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RM 210444A

ACCEPTED

04 May 2026

55 Cullen Street, Mangawhai Heads

GEOTECHNICAL COMPLETION REPORT

Foundry Group Limited

Job No. AKL2024-0013 | Version 1

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For and on behalf of CMW Geosciences

Review and Update History

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1.0 INTRODUCTION

In accordance with our instructions, this Geotechnical Completion Report has been prepared for Foundry Group Limited as part of the documentation to be submitted to Kaipara District Council following the completion of earthworks to form the 55 Cullen Street, Mangawhai Heads residential subdivision development (referred to herein as the Cullen Street Development) the extent of which is shown on the appended As-Built plans prepared by Capture Land Limited.

This report covers the construction period December 2024 to February 2026 and is intended to be used for certification purposes for new lots (listed below) created from Lot 9 DP191042 (RT-NA120D/756) as follows:

- 41 new residential lots numbered 1 to 41;
- 2 new Commonly Owned Access Lot's (COAL's) numbered 300, 301;
- A stormwater detention basin identified as Lot 42 and
- 2 public roads named Sandspit Avenue and Dunes Drive;

The Cullen Street Development is located along the northern side of Cullen Street, Mangawhai Heads. As shown on the as-built plans, the landform has been modified by earthworks operations generally comprising cutting to the east and filling to the west; specifically cut excavations of up to 3.5 metres depth and filling up to a maximum depth of up to 5.5 metres.

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

- Northland Regional Council's Regional Resource Consent number 43697.
- Kaipara District Council's Resource Consent number RM210444A and Engineering Approval letter dated 21/10/2024.
- Kaipara District Council's Building Consent BC240484 for cantilever pole and segmental block retaining walls numbered 1 to 8.
- Capture Land Limited consented drawing set referenced 1136, dated 04/09/2024.
- Kaipara District Council 2011 Engineering Standards.
- NZS 4431:2022.
- The geotechnical reports listed in Table 1 as follows:

Table 1: Project Geotechnical Documents

Report Type	Reference and/or Comments
Wiley Geotechnical, Geotechnical Investigation for Proposed Subdivision at 55 Cullen St, Mangawhai Heads	Report Ref: 21117 dated 15/10/2021
CMW Geosciences, Geotechnical Investigation Report	AKL2024-0013AB Rev 1 dated 22 April 2024 – Report combined but factual and interpretative work delineated
CMW Geosciences, Stability Design Memo	Appendix F to report AKL2024-0013AB Rev 1
CMW Geosciences, Static Settlement Design Memo	Appendix G to report AKL2024-0013AB Rev 1
CMW Geosciences, Geotechnical Works Specification (earthworks)	Appendix H to report AKL2024-0013AB Rev 1
CMW Geosciences, Cantilever Timber Pole, and Segmental Block Retaining Wall Design (structures- with PS1)	AKL2024-0013AE Rev 2 dated 24 October 2024

For the construction of the development, the following roles were fulfilled as defined in NZS 4431:2022:

- Geotechnical Designer: CMW Geotechnical NZ Limited
- Certifier: CMW Geotechnical NZ Limited
- Recognised Laboratory: CMW Geotechnical NZ Limited and Road Test Limited
- Contractor: MASCON Civil Contractors Limited
- Sub-contractor (earthworks): SCEATS Earthmovers 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 these aspects of the project work.

2.0 DESCRIPTION OF WORKS

2.1 Bulk Earthworks

Earthworks commenced on 10 December 2024 with topsoil stripping and the excavation of the temporary sediment pond including a gully muck out and filling in the northwest corner of the site. Shortly thereafter, cut and fill earthworks started with excavation of material from the ridge through the central portion of the site and filling in the northwest corner, below the road and lots in this area.

Site works were paused from 20 December 2024 before restarting on 5 January 2025 with the undercutting and removal of unsuitable material from the gully in the southwestern portion of the site. A subsoil drain was installed along the base of the gully, along with settlement markers before filling commenced.

Pre-load comprising additional fill was in place above the Sandspit Avenue entrance and Lots 27 and 28 by the end of February 2025.

Earthworks in the two fill areas in the northwest and southwest portions of the site continued into March 2025 before cutting to stockpile for backfilling the sediment pond at a later date.

Weak natural subgrade material was identified across Lots 17 to 21 and was undercut before being backfilled with engineered fill.

In September 2025, earthworks re-commenced after a winter break, starting with mucking out of the sediment pond then back filling using stockpiled material that required the addition of lime due to high moisture content. Along with backfilling of the pond, bulk filling along the western boundary was undertaken. Engineered fill, between 0.5m to 1.0m depth, was placed across the central northern Lots 33 to 37, and northeastern Lots 14 to 19. As these lots were previously excavated, the filling is not shown on the appended as-built plan, as the fill depth is below the original ground level.

Wet and weak natural subgrade was identified across Lots 22 and 23 and was undercut before installing subsoil drainage and backfilling with engineered fill.

Removal of the preload over Lots 27 and 28 was completed during September and October 2025.

2.2 Civil Construction

Road construction began in March 2025. Scala penetrometer testing for pre and post stabilisation was undertaken in May 2025 and carried out on the road subgrades not including CH0 to CH130 of Sandspit Avenue this was undertaken in October 2025. Where weaker ground with low equivalent CBR values were identified (CH0 to CH30, and CH85 to CH90 Dunes Drive, and CH140 to CH170, and CH225 to CH245 Sandspit Avenue) it was generally undercut and geofabric and grid placed before being hardfill backfilled.

The majority of underground service trenching throughout the site was undertaken in July and August 2025 with the remaining of the service trenching near the entrance to the site and around the permanent detention pond undertaken in October and November 2025.

Construction of the permanent stormwater detention pond was undertaken during October and November 2025 including the inlet and outlet structures.

Construction of a formalised overland flow path along the northern and eastern boundaries were undertaken in stages as the construction of the retaining walls and development progressed.

The main items of plant used by the contractors included:

- 5 to 20t excavators
- Bulldozer
- Motor Scrapers
- Hydrema dump trucks
- Tractor and Trailor
- Tractor with discs
- Single drum Sheep's foot compactor
- Grader
- Smooth drum roller
- Lime Spreader
- Lime Hoe

2.3 Retaining Wall Construction

The first phase of timber pole retaining wall construction started in February 2025 and continued until June 2025 when there was a break in construction. No fines segmental block walls were started in May and continued into June before a break. The seconds phase for both timber pole and segmental block retaining walls was restarted in October and completed in November 2025.

Due to elevated groundwater pressure and weaker than expected ground conditions encountered during construction of the timber pole retaining wall within Lot 18, ground improvement comprising a 2m deep by 2m wide trench, backfilled with no fines concrete was undertaken during February 2026. The extent of this trench is shown on the appended as-built plans.

2.4 Counterfort Drains

Due to elevated ground water levels encountered during construction, subsoil counterfort (or trench) drainage was constructed in a number of Lots including 1, 16 to 20, and 23, perforated drain coils were also installed in stormwater trench bedding within Lots 15 to 21 and 25 to 27.

Subsoil drainage along Lot boundaries within Lots 16 to 20 and Lot 23 general consisted of a 0.5m wide trench 0.6m to 1.0m deep with a 110mm diameter perforated clothed novacoil. Sub soil drainage within lots 16 to 20 also included sub soil drainage 0.5m wide and deep along the front of the retaining wall plus drainage piles 0.45m in diameter 2m deep at 2.4m centres below the subsoil drain. Drainage piles were backfilled with SAP 50 drainage metal, and 0.3m thick of compacted hardfill was placed to 3m off the front of the wall above the subsoil and drainage piles.

Topsoil of lots was undertaken as Lots were prepared and closed out with the final lots topsoiled in February 2026.

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 weak inorganic subsoils had been removed;
- Installation of subsoil drains including underfill drains but excluding road under-channel drains;
- Backfilling of subsoil drains;
- Subsoil drain connections to outlets;
- Placement and compaction of engineered fills;
- Retaining wall subgrade foundation conditions for keystone walls; and
- Construction of cantilever pole retaining walls including ground conditions, pile size, spacing and depth.

4.0 QUALITY ASSURANCE TESTING

Quality assurance testing of materials was completed as required by the Geotechnical Works Specification presented in Appendix H to report AKL2024-0013AB rev 1. Test results are presented in Appendix D.

Table 2: Compaction Test Criteria

Fill Type	Air Voids [1]		Vane Shear Strength [2]		Moisture Content [3]	Dry Density [3]
	Average	Maximum Single Value	Average	Minimum Single Value	Maximum	Minimum
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.

Building work is prohibited in no-build zones but is not prohibited in specific design zones. Restrictions vary depending on the hazard but full descriptions of the restrictions that apply to 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 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 during initial investigations. Our assessment was described in our Factual and Interpretative Report referenced in Section 1 above and found a low risk of 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 including the batters, has led to the construction of subsoil drainage, segmental block retaining walls and cantilever pole retaining walls.

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

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

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

Depths of mulch and topsoil applied to sloping areas should be limited to less than 150mm to minimise the risks of saturation leading to localised slumping on 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.

Specific Design Zones (slope) – have been applied where considered appropriate 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. A description of the building and earthworks restrictions within these zones are contained in our Opinion on Suitability in ***Appendix A.***

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

If cuts or fills greater than 600mm are required on any lot, in particular sloping ground, this fails outside standard NZS3604 design and further geotechnical assessment and /or analysis will be needed to assess the impact of the works and/or any required remediation.

5.4 Retaining Walls

Cantilever pole retaining walls and segmental block retaining walls formed with concrete blocks and no-fines concrete have been constructed in the locations shown on the appended Capture Land Development Consultants As-built Plan. These walls reach a maximum height of approximately 3.2 metres and were designed by CMW Geosciences Limited and the construction was observed by this consultancy. Copies of the wall design details and Producer Statements - Construction Review are provided in ***Appendix F***.

Specific Design Zones (retaining) with associated restrictions have been applied in the vicinity of the retaining walls to protect the walls from overloading at the crest or undermining at the toe that could lead to instability. Specific design zones of 1.5x the height of the wall in front and behind has mostly been applied to the walls, with additional 2x the height applied to the keystone walls behind, and 2x the height in front for the Eastern boundary wall. A description of the building and earthworks restrictions within these zones are contained in our Opinion on Suitability in ***Appendix A*** and is depicted schematically in Figures 1 and 2 below.

Figure 1: Cantilever Wall Schematic

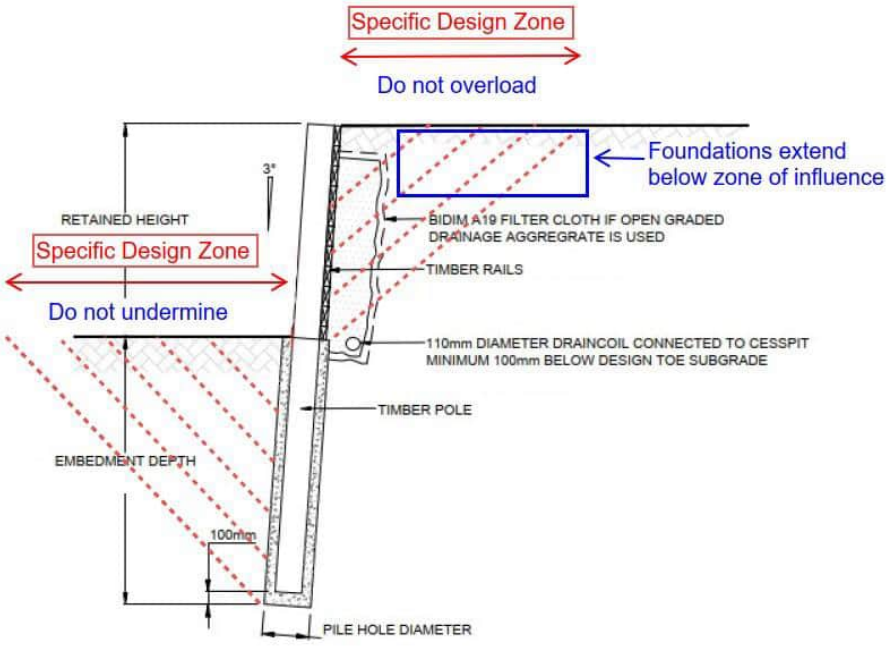
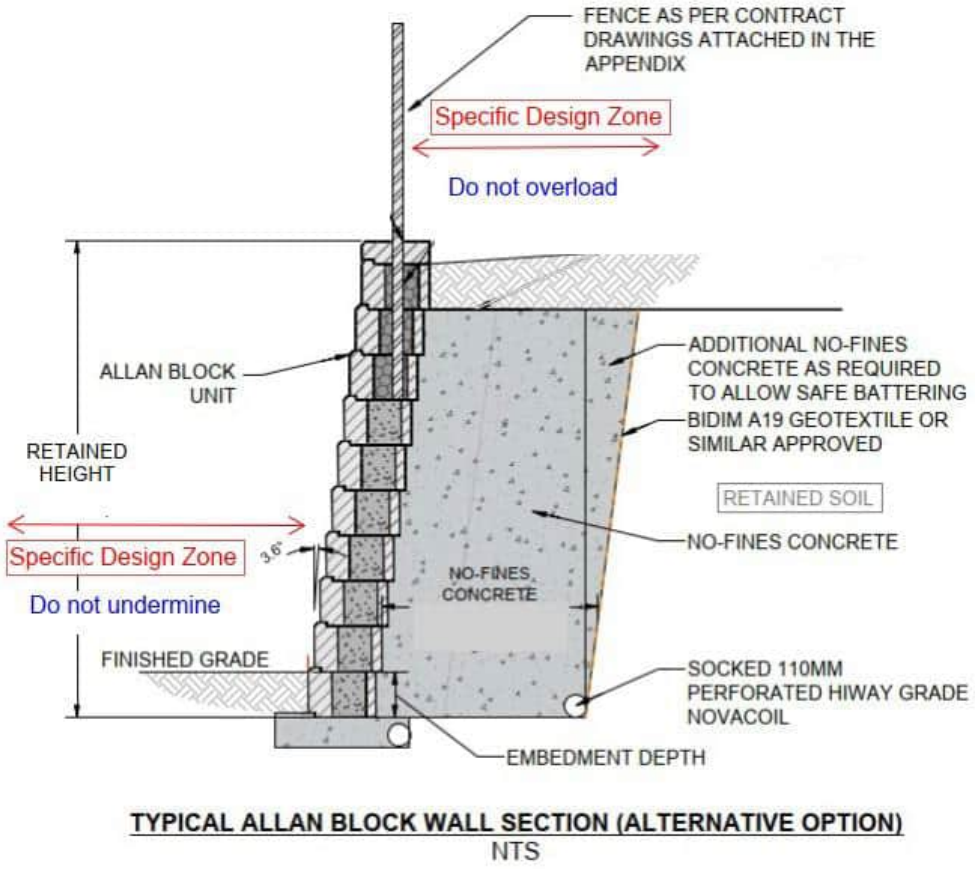


Figure 2: No Fines Segmental Retaining Wall Schematic



5.5 Retaining Wall Drainage

On Lots 25, 28, 33, 35 and 38 retaining wall drainage has been connected to cesspits that are to be connected to private drainage during development of the Lots. In Lots 1 and 2 the retaining wall drainage has been connected to cesspits that outlet at the ground level along the wall. Lot 41 retaining wall drainage is connected to a wing wall that discharges to the overland flow path below the stormwater pond wing wall in Lot 42. Lot 16, 17, 21, 23, 30 and 32 retaining wall drainage has been connected to cesspits that are connected to the private Lot connections or accessway cesspit connection. In Lot 21 additional drainage metal was placed around the Stormwater manhole behind the timber pole wall which contains a perforated novacoil connected into the public stormwater system.

5.6 Settlement Monitoring and Assessment

Based on our initial investigations an area below lots 27 and 28 and an area of Sandspit Avenue was underlain with weaker soils at a depth greater than 5.0m beneath a stiff to very stiff clay/silt cap. To reduce long term settlements, surcharge loads were placed across the lots and road. Four settlement markers were installed across the preload areas and monitored weekly for the first 3 months then fortnightly for the next 4 months until T_{90} consolidation was confirmed after 7 months. The surcharge was removed after 9 months for Lots 27 and 28 and 10 months for Road 1.

Four settlement markers were installed prior to the commencement of earthworks and the results of the settlement monitoring is provided in ***Appendix G.***

The original surcharge loads (1.5 to 2.7m) were based on a wide-spread floor load of 10 kPa but due to available material on site surcharge loads were approximately 3 to 4m above subgrade and exceeded the approximate loads (12 kPa) of light weight NZS3604-type timber framed buildings.

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

For the remaining lots, on the basis of the magnitude of fill depths and ground conditions, together with the elapsed time since it was placed we consider the at remaining post-construction settlements will also be within code limits.

5.7 Service Line Trenches

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

Stormwater trenches in certain locations contain a punched draincoil to facilitate draining of any groundwater seepages within the trench bedding. These draincoils are connected to the downstream stormwater manhole to outlet. This drainage has been installed as a precautionary measure that is not considered to be necessary for private connections.

As is normal on all subdivisions, service trench backfills have not been specifically tested; therefore future building developments involving foundations within a 45-degree zone of influence from pipe inverts will require engineering input. As not specifically outlined in the Kaipara District Council Engineering Standards an example of best practice has been provided in the form of the Auckland Council drawing referenced SW22 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 of best practice for water and wastewater pipes are available in the Watercare COP1 - General Requirements and Procedures. The majority of lots are known to have service trenches within the lots as shown on the appended stormwater and wastewater as-built plans. The resulting restrictions are presented in our Opinion on Suitability in ***Appendix A.***

5.8 Subsoil Drains and Groundwater

The appended cut to fill and stormwater layouts as-built plans show the positions of subsoil drains and their outlets that were installed during the earthworks as described in the following sub-sections.

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

5.8.1 Underfill Drains

These drains were installed at the bases of fills 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. Specific design details are provided in the project reports and specifications. If drain depths are unclear at specific locations, they can be estimated from the depths of fills depicted on the as-built plans.

5.8.2 Subsoil Drain Outlets

On lots where subsoil or retaining wall drainage discharges it is important that the function of these outlets is maintained. Details of the outlet structures and locations are shown on the Stormwater Layouts Sheets 2 to 4 as built plans.

5.8.3 Groundwater

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

In areas of natural ground, subsoil drains have been installed on lots 16 to 20 and 23, to maintain highest desirable groundwater levels to 0.6 to 1.0m depth. Based on our work to date we anticipate groundwater levels remaining below the depth of influence of anticipated earthworks and foundation works for NZS 3604 type dwellings.

5.9 Road Subgrades

Penetration resistance testing was carried out on the road subgrades during construction and the results of this testing were forwarded to Capture Land Development Consultants Limited for pavement remedial design. All road subgrade areas were subsequently lime stabilised to achieve appropriate CBR values. Where weaker ground with low equivalent CBR values was identified it was generally undercut and geogrid and geotextile cloth was installed.

Benkelman Beam testing of the base course was carried out by Road Test Limited on each road and those results were sent directly to Capture Land Development Consultants Limited.

5.10 Overland Flowpath

As part of the civil works, an overland flowpath was constructed along the northern and eastern boundaries of the development as shown on the appended Stormwater Layouts Sheet 1 to 4 As-built Plans.

The overland flowpath is considered outside any standard build areas and should be considered a no build zone.

5.11 Stormwater Ponds

The appended as-built plans depict the formation of a stormwater detention pond in Lot number 42.

Batter instability was analysed as part of Geotechnical Investigation Reporting (AKL2024-0013Ab Rev 1 dated 22 April 2024) including rapid drawdown using slide 2.0 and is not anticipated within the stormwater pond based on the batter angles.

The pond was constructed using engineered site won fill and has batter gradients of 1v:3h or lower.

5.12 Design of Shallow Foundations

5.12.1 Bearing Capacity

Hand auger boreholes were drilled across the finished lots 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.***

As also detailed in our Opinion on Suitability, the majority of the lots are considered as meeting the minimum geotechnical ultimate bearing capacity threshold of 300kPa as required by the definition of NZS 3604 “good ground”. There are however some lots in natural (cut) ground which have been assigned a reduced bearing capacity of 150kPa but this should not necessarily alter the form or cost of foundations on these lots, depending on development proposals.

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.

5.12.2 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.

Designers must also consider the NZS 3604 Figure 3.1 geometry requirements for foundations adjacent to sloping ground.

5.12.3 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 eight samples was completed in accordance with the requirements of NZS 3604 All testing was completed by Road Test Limited, a testing laboratory accredited by IANZ for the tests undertaken. Results are provided in ***Appendix E*** and plots of the tests on the Plasticity Chart are also included.

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 limited range of expansivity characteristics.

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

5.12.4 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***.

5.13 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 200 and 350mm 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.

5.14 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.

5.15 Sensitive Soils

In the appended Lot Summary Table in ***Appendix A***, we have identified some lots as a having highly sensitive subgrade soils.

We recommend at the time of individual lot subgrade preparation, a layer of hardfill is spread across the exposed subgrade immediately following topsoil stripping to protect and confine the potential sensitive soils. It is also recommended that the lots are not trafficked in the wet to avoid disturbing the potential sensitive soils.

If not carefully managed at the time of individual lot development, the subgrade soils may become damaged and require remedial works comprising undercutting and replacement with hardfill.

Where the highly sensitive and/or disturbed soils are encountered there maybe areas that need to be undercut up to a depth of around 0.5m and replaced with geofabric and compacted hardfill.

5.16 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 land owners 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 Foundry Group Limited in relation to the 55 Cullen St Development, Mangawhai 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 Foundry Group 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.

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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.

CMW Geosciences
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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: 55 Cullen St, Mangawhai Development
Developer: Foundry Group Limited
Location: Mangawhai

I, Richard Knowles, 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 Wiley Geotechnical Limited Geotechnical Investigation report referenced 21117 dated 15 October 2021, and CMW Geosciences Geotechnical Investigation Report referenced AKL2024-0013AB Rev. 1, dated 22 April 2024. 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 dated 4 May 2026.
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 all lots with 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 to Lots 1 to 9, 12 to 16, 20, 21, 28 to 41.

        Although not depicted on the as-builts as the slopes are generally shallower than 1(v) in 4 (h), **Specific Design Zone (Slope) areas** are also applied to sloping ground on Lots 21 to 27 due to the proximity to retaining walls and potential impacts to retaining wall and globally stability.

        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 service pipes and associated trench backfills, 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 3, 15 to 38, 40 and 41, 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 expect the Eastern boundary wall (5kPa) were designed for a maximum of 12 kPa surcharge load and 0° to 10° toe slope depending on the wall.

        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 1, 16 to 20 and 23 inclusive as shown on the as-built plans must not be impaired by any building development or landscaping works. Any bored or driven piles must be positioned to avoid damaging the draincoils. Where any subsoil drain is intercepted by building works, it must be reinstated under the direction of a Chartered Professional Engineer to ensure the integrity of the subsoil drainage system.

   Landscape subsoil drains as shown on the as-built plans were constructed at the crest of the landscape batters on lots 28 to 30 and 32. The landscape subsoil drains are considered temporary drainage solutions preconstruction of the houses to prevent water sheeting off the platforms and overflowing into the landscaped areas.

d. The formed retaining wall drainage outlets and cesspits depicted on the as-built plans on lots 1, 2, 16, 17, 25, 28, 33, 35, and 38 inclusive must be kept free of debris and otherwise maintained as necessary to ensure their ongoing function. On Lots 25, 28, 33, 35 and 38 retaining wall drainage has been connected to cesspits that are to be connected to private drainage during development of the Lots.

e. A geotechnical ultimate bearing capacity of 300 kPa may be assumed for shallow foundation design on the building platforms of lots 1 to 13, 17, 18, 21, 25 to 28, and 33 to 41 inclusive.

   Due to the presence of weaker natural subsoils on the building platforms of lots 14 to 16, 19, 20, 22 to 24 and 29 to 32 inclusive a geotechnical ultimate bearing capacity of 150 kPa may be assumed for shallow foundation design on these lots.

f. 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.

g.

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)
All	M (moderately reactive) / 40mm	M / 44mm

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.

h. No building development should take place within the 45 degree zone of influence of stormwater or sewer line 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 as an example of best practice in ***Appendix B*** for clarification. Details for water and wastewater pipes best practice are available in the Watercare COP1 - General Requirements and Procedures.

i. For the protection of the function of the retaining wall in Lot 18 no building should take place within the area of the inground no fines wall including 1m in front of the inground wall as depicted on the as-built plans. Additionally, no excavation should take place between 1 to 3m into the Lot from the no fines inground wall also depicted on the as-built plans.

j. Highly Sensitive Soils were encountered within areas of Lots 2 to 7, 14 to 24, 29 to 32 inclusive and require care during construction and may require under cutting and replacing if disturbed or encountered during topsoil stripping and earthworks. It is recommended that the lots are not trafficked in the wet to avoid disturbing the potential sensitive soils.

k. For the protection of the overland flow path no building should take place where the overland flow path is present.

l. 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), 4(g), 4(h), 4(i), 4(j), and 4(k) 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.
6. Stormwater detention pond and reserve areas have been formed with appropriate regard for slope stability and seepage risks.

