

17 March 2020

45 STATION ROAD, STAGE 1A

HUAPAI

GEOTECHNICAL COMPLETION REPORT

Cabra Developments Limited

Ref: AKL2016_0634AK Rev.0

AKL2016_0634AK		
Date	Revision	Comments
17 March 2020	A	Initial draft for internal review
18 March 2020	0	Final issue to client

	Name	Signature	Position
Prepared by	Jasmine Walden		Engineering Geologist
Reviewed by	Andrew Linton		Principal Geotechnical Engineer
Authorised by	Richard Knowles		Principal Geotechnical Engineer



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1. INTRODUCTION

In accordance with our instructions, this Geotechnical Completion Report has been prepared for Cabra Development Limited as part of the documentation to be submitted to Auckland Council following earthworks to form Stage 1A of the Huapai Triangle Sub Precinct A (45 Station Road, Huapai) Development. Construction of this residential subdivision has been undertaken in accordance with the Auckland Council Resource Consent number ENG 60068582 and SUB 60035794 and Engineering Approval letter dated 23 February 2017. Specific structures constructed during the civil works to create the subdivision include timber pole retaining walls and keystone retaining walls.

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

This report covers the construction period December 2016 to February 2020 and is intended to be used for certification purposes for new lots (listed below) created from Lot 1 DP 540873 as follows:

- 54 new residential lots numbered balance lot 2, together with lots 13 to 58 and 60 to 66;
- 1 new road numbered lot 1002 and named Vinistra Road;
- 2 new drives numbered lots 1001 and 1003 and named Dida Park Drive and Vintry Drive respectively;
- 1 new avenue numbered lot 1003 and named Podgora Avenue;
- 1 new right of way numbered 500.

This stage of the 45 Station Road Development is located off Station Road, Huapai. As can be seen from the As-built plans, 52 of the lots have been affected by filling as part of the earthworks operations to a maximum depth of approximately 10 metres.

2. PROJECT BACKGROUND

The geotechnical investigations and design were undertaken by CMW Geosciences as presented in the following reports:

- Geotechnical Report for Huapai Development Stage 1, Huapai, prepared by CMW Geosciences referenced 2015_1029AB Rev.0 dated 24 November 2014;
- Geotechnical Investigation Report prepared by CMW Geosciences, referenced AKL2017_0089AB Rev.0 dated 12 July 2017;
- Geotechnical Investigation Report prepared by CMW Geosciences, referenced AKL2018-0195AA Rev.0 dated 12 December 2018;
- Stage 1A & 1B Retaining Wall Designs prepared by CMW Geosciences, referenced AKL2016_0634AD Rev.0 dated 23 March 2017;
- Remaining Scope of Stage 1A & 1B Retaining Wall Designs prepared by CMW Geosciences, referenced AKL2016_0634AH Rev.1 dated 19 March 2019;
- Timber Pole Retaining Wall 2A prepared by CMW Geosciences, referenced AKL2016_0634AI Rev.0 dated 6 September 2019.

3. DESCRIPTION OF EARTHWORKS

Earthworks operations for the entire 45 Station Road Development began in early December 2016 with the installation of silt fences and other environmental controls. Cut and fills for Stage 1A were conducted in conjunction with the other stages of this development and with neighbouring developments, all of which

were under the observation of CMW Geosciences. The majority of this stage is in fill, with a small area of cut required to form approximately 10 of the western lots and a portion of Vinistra Road and Dida Park Drive.

By March 2017 the bulk earthworks for Stage 1A was mostly complete. A gully muck-out was completed in the northern portion of the site running from east to west and two subsoil drain coils were placed surrounded by scoria and Bidim cloth. In February 2018 an undercut was conducted along the western boundary of Lots 20 to 27 where the proposed retaining wall was to be constructed, through approximately 8 lots, and some of Vinistra Road to the east. A subsoil drain was installed, and filling placed in this area until finished level was reached. Development on Stage 1A was then put on hold for the remainder of the 2018 season.

Development of Stage 1A recommenced in mid-January 2019 and began with an undercut in the south western corner of the site (Lots 27 to 31). An underfill drain was installed along the back of the undercut behind the proposed retaining wall. Backfilling of this undercut was completed in late January 2019.

Civil works including road construction began in January 2019 and continued until completion of this stage in February 2020.

Construction of the timber pole and segmental block retaining walls began in April 2017 with completion of both types of walls in February 2020 and certification to be provided separately to this report.

4. GEOTECHNICAL QUALITY CONTROL

4.1. Site Observations

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

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

- Adequate topsoil stripping;
- Fill areas prior to the placement of fill materials to ascertain that all mullock and soft inorganic subsoils had been removed;
- Installation and backfilling of subsoil drains;
- Excavation and backfilling of sewer and stormwater trenches;
- Construction of cantilever timber pole retaining walls including ground conditions, pile size, spacing and depth; and
- Construction of keystone walls including ground conditions, block placement, geogrid placement and hardfill backfill;
- Placement and compaction of engineered fills.

4.2. Compaction Control

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

General Fills

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

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

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

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

5. EVALUATION OF COMPLETED EARTHWORKS

5.1. Natural Hazards

The appended as-built drawings depict the extents of a series of zones that contain limitations intended to ensure that future building and/ or earthworks on the lots is undertaken in a manner that does not lead to buildings being subject to any of the natural hazards described in Section 71(3) of the Building Act, i.e. erosion, falling debris, subsidence, slippage, and inundation. Consideration of the inundation hazard was outside the scope of CMW's brief and has been assessed by others. The applied zones on this subdivision are all **Specific Design Zones (retaining)** - intended to protect the retaining walls from overloading at the crest or undermining at the toe that could lead to instability.

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

5.2. Natural Soils Geotechnical Assessment

Portions of lots within this stage of the subdivision are formed partially within natural soils, which are predominantly of alluvial origin.

During construction and earthworks, lenses of firm to stiff organically stained clay soils were observed and were undercut and replaced with engineered fill.

Hand auger boreholes conducted in the centre of each lot as part of the post earthworks investigations did not encounter further lenses of organically stained soils but observed some lower strength natural subsoils.

While not expected, some discrete lenses of organic stained clay soils may still exist within the natural soils beneath lot areas. We do not consider that liquefaction and/or settlement due to discrete lenses of organically stained clay soils are a significant geotechnical risk for development or future residential dwellings built in general accordance with NZS 3604.

5.3. Land Stability and Erosion Control

The subdivision scheme layout includes a series of batter slopes to form level terraces for building platforms. The batters include portions of the residential lots with maximum gradients of 1(v) in 2.5(h) as depicted on the as-built drawings.

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

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 faces. Wherever practical on such land, and particularly on steep batters, existing vegetation and grass cover should be well maintained. Any vegetation cleared beyond the immediate area of building platforms for temporary construction purposes should be replanted or replaced as soon as possible. The roots of an established vegetation cover can serve to bind the surface soils while the foliage can reduce rain infiltration and soil saturation, resulting in better resistance to erosion and shallow slumping.

5.4. Retaining Walls

Cantilever timber pole and keystone retaining walls have been constructed in the locations shown on the appended Cato Bolam Limited As-built Plans. These walls reach a maximum height of approximately 2 metres and were designed by CMW Geosciences, and the construction was also observed by this consultancy. Copies of the Producer Statements - Construction Review (PS4) are provided in Appendix E.

Descriptions of the building and earthworks restrictions within the vicinity of these walls (Specific Design Zones – retaining) are contained in the Suitability Statement in Appendix A. Lots containing these zones include balance lot 2, together with lots 13 to 58 and 60 to 66 inclusive.

5.5. Fill Induced Settlement

On the basis of the elapsed time since fill has been placed across this stage of the subdivision, we consider that remaining post-construction settlements will be within code limits.

5.6. Service Line Trenches

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

As is normal on all subdivisions, building developments involving foundations within a 45 degree zone of influence from pipe inverts will require engineering input. The Auckland Council drawing referenced SW22 provided in Appendix B extracted from Chapter 4 of the Auckland Council Code of Practice for Land Development and Subdivision depicts their requirements for stormwater pipes. Details for water and wastewater pipes are available in the Watercare COP1 - General Requirements and Procedures. The majority of lots are known to have service trenches within the lots as shown on the appended stormwater and wastewater as-built plans. The resulting restrictions are presented in the Suitability Statement below.

5.7. Subsoil Drains

The appended Cato Bolam Consultants Cut/Fill As-built Plans show the positions of counterfort drains which were constructed in the natural ground during the earthworks operations. The drains were installed to help control groundwater levels and are either linked to the reticulated storm water system or extend to formed outlets within bush areas. The ongoing operation of these drains is important to the overall stability conditions of the site.

Typical trench excavations extended into natural ground and lie between 1.4 and 9.9 metres below the finished surface. Accordingly they are predominantly beyond the depths of anticipated foundations.

Descriptions of the restrictions related to these subsoil drains are contained in the appended Suitability Statement.

5.8. Road Subgrades

Penetration resistance testing was carried out on the road subgrades during construction and the results of this testing were forwarded to Cato Bolam Consultants for pavement remedial design. Where soft ground with low equivalent CBR values was identified it was generally undercut and replaced with engineered fill, including placement of geogrid and geotextile cloth. All road subgrade areas were subsequently lime/cement stabilised to achieve appropriate CBR values.

Benkelman Beam testing of the base course was carried out by Roadtest Limited on each road and those results were also forwarded to Cato Bolam Consultants.

5.9. Design of Shallow Foundations

5.9.1. Bearing Capacity

Once bulk earthworks and top-soiling of the building platforms had been completed, our staff drilled hand auger boreholes on platforms in natural ground to determine representative finished ground conditions and hence evaluate likely foundation options for future building development. Our assessments of bearing capacity for the design of shallow foundations on each building platform are contained in the appended Suitability Statement.

At current subgrade levels balance lot 2, together with lots 13 to 58 and 60 to 66 inclusive have been assessed as having a geotechnical ultimate bearing capacity of 300 kPa within the influence of conventional shallow residential building foundation loads.

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

5.9.2. Foundation Settlements

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

5.9.3. Soil Expansiveness Classification

12 sets of soil tests were carried out on samples taken from likely foundation level on lots within this stage of the development.

Testing to assess the Shrink-Swell Index (I_{ss}) was completed in accordance with AS 1289 Test 7.1.1 and was used in conjunction with the advice in Acceptable Solution B1/AS1 of the New Zealand Building Code to calculate the characteristic surface movement (y_s) and the expansive soil class. All test results are appended.

On the basis of the laboratory test results, and the general consistency of these results across both cut and fill areas, we have assessed the lots to be H (Highly) expansive.

Foundation design details for a specified range of NZS 3604 dwellings, including minimum embedment depths and reinforcing steel requirements are also contained in B1/AS1.

In recent years in Auckland, there have been examples of concrete floors and/ or foundations that have been poured on dry, desiccated subgrades in summer months on expansive soils and have undergone heaving and cracking once the soil moisture contents have returned to higher levels. Foundation contractors need to be made aware of this issue and the need to maintain appropriate moisture contents in the footings and building platform subgrade between the time of excavation and the pouring of concrete.

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

Land owners need to be mindful of the B1/AS1 advice that the planting or removal of high water demand plants where their roots may extend close to footings (i.e. within a lateral distance of 1.5 times the mature tree height) can also cause settlement damage.

5.10. Topsoil Depths

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

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

6. CLOSURE

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

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

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

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

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

I, Richard Knowles, of CMW Geosciences (NZ) Limited, Auckland, hereby confirm that:

1. As a Chartered Professional Engineer experienced in the field of geotechnical engineering, I am a Geoprofessional as defined in Section 1.2.2 of NZS 4404 and was retained by the Developer as the Geotechnical Engineer on Stage 1A of the Huapai Triangle Sub Precinct A (45 Station Road, Huapai) Development.
2. The extent of preliminary investigations carried out to date are described in:
 - Geotechnical Report for Huapai Development Stage 1, Huapai, prepared by CMW Geosciences referenced 2015_1029AB Rev.0 dated 24 November 2014;
 - Geotechnical Investigation Report prepared by CMW Geosciences, referenced AKL2017_0089AB Rev.0 dated 12 July 2017;
 - Geotechnical Investigation Report prepared by CMW Geosciences, referenced AKL2018-0195AA Rev.0 dated 12 December 2018;

The conclusions and recommendations of these documents have been re-evaluated in the preparation of this report. The results of all tests carried out are also appended.

3. In my professional opinion, not to be construed as a guarantee, I consider that:
 - (a) The earth fills shown on the appended Cato Bolam Consultants Cut/Fill As-built Plans have been placed in compliance with NZS 4431, the Auckland Council Unitary Plans and related documents.
 - (b) **Specific Design Zone (Retaining) areas** have been applied on balance lot 2, together with lots 13 to 58 and 60 to 66 inclusive for the protection of the function of the retaining walls. The Keystone walls on this stage of the development were designed for a maximum of 12 kPa surcharge load and 0° toe slope. The cantilever timber pole walls were designed for a range of conditions including a maximum 12 kPa surcharge load, maximum 1 in 2.5 (V:H) backslope and maximum 5° toe slope, as appropriate. No building construction and no earthworks (i.e. cut or fills) should take place within the Specific Design Zone areas 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 has considered the stability implications of the earthworks and/ or building proposals on the retaining walls.
 - (c) The function of the subsoil drains installed beneath balance lot 2 and lots 18, 27, 28, 41, 51 and 65 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.
 - (d) A geotechnical ultimate bearing capacity of 300 kPa may be assumed for shallow foundation design on the building platforms of balance lot 2, together with lots 13 to 58 and 60 to 66 inclusive.

If for any reason higher geotechnical bearing capacities are required, further specific site investigation and design of foundations should be carried out prior to Building Consent application.
 - (e) The expansive site Class for all lots has been assessed using B1/AS1 as H (Highly) expansive with a characteristic surface movement (y_s) up to 78mm. We recommend that building designers

note on the Building Consent drawings the need to maintain appropriate moisture levels across building subgrades and in footing excavations (as described in section 5.9.3 of the Geotechnical Completion Report) for reference by foundation contractors.

- (f) The backfilling and compaction of the storm water and sanitary sewer trenches on this subdivision has been carried out to appropriate standards having regard for the prevailing ground conditions and associated compaction induced pipe loadings.

However, no building development should take place within the 45 degree zone of influence of drain inverts unless endorsed by specific design and by construction inspections undertaken by a Chartered Professional Engineer experienced in geomechanics to ensure that lateral stability and differential settlement issues are addressed and that building loads are transferred beyond the influence of the pipe and trench backfill. A copy of drawing SW22 extracted from Chapter 4 of the Auckland Council Code of Practice for Land development and Subdivision this document is provided in Appendix B for clarification. Details for water and wastewater pipes are available in the Watercare COP1 - General Requirements and Procedures.

- (g) Subject to the geotechnical limitations, restrictions and recommendations contained in clauses 3(b), 3(c), 3(d), 3(e) and 3(f) above:
- (i) The filled and natural ground is generally suitable for residential buildings constructed in accordance with NZS 3604 and the requirements of Acceptable Solution B1/AS1 of the New Zealand Building Code for the appropriate expansive soil class.
 - (ii) Where shallow foundations are appropriate, design may be carried out in accordance with B1/AS1 (Class H) or alternately, a specific foundation and structural design may be undertaken by a Chartered Professional Engineer.

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

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

For and on behalf of CMW Geosciences



Richard Knowles

Principal Geotechnical Engineer, CPEng.

Condition	Specific Design Zone (retaining)	Subsoil Drains Present	Geotechnical Ultimate Bearing Capacity (kPa)	B1/AS1 Expansive Class	Service Lines Restrictions	Indicative Topsoil Depth (mm)
GCR SOPO Clause	3(b)	3(c)	3(d)	3(e)	3(f)	
Lot number						
2	●	●	300	H	●	200
13	●		300	H	●	150
14	●		300	H	●	200
15	●		300	H	●	150
16	●		300	H	●	200
17	●		300	H	●	200
18	●	●	300	H	●	200
19	●		300	H	●	200
20	●		300	H	●	200
21	●		300	H	●	100
22	●		300	H	●	150
23	●		300	H	●	200
24	●		300	H	●	150
25	●		300	H	●	200
26	●		300	H	●	150
27	●	●	300	H	●	150
28	●	●	300	H	●	150
29	●		300	H	●	150
30	●		300	H	●	200

Condition	Specific Design Zone (retaining)	Subsoil Drains Present	Geotechnical Ultimate Bearing Capacity (kPa)	B1/AS1 Expansive Class	Service Lines Restrictions	Indicative Topsoil Depth (mm)
GCR SOPO Clause	3(b)	3(c)	3(d)	3(e)	3(f)	
31	●		300	H	●	100
32	●		300	H	●	100
33	●		300	H	●	200
34	●		300	H	●	200
35	●		300	H	●	200
36	●		300	H	●	150
37	●		300	H	●	250
38	●		300	H	●	200
39	●		300	H	●	200
40	●		300	H	●	150
41	●	●	300	H	●	200
42	●		300	H	●	200
43	●		300	H	●	150
44	●		300	H	●	150
45	●		300	H	●	200
46	●		300	H	●	250
47	●		300	H	●	200
48	●		300	H	●	100
49	●		300	H	●	100

Condition	Specific Design Zone (retaining)	Subsoil Drains Present	Geotechnical Ultimate Bearing Capacity (kPa)	AS2870 Expansive Class	Service Lines Restrictions	Indicative Topsoil Depth (mm)
GCR SOPO Clause	3(c)	3(d)	3(f)	3(g)	3(h)	
Lot number						
50	●		300	H	●	200
51	●	●	300	H	●	100
52	●		300	H	●	150
53	●		300	H	●	100
54	●		300	H	●	100
55	●		300	H	●	100
56	●		300	H	●	150
57	●		300	H	●	100
58	●		300	H	●	150
60	●		300	H	●	150
61	●		300	H	●	250
62	●		300	H	●	200
63	●		300	H	●	250
64	●		300	H	●	300
65	●	●	300	H	●	250
66	●		300	H	●	250

Appendix B: Drawings

Title	Reference No.	Date	Revision
Cato Bolam Consultants Cut/Fill Asbuilt Plans – Stage 1A	42356-DR-SU-9007 to 9011	February 2020	0
Cato Bolam Consultants Final Contours and Retaining Walls Asbuilt Plans – Stage 1A	42356-DR-SU-9012 to 9016	February 2020	0
Cato Bolam Consultants Retaining Wall Specific Design Asbuilt Plans – Stage 1A	42356-DR-SU-9017 to 9021	February 2020	0
Cato Bolam Consultants Roothing Asbuilt Plans – Stage 1A	42356-DR-SU-9100 to 9103	February 2020	0
Cato Bolam Consultants Wastewater Asbuilt Plans – Stage 1A	42356-DR-SU-9200 to 9203	February 2020	0
Cato Bolam Consultants Stormwater Asbuilt Plans – Stage 1A	42356-DR-SU-9300 to 9306	February 2020	1
Cato Bolam Consultants Water Supply Asbuilt Plans – Stage 1A	42356-DR-SU-9400 to 9403	February 2020	0
Auckland Council Stormwater Pipe and Manhole Construction Clearance Requirements	ACSD SW22	September 2013	1

Cabra Developments Ltd - 45 Station Road, Huapai - Stage 1A

Asbuilt Plans



LOCATION DIAGRAM

Scale 1:10,000

Plan No	Rev	Plan Title
Earthworks		
9007	0	Cut/Fill Asbuilt Plan - Stage 1A (Overall)
9008	0	Cut/Fill Asbuilt Plan - Stage 1A (Sheet 1 of 4)
9009	0	Cut/Fill Asbuilt Plan - Stage 1A (Sheet 2 of 4)
9010	0	Cut/Fill Asbuilt Plan - Stage 1A (Sheet 3 of 4)
9011	0	Cut/Fill Asbuilt Plan - Stage 1A (Sheet 4 of 4)
9012	0	Final Contours and Retaining Walls - Asbuilt- Stage 1A (Overall)
9013	0	Final Contours and Retaining Walls - Asbuilt- Stage 1A (Sheet 1 of 4)
9014	0	Final Contours and Retaining Walls - Asbuilt- Stage 1A (Sheet 2 of 4)
9015	0	Final Contours and Retaining Walls - Asbuilt- Stage 1A (Sheet 3 of 4)
9016	0	Final Contours and Retaining Walls - Asbuilt- Stage 1A (Sheet 4 of 4)
9017	0	Retaining Wall Specific Design - Asbuilt Plan - Stage 1A (Overall)
9018	0	Retaining Wall Specific Design - Asbuilt Plan - Stage 1A (Sheet 1 of 4)
9019	0	Retaining Wall Specific Design - Asbuilt Plan - Stage 1A (Sheet 2 of 4)
9020	0	Retaining Wall Specific Design - Asbuilt Plan - Stage 1A (Sheet 3 of 4)
9021	0	Retaining Wall Specific Design - Asbuilt Plan - Stage 1A (Sheet 4 of 4)
Roading		
9100	0	Roading Asbuilt Plan- Stage 1A (Overall)
9101	0	Roading Asbuilt Plan- Stage 1A (sheet 1 of 3)

Plan No	Rev	Plan Title
9102	0	Roading Asbuilt Plan- Stage 1A (sheet 2 of 3)
9103	0	Roading Asbuilt Plan- Stage 1A (sheet 3 of 3)
Wastewater		
9200	0	Wastewater Asbuilt Plan- Stage 1A (Overall)
9201	0	Wastewater Asbuilt Plan- Stage 1A (Sheet 1 of 3)
9202	0	Wastewater Asbuilt Plan- Stage 1A (Sheet 2 of 3)
9203	0	Wastewater Asbuilt Plan- Stage 1A (Sheet 3 of 3)
Stormwater		
9300	1	Stormwater Asbuilt Plan- Stage 1A (Overall)
9301	1	Stormwater Asbuilt Plan- Stage 1A (Sheet 1 of 6)
9302	1	Stormwater Asbuilt Plan- Stage 1A (Sheet 2 of 6)
9303	1	Stormwater Asbuilt Plan- Stage 1A (Sheet 3 of 6)
9304	1	Stormwater Asbuilt Plan- Stage 1A (Sheet 4 of 6)
9305	1	Stormwater Asbuilt Plan- Stage 1A (Sheet 5 of 6)
9306	0	Stormwater Zone of Influence Asbuilt Plan- Stage 1A (Sheet 6 of 6)
Water		
9400	0	Water Supply Asbuilt Plan- Stage 1A (Overall)
9401	0	Water Supply Asbuilt Plan- Stage 1A (sheet 1 of 3)
9402	0	Water Supply Asbuilt Plan- Stage 1A (sheet 2 of 3)
9403	0	Water Supply Asbuilt Plan- Stage 1A (sheet 3 of 3)



ENG60068582 / SUB60035794

Refer to Sheet 9007 for legend and Notes

I certify that these As-Built Plans are an accurate record of the works undertaken and that:

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

Signed:  Registered Professional Surveyor

Date:

Name: Mark Parker

Phone : (09) 837 0486

Email : markp@catobolam.co.nz



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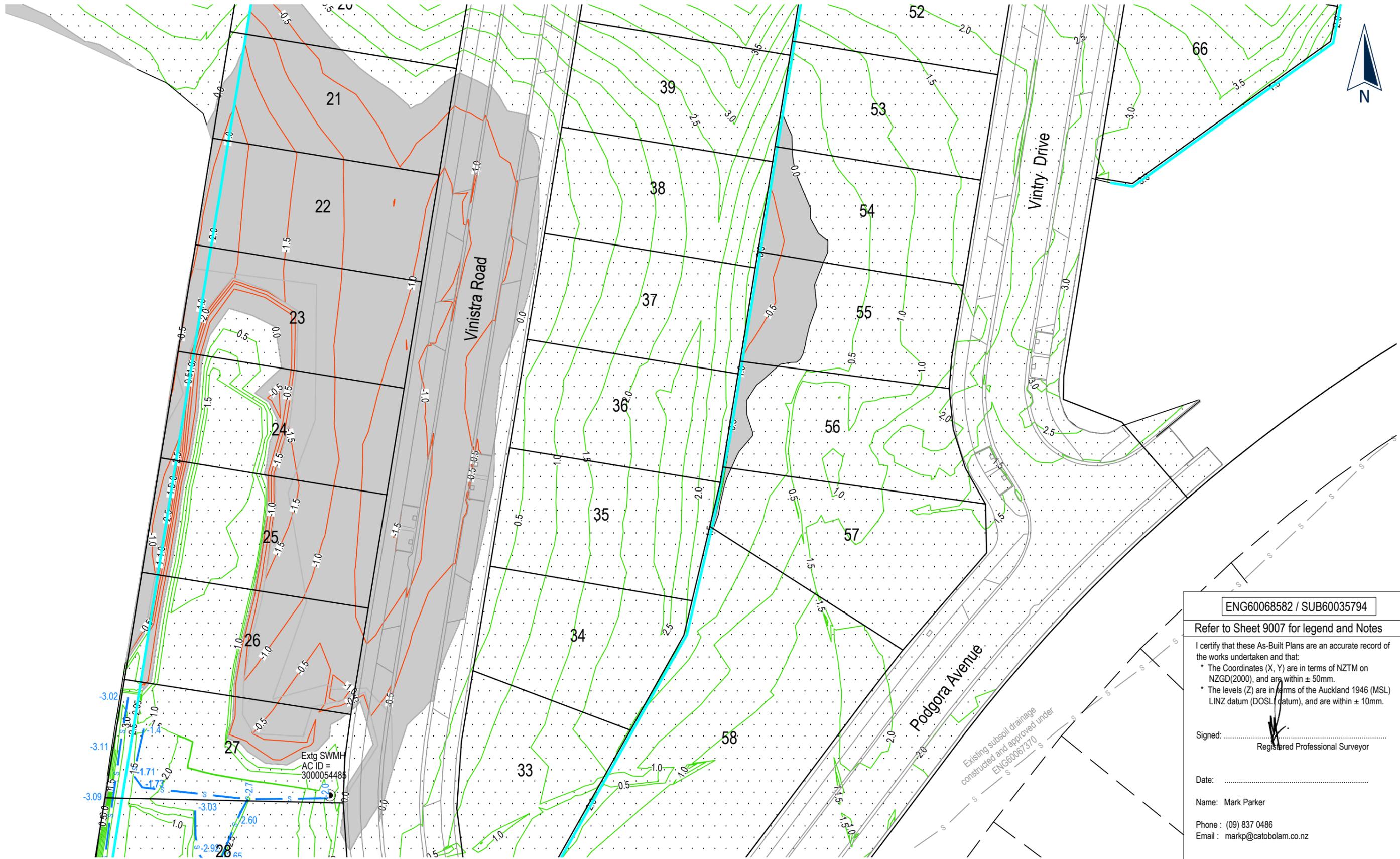
Cabra Developments Ltd
45 Station Road,
Huapai

Cut / Fill As Built Plan
- Stage 1A
(Sheet 1 of 4)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	25/02/2020

FOR COMPLETION

SURVEYED	DESIGNED	DRAWN	DATE	ORIGINAL SCALE	ORIGINAL SIZE	NAME	DATE
			03/12/2019	1:500	A3	RKC	03/12/2019
DRAWING NO. 42356-DR-SU-9008						REVISION 0	



ENG60068582 / SUB60035794

Refer to Sheet 9007 for legend and Notes

I certify that these As-Built Plans are an accurate record of the works undertaken and that:

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

Signed: 
Registered Professional Surveyor

Date:

Name: Mark Parker

Phone : (09) 837 0486
Email : markp@catobolam.co.nz

Existing subsoil drainage constructed and approved under ENG60067370

Extg SWMH
AC ID =
3000054485

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	??	??

