRETE:	CHARACTERISTIC COMPRESSIVE STRENGTH F'C = 30 MPa UNLESS OTHERWISE NOTED.
STEEL POLES:	MINIMUM G300 STRUCTURAL STEEL. HOT DIPPED GALVANISED IN ACCORDANCE WITH AS/NZS4680.2006. MINIMUM COATING MASS 900g/m^3. GALVANISE TO 300mm BGI
TIMBER RAILINGS:	H4 TREATED RADIATA PINE
RAILING FIXINGS:	GALVANISED NAILS
DRAIN COIL:	110mm DIAMETER
DRAINAGE AGGREGATE:	APPROVED DRAINAGE-GRADED AGGREGATE OR SCORIA (USE OF COMPOSITE DRAINAGE PRODUCTS OR POLYSTYRENE NOT APPROVED)

2. FOR LOCATION AND EXTENT OF THE RETAINING WALL REFER TO PROJECT ENGINEERING DRAWINGS. SET OUT LOCATIONS TO BE PROVIDED BY OTHERS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
3. MINIMUM CONCRETE COVER TO STEEL POST IS 75mm WITH A MINIMUM COVER OF 100mm AT THE PILE BASE. THIS WILL REQUIRE EITHER A PACKER OR POURING OF A PUNCH PAD TO ACHIEVE DESIGN. POLE HOLE DIAMETER MAY ONLY BE VARIED BY DESIGNER IN WRITING.
4. CUTTING OF STEEL POST SHALL BE AVOIDED WHEREVER POSSIBLE. TONGUE AND GROOVE BOARDS ARE NOT TO BE USED FOR RAILS. USE A NAIL WIDTH GAP BETWEEN RAILS.
5. IF CUTTING OF RAILS IS NECESSARY THE EXPOSED SURFACES SHALL BE FLOODED WITH A COPPER NAPTHENATE TYPE WOOD PRESERVATIVE.
6. THE MAXIMUM RETAINING HEIGHT, TOE SLOPE AND SURCHARGE SLOPE SHALL BE AS SPECIFIED ON THE DESIGN AND SHALL NOT BE EXCEEDED UNLESS APPROVED BY THE DESIGN ENGINEER IN WRITING. NOTE THAT RETAINED HEIGHT SHOWN ON THESE CMW DRAWINGS IGNORES TOPSOIL DEPTH AT THE TOE OF WALL.
7. THE EXTENT OF EXCAVATION REQUIRED SHALL BE MARKED OUT ON THE GROUND HAVING REGARD TO THE POSITIONS OF POLES, WORKING SPACE FOR CONSTRUCTION, BACKFILL AND DRAINAGE PROVISIONS.
8. ALL PILE HOLES TO BE AUGERED AND DRILLING SPOIL DISPOSED OF AWAY FROM THE RETAINING WALL.
9. A PERFORATED SUBSOIL DRAIN WITHOUT FILTER SOCK SHALL BE LAID AND SURROUNDED IN APPROVED DRAINAGE-GRADED AGGREGATE OR SCORIA WITH INVERT BELOW DESIGN TOE SUBGRADE LEVELS CONNECTED TO A FREE OUTLET AT A POINT OF SAFE DISCHARGE OR CONNECTED TO STORMWATER SYSTEM.
10. THE CONTRACTOR SHALL REFER TO THE DESIGN ENGINEER AS SOON AS POSSIBLE FOR FURTHER INSTRUCTION SHOULD ANY UNFORESEEN CIRCUMSTANCE OR ABNORMAL SITE CONDITION BE ENCOUNTERED DURING CONSTRUCTION.
11. A CUT-OFF DRAINAGE CHANNEL SHOULD BE INSTALLED ABOVE THE WALL.
12. WHERE EXCAVATIONS ARE UNDERTAKEN MORE THAN A FEW DAYS IN ADVANCE OF WALL CONSTRUCTION, THE CUT FACE MUST BE COVERED WITH POLYTHENE TO PREVENT IT DRYING OUT AND CRACKING, ESPECIALLY WHERE EXPANSIVE CLAY SOILS ARE PRESENT. SIMILARLY DURING PERIODS OF WET WEATHER THE EXCAVATION FACE SHOULD BE PROTECTED WITH POLYTHENE AND SURFACE WATER DIRECTED AWAY FROM THE CREST AND TOE OF THE EXCAVATION.
13. CONTRACTOR IS RESPONSIBLE FOR ENSURING EXCAVATIONS ARE STAGED SO THAT EXCAVATED FACES ARE NOT LEFT UNSUPPORTED FOR ANY SIGNIFICANT LENGTH OF TIME. THIS IS ESPECIALLY CRITICAL FOR BOUNDARY CUT FACES.

INSPECTION HOLD POINTS:

1. GROUND CONDITIONS IN PILE HOLES - PRIOR TO INSERTING POLES.
2. MEASUREMENT OF POLE AND RAIL SIZES AND CONFIRMATION OF TREATMENT.
3. DRAINCOIL PLACEMENT - PRIOR TO RAILING UP.
4. DRAINAGE AGGREGATE QUALITY AND RAILING - PRIOR TO BACKFILL WITH DRAINAGE AGGREGATE.
5. FINAL INSPECTION AND DRAINAGE CONNECTIONS.



UC STEEL POLE RETAINING WALL DETAIL

REV	DATE	DESCRIPTION	BY
0	03/08/2023	FOR BUILDING CONSENT	AL

CMW Geosciences

CLIENT: CABRA DEVELOPMENT LIMITED	DRAWN: IW/JS	PROJECT: AKL2018-0018	
PROJECT: 31 SCHOOLSIDE ROAD, HUAPAI	CHECKED: AL	DRAWING: 15	
	REVISION: 0	SCALE: NTS	
TITLE: UC STEEL POLE RETAINING WALL DESIGN DETAILS AND SPECIFICATION	DATE: 03/08/2023	SHEET: A3	

NO - FINES CONCRETE SEGMENTAL BLOCK WALL

1. SCOPE

This specification covers the construction of segmental block walls. This specification should be read in conjunction with the retaining wall design report reference : AKL2018-0018 AG Rev 0.

2. SETTING OUT & CONSTRUCTION TOLERANCES

The contractor is responsible for making sure the retaining wall is set out in the correct location and that the maximum retained heights, toe slope angles (below the wall) and slope surcharge angles (above the wall) are in accordance with those shown on the design calculations and drawings. The retained height shall be measured from the finished ground surface in front of the wall to the finished ground surface immediately behind the wall.

The maximum retained height, slope surcharge and toe slope shall be as specified on the drawings and must not be exceeded without the written approval of the Design Engineer. Acceptable construction tolerances are as follows:

Element	Vertical Position	Horizontal Position	Vertical Alignment	Horizontal Alignment
Soil Surface	±100mm	*	*	*
Facings and Wall structures	±50mm	±50mm	± 20mm in 3m	± 20mm in 3m
Footings or Supports	±50mm	± 50mm	± 20mm in 3m	± 20mm in 3m

*Not Applicable

3. MATERIALS & CONSTRUCTION

Excavation
All excavations should be monitored for signs of instability and should not be left unsupported for any extended period of time especially where located adjacent to property boundaries, services or structures. It is the contractors responsibility to ensure appropriate temporary stability conditions of any excavation is maintained.

Facia Type
The facia type must match that specified in the above referenced report and design drawings. Any changes to the specified facia will require further analysis and could influence the spacing of reinforcement to ensure the required factors of safety are met.

Backfill
Backfill behind the wall and fill all voids in the blocks with 10 MPa No-Fines concrete with a 6:1 ratio (gravel : cement) as per the design. The vertical height of any pour is limited to 800mm. For walls greater than 800mm in height the backfill concrete may be placed by consecutive pours each up to 800mm in height. Each pour must be allowed to harden prior to pouring the next lift. Check the wall face to ensure the blocks have not moved while backfilling. Any movement will become permanent once the concrete has set. The void ratio of the mix is expected to be 20% to 30% and should be free draining. This product has no slump and exerts similar pressures on the soil and formwork as loosely poured aggregates.

All voids in segmental blocks are to be filled with No-Fines concrete.

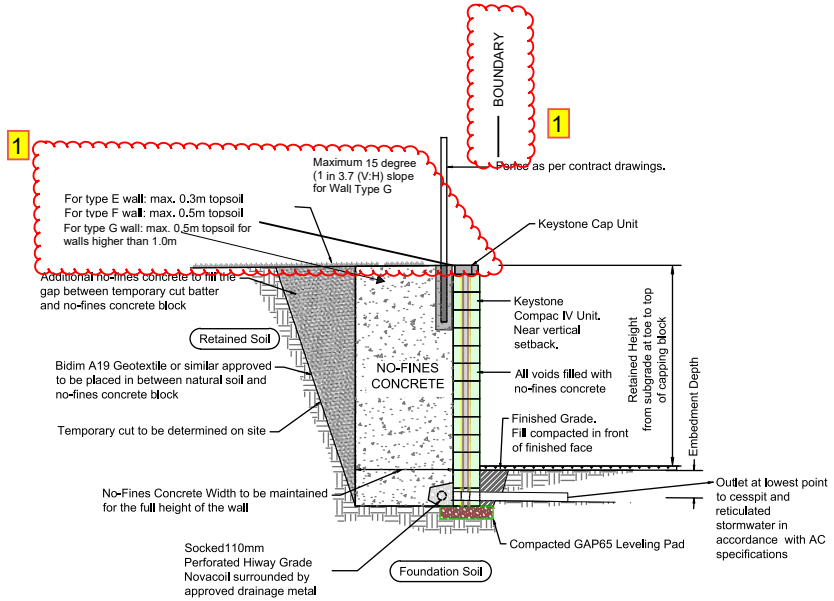
Drainage
Drainage outlets shall be via a 110mm diameter hiway grade perforated draincoil placed at the base of the wall. Drainage outlets shall be connected to the reticulated stormwater system or other approved outlet structure at the discretion of the Design Engineer. A geotextile filter surround (filter sock) is required around the draincoil.

Service Crossings
Where service lines are to pass beneath a retaining wall in excess of 0.5m height, a specially designed pipe bridge detail must be designed by a Geotechnical Engineer in accordance with the Auckland Council Standards.

Services
Where service trenches run parallel to the retaining walls or services are located within a horizontal distance of 1.5 times the height of the wall, they must be backfilled with compacted hardfill, placed in maximum 300mm thick lifts compacted to 95% of the maximum dry density (MDD).

Waste Material
All waste materials must be removed from site on completion of the works. It is not acceptable to place these materials behind the wall within the backfill material.

Unforseen Ground Conditions
The contractor shall refer to the Design Engineer as soon as possible for further instruction should any unforseen circumstances or abnormal site conditions be encountered during construction.

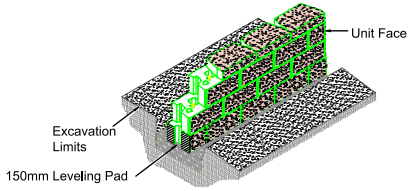


Typical Reinforced Wall Section
Design details refer to summary table below

Base Leveling Pad Notes:

1. The leveling pad is to be constructed with compacted GAP65 or un-reinforced concrete.

2.The base foundation is to be approved by the Geotechnical Engineer prior to placement of the leveling pad. An undrained shear strength at 50KPa is required.



Base Pad Isometric Section View

REV	DATE	DESCRIPTION	BY
0	03/08/2023	FOR CONSENT	AJL
1	05/09/2024	CONSENT AMENDMENT	AJL

CMW Geosciences

CLIENT: CABRA DEVELOPMENTS LIMITED		DRAWN: IW/JS	PROJECT: AKL2018-0018
PROJECT: 31 SCHOOLSIDE ROAD, HUAPAI		CHECKED: AL	DRAWING: 16
		REVISION: 1	SCALE: NTS
TITLE: SEGMENTAL BLOCK WALLS (TYPES E, F, G) DESIGN DETAIL AND SPECIFICATION		DATE: 05/09/2024	SHEET: A3

C:\USERS\IMOGENWEBB\CMW GEOSCIENCES PTY LTD\AUCKLAND OFFICE - AKL2018-0018 45 STATION ROAD STAGE 2\07 DRAWINGS\RETAINING WALLS\AKL2018-0018 SEGMENTAL BLOCK WALL DG07_18.01.23.DWG

TIMBER POLE RETAINING WALL DESIGN - WALL TYPE A

MAXIMUM SURCHARGE SLOPE	0	°
MAXIMUM TOE SLOPE	0	°
FACTORED SURCHARGE LOADING	12	kPa
RETAINED SOIL FRICTION ANGLE	28	°
FOUNDATION SOIL UNDRAINED SHEAR STRENGTH	60	kPa

WALL Locations: Walls 1 (Ch 26.5 to 77.5m), 10, 11 (Ch 0 to 32m), 13 (Ch 8.56m to end), 14, 18, 20 (Ch 6.5 to end), 24 and 25.

Retained Height (m)	Upright Spacing (m)	HD Pole Size (SED)	ND Pole Size (SED)	HD Hole Diameter (mm)	ND Hole Diameter (mm)	Minimum Embedment Depth (m)	SG6 Timber Rail Lagging	SG8 Timber Rail Lagging
3.2	1.2	375	425	575	625	3.2	3 No. 50mm x 150mm	2 No. 50mm x 150mm
3.0	1.2	375	400	575	600	3.0	3 No. 50mm x 150mm	2 No. 50mm x 150mm
2.5	1.2	325	350	525	550	2.6	2 No. 50mm x 150mm	2 No. 50mm x 150mm
2.0	1.2	275	300	450	475	2.3	2 No. 50mm x 150mm	1 No. 50mm x 150mm
1.5	1.2	225	225	375	400	1.9	2 No. 50mm x 150mm	1 No. 50mm x 150mm
1.0	1.2	150	175	325	350	1.5	1 No. 50mm x 150mm	1 No. 50mm x 150mm
0.5	1.2	150	150	275	275	0.9	1 No. 50mm x 150mm	1 No. 50mm x 150mm

UC STEEL RETAINING WALL DESIGN - WALL TYPE B

MAXIMUM SURCHARGE SLOPE	0	°
MAXIMUM TOE SLOPE	0	°
FACTORED SURCHARGE LOADING	12	kPa
RETAINED SOIL FRICTION ANGLE	28	°
FOUNDATION SOIL UNDRAINED SHEAR STRENGTH	100	kPa

WALL Locations: Wall 8 (Ch 0 to 22m) and Wall 11 (Ch32 to 54m).

Retained Height (m)	Upright Spacing (m)	Minimum Embedment Depth (m)	Hole Diameter (mm)	Steel UC Section Size	Lagging Options		
					Single Lagging Thickness (mm)	Stacked	Round Timber Diameter (mm)
1.5	1.5	1.7	450	200 UC 46.2	75	2 x 50 mm	100
1.0	1.5	1.4	450	200 UC 46.2	75	2 x 50 mm	100
0.5	1.5	1.1	450	200 UC 46.2	50	1 x 50 mm	100

TIMBER POLE RETAINING WALL DESIGN - WALL TYPE C, OPTION A

MAXIMUM SURCHARGE SLOPE	27	°
MAXIMUM TOE SLOPE	0	°
FACTORED SURCHARGE LOADING	0	kPa
RETAINED SOIL FRICTION ANGLE	28	°
FOUNDATION SOIL UNDRAINED SHEAR STRENGTH	60	kPa

WALL Locations: Wall 1 (Ch 77.5 to end) and Wall 7.

Retained Height (m)	Upright Spacing (m)	HD Pole Size (SED)	ND Pole Size (SED)	HD Hole Diameter (mm)	ND Hole Diameter (mm)	Minimum Embedment Depth (m)	SG6 Timber Rail Lagging	SG8 Timber Rail Lagging
3.0	1.2	375	-	550	-	6.0	3 No. 50mm x 150mm	3 No. 50mm x 150mm
2.5	1.2	325	400	475	550	4.5	3 No. 50mm x 150mm	2 No. 50mm x 150mm
2.0	1.2	275	300	425	450	4.0	3 No. 50mm x 150mm	2 No. 50mm x 150mm
1.5	1.2	200	250	350	400	2.5	2 No. 50mm x 150mm	2 No. 50mm x 150mm

UC STEEL RETAINING WALL DESIGN - WALL TYPE C, OPTION B

MAXIMUM SURCHARGE SLOPE	27	°
MAXIMUM TOE SLOPE	0	°
FACTORED SURCHARGE LOADING	0	kPa
RETAINED SOIL FRICTION ANGLE	28	°
FOUNDATION SOIL UNDRAINED SHEAR STRENGTH	60	kPa

WALL Locations: Wall 1 (Ch 77.5 to 220m) and Wall 7.