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

For and on behalf of CMW Geosciences

Richard Knowles

Principal Geotechnical Engineer CMEngNZ, CPEng

Table 4: Geotechnical Completion Report Summary Table – 55 Cullen St, Mangawhai

	GCR SOPO Clause											
Lot Number	4(a)	4(b)	4(c)	4(d)	4(e)	4(f)	4(g)	4(h)	4(i)	4(j)	4(k)	
	Specific Design Zone (slope)	Specific Design Zone (retaining)	Subsoil Drains Present	Retaining Wall Drainage Outlet	Geotechnical Ultimate Bearing Capacity (kPa)	NZS 1170.5 Site (seismic) Class	AS2870 Expansive Class	Service Lines Restrictions	Specific Design Zone/ No Build (Inground no fines concrete wall)	Highly Sensitive Soils Present	Overland Flow path	Indicative Topsoil Depth (mm)
1	✓	✓	✓	✓	300	C	M	✓				300
2	✓	✓		✓	300	C	M	✓		✓**		300
3	✓	✓			300	C	M	✓		✓**		300
4	✓				300	C	M	✓		✓**		300
5	✓				300	C	M	✓		✓**		300
6	✓				300	C	M	✓		✓**		300
7	✓				300	C	M	✓		✓**		250
8	✓				300	C	M	✓				350
9	✓				300	C	M	✓				300
10					300	C	M	✓			✓	300
11					300	C	M	✓			✓	350
12	✓				300	C	M				✓	350
13	✓				300	C	M				✓	300
14	✓				150	C	M	✓		✓**	✓	200
15	✓	✓			150	C	M	✓		✓**	✓	300
16	✓	✓	✓***	✓	150	C	M	✓		✓**	✓	350
17		✓	✓***	✓	300	C	M	✓		✓**	✓	250
18		✓	✓***		300	C	M	✓	✓	✓**	✓	200

Lot Number	GCR SOPO Clause											
	4(a)	4(b)	4(c)	4(d)	4(e)	4(f)	4(g)	4(h)	4(i)	4(j)	4(k)	
	Specific Design Zone (slope)	Specific Design Zone (retaining)	Subsoil Drains Present	Retaining Wall Drainage Outlet	Geotechnical Ultimate Bearing Capacity (kPa)	NZS 1170.5 Site (seismic) Class	AS2870 Expansive Class	Service Lines Restrictions	Specific Design Zone/ No Build (Inground no fines concrete wall)	Highly Sensitive Soils Present	Overland Flow path	Indicative Topsoil Depth (mm)
19		✓	✓***		150	C	M	✓		✓**	✓	350
20	✓	✓	✓***		150	C	M	✓		✓**	✓	200
21	✓	✓			300	C	M	✓		✓**	✓	250
22	✓	✓			150	C	M	✓		✓**	✓	250
23	✓	✓	✓		150	C	M	✓		✓**	✓	200
24	✓	✓			150	C	M	✓		✓**	✓	300
25	✓	✓		✓	300	C	M	✓			✓	200
26	✓	✓			300	C	M	✓			✓	300
27	✓	✓			300	C	M					350
28	✓	✓	✓*	✓	300	C	M					350
29	✓	✓	✓*		150	C	M	✓		✓**		200
30	✓	✓	✓*		150	C	M			✓**		250
31	✓	✓			150	C	M			✓**		300
32	✓	✓	✓*		150	C	M			✓**		350
33	✓	✓		✓	300	C	M					300
34	✓	✓			300	C	M	✓				300
35	✓	✓		✓	300	C	M	✓				350
36	✓	✓			300	C	M	✓				300
37	✓	✓			300	C	M	✓				350

GCR SOPO Clause												
Lot Number	4(a)	4(b)	4(c)	4(d)	4(e)	4(f)	4(g)	4(h)	4(i)	4(j)	4(k)	
	Specific Design Zone (slope)	Specific Design Zone (retaining)	Subsoil Drains Present	Retaining Wall Drainage Outlet	Geotechnical Ultimate Bearing Capacity (kPa)	NZS 1170.5 Site (seismic) Class	AS2870 Expansive Class	Service Lines Restrictions	Specific Design Zone/ No Build (Inground no fines concrete wall)	Highly Sensitive Soils Present	Overland Flow path	Indicative Topsoil Depth (mm)
38	✓	✓		✓	300	C	M	✓				300
39	✓				300	C	M	✓				300
40	✓	✓			300	C	M	✓				350
41	✓	✓			300	C	M	✓				350
	Notes: *Landscape subsoil drains were constructed at the crest of the landscape batters in these lots. The drains are considered temporary drainage solutions preconstruction of the houses to prevent water sheeting off the platforms and overflowing into the landscaped areas. **Highly Sensitive Soils encountered within areas of these lots requiring care during construction, for further guidance refer to Section 5.15 of the GCR. *** 300 – 500mm thick compacted hardfill backfill present to 3m in front of retaining wall as part of front of wall sub soil drainage.											

RM 210444A

ACCEPTED

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APPENDIX B

Statement of Suitability of Engineered Fill for Lightweight Structures

STATEMENT OF SUITABILITY OF ENGINEERED FILLS FOR LIGHTWEIGHT STRUCTURES

To:	Kaipara District Council
Development:	The 55 Cullen St, Mangahwai Heads Development
Land Title(s):	Lot 9 DP191042
Location:	55 Cullen St, Mangawhai Heads
Resource Consent Nos:	RM210444A
Developer:	Foundry Group Limited
Geotechnical Designer:	Sam Gibb of CMW Geotechnical NZ Limited
Certifier:	Richard Knowles 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, geotechnical works specification, test results and test inspection records relevant to the work completed.

1. I, Richard Knowles, 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 (as presented in the design, drawings and Geotechnical Works Specification) has been achieved.
5. The fill areas shown on the Capture Land Development Consultants Limited as-built cut and fill plan(s) 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

Richard Knowles

Principal Geotechnical Engineer CMEngNZ, CPEng

RM 210444A

ACCEPTED

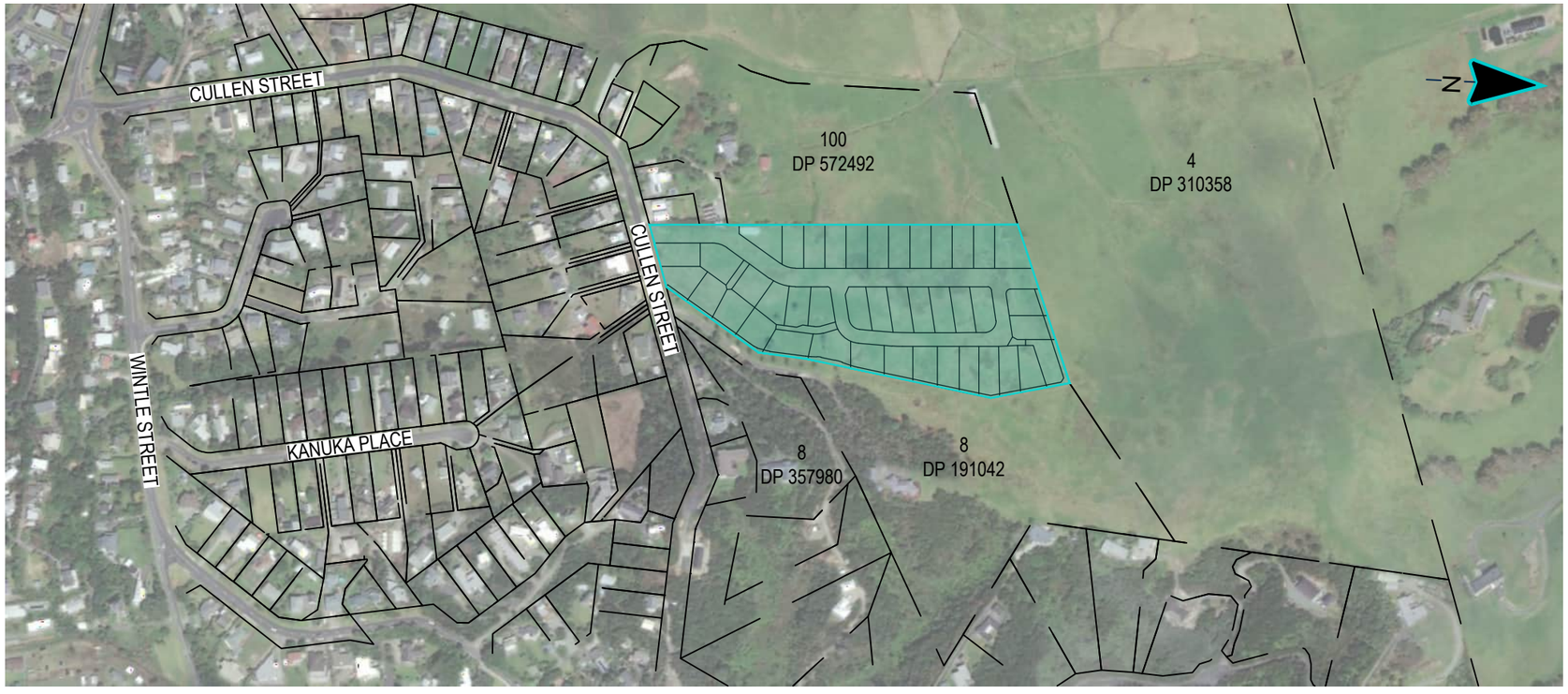
APPENDIX C
As-Built Drawings

Title	Reference No.	Date	Revision
As-Built Final Contours & Retaining Wall Layouts	1136-DR-SU-9000-9002 Sheet 1 to 3	4/05/2026	3
As-Built Cut to Fill Layouts	1136-DR-SU-9010-9012 Sheet 1 to 3	9/04/2026	3
As-Built Roading Layouts	1136-DR-SU-9100-9102 Sheet 1 to 3	9/04/2026	2
As-Built Roading Cross Sections	1136-DR-SU-9110-9111 Sheet 1 & 2	9/04/2026	2
As-Built Stormwater Layouts	1136-DR-SU-9300-9003 Sheet 1 to 4	9/04/2026	3
As-Built Stormwater Zone of Influence Layout	1136-DR-SU-9305-9008 Sheet 1 to 4	9/04/2026	2
As-Built Stormwater Lot Connections Layout	1136-DR-SU-9310-9312 Sheet 1 to 3	9/04/2026	2
As-Built Stormwater Raingarden Details	1136-DR-SU-9320 Sheet 1	9/04/2026	2
As-Built Stormwater Pond Enlarged Layout	1136-DR-SU-9350 Sheet 1	9/04/2026	2
As-Built Stormwater Pond Cross Sections	1136-DR-SU-9351 Sheet 1	9/04/2026	2
As-Built Wastewater Layouts	1136-DR-SU-9400-9403 Sheet 1 to 4	9/04/2026	2

Auckland Council Code of Practice for Land Development and Subdivision – SW22	SW22	1/11/2015	-
Guideline for Building Close to or Over Transmission Trunk Sewer	WW 60	14/4/2015	-

SCAN FOR
SITE ADDRESS

FOUNDRY DEVELOPMENTS LIMITED
55 CULLEN STREET,
MANGAWHAI



Foundry Group

CAPTURE
Land Development Consultants

DATE: 04/05/2026
SET STATUS: FOR COMPLETION
JOB No : 1136-DR-SU - ASPS - 4

Drawing Number	Drawing Title	Scale (A3)	Amendments
0002	Drawing Schedule	NTS	4
9000	As-Built Final Contours & Retaining Wall Layouts Sheet 1	1:1000	3
9001	As-Built Final Contours & Retaining Wall Layouts Sheet 2	1:750	3
9002	As-Built Final Contours & Retaining Wall Layouts Sheet 3	1:750	3
9010	As-Built Cut to Fill Layouts Sheet 1	1:1000	3
9011	As-Built Cut to Fill Layouts Sheet 2	1:750	3
9012	As-Built Cut to Fill Layouts Sheet 3	1:750	3
9100	As-Built Roading Layouts Sheet 1	1:1000	2
9101	As-Built Roading Layouts Sheet 2	1:500	2
9102	As-Built Roading Layouts Sheet 3	1:500	2
9110	As-Built Roading Cross Sections Sheet 1	1:50	2
9111	As-Built Roading Cross Sections Sheet 2	1:50	2
9300	As-Built Stormwater Layouts Sheet 1	1:1000	3
9301	As-Built Stormwater Layouts Sheet 2	1:500	3
9302	As-Built Stormwater Layouts Sheet 3	1:500	3
9303	As-Built Stormwater Layouts Sheet 4	1:500	3
9305	As-Built Stormwater Zone Of Influence Layouts Sheet 1	1:1000	2
9306	As-Built Stormwater Zone Of Influence Layouts Sheet 2	1:500	2
9307	As-Built Stormwater Zone Of Influence Layouts Sheet 3	1:500	2
9308	As-Built Stormwater Zone Of Influence Layouts Sheet 4	1:500	2
9310	As-Built Stormwater Lot Connections Layouts Sheet 1	1:1000	2
9311	As-Built Stormwater Lot Connections Layouts Sheet 2	1:500	2
9312	As-Built Stormwater Lot Connections Layouts Sheet 3	1:500	2
9320	As-Built Stormwater Raingarden Details	1:30	2
9350	As-Built Stormwater Pond Enlarged Layout	1:200	2
9351	As-Built Stormwater Pond Cross Sections	1:75	2
9400	As-Built Wastewater Layouts Sheet 1	1:1250	2
9401	As-Built Wastewater Layouts Sheet 2	1:500	2
9402	As-Built Wastewater Layouts Sheet 3	1:500	2
9403	As-Built Wastewater Layouts Sheet 4	1:500	2

RM 210444A

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 NZVD 2016 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: 04/05/2026

Contact Number: 09 906 3856

Email: Tom@captureland.nz

CLIENT

Foundry Group

PROJECT

55 CULLEN STREET
MANGAWHAI

CAPTURE
Land Development Consultants

	DATE	REVISION DETAILS	ISSUED
0	12/03/26	FOR COMPLETION	BN
1	16/03/26	FOR COMPLETION	BN
2	25/03/26	FOR COMPLETION	BN
3	09/04/26	NZVD 2016 UPDATE	
		FOR COMPLETION	BN
4	04/05/26	FOR COMPLETION	BN

DRAWING STATUS: FOR COMPLETION

DRAWING TITLE: **AS-BUILT** DRAWING SCHEDULE

PROJECT NO	SCALE	PLOT SIZE
1136	N.T.S	A3

DRAWING NO: 1136-DR-SU-0002

REVISION: 4

1136-DR-SU-0001-0002 Cover Sheet & Drawing Schdule.dwg

Refer Drawing 1136-DR-SU-9001

Refer Drawing 1136-DR-SU-9002

2
DP 506763

2
DP 343058

~~100~~
DP 572492

4
DP 310358

8
DP 191042

CULLEN STREET

SANDSPIT AVENUE

MITIMITI LANE

DUNES DRIVE

Lot 1 Lot 2 Lot 3 Lot 4 Lot 5 Lot 6 Lot 7 Lot 8 Lot 9 Lot 40 Lot 41 Lot 42

Lot 10 Lot 11 Lot 12 Lot 13 Lot 14 Lot 15 Lot 16 Lot 17 Lot 18 Lot 19 Lot 20

Lot 23 Lot 24 Lot 25 Lot 26 Lot 27 Lot 28 Lot 29 Lot 30 Lot 31 Lot 32 Lot 33 Lot 34 Lot 35 Lot 36 Lot 37 Lot 38 Lot 39 Lot 301

RM 210444A

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- The Levels (Z) are in terms of the NZVD 2016 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: 04/05/2026

Contact Number: 09 906 3856

Email: Tom@captureland.nz

Legend

- 38.0 — As built Contour (1m interval)
- As built Contour (0.5m interval)
- Extent of Works
- Top of Bank
- Bottom of Bank
- 1.45 — Timber Pole Retaining Wall (height label on low side of wall)
- 1.45 — Key Stone Retaining Wall (height label on low side of wall)
- Retaining Wall Fence
- 3.1 — Special Design Zone Offset (Dimension to be taken from lagging)

Legend

- Specific Design Zone (No Build) (Refer to CMW GCR For Details)
- Specific Design Zone (No Excavation) (Refer to CMW GCR For Details)
- Specific Design Zone (Retaining) (Refer to CMW GCR For Details)
- Specific Design Zone (1 in 2.5 Slope)
- Specific Design Zone (1 in 3 Slope)
- Specific Design Zone (1 in 4 to 5 Slope)

CLIENT

Foundry Group

PROJECT

55 CULLEN STREET
MANGAWHAI

CAPTURE
Land Development Consultants

	DATE	REVISION DETAILS	ISSUED
0	12/03/26	FOR COMPLETION	BN
1	16/03/26	FOR COMPLETION	BN
2	09/04/26	NZVD 2016 UPDATE	
		FOR COMPLETION	BN
3	04/05/26	FOR COMPLETION	BN

DRAWING STATUS
FOR COMPLETION

DRAWING TITLE
AS-BUILT
FINAL CONTOURS & RETAINING WALL LAYOUTS
SHEET 1

PROJECT NO	SCALE	PLOT SIZE
1136	1:1000	A3

DRAWING NO: 1136-DR-SU-9000
REVISION: 3

1136-DR-SU-9000-9002 Final Cont & RW Layout ASB.dwg

2
DP 506763

2
DP 343058

100
DP 572492

No Topsoil placed at base of RW
due to accessibility for Lots 1 to 3

CULLEN STREET

SANDSPIT AVENUE

DUNES DRIVE

MITIMITI LANE

Lot 1
Lot 2
Lot 3
Lot 4
Lot 5
Lot 6
Lot 7
Lot 8
Lot 9
Lot 17
Lot 18
Lot 19
Lot 20
Lot 21
Lot 22
Lot 23
Lot 24
Lot 25
Lot 26
Lot 27
Lot 28
Lot 29
Lot 30
Lot 31
Lot 32
Lot 33
Lot 34
Lot 35
Lot 36
Lot 37
Lot 300
Lot 301

RM 210444A

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 NZVD 2016 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: 04/05/2026

Contact Number: 09 906 3856

Email: Tom@captureland.nz

NOTE:
REFER DRAWING **1136-DR-SU-9000**
FOR DRAWING LEGEND

CLIENT
Foundry Group

PROJECT
55 CULLEN STREET
MANGAWHAI

CAPTURE
Land Development Consultants

	DATE	REVISION DETAILS	ISSUED
0	12/03/26	FOR COMPLETION	BN
1	16/03/26	FOR COMPLETION	BN
2	09/04/26	NZVD 2016 UPDATE	
		FOR COMPLETION	BN
3	04/05/26	FOR COMPLETION	BN

DRAWING STATUS
FOR COMPLETION

DRAWING TITLE
AS-BUILT
FINAL CONTOURS & RETAINING WALL LAYOUTS
SHEET 2

PROJECT NO	*SCALE*	*PLOT SIZE*
1136	1:750	A3

DRAWING NO
1136-DR-SU-9001

REVISION
3

1136-DR-SU-9000-9002 Final Cont & RW Layout ASB.dwg

DP 572492

No Topsoil placed at base of RW
due to accessibility for Lots 1 to 3

N

Lot 2
Lot 3
Lot 4
Lot 5
Lot 6
Lot 7
Lot 8
Lot 9
Lot 40
Lot 41
Lot 42

SANDSPIT AVENUE

4
DP 310358

Lot 10
Lot 11
Lot 12
Lot 13
Lot 14
Lot 15
Lot 16
Lot 17
Lot 18
Lot 19
Lot 20
Lot 21
Lot 22
Lot 31
Lot 32
Lot 33
Lot 34
Lot 35
Lot 36
Lot 37
Lot 38
Lot 39
Lot 301

DUNES DRIVE

MITIMITI LANE

8
DP 191042

2m Deep x 2m Wide Trench
Filled with No-Fines Concrete
at Toe of Retaining Wall

RM 210444A

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  - -For all other assets +/-20mm (e.g Manhole covers, Earthworks)

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FOR DRAWING LEGEND

CLIENT
Foundry Group

PROJECT
55 CULLEN STREET
MANGAWHAI

CAPTURE
Land Development Consultants

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2	09/04/26	NZVD 2016 UPDATE	
		FOR COMPLETION	BN
3	04/05/26	FOR COMPLETION	BN

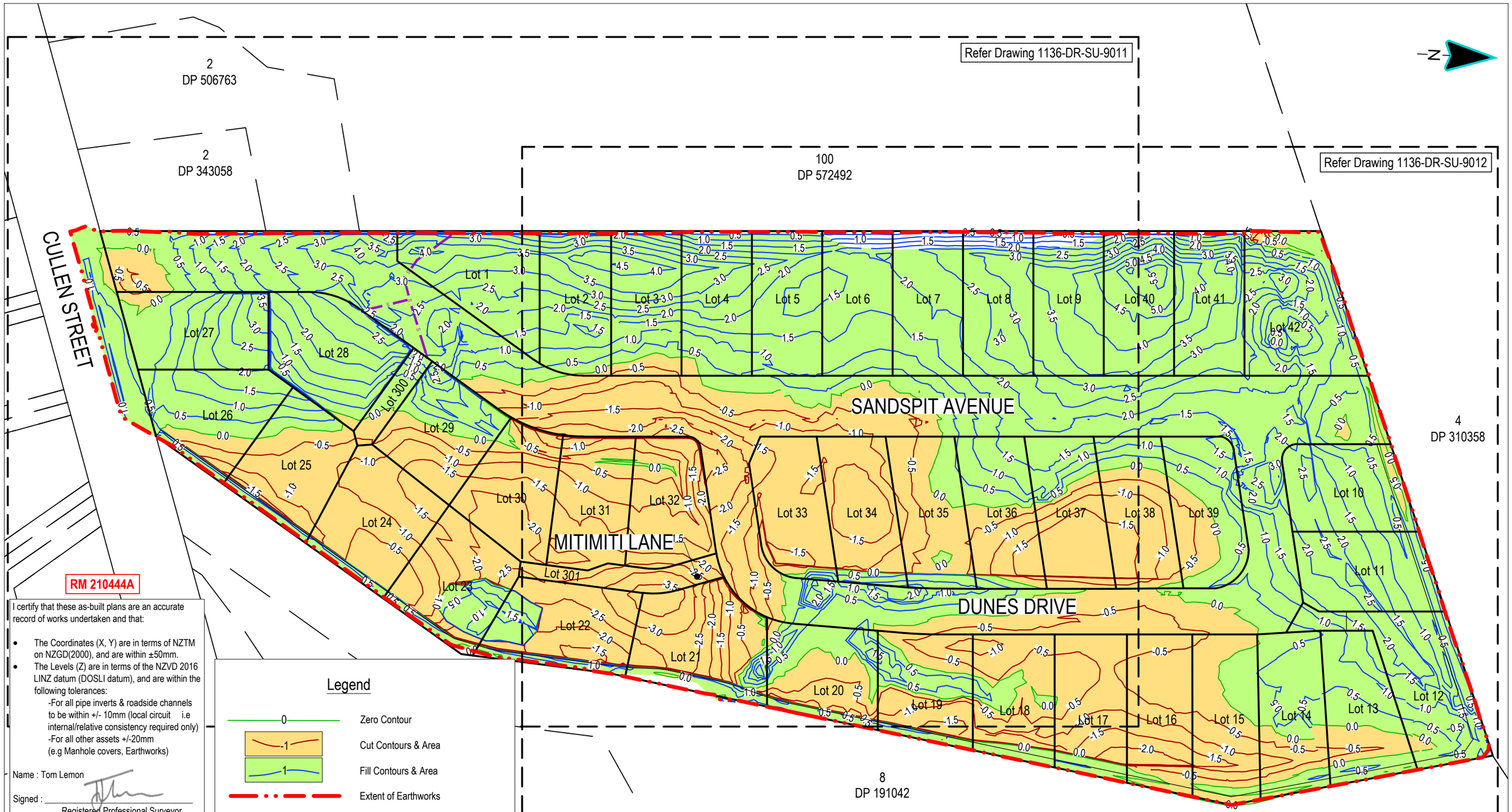
DRAWING STATUS
FOR COMPLETION

DRAWING TITLE
AS-BUILT
FINAL CONTOURS & RETAINING WALL LAYOUTS
SHEET 3

PROJECT NO	SCALE	PLOT SIZE
1136	1:750	A3

DRAWING NO: 1136-DR-SU-9002
REVISION: 3

1136-DR-SU-9000-9002 Final Cont & RW Layout ASB.dwg



RM 210444A

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Legend

- 0 — Zero Contour
- -1 — Cut Contours & Area
- 1 — Fill Contours & Area
- Extent of Earthworks
- Counterfort Drains (1600 Highway Grade Perforated Novacoil in SAP surround with Geotextile cloth) — -2.63 … -1.89

Note
- Cut & Fill Contours are from orginal level to finished As-built level
- Counterfort & Underfill drains capped and buried unless otherwise shown

CLIENT: Foundry Group

PROJECT: 55 CULLEN STREET MANGAWHAI

CAPTURE Land Development Consultants

	DATE	REVISION DETAILS	ISSUED
0	12/03/26	FOR COMPLETION	BN
1	16/03/26	FOR COMPLETION	BN
2	25/03/26	FOR COMPLETION	BN
3	09/04/26	NZVD 2016 UPDATE	
		FOR COMPLETION	BN

DRAWING STATUS: FOR COMPLETION

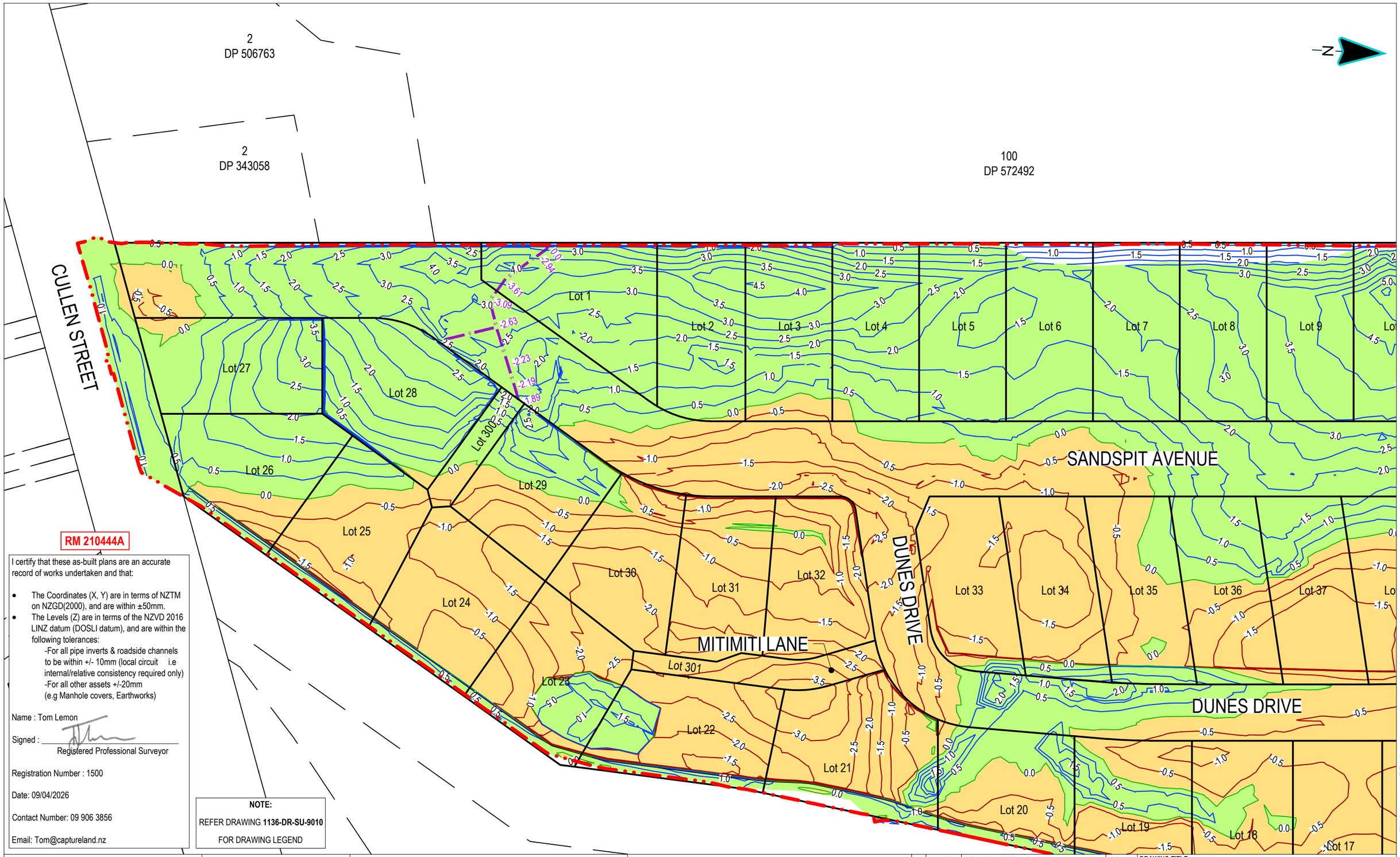
DRAWING TITLE: **AS-BUILT** CUT TO FILL LAYOUTS SHEET 1

PROJECT NO	SCALE	PLOT SIZE
1136	1:1000	A3

DRAWING NO: 1136-DR-SU-9010

REVISION: 3

1136-DR-SU-9010-9012 Cut to Fill Layout ASB.dwg



RM 210444A

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Email: Tom@captureland.nz

NOTE:
REFER DRAWING **1136-DR-SU-9010**
FOR DRAWING LEGEND

CLIENT
Foundry Group

PROJECT
55 CULLEN STREET
MANGAWHAI

CAPTURE
Land Development Consultants

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		FOR COMPLETION	BN

DRAWING STATUS
FOR COMPLETION

DRAWING TITLE
AS-BUILT
CUT TO FILL LAYOUTS
SHEET 2

PROJECT NO	SCALE	PLOT SIZE
1136	1:750	A3

DRAWING NO
1136-DR-SU-9011

REVISION
3

1136-DR-SU-9010-9012 Cut to Fill Layout ASB.dwg

RM 210444A

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NOTE:

REFER DRAWING **1136-DR-SU-9010**

FOR DRAWING LEGEND

CLIENT

Foundry Group

PROJECT

55 CULLEN STREET
MANGAWHAI

CAPTURE
Land Development Consultants

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3	09/04/26	NZVD 2016 UPDATE	
		FOR COMPLETION	BN

DRAWING STATUS

FOR COMPLETION

DRAWING TITLE

AS-BUILT
CUT TO FILL LAYOUTS
SHEET 3

PROJECT NO	*SCALE*	*PLOT SIZE*
1136	1:750	A3

DRAWING NO	*REVISION*
1136-DR-SU-9012	3

1136-DR-SU-9010-9012 Cut to Fill Layout ASB.dwg

Streetlight Coordinates (NZTM)		
Light No.	mN	mE
SL1	1742572.26	6005722.30
SL2	1742570.63	6005770.58
SL3	1742583.96	6005803.89
SL4	1742614.72	6005840.85
SL5	1742604.74	6005888.96
SL6	1742602.94	6005942.24
SL7	1742601.74	6005981.49
SL8	1742600.34	6006029.31
SL9	1742616.48	6006025.97
SL10	1742651.04	6006028.53
SL11	1742662.54	6005989.88
SL12	1742663.89	6005949.32
SL13	1742661.21	6005896.83
SL14	1742621.45	6005888.65

Concrete Footpath Extension
1.5
Existing Vehicle Crossings
2 DP 506763
2 DP 343058
100 DP 572492
Refer Drawing 1136-DR-SU-9101
Refer Drawing 1136-DR-SU-9102
CULLEN STREET
SANDSPIT AVENUE
MITIMITI LANE
DUNES DRIVE
Lot 1
Lot 2
Lot 3
Lot 4
Lot 5
Lot 6
Lot 7
Lot 8
Lot 9
Lot 40
Lot 41
Lot 42
Lot 10
Lot 11
Lot 12
Lot 13
Lot 14
Lot 15
Lot 16
Lot 22
Lot 23
Lot 24
Lot 25
Lot 26
Lot 27
Lot 28
Lot 29
Lot 30
Lot 31
Lot 32
Lot 33
Lot 34
Lot 35
Lot 36
Lot 37
Lot 38
Lot 39
Lot 300
Lot 301
4 DP 310358
Refer Section A on Drawing **1136-DR-SU-9301** For Swale Section
Refer Section B on Drawing **1136-DR-SU-9303** For Swale Section
N

RM 210444A

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Legend

- Concrete Footpath
- Channel Drain
- Parking Bays
- Stormwater Catchpit Single
- Stormwater Catchpit Double
- New Stormwater manhole & Pipeline
- Tactile Ground Surface Indicators

Legend

- Street Light SL01-SL04, SL07-SL11, SL14 NOX S 2600 (NSS-08-026-740-P1) SL05-SL06, SL12-SL13 NOX S 3750 (NSS-16-0307-740-P1)
- Street Tree
- Extent of Works
- Underchannel Drain
- NSAAT Road Marking
- Rain Garden

NOTES

Road Stabilising:
Refer Drawing **1136-DR-SU-9101** for stabilising details and locations

Road Footpaths:
1.5m Wide x 100mm THK 20MPa Broom Finish Concrete on 100mm AP40

Parking Bays:
200mm THK 25MPa Exposed Concrete with 661 mesh on 200mm GAP 65 basecourse with 8kg/m² Black Oxide

COAL:
150mm THK 25MPa Exposed Concrete with 665 mesh on 150mm GAP 65 basecourse with 8kg/m² Black Oxide

Roads:
Refer Drawing **1036-DR-SU-9110 - 1036-DR-SU-9111** for typical cross sections.

CLIENT
Foundry Group

PROJECT
55 CULLEN STREET
MANGAWHAI

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Land Development Consultants

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DRAWING STATUS
FOR COMPLETION

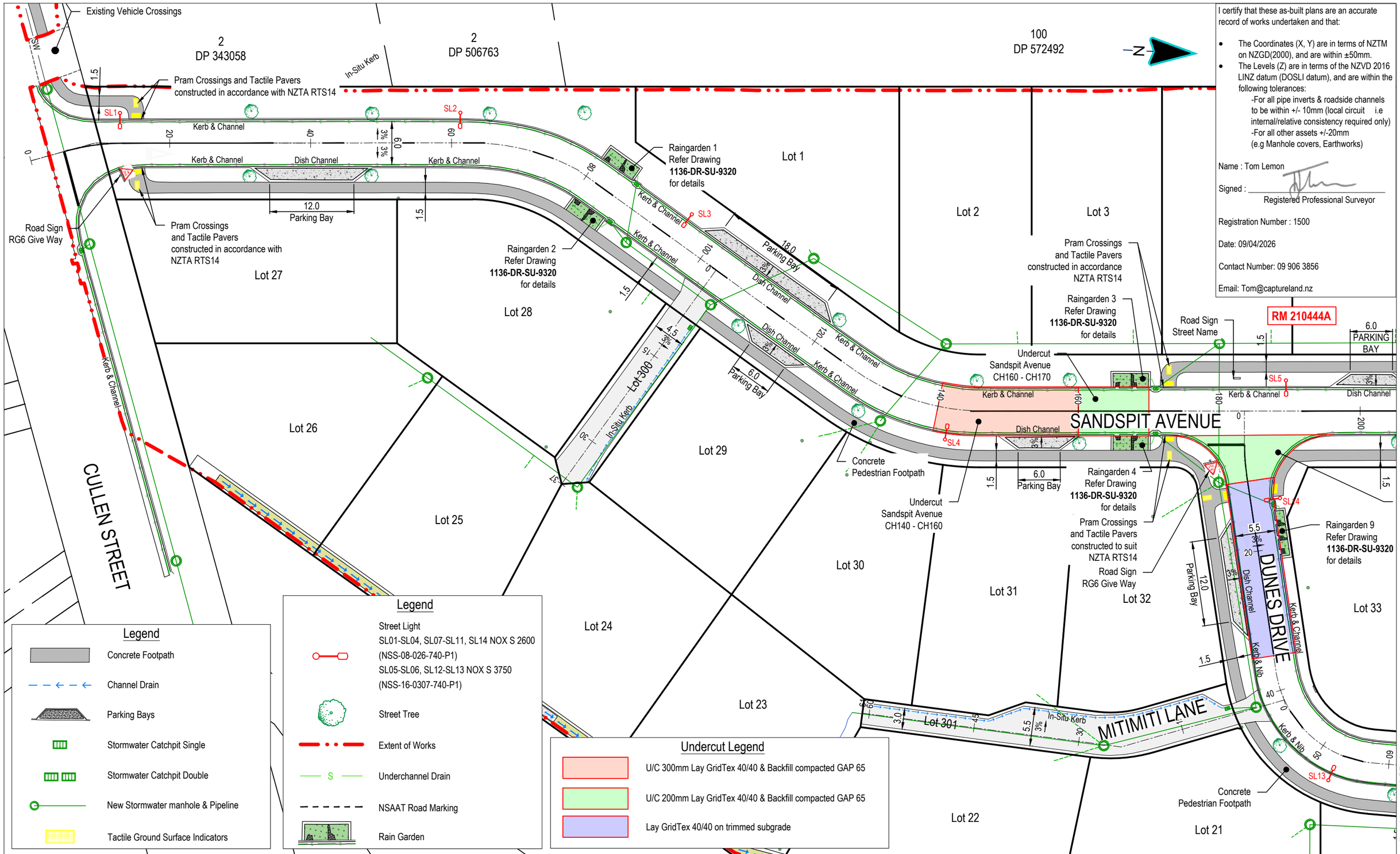
DRAWING TITLE
AS-BUILT
ROADING LAYOUTS
SHEET 1

PROJECT NO	SCALE	PLOT SIZE
1136	1:1000	A3

DRAWING NO
1136-DR-SU-9100

REVISION
2

1136-DR-SU-9100-9102 Roading Layouts ASB.dwg



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Legend

- Concrete Footpath
- Channel Drain
- Parking Bays
- Stormwater Catchpit Single
- Stormwater Catchpit Double
- New Stormwater manhole & Pipeline
- Tactile Ground Surface Indicators

Legend

- Street Light SL01-SL04, SL07-SL11, SL14 NOX S 2600 (NSS-08-026-740-P1) SL05-SL06, SL12-SL13 NOX S 3750 (NSS-16-0307-740-P1)
- Street Tree
- Extent of Works
- Underchannel Drain
- NSAAT Road Marking
- Rain Garden

Undercut Legend

- U/C 300mm Lay GridTex 40/40 & Backfill compacted GAP 65
- U/C 200mm Lay GridTex 40/40 & Backfill compacted GAP 65
- Lay GridTex 40/40 on trimmed subgrade

CLIENT: Foundry Group

PROJECT: 55 CULLEN STREET MANGAWHAI

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		FOR COMPLETION	BN

DRAWING STATUS: FOR COMPLETION

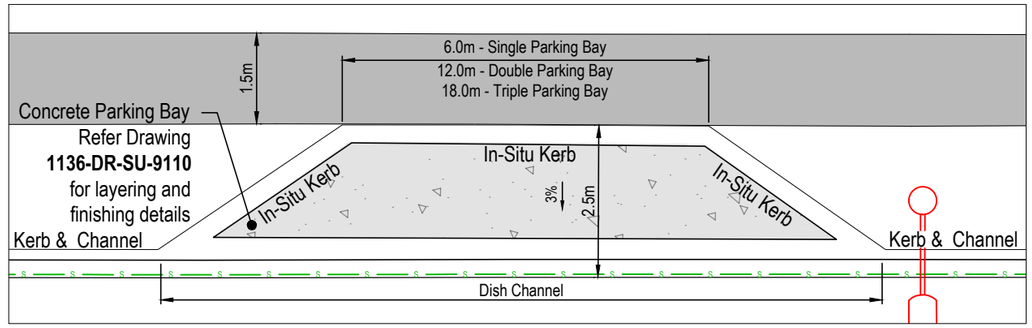
DRAWING TITLE: **AS-BUILT** ROADING LAYOUTS SHEET 2

PROJECT NO	SCALE	PLOT SIZE
1136	1:500	A3

DRAWING NO: 1136-DR-SU-9101

REVISION: 2

1136-DR-SU-9100-9102 Roading Layouts ASB.dwg



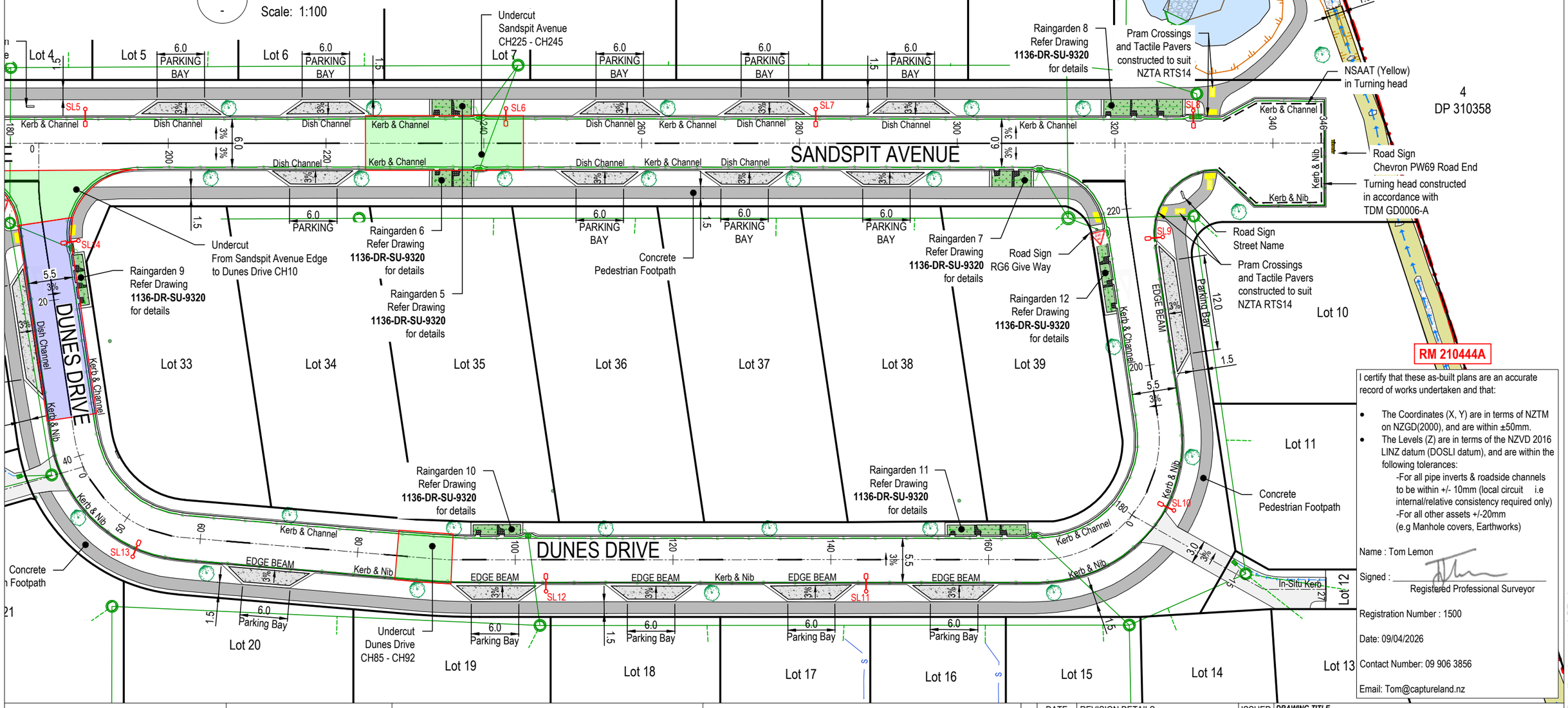
1 - TYPICAL PARKING BAY DETAIL

Scale: 1:100

NOTE:

REFER DRAWING **1136-DR-SU-9100**

FOR DRAWING LEGEND



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CLIENT: Foundry Group

PROJECT: 55 CULLEN STREET MANGAWHAI

CAPTURE Land Development Consultants

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DRAWING STATUS: FOR COMPLETION

DRAWING TITLE: **AS-BUILT** ROADING LAYOUTS SHEET 3

PROJECT NO	SCALE	PLOT SIZE
1136	1:500	A3

DRAWING NO: 1136-DR-SU-9102

REVISION: 2

1136-DR-SU-9100-9102 Roading Layouts ASB.dwg

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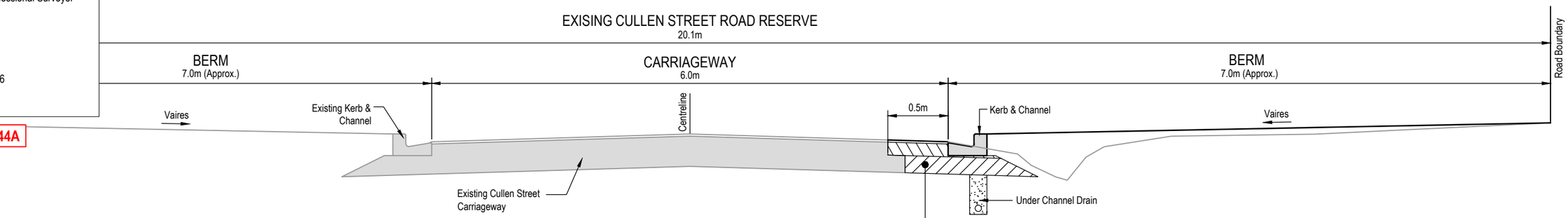
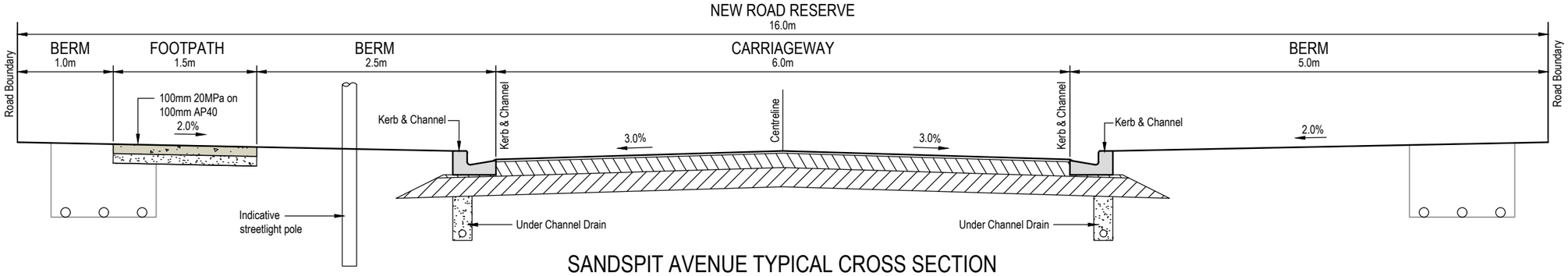
RM 210444A

Sandspit Avenue & Dunes Drive:
Seal: 30mm DG7 over 180/200 grade seal coat with 1.4 l/m² residual binder
Basecourse:150mm TNZ AP40
Subbase: 250mm GAP65
Subgrade: 250mm layer with 12kg/m2 lime and 5kg/m² cement

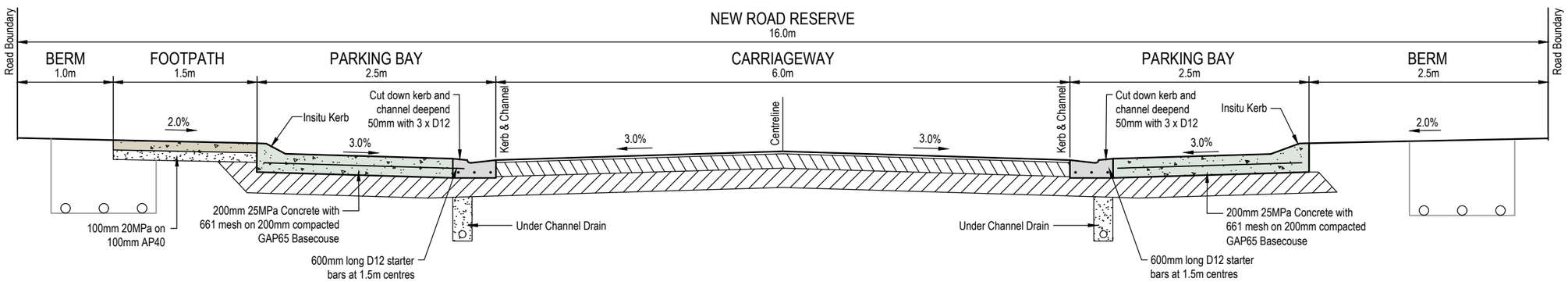
Cullen Street:
Seal: 30mm DG7 over 180/200 grade seal coat with 1.4 l/m² residual binder
Basecourse :150mm TNZ AP40
Subbase: 250mm GAP65



CULLEN STREET TYPICAL CROSS SECTION



SANDSPIT AVENUE TYPICAL CROSS SECTION



SANDSPIT AVENUE TYPICAL CROSS SECTION WITH PARKING BAYS

CLIENT
Foundry Group

PROJECT
55 CULLEN STREET
MANGAWHAI

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Land Development Consultants

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DRAWING STATUS
FOR COMPLETION

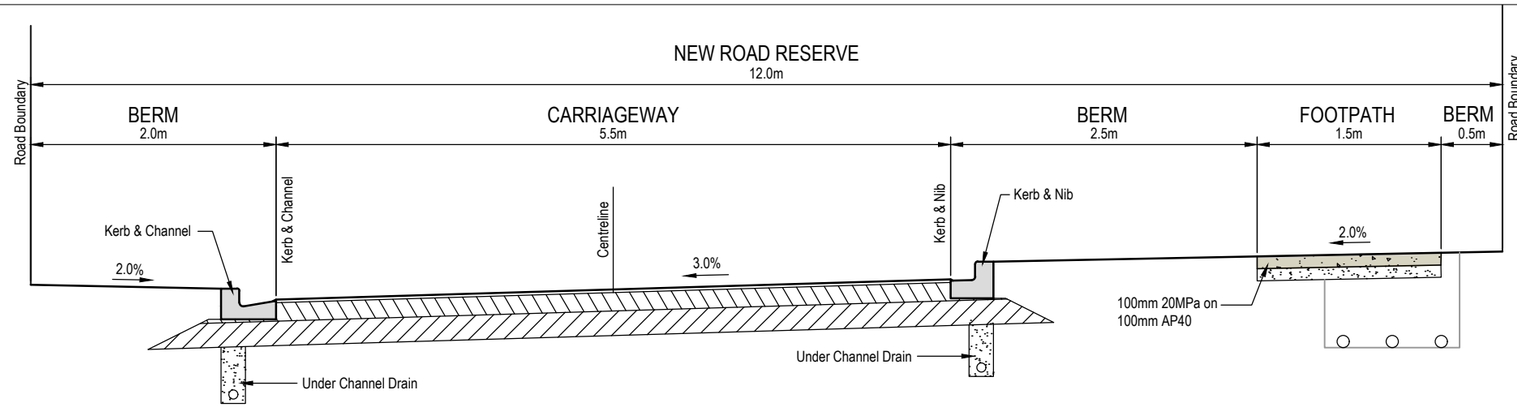
DRAWING TITLE
AS-BUILT
ROADING CROSS SECTIONS
SHEET 1

PROJECT NO	SCALE	PLOT SIZE
1136	1:50	A3

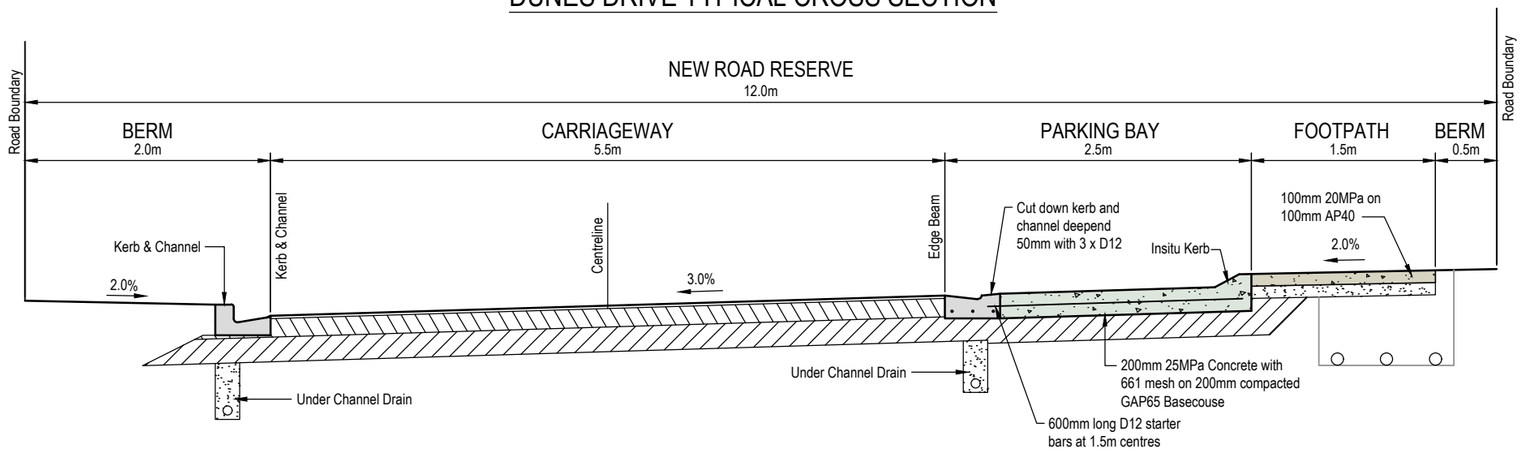
DRAWING NO
1136-DR-SU-9110

REVISION
2

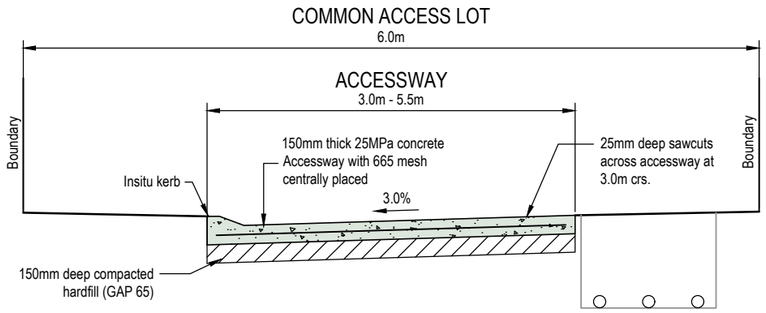
1136-DR-SU-9110-9111 Roading XS ASB.dwg



DUNES DRIVE TYPICAL CROSS SECTION



DUNES DRIVE TYPICAL CROSS SECTION (WITH PARKING BAY)



ACCESSWAY TYPICAL CROSS SECTION

RM 210444A

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CLIENT

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PROJECT

55 CULLEN STREET
MANGAWHAI

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DRAWING STATUS: FOR COMPLETION

DRAWING TITLE: **AS-BUILT**
ROADING CROSS SECTIONS
SHEET 2

PROJECT NO	SCALE	PLOT SIZE
1136	1:50	A3

DRAWING NO: 1136-DR-SU-9111

REVISION: 2

1136-DR-SU-9110-9111 Roading XS ASB.dwg

DP 506763

2
DP 343058

100
DP 572492

Refer Drawing 1136-DR-SU-9301

Refer Drawing 1136-DR-SU-9302

CULLEN STREET

Lot 1 Lot 2 Lot 3 Lot 4 Lot 5 Lot 6 Lot 7 Lot 8 Lot 9 Lot 40 Lot 41 Lot 42

Lot 27 Lot 28 Lot 300 Lot 26 Lot 29 Lot 25 Lot 30 Lot 31 Lot 32 Lot 24 Lot 23 Lot 301 Lot 22 Lot 21 Lot 20 Lot 19 Lot 18 Lot 17 Lot 16 Lot 15 Lot 14 Lot 13 Lot 12 Lot 11 Lot 10

SANDSPIT AVENUE

MITIMITI LANE

DUNES DRIVE

Lot 33 Lot 34 Lot 35 Lot 36 Lot 37 Lot 38 Lot 39

4
DP 310358

Refer Drawing 1136-DR-SU-9303

Refer Drawing 1136-DR-SU-9303

Refer Drawing 1136-DR-SU-9303

8
DP 191042

8
DP 357980

RM 210444A

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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 675mm x 450mm cycle friendly grate lids semi recessed unless otherwise shown.
5. For house connection boundary offsets, see Sheets **1136-DR-SU-9310**.
6. House connections 100Ø uPVC SN16
7. All Private retaining wall outlets are 100uPVC SN16 unless otherwise shown.
8. Refer drawings **1136-DR-SU-9320** for Raingarden details.
9. Retaining wall drainage outlet to catchpits within each lot. Catchpits to be reticulated by private drainage at building consent stage.