FOR COMPLETION

SURVEYED	NAME	DATE
	RKC	12/2019
DESIGNED		
DRAWN	RKC	03/12/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/12/2019	1:1500	A3
DRAWING NO.	REVISION	
42356-DR-SU-9009	0	



1

ENG60068582 / SUB60035794

Refer to Sheet 9007 for legend and Notes

I certify that these As-Built Plans are an accurate record of the works undertaken and that:
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Signed: 
 Registered Professional Surveyor

Date:

Name: Mark Parker

Phone : (09) 837 0486
 Email : markp@catobolam.co.nz



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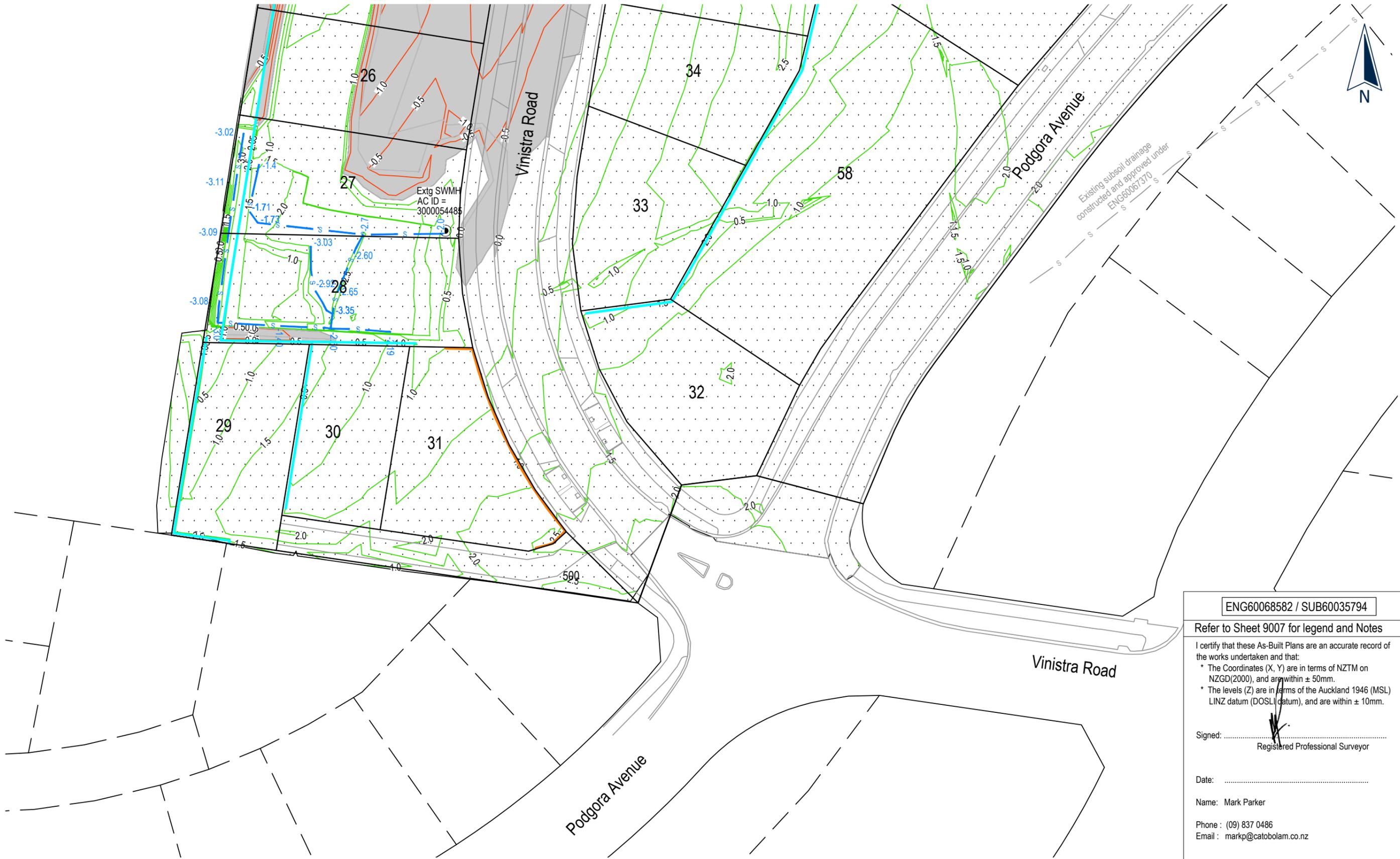
Cabra Developments Ltd
 45 Station Road,
 Huapai

Cut / Fill As Built Plan
 - Stage 1A
 (Sheet 3 of 4)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	25/02/2020

FOR COMPLETION

SURVEYED	NAME	DATE
	RKC	12/2019
DESIGNED		
DRAWN	RKC	03/12/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/12/2019	1:500	A3
DRAWING NO.	REVISION	
42356-DR-SU-9010	0	



ENG60068582 / SUB60035794

Refer to Sheet 9007 for legend and Notes

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

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Registered Professional Surveyor

Date:

Name: Mark Parker

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Cabra Developments Ltd
45 Station Road,
Huapai

Cut / Fill As Built Plan
- Stage 1A
(Sheet 4 of 4)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	25/02/2020

FOR COMPLETION

SURVEYED	NAME	DATE
	RKC	12/2019
DESIGNED		
DRAWN	RKC	03/12/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/12/2019	1:500	A3
DRAWING NO.	REVISION	
42356-DR-SU-9011	0	



As Built Earthworks Legend

- 38.0 As built Contour (1m interval)
- 38.5 As built Contour (0.5m interval)
- Timber Retaining Wall
- Stone Retaining Wall
- Retaining Wall Height
- Durapanel Titan Safety Fencing unless shown otherwise
- Private Field Catchpit

ENG60068582 / SUB60035794

Refer to Sheet 9012 for Notes

I certify that these As-Built Plans are an accurate record of the works undertaken and that:

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

Signed: Registered Professional Surveyor

Date:

Name: Mark Parker

Phone : (09) 837 0486
Email : markp@catobolam.co.nz



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Cabra Developments Ltd
45 Station Road,
Huapai

Final Contours and Retaining Walls
As Built Plan
- Stage 1A
(Sheet 1 of 4)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	24/02/2020

FOR COMPLETION

	NAME	DATE
SURVEYED	RKC	12/2019
DESIGNED		
DRAWN	RKC	03/12/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/12/2019	1:500	A3
DRAWING NO.	REVISION	
42356-DR-SU-9013	0	



1
DP 493438

As Built Earthworks Legend

- 38.0 As built Contour (1m interval)
- 38.5 As built Contour (0.5m interval)
- Timber Retaining Wall
- Stone Retaining Wall
- Retaining Wall Height
- Durapanel Titan Safety Fencing unless shown otherwise
- Private Field Catchpit

ENG60068582 / SUB60035794

Refer to Sheet 9012 for Notes

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

Signed:
Registered Professional Surveyor

Date:

Name: Mark Parker

Phone: (09) 837 0486
Email: markp@catobolam.co.nz

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CABRA
Land & Property Development

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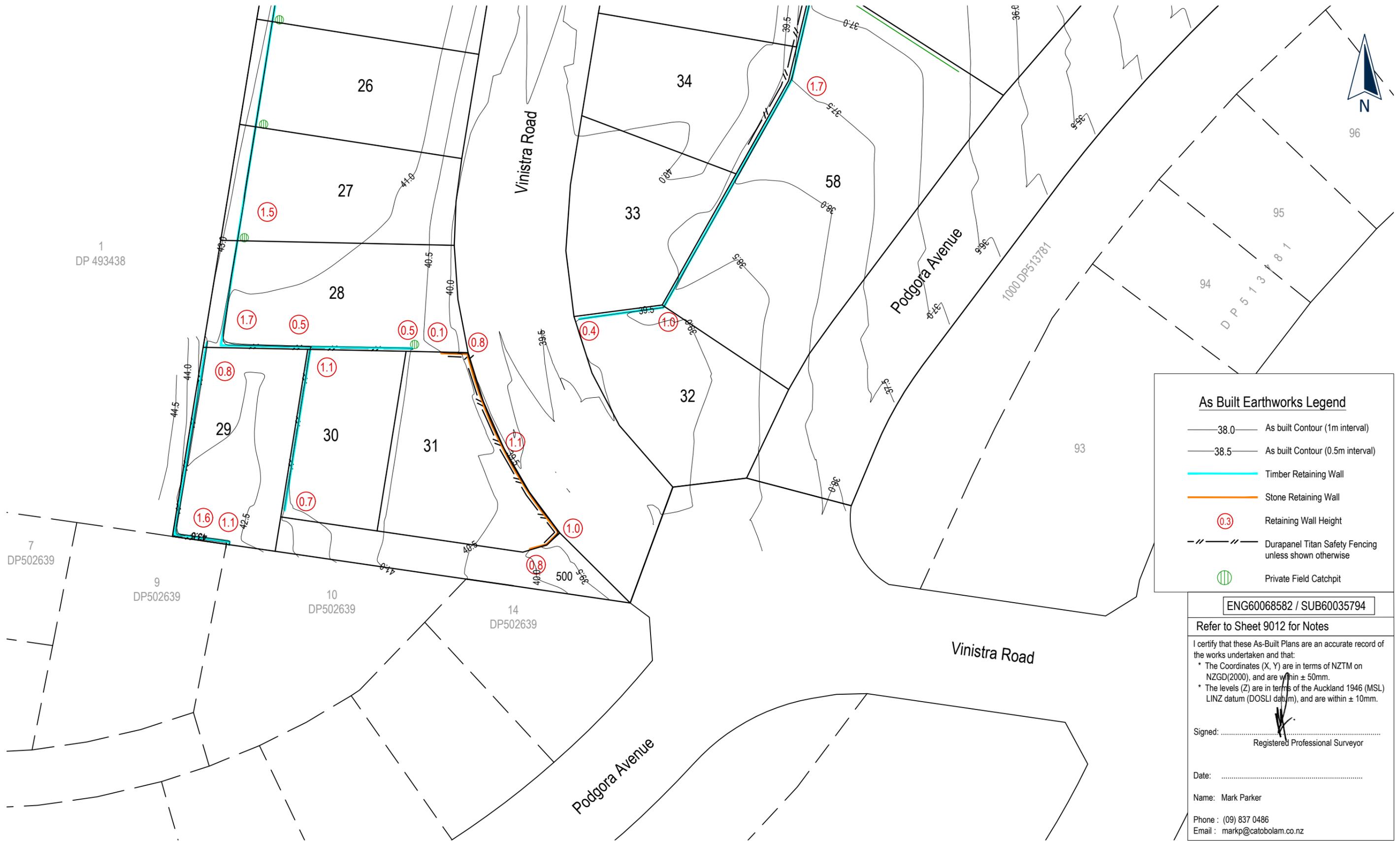
Cabra Developments Ltd
45 Station Road,
Huapai

Final Contours and Retaining Walls
As Built Plan
- Stage 1A
(Sheet 2 of 4)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	24/02/2020

FOR COMPLETION

	NAME	DATE
SURVEYED	RKC	12/2019
DESIGNED		
DRAWN	RKC	03/12/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/12/2019	1:500	A3
DRAWING NO.	REVISION	
42356-DR-SU-9014	0	



As Built Earthworks Legend

- 38.0 — As built Contour (1m interval)
- 38.5 — As built Contour (0.5m interval)
- Timber Retaining Wall
- Stone Retaining Wall
- 0.3 Retaining Wall Height
- - - Durapanel Titan Safety Fencing unless shown otherwise
- ⊕ Private Field Catchpit

ENG60068582 / SUB60035794

Refer to Sheet 9012 for Notes

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

Signed: 
 Registered Professional Surveyor

Date:

Name: Mark Parker

Phone : (09) 837 0486
 Email : markp@catobolam.co.nz



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Cabra Developments Ltd
 45 Station Road,
 Huapai

Final Contours and Retaining Walls
 As Built Plan
 - Stage 1A
 (Sheet 3 of 4)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	24/02/2020

FOR COMPLETION

SURVEYED	NAME	DATE
DESIGNED	RKC	12/2019
DRAWN	RKC	03/12/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/12/2019	1:500	A3
DRAWING NO.	REVISION	
42356-DR-SU-9015	0	



ENG60068582 / SUB60035794

Refer to Sheet 9012 for Notes

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

Signed: _____
Registered Professional Surveyor

Date: _____

Name: Mark Parker

Phone : (09) 837 0486
Email : markp@catobolam.co.nz

As Built Earthworks Legend

- 38.0 — As built Contour (1m interval)
- 38.5 — As built Contour (0.5m interval)
- Timber Retaining Wall
- Stone Retaining Wall
- ⊙ 0.3 Retaining Wall Height
- - - Durapanel Titan Safety Fencing unless shown otherwise
- ⊕ Private Field Catchpit

1



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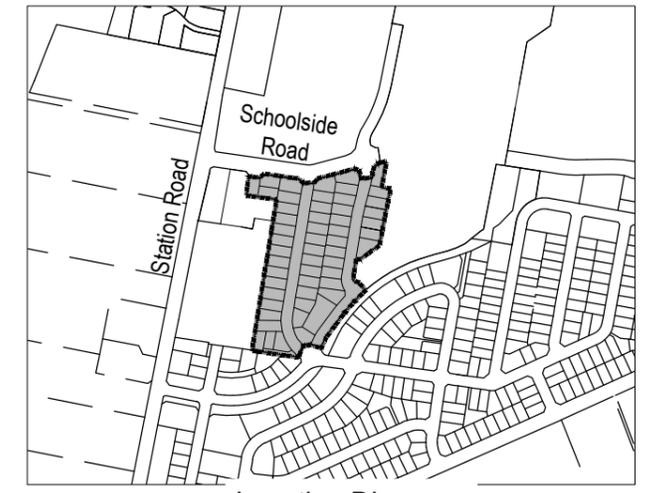
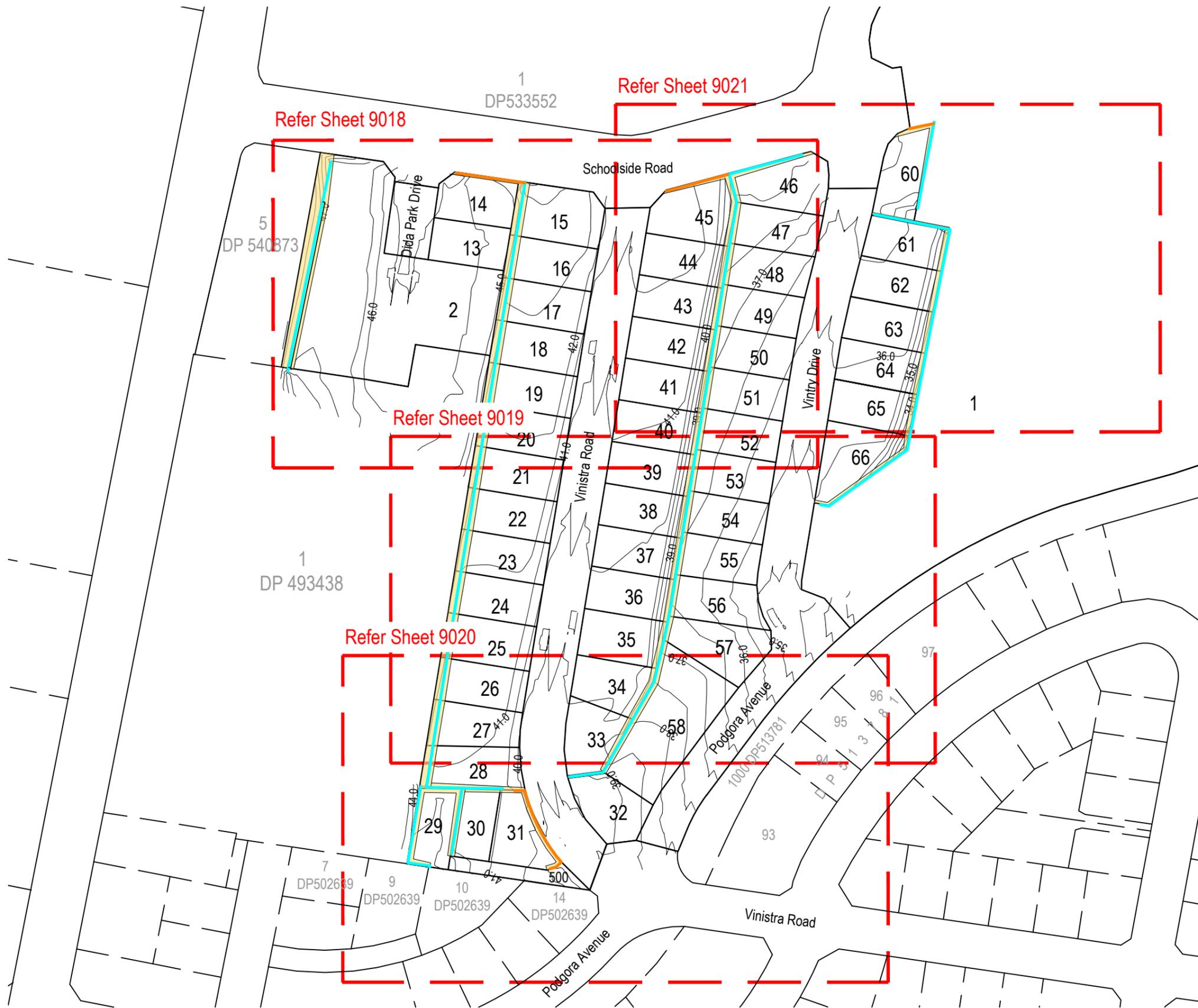
Cabra Developments Ltd
45 Station Road,
Huapai

Final Contours and Retaining Walls
As Built Plan
- Stage 1A
(Sheet 4 of 4)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	24/02/2020

FOR COMPLETION

SURVEYED	DESIGNED	DRAWN	DATE	ORIGINAL SCALE	ORIGINAL SIZE	NAME	DATE
			03/12/2019	1:500	A3	RKC	12/2019
DRAWING NO. 42356-DR-SU-9016						REVISION	0



Location Diagram
Scale 1:10,000

ENG60068582 / SUB60035794

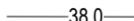
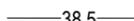
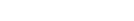
I certify that these As-Built Plans are an accurate record of the works undertaken and that:

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

Signed: 
Registered Professional Surveyor

Date:
Name: Mark Parker
Phone: (09) 837 0486
Email: markp@catobolam.co.nz

As Built Earthworks Legend

-  38.0 As built Contour (1m interval)
-  38.5 As built Contour (0.5m interval)
-  Timber Retaining Wall
-  Stone Retaining Wall
-  Retaining Wall Height
-  Durapanel Titan Safety Fencing unless shown otherwise
-  Private Field Catchpit
-  Retaining Walls specific design zone. (Refer to CMW Geosciences Ltd Geotechnical Completion Report Stage 1A for design requirements)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	24/02/2020

FOR COMPLETION

SURVEYED	DESIGNED	DRAWN	DATE	ORIGINAL SCALE	ORIGINAL SIZE	NAME	DATE
			03/12/2019	1:1500	A3	RKC	12/2019
DRAWING NO. 42356-DR-SU-9017						REVISION	0



ENG60068582 / SUB60035794

Refer to Sheet 9012 for Notes

I certify that these As-Built Plans are an accurate record of the works undertaken and that:

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

Signed:  Registered Professional Surveyor

Date:

Name: Mark Parker

Phone : (09) 837 0486
Email : markp@catobolam.co.nz

As Built Earthworks Legend

	As built Contour (1m interval)
	As built Contour (0.5m interval)
	Timber Retaining Wall
	Stone Retaining Wall
	Retaining Wall Height
	Durapanel Titan Safety Fencing unless shown otherwise
	Private Field Catchpit
	Retaining Walls specific design zone. (Refer to CMW Geosciences Ltd Geotechnical Completion Report Stage 1A for design requirements)



Cabra Developments Ltd
45 Station Road,
Huapai

Retaining Wall Specific Design
As Built Plan
- Stage 1A
(Sheet 1 of 4)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	24/02/2020

FOR COMPLETION

	NAME	DATE
SURVEYED	RKC	12/2019
DESIGNED		
DRAWN	RKC	03/12/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/12/2019	1:500	A3
DRAWING NO.	REVISION	
42356-DR-SU-9018	0	

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DP 493438

As Built Earthworks Legend

- 38.0 — As built Contour (1m interval)
- 38.5 — As built Contour (0.5m interval)
- Timber Retaining Wall
- Stone Retaining Wall
- Retaining Wall Height
- // — Durapanel Titan Safety Fencing unless shown otherwise
- Private Field Catchpit
- Retaining Walls specific design zone. (Refer to CMW Geosciences Ltd Geotechnical Completion Report Stage 1A for design requirements)

ENG60068582 / SUB60035794

Refer to Sheet 9012 for Notes

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Signed: 
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Date:

Name: Mark Parker
Phone: (09) 837 0486
Email: markp@catobolam.co.nz



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Cabra Developments Ltd
45 Station Road,
Huapai

Retaining Wall Specific Design
As Built Plan
- Stage 1A
(Sheet 2 of 4)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	24/02/2020

FOR COMPLETION

	NAME	DATE
SURVEYED	RKC	12/2019
DESIGNED		
DRAWN	RKC	03/12/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/12/2019	1:500	A3
DRAWING NO.	REVISION	
42356-DR-SU-9019	0	



As Built Earthworks Legend

- 38.0 — As built Contour (1m interval)
- 38.5 — As built Contour (0.5m interval)
- Timber Retaining Wall
- Stone Retaining Wall
- Retaining Wall Height
- // — Durapanel Titan Safety Fencing unless shown otherwise
- Private Field Catchpit
- Retaining Walls specific design zone. (Refer to CMW Geosciences Ltd Geotechnical Completion Report Stage 1A for design requirements)

ENG60068582 / SUB60035794

Refer to Sheet 9012 for Notes

I certify that these As-Built Plans are an accurate record of the works undertaken and that:

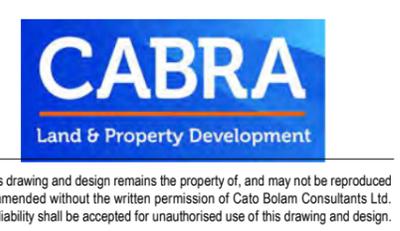
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- * The levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within ± 10mm.

Signed:  Registered Professional Surveyor

Date:

Name: Mark Parker

Phone : (09) 837 0486
Email : markp@catobolam.co.nz



Cabra Developments Ltd
45 Station Road,
Huapai

Retaining Wall Specific Design
As Built Plan
- Stage 1A
(Sheet 3 of 4)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	24/02/2020

FOR COMPLETION

SURVEYED	DESIGNED	DRAWN	DATE	ORIGINAL SCALE	ORIGINAL SIZE	NAME	DATE
			03/12/2019	1:500	A3	RKC	12/2019
DRAWING NO. 42356-DR-SU-9020						REVISION	0



ENG60068582 / SUB60035794

Refer to Sheet 9012 for Notes

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Name: Mark Parker

Phone : (09) 837 0486
Email : markp@catobolam.co.nz

As Built Earthworks Legend

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- 38.5 As built Contour (0.5m interval)
- Timber Retaining Wall
- Stone Retaining Wall
- Retaining Wall Height
- Durapanel Titan Safety Fencing unless shown otherwise
- Private Field Catchpit
- Retaining Walls specific design zone. (Refer to CMW Geosciences Ltd Geotechnical Completion Report Stage 1A for design requirements)

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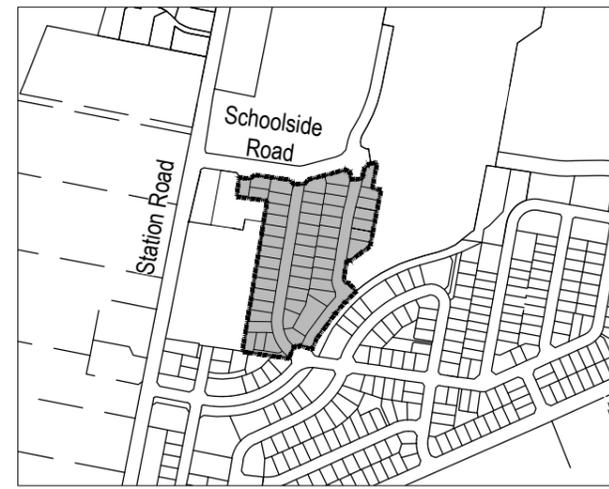
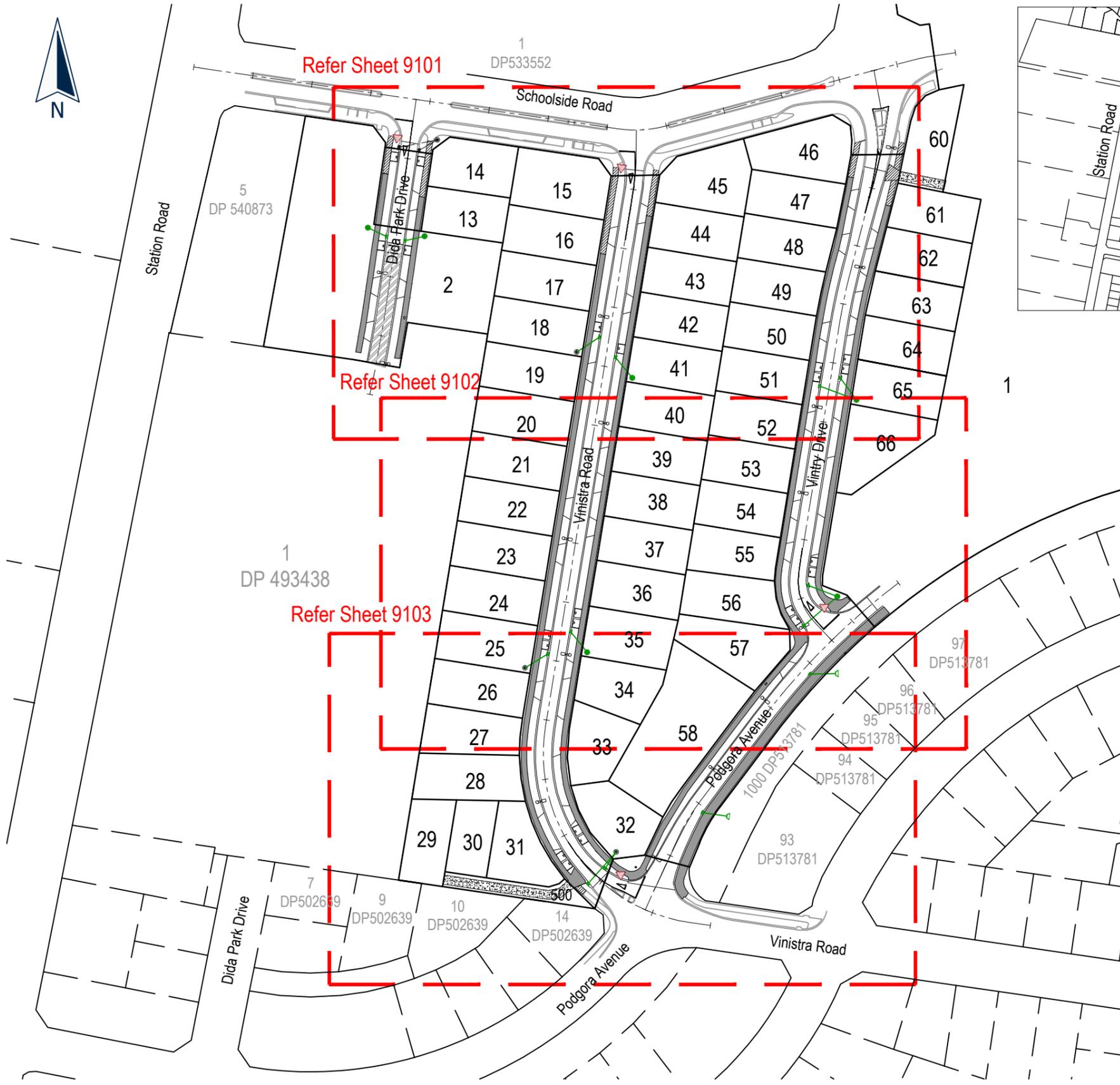
Cabra Developments Ltd
45 Station Road,
Huapai

Retaining Wall Specific Design
As Built Plan
- Stage 1A
(Sheet 4 of 4)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	24/02/2020

FOR COMPLETION

	NAME	DATE
SURVEYED	RKC	12/2019
DESIGNED		
DRAWN	RKC	03/12/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/12/2019	1:500	A3
DRAWING NO.	REVISION	
42356-DR-SU-9021	0	



Location Diagram
Scale 1:10,000

Road As Built Legend

- New Stormwater Manhole & Pipeline
- Existing Stormwater Manhole & Pipeline
- Stormwater Cesspit (Semi recessed)
- Concrete Footpath
- Rain Garden (RG)
- Exposed Concrete Parking Bay
- Street Light
Cree XSP1 IP66 T3ME 45W system 4000k version C on Vicpole Porchester 8m pole and 1m arm 0deg tilt (1m setback).
- Underchannel drain
- Grade 4 Chip seal only

ENG60068582 / SUB60035794

NOTES

GENERAL

1. Levels are in terms of LINZ Datum 1946.
2. Coordinates are in terms of NZTM.
3. All infrastructure is public unless otherwise shown.

Road Footpaths

1.8m wide, 100mm 20MPa concrete on 100mm GAP40 bedding

Parking Bays

175mm 20 MPa exposed concrete with 4kg/m² black oxide, 1 layer of 665 mesh on 100mm GAP 65 Subbase

Roads

Subgrade - Stabilised with 12kg/m² of lime
Subbase - 200mm GAP65
Basecourse - 150mm TNZ AP40
Seal - 40mm DG10 hotmix on grade 4 chipseal membrane

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

Signed: Registered Professional Surveyor

Date:

Name: Mark Parker

Phone: (09) 427 0072

Email: markp@catobolam.co.nz

Streetlight Coordinate Table

Name	mN	mE
SL1	5928852.08	1737245.15
SL2	5928882.84	1737242.25
SL3	5928866.89	1737316.15
SL4	5928830.78	1737318.11
SL5	5928792.64	1737302.57
SL6	5928753.53	1737304.02
SL7	5928704.44	1737292.15
SL8	5928685.51	1737330.64
SL9	5928715.21	1737350.34
SL10	5928738.02	1737368.21
SL11	5928761.17	1737381.52
SL12	5928806.59	1737381.92
SL13	5928835.33	1737387.12
SL14	5928881.42	1737404.86
SL15	5928921.20	1737416.14

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	19-02-2020

SURVEYED	NAME	DATE
DESIGNED	RKC	12/2019
DRAWN	RKC	03/12/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/12/2019	1:1500	A3

FOR COMPLETION

DRAWING NO. **42356-DR-SU-9100** REVISION **0**



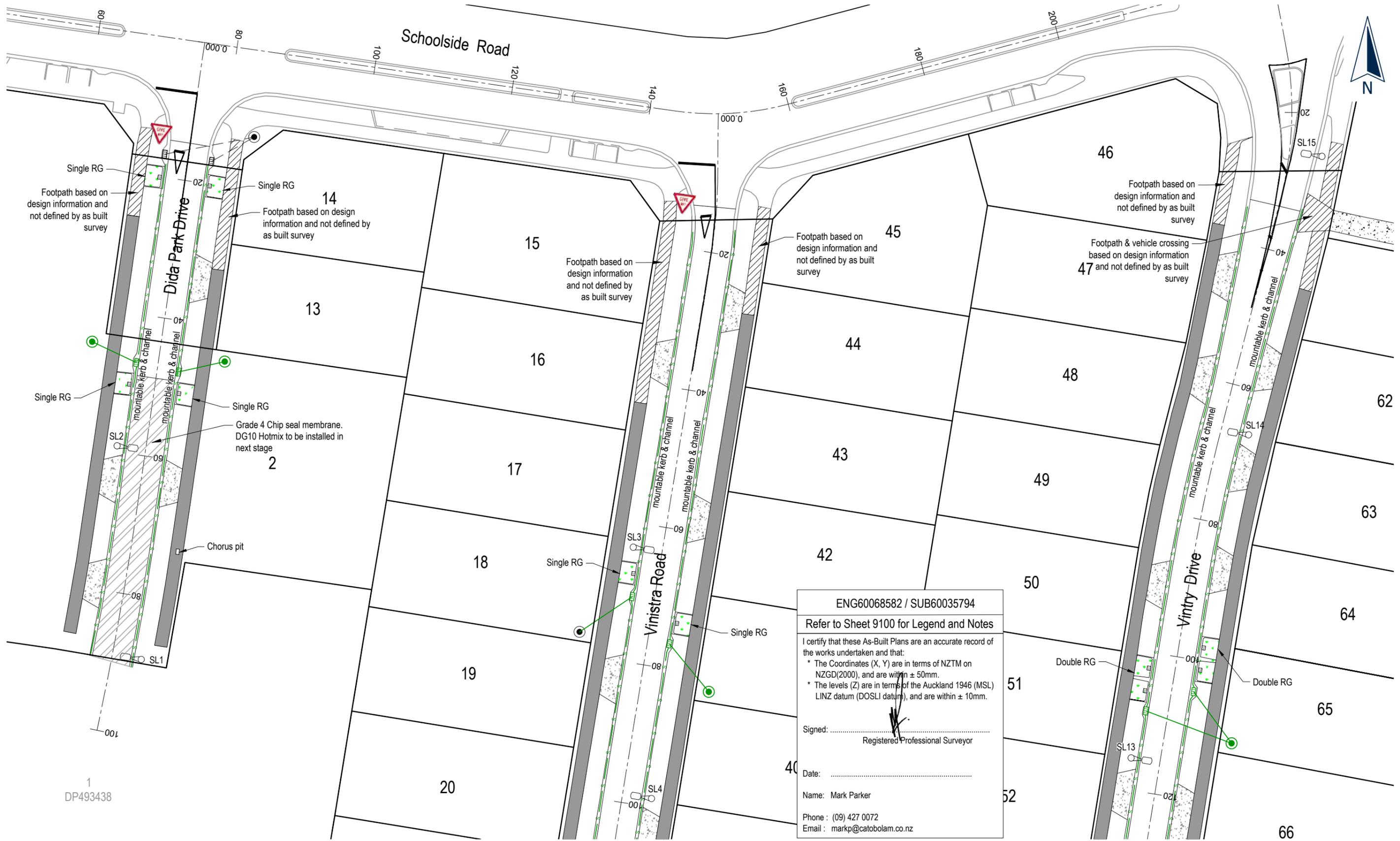
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Cabra Developments Ltd
45 Station Road,
Huapai

Roading As Built Plan
- Stage 1A
(Overall Plan)



ENG60068582 / SUB60035794

Refer to Sheet 9100 for Legend and Notes

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Signed: _____
Registered Professional Surveyor