Retained Height (m)	Upright Spacing (m)	Minimum Embedment Depth (m)	Hole Diameter (mm)	Steel UC Section Size	Lagging Options		
					Single Lagging Thickness (mm)	Stacked	Round Timber Diameter (mm)
3.0	1.2	4.9	500	250 UC 72.9	100	4 x 50 mm	150
2.5	1.2	3.8	450	200 UC 46.2	100	4 x 50 mm	150
2.0	1.2	2.9	450	200 UC 46.2	100	3 x 50 mm	150
1.5	1.2	2.3	450	200 UC 46.2	75	3 x 50 mm	100

TIMBER POLE RETAINING WALL DESIGN - Bridgings - Wall 11 Ch31m / Wall 20 Ch33.5m

MAXIMUM SURCHARGE SLOPE	0	°
MAXIMUM TOE SLOPE	0	°
FACTORED SURCHARGE LOADING	12	kPa
RETAINED SOIL FRICTION ANGLE	28	°
FOUNDATION SOIL UNDRAINED SHEAR STRENGTH	60	kPa

Retained Height (m)	Upright Spacing (m)	HD Pole Size (SED)	ND Pole Size (SED)	HD Hole Diameter (mm)	ND Hole Diameter (mm)	Minimum Embedment Depth (m)	SG8 Timber Rail Lagging	Round Timber Rail SED
1.4	2.8	275	325	475	500	2.5	3 No. 50mm x 150mm	SED 150

TIMBER POLE RETAINING WALL DESIGN - WALL TYPE D

MAXIMUM SURCHARGE SLOPE	0	°
MAXIMUM TOE SLOPE	0	°
FACTORED SURCHARGE LOADING	0	kPa
RETAINED SOIL FRICTION ANGLE	28	°
FOUNDATION SOIL UNDRAINED SHEAR STRENGTH	80	kPa

WALL Locations: Wall 16.

Retained Height (m)	Upright Spacing (m)	HD Pole Size (SED)	ND Pole Size (SED)	HD Hole Diameter (mm)	ND Hole Diameter (mm)	Minimum Embedment Depth (m)	SG6 Timber Rail Lagging	SG8 Timber Rail Lagging
1.8	1.2	200	225	375	400	1.8	2 No. 50mm x 150mm	1 No. 50mm x 150mm
1.5	1.2	175	175	350	350	1.5	1 No. 50mm x 150mm	1 No. 50mm x 150mm
1.0	1.2	150	150	300	300	1.1	1 No. 50mm x 150mm	1 No. 50mm x 150mm
0.5	1.2	150	150	250	250	0.9	1 No. 50mm x 150mm	1 No. 50mm x 150mm

NOTES:

1. WALL 1 CH0-26.5 CONSTRUCTED IN PREVIOUS STAGE.
2. WALL 13, CH0-8.56 TO BE DESIGNED / CONSTRUCTED IN FUTURE STAGE

REV	DATE	DESCRIPTION	BY
0	03/08/2023	FOR CONSENT	AL

CMW Geosciences

CLIENT: CABRA DEVELOPMENTS LIMITED		DRAWN: IW/JS	PROJECT: AKL2018-0018
PROJECT: 31 SCHOOLSIDE ROAD, HUAPAI		CHECKED: AL	DRAWING: 17
		REVISION: 0	SCALE: NTS
TITLE: RETAINING WALL SUMMARY TABLES (1 OF 2)		DATE: 03/08/2023	SHEET: A3

C:\USERS\IMOGENWEBB\CMW GEOSCIENCES PTY LTD\AUCKLAND OFFICE - AKL2018-0018 45 STATION ROAD STAGE 2\07 DRAWINGS\RETAINING WALLS\AKL 2018-0018 RETAINING WALL SUMMARY TABLES.DWG

KEYSTONE RETAINING WALL DESIGN - WALL TYPE E & F				
Cases / Walls	**Retained Height (m)**	**Embedment**	**Blocks Required Vertically**	**No-fines Concrete Width (m)**
Type E (Walls 9 and 20 - Ch 0 to 6.5m)	0.4	0.4m (2 blocks)	4	0.5
	0.6	0.4m (2 blocks)	5	0.7
	0.8	0.4m (2 blocks)	6	0.8
	1.0	0.4m (2 blocks)	7	1
	1.2	0.4m (2 blocks)	8	1.2
	1.4	0.4m (2 blocks)	9	1.4
	1.6	0.4m (2 blocks)	10	1.6
Type F (Wall 17)	0.6	0.4m (2 blocks)	5	0.4
	0.8	0.4m (2 blocks)	6	0.5
	1	0.4m (2 blocks)	7	0.6
	1.2	0.4m (2 blocks)	8	0.7
Note: Type F Walls contain 0.5m topsoil layer over the no-fines concrete.				

KEYSTONE RETAINING WALL DESIGN - WALL TYPE G (Wall 12 (All) and Wall 13 chainage 0m to 6.35m)				
	MAXIMUM SURCHARGE SLOPE	15 ° (1 in 3.7 V:H))		
	MAXIMUM TOE SLOPE	0 °		
	FACTORED SURCHARGE LOADING	5 kPa		
	RETAINED SOIL FRICTION ANGLE	28 °		
	FOUNDATION SOIL UNDRAINED SHEAR STRENGTH	60 kPa		
	WALL Locations: Wall 12 (All) and Wall 13 (Ch0m to 5m).			
	Note - Retained height measured from subgrade at toe of wall to top of wall (i.e. topsoil is ignored)			
Cases / Walls	**Retained Height (m)**	**Embedment**	**Blocks Required Vertically**	**No-fines Concrete Width (m)**
Type G - Walls **12** (All) and **13** (Ch 0 to 6.35m)	0.4	0.4m (2 blocks)	4	0.3
	0.6	0.4m (2 blocks)	5	0.3
	0.8	0.4m (2 blocks)	6	0.4
	1.0	0.4m (2 blocks)	7	0.5
	1.2	0.4m (2 blocks)	8	0.6
	1.4	0.4m (2 blocks)	9	0.8

1

REV	DATE	DESCRIPTION	BY
0	03/08/2023	FOR CONSENT	AJL
1	05/09/2024	CONSENT AMENDMENT	AJL

CMW Geosciences

CLIENT: **CABRA DEVELOPMENTS LIMITED**	DRAWN: JS	PROJECT: AKL2018-0018
PROJECT: **31 SCHOOLSIDE ROAD, HUAPAI**	CHECKED: AL	DRAWING: 18
	REVISION: 1	SCALE: NTS
TITLE: **RETAINING WALL SUMMARY TABLES (2 OF 2)**	DATE: 05/09/2024	SHEET: A3

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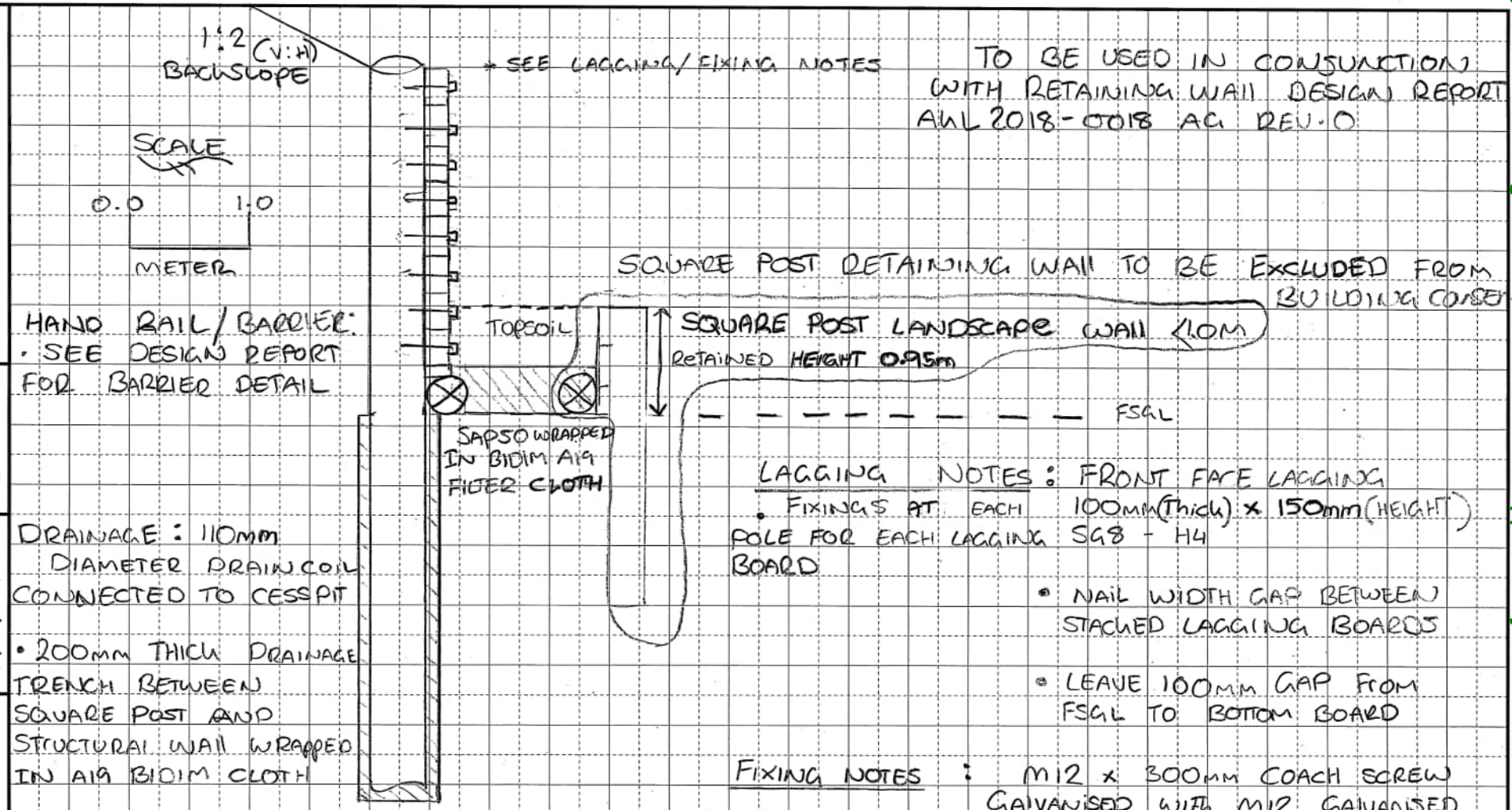
TYPICAL SECTION DETAIL

DRAWING NUMBER 20 REV.0

CMW Geosciences

Project: 21 SCHOOLSIDE ROAD
Client: CARBA DEVELOPMENTS LTD
Project No: AKL2018-0018
Date: 7/2/24
Designed: DW
Checked: AL
Page: 2



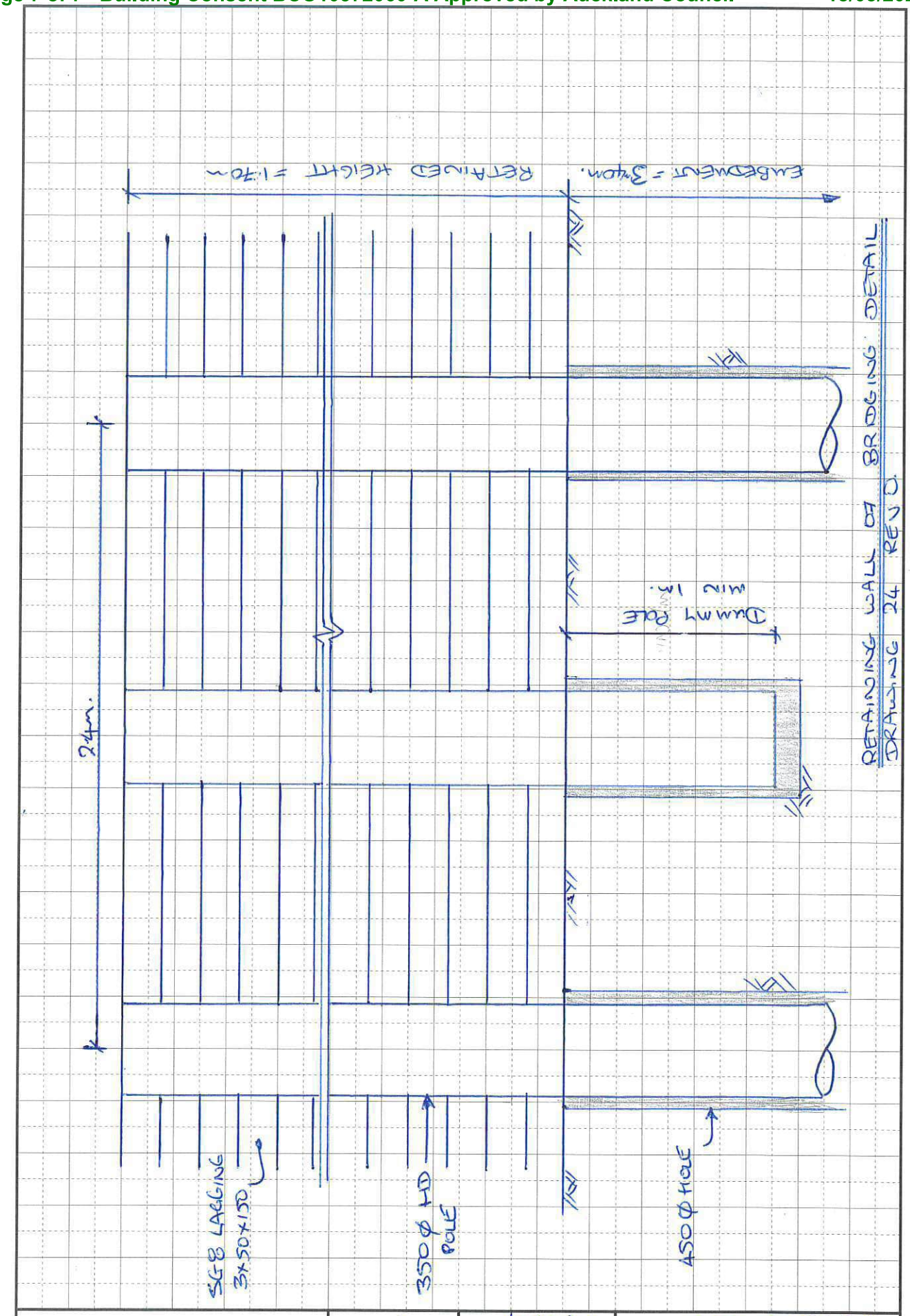
TO BE USED IN CONJUNCTION WITH RETAINING WALL DESIGN REPORT AKL 2018-0018 AC REV.0

LAGGING NOTES: FRONT FACE LAGGING 100mm(Thick) x 150mm(HEIGHT)

- FIXINGS AT EACH POLE FOR EACH LAGGING BOARD SG8 - H4
- NAIL WIDTH GAP BETWEEN STACKED LAGGING BOARDS
- LEAVE 100mm GAP FROM FSGL TO BOTTOM BOARD