CLIENT

Foundry Group

PROJECT

55 CULLEN STREET
MANGAWHAI

CAPTURE
Land Development Consultants

	DATE	REVISION DETAILS	ISSUED
0	12/03/26	FOR COMPLETION	BN
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		FOR COMPLETION	BN

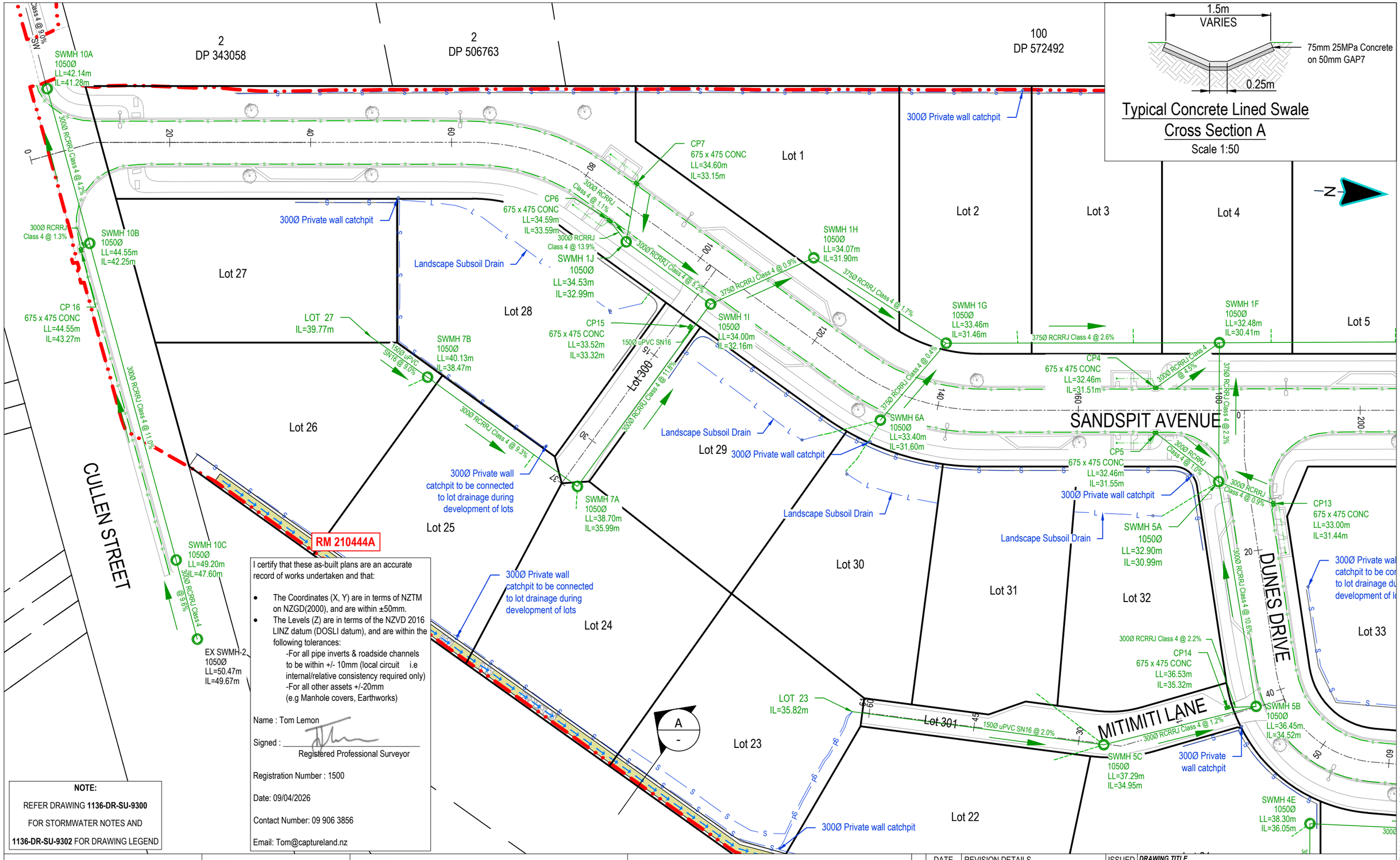
DRAWING STATUS
FOR COMPLETION

DRAWING TITLE
AS-BUILT
STORMWATER LAYOUTS
SHEET 1

PROJECT NO	SCALE	PLOT SIZE
1136	1:1000	A3

DRAWING NO: 1136-DR-SU-9300
REVISION: 3

1136-DR-SU-9300-9303 SW Layouts ASB.dwg



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  - -For all other assets +/-20mm (e.g Manhole covers, Earthworks)

Name : Tom Lemon

Signed : _____

Registered Professional Surveyor

Registration Number : 1500

Date: 09/04/2026

Contact Number: 09 906 3856

Email: Tom@captureland.nz

NOTE:

REFER DRAWING **1136-DR-SU-9300**

FOR STORMWATER NOTES AND

1136-DR-SU-9302 FOR DRAWING LEGEND

CLIENT

Foundry Group

PROJECT

55 CULLEN STREET
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		FOR COMPLETION	BN

DRAWING TITLE

AS-BUILT
STORMWATER LAYOUTS
SHEET 2

PROJECT NO	*SCALE*	*PLOT SIZE*
1136	1:500	A3

DRAWING STATUS
FOR COMPLETION

DRAWING NO
1136-DR-SU-9301

REVISION
3

1136-DR-SU-9300-9303 SW Layouts ASB.dwg

Legend

- Battered Raingardens (Public)
- Stormwater Catchpit (Public)
- New Stormwater Manhole & Pipeline (Public)
- Existing Stormwater Manhole
- Stormwater Scruffy Dome Manhole
- Street Tree

Legend

- Extent of Works
- S — Kerb Underchannel Drain
- L — Landscaping Subsoil Drain
- S — Retaining Wall Subsoil (Private)
- P — Retaining Wall PVC Pipe (Private)
- P — (Private)

Legend

- Retaining Wall Ø300 Catchpit (Private)
- Rock Rip Rap
- Lot Connection
- SW — Existing Stormwater Manhole & Pipeline

Refer Drawing 1136-DR-SU-9350

N

Outlet 1
IL=22.12m

300Ø Private wall catchpit

SWMH 1A
1500Ø
LL=25.67m
IL=22.29m

SWMH 1B
1050Ø
SCRUFFY DOME
LL=25.78m
IL=23.72m

Lot 40

Lot 41

Lot 42

SWMH 1C
1050Ø
LL=27.14m
IL=25.12m

SWMH 1D
1200Ø
LL=27.22m
IL=25.25m

Pond Inlet
with safety grill
IL=24.32m

SWMH 9A
1050Ø
LL=26.71m
IL=25.57m

4
DP 310358

RM 210444A

LL=32.48m
IL=30.41m

Lot 5

Lot 6

Lot 7

Lot 8

CP2
675 x 475 CONC
LL=30.10m
IL=29.09m

SWMH 1E
1050Ø
LL=30.21m
IL=28.13m

450Ø RCRRJ Class 4 @ 3.5%

450Ø RCRRJ Class 4 @ 3.7%

750Ø RCRRJ Class 4 @ 4.7%

750Ø RCRRJ Class 4 @ 5.3%

4500Ø RCRRJ Class 4 @ 11.0%

750Ø RCRRJ Class 4 @ 1.3%

750Ø RCRRJ Class 4 @ 10.9%

3000 RCRRJ Class 4 @ 1.0%

3000Ø RCRRJ Class 4 @ 6.3%

3750 RCRRJ Class 4 @ 2.3%

300Ø RCRRJ Class 4 @ 5.3%

300Ø RCRRJ Class 4 @ 1.0%

CP3
675 x 475 CONC
LL=30.07m
IL=28.79m

SANDSPIT AVENUE

CP8
675 x 475 CONC
LL=27.28m
IL=26.39m

DCP-1
675 x 475 CONC
LL=26.64m
IL=25.83m

6000 RCRRJ Class 4 @ 14%

300Ø RCRRJ Class 4 @ 7.1%

6000 RCRRJ Class 4 @ 3.3%

150Ø uPVC SN16 @ 5.7%

300Ø RCRRJ Class 4 @ 3.9%

300Ø RCRRJ Class 4 @ 0.9%

CP13
675 x 475 CONC
LL=33.00m
IL=31.44m

LOT 33
IL=30.94m

SWMH 3B
1050Ø
LL=31.12m
IL=29.73m

SWMH 3A
1200Ø
LL=27.91m
IL=25.67m

SWMH 4A
1050Ø
LL=27.60m
IL=26.26m

300Ø RCRRJ Class 4 @ 3.1%

CP9
675 x 475 CONC
LL=27.68m
IL=26.62m

Lot 10

525Ø RCRRJ Class 4 @ 5.2%

DUNES DRIVE

300Ø Private wall catchpit to be connected to lot drainage during development of lots

Lot 33

Lot 34

Lot 35

Lot 36

Lot 37

Lot 38

Lot 39

300Ø Private wall catchpit to be connected to lot drainage during development of lots

300Ø Private wall catchpit to be connected to lot drainage during development of lots

CP11
675 x 475 CONC
LL=31.14m
IL=29.82m

300Ø RCRRJ Class 4 @ 10.6%

SWMH 5B
1050Ø
LL=36.45m
IL=34.52m

CP12
675 x 475 CONC
LL=34.77m
IL=33.47m

DUNES DRIVE

CP10
675 x 475 CONC
LL=30.90m
IL=29.70m

300Ø RCRRJ Class 4 @ 1.0%

300Ø RCRRJ Class 4 @ 2.2%

300Ø RCRRJ Class 4 @ 1.3%

450Ø RCRRJ Class 4 @ 2.3%

SWMH 4E
1050Ø
LL=38.30m
IL=36.05m

SWMH 4B
1050Ø
LL=30.90m
IL=28.73m

300Ø RCRRJ Class 4 @ 5.5%

SWMH 4D
1050Ø
LL=35.23m
IL=32.99m

375Ø RCRRJ Class 4 @ 5.0%

SWMH 4C
1050Ø
LL=31.23m
IL=29.18m

Lot 20

Lot 19

Lot 18

Lot 17

Lot 16

Lot 15

Lot 14

Lot 13

Lot 12

B
9303

NOTE:
REFER DRAWING **1136-DR-SU-9300**
FOR STORMWATER NOTES

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Registration Number : 1500

Date: 09/04/2026

Contact Number: 09 906 3856

Email: Tom@captureland.nz

CLIENT: Foundry Group

PROJECT: 55 CULLEN STREET MANGAWHAI

CAPTURE Land Development Consultants

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		FOR COMPLETION	BN

DRAWING STATUS: FOR COMPLETION

DRAWING TITLE: **AS-BUILT** STORMWATER LAYOUTS SHEET 3

PROJECT NO	SCALE	PLOT SIZE
1136	1:500	A3

DRAWING NO: 1136-DR-SU-9302

REVISION: 3

1136-DR-SU-9300-9303 SW Layouts ASB.dwg

EX SWMH-1
1050Ø
LL=39.80m
IL=38.89m

SW

EX 300Ø RCRRJ Class 4 @ 9.0%

SWMH 10A
1050Ø
LL=42.14m
IL=41.28m

2
DP 343058

300Ø RCRRJ Class 4 @ 4.2%

300Ø RCRRJ Class 4 @ 1.3%

SWMH 10B
1050Ø
LL=44.55m
IL=42.25m

Lot 27

CP 16
675 x 475 CONC
LL=44.55m
IL=43.27m

300Ø RCRRJ Class 4 @ 11.0%

CULLEN STREET

300Ø RCRRJ Class 4 @ 9.6%

SWMH 10C
1050Ø
LL=49.20m
IL=47.60m

EX SWMH-2
1050Ø
LL=50.47m
IL=49.67m

RM 210444A

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NOTE:
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FOR STORMWATER NOTES AND
1136-DR-SU-9302 FOR DRAWING LEGEND

SWMH 1F
1050Ø
LL=32.48m
IL=30.41m

Lot 5

375Ø RCRRJ Class 4 @ 2.6%

450Ø RCRRJ Class 4 @ 3.5

CP4
675 x 475 CONC
LL=32.46m
IL=31.51m

300Ø RCRRJ Class 4 @ 4.5%

375Ø RCRRJ Class 4 @ 2.3%

SANDSPIT AVENUE

CP5
675 x 475 CONC
LL=32.46m
IL=31.55m

300Ø RCRRJ Class 4 @ 7.0%

300Ø Private wall catchpit

300Ø RCRRJ Class 4 @ 0.9%

150Ø uPVC SN16 @ 5.7%

CP13
675 x 475 CONC
LL=33.00m
IL=31.44m

LOT 33
IL=30.94m

Landscape Subsoil Drain

SWMH 5A
1050Ø
LL=32.90m
IL=30.99m

300Ø Private wall catchpit to be connected to lot drainage during development of lots

Lot 31

Lot 32

DUNES DRIVE

Lot 33

Lot 34

300Ø RCRRJ Class 4 @ 10.6%

300Ø RCRRJ Class 4 @ 2.2%

CP14
675 x 475 CONC
LL=36.53m
IL=35.32m

SWMH 5B
1050Ø
LL=36.45m
IL=34.52m

MITIMITI LANE

150Ø uPVC SN16 @ 2.0%

300Ø RCRRJ Class 4 @ 1.2%

SWMH 5C
1050Ø
LL=37.29m
IL=34.95m

300Ø Private wall catchpit

SWMH 4E
1050Ø
LL=38.30m
IL=36.05m

300Ø RCRRJ Class 4 @ 5.5%

Lot 21

Lot 20

300Ø RCRRJ Class 4 @ 6.4%

A
9301

Concrete lined swale and rock rip rap

SWMH 4F
1050Ø
LL=39.93m
IL=37.29m

8
DP 191042

300Ø RCRRJ Class 4 @ 1.7%

600Ø RCRRJ Class 4 @ 3.3%

SWMH 3A
1200Ø
LL=27.91m
IL=25.67m

SWMH 4A
1050Ø
LL=27.60m
IL=26.26m

300Ø RCRRJ Class 4 @ 3.1%

CP9
675 x 475 CONC
LL=27.68m
IL=26.62m

B
-

Lot 10

Lot 39

525Ø RCRRJ Class 4 @ 5.2%

CP11
675 x 475 CONC
LL=31.14m
IL=29.82m

Lot 11

CP10
675 x 475 CONC
LL=30.90m
IL=29.70m

300Ø RCRRJ Class 4 @ 1.0%

300Ø RCRRJ Class 4 @ 1.3%

450Ø RCRRJ Class 4 @ 2.3%

SWMH 4B
1050Ø
LL=30.90m
IL=28.73m

SWMH 4C
1050Ø
LL=31.23m
IL=29.18m

Lot 12

Lot 16

Lot 15

Lot 14

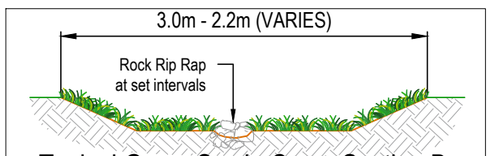
Lot 13

375Ø RCRRJ Class 4 @ 10.5%

300Ø Private wall catchpit

SWMH 4C1
1050Ø
LL=36.84m
IL=33.70m

8
DP 191042



Typical Grass Swale Cross Section B
Scale 1:50

CLIENT
Foundry Group

PROJECT
55 CULLEN STREET
MANGAWHAI

CAPTURE
Land Development Consultants

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DRAWING STATUS
FOR COMPLETION

DRAWING TITLE
AS-BUILT
STORMWATER LAYOUTS
SHEET 4

PROJECT NO	SCALE	PLOT SIZE
1136	1:500	A3

DRAWING NO
1136-DR-SU-9303

REVISION
3

1136-DR-SU-9300-9303 SW Layouts ASB.dwg

DP 506763

2
DP 343058

100
DP 572492

CULLEN STREET

SW

Refer Drawing 1136-DR-SU-9307

Refer Drawing 1136-DR-SU-9306

Lot 1 Lot 2 Lot 3 Lot 4 Lot 5 Lot 6 Lot 7 Lot 8 Lot 9 Lot 40 Lot 41 Lot 42

Lot 27 Lot 28 Lot 26 Lot 29 Lot 25 Lot 30 Lot 31 Lot 32 Lot 24 Lot 23 Lot 22 Lot 21 Lot 20 Lot 19 Lot 18 Lot 17 Lot 16 Lot 15 Lot 14 Lot 13 Lot 12 Lot 11 Lot 10

Lot 300

Lot 301

SANDSPIT AVENUE

MITIMITI LANE

DUNES DRIVE

Lot 33 Lot 34 Lot 35 Lot 36 Lot 37 Lot 38 Lot 39

4
DP 310358

8
DP 357980

8
DP 191042

RM 210444A

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Registration Number : 1500

Date: 09/04/2026

Contact Number: 09 906 3856

Email: Tom@captureland.nz

Legend

- Stormwater Catchpit (Public)
- New Stormwater Manhole & Pipeline (Public)
- Stormwater Scruffy Dome Manhole
- Lot Connection
- Stormwater Zone of Influence (ZOI)

CLIENT: Foundry Group

PROJECT: 55 CULLEN STREET MANGAWHAI

CAPTURE Land Development Consultants

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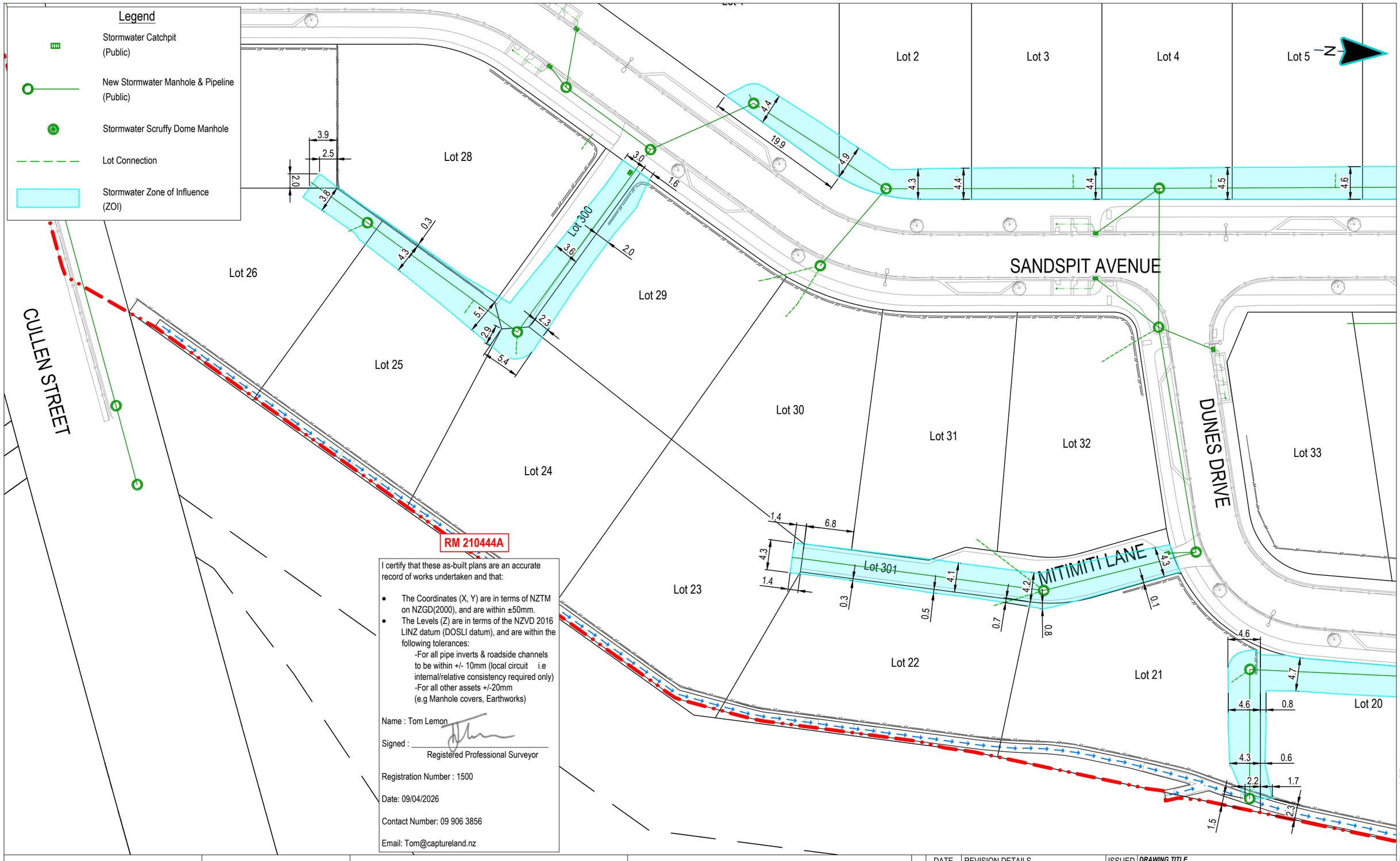
DRAWING TITLE: **AS-BUILT** STORMWATER ZONE OF INFLUENCE LAYOUTS SHEET 1

PROJECT NO	SCALE	PLOT SIZE
1136	1:1000	A3

DRAWING NO: 1136-DR-SU-9305

REVISION: 2

1136-DR-SU-9305-9307 SW ZOI Layouts ASB.dwg



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PROJECT

55 CULLEN STREET
MANGAWHAI

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DRAWING STATUS
FOR COMPLETION

DRAWING TITLE
AS-BUILT
STORMWATER ZONE OF INFLUENCE LAYOUTS
SHEET 2

PROJECT NO	SCALE	PLOT SIZE
1136	1:500	A3

DRAWING NO	REVISION
1136-DR-SU-9306	2

1136-DR-SU-9305-9307 SW ZOI Layouts ASB.dwg

Legend

- Stormwater Catchpit (Public)
- New Stormwater Manhole & Pipeline (Public)
- Stormwater Scruffy Dome Manhole
- Lot Connection
- Stormwater Zone of Influence (ZOI)

Lot 6 Lot 7 Lot 8 Lot 9 Lot 40 Lot 41 Lot 42

4

DP 310358

RM 210444A

SANDSPIT AVENUE

DUNES DRIVE

Lot 33 Lot 34 Lot 35 Lot 36 Lot 37 Lot 38 Lot 39

Lot 10

DUNES DRIVE

Lot 20 Lot 19 Lot 18 Lot 17 Lot 16 Lot 15 Lot 14 Lot 13 Lot 12

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DRAWING STATUS: FOR COMPLETION