Date: _____

Name: Mark Parker

Phone: (09) 427 0072
Email: markp@catobolam.co.nz

1
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45 Station Road,
Huapai

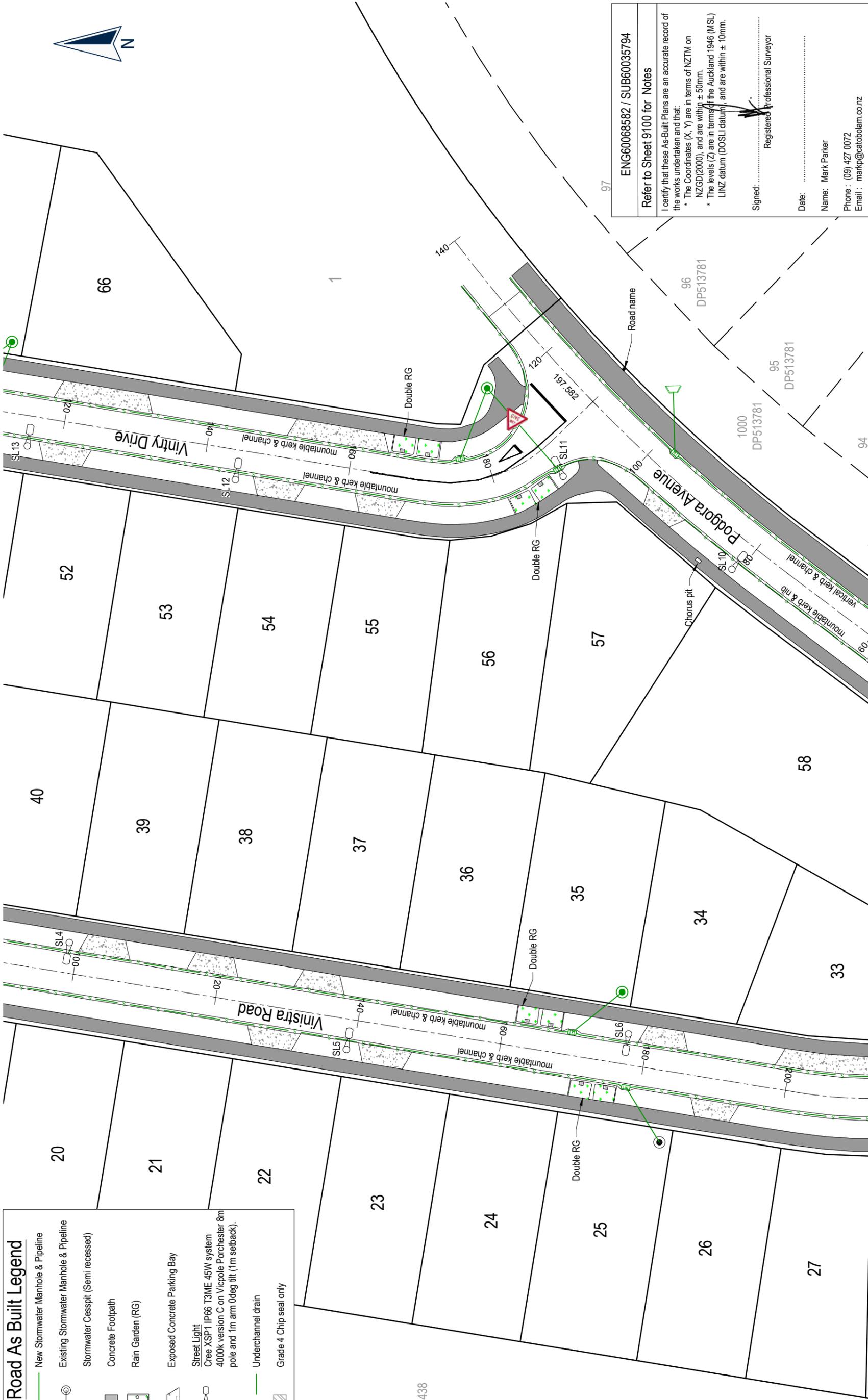
Roading
As Built Plan
- Stage 1A
(Sheet 1 of 3)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	19-02-2020

FOR COMPLETION

	NAME	DATE
SURVEYED		
DESIGNED		
DRAWN	RKC	03/12/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/12/2019	1:500	A3
DRAWING NO.	REVISION	
42356-DR-SU-9101	0	

Road As Built Legend	
	New Stormwater Manhole & Pipeline
	Existing Stormwater Manhole & Pipeline
	Stormwater Cesspit (Semi recessed)
	Concrete Footpath
	Rain Garden (RG)
	Exposed Concrete Parking Bay
	Street Light Cree XSP1 IP66 T3ME 45W system 4000k version C on Vicolite Porchester 8m pole and 1m arm 0deg tilt (1m setback).
	SL#
	Underchannel drain
	Grade 4 Chip seal only



1
DP493438

ENG60068582 / SUB60035794

Refer to Sheet 9100 for Notes

I certify that these As-Built Plans are an accurate record of the works undertaken and that:

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

Signed: Registered Professional Surveyor

Date:

Name: Mark Parker

Phone : (09) 427 0072

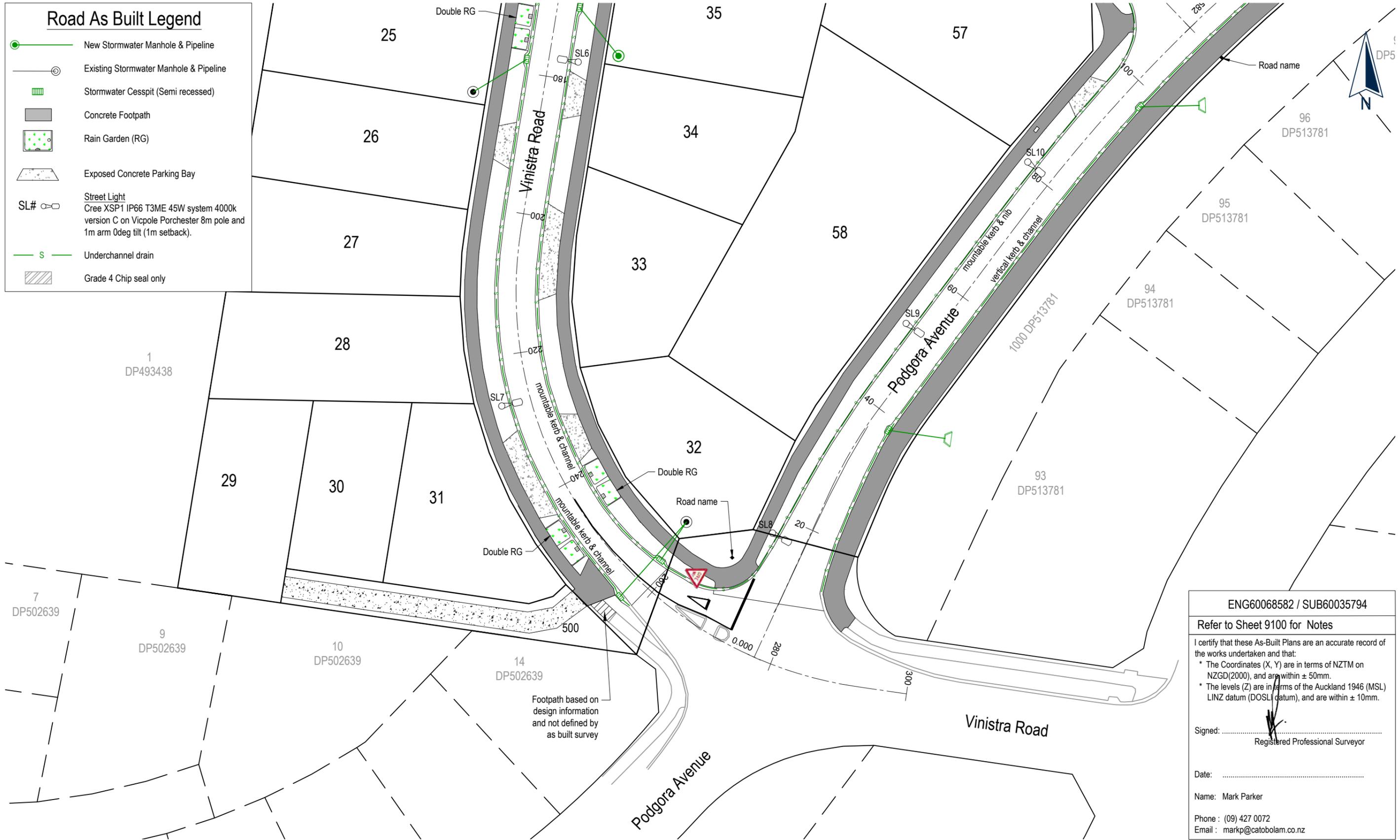
Email : markp@catobolam.co.nz

No. REVISION (DESCRIPTIONS)	NAME	DATE
0 Issue for As-Built Completion	DL	19-02-2020

SURVEYED	NAME	DATE
DESIGNED		
DRAWN	RKC	03/12/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/12/2019	1:500	A3
DRAWING NO.	REVISION	
42356-DR-SU-9102	0	

Road As Built Legend

-  New Stormwater Manhole & Pipeline
-  Existing Stormwater Manhole & Pipeline
-  Stormwater Cesspit (Semi recessed)
-  Concrete Footpath
-  Rain Garden (RG)
-  Exposed Concrete Parking Bay
-  Street Light
Cree XSP1 IP66 T3ME 45W system 4000k version C on Vicpole Porchester 8m pole and 1m arm 0deg tilt (1m setback).
-  Underchannel drain
-  Grade 4 Chip seal only



ENG60068582 / SUB60035794

Refer to Sheet 9100 for Notes

I certify that these As-Built Plans are an accurate record of the works undertaken and that:

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Signed: 
Registered Professional Surveyor

Date:

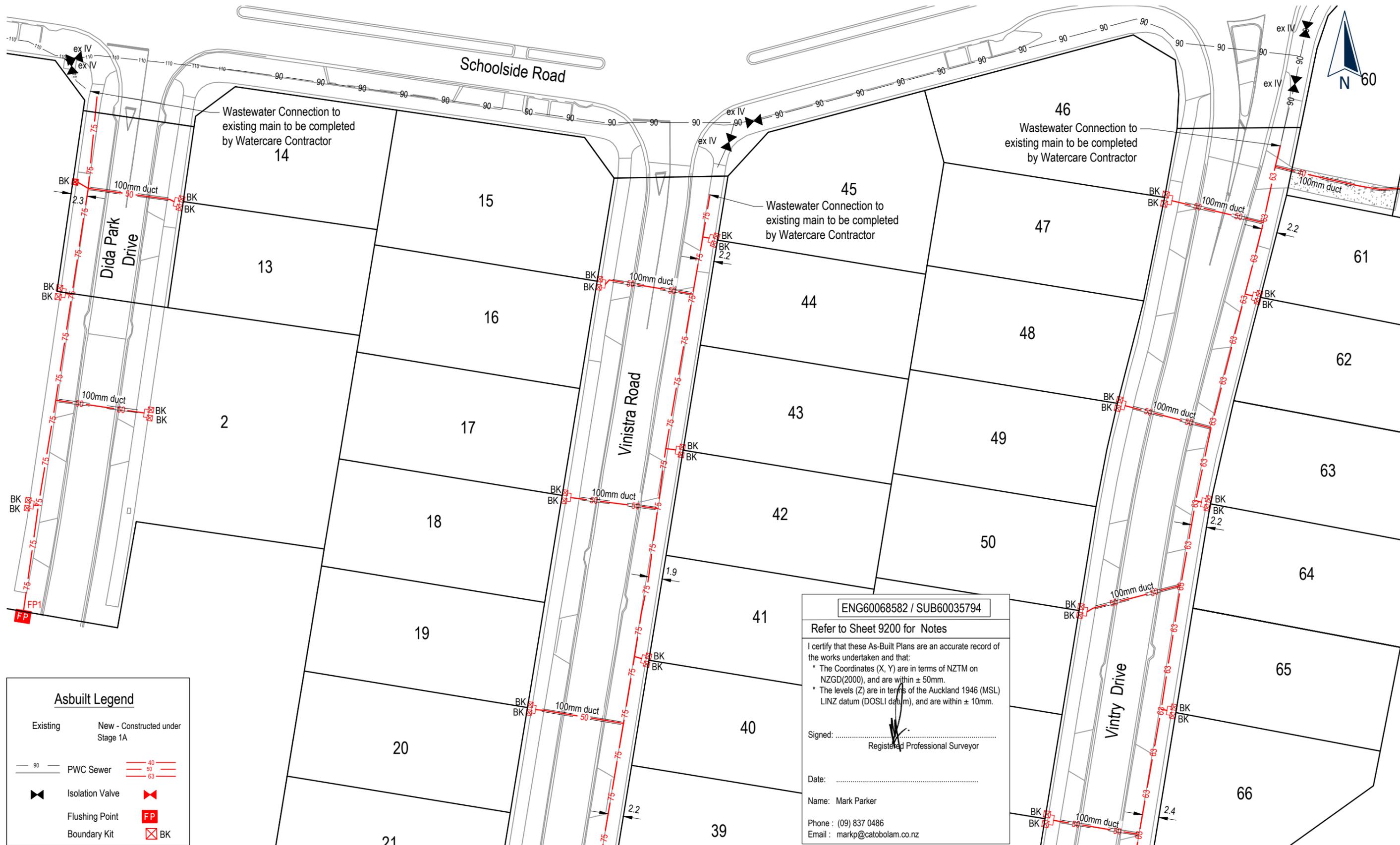
Name: Mark Parker

Phone : (09) 427 0072
Email : markp@catobolam.co.nz

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	19/02/2020

FOR COMPLETION

	NAME	DATE
SURVEYED	RKC	12/2019
DESIGNED		
DRAWN	RKC	03/12/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/12/2019	1:500	A3
DRAWING NO.	REVISION	
42356-DR-SU-9103	0	



Asbuilt Legend

Existing	New - Constructed under Stage 1A
90	PWC Sewer
Isolation Valve	Flushing Point
Boundary Kit	Boundary Kit
	40
	50
	63
	FP
	BK

ENG60068582 / SUB60035794

Refer to Sheet 9200 for Notes

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Signed: 
Registered Professional Surveyor

Date:

Name: Mark Parker

Phone : (09) 837 0486
Email : markp@catobolam.co.nz



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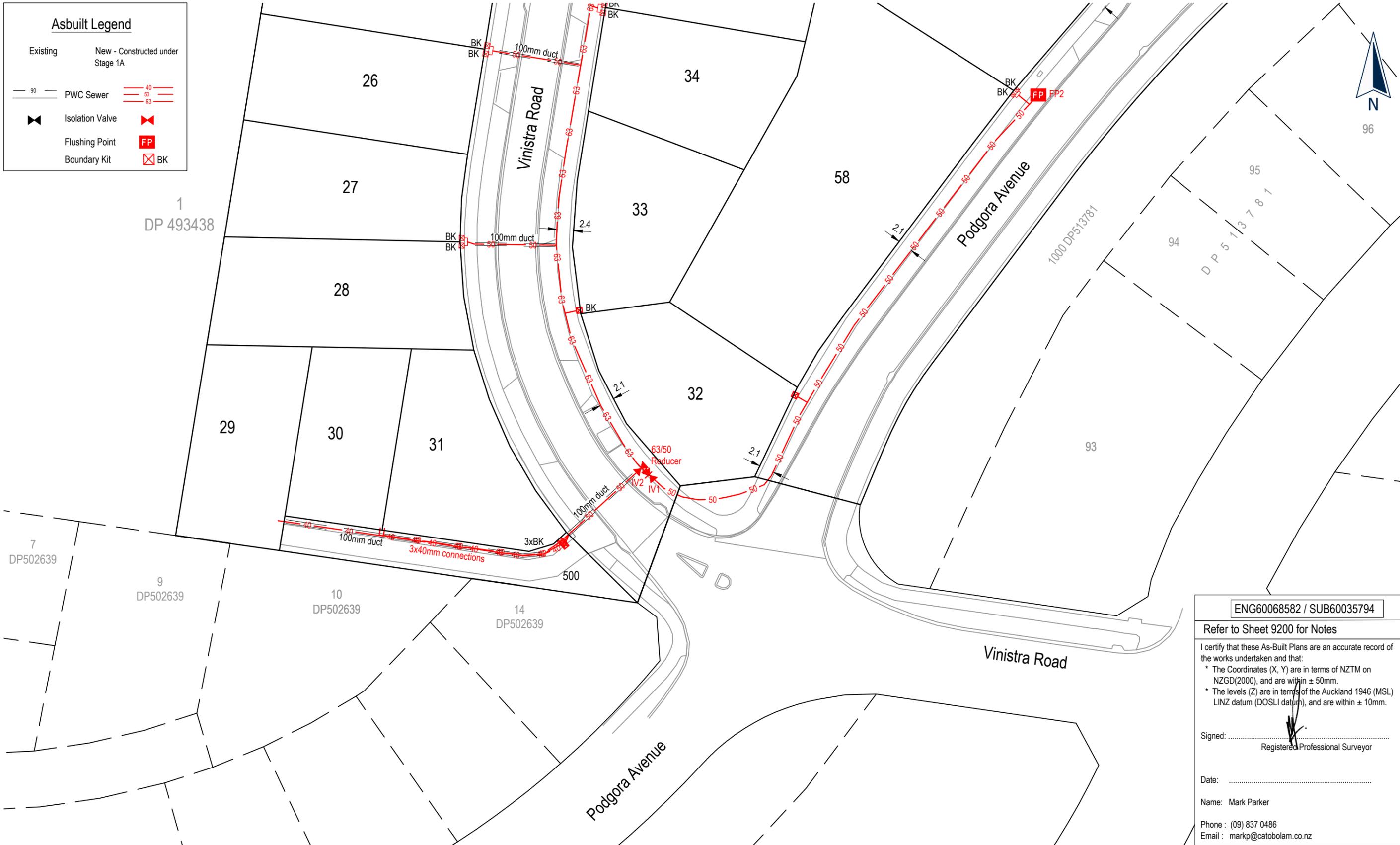
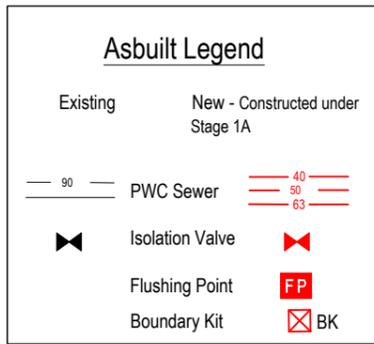
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Wastewater As Built Plan
- Stage 1A
(Sheet 1 of 3)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	19/02/2020

FOR COMPLETION

SURVEYED	DESIGNED	DRAWN	DATE	ORIGINAL SCALE	ORIGINAL SIZE	NAME	DATE
			03/12/2019	1:1500	A3	RKC	12/2019
DRAWING NO. 42356-DR-SU-9201						REVISION	0



ENG60068582 / SUB60035794

Refer to Sheet 9200 for Notes

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Signed: 
Registered Professional Surveyor

Date:

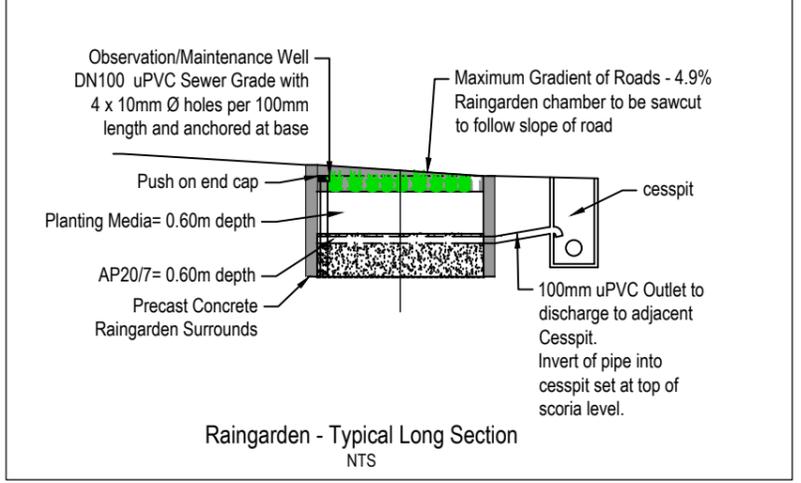
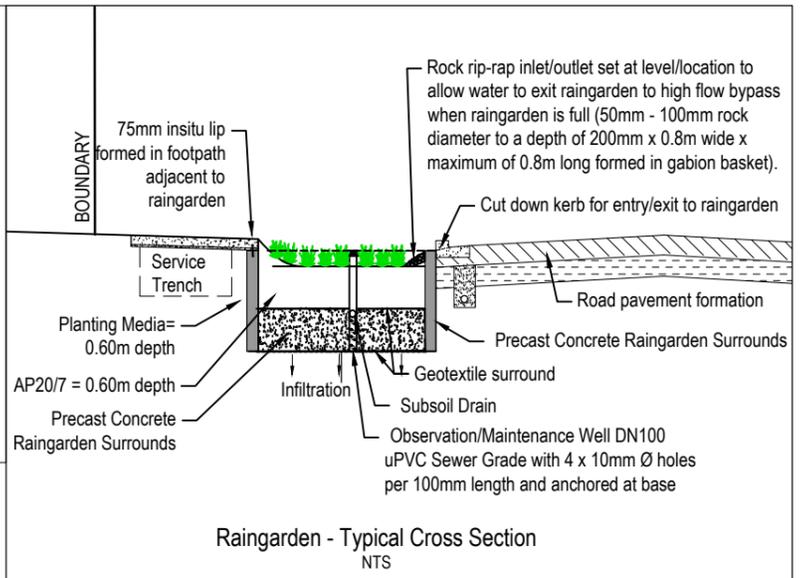
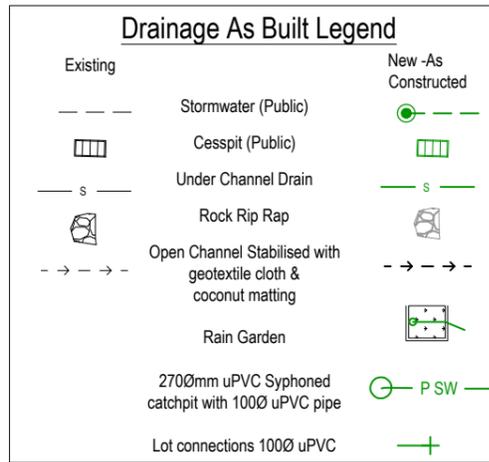
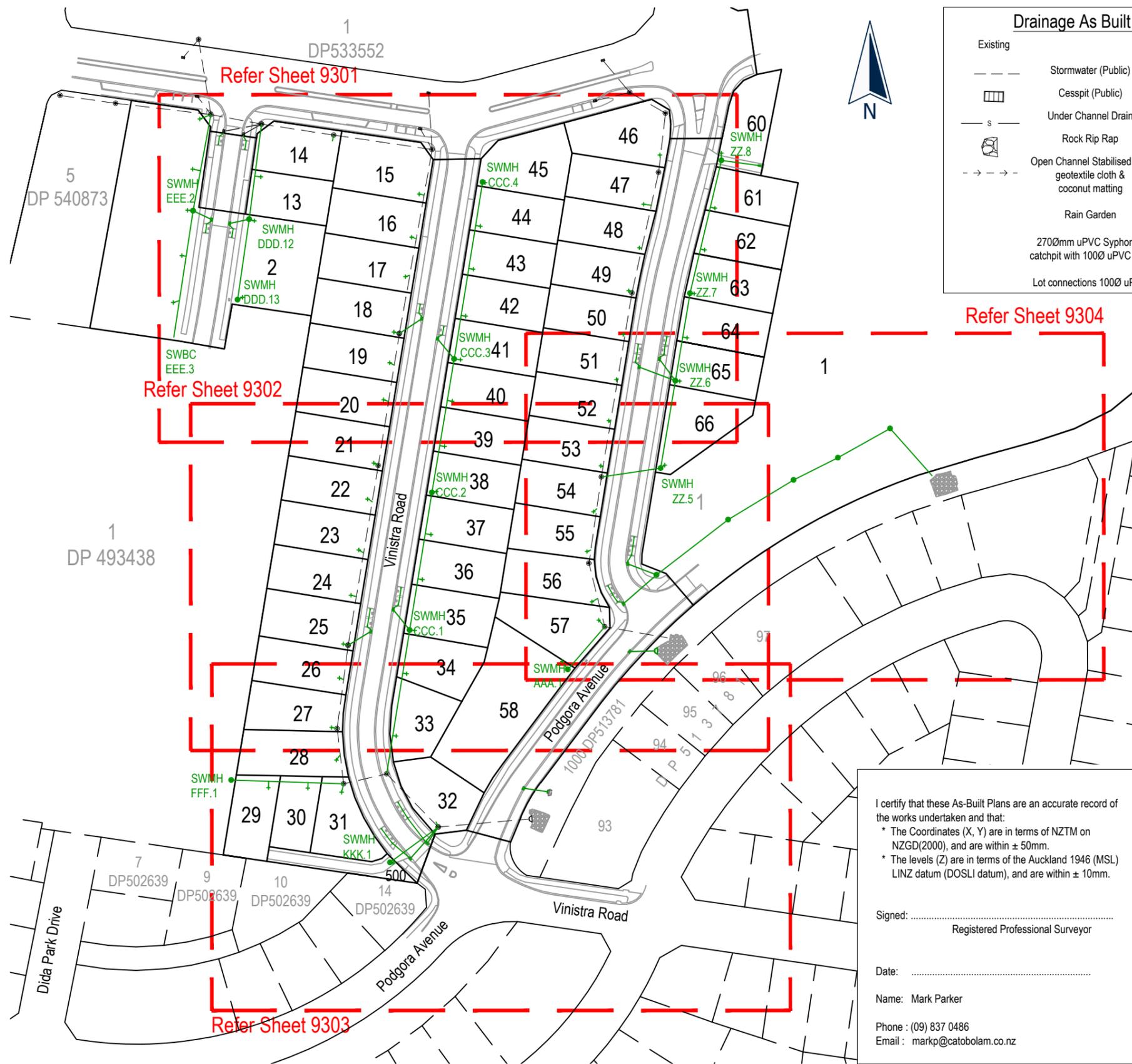
Name: Mark Parker

Phone : (09) 837 0486
Email : markp@catobolam.co.nz

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	19/02/2020

FOR COMPLETION

SURVEYED	DESIGNED	DRAWN	DATE	ORIGINAL SCALE	ORIGINAL SIZE	NAME	DATE
			03/12/2019	1:500	A3	RKC	12/2019
DRAWING NO. 42356-DR-SU-9203						REVISION	0



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

Signed:
Registered Professional Surveyor

Date:

Name: Mark Parker

Phone : (09) 837 0486
Email : markp@catobolam.co.nz



- ### NOTES
- #### GENERAL
- Levels are in terms of LINZ Datum 1946.
 - Coordinates are in terms of NZTM.
 - All infrastructure is public unless otherwise shown.
- #### STORMWATER
- All pipes are Class 4 reinforced concrete rubber ring jointed (RCRRJ), unless otherwise shown.
 - All manholes are 1050mmØ concrete flange base and riser, unless otherwise shown.
 - Bedding is H2 type unless otherwise stated.
 - All catchpits are 675mm x 450mm cycle friendly grate lids semi recessed unless otherwise shown.
 - For house connection boundary offsets, see Sheet 5.
 - House connections 100Ø uPVC SN16
 - All Private retaining wall outlets are 100uPVC SN16 unless otherwise shown.
 - Refer to Sheet 9305 for private drainage details



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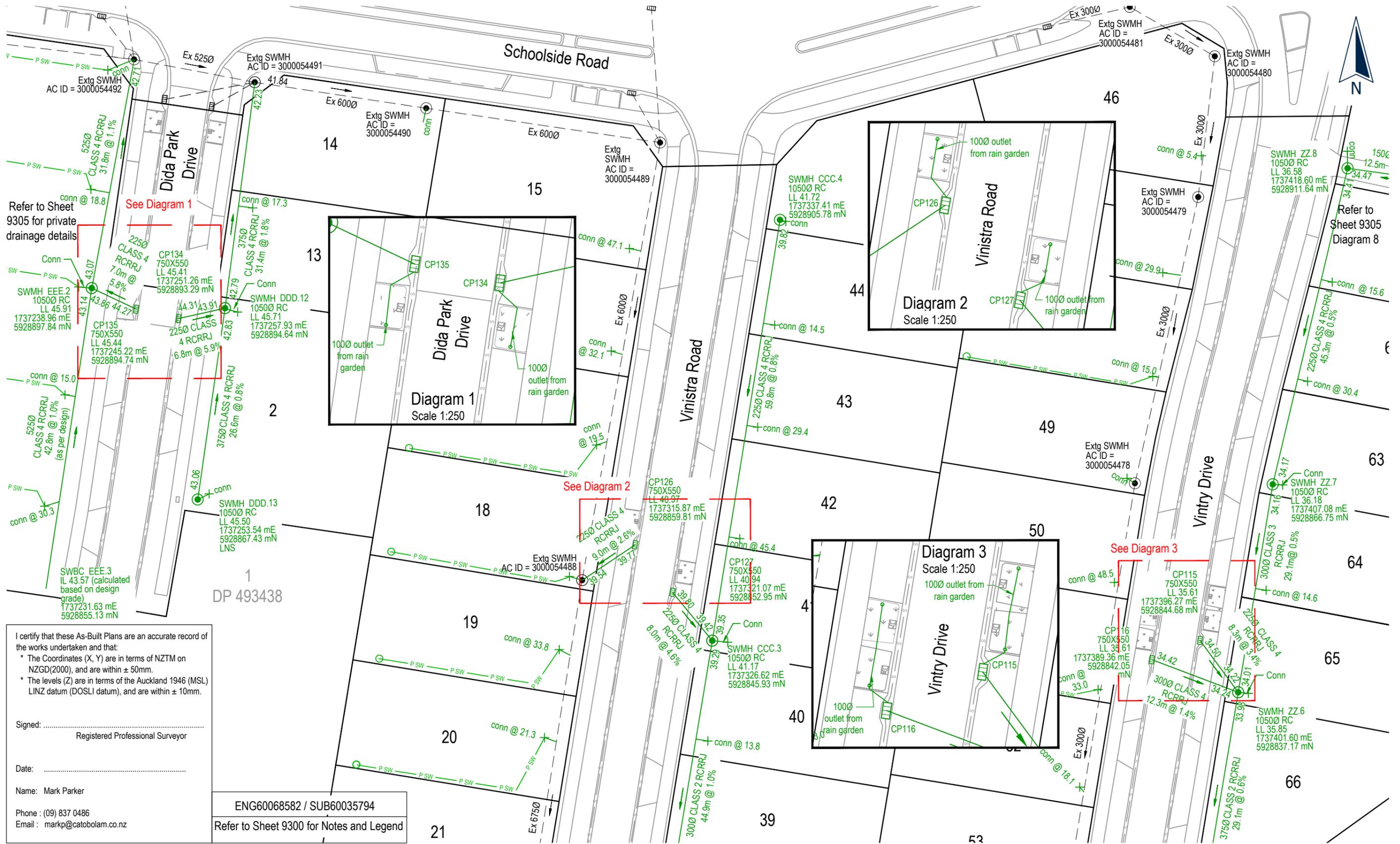
Stormwater As Built Plan
- Stage 1A
(Overall Sheet)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issued for As-Built Completion	DL	21/02/2020
1	Pipe lengths amended	DL	04/03/2020

	NAME	DATE
SURVEYED	RKC	12/2019
DESIGNED		
DRAWN	RKC	12/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/12/2019	1:1500	A3