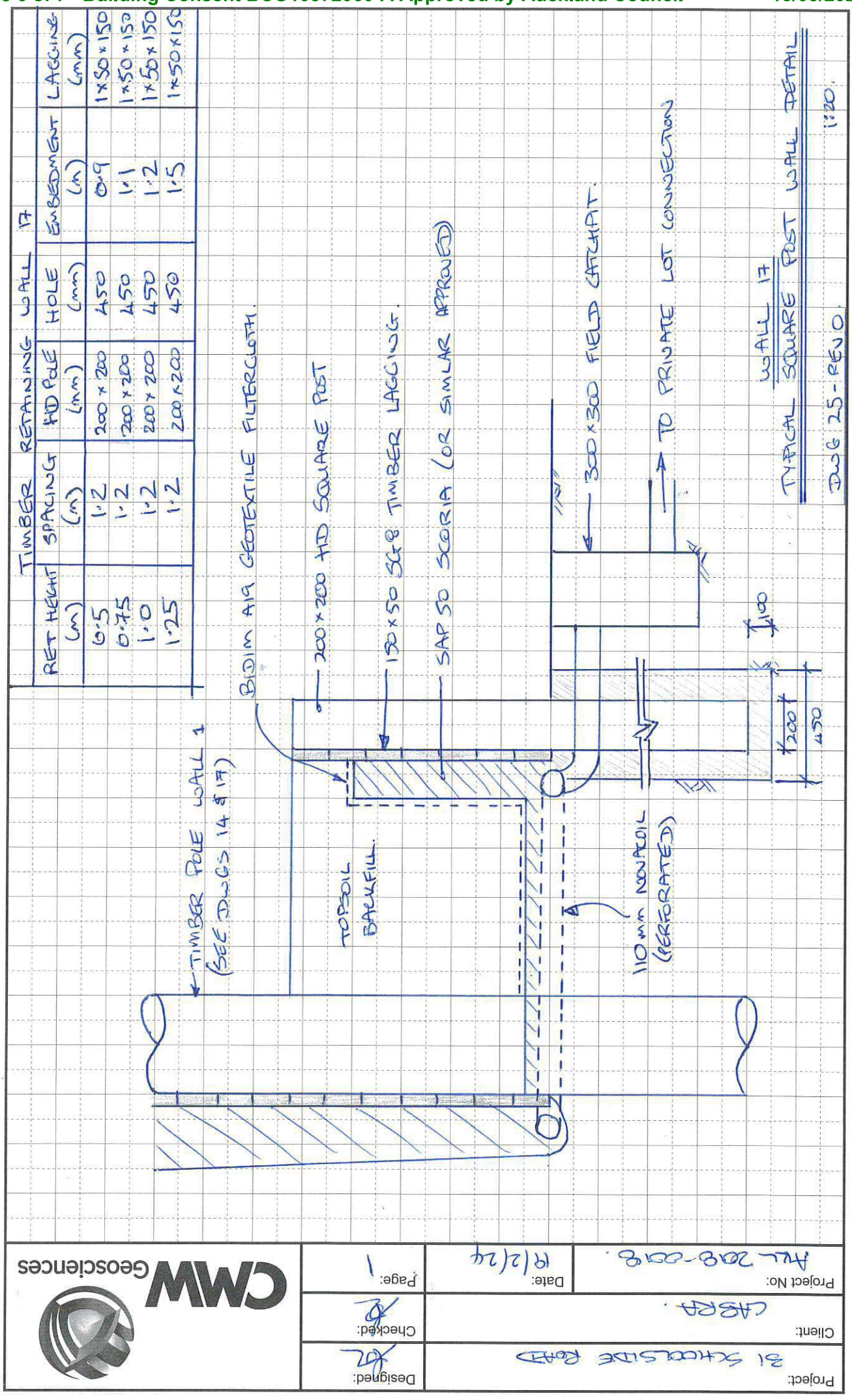
FIXING NOTES: M12 x 300mm COACH SCREW GALVANISED WITH M12 GALVANISED PENNY WASHER

- PREDRILL COACH SCREW HOLE W/ 8mm DRILL BIT TO REDUCE RISK OF TIMBER SPLITTING/CRACKING

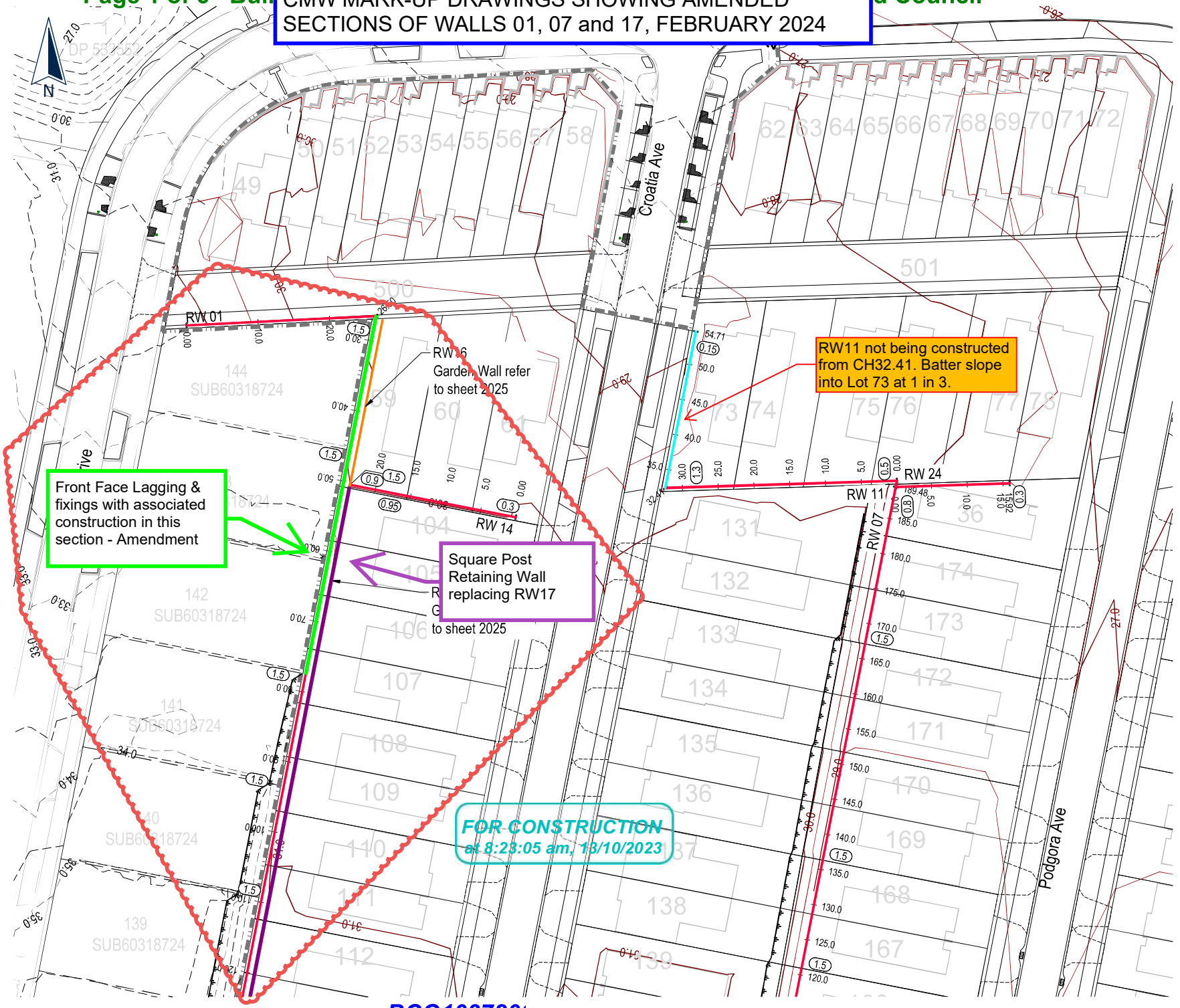


Project: 31 Shoebridge Rd	Date: 19/2/24	Project No: AKL 2018-6018
Client: CRPA		
Designed: DL	Checked:	Page: 1

CMW Geosciences


TIMBER RETAINING WALL 17
RET HEIGHT (m) | SPACING (m) | HD POLE (mm) | HOLE (mm) | EMBEDMENT (m) | LAGGING (mm)
0.5 | 1.2 | 200 x 200 | 450 | 0.9 | 1x50x150
0.75 | 1.2 | 200 x 200 | 450 | 1.1 | 1x50x150
1.0 | 1.2 | 200 x 200 | 450 | 1.2 | 1x50x150
1.25 | 1.2 | 200 x 200 | 450 | 1.5 | 1x50x150
BIDIM A19 GEOTEXTILE FILTERCLOTH.
200 x 200 HD SQUARE POST
150 x 50 SG8 TIMBER LAGGING.
SAP 50 SCORIA (OR SIMILAR APPROVED)
300 x 300 FIELD CAST PAT.
TO PRIVATE LOT CONNECTION
TIMBER POLE WALL 1 (SEE DWGS 14 & 17)
TOPSOIL BACKFILL.
110 mm NOVAFOIL (PERFORATED)
1100
200
450
WALL 17
TYPICAL SQUARE POST WALL DETAIL
1:20.
DWG 25 - REV 0
CMW Geosciences
Project: 31 Schoolside Rd
Client: CASRA.
Designed:
Checked:
Date: 19/2/24
Page: 1
Project No: Akl 2018-2018.

CMW MARK-UP DRAWINGS SHOWING AMENDED SECTIONS OF WALLS 01, 07 and 17, FEBRUARY 2024



CABRA
Land & Property Development

Proposed Earthworks Legend

- Existing Contours
- Proposed Contours Major
- Proposed Contours Minor
- Keystone Ret. Wall
- Timber Pole Ret. Wall
- Garden Wall
- Block Wall
- Future Wall
- Existing Wall
- Retaining Wall Height (labels on low side of wall unless noted otherwise)

NOTE
For General Notes
Refer Drawing 46565-DR-C-2020

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

Cabra Developments Limited
31 Schoolside Road,
Huapai

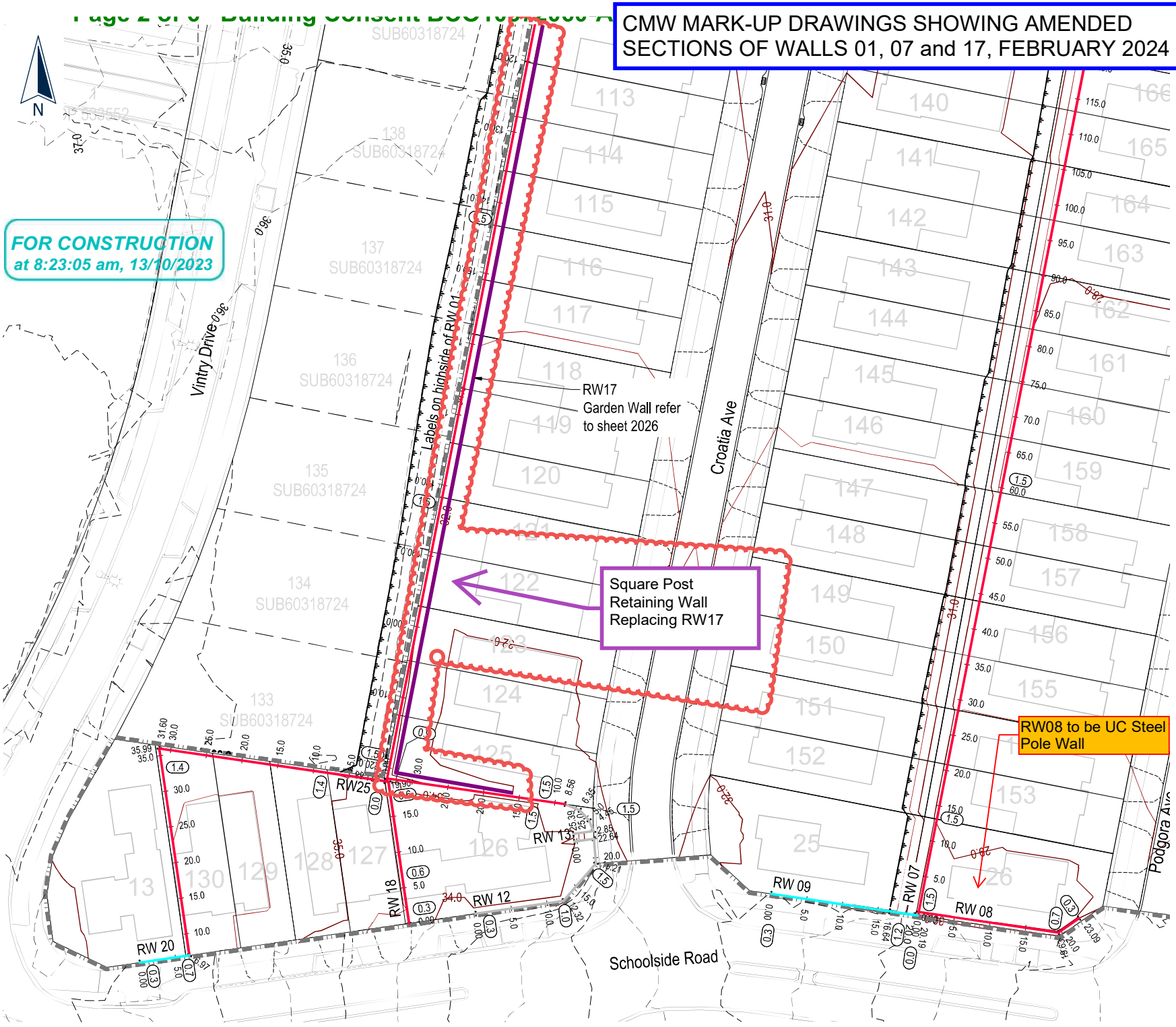
Proposed Contours & Retaining Walls Enlarged Layout Sheet 1

FOR BUILDING CONSENT

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued For Building Consent	K.Middeldorp	16/12/2022

SURVEYED		-	-
DESIGNED		K.Middeldorp	10/08/2022
DRAWN		I.Vishwasrao	09/12/2022
DATE	ORIGINAL SCALE	ORIGINAL SIZE	
06/09/2022	1:500	A3	
DRAWING NO.		REVISION	
46565-DR-C-2021		A	

CMW MARK-UP DRAWINGS SHOWING AMENDED SECTIONS OF WALLS 01, 07 and 17, FEBRUARY 2024



CABRA Land & Property Development

Proposed Earthworks Legend

- Existing Contours
- Proposed Contours Major
- Proposed Contours Minor
- Keystone Ret. Wall
- Timber Pole Ret. Wall
- Garden Wall
- Block Wall
- Future Wall
- Existing Wall
- (1.2) Retaining Wall Height (labels on low side of wall unless noted otherwise)

NOTE
For General Notes
Refer Drawing 46565-DR-C-2020

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PLANNERS | SURVEYORS | ENGINEERS
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Cabra Developments Limited
31 Schoolside Road,
Huapai

Proposed
Contours & Retaining
Walls Enlarged Layout
Sheet 4

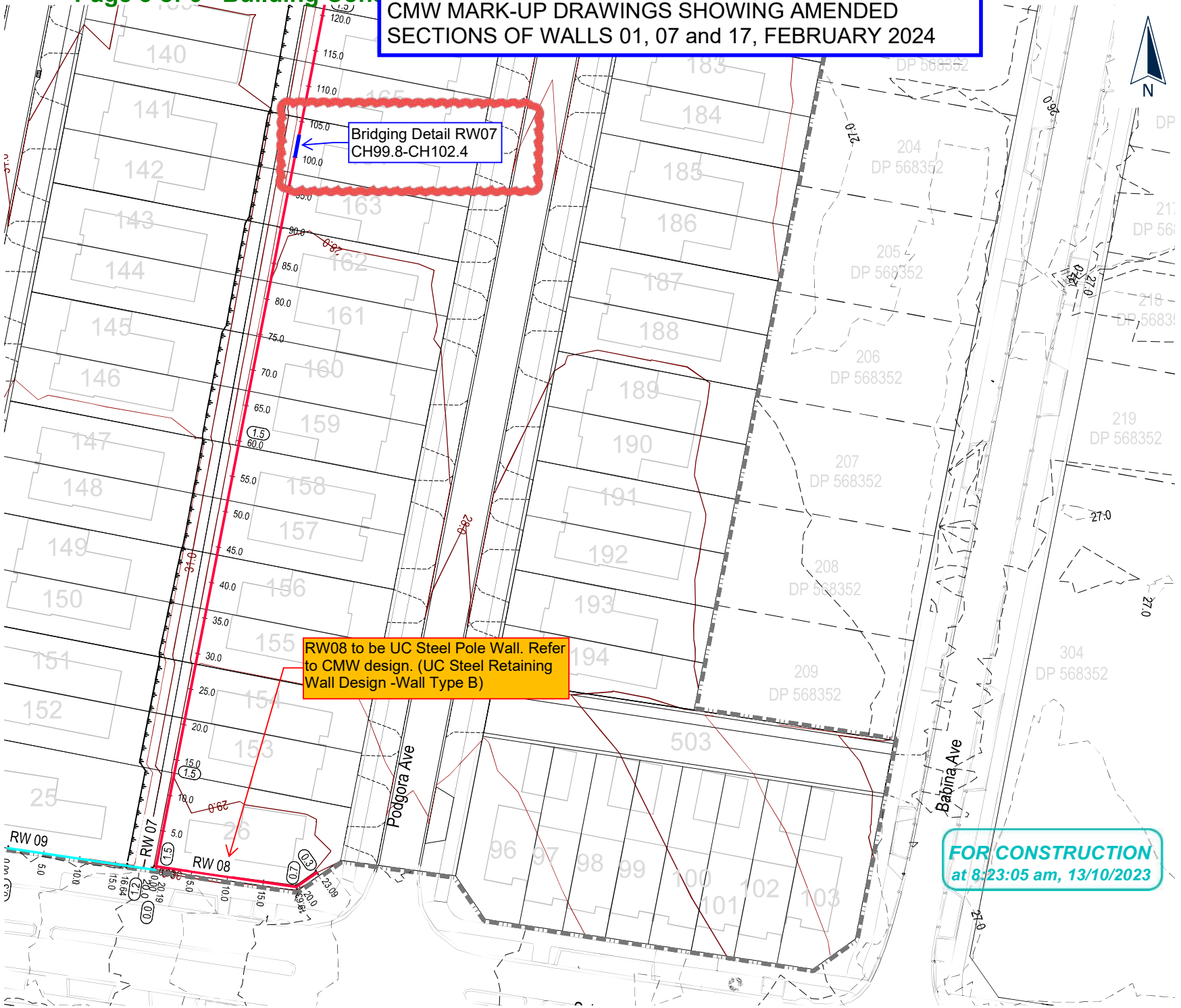
FOR BUILDING CONSENT

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued For Building Consent	K.Middeldorp	16/12/2022
	SURVEYED	-	-
	DESIGNED	K.Middeldorp	10/08/2022
	DRAWN	I.Vishwasrao	09/12/2022