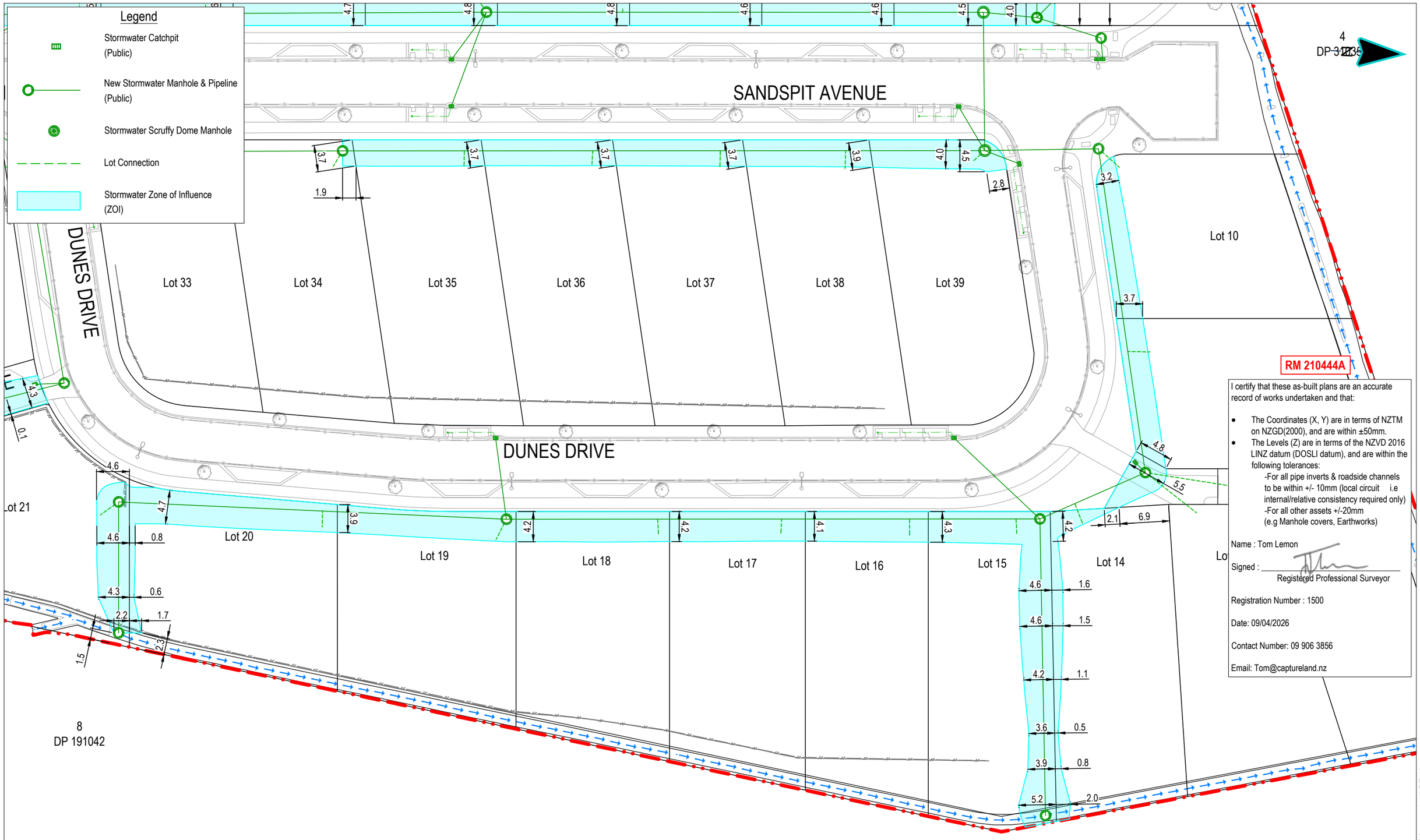
DRAWING TITLE: **AS-BUILT** STORMWATER ZONE OF INFLUENCE LAYOUTS SHEET 3

PROJECT NO	SCALE	PLOT SIZE
1136	1:500	A3

DRAWING NO: 1136-DR-SU-9307

REVISION: 2

1136-DR-SU-9305-9307 SW ZOI Layouts ASB.dwg



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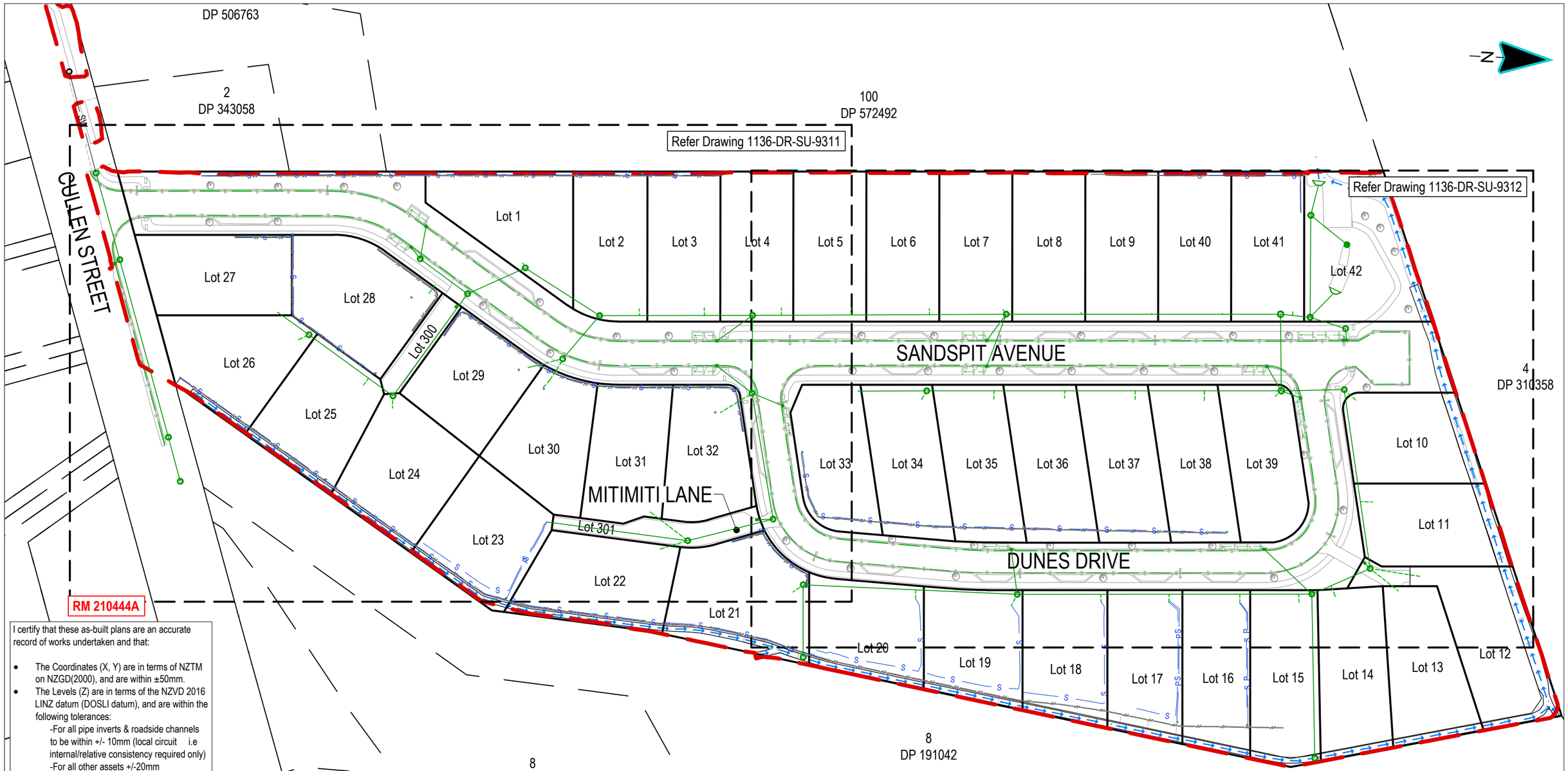
DRAWING STATUS: FOR COMPLETION

DRAWING TITLE: **AS-BUILT** STORMWATER ZONE OF INFLUENCE LAYOUTS SHEET 4

PROJECT NO	SCALE	PLOT SIZE
1136	1:500	A3

DRAWING NO	REVISION
1136-DR-SU-9308	2

1136-DR-SU-9305-9307 SW ZOI Layouts ASB.dwg



RM 210444A

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PROJECT

55 CULLEN STREET
MANGAWHAI

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		FOR COMPLETION	BN

DRAWING STATUS
FOR COMPLETION

DRAWING TITLE
AS-BUILT
STORMWATER LOT CONNECTIONS LAYOUTS
SHEET 1

PROJECT NO	SCALE	PLOT SIZE
1136	1:1000	A3

DRAWING NO
1136-DR-SU-9310

REVISION
2

1136-DR-SU-9310-9312 SW Lot Conn Layouts ASB.dwg

Legend

- Battered Raingardens (Public)
- Stormwater Catchpit (Public)
- New Stormwater Manhole & Pipeline (Public)
- Existing Stormwater Manhole
- Stormwater Scruffy Dome Manhole
- Street Tree

Legend

- Extent of Works
- S — Kerb Underchannel Drain
- S — Retaining Wall Subsoil (Private)
- P — Retaining Wall PVC Pipe (Private)

Legend

- Retaining Wall Ø300 Catchpit (Private)
- Rock Rip Rap
- Lot Connection

100
DP 572492

N

Lot 1
Lot 2
Lot 3
Lot 4
Lot 5
Lot 11 Conn
Lot 2 Conn
Lot 3 Conn
Lot 4 Conn
Lot 5 Conn
Lot 27
Lot 27 Conn
Lot 28
Lot 28 Conn
Lot 300
Lot 26
Lot 26 Conn
Lot 29
Lot 29 Conn
Lot 30
Lot 30 Conn
Lot 25
Lot 25 Conn
Lot 24
Lot 24 Conn
Lot 31
Lot 31 Conn
Lot 32
Lot 32 Conn
Lot 33
Lot 23
Lot 23 Conn
Lot 301
Lot 22
Lot 22 Conn
Lot 21
Lot 21 Conn

SANDSPIT AVENUE
DUNES DRIVE
MITIMITI LANE
CULLEN STREET

RM 210444A

EX SWMH-2
1050Ø
LL=50.47m
IL=49.67m

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Signed : _____
Registered Professional Surveyor

Registration Number : 1500

Date: 09/04/2026

Contact Number: 09 906 3856

Email: Tom@captureland.nz

NOTE:
REFER DRAWING **1136-DR-SU-9300**
FOR STORMWATER NOTES

CLIENT
Foundry Group

PROJECT
55 CULLEN STREET
MANGAWHAI

CAPTURE
Land Development Consultants

	DATE	REVISION DETAILS	ISSUED
0	12/03/26	FOR COMPLETION	BN
1	16/03/26	FOR COMPLETION	BN
2	09/04/26	NZVD 2016 UPDATE	
		FOR COMPLETION	BN

DRAWING STATUS
FOR COMPLETION

DRAWING TITLE
AS-BUILT
STORMWATER LOT CONNECTIONS LAYOUTS
SHEET 2

PROJECT NO	SCALE	PLOT SIZE
1136	1:500	A3

DRAWING NO: 1136-DR-SU-9311
REVISION: 2

1136-DR-SU-9310-9312 SW Lot Conn Layouts ASB.dwg

NOTE:

REFER DRAWING **1136-DR-SU-9300** FOR STORMWATER NOTES AND **1136-DR-SU-9311** FOR DRAWING LEGEND

N

Lot 4 | Lot 5 | Lot 6 | Lot 7 | Lot 8 | Lot 9 | Lot 40 | Lot 41 | Lot 42

Lot 4 Conn 3.0 3.5 | Lot 5 Conn 3.8 3.6 | Lot 6 Conn 2.5 3.4 | Lot 7 Conn 2.3 3.1 | Lot 8 Conn 1.0 2.3 | Lot 9 Conn 1.7 2.0 | Lot 40 Conn 2.2 2.1 | Lot 41 Conn 2.9 2.5

4
DP 310358

SANDSPIT AVENUE

RM 210444A

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DUNES DRIVE

Lot 33 | Lot 34 | Lot 35 | Lot 36 | Lot 37 | Lot 38 | Lot 39 | Lot 10

Lot 33 Conn 0.9 1.9 | Lot 34 Conn 3.2 3.7 | Lot 35 Conn 2.9 3.6 | Lot 36 Conn 3.4 3.4 | Lot 37 Conn 3.7 3.7 | Lot 38 Conn 3.9 4.0 | Lot 39 Conn 14.1 2.9 | Lot 10 Conn 3.6 1.8

Lot 11 Conn 4.7 4.0

Lot 12 Conn 14.5 2.5

Lot 13 Conn 11.6 1.2

Lot 21 Conn 6.4 4.1 | Lot 20 Conn 2.1 3.3 | Lot 19 Conn 2.8 3.9 | Lot 18 Conn 1.5 3.1 | Lot 17 Conn 3.4 3.0 | Lot 16 Conn 2.6 3.3 | Lot 15 Conn 4.7 3.1 | Lot 14 Conn 4.5 1.9

Lot 20 | Lot 19 | Lot 18 | Lot 17 | Lot 16 | Lot 15 | Lot 14 | Lot 13 | Lot 12

CLIENT: Foundry Group

PROJECT: 55 CULLEN STREET MANGAWHAI

CAPTURE Land Development Consultants

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DRAWING STATUS: FOR COMPLETION

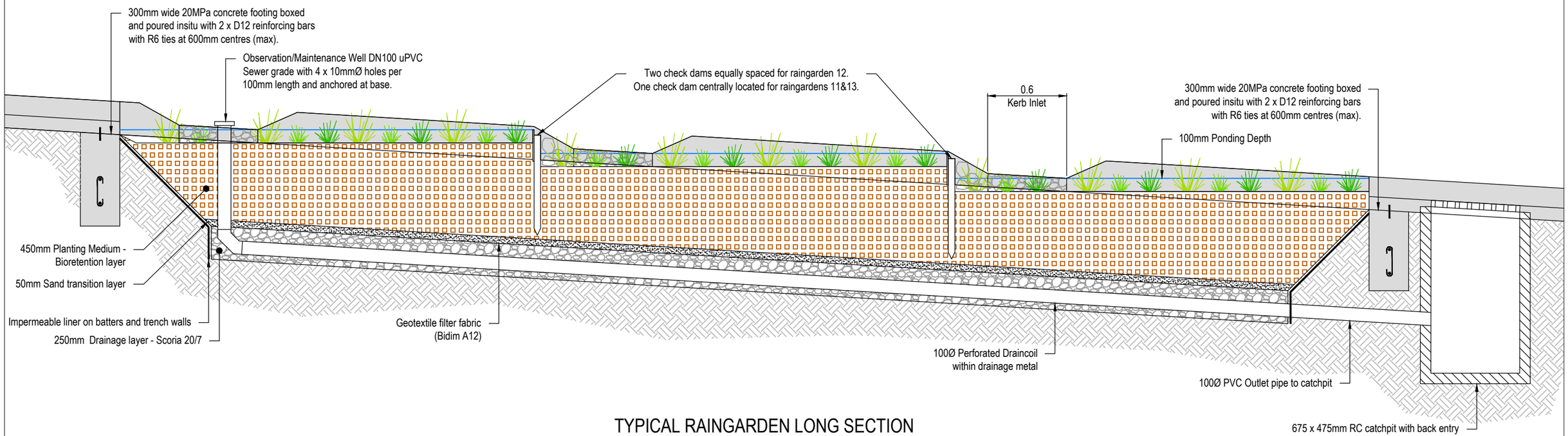
DRAWING TITLE: **AS-BUILT** STORMWATER LOT CONNECTIONS LAYOUTS SHEET 3

PROJECT NO	SCALE	PLOT SIZE
1136	1:500	A3

DRAWING NO: 1136-DR-SU-9312

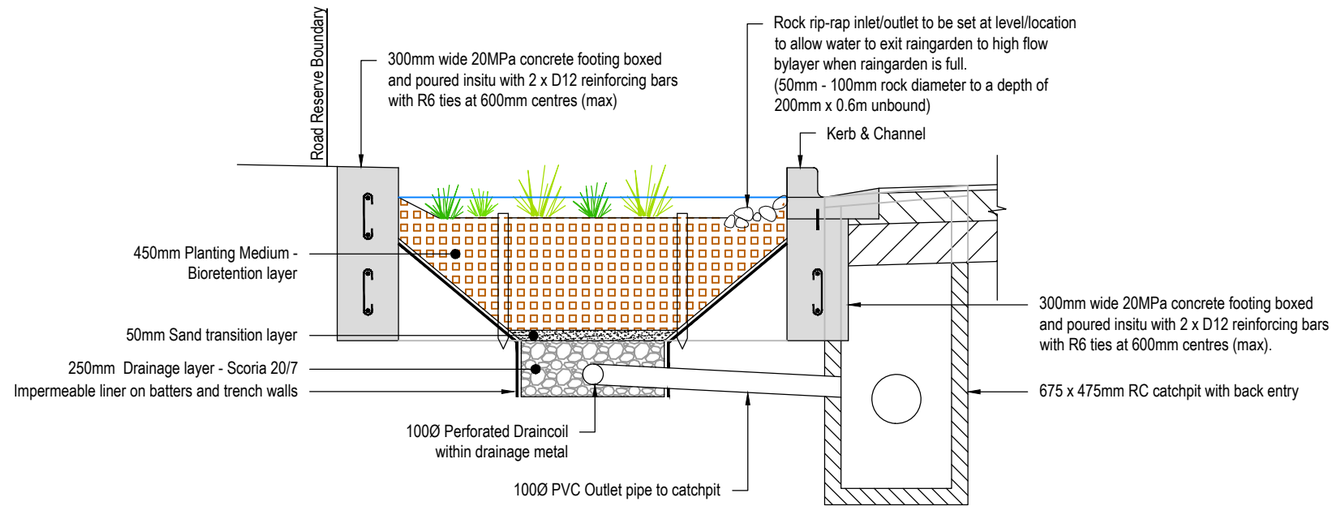
REVISION: 2

1136-DR-SU-9310-9312 SW Lot Conn Layouts ASB.dwg



TYPICAL RAINGARDEN LONG SECTION

Scale 1:30



TYPICAL RAINGARDEN CROSS SECTION

Scale 1:30

RM 210444A

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PROJECT: 55 CULLEN STREET MANGAWHAI

CAPTURE Land Development Consultants

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DRAWING STATUS: FOR COMPLETION

DRAWING TITLE: **AS-BUILT** STORMWATER RAINGARDEN DETAILS

PROJECT NO	SCALE	PLOT SIZE
1136	1:30	A3

DRAWING NO: 1136-DR-SU-9320

REVISION: 2

1136-DR-SU-9320 SW RG Details ASB.dwg

100
DP 572492

Lot 40

Lot 41

Lot 42

4
DP 310358

B
9351

200mm - 400mm Rock Rip Rap
on Geotectile cloth

Outlet 1
IL=22.12m

6.0m Wide x 200mm Deep
Emergency Spoll Way
Refer Drawing **1136-DR-SU-9351**
For Section

100mm Rock Rip Rap
set in 75mm concrete
lined channel

750Ø RCRRJ
Class 4 @ 4.4%

SWMH 1A
1500Ø
LL=25.67m
IL=22.29m

750Ø RCRRJ Class 4
@ 5.3%

SWMH 1B
1050Ø
SCRUFFY DOME
LL=25.78m
IL=23.72m

1% AEP Water Level RL: 25.73m

Pond Top of Bank RL 26.10m

B
9351

1500 RCRRJ Class 4 @ 11.0%

Pond Base RL: 24.19m

A
9351

Pond Inlet
with safety
grill
IL=24.32m

750Ø RCRRJ
Class 4 @ 16.9%

200mm - 400mm Rock Rip Rap
on Geotectile cloth

1.5m Wide
Concrete Footpath

Grassed Swale
with rip rap base

SWMH 1D
1200Ø
LL=27.22m
IL=25.25m

750Ø RCRRJ Class 4 @ 1.3%

SWMH 9A
1050Ø
LL=26.71m
IL=25.57m

300Ø RCRRJ
Class 4 @ 1.0%

SWMH 1C
1050Ø
LL=27.14m
IL=25.12m

300Ø RCRRJ Class 4 @ 6.3%

600Ø RCRRJ Class 4 @ 1.4%

DCP-1
675 x 475 CONC
LL=26.64m
IL=25.83m

NOTE:

REFER DRAWING **1136-DR-SU-9300**

FOR STORMWATER NOTES AND

1136-DR-SU-9302 FOR DRAWING LEGEND

RM 210444A

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CLIENT

Foundry Group

PROJECT

55 CULLEN STREET
MANGAWHAI

CAPTURE
Land Development Consultants

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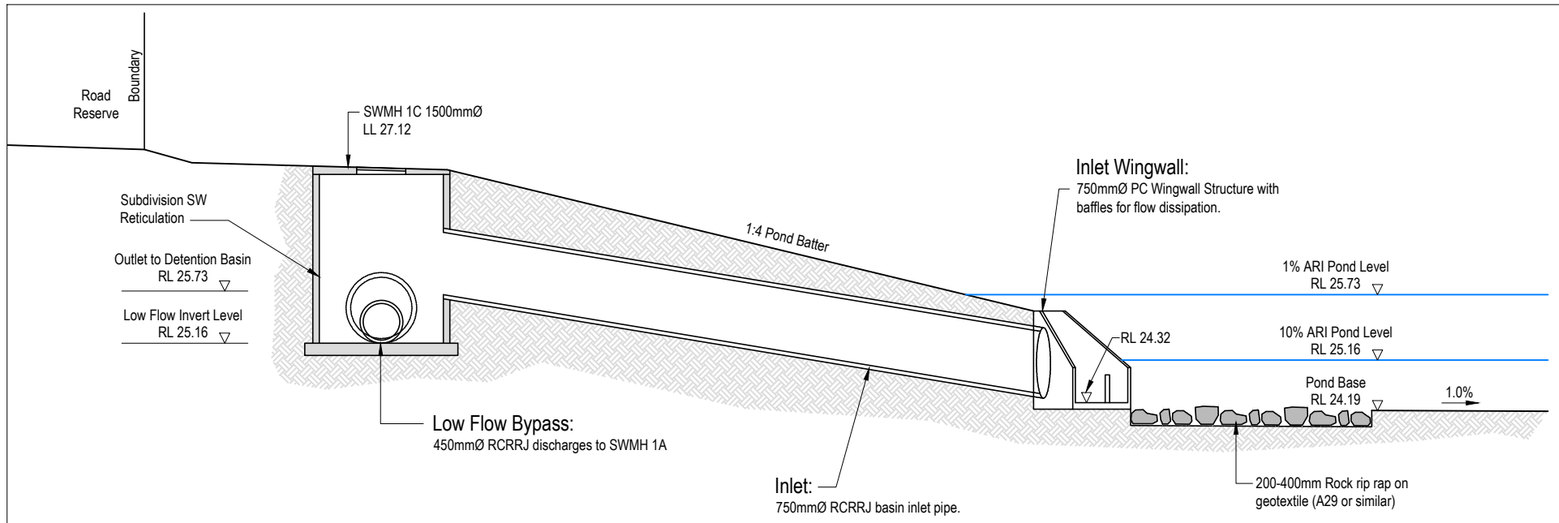
DRAWING STATUS
FOR COMPLETION

DRAWING TITLE
AS-BUILT
STORMWATER POND
ENLARGED LAYOUT

PROJECT NO	SCALE	PLOT SIZE
1136	1:200	A3

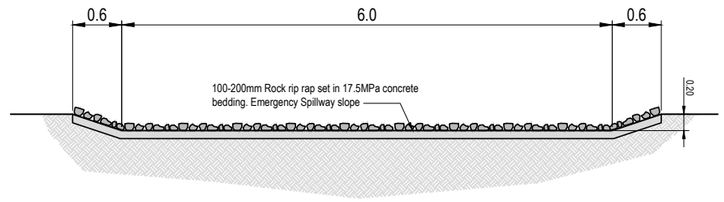
DRAWING NO: 1136-DR-SU-9350
REVISION: 2

1136-DR-SU-9350 SW Pond Layout & Details ASB.dwg



A 9350 STORMWATER POND SECTION

Scale: 1:75



TYPICAL EMERGENCY SPILL WAY CROSS SECTION

Scale: 1:75

RM 210444A

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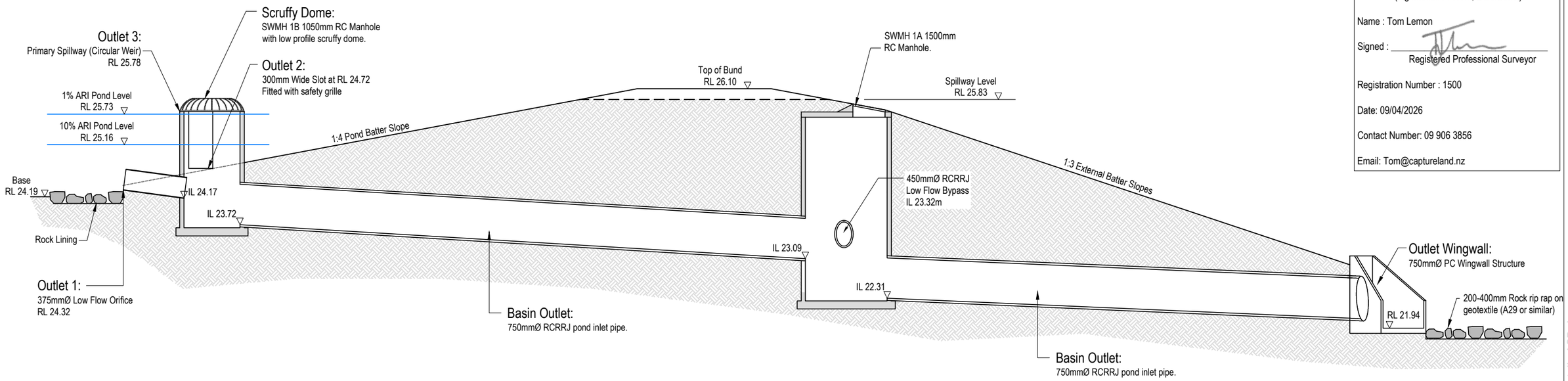