FOR COMPLETION

DRAWING NO. 42356-DR-SU-9300 REVISION 1



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

Signed: _____
Registered Professional Surveyor

Date: _____

Name: Mark Parker

Phone : (09) 837 0486
Email : markp@catobolam.co.nz

ENG60068582 / SUB60035794
Refer to Sheet 9300 for Notes and Legend



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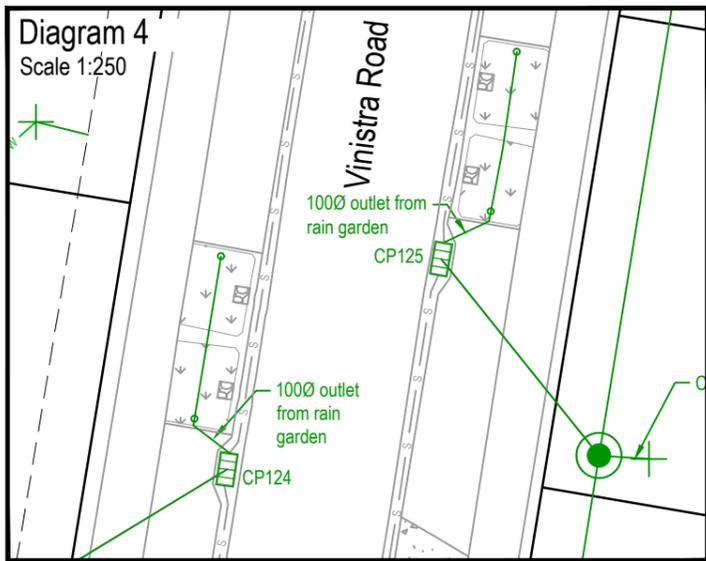
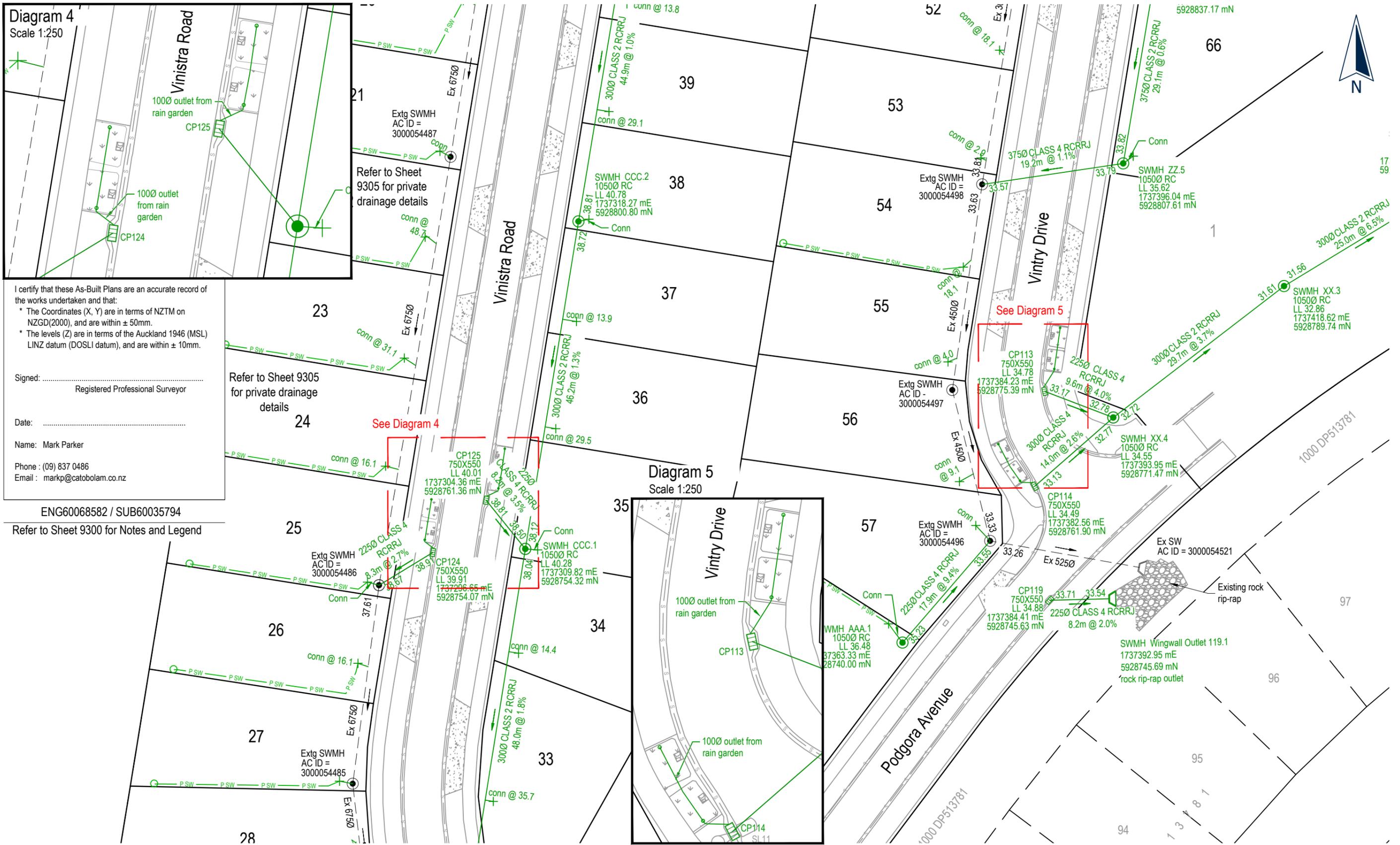
Stormwater As Built Plan
- Stage 1A
(Sheet 1 of 6)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issued for As-Built Completion	DL	21/02/2020
1	Pipe lengths amended	DL	04/03/2020

FOR COMPLETION

SURVEYED	DESIGNED	DRAWN	DATE	ORIGINAL SCALE	ORIGINAL SIZE	NAME	DATE
			03/12/2019	1:500	A3	RKC	12/2019

DRAWING NO.	42356-DR-SU-9301	REVISION	1
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- * The levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within ± 10mm.

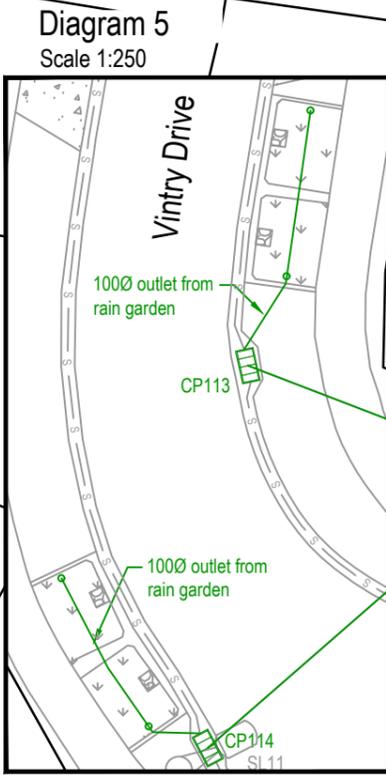
Signed:
Registered Professional Surveyor

Date:

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Phone : (09) 837 0486
Email : markp@catobolam.co.nz

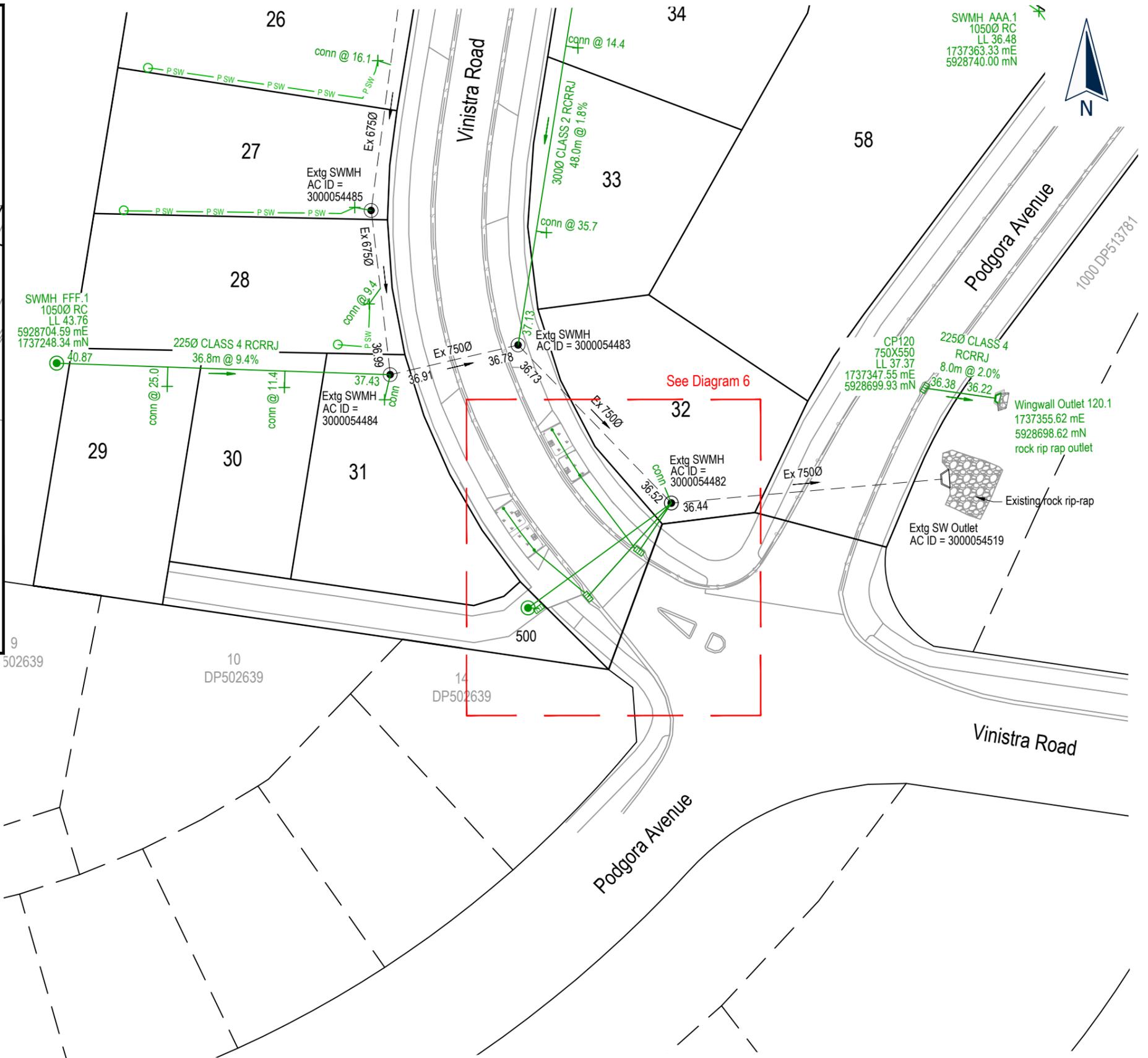
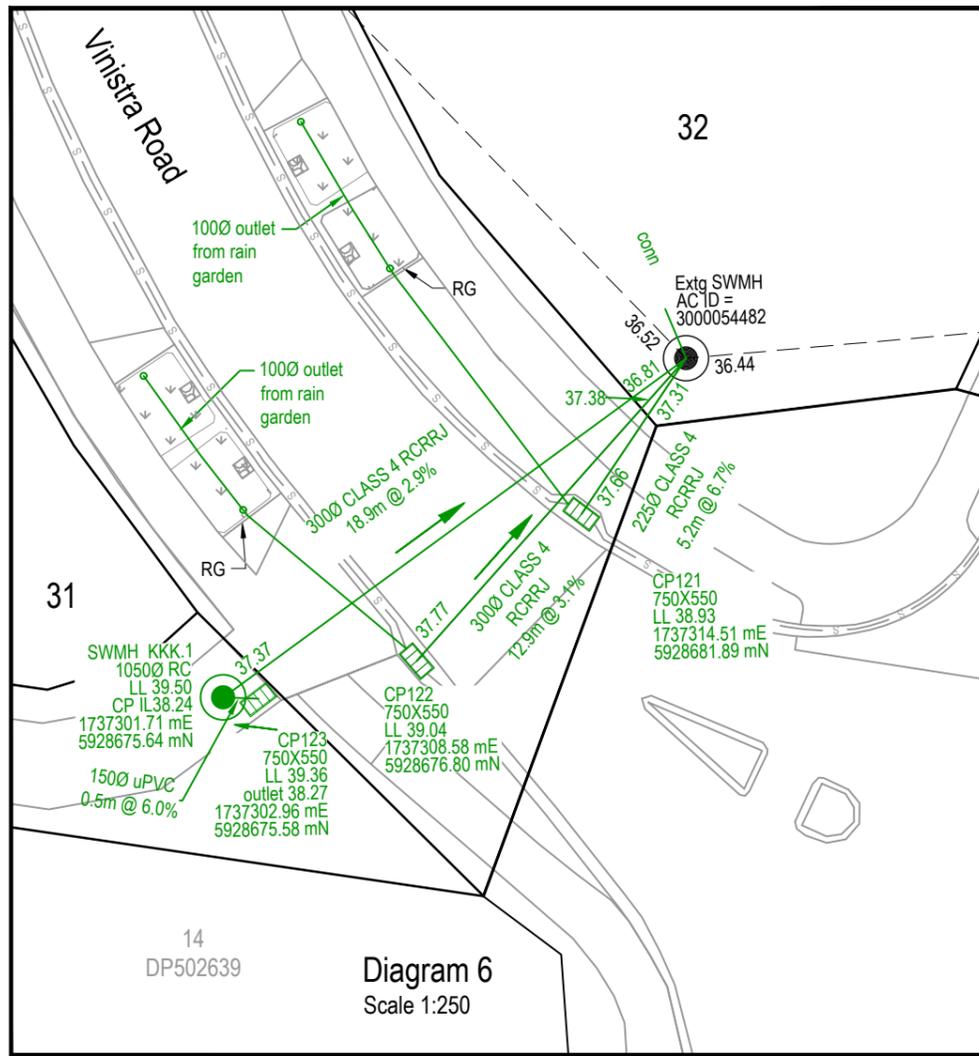
ENG60068582 / SUB60035794
Refer to Sheet 9300 for Notes and Legend



No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issued for As-Built Completion	DL	21/02/2020
1	Pipe lengths amended	DL	04/03/2020

FOR COMPLETION

		NAME	DATE
SURVEYED		RKC	12/2019
DESIGNED			
DRAWN		RKC	12/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE	
03/12/2019	1:500	A3	
DRAWING NO.		REVISION	
42356-DR-SU-9302		1	



ENG60068582 / SUB60035794
 Refer to Sheet 9300 for Notes and Legend

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

Signed:
 Registered Professional Surveyor

Date:

Name: Mark Parker
 Phone : (09) 837 0486
 Email : markp@catobolam.co.nz



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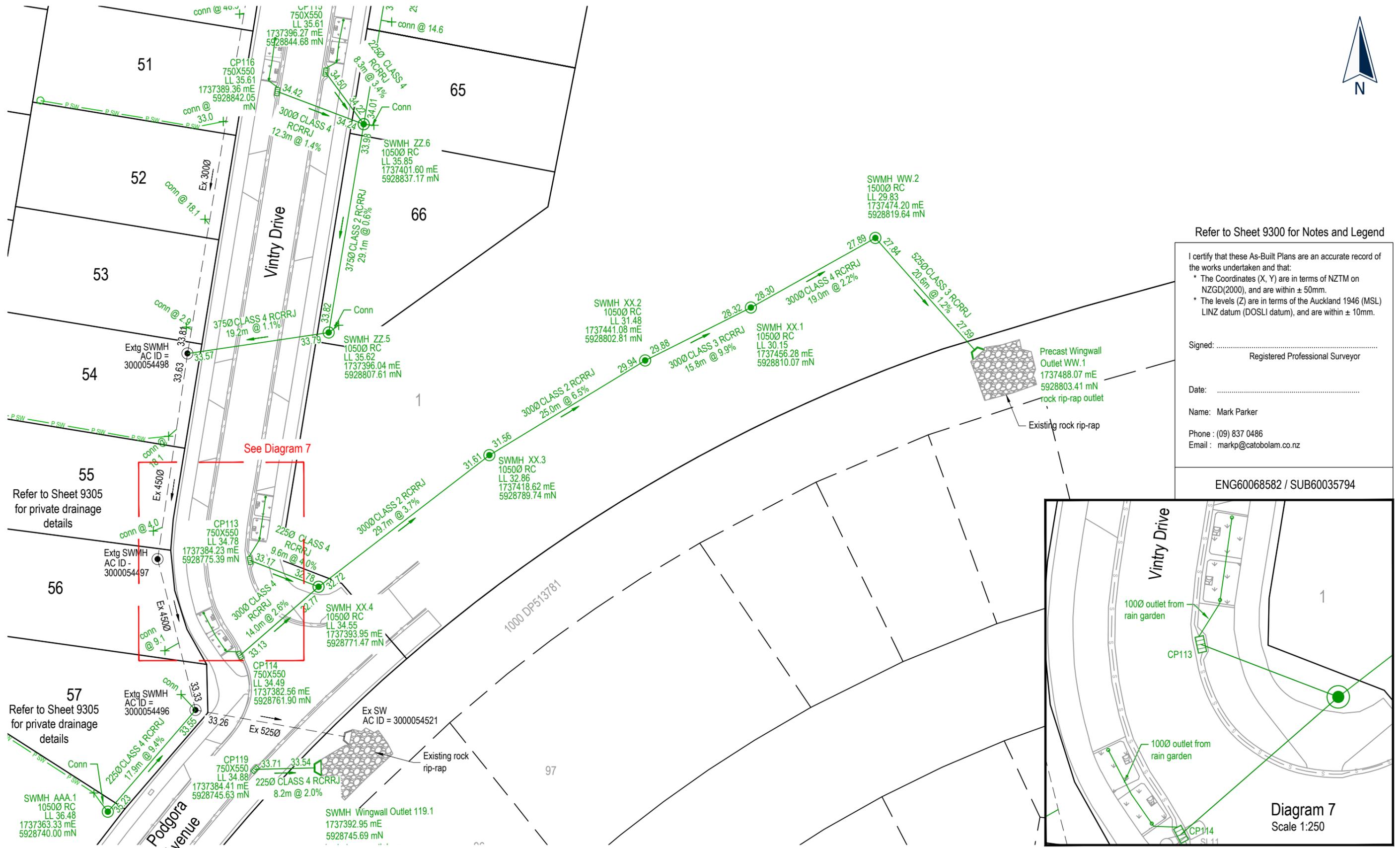
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 45 Station Road,
 Huapai

Stormwater As Built Plan
 - Stage 1A
 (Sheet 3 of 6)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issued for As-Built Completion	DL	21/02/2020
1	Pipe lengths amended	DL	04/03/2020

FOR COMPLETION

	NAME	DATE
SURVEYED	RKC	12/2019
DESIGNED		
DRAWN	RKC	12/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/12/2019	1:500	A3
DRAWING NO.	42356-DR-SU-9303	REVISION
		1

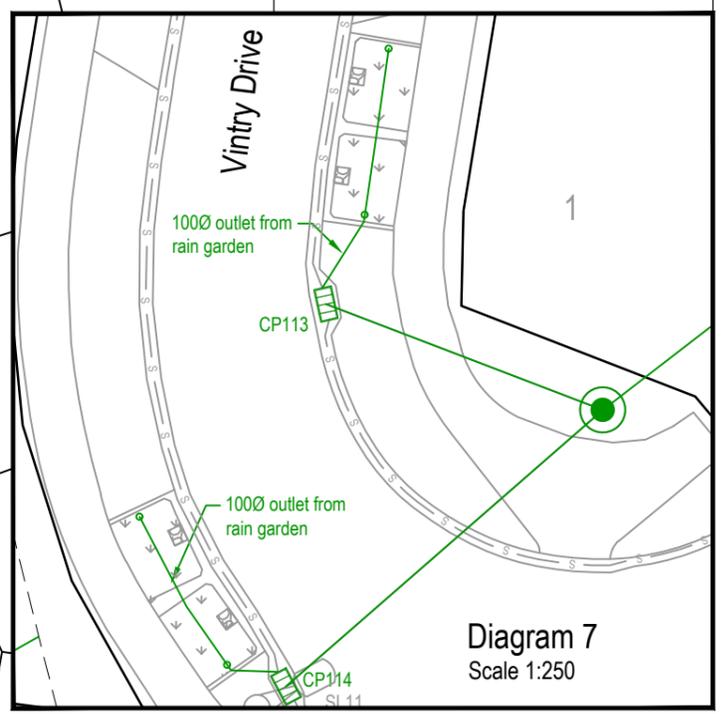


Refer to Sheet 9300 for Notes and Legend

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Signed:
 Registered Professional Surveyor
 Date:
 Name: Mark Parker
 Phone : (09) 837 0486
 Email : markp@catobolam.co.nz

ENG60068582 / SUB60035794



55 Refer to Sheet 9305 for private drainage details

57 Refer to Sheet 9305 for private drainage details

See Diagram 7



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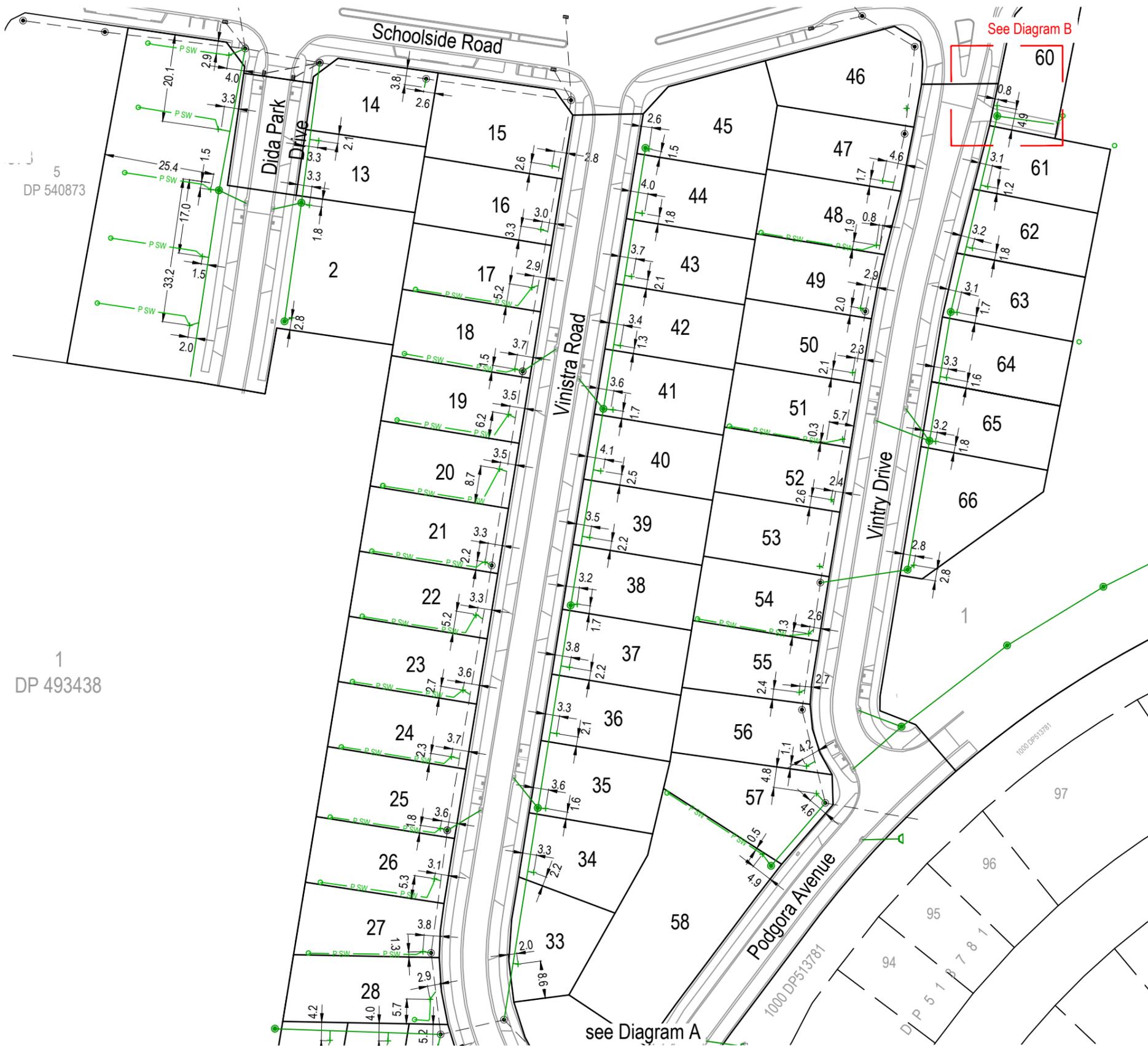
Cabra Developments Ltd
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Stormwater As Built Plan
 - Stage 1A
 (Sheet 4 of 6)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issued for As-Built Completion	DL	21/02/2020
1	Pipe lengths amended	DL	04/03/2020

FOR COMPLETION

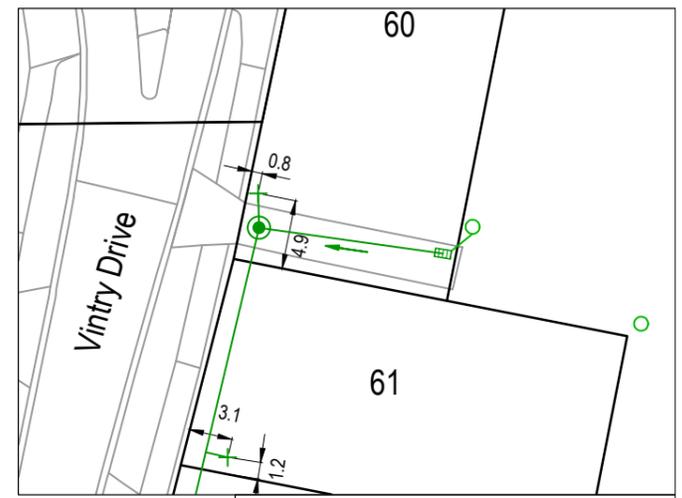
SURVEYED	DESIGNED	DRAWN	DATE	ORIGINAL SCALE	ORIGINAL SIZE	NAME	DATE
			03/12/2019	1:500	A3	RKC	12/2019
DRAWING NO.			42356-DR-SU-9304		REVISION		
					1		



See Diagram B



Diagram 8
Scale 1:500



Refer to Sheet 9300 for Notes and Legend

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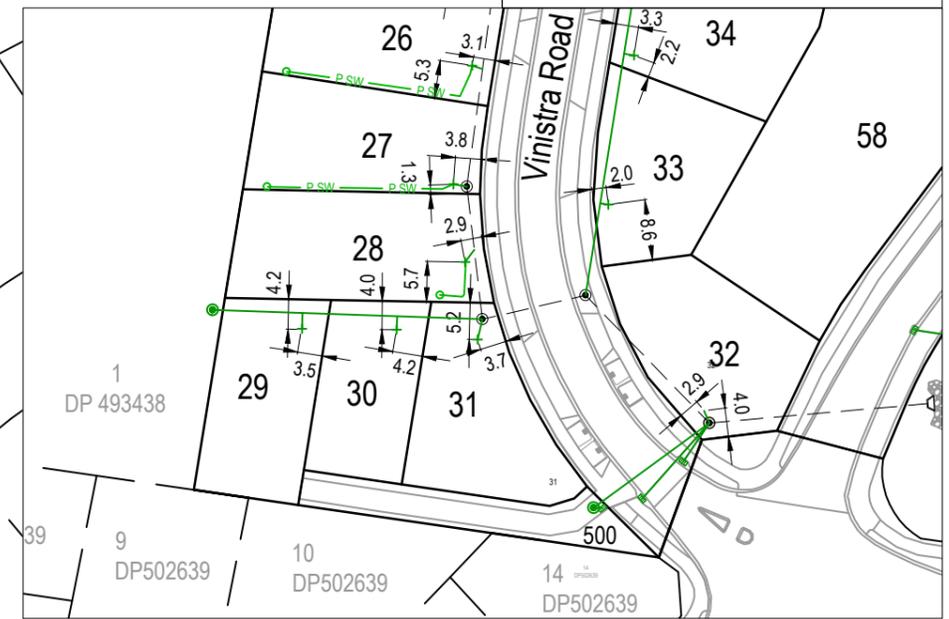
Signed:
Registered Professional Surveyor

Date:

Name: Mark Parker

Phone : (09) 837 0486
Email : markp@catobolam.co.nz

Diagram A



5
DP 540873

1
DP 493438

see Diagram A

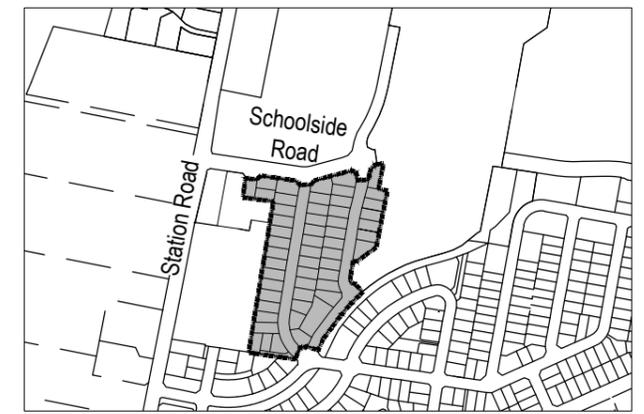
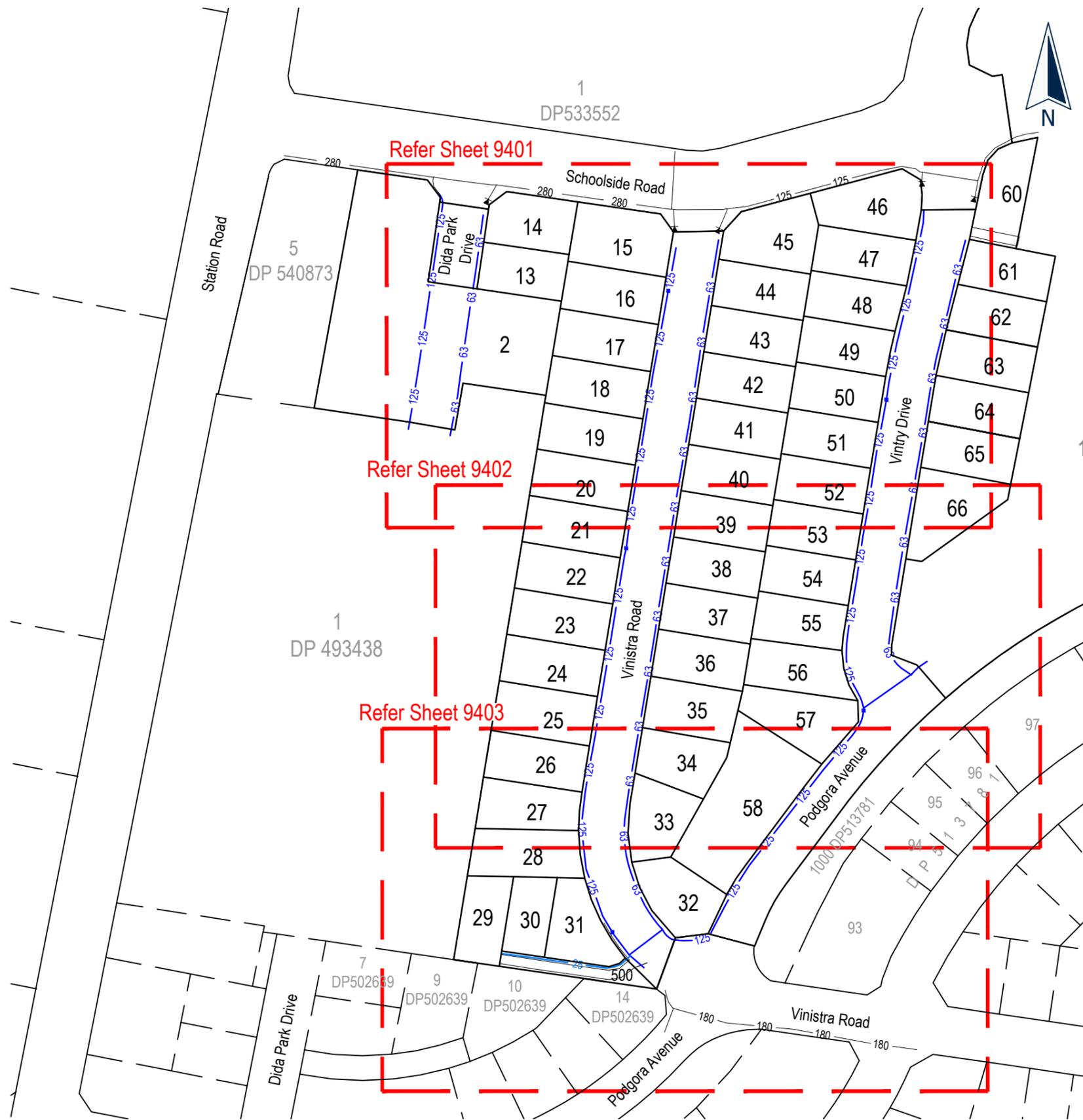
No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issued for As-Built Completion	DL	21/02/2020
1	Pipe lengths amended	DL	04/03/2020

SURVEYED	NAME	DATE
DESIGNED	RKC	12/2019
DRAWN	RKC	12/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/12/2019	1:1000	A3

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DRAWING NO. **42356-DR-SU-9305** REVISION **1**

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Location Diagram

Scale 1:10,000

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Signed: Registered Professional Surveyor

Date:

Name: Mark Parker

Phone : (09) 837 0486

Email : markp@catobolam.co.nz

NOTES

GENERAL

- Coordinates are in terms of NZTM 2000.