DATE	ORIGINAL SCALE	ORIGINAL SIZE
10/08/2022	1:500	A3

DRAWING NO. 46565-DR-C-2024 REVISION A

CMW MARK-UP DRAWINGS SHOWING AMENDED SECTIONS OF WALLS 01, 07 and 17, FEBRUARY 2024



CABRA
Land & Property Development

Proposed Earthworks Legend

- Existing Contours
- Proposed Contours Major
- Proposed Contours Minor
- Keystone Ret. Wall
- Timber Pole Ret. Wall
- Garden Wall
- Block Wall
- Future Wall
- Existing Wall
- (1.2) Retaining Wall Height (labels on low side of wall unless noted otherwise)

NOTE
For General Notes
Refer Drawing 46565-DR-C-2020

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Cabra Developments Limited
31 Schoolside Road,
Huapai

Proposed
Contours & Retaining
Walls Enlarged Layout
Sheet 3

FOR BUILDING CONSENT

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued For Building Consent	K.Middeldorp	16/12/2022
	SURVEYED	-	-
	DESIGNED	K.Middeldorp	10/08/2022
	DRAWN	I.Vishwasrao	09/12/2022

DATE	ORIGINAL SCALE	ORIGINAL SIZE
06/09/2022	1:500	A3

DRAWING NO.	REVISION
46565-DR-C-2023	A

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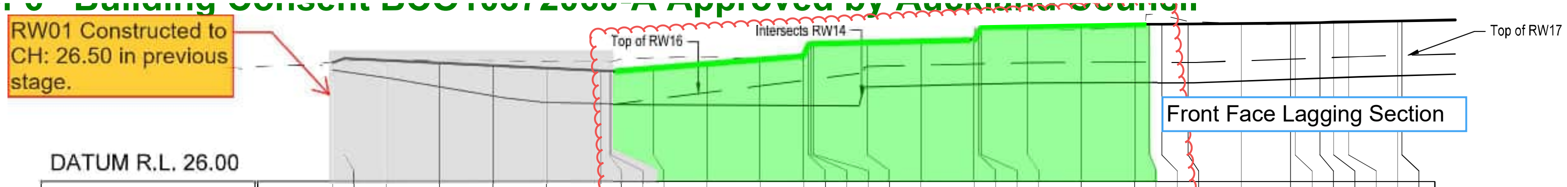


DATUM R.L. 26.00

Chainage	Retained Height	Top of Wall	Top of Garden Wall	Bottom of Wall	Existing Ground
0.00	0.35	31.52		31.17	31.55
1.08	0.60	31.71		31.10	31.58
5.00	0.80	31.62		30.82	31.64
10.00	1.10	31.50		30.39	31.62
15.00	1.41	31.38		29.97	31.60
20.00	1.60	31.26		29.66	31.57
25.00	1.58	31.14	30.15	29.56	31.54
25.85	1.55	31.12	29.93	29.57	31.54
25.95		31.12			31.55
30.00	1.72	31.29	29.82	29.57	31.77
35.00	1.94	31.51	30.14	29.56	31.81
40.00	2.17	31.72	30.45	29.55	31.77
44.09	2.35	31.89	30.70	29.54	31.89
44.49	2.86	32.39	30.73	29.54	32.34
44.70	2.90	32.44	30.74	29.54	32.35
45.00	2.90	32.44	30.76	29.54	32.37
50.00	2.10	32.50	31.35	30.40	32.36
55.00	2.10	32.56	31.41	30.46	32.46
60.00	2.10	32.62	31.47	30.52	32.53
60.45	2.59	33.12	31.48	30.53	33.11
60.65	2.64	33.17	31.48	30.53	33.11
65.00	2.64	33.22	31.53	30.58	33.18
70.00	2.69	33.28	31.55	30.60	33.07
75.00	2.74	33.34	31.56	30.61	33.25
76.40	2.75	33.36	31.56	30.61	33.82
77.55	2.75	33.37	31.56	30.61	33.79
80.00	2.76	33.37	31.57	30.62	33.50
85.00	2.7	33.39	31.65	30.70	33.41
89.59	2.63	33.41	31.73	30.78	33.39
90.00	2.63	33.42	31.74	30.79	33.40
92.34	2.61	33.44	31.78	30.83	33.42
93.60	2.6	33.45	31.80	30.85	33.45
95.00	2.59	33.47	31.82	30.88	33.49
99.59	2.57	33.51	31.89	30.94	33.51
100.00	2.57	33.52	31.90	30.95	33.52

LONGITUDINAL SECTION RW 01
Horizontal Scale 1 : 500
Vertical Scale 1 : 250

DATUM R.L. 26.00

Chainage	Retained Height	Top of Wall	Top of Garden Wall	Bottom of Wall	Existing Ground
90.00	2.63	33.42	31.74	30.79	33.40
92.34	2.61	33.44	31.78	30.83	33.42
93.60	2.60	33.45	31.80	30.85	33.45
95.00	2.59	33.47	31.82	30.88	33.49
99.59	2.57	33.51	31.89	30.94	33.51
100.00	2.57	33.52	31.90	30.95	33.52
105.00	2.55	33.57	31.97	31.02	33.51
108.31	2.54	33.60	32.01	31.06	33.56
109.59	2.53	33.61	32.03	31.08	33.53
110.00	2.53	33.62	32.03	31.09	33.50
115.00	2.54	33.67	32.08	31.13	33.54
119.59	2.55	33.71	32.11	31.16	33.41
120.00	2.56	33.72	32.11	31.16	33.35
124.26	2.57	33.76	32.14	31.19	33.04
125.00	2.57	33.76	32.14	31.19	33.04
125.44	2.57	33.77	32.15	31.20	33.04
129.59	2.56	33.80	32.19	31.24	33.14
130.00	2.56	33.81	32.20	31.25	33.12
134.59	2.55	33.86	32.26	31.31	33.20
135.00	2.55	33.86	32.27	31.32	33.20
139.59	2.53	33.91	32.33	31.38	33.27
140.00	2.53	33.92	32.33	31.39	33.28
145.00	2.54	33.97	32.38	31.43	33.37
149.59	2.57	34.01	32.39	31.44	33.48
150.00	2.57	34.02	32.39	31.45	33.46
155.00	2.59	34.06	32.41	31.47	33.37
159.59	2.58	34.09	32.46	31.51	33.46
160.00	2.58	34.10	32.46	31.52	33.47
165.00	2.55	34.15	32.55	31.60	33.56
170.00	2.56	34.21	32.60	31.65	33.62
174.59	2.57	34.26	32.64	31.70	33.67
175.00	2.57	34.27	32.65	31.70	33.67
180.00	2.57	34.32	32.70	31.75	33.83
184.59	2.56	34.36	32.75	31.81	33.85
185.00	2.56	34.37	32.76	31.81	33.85
190.00	2.54	34.41	32.82	31.88	33.96
194.59	2.52	34.46	32.88	31.94	33.99
195.00	2.52	34.46	32.89	31.94	34.00
200.00	2.55	34.50	32.91	31.95	34.04
204.59	2.59	34.54	32.91	31.95	34.02
205.00	2.59	34.55	32.91	31.95	34.02
208.10	2.64	34.60	32.91	31.95	34.05
210.00	2.64	34.60	32.91	31.95	34.12
211.61	2.64	34.60	32.91	31.95	34.16
215.00	2.67	34.62	32.91	31.95	34.24
219.36		34.65	32.91		34.41
220.00		34.66			34.45

LONGITUDINAL SECTION RW 01
Horizontal Scale 1 : 500
Vertical Scale 1 : 250

FOR CONSTRUCTION
at 8:23:05 am, 13/10/2023

CMW MARK-UP DRAWINGS SHOWING AMENDED SECTIONS OF WALLS 01, 07 and 17, FEBRUARY 2024

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

CABRA
Land & Property Development

Cabra Developments Limited
31 Schoolside Road
Huapai

Proposed Retaining Wall
Longsections
Sheet 1

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued For Building Consent	K.Middeldorp	16/12/2022

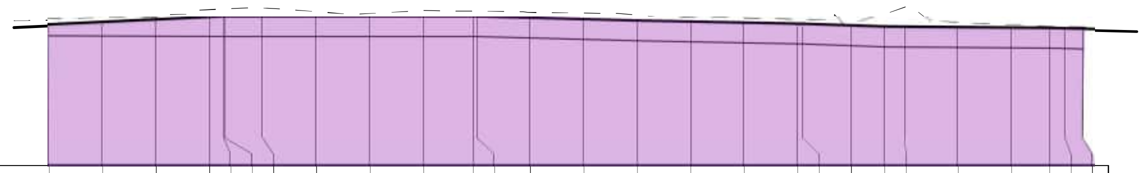
FOR BUILDING CONSENT

	NAME	DATE
SURVEYED	-	-
DESIGNED	K.Middeldorp	10/08/2022
DRAWN	I.Vishwasrao	07/12/2022

DATE	ORIGINAL SCALE	ORIGINAL SIZE
07/12/2022	1:1000	A3

DRAWING NO.	REVISION
46565-DR-C-2310	A

BCO103720



DATUM R.L. 26.00

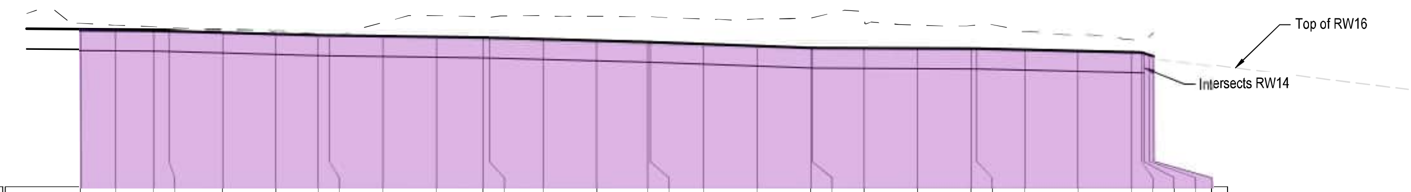
Retained Height	0.53	0.66	0.79	0.92			0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Top of Wall	32.53	32.64	32.76	32.87	32.90	32.91	32.91	32.91	32.91	32.91	32.91	32.90	32.84	32.77	32.71	32.66	32.61	32.56	32.55	32.48	32.42	32.42	32.40	32.38	32.37	32.35	32.32
Bottom of Wall	31.99	31.98	31.97	31.96			31.95	31.95	31.95	31.95	31.95	31.95	31.89	31.82	31.76	31.71	31.66	31.61	31.61	31.53	31.48	31.47	31.45	31.43	31.42	31.40	31.37
Existing Ground	32.77	32.80	32.84	33.05	33.19	33.29	33.32	33.31	33.12	33.15	33.23	33.22	33.20	33.14	33.12	32.96	32.85	32.81	32.81	32.73	32.59	32.82	33.00	32.57	32.50	32.47	32.44
Chainage	0.00	5.00	10.00	15.00	16.35	16.46	20.00	25.00	30.00	35.00	39.65	40.00	45.00	50.00	55.00	60.00	65.00	70.00	70.45	75.00	78.15	80.00	85.00	90.00	93.55	95.00	96.70

LONGITUDINAL SECTION RW 17 Keystone Garden wall

Horizontal Scale 1 : 500
Vertical Scale 1 : 250

Now a Square Post Wall

FOR CONSTRUCTION
at 8:23:05 am, 13/10/2023



DATUM R.L. 25.00

Retained Height	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Top of Wall	32.39	32.38	32.37	32.35	32.28	32.21	32.16	32.15	32.12	32.08	32.05	32.05	31.98	31.91	31.84	31.84	31.75	31.66	31.57	31.57	31.56	31.55	31.54	31.53	31.48	31.42	31.36	31.35	31.32	31.23	31.18
Bottom of Wall	31.44	31.43	31.42	31.40	31.33	31.26	31.21	31.20	31.17	31.13	31.11	31.10	31.03	30.96	30.90	30.89	30.80	30.71	30.63	30.62	30.61	30.60	30.59	30.59	30.53	30.47	30.41	30.40			
Existing Ground	32.67	32.57	32.50	32.47	32.40	32.36	32.21	32.17	32.70	33.01	32.96	32.95	33.02	32.99	32.98	32.97	32.86	32.86	32.92	32.92	33.22	32.58	32.56	32.59	32.32	32.18	31.94	31.89	31.88	32.11	32.27
Chainage	86.70	90.00	93.55	95.00	100.00	105.00	108.95	110.00	115.00	120.00	124.35	125.00	130.00	135.00	139.75	140.00	145.00	150.00	155.00	155.15	160.00	165.00	170.00	170.55	175.00	180.00	185.00	185.95	186.16	186.70	187.06

LONGITUDINAL SECTION RW 17 Keystone Garden wall

Horizontal Scale 1 : 500
Vertical Scale 1 : 250

Now a Square Post Wall

CMW MARK-UP DRAWINGS SHOWING AMENDED SECTIONS OF WALLS 01, 07 and 17, FEBRUARY 2024

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ARCHITECTS | ENVIRONMENTAL

CABRA
Land & Property Development

Cabra Developments Limited
31 Schoolside Road
Huapai

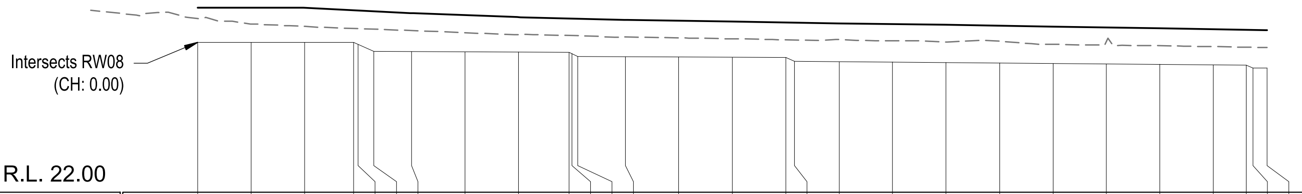
Proposed Retaining Wall
Longsections
Sheet 6

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued For Building Consent	K.Middeldorp	16/12/2022

FOR BUILDING CONSENT

	NAME	DATE
SURVEYED	-	-
DESIGNED	K.Middeldorp	10/08/2022
DRAWN	I.Vishwasrao	07/12/2022