B 9350 STORMWATER POND SECTION

Scale: 1:75

CLIENT: Foundry Group

PROJECT: 55 CULLEN STREET MANGAWHAI

CAPTURE Land Development Consultants

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		FOR COMPLETION	BN

DRAWING STATUS: FOR COMPLETION

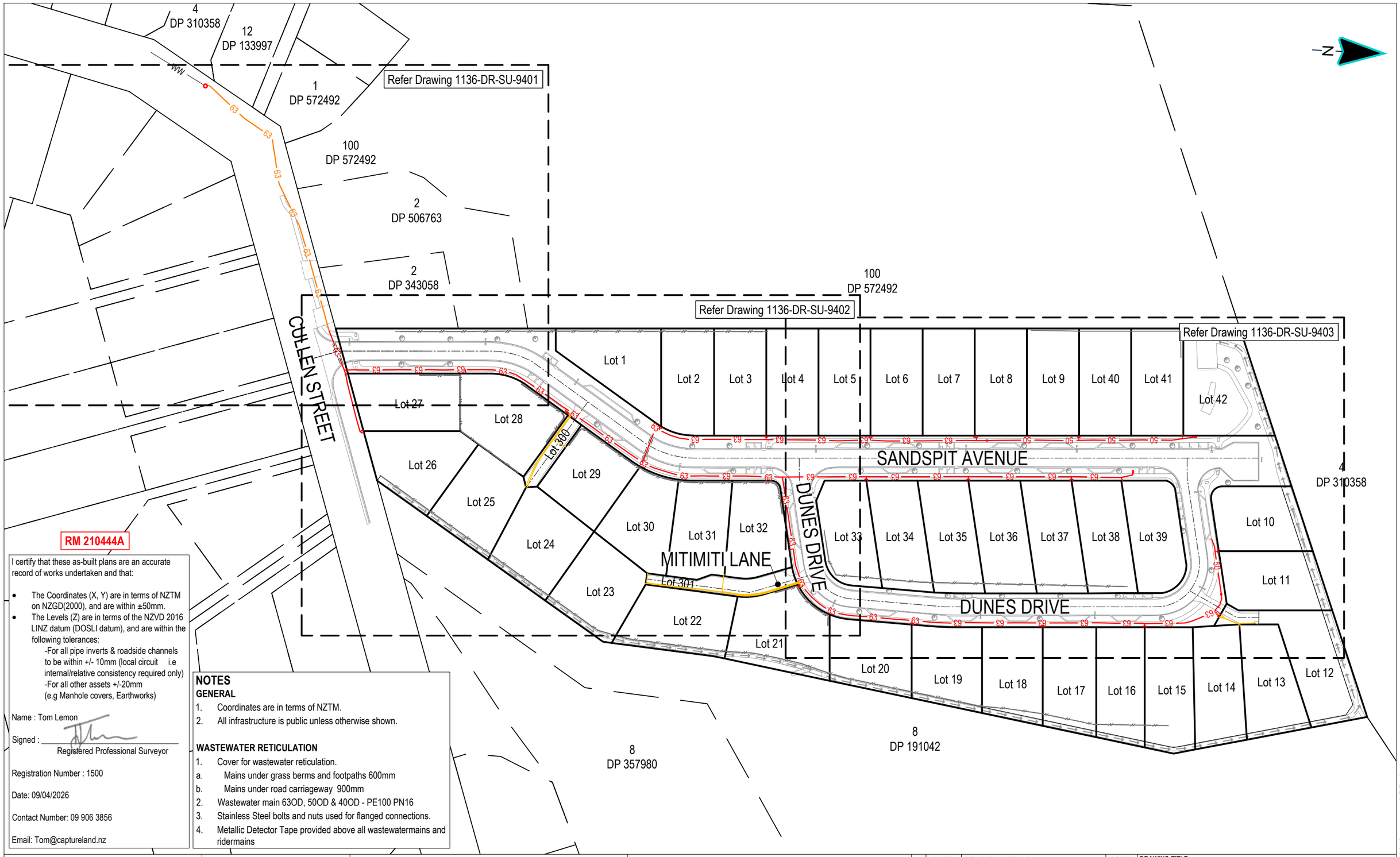
DRAWING TITLE: **AS-BUILT** STORMWATER POND CROSS SECTIONS

PROJECT NO	SCALE	PLOT SIZE
1136	1:75	A3

DRAWING NO: 1136-DR-SU-9351

REVISION: 2

1136-DR-SU-9350 SW Pond Layout & Details ASB.dwg



RM 210444A

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NOTES

GENERAL

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

WASTEWATER RETICULATION

1. Cover for wastewater reticulation.
   a. Mains under grass berms and footpaths 600mm
   b. Mains under road carriageway 900mm
2. Wastewater main 63OD, 50OD & 40OD - PE100 PN16
3. Stainless Steel bolts and nuts used for flanged connections.
4. Metallic Detector Tape provided above all wastewatermains and ridermains

CLIENT

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PROJECT

55 CULLEN STREET
MANGAWHAI

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DRAWING STATUS: FOR COMPLETION

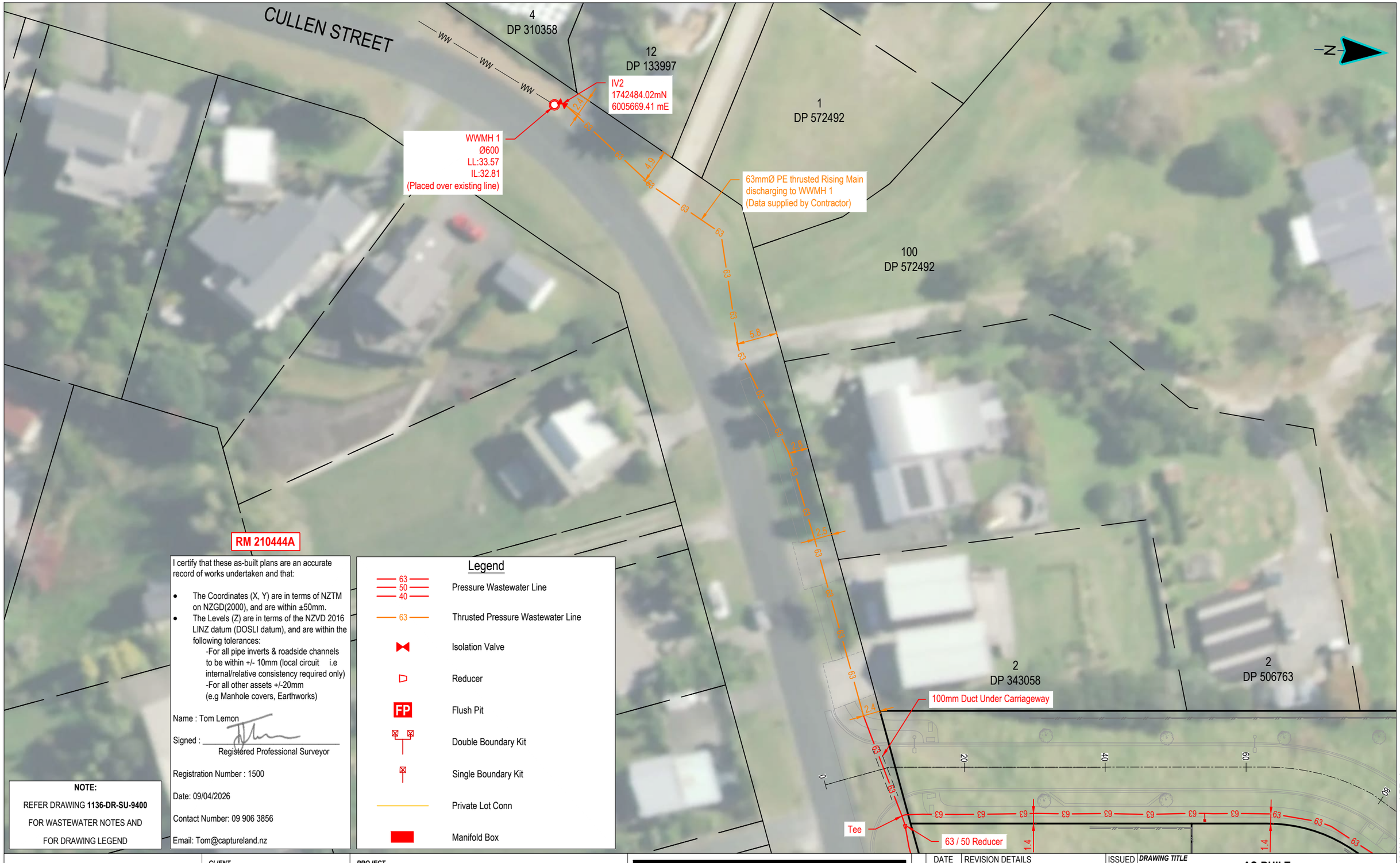
DRAWING TITLE

AS-BUILT
WASTEWATER LAYOUTS
SHEET 1

PROJECT NO	SCALE	PLOT SIZE
1136	1:1250	A3

DRAWING NO: 1136-DR-SU-9400

REVISION: 2



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Legend

- 63 / 50 / 40 — Pressure Wastewater Line
- 63 — Thrusted Pressure Wastewater Line
- Isolation Valve
- Reducer
- FP — Flush Pit
- Double Boundary Kit
- Single Boundary Kit
- Private Lot Conn
- Manifold Box

NOTE:

REFER DRAWING **1136-DR-SU-9400**

FOR WASTEWATER NOTES AND

FOR DRAWING LEGEND

CLIENT

Foundry Group

PROJECT

55 CULLEN STREET
MANGAWHAI

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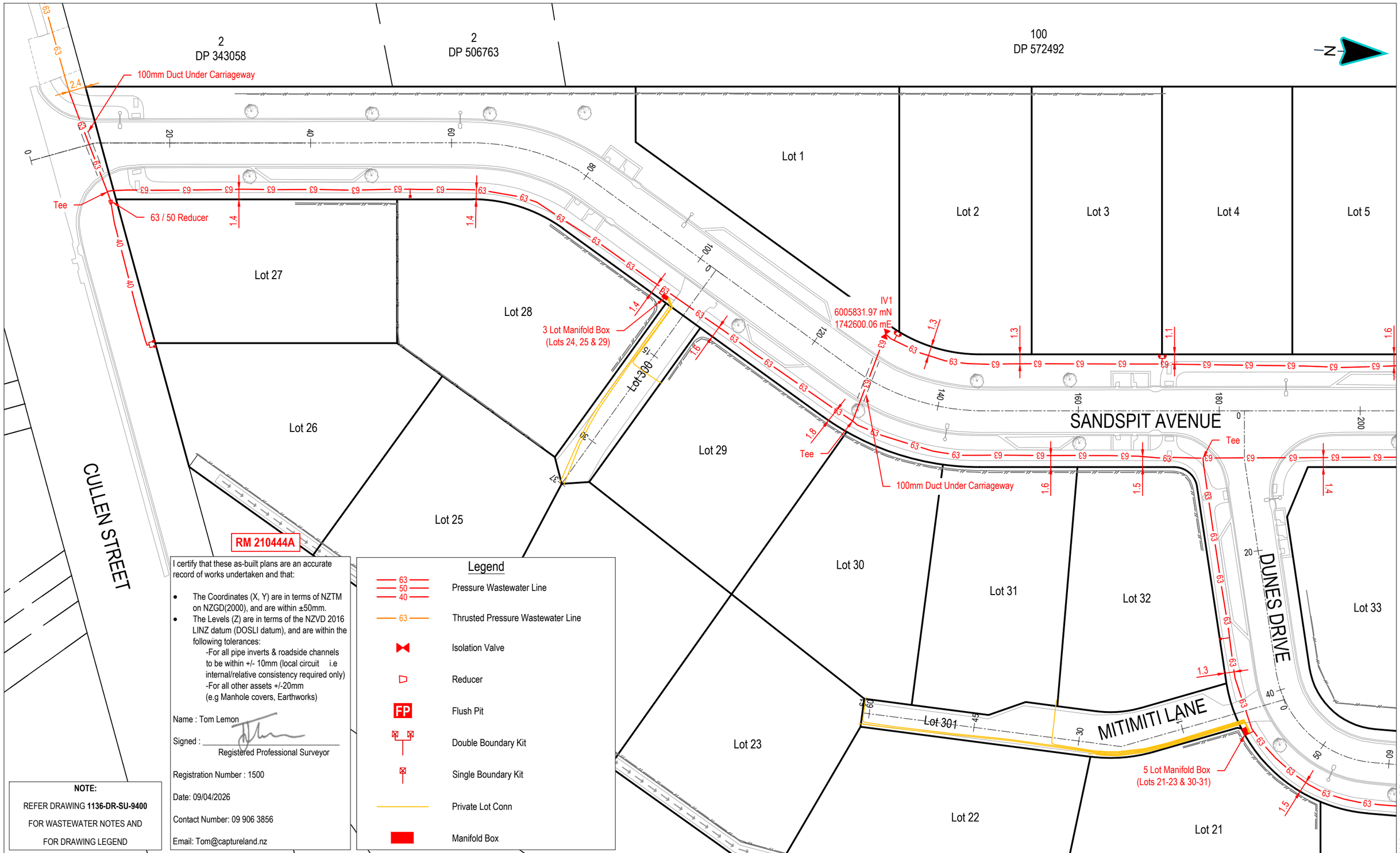
DRAWING STATUS
FOR COMPLETION

DRAWING TITLE
AS-BUILT
WASTEWATER LAYOUTS
SHEET 2

PROJECT NO	*SCALE*	*PLOT SIZE*
1136	1:500	A3

DRAWING NO 1136-DR-SU-9401

REVISION 2



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NOTE:
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FOR WASTEWATER NOTES AND
FOR DRAWING LEGEND

Legend

- 63 / 50 / 40 — Pressure Wastewater Line
- 63 — Thrusted Pressure Wastewater Line
- Isolation Valve
- Reducer
- FP — Flush Pit
- Double Boundary Kit
- Single Boundary Kit
- Private Lot Conn
- Manifold Box

CLIENT: Foundry Group

PROJECT: 55 CULLEN STREET MANGAWHAI

CAPTURE Land Development Consultants

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DRAWING STATUS: FOR COMPLETION

DRAWING TITLE: **AS-BUILT** WASTEWATER LAYOUTS SHEET 3

PROJECT NO	SCALE	PLOT SIZE
1136	1:500	A3

DRAWING NO: 1136-DR-SU-9402

REVISION: 2

Legend

- Pressure Wastewater Line (63, 50, 40)
- Thrusted Pressure Wastewater Line (63)
- Isolation Valve
- Reducer
- Flush Pit (FP)
- Double Boundary Kit
- Single Boundary Kit
- Private Lot Conn
- Manifold Box

N

Lot 6 | Lot 7 | Lot 8 | Lot 9 | Lot 40 | Lot 41 | Lot 42

63 / 50 Reducer

FP1
6006023.55 mN
1742597.14 mE

FP2
6006001.73 mN
1742610.14 mE

FP3
6006029.73 mN
1742633.24 mE

63 / 50 Reducer

Tee

SANDSPIT AVENUE

DUNES DRIVE

Lot 33 | Lot 34 | Lot 35 | Lot 36 | Lot 37 | Lot 38 | Lot 39 | Lot 10 | Lot 20 | Lot 19 | Lot 18 | Lot 17 | Lot 16 | Lot 15 | Lot 14 | Lot 13 | Lot 12

4
DP 310358

RM 210444A

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NOTE:
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FOR WASTEWATER NOTES

CLIENT: Foundry Group

PROJECT: 55 CULLEN STREET MANGAWHAI

CAPTURE Land Development Consultants

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		FOR COMPLETION	BN

DRAWING STATUS: FOR COMPLETION

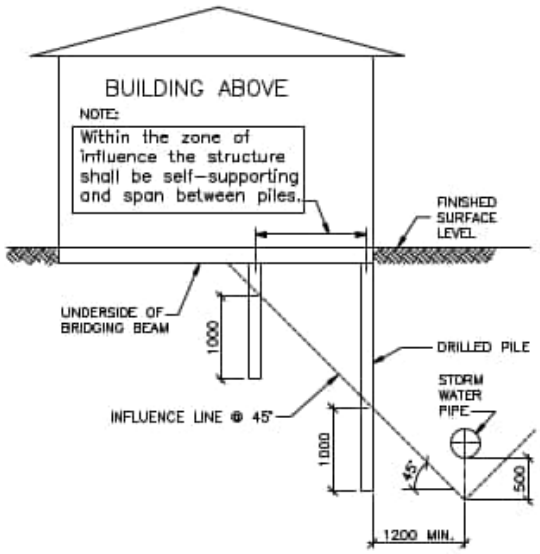
DRAWING TITLE: **AS-BUILT** WASTEWATER LAYOUTS SHEET 4

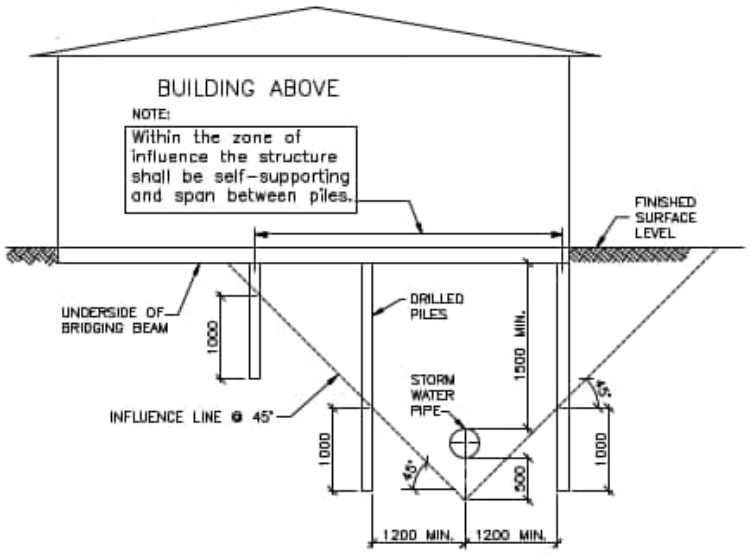
PROJECT NO	SCALE	PLOT SIZE
1136	1:500	A3

DRAWING NO: 1136-DR-SU-9403

REVISION: 2

1136-DR-SU-9400-9403 WW Layouts ASB.dwg





NOTES

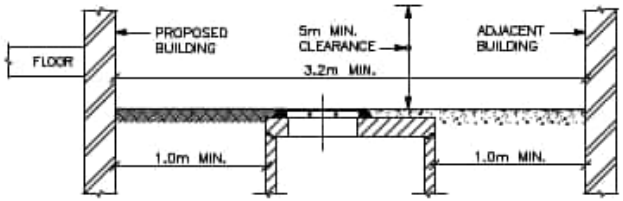
1. The information on this page is intended to show examples of typical scenarios and should be used for general guidance purposes only. Significant variations on a site by site basis are to be expected and it is in no way implied that meeting any of the above will guarantee approval.
2. Requirements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

"BUILD CLOSE" NOTES:

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

"BUILD OVER" NOTES:

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

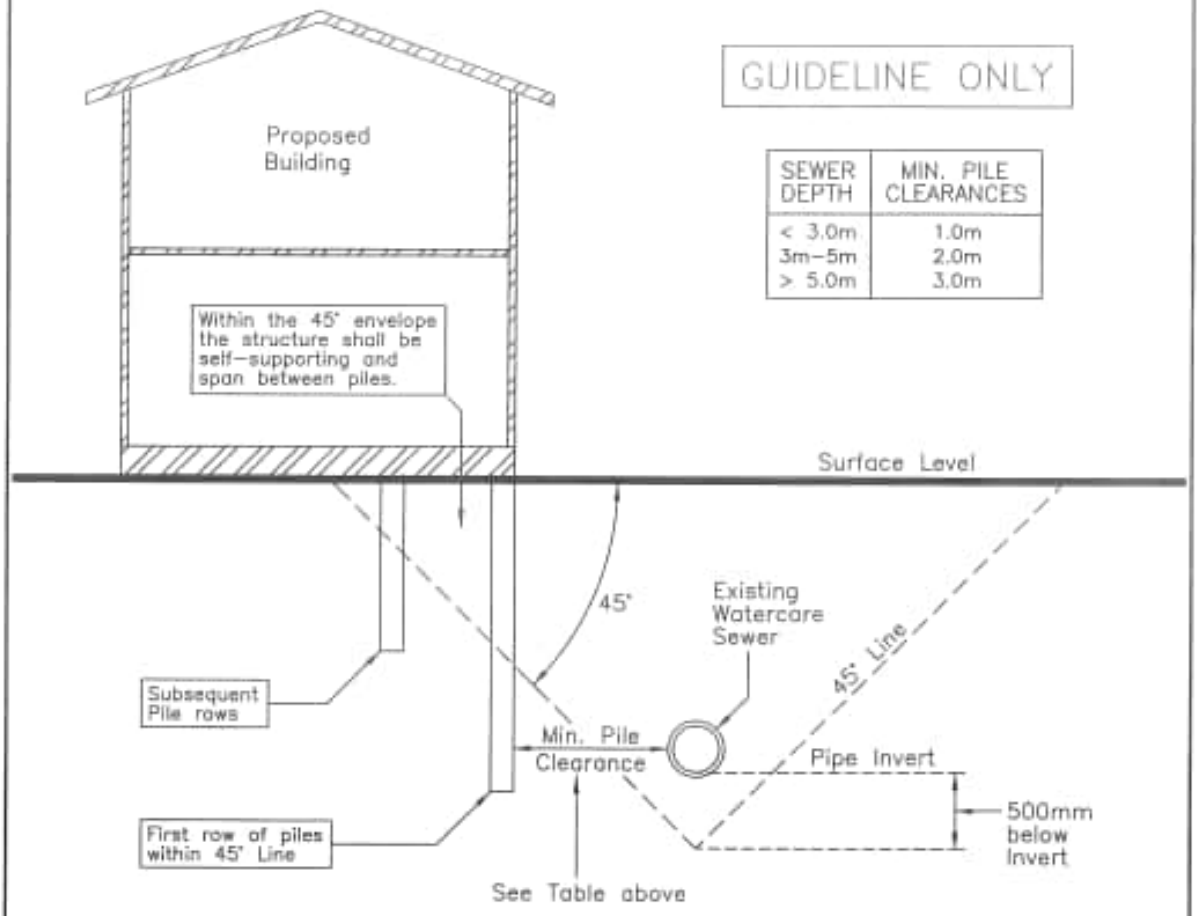


MANHOLE CONSTRUCTION CLEARANCE

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

GUIDELINE ONLY

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



SECTION THROUGH BUILDING AND TRANSMISSION SEWER

NOTES:

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

Watercare

GUIDELINE FOR BUILDING CLOSE TO OR OVER TRANSMISSION (TRUNK) SEWER

SCALE:	N.T.S.
ISSUE DATE:	14–04–2015
DWG No.	2010070.051A
REFERENCE No.	WW 60

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APPENDIX D
Field Test Data

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: 55 Cullen Street
Project No: AKL2024-0013
Location: Mangawhai
Report No: AKL2024-0013LAB Rev 1
Report Date: 12/11/2025
Client: Cabra
Client Address: 30 Foundry Road, Silverdale 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
		Test Area	RL/Details			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 (%) *	
19/12/2024	N1	Lot 41	-	CLAY FILL	2.62	4108	4108	200+	200+	200+	200+	200+	NDM02	1.92	1.46	31.6	-2	300	25.1	1.54	3	
	N2	Lot 40	-	CLAY FILL	2.62	4108	4108	200+	171	200+	200+	193+	NDM02	1.90	1.40	36.0	-4	300	28.1	1.49	1	
	N3	Lot 40	-	CLAY FILL	2.62	4108	4108	UTP	UTP	191	171	181+	NDM02	2.00	1.65	21.2	2	300	21.9	1.64	1	
28/01/2025	N4	Lot 28	200mm Pad	CLAY FILL	2.62	1702	1702	198+	155	155	127	159+	NDM02	1.92	1.51	27.2	2	300	35.3	1.42	-4	
	N5	Korimako Drive	500mm Pad	CLAY FILL	2.62	1702	1702	198+	198+	141	136	168+	NDM02	1.94	1.50	29.5	-2	300	23.4	1.57	3	
	N6	Lot 1	200mm Pad	CLAY FILL	2.62	1702	1702	198+	130	144	141	153+	NDM02	1.87	1.41	32.8	0	300	28.4	1.46	3	
3/02/2025	N7	Lot 28	500mm Undercut	CLAY FILL	2.62	1702	1702	127	99	71	107	101	-	-	-	-	-	-	-	-	-	No Sample Taken
	N8	Lot 1	1000mm Undercut	CLAY FILL	2.62	1702	1702	198+	198+	144	141	170+	NDM02	1.88	1.37	37.2	-3	300	29.2	1.46	2	
	N9	Lot 28	400mm Undercut	CLAY FILL	2.62	1702	1702	198+	UTP	UTP	141	170+	NDM02	1.93	1.46	32.7	-3	300	28.0	1.51	0	
	N10	Lot 3	500mm Undercut	CLAY FILL	2.62	1702	1702	198+	155	198+	UTP	184+	NDM02	1.92	1.45	32.8	-3	300	22.8	1.56	5	
	N11	Lot 5	-	CLAY FILL	2.62	1702	1702	UTP	UTP	UTP	UTP	UTP	NDM02	1.91	1.47	30.2	0	300	28.5	1.49	1	
10/02/2025	N12	Lot 1	-	CLAY FILL	2.62	1702	1702	UTP	UTP	UTP	UTP	UTP	NDM02	1.88	1.45	30.1	1	300	23.7	1.52	6	
	N13	Lot 28	-	CLAY FILL	2.62	1702	1702	UTP	UTP	UTP	UTP	UTP	NDM02	1.81	1.35	33.8	3	300	31.7	1.38	4	
	N14	Lot 28	-	CLAY FILL	2.62	1702	1702	UTP	UTP	UTP	UTP	UTP	NDM02	1.87	1.48	26.1	5	300	19.5	1.56	10	Retest of N7
	N15	Lot 28	-	CLAY FILL	2.62	1702	1702	155	144	141	116	139	NDM02	1.77	1.23	44.7	-2	300	33.4	1.33	5	
	N16	Korimako Drive	-	CLAY FILL	2.62	1702	1702	UTP	UTP	UTP	UTP	UTP	NDM02	1.83	1.39	32.0	3	300	26.3	1.45	6	
19/02/2025	N17	Lot 12	+1000mm	CLAY FILL	2.62	1702	1702	144	155	170	139	152	NDM02	1.86	1.41	31.9	1	300	24.2	1.50	7	
	N18	Lot 11	+1000mm	CLAY FILL	2.62	1702	1702	198+	198+	198+	155	187+	NDM02	1.83	1.38	32.6	2	300	30.4	1.40	4	
	N19	Lot 10	+1000mm	CLAY FILL	2.62	1702	1702	127	153	UTP	UTP	140+	NDM02	1.84	1.34	37.4	-1	300	23.1	1.50	8	
24/02/2025	N20	Lot 38	+500mm	CLAY FILL	2.62	1702	1702	99	99	127	127	113	-	-	-	-	-	-	-	-	-	No Sample Taken
	N21	Lot 37	+500mm	CLAY FILL	2.62	1702	1702	85	99	110	130	106	-	-	-	-	-	-	-	-	-	No Sample Taken
	N22	Lot 2	1000mm Undercut	CLAY FILL	2.62	1702	1702	141	141	198+	170	163+	NDM02	1.81	1.27	42.6	-2	300	36.4	1.33	1	
3/03/1935	N23	Lot 41	-	CLAY FILL	2.62	1603	1603	UTP	UTP	218+	218+	218+	NDM12	1.88	1.49	26.0	4	300	24.3	1.51	6	
	N24	Lot 40	-	CLAY FILL	2.62	1603	1603	218+	218+	171	218+	206+	NDM12	1.83	1.31	39.6	-2	300	19.2	1.54	12	
7/03/2025	N25	Lot 41	-	CLAY FILL	2.62	3661	3661	UTP	233+	233+	233+	233+	NDM12	2.00	1.64	21.8	1	300	17.8	1.70	5	
	N26	Lot 40	-	CLAY FILL	2.62	3661	3661	213	200	233+	UTP	215+	NDM12	1.95	1.54	26.9	0	300	18.5	1.65	7	
	N27	Lot 9	-	CLAY FILL	2.62	3661	3661	233+	200	UTP	UTP	217+	NDM12	1.89	1.47	28.2	2	200	22.9	1.53	6	