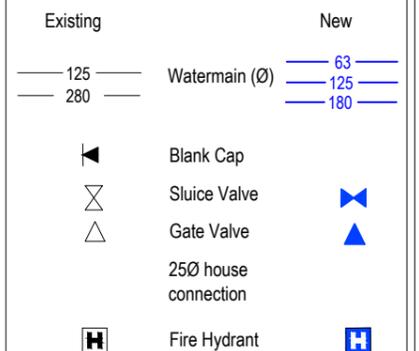
WATER RETICULATION

- Cover for water reticulation.
 - Mains under grass berms and footpaths 600mm
 - Mains under road carriageway 900mm
- Watermain 125, 180 & 280 OD - PE100 PN12.5
- All ridermains 63 OD - PE80 PN12.5
- Stainless Steel bolts and nuts used for flanged connections.
- Metallic Detector Tape provided above all watermains and ridermains

ENG60068582 / SUB60035794

Water Supply Coordinate Table		
Name	mN	mE
SV41	5928686.67	1737297.07
SV43	5928687.48	1737312.81
SV44	5928687.39	1737313.25
SV45	5928758.08	1737379.57
SV46	5928758.41	1737379.86
SV47	5928758.69	1737379.55
SV48	5928768.93	1737395.34
GV9	5928687.92	1737312.87
GV11	5928769.05	1737394.82
Hydrant 1	5928894.59	1737318.77
Hydrant 2	5928811.47	1737303.57
Hydrant 3	5928687.17	1737296.78
Hydrant 4	5928858.04	1737388.88
Hydrant 5	5928757.42	1737379.57

Water Reticulation Legend



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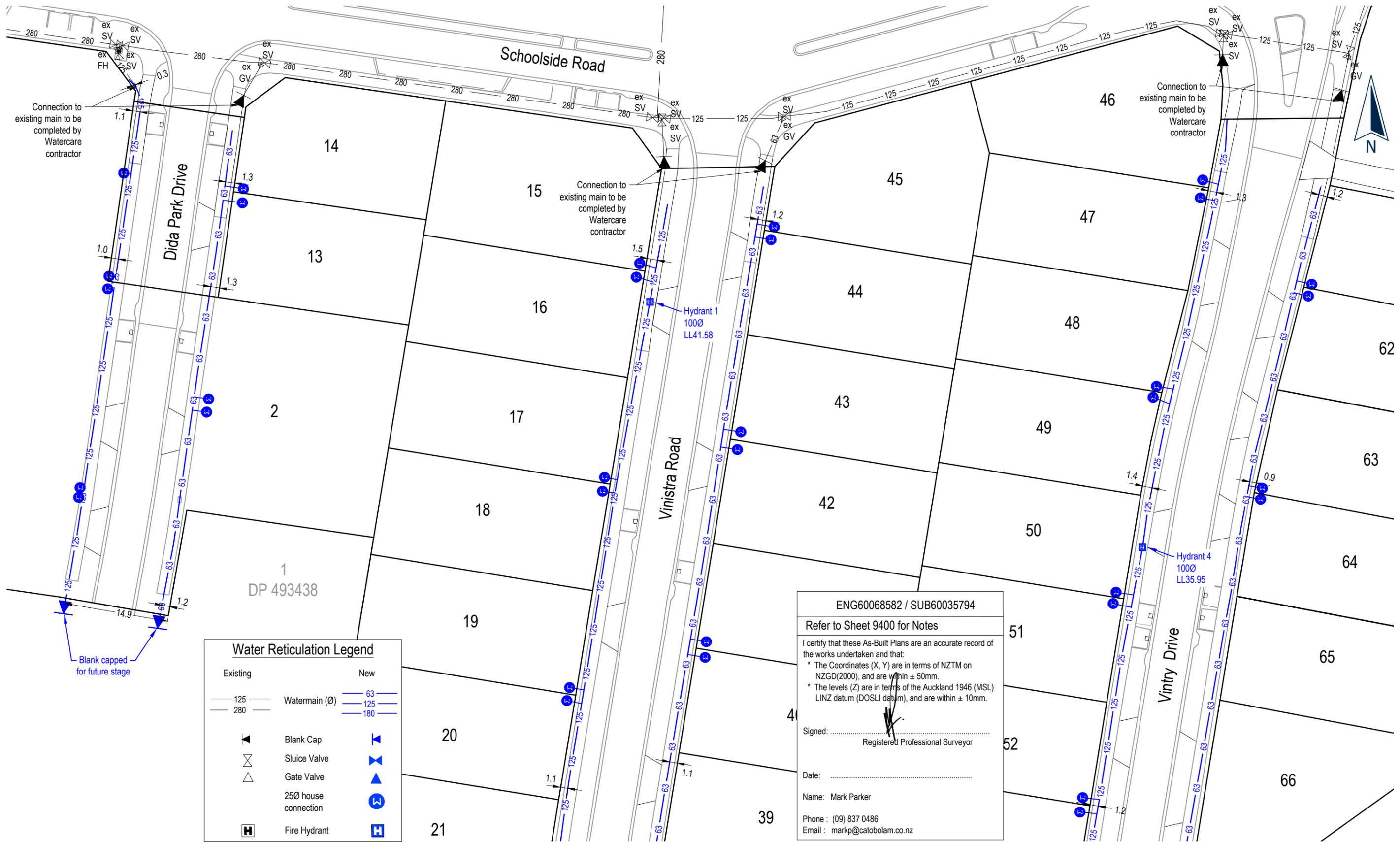
Water Supply As Built Plan
- Stage 1A
(Overall Sheet)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	19/02/2020

FOR COMPLETION

SURVEYED	DESIGNED	DRAWN	DATE	ORIGINAL SCALE	ORIGINAL SIZE	NAME	DATE
			03/12/2019	1:1500	A3	RKC	03/12/2019

DRAWING NO. **42356-DR-SU-9400** REVISION **0**



Water Reticulation Legend

Existing	New
— 125 — Watermain (Ø)	— 63 —
— 280 —	— 125 —
◀ Blank Cap	▶
⊗ Sluice Valve	⊗
△ Gate Valve	▲
25Ø house connection	⊕
⊠ Fire Hydrant	⊠

ENG60068582 / SUB60035794
 Refer to Sheet 9400 for Notes
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Signed: _____
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Date: _____

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 Phone : (09) 837 0486
 Email : markp@catobolam.co.nz



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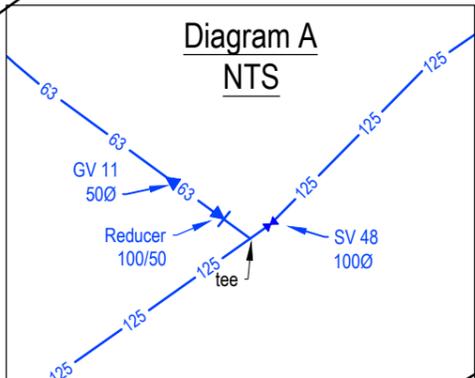
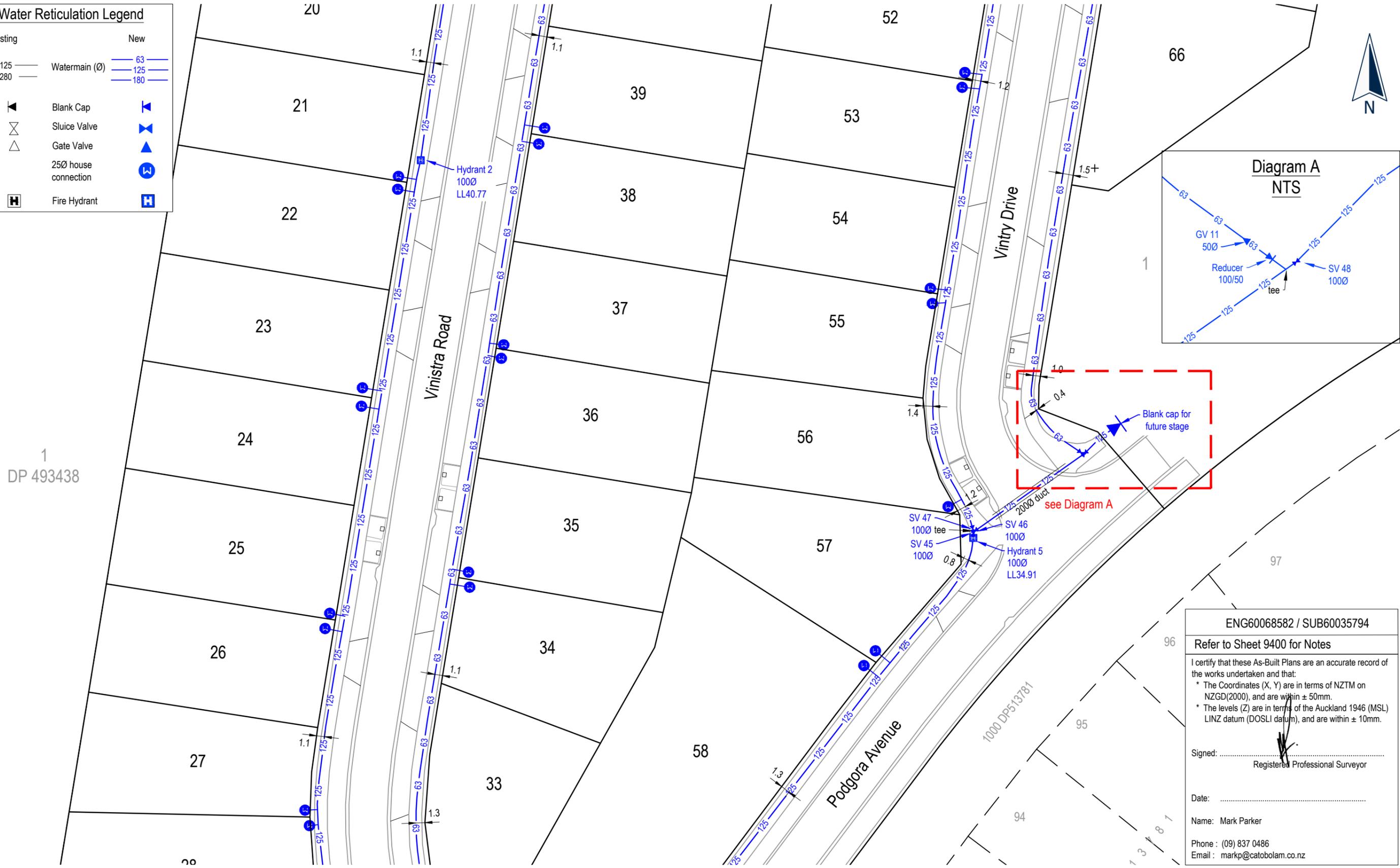
Water Supply As Built Plan
 - Stage 1A
 (Sheet 1 of 3)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	19/02/2020

FOR COMPLETION

	NAME	DATE
SURVEYED	RKC	12/2019
DESIGNED		
DRAWN	RKC	03/12/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/12/2019	1:500	A3
DRAWING NO.	REVISION	
42356-DR-SU-9401	0	

Water Reticulation Legend	
Existing	New
— 125 —	Watermain (Ø)
— 280 —	
◀	Blank Cap
⊗	Sluice Valve
△	Gate Valve
⊕	250 house connection
⊠	Fire Hydrant
— 63 —	
— 125 —	
— 180 —	
▶	
⊗	
△	
⊕	
⊠	



1
DP 493438

ENG60068582 / SUB60035794
 Refer to Sheet 9400 for Notes
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 Signed:
 Registered Professional Surveyor
 Date:
 Name: Mark Parker
 Phone: (09) 837 0486
 Email: markp@catobolam.co.nz



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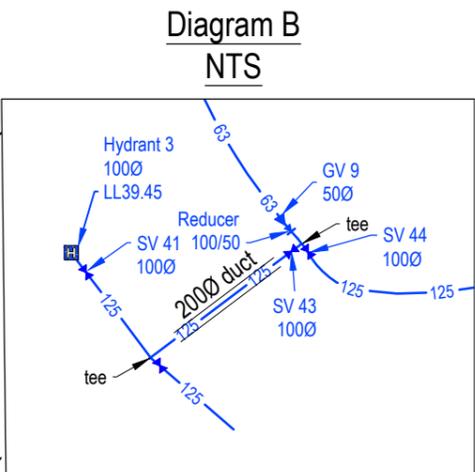
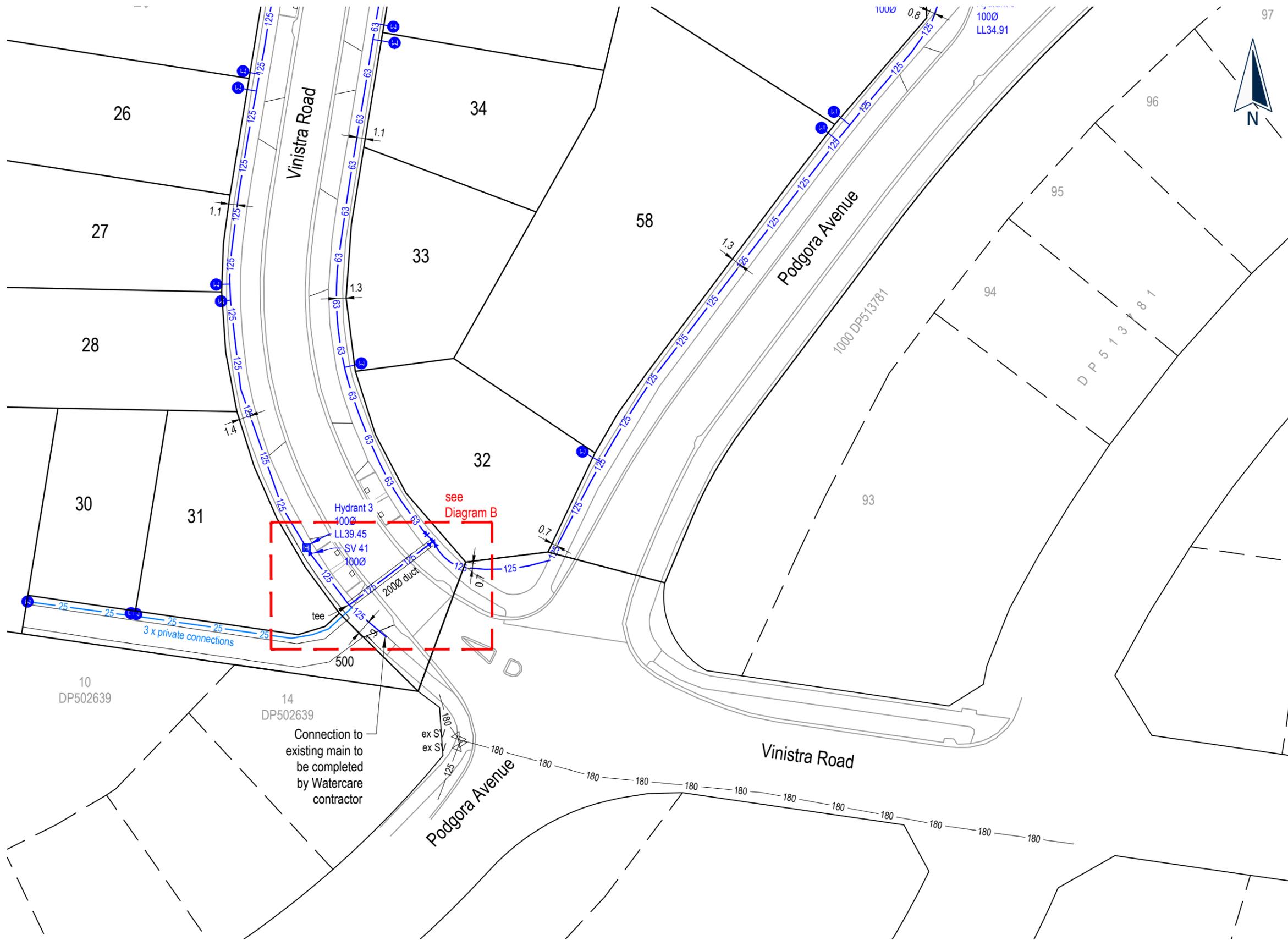
Water Supply As Built Plan
 - Stage 1A
 (Sheet 2 of 3)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	19/02/2020

FOR COMPLETION

SURVEYED	NAME	DATE
DESIGNED	RKC	12/2019
DRAWN	RKC	03/12/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/12/2019	1:500	A3
DRAWING NO.	REVISION	
42356-DR-SU-9402	0	

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Water Reticulation Legend

Existing	New
125	Watermain (Ø) 63
280	125
	180
◀	Blank Cap
⊗	Sluice Valve
△	Gate Valve
⊕	25Ø house connection
⊠	Fire Hydrant

ENG60068582 / SUB60035794

Refer to Sheet 9400 for Notes

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

Signed:
Registered Professional Surveyor

Date:

Name: Mark Parker

Phone : (09) 837 0486
Email : markp@catobolam.co.nz



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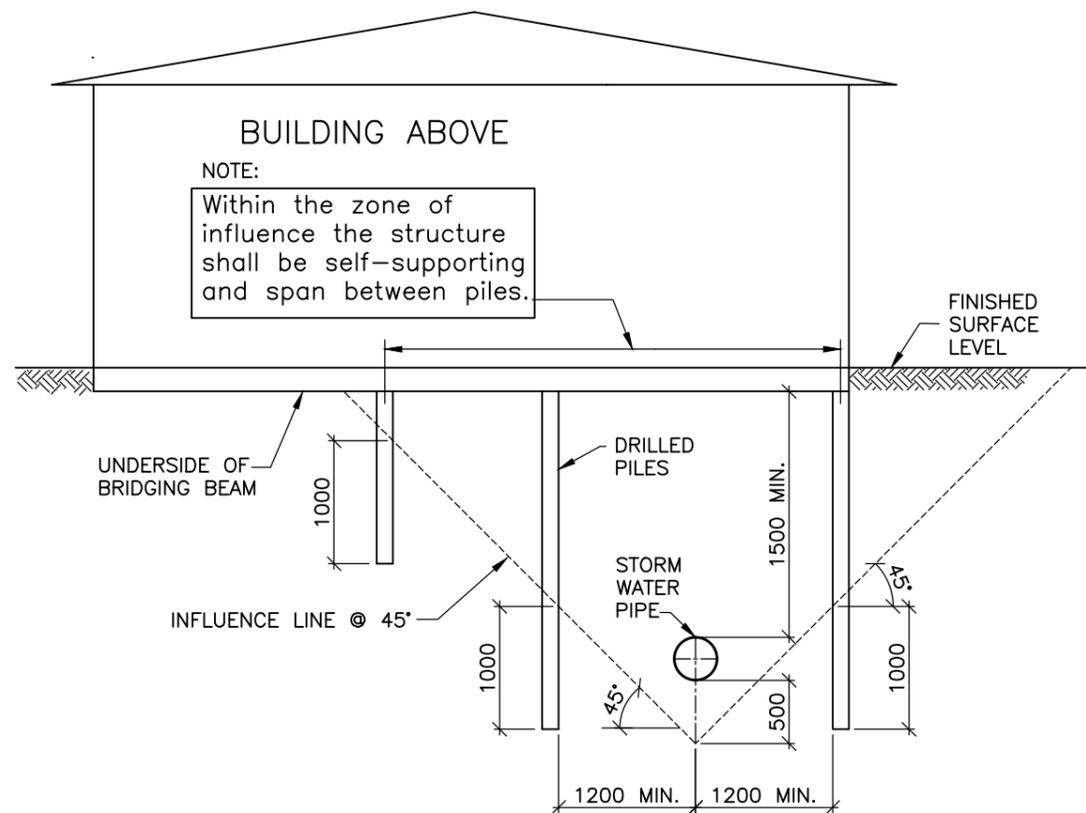
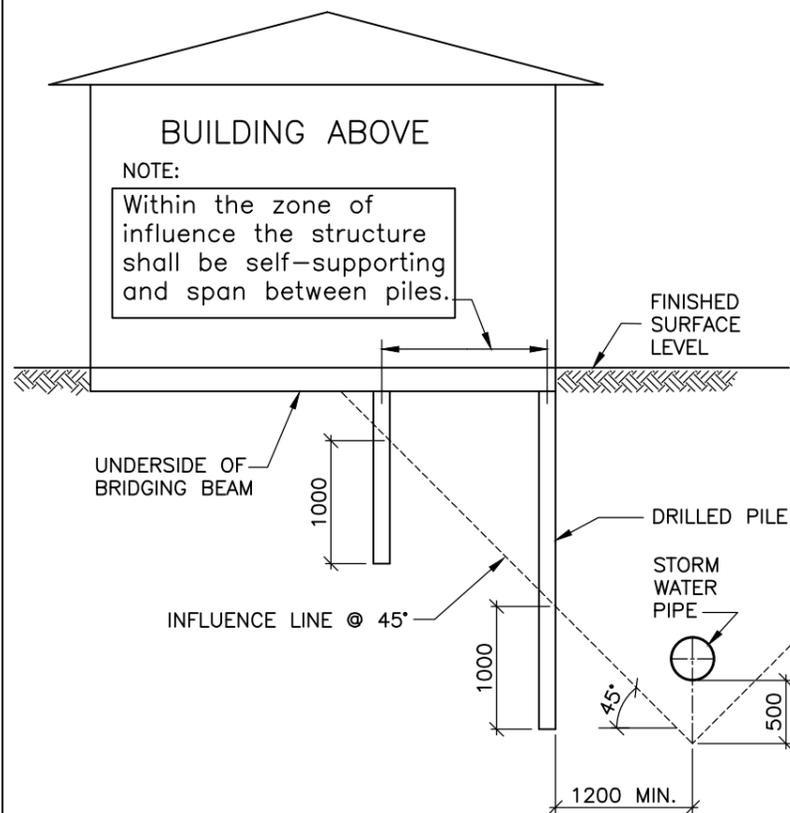
Cabra Developments Ltd
45 Station Road,
Huapai

Water Supply As Built Plan
- Stage 1A
(Sheet 3 of 3)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
0	Issue for As-Built Completion	DL	19/02/2020

FOR COMPLETION

SURVEYED	DESIGNED	DRAWN	DATE	ORIGINAL SCALE	ORIGINAL SIZE	NAME	DATE	
			03/12/2019	1:500	A3	RKC	03/12/2019	
DRAWING NO. 42356-DR-SU-9403							REVISION	0



NOTES

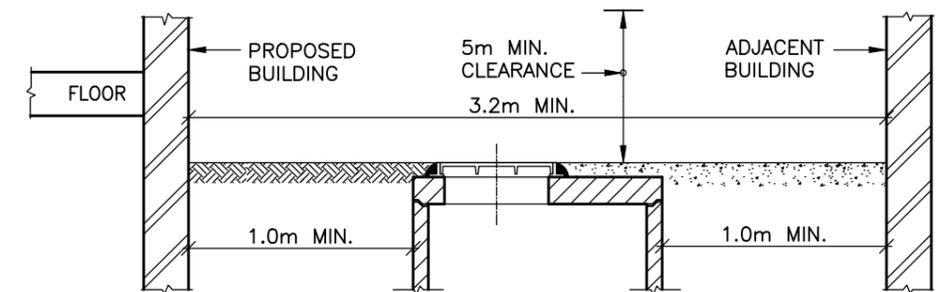
1. The information on this page is intended to show examples of typical scenarios and should be used for general guidance purposes only. Significant variations on a site by site basis are to be expected and it is in no way implied that meeting any of the above will guarantee approval.
2. Requirements 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 separation 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	ORIGINAL SCALE: AS NOTED
	Sht 1 OF 1
	DRAWING No. ACSD
	SW22
	REV A3

Appendix C: Laboratory Test Data

Please reply to: W.E. Campton

Page 1 of 5

CMW Geosciences Ltd.
PO Box 300 206
Albany
Auckland 0752

Job Number: 63282#L
BGL Registration Number: 2766
Checked by: WEC

Attention: **JASMINE WALDEN**

24th February 2020

SHRINK-SWELL INDEX TESTING

Dear Jasmine,

Re: STATION ROAD, HUAPAI
(your reference AKL2016-0634)
Report Number: 63282#L/SS Station Road, Huapai

The following report presents the results of Shrink-swell Index testing at BGL of 54mm diameter undisturbed push-tube soil samples delivered to this laboratory on the 14th of February 2020. The test standards used were:

Water Content:	NZS4402:1986:Test 2.1
Sampling Tube <i>in situ</i> Density:	NZS4402:1986:Test 5.1.3
Shrink-swell Index:	AS1289:Test 7.1.1 - 2003

As per the reporting requirements of AS1289: Test 7.1.1 – 2003: the shrink-swell index value has been reported to the nearest 0.1%. As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. As per the reporting requirements of NZS4402: 1986: Test 5.1.3: sampling tube density, all density values have been reported to the nearest 0.02t/m³ and air voids have been reported to two significant figures.

For calculating the air voids percentages a solid density of 2.65t/m³ was assumed for these tests. Note that this assumed value is not part of the IANZ endorsement for this report.

Sample Descriptions (not part of BGL IANZ Accreditation)

- 1 - LOT 06 / 0.50 – 0.65m:** CLAY, slightly silty, very stiff, moderately plastic, pinkish yellow, light grey & light brown, slightly moist.
- 2 - LOT 12 / 0.50 – 0.65m:** CLAY, silty, trace gravel, very stiff, moderately plastic, mottle light grey, brown & pink, slightly moist.
- 3 - LOT 16 / 0.50 – 0.65m:** CLAY, slightly silty, very stiff, moderately plastic, mottled light grey, orange, brown & pink, slightly moist.
- 4 - LOT 22 / 0.50 – 0.65m:** CLAY, slightly silty, very stiff, moderately plastic, light grey with occasional yellow mottles, slightly moist.
- 5 - LOT 28 / 0.40 – 0.55m:** CLAY, silty, very stiff, moderately plastic, mottled grey, orange, & brown, slightly moist.
- 6 - LOT 30 / 0.50 – 0.65m:** CLAY, silty, very stiff, moderately plastic, mottled light grey, orange, & brown, slightly moist.
- 7 - LOT 35 / 0.50 – 0.65m:** CLAY, silty, very stiff, moderately plastic, mottled yellow, pink, black & white, moist.
- 8 - LOT 41 / 0.50 – 0.65m:** CLAY, silty, very stiff, moderately plastic, dark yellow with black & white mottles.
- 9 - LOT 46 / 0.50 – 0.65m:** CLAY, very stiff, moderately plastic, mottled light grey, orange, & pink, slightly moist.
- 10 - LOT 52 / 0.50 – 0.65m:** CLAY, slightly silty, stiff to very stiff, moderately plastic, mottled light grey, orange, pink & brown, slightly moist.
- 11 - LOT 58 / 0.50 – 0.65m:** CLAY, slightly silty, stiff to very stiff, moderately plastic, streaked pinkish light grey, slightly moist.
- 12 - LOT 62 / 0.50 – 0.65m:** CLAY, fine to medium gravelly, very stiff, moderately plastic, light greyish brown, slightly moist to dry.

SHRINK-SWELL TEST RESULTS							
Sample Number		1	2	3	4	5	6
Lot Number		LOT 06	LOT 12	LOT 16	LOT 22	LOT 28	LOT 30
Depth (m)		0.50 – 0.65	0.50 – 0.65	0.50 – 0.65	0.50 – 0.65	0.50 – 0.65	0.50 – 0.65
SWELL TEST							
Initial Water Content	%	46.8	29.9	41.3	44.5	30.6	34.0
Initial Bulk Density	t/m ³	1.70	1.94	1.74	1.72	1.88	1.82
Initial Dry Density	t/m ³	1.10	1.58	1.22	1.18	1.44	1.38
Initial Air Voids	%	0.0	3.6	0.84	0.64	1.9	4.1
Total Swell	mm	0.0	0.1	0.1	0.1	0.03	0.1
Swelling Strain	%	0.0	0.3	0.2	0.3	0.1	0.3
SHRINKAGE TEST							
Water Content	%	45.6	32.8	47.3	48.0	32.8	34.0
Initial Bulk Density	t/m ³	1.58	1.88	1.72	1.72	1.86	1.86
Initial Dry Density	t/m ³	1.08	1.42	1.18	1.16	1.40	1.38
Initial Air Voids	%	10	0.50	0.31	0.16	1.2	0.85
Total Shrinkage	mm	12.2	6.3	8.0	11.0	7.1	6.1
Shrinkage Strain	%	11.2	6.5	9.1	10.1	6.5	7.3
SHRINK-SWELL INDEX							
SHRINK-SWELL INDEX	%	6.2	3.7	5.1	5.7	3.7	4.2

SHRINK-SWELL TEST RESULTS							
Sample Number		7	8	9	10	11	12
Lot Number		LOT 35	LOT 41	LOT 46	LOT 52	LOT 58	LOT 62
Depth (m)		0.50 – 0.65	0.50 – 0.65	0.50 – 0.65	0.50 – 0.65	0.50 – 0.65	0.50 – 0.65
SWELL TEST							
Initial Water Content	%	37.8	43.4	36.9	47.5	40.9	31.1
Initial Bulk Density	t/m ³	1.86	1.82	1.80	1.76	1.80	1.88
Initial Dry Density	t/m ³	1.38	1.32	1.28	1.24	1.26	1.44
Initial Air Voids	%	0.55	0.15	1.2	0.94	0.0	0.63
Total Swell	mm	0.1	0.1	0.1	0.3	0.1	0.1
Swelling Strain	%	0.4	0.7	0.7	1.3	0.6	0.7
SHRINKAGE TEST							
Water Content	%	40.3	43.0	42.0	51.6	35.2	29.7
Initial Bulk Density	t/m ³	1.78	1.76	1.76	1.68	1.82	1.84
Initial Dry Density	t/m ³	1.26	1.22	1.24	1.12	1.34	1.42
Initial Air Voids	%	1.2	1.0	1.2	0.55	2.3	4.0
Total Shrinkage	mm	7.1	10.9	7.6	12.4	5.8	4.5
Shrinkage Strain	%	6.6	10.0	8.6	11.5	7.0	4.4
SHRINK-SWELL INDEX							
SHRINK-SWELL INDEX	%	3.8	5.8	5.0	6.7	4.1	2.6

Please note that the test results relate only to the samples under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Justin Franklin
Signatory (Assistant Laboratory Manager)
Babbage Geotechnical Laboratory



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation. This report may not be reproduced except in full & with written approval from BGL.