DATE: 07/12/2022
ORIGINAL SCALE: 1:1000
ORIGINAL SIZE: A3
DRAWING NO.: 46565-DR-C-2315
REVISION: A



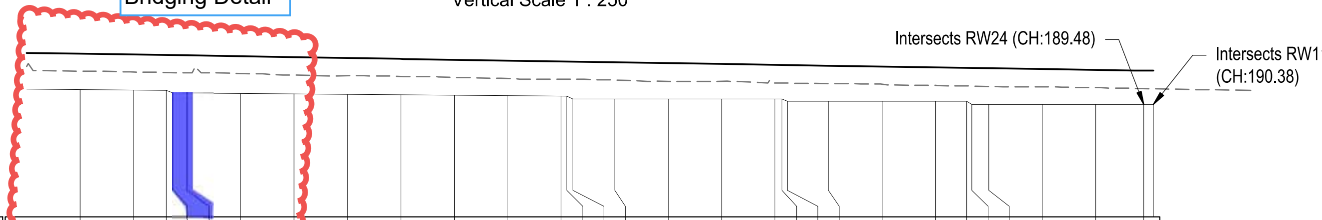
DATUM R.L. 22.00

Top of Wall	30.62	30.62	30.62	30.50	30.49	30.45	30.36	30.26	30.17	30.11	30.11	30.10	30.05	30.01	29.97	29.93	29.92	29.89	29.85	29.81	29.77	29.73	29.69	29.65	29.61	29.59	29.58	29.57
Retained Height	1.62	1.62	1.62	1.5	1.58	1.87	1.79	1.71	1.63	1.58	1.64	1.77	1.73	1.7	1.67	1.64	1.81	1.8	1.78	1.76	1.74	1.72	1.7	1.68	1.66	1.65	1.78	1.77
Bottom of Wall	29.00	29.00	29.00	29.00	28.91	28.58	28.57	28.56	28.54	28.53	28.47	28.33	28.32	28.31	28.30	28.29	28.11	28.09	28.07	28.05	28.03	28.01	27.99	27.97	27.95	27.94	27.80	27.80
Existing Ground	30.12	29.86	29.74	29.64	29.64	29.62	29.55	29.45	29.36	29.32	29.31	29.31	29.25	29.21	29.16	29.12	29.11	29.13	29.07	29.01	29.05	28.90	29.06	28.84	28.80	28.77	28.77	28.75
Chainage	0.00	5.00	10.00	14.60	15.00	16.47	20.00	25.00	30.00	34.75	35.00	35.55	40.00	45.00	50.00	55.00	55.80	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	98.05	98.69	100.00

LONGITUDINAL SECTION RW07
Horizontal Scale 1 : 500
Vertical Scale 1 : 250

FOR CONSTRUCTION
at 11:55:09 am, 30/11/2023

Bridging Detail



DATUM R.L. 22.00

Top of Wall	29.65	29.61	29.59	29.58	29.57	29.53	29.49	29.45	29.41	29.37	29.33	29.29	29.29	29.28	29.25	29.21	29.17	29.13	29.13	29.12	29.09	29.05	29.01	28.99	28.99	28.97	28.93	28.89	28.86
Retained Height	1.68	1.66	1.65	1.78	1.77	1.75	1.73	1.71	1.69	1.66	1.64	1.62	1.62	1.75	1.72	1.68	1.64	1.6	1.59	1.7	1.67	1.63	1.59	1.56	1.7	1.69	1.65	1.62	1.58
Bottom of Wall	27.97	27.95	27.94	27.80	27.80	27.78	27.76	27.74	27.73	27.71	27.69	27.67	27.67	27.54	27.54	27.54	27.54	27.54	27.53	27.43	27.43	27.43	27.43	27.42	27.28	27.28	27.28	27.28	27.28
Existing Ground	28.84	28.80	28.77	28.77	28.75	28.73	28.64	28.62	28.59	28.54	28.49	28.46	28.46	28.46	28.41	28.36	28.36	28.28	28.27	28.27	28.25	28.23	28.16	28.14	28.13	28.12	28.10	28.06	28.02
Chainage	90.00	95.00	98.05	98.69	100.00	105.00	110.00	115.00	120.00	125.00	130.00	135.00	135.52	136.10	140.00	145.00	150.00	155.00	155.65	156.16	160.00	165.00	170.00	172.91	173.39	175.00	180.00	185.00	189.48

CMW MARK-UP DRAWINGS SHOWING AMENDED SECTIONS OF WALLS 01, 07 and 17, FEBRUARY 2024

LONGITUDINAL SECTION RW07
Horizontal Scale 1 : 500
Vertical Scale 1 : 250

CLIENT: CABRA LAND & PROPERTY DEVELOPMENT — CABRA DEVELOPMENTS LIMITED

PROJECT: 31 SCHOOLSIDE ROAD HUAPAI

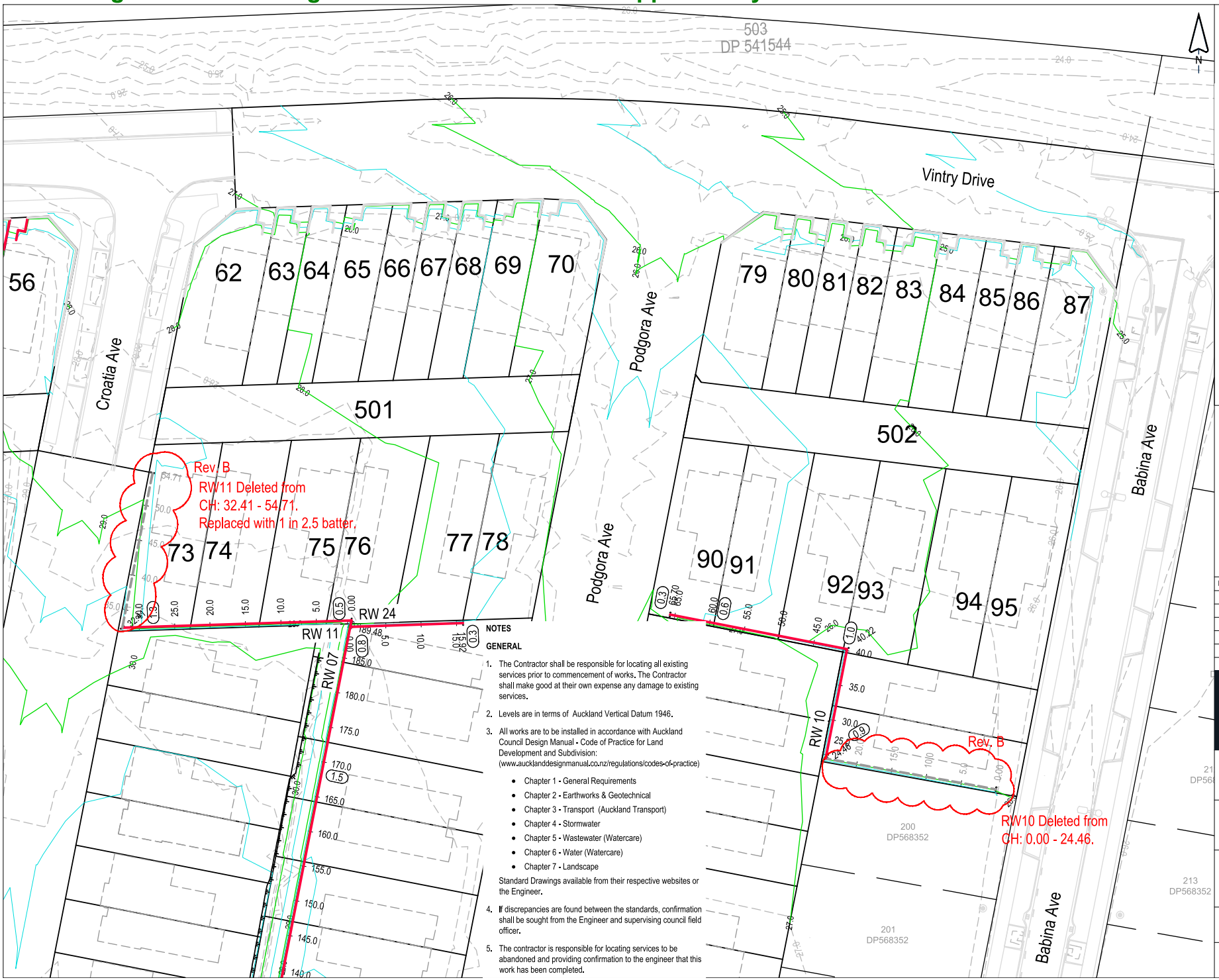
CAPTURE Land Development Consultants

REV	DATE	REVISION DETAILS	ISSUED
A	29/11/23	FOR CONSTRUCTION	KM

DRAWING TITLE: RETAINING WALL RW07 LONGSECTION

STATUS	SCALE	SIZE
For Construction	1:1000(H) 1:200(V)	A3

PROJECT NO	DRAWING NO	REVISION
1095	EWKS-250	A



NOTES

GENERAL

1. The Contractor shall be responsible for locating all existing services prior to commencement of works. The Contractor shall make good at their own expense any damage to existing services.
2. Levels are in terms of Auckland Vertical Datum 1946.
3. All works are to be installed in accordance with Auckland Council Design Manual - Code of Practice for Land Development and Subdivision: (www.aucklanddesignmanual.co.nz/regulations/codes-of-practice)
   - Chapter 1 - General Requirements
   - Chapter 2 - Earthworks & Geotechnical
   - Chapter 3 - Transport (Auckland Transport)
   - Chapter 4 - Stormwater
   - Chapter 5 - Wastewater (Watercare)
   - Chapter 6 - Water (Watercare)
   - Chapter 7 - Landscape

   Standard Drawings available from their respective websites or the Engineer.
4. If discrepancies are found between the standards, confirmation shall be sought from the Engineer and supervising council field officer.
5. The contractor is responsible for locating services to be abandoned and providing confirmation to the engineer that this work has been completed.

CABRA
LAND & PROPERTY DEVELOPMENT

Proposed Earthworks Legend

- Existing Contours
- Proposed Contours Major
- Proposed Contours Minor
- Keystone Retaining Wall
- Timber Pole Ret Wall
- Garden Wall
- Block Wall
- Future Wall
- Retaining Wall Height (labels on low side of wall unless noted otherwise)

NOTE: Plan replaces Original Consent plan 46565-DR-C-2022-A Proposed Contours & Retaining Walls Enlarged Layout Sheet 2

REV	DATE	REVISION DETAILS	ISSUED
A	02/08/24	FOR RC VARIATION	KM
B	05/06/24	FOR BC AMENDMENT	KM

CAPTURE
Land Development Consultants

CLIENT
CABRA DEVELOPMENTS LIMITED

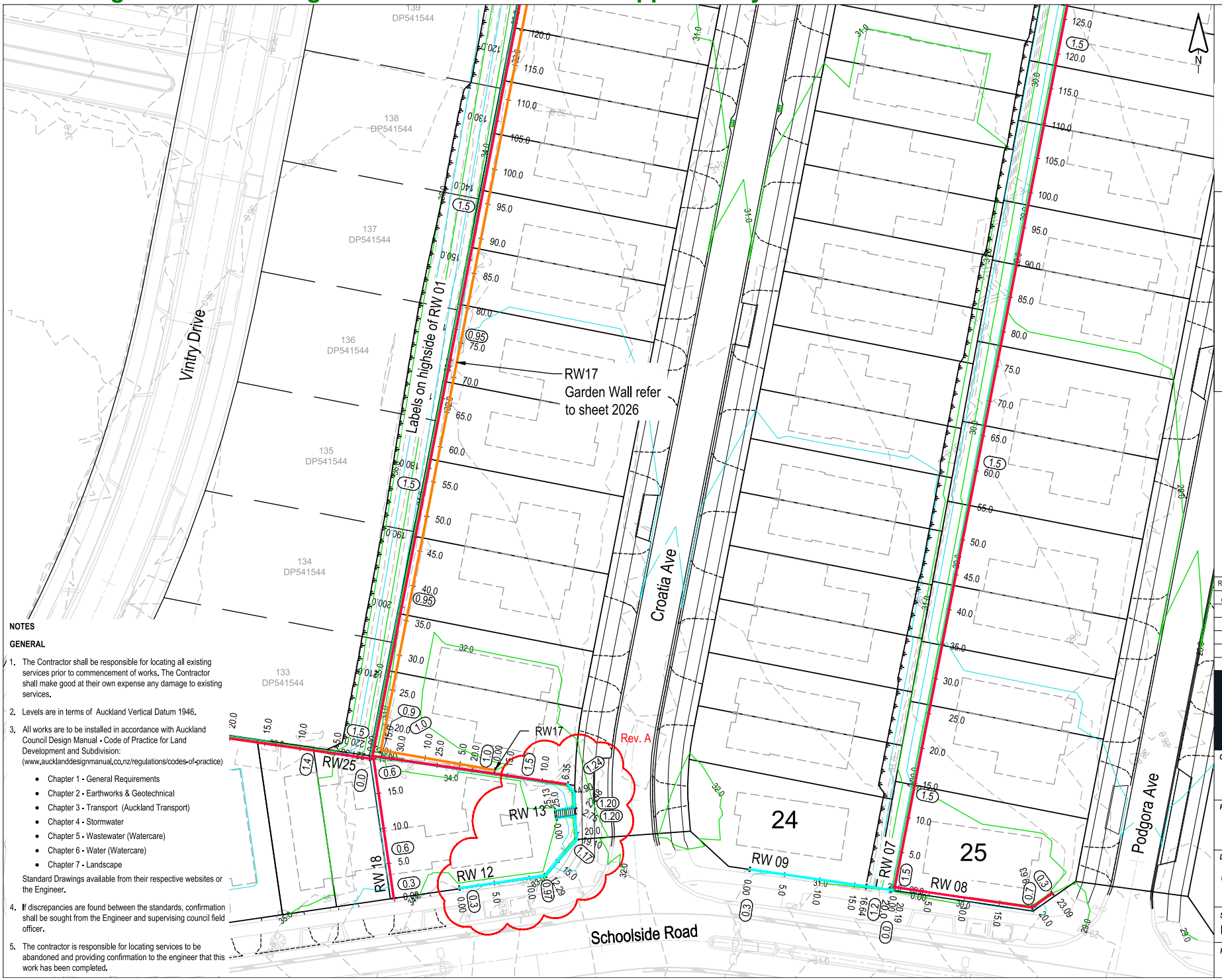
PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
PROPOSED CONTOURS AND RETAINING WALLS ENLARGED LAYOUT - SHEET 2

STATUS	SCALE	SIZE
FOR BC	1:500	A3

PROJECT	DRAWING NO	REVISION
1095	EWKS-202	B

c:\users\ken\capture\land clients - documents\cabra\1095 - 31 schoolside road\technical\cad\civil\1095-ewks-200 proposed cont and rw plan



CABRA
LAND & PROPERTY DEVELOPMENT

Proposed Earthworks Legend

- Existing Contours
- Proposed Contours Major
- Proposed Contours Minor
- Keystone Retaining Wall
- Timber Pole Ret Wall
- Garden Wall
- Block Wall
- 1.5m — Retaining Wall Height (labels on low side of wall unless noted otherwise)

NOTE: Plan replaces Original Consent plan 46565-DR-C-2024-A Proposed Contours & Retaining Walls Enlarged Layout Sheet 4

REV	DATE	REVISION DETAILS	ISSUED
A	30/08/24	FOR BUILDING CONSENT	KM

CAPTURE
Land Development Consultants

CLIENT
CABRA DEVELOPMENTS LIMITED

PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
PROPOSED CONTOURS AND RETAINING WALLS ENLARGED LAYOUT - SHEET 6

STATUS	SCALE	SIZE
FOR BC	1:500	A3

PROJECT	DRAWING NO	REVISION
1095	EWKS-206	A

NOTES

GENERAL

1. The Contractor shall be responsible for locating all existing services prior to commencement of works. The Contractor shall make good at their own expense any damage to existing services.
2. Levels are in terms of Auckland Vertical Datum 1946.
3. All works are to be installed in accordance with Auckland Council Design Manual - Code of Practice for Land Development and Subdivision: (www.aucklanddesignmanual.co.nz/regulations/codes-of-practice)
   - Chapter 1 - General Requirements
   - Chapter 2 - Earthworks & Geotechnical
   - Chapter 3 - Transport (Auckland Transport)
   - Chapter 4 - Stormwater
   - Chapter 5 - Wastewater (Watercare)
   - Chapter 6 - Water (Watercare)
   - Chapter 7 - Landscape

   Standard Drawings available from their respective websites or the Engineer.
4. If discrepancies are found between the standards, confirmation shall be sought from the Engineer and supervising council field officer.
5. The contractor is responsible for locating services to be abandoned and providing confirmation to the engineer that this work has been completed.