** 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.

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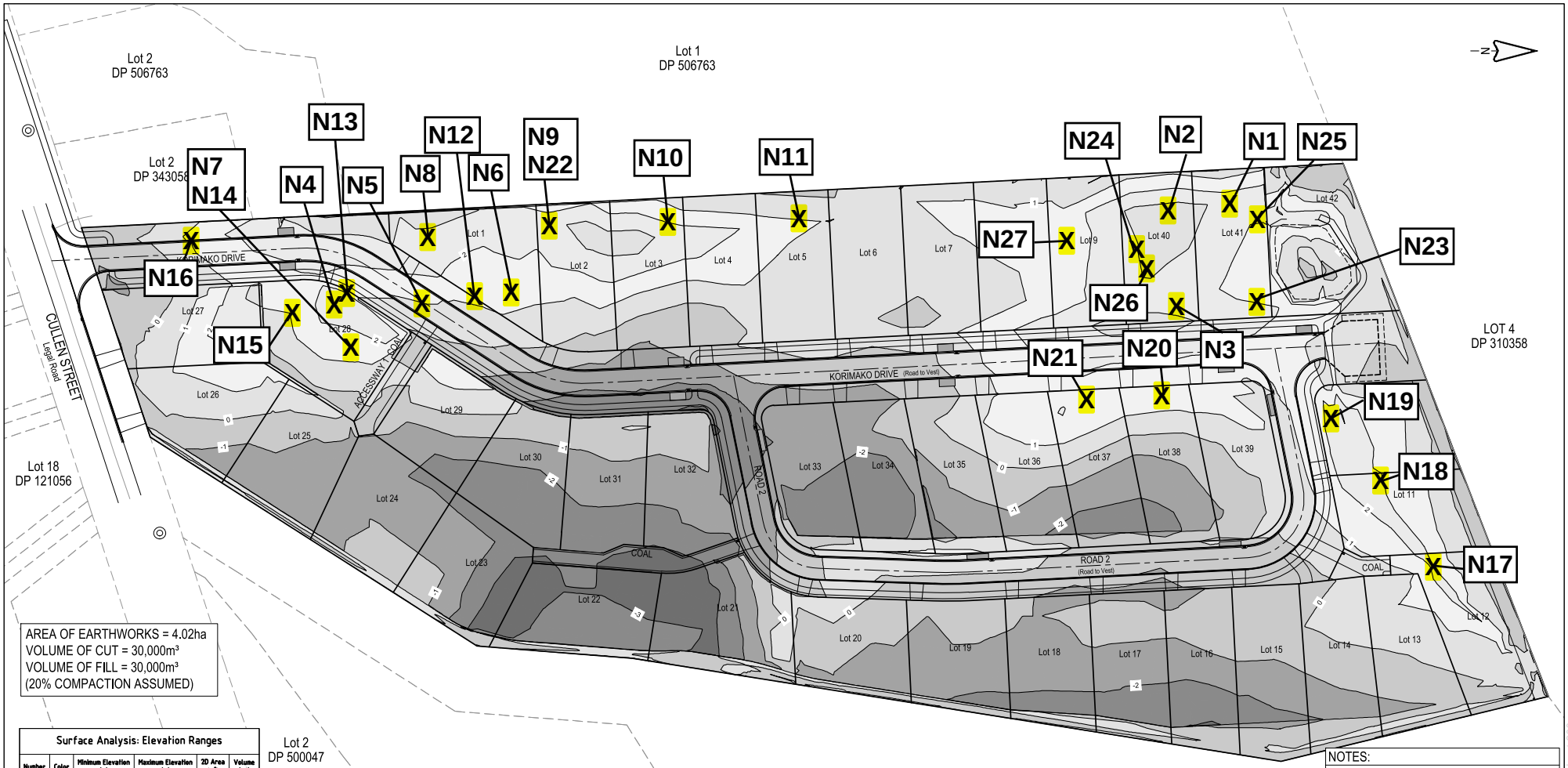
Checked By: JP Date: 12/11/2025
Authorised Signatory (KTP): CL Date: 13/11/2025



AREA OF EARTHWORKS = 4.02ha
VOLUME OF CUT = 30,000m³
VOLUME OF FILL = 30,000m³
(20% COMPACTION ASSUMED)

Surface Analysis: Elevation Ranges

Number	Color	Minimum Elevation (m)	Maximum Elevation (m)	2D Area (m²)	Volume (m³)
1		-5.000	-4.000	173.5	37.8
2		-4.000	-3.000	2218.5	1060.3
3		-3.000	-2.000	3464.6	4079.7
4		-2.000	-1.000	5778.2	8524.6
5		-1.000	0.000	9562.1	16066.5
6		0.000	1.000	7680.9	14852.7
7		1.000	2.000	6156.4	8318.6
8		2.000	3.000	3355.0	3330.4
9		3.000	4.000	1806.7	712.4
10		4.000	5.000	105.4	16.7
11		5.000	6.000	0.2	0.0

NOTES:

1. All works to comply with Kaipara District Council Engineering Standards.
2. All existing services to be located and protected prior to commencing earthworks.
3. All levels to be confirmed on site prior to construction.
4. All Erosion & Sediment Control to be installed and maintained in accordance with Auckland Council's "Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region" dated June 2016.
5. All Erosion & Sediment control to be installed and operational prior to commencing earthworks.

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CLIENT: CABRA LAND & PROPERTY DEVELOPMENT — CABRA DEVELOPMENTS LIMITED

PROJECT: 55 CULLEN STREET MANGAWHAI

CAPTURE Land Development Consultants

REV	DATE	REVISION DETAILS	ISSUED
B	18/04/24	ISSUE FOR APPROVAL	DL
A	16/04/24	GENERAL REVISIONS	DL

DRAWING TITLE: CUT & FILL PLAN

STATUS	SCALE	SIZE
RC VARIATION	1:1000	A3

PROJECT NO	DRAWING NO	REVISION
1136	RC-EW201	B

c:_cam\jobs\1136 cabra 55 cullen street\rc variation\1136 rc sheet 200

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:	55 Cullen Street
Project No:	AKL2024-0013
Location:	Mangawhai
Report No:	AKL2024-0013LAC Rev 1
Report Date:	15/08/2025
Client:	Cabra Developments Ltd
Client Address:	30 Foundry Road, Silverdale 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.

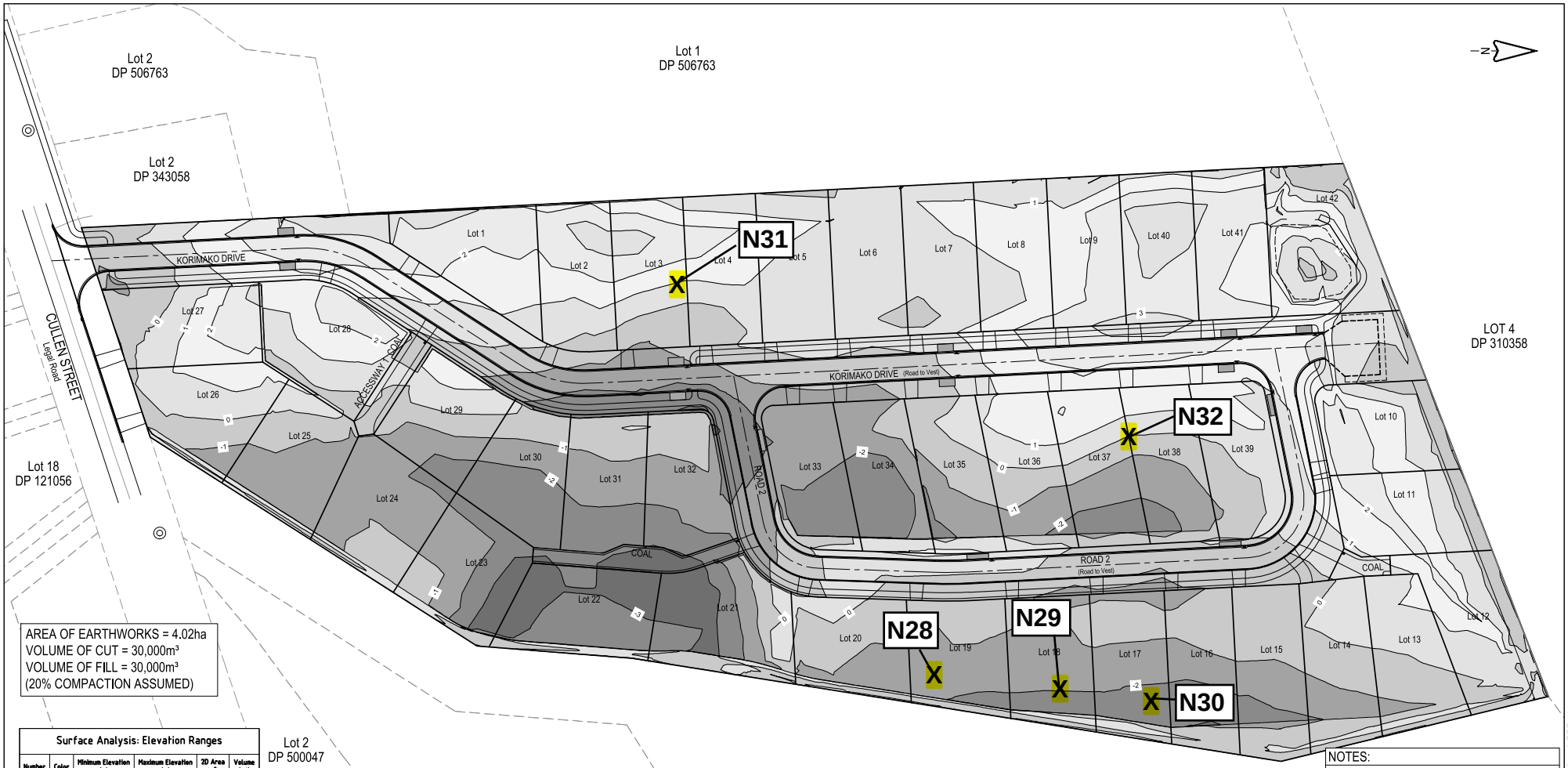
All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

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.	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 (%) *	
24/03/2025	N28	Lot 19	Blended CLAY	2.62	2327	2327	211	211	UTP	UTP	211	NDM07	1.88	1.49	25.5	5	300	18.8	1.58	10	
	N29	Lot 18	Blended CLAY	2.62	2327	2327	181	211	157	175	181	NDM07	1.83	1.38	32.6	3	300	28.5	1.42	5	
	N30	Lot 17	Blended CLAY	2.62	2327	2327	211	211	211	211	211	NDM07	1.79	1.41	27.0	8	300	19.4	1.50	14	
26/03/2025	N31	Lot 3	CLAY FILL	2.62	1702	1702	UTP	UTP	UTP	UTP	UTP	NDM02	1.90	1.46	30.4	0	300	22.5	1.55	6	
	N32	Lot 37	CLAY FILL	2.62	1702	1702	192+	192+	192+	192+	192+	NDM02	1.89	1.40	35.4	-3	300	32.9	1.42	-1	

** 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:	31/03/2025
Checked By:	JP	Date:	12/11/2025
Authorised Signatory (KTP):	CL	Date:	13/11/2025



AREA OF EARTHWORKS = 4.02ha
VOLUME OF CUT = 30,000m³
VOLUME OF FILL = 30,000m³
(20% COMPACTION ASSUMED)

Surface Analysis: Elevation Ranges

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2		-4.000	-3.000	2218.5	1060.3
3		-3.000	-2.000	3464.6	4079.7
4		-2.000	-1.000	5778.2	8524.6
5		-1.000	0.000	9562.1	16066.5
6		0.000	1.000	7680.9	14852.7
7		1.000	2.000	6156.4	8318.6
8		2.000	3.000	3355.0	3330.4
9		3.000	4.000	1806.7	712.4
10		4.000	5.000	105.4	16.7
11		5.000	6.000	0.2	0.0

NOTES:

1. All works to comply with Kaipara District Council Engineering Standards.
2. All existing services to be located and protected prior to commencing earthworks.
3. All levels to be confirmed on site prior to construction.
4. All Erosion & Sediment Control to be installed and maintained in accordance with Auckland Council's "Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region" dated June 2016.
5. All Erosion & Sediment control to be installed and operational prior to commencing earthworks.

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Great People | Practical Solutions

CLIENT: CABRA LAND & PROPERTY DEVELOPMENT
CABRA DEVELOPMENTS LIMITED

PROJECT: 55 CULLEN STREET MANGAWHAI

CAPTURE Land Development Consultants

REV	DATE	REVISION DETAILS	ISSUED
B	18/04/24	ISSUE FOR APPROVAL	DL
A	16/04/24	GENERAL REVISIONS	DL

DRAWING TITLE: CUT & FILL PLAN

STATUS	SCALE	SIZE
RC VARIATION	1:1000	A3

PROJECT NO	DRAWING NO	REVISION
1136	RC-EW201	B

c:_cam jobs\1136 cabra 55 cullen street\rc variation\1136 rc sheet 200

LF11 Soil Field Density NDM Direct Transmission with VSS Report (Cohesive Soils) (Rev 20)

Auckland Laboratory
CMW Geotechnical NZ Limited
Unit 46, 4 Orbit Drive, Rosedale, NZ 0632
Phone: +64 (09) 4144 632

Project:	55 Cullen Street
Project No:	AKL2024-0013
Location:	Mangawhai
Report No:	AKL2024-0013LAF Rev 0
Report Date:	12/11/2025
Client:	Cabra Developments Ltd
Client Address:	30 Foundry Road, Silverdale 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
		Test Area	RL/Details			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 (%) *	
17/09/2025	N33	Lot 41	-	CLAY FILL	2.62	3449	3449	226+	UTP	UTP	UTP	226+	NDM12	1.74	1.32	31.7	8	300	31.8	1.32	8	
	N34	Lot 40	-	CLAY FILL	2.62	3449	3449	UTP	UTP	UTP	UTP	UTP	NDM12	1.83	1.29	42.1	-3	300	32.2	1.38	3	
18/09/2025	N35	Lot 41	+1000mm	CLAY FILL	2.62	3449	3449	UTP	UTP	UTP	UTP	UTP	NDM12	1.78	1.30	36.9	2	300	31.2	1.36	6	
	N36	Lot 41	+500mm	CLAY FILL	2.62	3449	3449	UTP	UTP	UTP	UTP	UTP	NDM12	1.76	1.28	37.9	3	300	29.7	1.36	8	
	N37	Lot 23	-	CLAY FILL	2.62	3449	3449	UTP	UTP	UTP	UTP	UTP	NDM12	1.67	1.21	38.0	8	250	31.3	1.27	12	
22/09/2025	N38	Lot 41	+1000mm	CLAY FILL	2.62	3449	3449	UTP	226+	213	193	211+	NDM12	1.81	1.36	33.0	3	300	22.2	1.48	11	
	N39	Lot 40	+1000mm	CLAY FILL	2.62	3449	3449	226+	UTP	UTP	UTP	226+	NDM12	1.64	1.15	42.1	8	300	28.8	1.27	15	
	N40	Lot 33	+1000mm	CLAY FILL	2.62	3449	3449	142	148	145	UTP	145+	NDM12	1.69	1.24	36.7	7	300	32.8	1.27	10	
	N41	Lot 36	+1000mm	CLAY FILL	2.62	3449	3449	226+	226+	226+	117	199+	NDM12	1.80	1.31	36.9	1	300	28.1	1.40	7	
	N42	Lot 40	+1000mm	CLAY FILL	2.62	3449	3449	226+	UTP	UTP	UTP	226+	NDM12	1.64	1.15	42.1	7	300	30.0	1.26	14	Retest of N39
1/10/2025	N43	Lot 40	+1000mm	CLAY FILL w/ Lime	2.62	3661	3661	150	163	130	166	152	NDM12	1.82	1.32	37.2	0	300	29.8	1.40	5	
	N44	Lot 40	+500mm	CLAY FILL w/ Lime	2.62	3661	3661	UTP	UTP	233+	233+	233+	NDM12	1.72	1.24	39.2	4	300	28.6	1.34	11	
	N45	Lot 7	+500mm	CLAY FILL w/ Lime	2.62	3661	3661	190	150	133	163	159	NDM12	1.84	1.37	34.3	1	300	31.5	1.40	3	
	N46	Lot 4	+1000mm	CLAY FILL w/ Lime	2.62	3661	3661	183	183	166	140	168	NDM12	1.84	1.37	34.9	0	300	30.0	1.42	3	
	N47	Lot 5	+1000mm	CLAY FILL w/ Lime	2.62	3661	3661	200	150	183	166	175	NDM12	1.79	1.32	36.1	2	300	30.0	1.38	6	
	N48	Lot 5	+500mm	CLAY FILL w/ Lime	2.62	3661	3661	150	150	171	183	164	NDM12	1.67	1.21	38.4	7	300	33.1	1.26	10	
	N49	Lot 3	+500mm	CLAY FILL w/ Lime	2.62	3661	3661	166	183	183	223	189	NDM12	1.78	1.25	42.9	-1	300	40.4	1.27	0	
	N50	Lot 3	+1000mm	CLAY FILL w/ Lime	2.62	3661	3661	200	196	200	190	197	NDM12	1.88	1.38	36.3	-3	300	-	-	-	No Sample Taken
	N51	Lot 3	+1000mm	CLAY FILL w/ Lime	2.62	3661	3661	200	196	200	190	197	NDM12	1.86	1.37	35.6	-1	250	31.8	1.41	1	Retest of N50
16/10/2025	N52	Lot 40	-500mm	CLAY FILL w/ Lime	2.62	3661	3661	216	216	233+	233+	225+	NDM02	1.70	1.30	30.6	10	300	30.6	1.30	10	
	N53	Lot 40	-	CLAY FILL w/ Lime	2.62	3661	3661	UTP	UTP	UTP	UTP	UTP	NDM02	1.81	1.35	34.1	3	300	28.1	1.41	7	
	N54	Lot 41	-	CLAY FILL w/ Lime	2.62	3661	3661	UTP	UTP	UTP	UTP	UTP	NDM02	1.91	1.46	30.3	0	300	25.0	1.52	4	
	N55	Lot 40	-500mm	CLAY FILL w/ Lime	2.62	3661	3661	UTP	UTP	UTP	UTP	UTP	NDM02	1.84	1.36	35.2	0	300	30.4	1.41	3	Retest of N42
	N56	Lot 41	-	CLAY FILL w/ Lime	2.62	3661	3661	UTP	UTP	UTP	233+	233+	NDM02	1.89	1.44	31.5	0	300	22.9	1.54	6	
	N57	Lot 42	-2000mm	CLAY FILL w/ Lime	2.62	3661	3661	200	216	136	183	184	NDM02	1.82	1.40	30.2	4	300	32.5	1.37	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.

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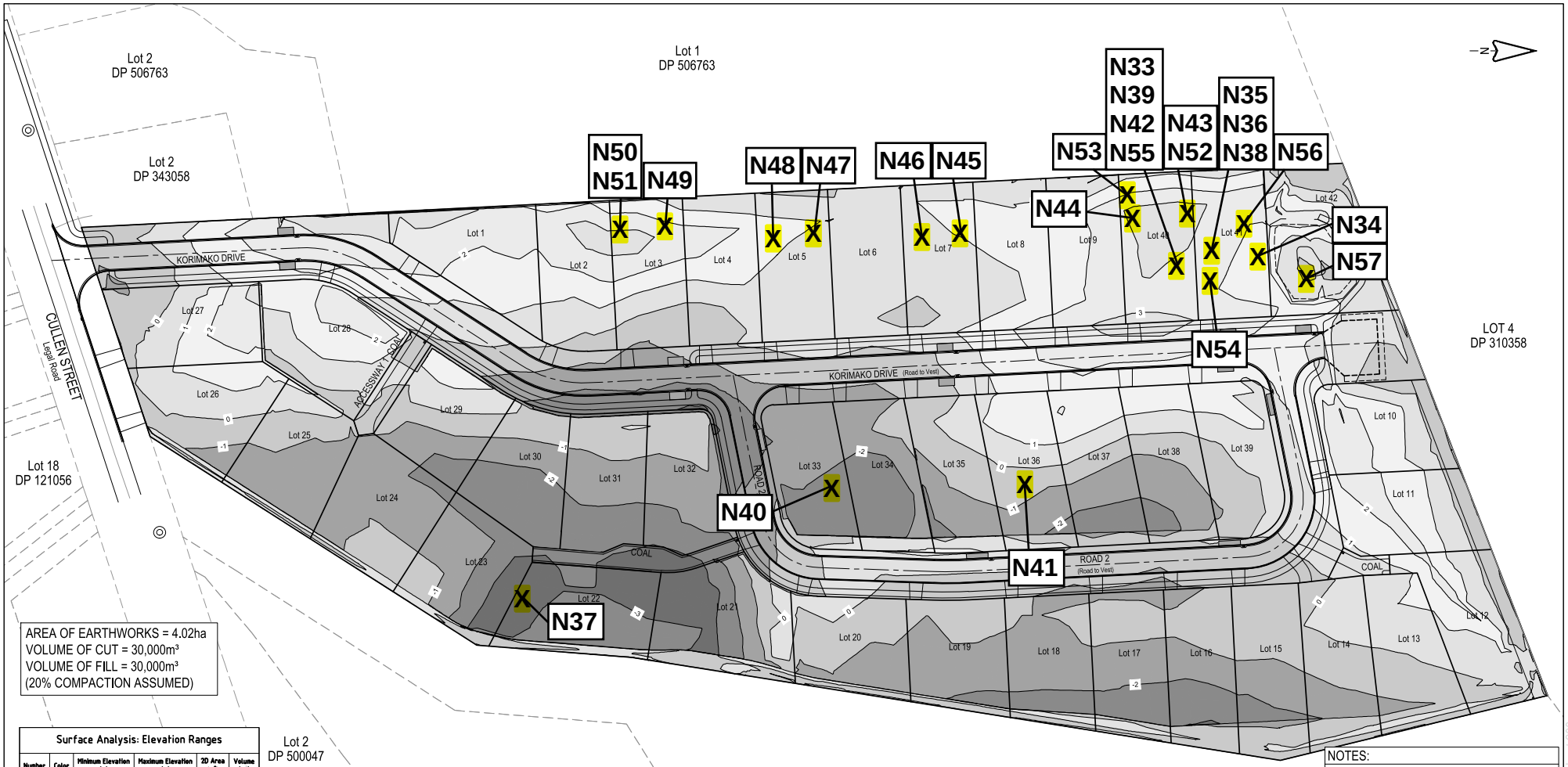
Checked By:	JP	Date:	12/11/2025
Authorised Signatory (KTP):	CL	Date:	13/11/2025



Surface Analysis: Elevation Ranges

Number	Color	Minimum Elevation (m)	Maximum Elevation (m)	2D Area (m²)	Volume (m³)
1		-5.000	-4.000	173.5	37.8
2		-4.000	-3.000	2218.5	1060.3
3		-3.000	-2.000	3464.6	4079.7
4		-2.000	-1.000	5778.2	8524.6
5		-1.000	0.000	9562.1	16066.5
6		0.000	1.000	7680.9	14852.7
7		1.000	2.000	6156.4	8318.6
8		2.000	3.000	3355.0	3330.4
9		3.000	4.000	1806.7	712.4
10		4.000	5.000	195.4	16.7
11		5.000	6.000	0.2	0.0

NOTES:

1. All works to comply with Kaipara District Council Engineering Standards.
2. All existing services to be located and protected prior to commencing earthworks.
3. All levels to be confirmed on site prior to construction.
4. All Erosion & Sediment Control to be installed and maintained in accordance with Auckland Council's "Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region" dated June 2016.
5. All Erosion & Sediment control to be installed and operational prior to commencing earthworks.

CMW Geosciences
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CLIENT: CABRA LAND & PROPERTY DEVELOPMENT — CABRA DEVELOPMENTS LIMITED

PROJECT: 55 CULLEN STREET MANGAWHAI

CAPTURE Land Development Consultants

REV	DATE	REVISION DETAILS	ISSUED
B	18/04/24	ISSUE FOR APPROVAL	DL
A	16/04/24	GENERAL REVISIONS	DL

DRAWING TITLE: CUT & FILL PLAN

STATUS	SCALE	SIZE
RC VARIATION	1:1000	A3

PROJECT NO	DRAWING NO	REVISION
1136	RC-EW201	B

c:_cam jobs\1136 cabra 55 cullen street\rc variation\1136 rc sheet 200

LF11 Soil Field Density NDM Direct Transmission with VSS Report (Cohesive Soils) (Rev 20)

Auckland Laboratory
CMW Geotechnical NZ Limited
Unit 46, 4 Orbit Drive, Rosedale, NZ 0632
Phone: +64 (09) 4144 632

Project:	55 Cullen Street
Project No:	AKL2024-0013
Location:	Mangawhai
Report No:	AKL2024-0013LAI Rev 0
Report Date:	12/11/2025
Client:	Cabra Developments Ltd
Client Address:	30 Foundry Road, Silverdale 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.