Appendix D: Field Test Data



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

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

Project: 45 Station Road, Huapai
 Project No: AKL2016_0634
 Location: Huapai
 Report No: AKL2016_0634LAA Rev.0
 Report Date: 25/01/2017
 Client: Cabra Developments Limited
 Client Address:
 Client Reference:

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

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



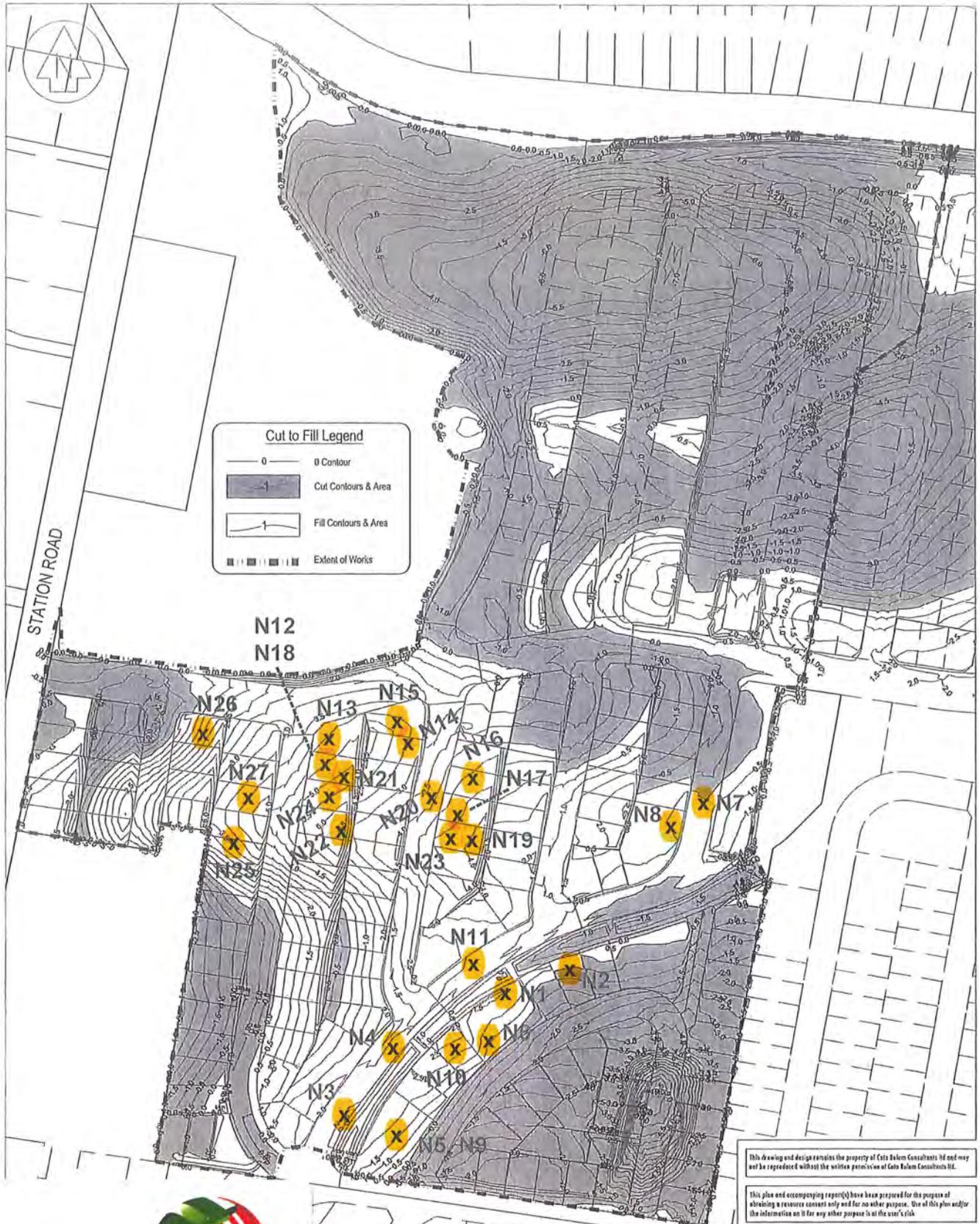
Tests indicated as not accredited are outside the scope of the laboratory's accreditation

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

Date Sampled	Sample No.	Test Location	Soil Description	In-situ Vane Shear Strengths					Field and Laboratory Testing Data								Comments	
				Test 1 (kPa)	Test 2 (kPa)	Test 3 (kPa)	Test 4 (kPa)	Ave.	Gaugé Wet Density (t/m ³)	Gaugé Dry Density (t/m ³)	Gauge Water Content (%)	Gauge Air Voids (%)	Gauge Probe Depth	Oven Water Content (%)	Solid Density (t/m ³) *	Oven Dry Density (t/m ³)		Calculated Air Voids (%) *
7/12/2016	N1	Lot 97	CLAY	189	189	>189	>189	>189	1.8543	1.3865	33.7	1.76	300	29.3	2.7	1.44	4.9	
	N2	Lot 99	CLAY	>189	>189	>189	>189	>189	1.8482	1.3592	36.0	0.65	300	37.4	2.7	1.34	-0.1	
14/12/2016	N3	Refer to site plan	CLAY	UTP	UTP	UTP	UTP	UTP	1.7574	1.3213	33.0	7.35	300	29.6	2.7	1.36	9.6	
	N4	Refer to site plan	CLAY	173	178	189	189	182	1.8379	1.3691	34.2	2.31	300	35.0	2.7	1.36	1.9	
16/12/2016	N5	Lot 93	CLAY	175	173	189	189	182	1.7953	1.2722	41.1	0.45	250	31.0	2.7	1.38	6.8	
	N6	Lot 97	CLAY	UTP	UTP	UTP	UTP	UTP	1.7946	1.3099	37.0	2.91	300	33.4	2.7	1.34	5.2	
	N7	Refer to site plan	CLAY	>189	>189	UTP	UTP	>189	1.8157	1.3169	37.9	1.24	250	30.8	2.7	1.38	5.9	
	N8	Lot 86	CLAY	UTP	UTP	UTP	UTP	UTP	1.8583	1.3689	35.7	0.25	300	38.6	2.7	1.34	-1.4	
20/12/2016	N9	Lot 93	CLAY	UTP	UTP	>189	>189	>189	1.8210	1.3141	38.6	0.52	300	34.9	2.7	1.34	2.9	
	N10	Lot 95	CLAY	UTP	UTP	>189	>189	>189	1.8331	1.3237	38.5	-0.08	300	33.5	2.7	1.38	3.2	
22/12/2016	N11	Road	CLAY	189	186	183	159	179	1.7840	1.3012	37.7	2.30	300	36.3	2.7	1.30	4.0	
30/12/2016	N12	Lot 44	Silty CLAY	>194	>194	193	141	>181	1.7770	1.2843	38.4	3.05	300	48.3	2.7	1.20	-2.2	Failed
	N13	Lot 45	Clayey SILT	UTP	151	158	148	>162	1.7915	1.3219	35.5	3.98	300	36.7	2.7	1.30	2.2	
	N14	Lot 47	Silty CLAY	>194	>194	>194	>194	>194	1.8021	1.3070	37.9	1.97	300	39.5	2.7	1.30	1.1	
	N15	Lot 46	Silty CLAY	>194	>194	>194	>194	>194	1.7969	1.3130	36.8	2.88	300	40.3	2.7	1.28	1.0	
	N16	Lot 62	Silty CLAY	UTP	UTP	UTP	UTP	UTP	1.8617	1.3590	37.0	-0.72	300	31.6	2.7	1.42	2.9	
4/01/2017	N17	Lot 63	Silty CLAY	UTP	UTP	UTP	UTP	UTP	1.8246	1.3219	38.0	0.66	300	36.7	2.7	1.34	1.6	
	N18	Lot 44	Silty CLAY	UTP	UTP	UTP	UTP	UTP	1.8530	1.3908	33.2	2.17	300	37.4	2.7	1.34	-0.4	Retest of N12
	N19	Lot 64	Silty CLAY	188	151	154	157	163	1.7956	1.2963	38.5	1.95	300	54.4	2.7	1.16	-6.3	Failed
6/01/2017	N20	Road	Silty CLAY	>194	>194	>194	148	>182	1.7699	1.2558	40.9	1.96	300	28.7	2.7	1.38	9.6	
	N21	Lot 44	CLAY	UTP	UTP	UTP	UTP	UTP	1.8059	1.3199	36.8	2.44	300	44.8	2.7	1.24	-2.0	
	N22	Lot 42	CLAY	>194	>194	191	>194	>193	1.8125	1.3097	38.7	1.09	300	32.9	2.7	1.36	4.6	
10/01/2017	N23	Lot 64	CLAY	UTP	UTP	UTP	UTP	UTP	1.8148	1.3314	36.3	2.25	300	43.2	2.7	1.26	-1.7	Retest of N19
	N24	Lot 43	CLAY	189	189	>189	>189	>189	1.7905	1.3118	36.5	3.44	300	36.3	2.7	1.32	3.6	
	N25	Lot 19	CLAY	178	189	189	>189	>186	1.7855	1.2864	38.8	2.33	300	38.5	2.7	1.28	2.6	
12/01/2017	N26	Lot 14	CLAY	>189	>189	UTP	UTP	>189	1.7964	1.2794	40.4	0.80	300	41.3	2.7	1.28	0.4	
	N27	Lot 17	CLAY	>189	>189	UTP	UTP	>189	1.7357	1.2292	41.2	3.71	300	36.9	2.7	1.26	6.3	

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Created By: TG Date: 8/12/2016
 Checked By: TG Date: 25/01/2017
 Authorised Signatory: *Paul Mignard* Date: 25/01/2017



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CATO BOLAM CONSULTANTS

SURVEYORS PLANNERS ENGINEERS

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PO Box 157
Orawa 0116
phone 07-427 0072
fax 07-426 7331
email cato@cm@catabolam.co.nz



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

CABRA DEVELOPMENTS LTD
45 STATION ROAD,
HUAPAI

DRAWING TITLE

CUT AND FILL DEPTH
CONTOURS PLAN

ORIGINAL SCALE	ORIGINAL SIZE	REVISION NO
1 : 2000	A3	R1
DATE	CAD REFERENCE	SHEET NO
15/11/2016	31745 0110 cwt/11.p	E112
DIRECTORY	JOB NO	
Z:\1745\1601	34745	



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

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

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

Test Methods: NZS 4402.2.1:1986
 Notes: Solid Density: Assumed
 NZS 4407.4.2.2:2015 Testing Locations Selected By: CMW Field Staff
 NZGS: August 2001



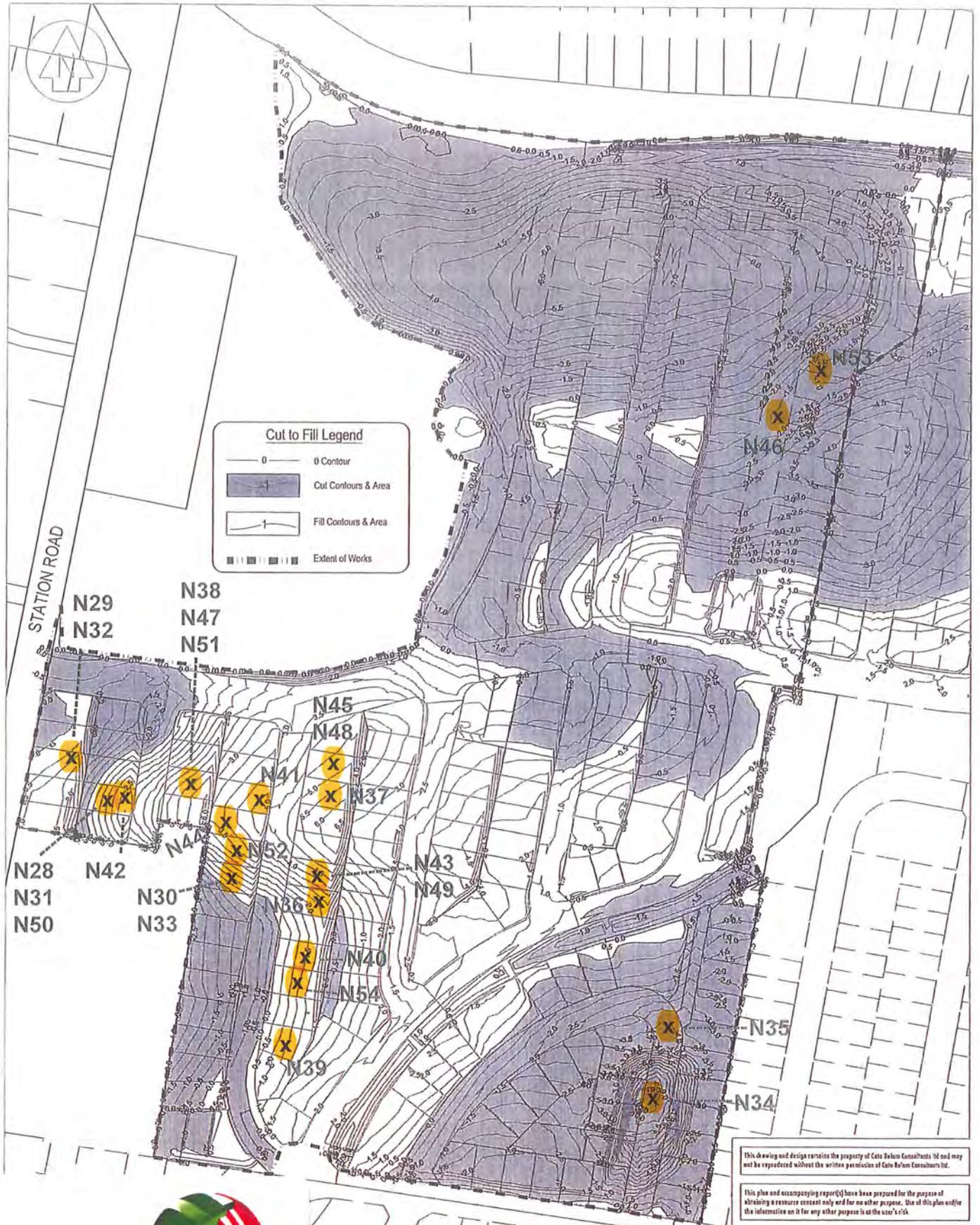
Tests indicated as not accredited are outside the scope of the laboratory's accreditation

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

Date Sampled	Sample No.	Test Location	Soil Description	In-situ Vane Shear Strengths					Field and Laboratory Testing Data									Comments
				Test 1 (kPa)	Test 2 (kPa)	Test 3 (kPa)	Test 4 (kPa)	Ave.	Gauge Wet Density (t/m ³)	Gauge Dry Density (t/m ³)	Gauge Water Content (%)	Gauge Air Voids (%)	Gauge Probe Depth	Oven Water Content (%)	Solid Density (t/m ³) *	Oven Dry Density (t/m ³)	Calculated Air Voids (%) *	
12/01/2017	N28	Lot 9	CLAY	97	124	138	135	124	1.7523	1.2313	42.3	2.18	300	35.5	2.7	1.30	6.2	Failed
	N29	Lot 3	CLAY	167	189	>189	>189	>184	1.7401	1.2240	42.2	2.94	300	39.0	2.7	1.26	4.8	
	N30	Lot 20	CLAY	138	132	167	140	144										Failed
13/01/2017	N31	Lot 9	CLAY	189	189	>189	>189	>189	1.7241	1.2262	40.6	4.68	300	41.6	2.7	1.22	4.3	Re-test of N28
	N32	Lot 3	CLAY	>189	>189	189	189	>189	1.7342	1.2154	42.7	2.99	300	50.0	2.7	1.16	-0.6	
	N33	Lot 20	CLAY	178	170	189	183	180	1.7505	1.2899	35.7	6.07	300	36.1	2.7	1.28	5.9	Re-test of N30
16/01/2017	N34	Refer to site plan	CLAY	189	189	>189	>189	>189	1.8756	1.4034	33.6	0.70	300	32.9	2.7	1.42	1.3	
	N35	Refer to site plan	CLAY	178	175	189	189	183	1.7740	1.3549	30.9	7.82	300	32.3	2.7	1.34	7.0	
	N36	Lot 39	CLAY	UTP	UTP	UTP	UTP	UTP	1.7281	1.2764	35.4	7.46	300	30.7	2.7	1.32	10.0	
	N37	Lot 43	CLAY	UTP	UTP	UTP	UTP	UTP	1.7351	1.2784	35.7	6.88	300	37.1	2.7	1.26	6.2	
	N38	Lot 12	CLAY	UTP	UTP	UTP	UTP	UTP	1.8507	1.3499	37.1	-0.19	300	43.6	2.7	1.28	-3.9	
18/01/2017	N39	Lot 37	CLAY	UTP	UTP	UTP	UTP	UTP	1.8490	1.4097	31.2	3.76	300	31.1	2.7	1.42	3.9	
	N40	Lot 34	CLAY	183	189	189	>189	>188	1.7472	1.2828	36.2	5.95	300	34.9	2.7	1.30	6.9	
	N41	Lot 17	CLAY	127	140	119	121	127	1.6636	1.1636	44.0	5.64	300	35.0	2.7	1.24	11.0	Failed
	N42	Lot 9	CLAY	>189	>189	>189	>189	>189	1.7471	1.2521	39.5	4.01	300	46.0	2.7	1.20	0.6	
25/01/2017	N43	Lot 40	CLAY	>189	>189	UTP	UTP	>189	1.7865	1.3862	28.9	8.54	300	26.7	2.7	1.40	10.0	
	N44	Lot 18	CLAY	186	189	>189	>189	>188	1.8318	1.3358	37.1	0.81	300	38.8	2.7	1.32	-0.1	Re-test of N41
	N45	Lot 44	CLAY	173	178	189	>189	>182	1.7411	1.2510	39.2	4.55	300	37.3	2.7	1.26	5.8	
27/01/2017	N46	Refer to site plan	CLAY	178	146	151	165	160	1.7280	1.2275	40.8	4.38	200	45.5	2.7	1.18	2.0	
31/01/2017	N47	Lot 12	CLAY	UTP	UTP	UTP	UTP	UTP	1.7523	1.2719	37.8	4.74	300	39.3	2.7	1.25	3.9	
	N48	Lot 44	CLAY	UTP	UTP	UTP	UTP	UTP	1.7986	1.4142	27.2	9.10	300	34.6	2.7	1.34	4.3	
	N49	Lot 40	CLAY	UTP	UTP	UTP	UTP	UTP	1.7970	1.3901	29.3	7.74	300	35.3	2.7	1.32	3.9	
7/02/2017	N50	Lot 9	CLAY	UTP	UTP	UTP	UTP	UTP	1.7613	1.2824	37.3	4.50	300	44.4	2.7	1.22	0.7	
	N51	Lot 12	CLAY	UTP	UTP	UTP	UTP	UTP	1.7743	1.2653	40.2	2.12	300	52.4	2.7	1.16	-4.1	
	N52	Lot 19	CLAY	UTP	UTP	UTP	UTP	UTP	1.7893	1.3263	34.9	4.48	300	33.2	2.7	1.34	5.6	
	N53	Refer to site plan	CLAY	UTP	UTP	UTP	UTP	UTP	1.7614	1.2984	35.7	5.51	300	34.4	2.7	1.32	6.4	
13/02/2017	N54	Lot 36	CLAY	189	189	181	>189	>187	1.7475	1.2313	41.9	2.66	300	46.5	2.7	1.20	0.4	

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Created By: TG Date: 13/01/2017
 Checked By: TG Date: 15/02/2017
 Authorised Signatory: *[Signature]* Date: 15/2/2017



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CATO BOLAM CONSULTANTS

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 phone 09 437 0022
 fax 09 426 7331
 email cato@bolam.co.nz

ORIGINAL SCALE	ORIGINAL SIZE	REVISION NO	R1
1 : 2000	A3		
DATE	CAD REFERENCE	SHEET NO	E112
15/11/2016	31745 E112 C417A.p		
DIRECTORY	JOB NO		34745
21314715(ACAD)			



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

CABRA DEVELOPMENTS LTD
 45 STATION ROAD,
 HUAPAI

DRAWING TITLE
**CUT AND FILL DEPTH
 CONTOURS PLAN**



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

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

Project: 45 Station Road, Huapai
Project No: AKL2016_0634
Location: Huapai
Report No: AKL2016_0634LAE Rev.0
Report Date: 7/08/2017
Client: Cabra Developments Limited
Client Address:
Client Reference:

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

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



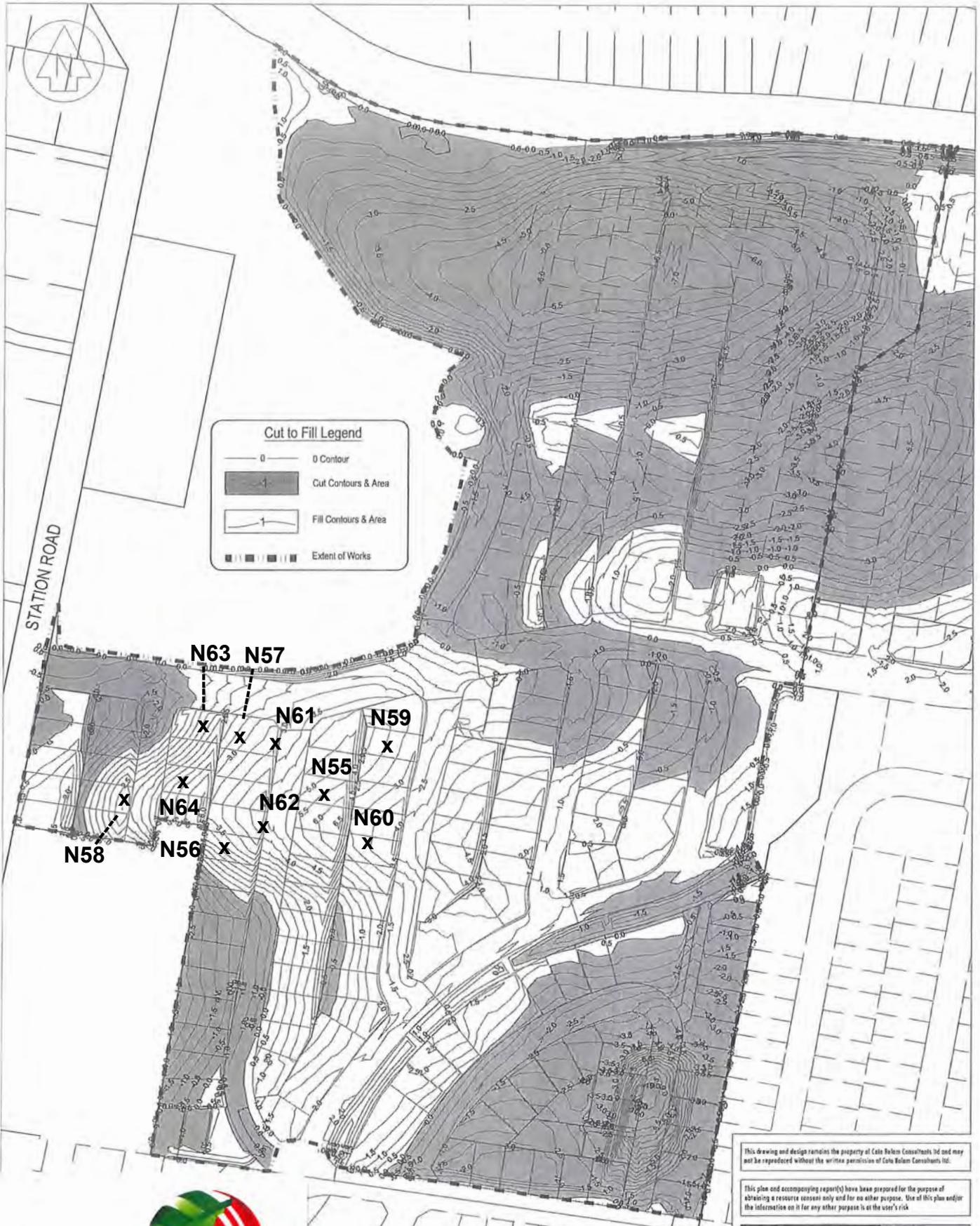
Tests indicated as not accredited are outside the scope of the laboratory's accreditation

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

Date Sampled	Sample No.	Test Location	Soil Description	In-situ Vane Shear Strengths					Field and Laboratory Testing Data									Comments
				Test 1 (kPa)	Test 2 (kPa)	Test 3 (kPa)	Test 4 (kPa)	Ave.	Gauge Wet Density (t/m ³)	Gauge Dry Density (t/m ³)	Gauge Water Content (%)	Gauge Air Voids (%)	Gauge Probe Depth	Oven Water Content (%)	Solid Density (t/m ³) *	Oven Dry Density (t/m ³)	Calculated Air Voids (%) *	
13/02/2017	N55	Lot 43	CLAY	189	181	189	181	185	1.7503	1.2697	37.8	4.81	300	39.3	2.7	1.26	4.1	
	N56	Lot 19	CLAY	>189	>189	>189	>189	>189	1.7807	1.3258	34.3	5.30	300	36.0	2.7	1.30	4.3	
	N57	Lot 15	CLAY	189	189	>189	>189	>189	1.7570	1.3029	34.9	6.23	300	37.9	2.7	1.28	4.5	
	N58	Lot 9	CLAY	154	178	183	189	176	1.7871	1.2880	38.7	2.28	300	35.9	2.7	1.32	4.1	
3/03/2017	N59	Lot 47	CLAY	>185	>185	>185	>185	>185	1.7501	1.3173	32.8	7.84	300	34.5	2.7	1.30	6.9	
	N60	Lot 51	CLAY	>185	>185	>185	>185	>185	1.8485	1.4333	29.0	5.30	300	30.2	2.7	1.42	4.5	
6/03/2017	N61	Lot 15	CLAY	>185	>185	>185	>185	>185	1.7496	1.2828	36.4	5.73	300	41.9	2.7	1.24	2.6	
	N62	Lot 18	CLAY	>185	>185	>185	>185	>185	1.7843	1.3322	33.9	5.35	300	31.2	2.7	1.36	7.2	
22/03/2017	N63	Lot 14	CLAY	>185	UTP	UTP	>185	>185	1.7893	1.4001	27.8	9.14	300	28.3	2.7	1.40	8.9	
	N64	Lot 12	CLAY	>185	>185	>185	>185	>185	1.8275	1.3958	30.9	5.04	300	26.4	2.7	1.44	8.3	

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Created By: TG Date: 14/02/2017
 Checked By: TG Date: 7/08/2017
 Authorised Signatory: GS Date: 8/08/2017



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

CABRA DEVELOPMENTS LTD
 45 STATION ROAD,
 HUAPAI

DRAWING TITLE
**CUT AND FILL DEPTH
 CONTOURS PLAN**

ORIGINAL SCALE	ORIGINAL SIZE	REVISION NO
1 : 2000	A3	R1
DATE	CAD REFERENCE	SHEET NO
15/11/2016	06345 E112 Cut/Fill	E112
DIRECTORY		JOB NO
21307451ACAD1		34745



LF11 Rev 5 Soil Field Density NDM Direct Transmission with VSS Report

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

Project: 45 Station Road, Huapai
Project No: AKL2016_0634
Location: Huapai
Report No: AKL2016_0634LAF Rev.0
Report Date: 17/07/2018
Client: Cabra Developments Limited
Client Address:
Client Reference:

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

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



Tests indicated as not accredited are outside the scope of the laboratory's accreditation

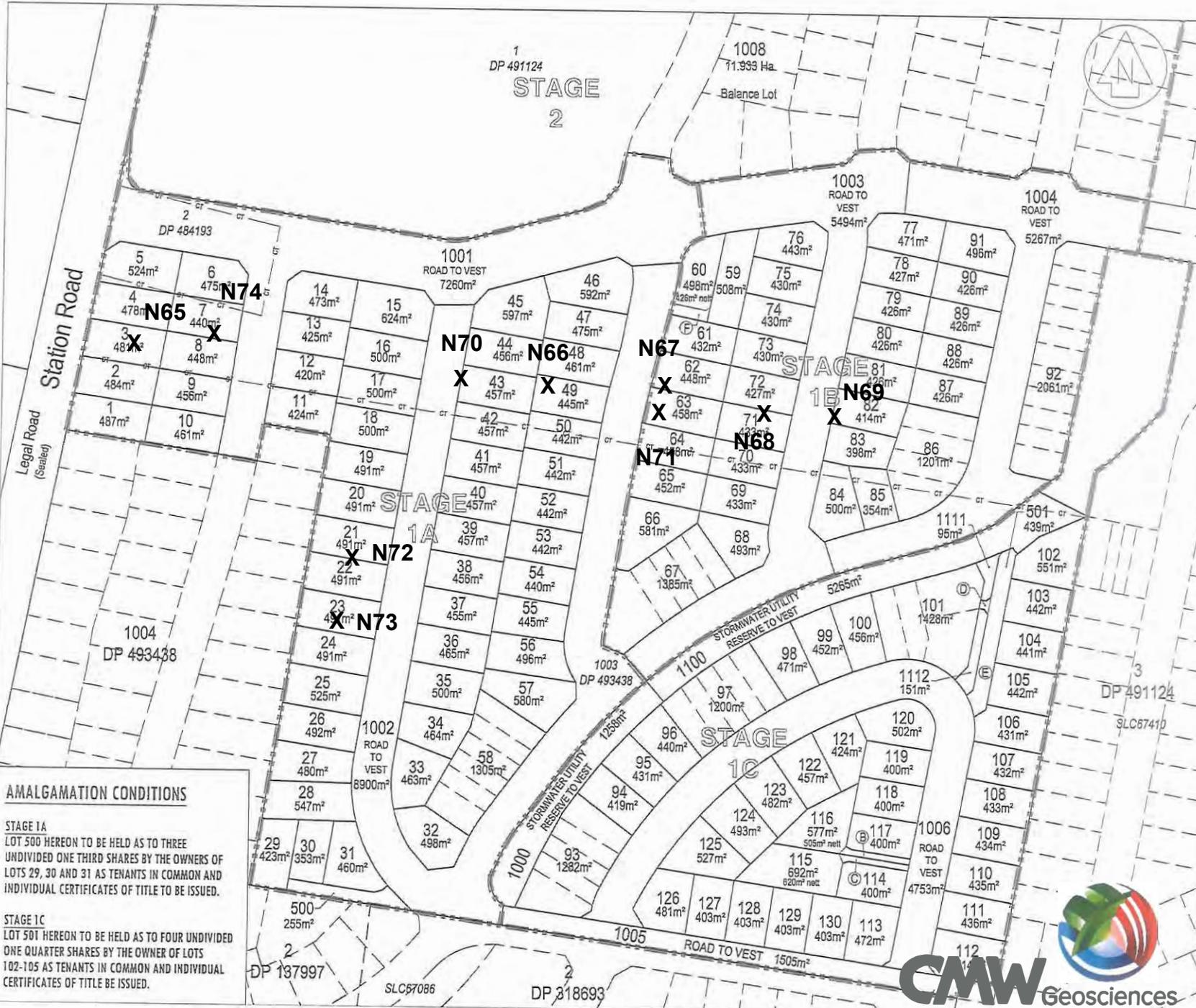
Measurements marked * are not accredited and are outside the scope of the laboratories accreditation

Date Sampled	Sample No.	Test Location	Soil Description	In-situ Vane Shear Strengths					Field and Laboratory Testing Data									Comments
				Test 1 (kPa)	Test 2 (kPa)	Test 3 (kPa)	Test 4 (kPa)	Ave.	Gauge Wet Density (t/m ³) **	Gauge Dry Density (t/m ³)	Gauge Water Content (%)	Gauge Air Voids (%)	Gauge Probe Depth	Oven Water Content (%)	Solid Density (t/m ³) *	Oven Dry Density (t/m ³)	Calculated Air Voids (%) *	
8/02/2018	N65	Refer to site plan	CLAY	155	155	UTP	UTP	155+	1.8720	1.3980	30.0	7.5	300	28.9	2.7	1.46	4.2	No Sample taken Retest of N68
26/02/2018	N66	Refer to site plan	CLAY	UTP	UTP	UTP	120	120+	1.8590	1.3508	34.0	1.0	300	31.8	2.7	1.42	2.9	
	N67	Refer to site plan	CLAY	UTP	180	140	180	167+	1.8680	1.3681	36.0	2.6	300	31.3	2.7	1.42	2.8	
	N68	Refer to site plan	CLAY	90	109	180	168	137	1.8010	1.2510	38.0	9.0	300					
	N69	Refer to site plan	CLAY	180	140	180	190	173	1.8460	1.3480	36.0	3.4	300	20.9	2.7	1.52	12	
5/03/2018	N70	Refer to site plan	CLAY	137	171	155	218+	170+	1.8410	1.3420	35.7	2.3	300	32.5	2.7	1.38	3.4	
	N71	Refer to site plan	CLAY	171	218	218	155	191	1.8520	1.3501	35.1	2.1	300	30.4	2.7	1.42	4.2	
6/03/2018	N72	Refer to site plan	CLAY	UTP	UTP	UTP	UTP	UTP	1.8920	1.4590	29.1	2.8	300	28.3	2.7	1.48	3.6	
	N73	Refer to site plan	CLAY	UTP	UTP	215	UTP	215+	1.8290	1.3750	32.0	3.0	300	32.4	2.7	1.38	4.1	
15/03/2018	N74	Refer to site plan	CLAY	UTP	UTP	UTP	UTP	UTP	1.8755	1.4444	29.8	3.3	300	27.6	2.7	1.48	5.0	

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** Gauge Wet Densities outside of the calibrated range of 1.728 to 2.756 t/m³ are not accredited and are outside the laboratories scope of accreditation.