CMW Geosciences
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APPENDIX D
Earthworks Test Results

LF11 Rev 4 Soil Field Density NDM Direct Transmission with VSS Report

Auckland Laboratory
CMW Geosciences (NZ) Limited
Building C, 9 Piermark Drive, Rosedale, NZ 0632
PO Box 300206, Albany, Auckland, NZ 0752
Phone: +64 (09) 4144 632

Project:	45 Station Road, Huapai
Project No:	AKL2016_0634
Location:	Huapai
Report No:	AKL2016_0634LAD Rev.0
Report Date:	15/02/2017
Client:	Cabra Developments Limited
Client Address:	
Client Reference:	

Test Methods:
NZS 4402.2.1:1986
NZS 4407.4.2.2:2015
NZGS:August 2001

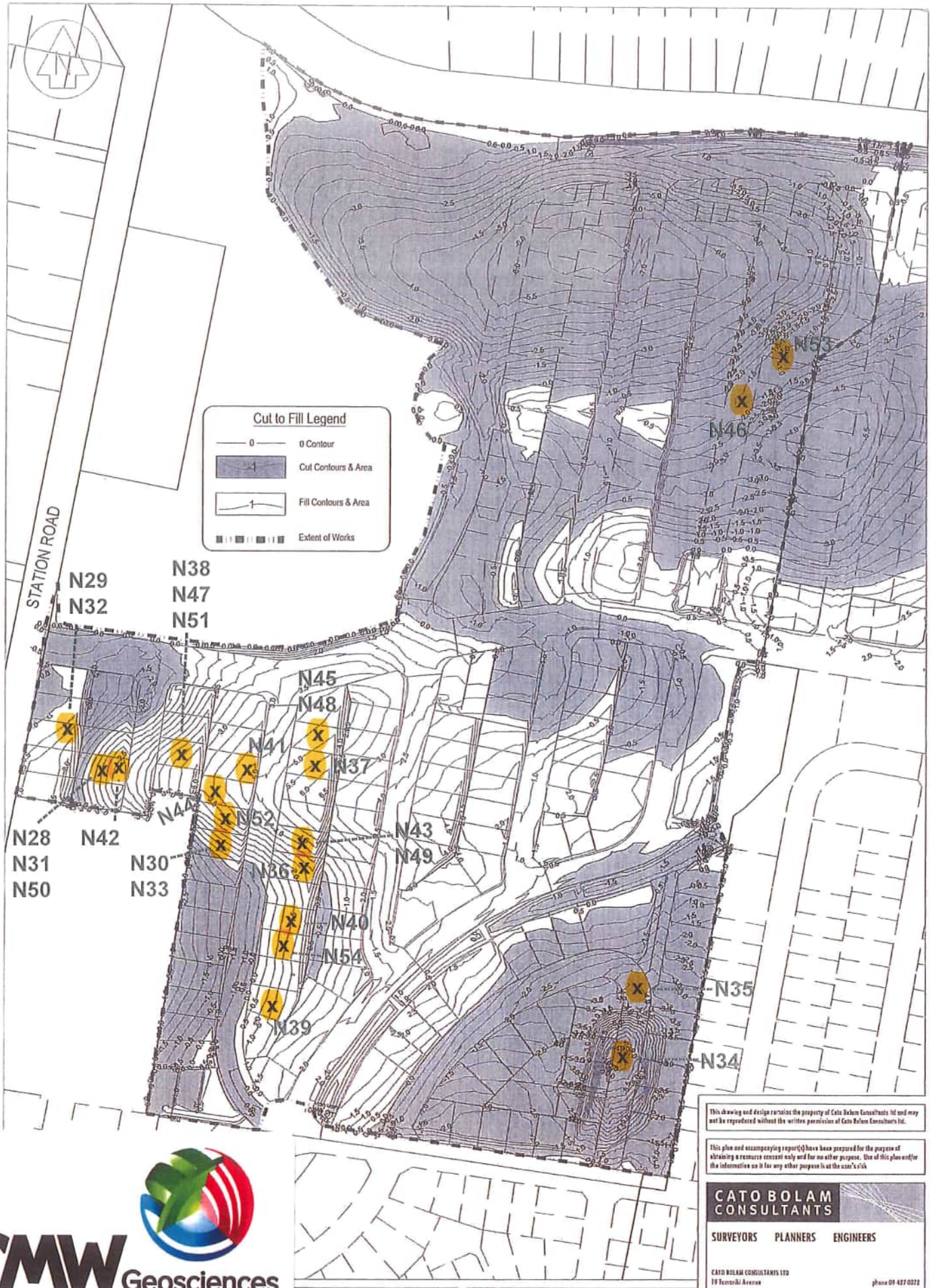
Notes:
Solid Density: Assumed
Testing Locations Selected By: CMW Field Staff

IANZ ACCREDITED LABORATORY — Tests indicated as not accredited are outside the scope of the laboratory's accreditation

Measurements marked * are not accredited and are outside the scope of the laboratories accreditation

Date Sampled	Sample No.	Test Location	Soil Description	In-situ Vane Shear Strengths					Field and Laboratory Testing Data									Comments
				Test 1 (kPa)	Test 2 (kPa)	Test 3 (kPa)	Test 4 (kPa)	Ave.	Gauge Wet Density (t/m^3)	Gauge Dry Density (t/m^3)	Gauge Water Content (%)	Gauge Air Voids (%)	Gauge Probe Depth	Oven Water Content (%)	Solid Density (t/m^3) *	Oven Dry Density (t/m^3)	Calculated Air Voids (%) *	
12/01/2017	N28	Lot 9	CLAY	97	124	138	135	124	1.7523	1.2313	42.3	2.18	300	35.5	2.7	1.30	6.2	Failed
	N29	Lot 3	CLAY	167	189	>189	>189	>184	1.7401	1.2240	42.2	2.94	300	39.0	2.7	1.26	4.8	
	N30	Lot 20	CLAY	138	132	167	140	144										Failed
13/01/2017	N31	Lot 9	CLAY	189	189	>189	>189	>189	1.7241	1.2262	40.6	4.68	300	41.6	2.7	1.22	4.3	Re-test of N28
	N32	Lot 3	CLAY	>189	>189	189	189	>189	1.7342	1.2154	42.7	2.99	300	50.0	2.7	1.16	-0.6	
	N33	Lot 20	CLAY	178	170	189	183	180	1.7505	1.2899	35.7	6.07	300	36.1	2.7	1.28	5.9	Re-test of N30
16/01/2017	N34	Refer to site plan	CLAY	189	189	>189	>189	>189	1.8756	1.4034	33.6	0.70	300	32.9	2.7	1.42	1.3	
	N35	Refer to site plan	CLAY	178	175	189	189	183	1.7740	1.3549	30.9	7.82	300	32.3	2.7	1.34	7.0	
	N36	Lot 39	CLAY	UTP	UTP	UTP	UTP	UTP	1.7281	1.2764	35.4	7.46	300	30.7	2.7	1.32	10.0	
	N37	Lot 43	CLAY	UTP	UTP	UTP	UTP	UTP	1.7351	1.2784	35.7	6.88	300	37.1	2.7	1.26	6.2	
	N38	Lot 12	CLAY	UTP	UTP	UTP	UTP	UTP	1.8507	1.3499	37.1	-0.19	300	43.6	2.7	1.28	-3.9	
18/01/2017	N39	Lot 37	CLAY	UTP	UTP	UTP	UTP	UTP	1.8490	1.4097	31.2	3.76	300	31.1	2.7	1.42	3.9	
	N40	Lot 34	CLAY	183	189	189	>189	>188	1.7472	1.2828	36.2	5.95	300	34.9	2.7	1.30	6.9	
	N41	Lot 17	CLAY	127	140	119	121	127	1.6636	1.1636	44.0	5.64	300	35.0	2.7	1.24	11.0	Failed
	N42	Lot 9	CLAY	>189	>189	>189	>189	>189	1.7471	1.2521	39.5	4.01	300	46.0	2.7	1.20	0.6	
25/01/2017	N43	Lot 40	CLAY	>189	>189	UTP	UTP	>189	1.7865	1.3862	28.9	8.54	300	26.7	2.7	1.40	10.0	
	N44	Lot 18	CLAY	186	189	>189	>189	>188	1.8318	1.3358	37.1	0.81	300	38.8	2.7	1.32	-0.1	Re-test of N41
	N45	Lot 44	CLAY	173	178	189	>189	>182	1.7411	1.2510	39.2	4.55	300	37.3	2.7	1.26	5.8	
27/01/2017	N46	Refer to site plan	CLAY	178	146	151	165	160	1.7280	1.2275	40.8	4.38	200	45.5	2.7	1.18	2.0	
31/01/2017	N47	Lot 12	CLAY	UTP	UTP	UTP	UTP	UTP	1.7523	1.2719	37.8	4.74	300	39.3	2.7	1.26	3.9	
	N48	Lot 44	CLAY	UTP	UTP	UTP	UTP	UTP	1.7986	1.4142	27.2	9.10	300	34.6	2.7	1.34	4.3	
	N49	Lot 40	CLAY	UTP	UTP	UTP	UTP	UTP	1.7970	1.3901	29.3	7.74	300	35.3	2.7	1.32	3.9	
7/02/2017	N50	Lot 9	CLAY	UTP	UTP	UTP	UTP	UTP	1.7613	1.2824	37.3	4.50	300	44.4	2.7	1.22	0.7	
	N51	Lot 12	CLAY	UTP	UTP	UTP	UTP	UTP	1.7743	1.2653	40.2	2.12	300	52.4	2.7	1.16	-4.1	
	N52	Lot 19	CLAY	UTP	UTP	UTP	UTP	UTP	1.7893	1.3263	34.9	4.48	300	33.2	2.7	1.34	5.6	
	N53	Refer to site plan	CLAY	UTP	UTP	UTP	UTP	UTP	1.7614	1.2984	35.7	5.51	300	34.4	2.7	1.32	6.4	
13/02/2017	N54	Lot 36	CLAY	189	189	181	>189	>187	1.7475	1.2313	41.9	2.66	300	46.5	2.7	1.20	0.4	

Created By: TG Date: 13/01/2017
Checked By: TG Date: 15/02/2017
Authorised Signatory: Date: 15/2/2017



CMW Geosciences

CATO BOLAM CONSULTANTS
SURVEYORS PLANNERS ENGINEERS
CATO BOLAM CONSULTANTS LTD
79 Centreiki Avenue
PO Box 157
Orewa 0946
phone 09 427 0022
fax 09 426 7331
email catobolam@catobolam.co.nz

REVISION (DESCRIPTIONS)	NAME	DATE
R1 REVISED FOR AMENDED DESIGN	KM	05/12/2016
	NAME	DATE
SURVEYED		
DESIGNED	KM	15/11/2016
DRAWN	KM	15/11/2016
CHECKED		
APPROVED		

CABRA DEVELOPMENTS LTD
45 STATION ROAD,
HUAPAI

DRAWING TITLE

CUT AND FILL DEPTH CONTOURS PLAN

ORIGINAL SCALE 1 : 2000	ORIGINAL SIZE A3	REVISION NO R1
DATE 15/11/2016	CAD REFERENCE 34745 E112 Cut/Fill.p	SHEET NO E112
DIRECTORY Z:\34745\LAD\		JOB NO 34745

LF11 Soil Field Density NDM Direct Transmission with VSS Report (Cohesive Soils) (Rev 19)

Auckland Laboratory
CMW Geotechnical NZ Limited
11/63, Arrenway Drive, Rosedale, NZ 0632
PO Box 300206, Albany, Auckland, NZ 0752
Phone: +64 (09) 4144 632

Project:	45 Station Road Stage 2
Project No:	AKL2018-0018
Location:	Huapai
Report No:	AKL2018-0018LAA Rev 1
Report Date:	7/01/2025
Client:	Cabra Developments Ltd
Client Address:	19 Tamariki Avenue, Orewa, Auckland 0932

Test Methods:
NZS 4407 2015 Test 3.1 ◊
NZS 4407 2015 Test 4.2
NZGS:August 2001

Notes:
Solid Density: Assumed
Solid Density Data Source: N/A
Testing Locations Selected By: CMW Field Staff
◊ Only samples <2.0mm will be considered for endorsed testing
① Blade size of 19mm used.

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

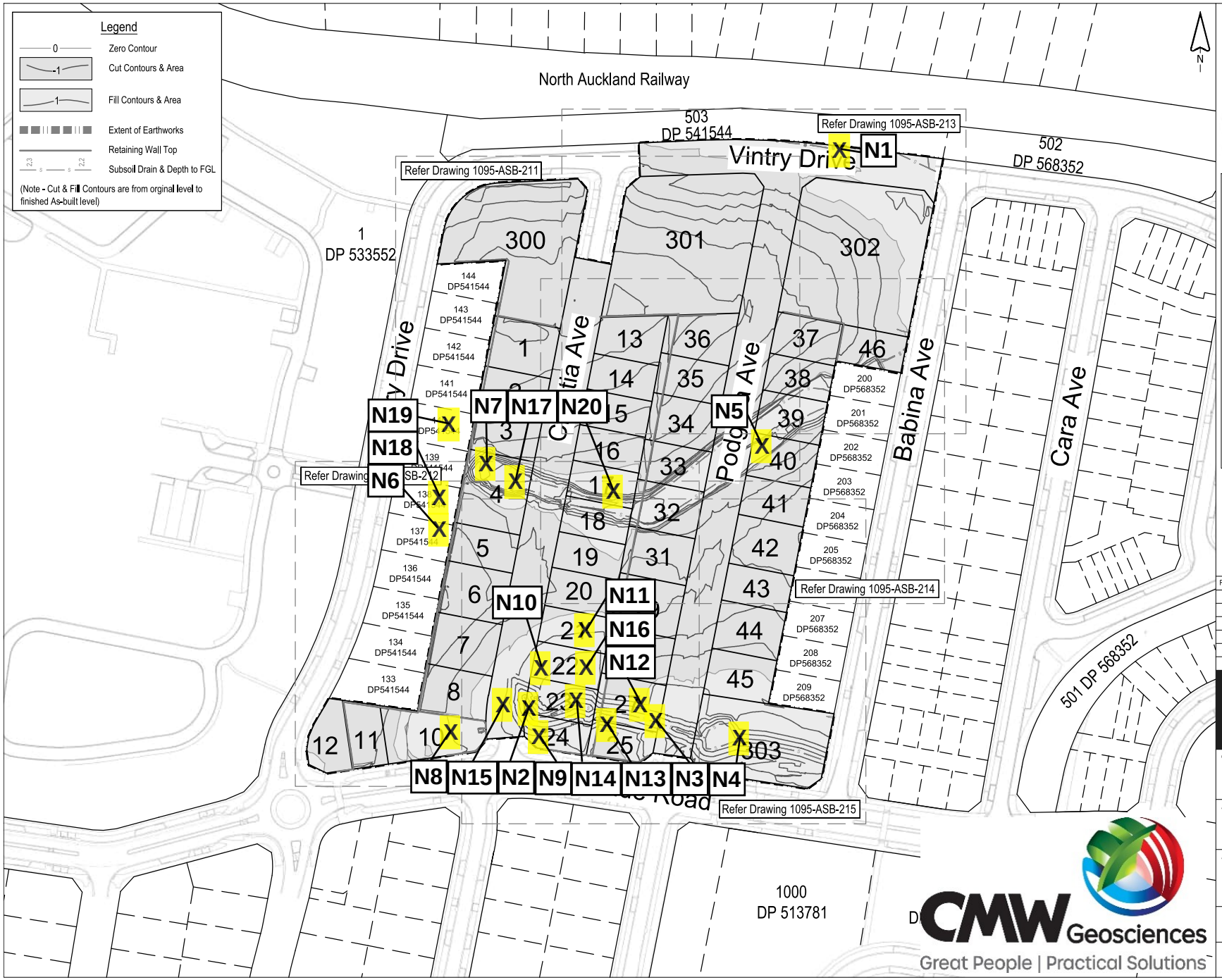
Measurements marked * are not accredited and are outside the scope of the laboratories accreditation