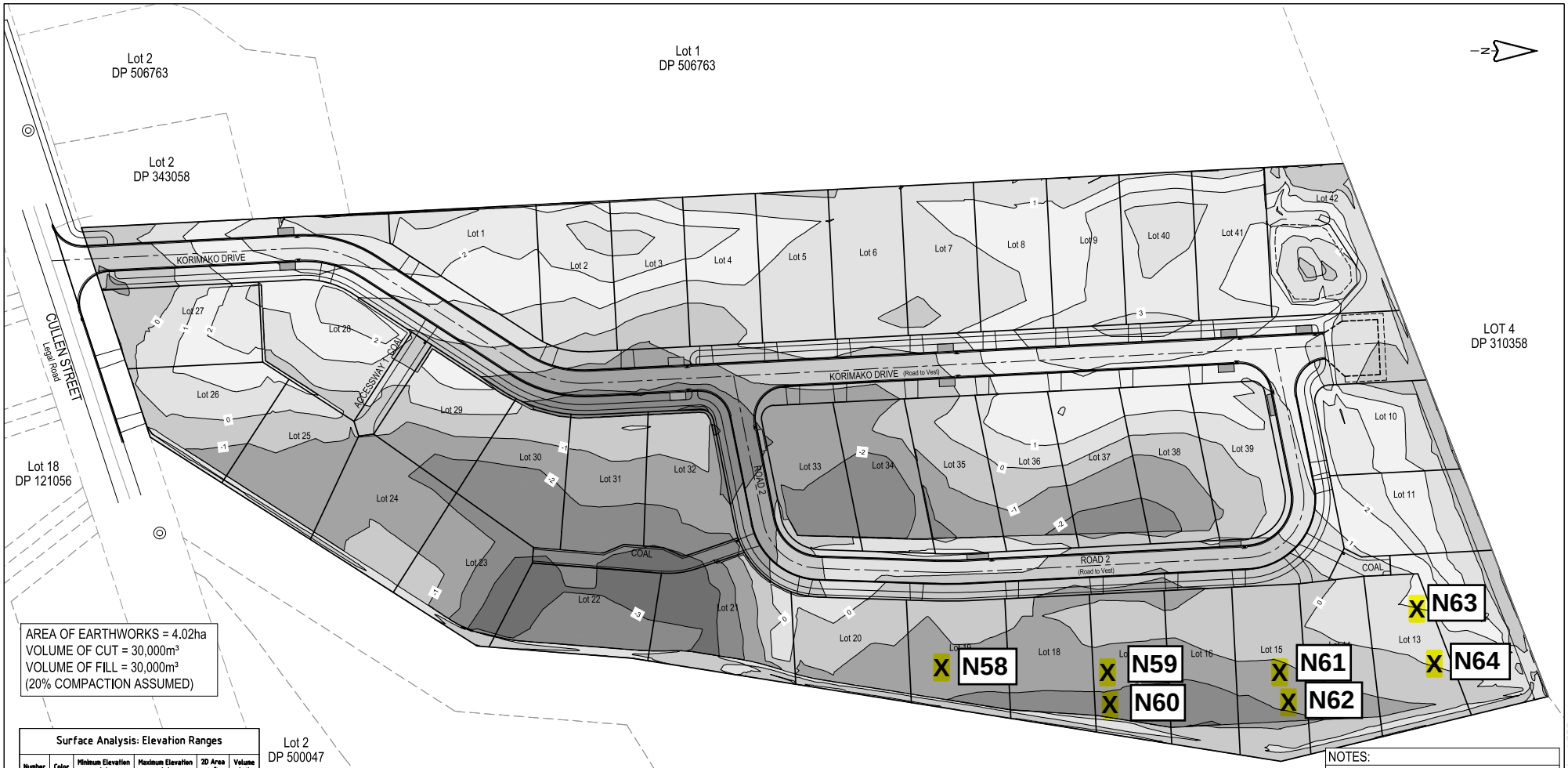
All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

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
		Test Area	RL/Details			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 (%) *	
6/11/2025	N58	Lot 19	+500mm	CLAY / SILT	2.62	3661	3661	UTP	UTP	196	233+	215+	NDM02	1.79	1.40	27.7	8	300	-	-	-	No Sample Taken
	N59	Lot 17	+500mm	CLAY / SILT	2.62	3661	3661	203	UTP	UTP	UTP	203+	NDM02	1.93	1.49	29.7	-1	300	25.2	1.54	3	
	N60	Lot 17	-	CLAY / SILT	2.62	3661	3661	200	200	200	UTP	200+	NDM02	1.94	1.49	29.8	-2	300	24.9	1.55	2	Retest of N30
	N61	Lot 15	+1000mm	CLAY / SILT	2.62	3661	3661	140	UTP	190	UTP	165+	NDM02	1.91	1.50	27.0	2	300	25.3	1.52	4	
	N62	Lot 15	+500mm	CLAY / SILT	2.62	3661	3661	116	233+	216	226	198+	NDM02	1.91	1.49	28.4	1	300	25.7	1.52	3	
	N63	Lot 13	-	CLAY / SILT	2.62	3661	3661	UTP	UTP	UTP	UTP	UTP	NDM02	2.00	1.58	26.0	-2	300	26.0	1.59	-2	
	N64	Lot 13	-	CLAY / SILT	2.62	3661	3661	UTP	UTP	UTP	UTP	UTP	NDM02	1.84	1.42	29.2	4	300	26.5	1.45	6	

** 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: 11/11/2025
Checked By: JP Date: 12/11/2025
Authorised Signatory (KTP): CL Date: 13/11/2025



Surface Analysis: Elevation Ranges

Number	Color	Minimum Elevation (m)	Maximum Elevation (m)	2D Area (m²)	Volume (m)
1		-5.000	-4.000	173.5	37.8
2		-4.000	-3.000	2218.5	1060.3
3		-3.000	-2.000	3464.6	4079.7
4		-2.000	-1.000	5778.2	8524.6
5		-1.000	0.000	9562.1	16066.5
6		0.000	1.000	7680.9	14852.7
7		1.000	2.000	6156.4	8318.6
8		2.000	3.000	3355.0	3330.4
9		3.000	4.000	1806.7	712.4
10		4.000	5.000	105.4	16.7
11		5.000	6.000	0.2	0.0

NOTES:

1. All works to comply with Kaipara District Council Engineering Standards.
2. All existing services to be located and protected prior to commencing earthworks.
3. All levels to be confirmed on site prior to construction.
4. All Erosion & Sediment Control to be installed and maintained in accordance with Auckland Council's "Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region" dated June 2016.
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CLIENT: CABRA LAND & PROPERTY DEVELOPMENT — CABRA DEVELOPMENTS LIMITED

PROJECT: 55 CULLEN STREET MANGAWHAI

CAPTURE Land Development Consultants

REV	DATE	REVISION DETAILS	ISSUED
B	18/04/24	ISSUE FOR APPROVAL	DL
A	16/04/24	GENERAL REVISIONS	DL

DRAWING TITLE: CUT & FILL PLAN

STATUS	SCALE	SIZE
RC VARIATION	1:1000	A3

PROJECT NO	DRAWING NO	REVISION
1136	RC-EW201	B

c:_cam jobs\1136 cabra 55 cullen street\rc variation\1136 rc sheet 200

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APPENDIX E
Laboratory Test Data

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 :	**55 Cullen Street, Mangawhai**		
		Project No :	25 0001 52-2
Client :	CMW Geosciences Ltd		
Address :	PO Box 300206 Albany, Auckland	Date of Order :	02.10.25
		Sample Method :	Hand Auger
Attention :	Richard Tichborne	Sample Date :	01.10.25
		Sampled By :	CMW Geosciences Ltd

Test Details :	Test performed on :	Whole Sample		
	History :	Natural		
Tested By:	KC		Date :	06.10.25
Calculated By :	KC		Date :	09.10.25
Checked By :	ZH		Date :	10.10.25

Sample No.	Location	Depth (m)	Cone Penetration (CPL)	Plastic Limit (PL)	Plasticity Index (PI)	Linear Shrinkage (LS)	Natural Water Content (%)
547V	Lot 4	0 to 0.5	63	36	27	12	30.7

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 :	**55 Cullen Street, Mangawhai**		
		Project No :	25 0001 69
Client :	CMW Geosciences Ltd		
Address :	PO Box 300206 Albany, Auckland	Date of Order :	03.12.25
		Sample Method :	Hand Auger
Attention :	Richard Tichborne	Sample Date :	02.12.25
		Sampled By :	CMW Geosciences Ltd

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

Tested By:	JH	Date :	04 & 10.12.25
Calculated By :	ZRH	Date :	12.12.25
Checked By :	ZH	Date :	12.12.25

Sample No.	Location	Depth (m)	Cone Penetration (CPL)	Plastic Limit (PL)	Plasticity Index (PI)	Linear Shrinkage (LS)	Natural Water Content (%)
321W	Lot 2	0.4 to 1.0	52	28	24	11	30.7
322W	Lot 11	0.35 to 1.0	36	21	15	7	23.8
323W	Lot 19	0.35 to 1.0	45	26	19	12	27.1

ROADTEST LTD

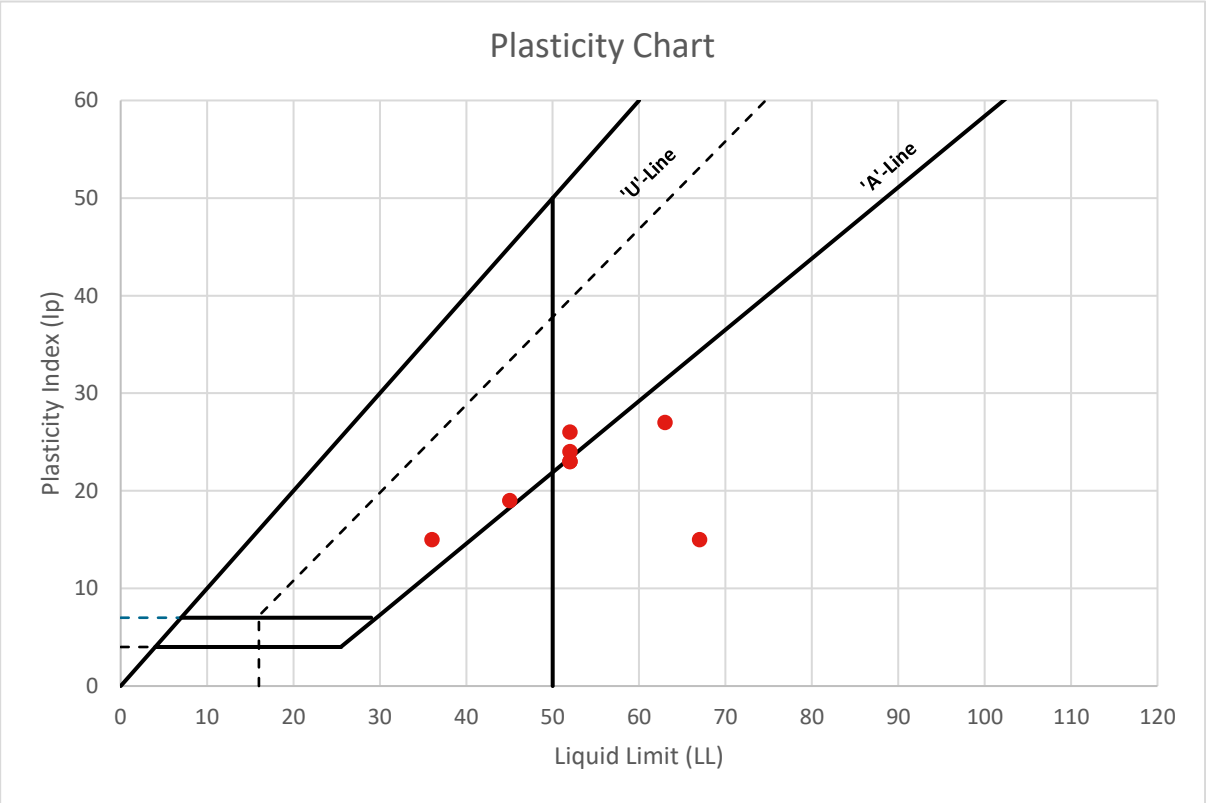
Revision: 1

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 :	**55 Cullen Street, Mangawhai**		
		Project No :	25 0001 62
Client :	CMW Geosciences Ltd		
Address :	PO Box 300206 Albany, Auckland	Date of Order :	11.11.25
		Sample Method :	Hand Auger
Attention :	Richard Tichborne	Sample Date :	10.11.25
		Sampled By :	CMW Geosciences Ltd

Test Details :	Test performed on :	Whole Sample	
	History :	Natural	
Tested By:	JH & KC	Date :	12 to 13.11.25
Calculated By :	AH	Date :	17.11.25
Checked By :	ZH	Date :	18.11.25

Sample No.	Location	Depth (m)	Cone Penetration (CPL)	Plastic Limit (PL)	Plasticity Index (PI)	Linear Shrinkage (LS)	Natural Water Content (%)
083W	Lot 38	0.65 to 1.1	52	29	23	10	35.4
084W	Lot 31	0.4 to 0.8	67	34	33	15	32.3
085W	Lot 27	0.4 to 0.8	52	25	26	11	28.6
086W	Lot 23	0.4 to 0.8	54	34	20	9	37.5


Plasticity Chart
Plasticity Index (Ip)
Liquid Limit (LL)
'U'-Line
'A'-Line
0
10
20
30
40
50
60
70
80
90
100
110
120

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APPENDIX F

Retaining Wall Details and Producer Statement(s)

01 May 2026 Document Ref: AKL2024-0013AH | Rev 0

Foundry Group Limited
9b / 30 Foundry Rd
Silverdale, Akl 0944

Attention: Duncan Unsworth

Dear Duncan

RE: PRODUCER STATEMENT – PS4 CONSTRUCTION REVIEW FOR TIMBER POLE AND SEGMENTAL BLOCK RETAINING WALLS, BC240484

55 CULLEN STREET, MANGAWHAI HEADS

CMW Geosciences (CMW) visited the site at 55 Cullen Street Mangawhai Heads (legally described as Lot 9 DP 191042) on numerous occasions from February 2025 to February 2026 to observe the construction of cantilever timber pole retaining walls, and segmented block retaining walls.

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

- Conditions of Kaipara District Council Building Consent referenced BC240484 issued 28 November 2024;
- CMW Geosciences Cantilever Timber Pole and Segmental Block Retaining Wall Design Report 55 Cullen St, Mangawhai referenced: AKL2024-0013AE Rev 2, dated 24 October 2024;
- Geotechnical investigation report for 55 Cullen St, Managwhai prepared by CMW Geosciences, referenced AKL2024-0013AB Rev 1, dated 22 April 2024.

The work observed and/or tested by CMW staff for the timber pole retaining walls identified on the appended plans, incorporated the following in order to confirm compliance with the design specifications:

- assessment of soil strengths in the exposed retaining wall pole excavations;
- where ground water was encountered in retaining wall pole holes, this was pumped out before pouring concrete or else tremie pouring was undertaken;
- assessment of soil strengths within the retained ground;
- measurements of retaining wall pole dimensions (depth, spacing, and diameter), and rail dimensions
- observations of drainage placement behind walls and drainage outlets; future building development will need to connect identified cesspits on Lots 25, 28, 33, 35 and 38 to the reticulated stormwater system;
- drain bridging on retaining wall 1 to design requirements was observed within Lot 21; and
- compaction testing of compacted hardfill behind retaining walls to reinstate temporary batters.

The work observed and/or tested by CMW staff for the segmental block retaining wall incorporated the following in order to confirm compliance with the design specifications:

- assessment of soil strengths within the subgrade and retained ground;
- measurements of retaining wall foundation levelling pad dimensions;
- observations of drainage placement behind walls and drainage outlets; and
- no fines width and placement;

Our testing demonstrated ground conditions for all retaining walls were generally in excess of the minimum required undrained shear strength of either 70 kPa or 100 kPa as assumed in the retaining wall designs with the following exception:

- Due to elevated groundwater pressure and weaker than expected ground conditions encountered during construction of the timber pole retaining wall within Lot 18, ground improvement comprising a 2m deep by 2m wide trench, backfilled with no fines concrete was undertaken during February 2026. The extent of this trench is shown on the as-built plans within the pertinent Geotechnical Completion Report.

We also observed that there were no significant adverse impacts to adjacent properties apart from localised slumping of the temporary batter which were remediated by undercutting the disturbed soils, benching the cut face and replacing with compacted hardfill and/or additional drainage metal.

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

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

1. The approved Contract drawings and design details.

2. The approved Contract specifications.

3. Authorised Variations to (1) and (2) during the execution of the works.

4. The conditions of Resource and Building Consents where applicable.

5. The relevant Geotechnical Investigation reports, recommendations, and site instructions.

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

For and on behalf of CMW Geosciences

Prepared by:

Richard Tichborne
Associate Engineering Geologist

Reviewed and authorised by:

Richard Knowles
Principal Geotechnical Engineer CPEng

Distribution: 1 electronic copy to Foundry Group Limited via email
Original held at CMW Geosciences

Attachments: Producer Statement – Construction Review
As-Built / Design Drawings

PRODUCER STATEMENT – PS4
CONSTRUCTION REVIEW

BUILDING CODE CLAUSE(S): B1 **JOB NUMBER:** AKL2024-0013

ISSUED BY: CMW Geotechnical NZ Limited
(Construction Monitoring Firm)
TO: Foundry Group Limited
(Owner/Developer)
TO BE SUPPLIED TO: Kaipara District Council
(Building Consent Authority)
IN RESPECT OF: Timber pole and Segmental Block Wall Retaining Walls (Numbered as Walls 1 to 8)
(Description of Building Work)
AT: 55 Cullen Street, Mangawhai
(Address, Town/City)
LEGAL DESCRIPTION: Lot 9 DP191042 **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. BC240484 and those relating to Building Consent Amendment(s) No. 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 , 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
(Signature below):

ON BEHALF OF *(Construction Monitoring Firm)*: CMW Geotechnical NZ Limited Date: 30/4/26

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 to attached report by CMW Geotechnical NZ Limited referenced AKL2024-0013AH Rev 0 and the Geotechnical Completion Report referenced AKL2024-0013AG Rev 0 for all details of inspections, testing and compliance.

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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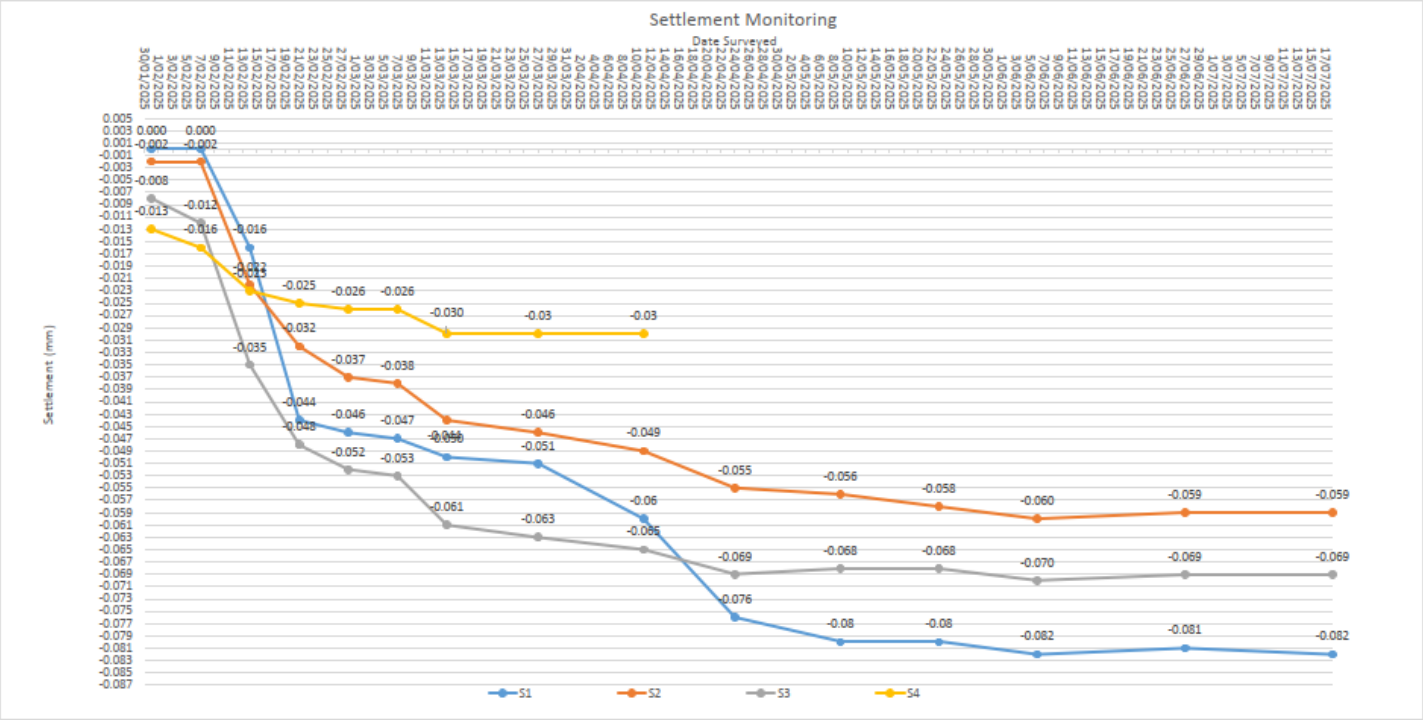
APPENDIX G
Settlement Monitoring Data

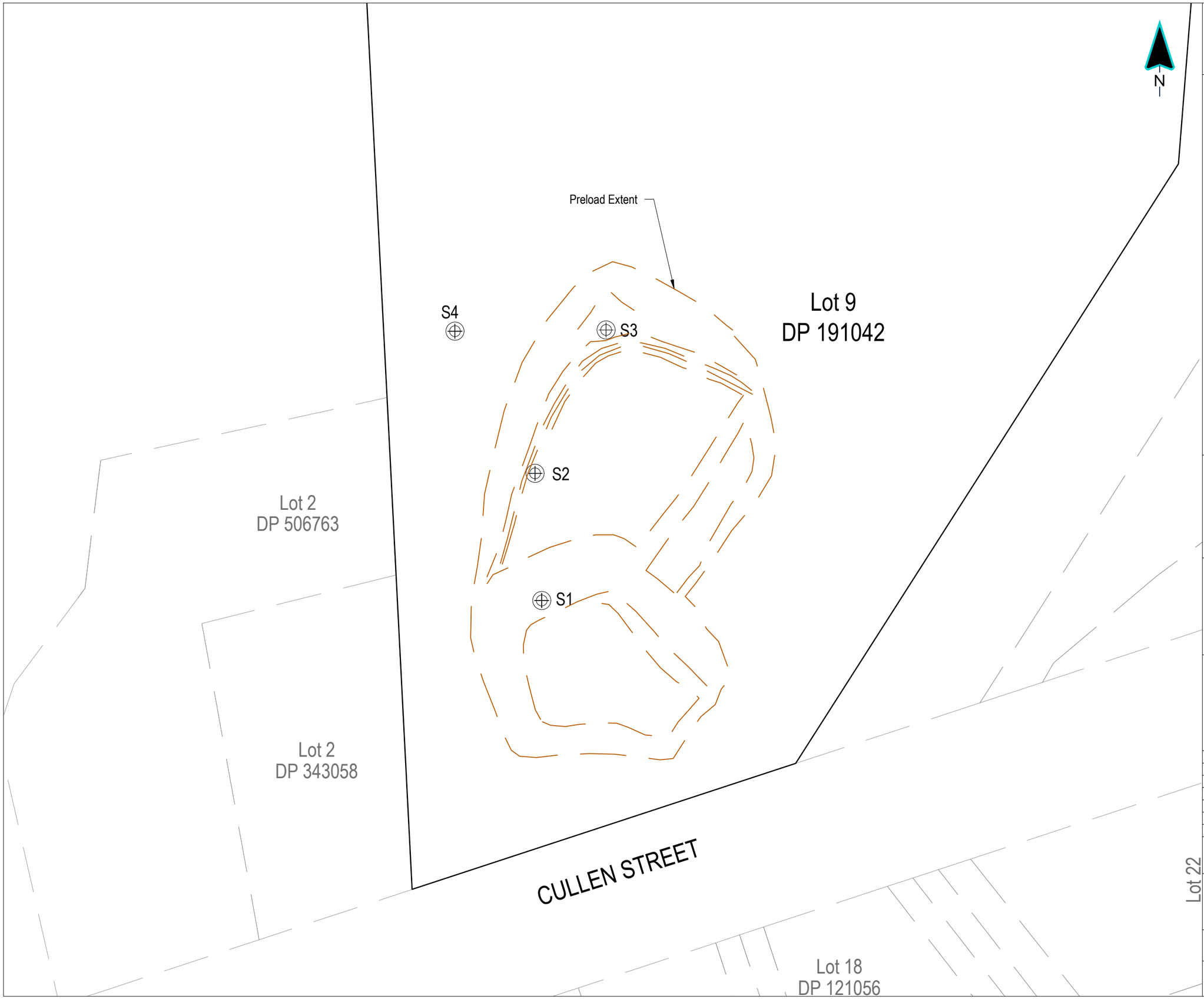
DATE: 23/03/2026	CLIENT: **FOUNDRY GROUP LIMITED**	
REFERENCE: AKL2024-0013	PROJECT: **55 CULLEN STREET, MANGAWHAI**	
DRAWING BY: RT	TITLE: **SETTLEMENT MONITORING DATA**	



	S1	S2	S3	S4
17/01/2025				
31/01/2025	0.000	-0.002	-0.008	-0.013
7/02/2025	0.000	-0.002	-0.012	-0.016
14/02/2025	-0.016	-0.022	-0.035	-0.023
21/02/2025	-0.044	-0.032	-0.048	-0.025
28/02/2025	-0.046	-0.037	-0.052	-0.026
7/03/2025	-0.047	-0.038	-0.053	-0.026
14/03/2025	-0.050	-0.044	-0.061	-0.030
27/03/2025	-0.051	-0.046	-0.063	-0.03
11/04/2025	-0.06	-0.049	-0.065	-0.03
24/04/2025	-0.076	-0.055	-0.069	
9/05/2025	-0.08	-0.056	-0.068	
23/05/2025	-0.08	-0.058	-0.068	
6/06/2025	-0.082	-0.060	-0.070	
27/06/2025	-0.081	-0.059	-0.069	
18/07/2025	-0.082	-0.059	-0.069	

Debth of Fill above Baseplate

S1	S2	S3	S4
6.38	5.23	5.88	2.98



S3 = Settlement Marker

CLIENT

CABRA
LAND & PROPERTY DEVELOPMENT

PROJECT

55 CULLEN STREET
MANGAWHAI

CAPTURE
Land Development Consultants

	DATE	REVISION DETAILS	ISSUED
A	13/02/25	FOR INFORMATION	DL
B	04/04/25	FOR INFORMATION	DL

DRAWING STATUS

INFORMATION ONLY

DRAWING TITLE

SETTLEMENT MONITORING MARKS ON LOT 9 DP 191042

PROJECT NO	*SCALE*	*PLOT SIZE*
1136	1:500	A3

DRAWING NO	*REVISION*
1136-DR-S-1300	B

1136-DR-S-1300 Settlement Marks.dwg

Auckland

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Rosedale 0632
New Zealand

Ph: +64 9 4144 632

www.cmwgeosciences.com