Created By: JLM Date: 09/02/2018
 Checked By: JLM Date: 17/07/2018
 Authorised Signatory: CS Date: 19/07/2018



AMALGAMATION CONDITIONS

STAGE 1A
LOT 500 HEREON TO BE HELD AS TO THREE UNDIVIDED ONE THIRD SHARES BY THE OWNERS OF LOTS 29, 30 AND 31 AS TENANTS IN COMMON AND INDIVIDUAL CERTIFICATES OF TITLE TO BE ISSUED.

STAGE 1C
LOT 501 HEREON TO BE HELD AS TO FOUR UNDIVIDED ONE QUARTER SHARES BY THE OWNER OF LOTS 102-105 AS TENANTS IN COMMON AND INDIVIDUAL CERTIFICATES OF TITLE TO BE ISSUED.

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AUCKLAND COUNCIL Rodney Section
 COMPRISED IN CT 710969 16.0204ha
 CT 719628 6.4566ha
 CT 691216 0.2469ha

TOTAL AREA 22.7239ha
 AREAS AND MEASUREMENTS ARE SUBJECT TO SURVEY.

MEMORANDUM OF EASEMENTS

PURPOSE	SHOWN	SERVIENT TENEMENT	DOMINANT TENEMENT
RIGHT OF WAY, RIGHT TO DRAIN STORMWATER AND WASTEWATER, RIGHT TO CONVEY WATER, ELECTRICITY, TELECOMMUNICATIONS AND COMPUTER MEDIA	(B), (C), (D), (E), (F)	LOT 116 HEREON	LOT 115 HEREON, LOT 116 HEREON, LOT 101 HEREON, LOT 59 HEREON

SCHEDULE OF EASEMENTS GROSS

PURPOSE	SHOWN	SERVIENT TENEMENT	GRANTEE
PEDESTRIAN RIGHT OF WAY	(D)	LOT 501	AUCKLAND COUNCIL

REVISION (DESCRIPTIONS)	NAME	DATE
SURVEYED		
DESIGNED	SAH	08/16
DRAWN	SL	08/16
CHECKED		
APPROVED		

CATO BOLAM CONSULTANTS

SURVEYORS PLANNERS ENGINEERS

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 PO Box 157 Fax 01-426 7231
 Drawa 0916 email cato@catobolam.co.nz

CLIENT
 CABRA DEVELOPMENTS LTD
 SUB PRECINCT A
 45 STATION ROAD, HUAPAI

TITLE
 LOTS 1 - 130, 500-501, 1000-1006,
 1100, 1111 & 1112 BEING
 SUBDIVISION OF LOT 1 DP 491124,
 LOT 2 DP 484193 & LOT 1003 DP
 493438 (Sheet 2 of 5)

ORIGINAL SCALE	ORIGINAL SIZE	REVISION NO
1:1500	A3	
DATE	CAD REFERENCE	SHEET NO
OCTOBER 2016	34745 S1.dwg	52
DIRECTORY		JOB NO
2\34745\AC\A1		34745





LF14 Rev.8 Dynamic Cone Penetration (DCP) Test Report

NZS 4402: Test 6.5.2: 1988

Report No:	AKL2016_0634LAG Rev.0	Auckland Laboratory CMW Geosciences (NZ) Limited Building C, 9 Piermark Drive, Rosedale, NZ 0632 PO Box 300206, Albany, Auckland, NZ 0752 Phone: +64 (09) 4144 632	
Project Name:	45 Station Road - Stage 1		
Project Location:	Huapi		
Project Number:	AKL2016_0634		
Test Date:	23/03/2018	Testing Locations Selected By: CMW Field Staff	
Tested By:	MMC/JMJ		
Client:	Cabra	 <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <p>Equivalent CBR Values are not accredited and are outside the scope of the laboratory's accreditation</p>	
Client Address:	19 Tamariki Ave, Orewa 0931		
Client Reference:			

Test No.	1		2		3		4		5	
Test Location	Road 1		Road 1		Road 1		Road 1		Road 1	
Chainage & Offset	CH 20 Right		CH 30 Left		CH 40 Right		CH 50 Left		CH 60 Right	
Material & Layer:	CLAY / SG		CLAY / SG		CLAY / SG		CLAY / SG		CLAY / SG	
Depth (mm)	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*
0 - 100	2	4	4	8	4	8	2	4	3	6
100 - 200	4	8	2	4	3	6	3	6	3	6
200 - 300	3	6	3	6	3	6	2	4	5	10
300 - 400	3	6	3	6	3	6	2	4	5	10
400 - 500	3	6	4	8	4	8	3	6	7	15
500 - 600	5	10	5	10	3	6	4	8	9	20
600 - 700	7	15	5	10	2	4	4	8	9	20
700 - 800	15+	20+	6	13	3	6	5	10	9	20
800 - 900										
900 - 1000										

Test No.	6		7		8		9		10	
Test Location	Road 1		Road 1		Road 1		Road 1		Road 1	
Chainage & Offset	CH 70 Left		CH 80 Right		CH 90 Left		CH 100 Right		CH 110 Left	
Material & Layer:	CLAY / SG		CLAY / SG		CLAY / SG		CLAY / SG		CLAY / SG	
Depth	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*
0 - 100	4	8	2	4	5	10	5	10	7	15
100 - 200	2	4	2	4	8	18	6	13	6	13
200 - 300	1	2	3	6	5	10	4	8	7	15
300 - 400	2	4	3	6	4	8	3	6	7	15
400 - 500	4	8	2	4	5	10	4	8	7	15
500 - 600	4	8	4	8	8	18	5	10	6	13
600 - 700	4	8	2	4	6	13	4	8	4	8
700 - 800	4	8	4	8	7	15	4	8	5	10
800 - 900										
900 - 1000										

Prepared by: JLM	Date: 26/03/2018	<p>This report should only be reproduced in full</p> <p>*Equivalent CBR values calculated using AUSTRROADS (2010) Guide to Pavement Technology Part 2, Figure 5.3, For Fine Grained Cohesive Soils, and are relevant to fine grained cohesive soils only.</p> <p>Page 1 of 4</p>
Checked by: JLM	Date: 27/03/2018	
Authorised Signatory: JMJ	Date: 27/03/2018	



LF14 Rev.8 Dynamic Cone Penetration (DCP) Test Report

NZS 4402: Test 6.5.2: 1988

Report No:	AKL2016_0634LAG Rev.0	Auckland Laboratory CMW Geosciences (NZ) Limited Building C, 9 Piermark Drive, Rosedale, NZ 0632 PO Box 300206, Albany, Auckland, NZ 0752 Phone: +64 (09) 4144 632	
Project Name:	45 Station Road - Stage 1	Testing Locations Selected By: CMW Field Staff	
Project Location:	Huapi	 <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <p>Equivalent CBR Values are not accredited and are outside the scope of the laboratory's accreditation</p>	
Project Number:	AKL2016_0634		
Test Date:	23/03/2018		
Tested By:	MMC/JMJ		
Client:	Cabra		
Client Address:	19 Tamariki Ave, Orewa 0931		
Client Reference:			

Test No.	11		12		13		14		15	
Test Location	Road 1		Road 1		Road 1		Road 1		Road 1	
Chainage & Offset	CH 120 Right		CH 130 Left		CH 140 Right		CH 150 Left		CH 160 Right	
Material & Layer:	CLAY / SG		CLAY / SG		CLAY / SG		CLAY / SG		CLAY / SG	
Depth (mm)	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*
0 - 100	5	10	9	20	4	8	5	10	4	8
100 - 200	5	10	4	8	4	8	4	8	4	8
200 - 300	5	10	3	6	4	8	4	8	4	8
300 - 400	6	13	4	8	5	10	4	8	3	6
400 - 500	4	8	4	8	2	4	3	6	3	6
500 - 600	6	13	6	13	5	10	4	8	4	8
600 - 700	4	8	4	8	5	10	3	6	6	13
700 - 800	4	8	4	8	5	10	5	10	6	13
800 - 900										
900 - 1000										

Test No.	16		17		18		19		20	
Test Location	Road 1		Road 1		Road 1		Road 1		Road 1	
Chainage & Offset	CH 170 Right		CH 180 Left		CH 190 Right		CH 200 Right		CH210 Left	
Material & Layer:	CLAY / SG		CLAY / SG		CLAY / SG		CLAY / SG		CLAY / SG	
Depth	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*
0 - 100	4	8	4	8	5	10	6	13	4	8
100 - 200	4	8	4	8	3	6	5	10	2	4
200 - 300	4	8	3	6	4	8	4	8	2	4
300 - 400	4	8	4	8	3	6	5	10	3	6
400 - 500	3	6	4	8	3	6	4	8	4	8
500 - 600	4	8	4	8	4	8	4	8	6	13
600 - 700	3	6	5	10	3	6	5	10	4	8
700 - 800	4	8	10	20+	5	10	4	8	6	13
800 - 900										
900 - 1000										

Prepared by: JLM	Date: 26/03/2018	<p>This report should only be reproduced in full</p> <p>*Equivalent CBR values calculated using AUSTRROADS (2010) Guide to Pavement Technology Part 2, Figure 5.3, For Fine Grained Cohesive Soils, and are relevant to fine grained cohesive soils only.</p> <p>Page 2 of 4</p>
Checked by: JLM	Date: 27/03/2018	
Authorised Signatory: JMJ	Date: 27/03/2018	



LF14 Rev.8 Dynamic Cone Penetration (DCP) Test Report

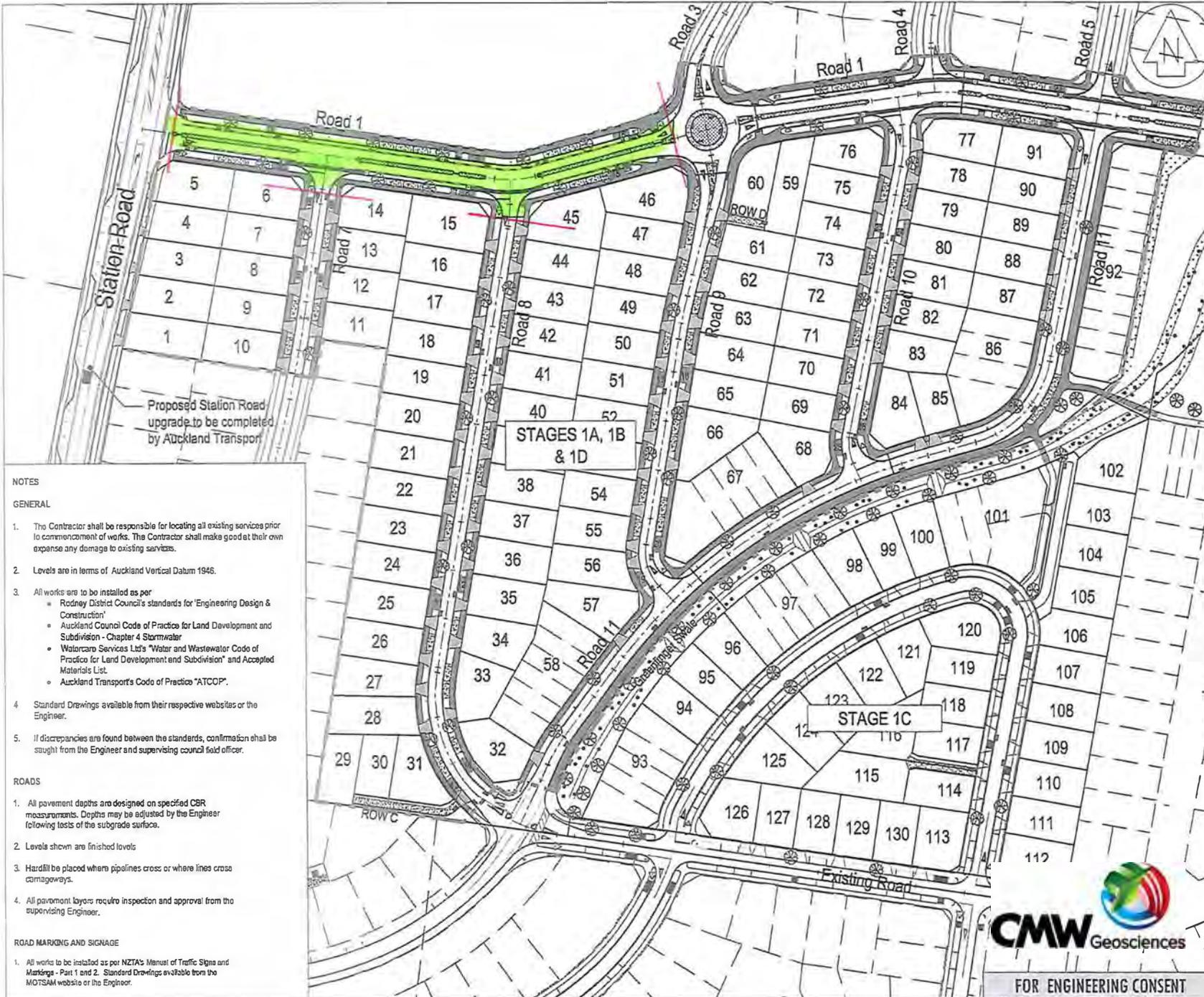
NZS 4402: Test 6.5.2: 1988

Report No:	AKL2016_0634LAG Rev.0	Auckland Laboratory CMW Geosciences (NZ) Limited Building C, 9 Piermark Drive, Rosedale, NZ 0632 PO Box 300206, Albany, Auckland, NZ 0752 Phone: +64 (09) 4144 632	
Project Name:	45 Station Road - Stage 1	Testing Locations Selected By: CMW Field Staff	
Project Location:	Huapi		
Project Number:	AKL2016_0634	 Tests indicated as not accredited are outside the scope of the laboratory's accreditation Equivalent CBR Values are not accredited and are outside the scope of the laboratory's accreditation	
Test Date:	23/03/2018		
Tested By:	MMC/JMJ		
Client:	Cabra		
Client Address:	19 Tamariki Ave, Orewa 0931		
Client Reference:			

Test No.	21		22		23					
Test Location	Road 1 Intersection		Road 7		Road 8					
Chainage & Offset	CH 220 Centre		CH 15 Centre		CH15 Centre					
Material & Layer:	CLAY / SG		CLAY / SG		CLAY / SG					
Depth (mm)	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*	Blow Count	Equiv CBR*
0 - 100	2	4	3	6	8	18				
100 - 200	3	6	3	6	2	4				
200 - 300	3	6	3	6	3	6				
300 - 400	3	6	3	6	4	8				
400 - 500	4	8	7	15	3	6				
500 - 600	4	8	10+	20+	4	8				
600 - 700	4	8			3	6				
700 - 800	4	8			4	8				
800 - 900										
900 - 1000										

Test No.										
Test Location										
Chainage & Offset										
Material & Layer:										
Depth	Blow Count	Equiv CBR*								
0 - 100										
100 - 200										
200 - 300										
300 - 400										
400 - 500										
500 - 600										
600 - 700										
700 - 800										
800 - 900										
900 - 1000										

Prepared by: JLM	Date: 26/03/2018	This report should only be reproduced in full *Equivalent CBR values calculated using AUSTRROADS (2010) Guide to Pavement Technology Part 2, Figure 5.3, For Fine Grained Cohesive Soils, and are relevant to fine grained cohesive soils only. Page 3 of 4
Checked by: JLM	Date: 27/03/2018	
Authorised Signatory: JMJ	Date: 27/03/2018	



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Road Layout Legend

- Footpath
- Indicative Vehicle Crossing Locations
- Parking Bays/Driveways
- Raingardens and ID
- Street Lights
- Street Trees
- Road Name Sign
- Job Boundary
- Cycleway
- 0.5m Buffer Zone
- TGS1

- NOTES**
- GENERAL**
- The Contractor shall be responsible for locating all existing services prior to commencement of works. The Contractor shall make good at their own expense any damage to existing services.
 - Levels are in terms of Auckland Vertical Datum 1946.
 - All works are to be installed as per
 - Rodney District Council's standards for 'Engineering Design & Construction'
 - Auckland Council Code of Practice for Land Development and Subdivision - Chapter 4 Stormwater
 - Watercare Services Ltd's 'Water and Wastewater Code of Practice for Land Development and Subdivision' and Accepted Materials List
 - Auckland Transport's Code of Practice 'ATCOP'.
 - Standard Drawings available from their respective websites or the Engineer.
 - If discrepancies are found between the standards, confirmation shall be sought from the Engineer and supervising council field officer.
- ROADS**
- All pavement depths are designed on specified CBR measurements. Depths may be adjusted by the Engineer following tests of the subgrade surface.
 - Levels shown are finished levels
 - Hardfill to be placed where pipelines cross or where lines cross carriageways.
 - All pavement layers require inspection and approval from the supervising Engineer.
- ROAD MARKING AND SIGNAGE**
- All works to be installed as per NZTA's Manual of Traffic Signs and Markings - Part 1 and 2. Standard Drawings available from the MOTSAM website or the Engineer.

REVISION (DESCRIPTIONS)	NAME	DATE
SURVEYED		
DESIGNED	KM	09/16
DRAWN	SL	09/16
CHECKED		
APPROVED		

CATO BOLAM CONSULTANTS

SURVEYORS PLANNERS
LAND DEVELOPMENT ENGINEERS

CATO BOLAM CONSULTANTS LTD
19 Tamaki Avenue
PO Box 157
Orawa 0946

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fax 09-426 7331
www2.mickelab@cato-bolam.co.nz

CLIENT

CABRA DEVELOPMENTS LTD
45 STATION ROAD,
HUAPAI

DRAWING TITLE

ROADING LAYOUT - OVERALL
STAGE 1A, 1B & 1D
SHEET 1 OF 6

ORIGINAL SCALE	ORIGINAL SIZE	REVISION NO
1 : 1500	A3	
DATE	CAD REFERENCE	SHEET NO
11/01/2017	41745 2749 ROAD LAYOUT	E240
DIRECTORY		JOB NO
232745/004/Stage 1A & B		34745

CMW Geosciences

FOR ENGINEERING CONSENT



LF11 Rev.9 Soil Field Density NDM Direct Transmission with VSS Report (Cohesive Soils)

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

Project: 45 Station Road, Huapai
Project No: AKL2016_0634
Location: Huapai
Report No: AKL2016_0634LAH Rev.0
Report Date: 4/02/2019
Client: Cabra Developments Limited
Client Address:
Client Reference:

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

Notes: Solid Density: Assumed
 Testing Locations Selected By: CMW Field Staff
 ① Blade size of 19mm used.



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

Date Sampled	Sample No.	Test Location*	Soil Description*	Vane ID		In-situ Vane Shear Strengths					Field and Laboratory Testing Data								Comments	
				Head #	Blade # ①	Test 1 (kPa)	Test 2 (kPa)	Test 3 (kPa)	Test 4 (kPa)	Ave.	Gauge Wet Density (t/m ³) **	Gauge Dry Density (t/m ³)	Gauge Water Content (%)	Gauge Air Voids (%)	Gauge Probe Depth	Oven Water Content (%)	Solid Density (t/m ³) *	Oven Dry Density (t/m ³)		Calculated Air Voids (%) *
7/05/2018	N75	Refer to site plan	LS CLAY	1620	1620	UTP	UTP	UTP	133	133+	1.73	1.27	36.2	6.6	300		2.70			No sample taken
	N76	Refer to site plan	LS CLAY	1620	1620	UTP	147	133	133	138+	1.70	1.26	34.9	9.1	300		2.70			No sample taken
	N77	Refer to site plan	LS CLAY	1620	1620	UTP	147	147	133	142	1.73	1.27	36.9	8.6	300		2.70			No sample taken
9/05/2018	N78	Refer to site plan	LS CLAY	1620	1620	UTP	UTP	UTP	UTP	UTP	1.86	1.36	36.0	4.2	300	39.2	2.70	1.34	-2.0	Retest of N75/76/77
25/01/2019	N79	Refer to site plan	CLAY	1589	1589	UTP	UTP	UTP	UTP	UTP	1.82	1.57	33.1	4.0	300	32.7	2.70	1.38	4.4	
	N80	Refer to site plan	CLAY	1589	1589	UTP	UTP	185	139	162+	1.83	1.42	28.6	6.9	300	28.1	2.70	1.42	6.8	

This report should only be reproduced in full.

** Gauge Wet Densities outside of the calibrated range of 1.728 to 2.756 t/m³ are not accredited and are outside the laboratories scope of accreditation.

Created By: JLM Date: 7/05/2018
 Checked By: JLM Date: 5/02/2019
 Authorised Signatory: JMJ Date: 7/02/2019



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This plan and accompanying report(s) have been prepared for the purpose of obtaining a resource consent only and for no other purpose. Use of this plan and the information on it for any other purpose is at the user's risk.

AUCKLAND COUNCIL Rodney Section
 COMPRISED IN CT 710969 16.0204ha
 CT 719628 6.4566ha
 CT 691216 0.2469ha

TOTAL AREA 22.7239ha
 AREAS AND MEASUREMENTS ARE SUBJECT TO SURVEY.

MEMORANDUM OF EASEMENTS			
PURPOSE	SHOWN	SERVIENT TENEMENT	DOWNSIDE TENEMENT
RIGHT OF WAY, RIGHT TO DRAIN STORMWATER AND WASTEWATER, AND RIGHT TO CONVEY WATER, ELECTRICITY, TELECOMMUNICATIONS AND COMPUTER MEDIA	(B), (C), (D), (E), (F)	LOT 116 HEREON	LOT 115 HEREON
		LOT 115 HEREON	LOT 116 HEREON
		LOT 501 HEREON	LOT 101 HEREON
		LOT 80 HEREON	LOT 59 HEREON

SCHEDULE OF EASEMENTS GROSS			
PURPOSE	SHOWN	SERVIENT TENEMENT	GRANTEE
PEDESTRIAN RIGHT OF WAY	(D)	LOT 501	AUCKLAND COUNCIL

REVISION (DESCRIPTIONS)	NAME	DATE
SURVEYED		
DESIGNED	YAH	09/16
DRAWN	SL	09/16
CHECKED		
APPROVED		

CATO BOLAM CONSULTANTS
 SURVEYORS PLANNERS ENGINEERS
 CATO BOLAM CONSULTANTS LTD
 19 Tamariki Avenue Phone 07-427 3072
 PO Box 157 Fax 09-426 7231
 Drawn DP16 email cato@catobolam.co.nz catobolam.co.nz

CLIENT
CABRA DEVELOPMENTS LTD
 SUB PRECINCT A
 45 STATION ROAD, HUAPAI

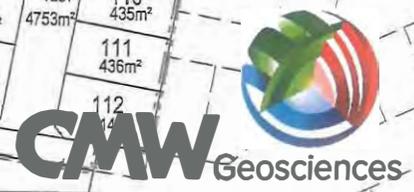
TITLE
 LOTS 1 - 130, 500-501, 1000-1006,
 1100, 1111 & 1112 BEING
 SUBDIVISION OF LOT 1 DP 491124,
 LOT 2 DP 484193 & LOT 1003 DP
 493438 (Sheet 2 of 5)

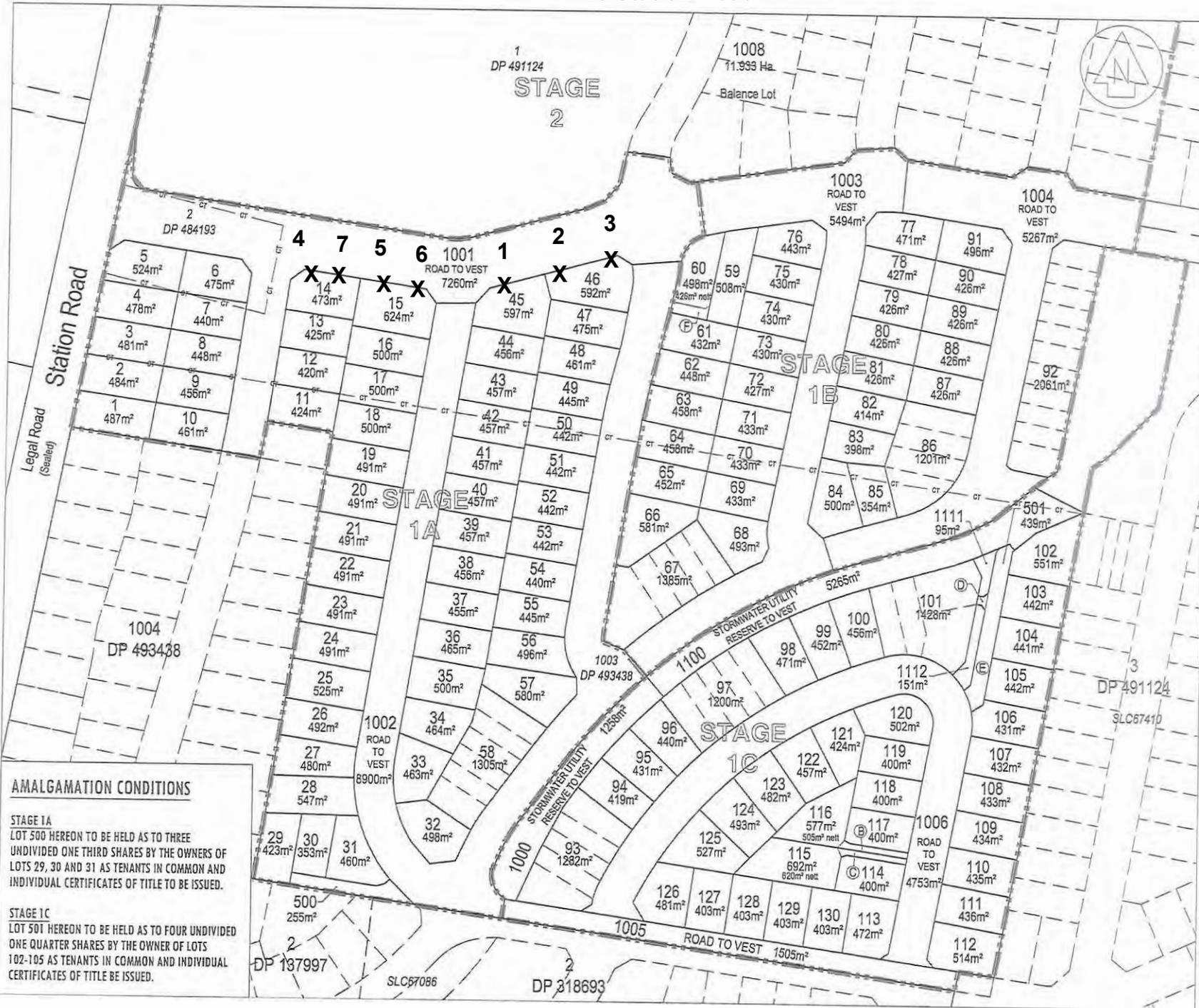
ORIGINAL SCALE	ORIGINAL SIZE	REVISION NO
1:1500	A3	
DATE	CAD REFERENCE	SHEET NO
OCTOBER 2016	34745_S1.dwg	52
DIRECTORY		JOB NO
2\34745\ACAD		34745

AMALGAMATION CONDITIONS

STAGE 1A
 LOT 500 HEREON TO BE HELD AS TO THREE UNDIVIDED ONE THIRD SHARES BY THE OWNERS OF LOTS 29, 30 AND 31 AS TENANTS IN COMMON AND INDIVIDUAL CERTIFICATES OF TITLE TO BE ISSUED.

STAGE 1C
 LOT 501 HEREON TO BE HELD AS TO FOUR UNDIVIDED ONE QUARTER SHARES BY THE OWNER OF LOTS 102-105 AS TENANTS IN COMMON AND INDIVIDUAL CERTIFICATES OF TITLE TO BE ISSUED.