Date Sampled	Sample No.	Test Location*	Soil Description*	Solid Density (t/m³) *	Vane ID		In-situ Vane Shear Strengths					Field and Laboratory Testing Data									Comments
					Head #	Blade # ①	Test 1 (kPa)	Test 2 (kPa)	Test 3 (kPa)	Test 4 (kPa)	Ave.	NDM No.	Gauge Wet Density (t/m³) **	Gauge Dry Density (t/m³)	Gauge Water Content (%)	Gauge Air Voids (%)	Gauge Probe Depth (mm)	Oven Water Content (%)	Oven Dry Density (t/m³)	Oven Calculated Air Voids (%) *	
26/04/2018	N1	Refer to Site Plan	CLAY	2.70	1620	1620	133	147	133	142	139	NDM02	1.83	1.35	35.0	2	300	29.8	1.41	6	
9/04/2018	N2	Refer to Site Plan	CLAY	2.70	1620	1620	UTP	UTP	UTP	UTP	UTP	NDM02	1.85	1.43	29.0	5	300	30.8	1.41	4	
	N3	Refer to Site Plan	CLAY	2.70	1620	1620	UTP	UTP	UTP	UTP	UTP	NDM02	1.83	1.40	30.2	6	300	31.0	1.40	5	
19/04/2018	N4	Refer to Site Plan	LS CLAY	2.70	1620	1620	UTP	UTP	UTP	UTP	UTP	NDM02	1.90	1.42	34.2	-1	300	31.3	1.45	1	
	N5	Refer to Site Plan	LS CLAY	2.70	1620	1620	UTP	UTP	UTP	UTP	UTP	NDM02	1.85	1.37	35.0	1	300	46.0	1.26	-5	
	N6	Refer to Site Plan	LS CLAY	2.70	1620	1620	133	147	133	147	140	NDM02	1.79	1.32	35.1	5	300	41.6	1.26	1	
	N7	Refer to Site Plan	LS CLAY	2.70	1620	1620	133	186+	133	142	149+	NDM02	1.82	1.37	33.1	4	300	38.7	1.31	1	
	N8	Refer to Site Plan	LS CLAY	2.70	1620	1620	105	95	133	142	119	NDM02	1.78	1.32	35.0	5	300	-	-	-	No Sample Taken
13/04/2019	N9	Refer to Site Plan	CLAY	2.70	1620	1620	147	147	96	120	128	NDM02	1.89	1.40	35.0	-1	300	-	-	-	No Sample Taken
	N10	Refer to Site Plan	CLAY	2.70	1620	1620	80	107	93	93	93	NDM02	1.78	1.26	41.1	1	300	-	-	-	No Sample Taken
	N11	Refer to Site Plan	CLAY	2.70	1620	1620	61	80	107	133	95	-	-	-	-	-	-	-	-	-	No Sample Taken
	N12	Refer to Site Plan	CLAY	2.70	1620	1620	80	101	112	120	103	-	-	-	-	-	-	-	-	-	No Sample Taken
	N13	Refer to Site Plan	CLAY	2.70	1620	1620	133	91	133	75	108	-	-	-	-	-	-	-	-	-	No Sample Taken
7/05/2018	N14	Refer to Site Plan	LS CLAY	2.70	1620	1620	133	147	133	147	140	NDM02	1.68	1.23	37.0	9	300	-	-	-	No Sample Taken
9/05/2018	N15	Refer to Site Plan	LS CLAY	2.70	1620	1620	UTP	UTP	UTP	UTP	UTP	NDM02	1.80	1.30	38.1	2	300	38.3	1.30	2	
	N16	Refer to Site Plan	LS CLAY	2.70	1620	1620	UTP	UTP	UTP	UTP	UTP	NDM02	1.83	1.34	36.0	2	300	33.7	1.37	3	
	N17	Refer to Site Plan	LS CLAY	2.70	1620	1620	UTP	UTP	UTP	UTP	UTP	NDM02	1.80	1.31	37.6	2	300	-	-	-	No Sample Taken
	N18	Refer to Site Plan	LS CLAY	2.70	1620	1620	UTP	UTP	UTP	UTP	UTP	NDM02	1.79	1.35	32.8	6	300	38.0	1.30	3	
	N19	Refer to Site Plan	LS CLAY	2.70	1620	1620	UTP	186+	UTP	186+	186+	NDM02	1.77	1.32	34.1	6	300	-	-	-	No Sample Taken
29/11/2018	N20	Refer to Site Plan	CLAY	2.70	1620	1620	UTP	UTP	UTP	UTP	UTP	NDM02	1.86	1.46	27.7	6	300	31.3	1.42	3	

** Gauge Wet Densities outside of the calibrated range of 1.754 to 2.611 t/m³ are not accredited and are outside the laboratories scope of accreditation.

This report replaces reports numbered AKL2018-0018LAA Rev.0 as site plans have been updated to reflect as built plans.

Created By: JLM Date: 27/04/2018
Checked By: JP Date: 7/01/2025
Authorised Signatory (KTP): CL Date: 7/01/2025



CABRA LAND & PROPERTY DEVELOPMENT

I certify that these as-built plans are an accurate record of 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 the following tolerances:
  - -For all pipe inverts & roadside channels to be within +/- 10mm (local circuit i.e internal/relative consistency required only)
  - -For all other assets +/-20mm (e.g Manhole covers, Earthworks)

Name : Tom Lemon

Signed : _____
Registered Professional Surveyor

Registration Number : 1500

Date: 19/12/24

Contact Number: 09 906 3856

Email: Tom@captureland.nz

ENG60422861 / LUC60413069 / SUB60413068

REV	DATE	REVISION DETAILS	ISSUED
0	19/12/24	FOR COMPLETION	KM

CAPTURE Land Development Consultants

CLIENT
CABRA DEVELOPMENTS LIMITED

PROJECT
31 SCHOOLSIDE ROAD HUAPAI

DRAWING TITLE
AS-BUILT CUT TO FILL LAYOUT SHEET 1

STATUS	SCALE	SIZE
AS-BUILT	1:1500	A3

PROJECT	DRAWING NO	REVISION
1095	ASB-210	0

CMW Geosciences
Great People | Practical Solutions

1095-ASB-210-215 Cut to Fill As-Built.dwg

LF11 Soil Field Density NDM Direct Transmission with VSS Report (Cohesive Soils) (Rev 19)

Auckland Laboratory
CMW Geotechnical NZ Limited
11/63, Arrenway Drive, Rosedale, NZ 0632
PO Box 300206, Albany, Auckland, NZ 0752
Phone: +64 (09) 4144 632

Project:	45 Station Road Stage 2
Project No:	AKL2018-0018
Location:	Huapai
Report No:	AKL2018-0018LAB Rev 1
Report Date:	7/01/2025
Client:	Cabra Developments Ltd
Client Address:	19 Tamariki Avenue, Orewa, Auckland 0932

Test Methods:
NZS 4407 2015 Test 3.1 ◊
NZS 4407 2015 Test 4.2
NZGS:August 2001

Notes:
Solid Density: Assumed
Solid Density Data Source: N/A
Testing Locations Selected By: CMW Field Staff
◊ Only samples <2.0mm will be considered for endorsed testing
① Blade size of 19mm used.

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

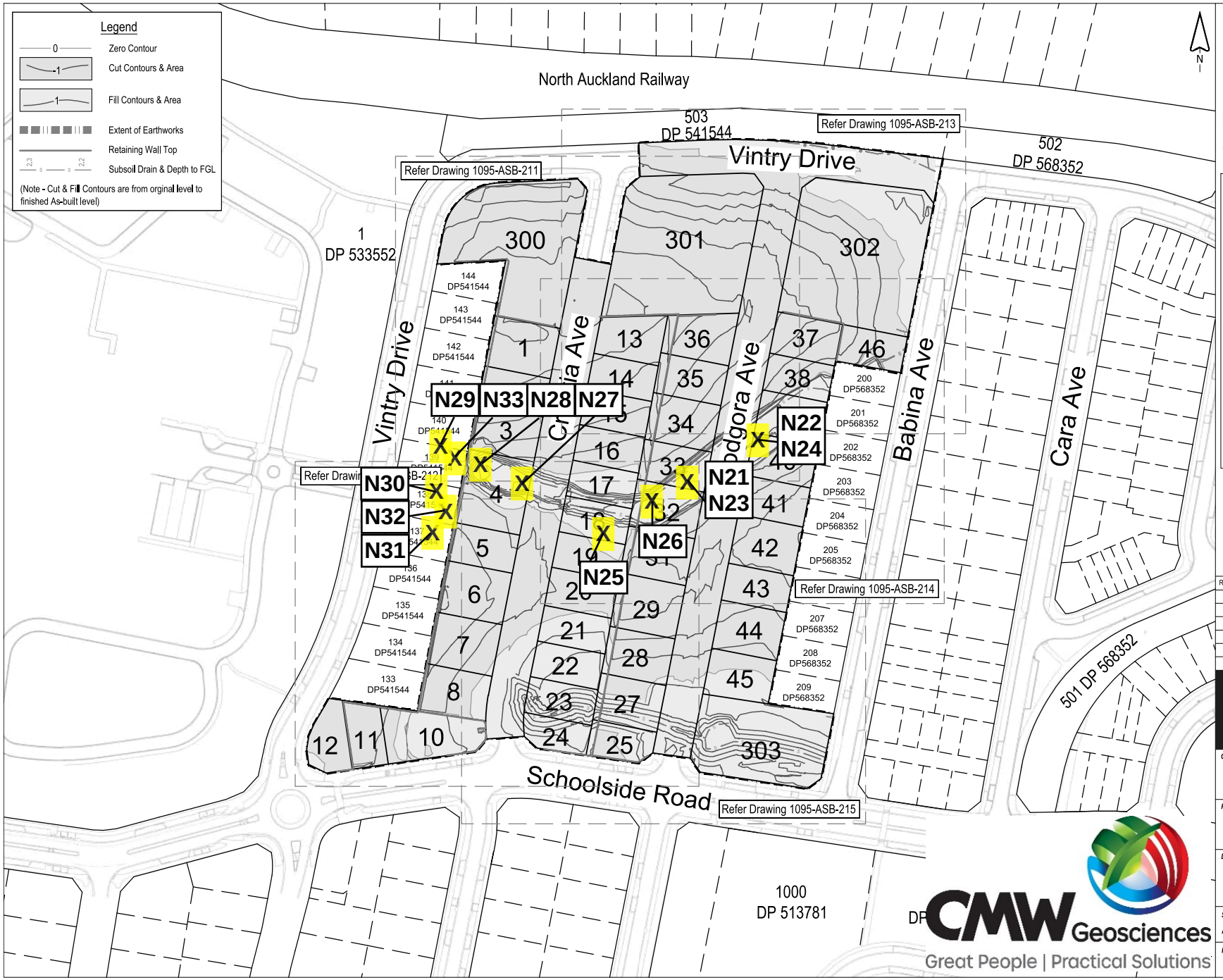
Measurements marked * are not accredited and are outside the scope of the laboratories accreditation

Date Sampled	Sample No.	Test Location*	Soil Description*	Solid Density (t/m³) *	Vane ID		In-situ Vane Shear Strengths					Field and Laboratory Testing Data									Comments
					Head #	Blade # ①	Test 1 (kPa)	Test 2 (kPa)	Test 3 (kPa)	Test 4 (kPa)	Ave.	NDM No.	Gauge Wet Density (t/m³) **	Gauge Dry Density (t/m³)	Gauge Water Content (%)	Gauge Air Voids (%)	Gauge Probe Depth (mm)	Oven Water Content (%)	Oven Dry Density (t/m³)	Oven Calculated Air Voids (%) *	
30/01/2019	N21	Refer to Site Plan	CLAY	2.70	1589	1589	154	151	157	163	156	NDM09	1.77	1.24	42.1	2	300	-	-	-	No Sample Taken
	N22	Refer to Site Plan	CLAY	2.70	1589	1589	198	151	154	154	164	NDM09	1.78	1.24	43.8	0	300	-	-	-	No Sample Taken
4/02/2019	N23	Refer to Site Plan	CLAY	2.70	1589	1589	UTP	UTP	UTP	UTP	UTP	NDM09	1.83	1.41	29.6	6	300	31.0	1.40	5	Retest of N21
	N24	Refer to Site Plan	CLAY	2.70	1589	1589	UTP	UTP	UTP	UTP	UTP	NDM09	1.83	1.39	32.0	4	300	28.4	1.43	7	Retest of N22
27/02/2019	N25	Refer to Site Plan	CLAY	2.70	1589	1589	UTP	UTP	UTP	UTP	UTP	NDM09	1.97	1.56	26.7	1	300	29.9	1.52	-2	
	N26	Refer to Site Plan	CLAY	2.70	1589	1589	UTP	UTP	UTP	UTP	UTP	NDM09	1.92	1.51	27.3	3	300	33.8	1.43	-2	
	N27	Refer to Site Plan	CLAY	2.70	1589	1589	UTP	UTP	UTP	UTP	UTP	NDM09	1.91	1.50	27.6	3	300	23.9	1.54	6	
	N28	Refer to Site Plan	CLAY	2.70	1589	1589	UTP	UTP	UTP	UTP	UTP	NDM09	1.88	1.46	28.2	4	300	23.1	1.53	8	
	N29	Refer to Site Plan	CLAY	2.70	1589	1589	UTP	UTP	UTP	UTP	UTP	NDM09	1.90	1.48	27.8	4	300	24.5	1.52	6	
	N30	Refer to Site Plan	CLAY	2.70	1589	1589	UTP	UTP	UTP	UTP	UTP	NDM09	1.90	1.54	23.9	6	300	25.9	1.51	5	
	N31	Refer to Site Plan	CLAY	2.70	1589	1589	UTP	UTP	UTP	UTP	UTP	NDM09	1.88	1.42	32.1	2	300	31.4	1.43	2	
6/03/2019	N32	Refer to Site Plan	CLAY	2.70	1589	1589	UTP	UTP	UTP	UTP	UTP	NDM09	1.81	1.34	35.1	3	300	28.8	1.40	8	
	N33	Refer to Site Plan	CLAY	2.70	1589	1589	UTP	UTP	UTP	UTP	UTP	NDM09	1.81	1.34	35.5	3	300	29.4	1.40	7	

** Gauge Wet Densities outside of the calibrated range of 1.754 to 2.611 t/m³ are not accredited and are outside the laboratories scope of accreditation.

This report replaces reports numbered AKL2018-0018LAB Rev.0 as site plans have been updated to reflect as built plans.

Created By: JLM Date: 7/02/2019
Checked By: JP Date: 7/01/2025
Authorised Signatory (KTP): CL Date: 7/01/2025



CABRA
LAND & PROPERTY DEVELOPMENT

I certify that these as-built plans are an accurate record of 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 the following tolerances:
  - -For all pipe inverts & roadside channels to be within +/- 10mm (local circuit i.e internal/relative consistency required only)
  - -For all other assets +/-20mm (e.g Manhole covers, Earthworks)

Name : Tom Lemon

Signed : _____
Registered Professional Surveyor

Registration Number : 1500

Date: 19/12/24

Contact Number: 09 906 3856

Email: Tom@captureland.nz

ENG60422861 / LUC60413069 / SUB60413068

REV	DATE	REVISION DETAILS	ISSUED
0	19/12/24	FOR COMPLETION	KM

CAPTURE
Land Development Consultants

CLIENT
CABRA DEVELOPMENTS LIMITED

PROJECT
31 SCHOOLSIDE ROAD
HUAPAI

DRAWING TITLE
AS-BUILT
CUT TO FILL LAYOUT
SHEET 1

STATUS	SCALE	SIZE
AS-BUILT	1:1500	A3

PROJECT	DRAWING NO	REVISION
1095	ASB-210	0

1095-ASB-210-215 Cut to Fill As-Built.dwg

LF11 Soil Field Density NDM Direct Transmission with VSS Report (Cohesive Soils) (Rev 18)

Auckland Laboratory
CMW Geotechnical NZ Limited
11/63, Arrenway Drive, Rosedale, NZ 0632
PO Box 300206, Albany, Auckland, NZ 0752
Phone: +64 (09) 4144 632

Project:	45 Station Road - Stage 2
Project No:	AKL2018-0018
Location:	Huapai
Report No:	AKL2018-0018LAE Rev 1
Report Date:	9/01/2025
Client:	Cabra Developments Ltd
Client Address:	19 Tamariki Avenue, Orewa, Auckland 0931

Test Methods:
NZS 4407 2015 Test 3.1 ◊
NZS 4407 2015 Test 4.2
NZGS:August 2001

Notes:
Solid Density: Assumed
Solid Density Data Source: N/A
Testing Locations Selected By: CMW Field Staff
◊ Only samples <2.0mm will be considered for endorsed testing
① Blade size of 19mm used.

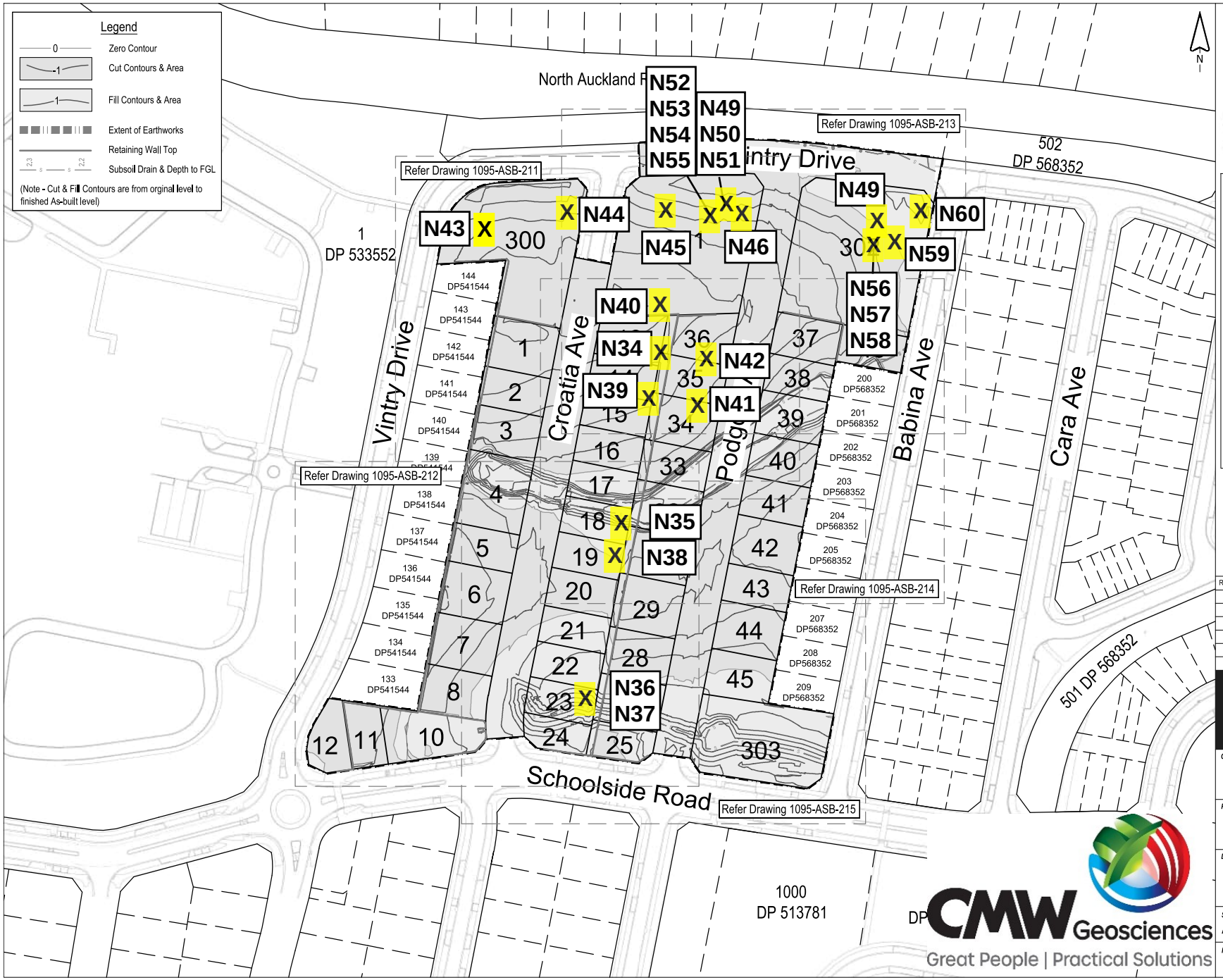
All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Measurements marked * are not accredited and are outside the scope of the laboratories accreditation

Date Sampled	Sample No.	Test Location*	Soil Description*	Solid Density (t/m³) *	Vane ID		In-situ Vane Shear Strengths					Field and Laboratory Testing Data								Comments
					Head #	Blade # ①	Test 1 (kPa)	Test 2 (kPa)	Test 3 (kPa)	Test 4 (kPa)	Ave.	Gauge Wet Density (t/m³) **	Gauge Dry Density (t/m³)	Gauge Water Content (%)	Gauge Air Voids (%)	Gauge Probe Depth (mm)	Oven Water Content (%)	Oven Dry Density (t/m³)	Oven Calculated Air Voids (%) *	
12/12/2023	N34	Refer to site plan	CLAY Fill	2.70	3661	3661	203	183	203	237+	207+	1.89	1.41	34.2	0	300	30.1	1.45	3	
	N35	Refer to site plan	CLAY Fill	2.70	3661	3661	203	210	217	237+	217+	1.89	1.38	37.1	-2	300	32.1	1.43	1	
	N36	Refer to site plan	CLAY Fill	2.70	3661	3661	237	237	UTP	UTP	237+	1.89	1.39	35.5	-1	300	30.0	1.45	3	
18/12/2023	N37	Refer to site plan	Volcanic Clayey SILT	2.70	3661	3661	237	237	237	237	237	1.89	1.44	31.2	1	300	26.8	1.49	5	
	N38	Refer to site plan	Volcanic Clayey SILT	2.70	3661	3661	237	237	237	237	237	1.88	1.41	33.3	1	300	28.5	1.46	4	
	N39	Refer to site plan	Volcanic Clayey SILT	2.70	3661	3661	237	237	237	237	237	1.91	1.46	31.3	0	300	29.0	1.48	2	
	N40	Refer to site plan	Volcanic Clayey SILT	2.70	3661	3661	237	237	237	237	237	1.87	1.45	29.0	4	300	30.1	1.44	4	
30/01/2024	N41	Refer to site plan	CLAY Fill	2.70	3661	3661	237+	237+	237+	237+	237+	1.74	1.24	39.8	5	300	38.2	1.26	6	
	N42	Refer to site plan	CLAY Fill	2.70	3661	3661	237+	237+	237+	237+	237+	1.69	1.18	42.8	5	300	49.3	1.13	2	
2/02/2024	N43	Refer to site plan	CLAY Fill	2.70	3661	3661	237+	UTP	UTP	UTP	237+	1.78	1.34	32.3	7	300	25.7	1.41	11	
	N44	Refer to site plan	CLAY Fill	2.70	3661	3661	UTP	UTP	UTP	UTP	UTP	1.79	1.31	36.8	3	300	26.5	1.41	10	
9/09/2024	N45	Refer to site plan	Clayey SILT	2.70	3449	3449	228+	228+	228+	228+	228+	1.73	1.25	37.7	6	300	36.4	1.27	7	
	N46	Refer to site plan	Clayey SILT	2.70	3449	3449	228+	228+	228+	228+	228+	1.76	1.22	44.0	1	300	37.3	1.28	5	
10/09/2024	N47	Refer to site plan	CLAY FILL w/ Lime	2.70	1824	1824	UTP	UTP	UTP	UTP	UTP	1.77	1.34	31.7	8	300	37.7	1.28	4	
	N48	Refer to site plan	CLAY FILL w/ Lime	2.70	1824	1824	UTP	UTP	UTP	UTP	UTP	1.76	1.31	34.1	7	300	37.3	1.28	5	
11/09/2024	N49	Refer to site plan	CLAY FILL w/ Lime	2.70	1824	1824	UTP	UTP	UTP	UTP	UTP	1.82	1.38	32.2	4	300	34.4	1.36	3	
12/09/2024	N50	Refer to site plan	CLAY FILL w/ Lime	2.70	1824	1824	UTP	UTP	UTP	UTP	UTP	1.81	1.36	33.1	5	300	36.4	1.32	3	
13/09/2024	N51	Refer to site plan	CLAY FILL w/ Lime	2.70	1824	1824	UTP	UTP	UTP	UTP	UTP	1.80	1.40	29.1	8	300	31.9	1.37	6	
16/09/2024	N52	Refer to site plan	CLAY FILL w/ Lime	2.70	1824	1824	UTP	UTP	UTP	UTP	UTP	1.77	1.32	34.1	6	300	38.2	1.28	4	
25/09/1940	N53	Refer to site plan	CLAY FILL w/ Lime	2.70	1824	1824	162	226+	UTP	UTP	194+	1.86	1.42	31.1	3	300	31.4	1.42	3	
26/09/2024	N54	Refer to site plan	CLAY FILL w/ Lime	2.70	1824	1824	136	162	UTP	UTP	149+	1.87	1.45	28.7	4	300	31.3	1.43	3	
27/09/2024	N55	Refer to site plan	CLAY FILL w/ Lime	2.70	1824	1824	UTP	UTP	UTP	UTP	UTP	1.87	1.47	27.1	6	300	28.0	1.46	5	
18/10/2024	N56	Silt Pond	CLAY FILL	2.70	3661	3661	193	237+	149	220	200+	1.67	1.19	40.5	8	300	39.1	1.20	8	
22/10/2024	N57	Refer to site plan	Stabilised CLAY	2.70	3661	3661	237+	237+	210	234	230+	1.79	1.29	38.8	2	300	36.7	1.31	4	
24/10/2024	N58	Refer to site plan	Stabilised CLAY	2.70	3661	3661	217	UTP	UTP	UTP	217+	1.88	1.38	36.0	-1	300	28.9	1.46	4	
7/11/2024	N59	Refer to site plan	CLAY Fill	2.70	1603	1603	207+	UTP	207+	UTP	207+	2.08	1.73	19.8	2	300	17.7	1.76	4	
	N60	Refer to site plan	CLAY Fill	2.70	1603	1603	162	207+	207+	207+	196+	1.99	1.62	23.0	3	300	21.7	1.63	4	

** Gauge Wet Densities outside of the calibrated range of 1.754 to 2.611 t/m³ are not accredited and are outside the laboratories scope of accreditation.

Created By: JP Date: 20/12/2023
Checked By: JP Date: 9/01/2025
Authorised Signatory (KTP): CL Date: 9/01/2025



CABRA
LAND & PROPERTY DEVELOPMENT

I certify that these as-built plans are an accurate record of 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 the following tolerances:
  - -For all pipe inverts & roadside channels to be within +/- 10mm (local circuit i.e internal/relative consistency required only)
  - -For all other assets +/-20mm (e.g Manhole covers, Earthworks)

Name : Tom Lemon

Signed : _____
Registered Professional Surveyor

Registration Number : 1500

Date: 19/12/24

Contact Number: 09 906 3856

Email: Tom@captureland.nz

ENG60422861 / LUC60413069 / SUB60413068

REV	DATE	REVISION DETAILS	ISSUED
0	19/12/24	FOR COMPLETION	KM

CAPTURE
Land Development Consultants

CMW Geosciences
Great People | Practical Solutions

CLIENT
CABRA DEVELOPMENTS LIMITED

PROJECT
31 SCHOOLSIDE ROAD HUAPAI

DRAWING TITLE
AS-BUILT
CUT TO FILL LAYOUT
SHEET 1

STATUS	SCALE	SIZE
AS-BUILT	1:1500	A3

PROJECT	DRAWING NO	REVISION
1095	ASB-210	0

1095-ASB-210-215 Cut to Fill As-Built.dwg

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APPENDIX E
Laboratory Test Results

ROADTEST LTD

Revision: 1

DETERMINATION OF THE WATER CONTENT, CONE PENETRATION LIMIT, PLASTIC LIMIT, PLASTICITY INDEX & LINEAR SHRINKAGE

TEST METHOD NZS 4402 : 1986 TEST 2.1, 2.3, 2.4, 2.5 & 2.6

Project Name :	**31 Schoolside Road, Kumeu**		
		Project No :	24 0001 31
Client :	CMW Geosciences Ltd		
Address :	PO Box 300206 Albany, Auckland	Date of Order :	30.04.24
		Sample Method :	Hand Auger
Attention :	Andrew Linton	Sample Date :	29.04.24
		Sampled By :	CMW Geosciences Ltd

Test Details :	Test performed on :	Whole Sample
	History :	Natural

Tested By:	KC	Date :	29.04.24 to 02.05.24
Calculated By :	ZH	Date :	04.03.24
Checked By :	ZH	Date :	06.05.24

Sample No.	Location	Depth (m)	Cone Penetration (CPL)	Plastic Limit (PL)	Plasticity Index (PI)	Linear Shrinkage (LS)	Natural Water Content (%)
648T	Lot 11	0.4 to 0.8	63	27	36	14	35.1
649T	Lot 10	0.4 to 0.8	76	33	43	16	32.3
650T	Lot 6	0.4 to 0.8	55	29	26	10	39.0
651T	Lot 46	0.4 to 0.8	65	29	36	15	29.3

ROADTEST LTD

Revision: 1

DETERMINATION OF THE WATER CONTENT, CONE PENETRATION LIMIT, PLASTIC LIMIT, PLASTICITY INDEX & LINEAR SHRINKAGE

TEST METHOD NZS 4402 : 1986 TEST 2.1, 2.3, 2.4, 2.5 & 2.6

Project Name :	**31 Schoolside Road, Huapai**		
		Project No :	24 0001 65
Client :	CMW Geosciences Ltd		
Address :	PO Box 300206 Albany, Auckland	Date of Order :	04.10.24
		Sample Method :	Hand Auger
Attention :	Andrew Linton	Sample Date :	04.10.24
		Sampled By :	CMW Geosciences Ltd

Test Details :	Test performed on :	Whole Sample
	History :	Natural

Tested By:	KC & DT	Date :	07 to 10.10.24
Calculated By :	KC	Date :	11.10.24
Checked By :	ZH	Date :	14.10.24

Sample No.	Location	Depth (m)	Cone Penetration (CPL)	Plastic Limit (PL)	Plasticity Index (PI)	Linear Shrinkage (LS)	Natural Water Content (%)
083U	Lot 300	0.4 to 0.8	69	31	38	15	46.0
084U	Lot 301	0.4 to 0.8	65	34	31	11	36.6
085U	Lot 29	0.4 to 0.8	72	29	43	19	39.3
086U	Lot 19	0.4 to 0.8	69	27	43	17	35.1
087U	Lot 4	0.4 to 0.8	68	33	35	16	40.2
088U	Lot 35	0.4 to 0.8	60	36	24	9	43.5
089U	Lot 24	0.4 to 0.8	66	28	38	16	26.6
090U	Lot 1	0.4 to 0.8	69	39	30	11	43.7
091U	Lot 13	0.4 to 0.8	69	30	39	17	32.5
092U	Lot 43	0.4 to 0.8	62	36	26	9	32.6
093U	Lot 8	0.4 to 0.8	138	53	84	24	78.3
094U	Lot 39	0.4 to 0.8	65	29	35	17	31.2

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APPENDIX F
Retaining Wall PS4

PRODUCER STATEMENT – PS4
CONSTRUCTION REVIEW

BUILDING CODE CLAUSE(S): B1 **JOB NUMBER:** AKL2018-0018

ISSUED BY: CMW Geotechnical NZ Limited
(Construction Monitoring Firm)
TO: Cabra Developments Limited
(Owner/Developer)
TO BE SUPPLIED TO: Auckland Council
(Building Consent Authority)
IN RESPECT OF: New Timber Pole, Steel UC and Keystone retaining walls (# 1, 7 to 14, 17, 18, 20, 24 and 25)
(Description of Building Work)
AT: 25 Schoolside Road, Huapai, Auckland 0891
(Address, Town/City)
LEGAL DESCRIPTION: Lot 500 DP 541544, Lot 2 DP 544111 **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 CMW Geosciences (*Engineering Design Firm*) and which is described in the documents relating to the Building Consent No. BCO10372060 and those relating to Building Consent Amendment(s) No. BCO10372060-A and BCO10372060-B 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/VM4 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) ,

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 Geotechnical NZ Limited Date: 20/12/24

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

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

SCHEDULE to PS4

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

Refer CMW letter referenced AKL2018-0018AK Rev 0
CMW Site Inspection Notes
Building Consent Amendments A and B
CMW Retaining Wall Design Report, referenced AKL2018-0018AG Rev 0
Cato Bolam Design Drawings, referenced 46565-DR-C-2020-2026 and 2310-2316

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

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