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AUCKLAND COUNCIL Rodney Section
 COMPRISED IN CT 710969 16.0204ha
 CT 719628 6.4566ha
 CT 691216 0.2469ha

TOTAL AREA 22.7239ha
 AREAS AND MEASUREMENTS ARE SUBJECT TO SURVEY.

MEMORANDUM OF EASEMENTS			
PURPOSE	SHOWN	SERVIENT TENEMENT	DOWNTANT TENEMENT
RIGHT OF WAY, RIGHT TO DRAIN STORMWATER AND WASTEWATER, RIGHT TO CONVEY WATER, ELECTRICITY, TELECOMMUNICATIONS AND COMPUTER MEDIA	(B), (C), (D), (E), (F)	LOT 116 HEREON	LOT 115 HEREON
		LOT 115 HEREON	LOT 116 HEREON
		LOT 501 HEREON	LOT 101 HEREON
		LOT 60 HEREON	LOT 59 HEREON

SCHEDULE OF EASEMENTS GROSS			
PURPOSE	SHOWN	SERVIENT TENEMENT	GRANTEE
PEDESTRIAN RIGHT OF WAY	(D)	LOT 501	AUCKLAND COUNCIL

REVISION (DESCRIPTIONS)	NAME	DATE
SURVEYED		
DESIGNED	KAH	09/16
DRAWN	SL	09/16
CHECKED		
APPROVED		

CATO BOLAM CONSULTANTS

SURVEYORS PLANNERS ENGINEERS

CATO BOLAM CONSULTANTS LTD
 19 Tamariki Avenue
 PO Box 157
 Dreva 0916
 Phone 07-437 0972
 Fax 09-426 7201
 Email cato@catobolam.co.nz

CLIENT
CABRA DEVELOPMENTS LTD
 SUB PRECINCT A
 45 STATION ROAD, HUAPAI

TITLE
LOTS 1 - 130, 500-501, 1000-1006, 1100, 1111 & 1112 BEING SUBDIVISION OF LOT 1 DP 491124, LOT 2 DP 484193 & LOT 1003 DP 493438 (Sheet 2 of 5)

ORIGINAL SCALE	ORIGINAL SIZE	REVISION NO
1 : 1500	A3	
DATE	CAD REFERENCE	SHEET NO
OCTOBER 2016	34745 SL.dwg	52
DIRECTORY	JOB NO	
23247451AC16	34745	

AMALGAMATION CONDITIONS

STAGE 1A
 LOT 500 HEREON TO BE HELD AS TO THREE UNDIVIDED ONE THIRD SHARES BY THE OWNERS OF LOTS 29, 30 AND 31 AS TENANTS IN COMMON AND INDIVIDUAL CERTIFICATES OF TITLE TO BE ISSUED.

STAGE 1C
 LOT 501 HEREON TO BE HELD AS TO FOUR UNDIVIDED ONE QUARTER SHARES BY THE OWNER OF LOTS 102-105 AS TENANTS IN COMMON AND INDIVIDUAL CERTIFICATES OF TITLE TO BE ISSUED.



LF14 Rev.10 Dynamic Cone Penetration (DCP) Test Report

NZS 4402: Test 6.5.2: 1988

Report No:	AKL2016-0634LAI Rev.0	Auckland Laboratory CMW Geosciences (NZ) Ltd Partnership Building C, 9 Piermark Drive, Rosedale, NZ 0632 PO Box 300206, Albany, Auckland, NZ 0752 Phone: +64 (09) 4144 632	
Project Name:	45 Station Road Stage 1	Testing Locations Selected By: CMW Field Staff	
Project Location:	Huapai	 <p>All tests reported herein have been performed in accordance with the laboratory's scope of accreditation</p> <p>* Equivalent CBR Values are not accredited and are outside the scope of the laboratory's accreditation</p>	
Project Number:	AKL2016-0634		
Test Date:	2/04/2019		
Tested By:	MMC		
Client:	Cabra		
Client Address:			
Client Reference:			

Test No.	1		2		3		4		5	
Test Location	Road 9									
Chainage & Offset	CH50R		CH60L		CH70R		CH80L		CH90R	
Material & Layer:	CLAY/SG									
Depth (mm)	Blow Count	Equiv CBR*								
0 - 100	8	18	1	2	1	2	3	6	2	4
100 - 200	3	6	3	6	3	6	3	6	2	4
200 - 300	4	8	2	4	3	6	3	6	3	6
300 - 400	4	8	3	6	4	8	3	6	5	10
400 - 500	5	10	5	10	5	10	5	10	5	10
500 - 600	4	8	5	10	5	10	5	10	4	8
600 - 700	5	10	5	10	4	8	4	8	5	10
700 - 800	4	8	4	8	4	8	4	8	4	8
800 - 900	5	10	4	8	4	8	4	8	4	8
900 - 1000										

Test No.	6		7		8		9		10	
Test Location	Road 9									
Chainage & Offset	CH100L		CH110R		CH120L		CH130R		CH140L	
Material & Layer:	CLAY/SG									
Depth	Blow Count	Equiv CBR*								
0 - 100	1	2	2	4	4	8	2	4	4	8
100 - 200	1	2	3	6	3	6	2	4	3	6
200 - 300	3	6	2	4	3	6	3	6	4	8
300 - 400	4	8	2	4	2	4	4	8	4	8
400 - 500	4	8	3	6	4	8	3	6	2	4
500 - 600	4	8	4	8	1	2	5	10	2	4
600 - 700	5	10	7	15	3	6	4	8	2	4
700 - 800	4	8	4	8	5	10	4	8	2	4
800 - 900	5	10	6	13	5	10	5	10	6	13
900 - 1000										

Prepared by: JLM	Date: 4/04/2019	<p>This report should only be reproduced in full</p> <p>*Equivalent CBR values calculated using AUSTRROADS (2010) Guide to Pavement Technology Part 2, Figure 5.3, For Fine Grained Cohesive Soils, and are relevant to fine grained cohesive soils only.</p> <p>Page 1 of 6</p>
Checked by: JLM	Date: 10/04/2019	
Authorised Signatory: JLM	Date: 27/06/2019	



LF14 Rev.10 Dynamic Cone Penetration (DCP) Test Report

NZS 4402: Test 6.5.2: 1988

Report No:	AKL2016-0634LAI Rev.0	Auckland Laboratory CMW Geosciences (NZ) Ltd Partnership Building C, 9 Piermark Drive, Rosedale, NZ 0632 PO Box 300206, Albany, Auckland, NZ 0752 Phone: +64 (09) 4144 632	
Project Name:	45 Station Road Stage 1	Testing Locations Selected By: CMW Field Staff	
Project Location:	Huapai	 <p>All tests reported herein have been performed in accordance with the laboratory's scope of accreditation</p> <p>* Equivalent CBR Values are not accredited and are outside the scope of the laboratory's accreditation</p>	
Project Number:	AKL2016-0634		
Test Date:	2/04/2019		
Tested By:	MMC		
Client:	Cabra		
Client Address:			
Client Reference:			

Test No.	11		12		13		14		15	
Test Location	Road 9		Road 9		Road 9		Road 9		Road 11	
Chainage & Offset	CH150R		CH160L		CH170R		CH180L		CH100R	
Material & Layer:	CLAY/SG									
Depth (mm)	Blow Count	Equiv CBR*								
0 - 100	2	4	2	4	1	2	3	6	1	2
100 - 200	4	8	3	6	2	4	4	8	4	8
200 - 300	2	4	2	4	3	6	4	8	10+	20+
300 - 400	5	10	4	8	3	6	4	8		
400 - 500	2	4	2	4	3	6	3	6		
500 - 600	4	8	3	6	4	8	4	8		
600 - 700	4	8	4	8	5	10	4	8		
700 - 800	3	6	4	8	4	8	4	8		
800 - 900	5	10	4	8	4	8	4	8		
900 - 1000										

Test No.	16		17		18		19		20	
Test Location	Road 11		Road 11		Road 11		Road 11		Road 8	
Chainage & Offset	CH90L		CH80R		CH70L		CH60R		CH250R	
Material & Layer:	CLAY/SG									
Depth	Blow Count	Equiv CBR*								
0 - 100	4	8	0	0	4	8	2	4	2	4
100 - 200	5	10	2	4	4	8	2	4	16	20+
200 - 300	6	13	3	6	5	10	2	4		
300 - 400	5	10	4	8	3	6	2	4		
400 - 500	6	13	2	4	3	6	3	6		
500 - 600	7	15	1	2	3	6	4	8		
600 - 700	4	8	3	6	3	6	4	8		
700 - 800	4	8	3	6	3	6	9	20		
800 - 900	5	10	4	8	3	6	8	18		
900 - 1000										

Prepared by: JLM	Date: 4/04/2019	<p>This report should only be reproduced in full</p> <p>*Equivalent CBR values calculated using AUSTRROADS (2010) Guide to Pavement Technology Part 2, Figure 5.3, For Fine Grained Cohesive Soils, and are relevant to fine grained cohesive soils only.</p> <p>Page 2 of 6</p>
Checked by: JLM	Date: 10/04/2019	
Authorised Signatory: JLM	Date: 27/06/2019	



LF14 Rev.10 Dynamic Cone Penetration (DCP) Test Report

NZS 4402: Test 6.5.2: 1988

Report No:	AKL2016-0634LAI Rev.0	Auckland Laboratory	
Project Name:	45 Station Road Stage 1	CMW Geosciences (NZ) Ltd Partnership	
Project Location:	Huapai	Building C, 9 Piermark Drive, Rosedale, NZ 0632	
Project Number:	AKL2016-0634	PO Box 300206, Albany, Auckland, NZ 0752	
Test Date:	2/04/2019	Phone: +64 (09) 4144 632	
Tested By:	MMC	Testing Locations Selected By: CMW Field Staff	
Client:	Cabra	<p>All tests reported herein have been performed in accordance with the laboratory's scope of accreditation</p>	<p>* Equivalent CBR Values are not accredited and are outside the scope of the laboratory's accreditation</p>
Client Address:			
Client Reference:			

Test No.	21		22		23		24		25	
Test Location	Road 8									
Chainage & Offset	CH240L		CH230R		CH220L		CH210R		CH200L	
Material & Layer:	CLAY/SG									
Depth (mm)	Blow Count	Equiv CBR*								
0 - 100	3	6	3	6	2	4	2	4	3	6
100 - 200	4	8	10+	20+	4	8	3	6	3	6
200 - 300	3	6			3	6	4	8	3	6
300 - 400	3	6			3	6	1	2	3	6
400 - 500	3	6			2	4	3	6	3	6
500 - 600	9	20			3	6	3	6	2	4
600 - 700	2	4			3	6	1	2	3	6
700 - 800	1	2			3	6	4	8	2	4
800 - 900	2	4			3	6	3	6	3	6
900 - 1000										

Test No.	26		27		28		29		30	
Test Location	Road 8									
Chainage & Offset	CH190R		CH180L		CH170R		CH160L		CH150R	
Material & Layer:	CLAY/SG									
Depth	Blow Count	Equiv CBR*								
0 - 100	2	4	3	6	4	8	3	6	2	4
100 - 200	4	8	4	8	4	8	4	8	2	4
200 - 300	2	4	4	8	3	6	3	6	3	6
300 - 400	4	8	3	6	3	6	4	8	3	6
400 - 500	4	8	4	8	3	6	3	6	3	6
500 - 600	3	6	3	6	3	6	4	8	3	6
600 - 700	3	6	3	6	3	6	5	10	3	6
700 - 800	3	6	3	6	3	6	3	6	3	6
800 - 900	3	6	4	8	3	6	3	6	3	6
900 - 1000										

Prepared by: JLM	Date: 4/04/2019	<p>This report should only be reproduced in full</p> <p>*Equivalent CBR values calculated using AUSTRROADS (2010) Guide to Pavement Technology Part 2, Figure 5.3, For Fine Grained Cohesive Soils, and are relevant to fine grained cohesive soils only.</p> <p>Page 3 of 6</p>
Checked by: JLM	Date: 10/04/2019	
Authorised Signatory: JLM	Date: 27/06/2019	



LF14 Rev.10 Dynamic Cone Penetration (DCP) Test Report

NZS 4402: Test 6.5.2: 1988

Report No:	AKL2016-0634LAI Rev.0	Auckland Laboratory CMW Geosciences (NZ) Ltd Partnership Building C, 9 Piermark Drive, Rosedale, NZ 0632 PO Box 300206, Albany, Auckland, NZ 0752 Phone: +64 (09) 4144 632	
Project Name:	45 Station Road Stage 1	Testing Locations Selected By: CMW Field Staff	
Project Location:	Huapai	 <p>All tests reported herein have been performed in accordance with the laboratory's scope of accreditation</p> <p>* Equivalent CBR Values are not accredited and are outside the scope of the laboratory's accreditation</p>	
Project Number:	AKL2016-0634		
Test Date:	2/04/2019		
Tested By:	MMC		
Client:	Cabra		
Client Address:			
Client Reference:			

Test No.	31		32		33		34		35	
Test Location	Road 8									
Chainage & Offset	CH140L		CH130R		CH120L		CH110R		CH100L	
Material & Layer:	CLAY/SG									
Depth (mm)	Blow Count	Equiv CBR*								
0 - 100	2	4	1	2	2	4	2	4	3	6
100 - 200	2	4	4	8	1	2	2	4	2	4
200 - 300	2	4	2	4	1	2	2	4	4	8
300 - 400	2	4	1	2	2	4	3	6	3	6
400 - 500	1	2	2	4	2	4	1	2	4	8
500 - 600	2	4	2	4	1	2	2	4	4	8
600 - 700	2	4	1	2	1	2	2	4	4	8
700 - 800	1	2	1	2	1	2	2	4	4	8
800 - 900	3	6	1	2	1	2	3	6	4	8
900 - 1000										

Test No.	36		37		38		39		40	
Test Location	Road 8									
Chainage & Offset	CH90R		CH80L		CH70R		CH60L		CH50R	
Material & Layer:	CLAY/SG									
Depth	Blow Count	Equiv CBR*								
0 - 100	4	8	2	4	3	6	5	10	4	8
100 - 200	4	8	2	4	3	6	4	8	3	6
200 - 300	4	8	2	4	3	6	3	6	3	6
300 - 400	4	8	3	6	3	6	3	6	3	6
400 - 500	4	8	3	6	3	6	3	6	3	6
500 - 600	4	8	3	6	3	6	6	13	3	6
600 - 700	6	13	3	6	3	6	5	10	3	6
700 - 800	5	10	3	6	3	6	4	8	2	4
800 - 900	5	10	3	6	3	6	6	13	3	6
900 - 1000										

Prepared by: JLM	Date: 4/04/2019	<p>This report should only be reproduced in full</p> <p>*Equivalent CBR values calculated using AUSTRROADS (2010) Guide to Pavement Technology Part 2, Figure 5.3, For Fine Grained Cohesive Soils, and are relevant to fine grained cohesive soils only.</p> <p>Page 4 of 6</p>
Checked by: JLM	Date: 10/04/2019	
Authorised Signatory: JLM	Date: 27/06/2019	



LF14 Rev.10 Dynamic Cone Penetration (DCP) Test Report

NZS 4402: Test 6.5.2: 1988

Report No:	AKL2016-0634LAI Rev.0	Auckland Laboratory
Project Name:	45 Station Road Stage 1	CMW Geosciences (NZ) Ltd Partnership
Project Location:	Huapai	Building C, 9 Piermark Drive, Rosedale, NZ 0632
Project Number:	AKL2016-0634	PO Box 300206, Albany, Auckland, NZ 0752
Test Date:	2/04/2019	Phone: +64 (09) 4144 632
Tested By:	MMC	Testing Locations Selected By: CMW Field Staff
Client:	Cabra	 <p style="font-size: small;">All tests reported herein have been performed in accordance with the laboratory's scope of accreditation</p> <p style="font-size: x-small;">* Equivalent CBR Values are not accredited and are outside the scope of the laboratory's accreditation</p>
Client Address:		
Client Reference:		

Test No.	41		42		43		44		45	
Test Location	Road 8		Road 8		Road 7		Road 7		Road 7	
Chainage & Offset	CH40L		CH30R		CH10R		CH20L		CH30R	
Material & Layer:	CLAY/SG									
Depth (mm)	Blow Count	Equiv CBR*								
0 - 100	4	8	15	20+	4	8	2	4	2	4
100 - 200	3	6			4	8	3	6	3	6
200 - 300	3	6			5	10	3	6	5	10
300 - 400	3	6			2	4	2	4	5	10
400 - 500	4	8			1	2	3	6	5	10
500 - 600	3	6			1	2	3	6	7	15
600 - 700	3	6			2	4	4	8	5	10
700 - 800	4	8			2	4	3	6	5	10
800 - 900	4	8			4	8	3	6	4	8
900 - 1000										

Test No.	46		47		48		49		50	
Test Location	Road 7									
Chainage & Offset	CH40L		CH50R		CH60L		CH70R		CH80L	
Material & Layer:	CLAY/SG									
Depth	Blow Count	Equiv CBR*								
0 - 100	3	6	3	6	3	6	2	4	2	4
100 - 200	3	6	4	8	3	6	3	6	3	6
200 - 300	3	6	4	8	3	6	3	6	3	6
300 - 400	3	6	4	8	5	10	3	6	3	6
400 - 500	3	6	4	8	4	8	3	6	4	8
500 - 600	5	10	4	8	6	13	4	8	4	8
600 - 700	4	8	4	8	5	10	4	8	5	10
700 - 800	3	6	4	8	4	8	4	8	4	8
800 - 900	4	8	5	10	4	8	4	8	5	10
900 - 1000										

<table style="width: 100%;"> <tr> <td style="width: 30%;">Prepared by:</td> <td style="width: 30%;">JLM</td> <td style="width: 30%;">Date:</td> <td style="width: 10%;">4/04/2019</td> </tr> <tr> <td>Checked by:</td> <td>JLM</td> <td>Date:</td> <td>10/04/2019</td> </tr> <tr> <td>Authorised Signatory:</td> <td>JLM</td> <td>Date:</td> <td>27/06/2019</td> </tr> </table>	Prepared by:	JLM	Date:	4/04/2019	Checked by:	JLM	Date:	10/04/2019	Authorised Signatory:	JLM	Date:	27/06/2019	<p style="font-size: small;">This report should only be reproduced in full</p> <p style="font-size: x-small;">*Equivalent CBR values calculated using AUSTRROADS (2010) Guide to Pavement Technology Part 2, Figure 5.3, For Fine Grained Cohesive Soils, and are relevant to fine grained cohesive soils only.</p> <p style="font-size: x-small;">Page 5 of 6</p>
Prepared by:	JLM	Date:	4/04/2019										
Checked by:	JLM	Date:	10/04/2019										
Authorised Signatory:	JLM	Date:	27/06/2019										



LF11 Rev.12 Soil Field Density NDM Direct Transmission with VSS Report (Cohesive Soils)

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

Project: 45 Station Road
Project No: AKL2016-0634
Location: Huapai
Report No: AKL2016-0634LAK Rev.0
Report Date: 11/02/2020
Client: Cabra Developments Limited
Client Address:

Test Methods: NZS 4402 1986 Test 2.1
 NZS 4407 2015 Test 3.1
 NZS 4407 2015 Test 4.2
 NZS 4407 2015 Test 4.3
 NZGS:August 2001

Notes: Solid Density: Assumed
 Solid Density Data Source: N/A
 Testing Locations Selected By: CMW Field Staff

① Blade size of 19mm used.



Tests indicated as not accredited are outside the scope of the laboratory's accreditation

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

Date Sampled	Sample No.	Test Location*	Soil Description*	Solid Density (t/m ³) *	Vane ID		In-situ Vane Shear Strengths					Field and Laboratory Testing Data							Comments	
					Head #	Blade # ①	Test 1 (kPa)	Test 2 (kPa)	Test 3 (kPa)	Test 4 (kPa)	Ave.	Gauge Wet Density (t/m ³) **	Gauge Dry Density (t/m ³)	Gauge Water Content (%)	Gauge Air Voids (%)	Gauge Probe Depth (mm)	Oven Water Content (%)	Oven Dry Density (t/m ³)		Oven Calculated Air Voids (%) *
11/12/2019	N81	Batter extension	CLAY minor Gravel	2.70	2080	2080	UTP	174	222+	177	191+	1.90	1.46	29.9	2	300	25.9	1.51	5	

This report should only be reproduced in full.

** Gauge Wet Densities outside of the calibrated range of 1.728 to 2.756 t/m³ are not accredited and are outside the laboratories scope of accreditation.

Created By: JLM Date: 12/12/2019
 Checked By: JLM Date: 11/02/2020
 Authorised Signatory: JW Date: 11/02/2020

Appendix E: Producer Statements

17 March 2020

Document Ref: AKL2016_0634AL Rev.0

Cabra Developments Limited
PO Box 197
Orewa 0946

Attention: Duncan Unsworth

Dear Sir

RE: CONSTRUCTION REVIEW FOR TIMBER POLE CANTILEVER AND KEYSTONE RETAINING WALLS– CONSENT BCO10092414-1-B
45 STATION ROAD, HUAPAI (53 STATION ROAD, HUAPAI)

CMW Geosciences (CMW) has visited the site at 45 Station Road, Huapai now legally described as 53 Station Road, Huapai Lot 2 DP 533552 on several occasions between April 2017 and February 2020 to observe the site works for the construction of timber pole cantilever retaining walls 4A (beyond chainage 170m), 7A, 7B, 7C, 9, 10, 11A and keystone retaining walls 3, 8 and 27.

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

- Conditions of Auckland Council Building Consent referenced BCO10092414-1-B issued 5 May 2017;
- Consented construction drawings, prepared by CMW Geosciences, referenced AKL2016_0634 Stage 1A & 1B Keystone Wall figures 201 to 203 and Stage 1A & 1B Timber Pole Wall figures 204-206 dated 23 March 2017;
- Geotechnical Report for Stage 1A & 1B Retaining Wall Designs 45 Station Road, Huapai prepared by CMW Geosciences, referenced AKL2016_0634AD Rev.0, dated 23 March 2017.

The site works observed and/or tested by CMW staff for the Keystone Retaining Walls incorporated:

- Assessment of soil strengths at subgrade and retained ground;
- Drainage placement and outlets;
- Backfill aggregate quality and placement;
- Geogrid type, orientation and placement.

Our testing demonstrated vane shear strengths in the subgrade and retained ground that met design specifications. Drainage placement and outlets were observed by CMW.

During February 2020 a few layers of wall 27 were removed and sleeves for fence posts were installed. Grids and compacted hardfill was then re-installed. The orientation and placement of grids were inspected by CMW

and met design specifications. Hardfill compaction was inspected using impact hammer tests; CIV values met design specifications ranging between 228 and 35.

The site works observed and/or tested by CMW staff for the Timber Pole Cantilever Retaining Walls incorporated:

- Measurement of pile hole depth, spacing and diameter;
- Assessment of soil strengths in the pile holes;
- Measurement of timber pole and rail sizes;
- Drainage placement and outlets;
- Confirmation of timber treatment levels.

Between April 2017 and February 2020 CMW inspected the construction of the timber pole cantilever retaining walls. Vane shear strengths in the bases and sides of the pile holes met design specifications, exceeding 70kPa in the 2 metre crust and in excess of 50kPa below 2 metres depth. Groundwater was encountered in some of the piles holes during construction and the contractors were advised to pump this out before concrete was poured.

During December 2019 it was observed that the bridging detail piles at the wall 11A and 11B connections had been drilled too close together. Two piles were subsequently pulled out and redrilled to the correct spacing and depth. Bridging details across the remaining pipe crossings were inspected and met design specifications.

The measurements, dimensions and drainage placement and outlets across the timber pole cantilever retaining walls were observed and met design specifications.

On the basis of our observations and testing, we consider that the site works have been undertaken 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 design 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, construction observations and their attached PS3 certification to ensure that the works have been carried out in accordance with:

- a) The approved Contract drawings and design details;
- b) The approved Contract specifications;
- c) Authorised Variations to (a) and (b) during the execution of the works;
- d) The conditions of Resource and Building Consents where applicable;
- e) The relevant Geotechnical Investigation reports, recommendations and site instructions;

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

For and on behalf of CMW Geosciences



Richard Knowles
Principal Geotechnical Engineer

Distribution: 1 electronic copy to Cabra Developments Limited via email
Original held at CMW Geosciences

Attachments: Producer Statement - Construction Review





New Zealand Institute of Architects Incorporated



Building Code Clause(s) B1

PRODUCER STATEMENT – PS4 – CONSTRUCTION REVIEW

(Guidance on use of Producer Statements (formerly page 2) is available at www.engineeringnz.org)

ISSUED BY: CMW Geosciences (NZ) Limited Partnership
(Construction Review Firm)

TO: Cabra Developments Limited
(Owner/Developer)

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

IN RESPECT OF: The Construction of Timber Cantilever Retaining Walls 4A (part), 7A, 7B, 7C, 9, 10, 11 and
(Description of Building Work)

AT: Segmental Block Retaining Walls 3, 8 and 27 at 45 Station Road, Huapai (53 Station Road, Huapai)
(Address)

Town/City: Auckland LOT 2 DP 533552 SO
(Address)

We CMW Geosciences (NZ) Limited Partnership have been engaged by Cabra Developments Limited
(Construction Review Firm)

To provide CM1 CM2 CM3 CM4 CM5 (Engineering Categories) or observation as per agreement with
owner/developer Cabra Developments Limited

or other as described in CMW letter referenced AKL2016_0634AL Rev.0, dated 17 March 2020 services
(Extent of Engagement)

in respect of clause(s) B1 of the Building Code for the building work described in
documents relating to Building Consent No. BCO10092414-1 and those relating to

Building Consent Amendment(s) Nos. BCO10092414-1-B issued during the
course of the works. We have sighted these Building Consents and the conditions of attached to them.

Authorised instructions/variation(s) No. _____ (copies attached)
or by the attached Schedule have been issued during the course of the works.

On the basis of this review these review(s) and information supplied by the contractor during the course of the works
and **on behalf of the firm** undertaking this Construction Review, **I believe on reasonable grounds** that
 All or Part only of the building works have been completed in accordance with the relevant requirements of the

Building Consent and Building Consent Amendments identified above, with respect to Clause(s) B1
of the Building Code. I also believe on reasonable grounds that the persons who have undertaken this construction review have
the necessary competency to do so.

I, Richard Knowles (AC Author #2342) am: CPEng 160049 # Reg Arch _____ #
(Name of Construction Review Professional)

I am a member of: Engineering New Zealand NZIA and hold the following qualifications BE (civil), CMEngNZ, CPEng
The Construction Review Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than
\$200,000*.

The Construction Review Firm is a member of ACENZ:

SIGNED BY Richard Knowles (AC Author #2342) (Signature) 
(Name of Construction Review Professional)

ON BEHALF OF CMW Geosciences (NZ) Limited Partnership Date 18/3/20
(Construction Review Firm)

Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the
Design Firm only. The total maximum amount of damages payable arising from this statement and all other statements provided to the Building
Consent Authority in relation to this building work, whether in contract, tort or otherwise (including negligence), is limited to the sum of \$200,000*.

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

THIS FORM AND ITS CONDITIONS ARE COPYRIGHT TO ACENZ, ENGINEERING NEW ZEALAND AND NZIA

17 March 2020

Document Ref: AKL2016_0634AN Rev.0

Cabra Developments Limited
PO Box 197
Orewa 0946

Attention: Duncan Unsworth

Dear Sir

**RE: CONSTRUCTION REVIEW FOR TIMBER POLE CANTILEVER AND SEGMENTAL BLOCK
RETAINING WALLS– CONSENT BCO10285560
45 STATION ROAD, HUAPAI (53 STATION ROAD, HUAPAI)**

CMW Geosciences (CMW) has visited the site at 45 Station Road, Huapai now legally described as 53 Station Road, Huapai Lot 200 DP 513781 and Lot 201 DP 513781 on several occasions between December 2019 and January 2020 to observe the site works for the construction of timber pole cantilever retaining walls 4A (approximate chainage 0m to 170m), 5 and 6 and segmental block retaining wall 28.

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

- Conditions of Auckland Council Building Consent referenced BCO10285560 issued 10 June 2019;
- Consented construction drawings, prepared by CMW Geosciences, referenced AKL2016_0634 Timber Pole Retaining Wall Design and Segmental Block Wall with No-Fines Concrete figures 01-04 dated 23 April 2019;
- Geotechnical Report for Remaining Scope of Stage 1A & 1B Retaining Wall Designs 45 Station Road, Huapai prepared by CMW Geosciences, referenced AKL2016_0634AH Rev.1, dated 19 March 2019.

The site works observed and/or tested by CMW staff for the Segmental Block Retaining Wall incorporated:

- Assessment of soil strengths at subgrade and retained ground;
- Drainage placement and outlets;
- Foundation preparation for segmental block walls;
- Backfill No-Fines concrete placement
- Subsoil drainage installation;
- Compaction testing of engineered backfill during placement.

Our testing demonstrated vane shear strengths in the footing and retained soil of wall 28 averaged over 100kPa. No-fines concrete placement met design specifications. Drainage placement and outlets were observed.

The site works observed and/or tested by CMW staff for the Timber Pole Cantilever Retaining Walls incorporated:

- Measurement of pile hole depth, spacing and diameter;
- Assessment of soil strengths in the pile holes;
- Measurement of timber pole and rail sizes;
- Drainage placement and outlets;
- Confirmation of timber treatment levels.

Between early December 2019 and late January 2020 CMW inspected the construction of the 3 timber pole retaining walls 5, 6 and a section of 4a (approximately CH 0m to CH 170m). Vane shear strengths in the base and sides of all pile holes met design specifications with all exceeding 70kPa. Where groundwater was encountered in the pile holes, contractors were asked to pump it out before concrete was poured. Drainage outlets were observed to have been installed in every lot.

The measurements, dimensions and drainage placement across the timber pole cantilever retaining walls were observed and met design specifications.

On the basis of our observations and testing, we consider that the site works have been undertaken 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 design 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, construction observations and their attached PS3 certification to ensure that the works have been carried out in accordance with:

- a) The approved Contract drawings and design details;
- b) The approved Contract specifications;
- c) Authorised Variations to (a) and (b) during the execution of the works;
- d) The conditions of Resource and Building Consents where applicable;
- e) The relevant Geotechnical Investigation reports, recommendations and site instructions;

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

For and on behalf of CMW Geosciences



Richard Knowles

Principal Geotechnical Engineer

Distribution: 1 electronic copy to Cabra Developments Limited via email
Original held at CMW Geosciences

Attachments: Producer Statement - Construction Review





Building Code Clause(s) B1

PRODUCER STATEMENT – PS4 – CONSTRUCTION REVIEW

(Guidance on use of Producer Statements (formerly page 2) is available at www.engineeringnz.org)

ISSUED BY: CMW Geosciences (NZ) Limited Partnership
(Construction Review Firm)

TO: Cabra Developments Limited
(Owner/Developer)

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

IN RESPECT OF: The Construction of Timber Cantilever Retaining Walls 4A (part), 5 & 6 & Segmental Block Wall 28
(Description of Building Work)

AT: 45 Station Road, Huapai (53 Station Road, Huapai)
(Address)

Town/City: Auckland LOT 200/201 DP 513781 SO
(Address)

We CMW Geosciences (NZ) Limited Partnership have been engaged by Cabra Developments Limited
(Construction Review Firm)

To provide CM1 CM2 CM3 CM4 CM5 (Engineering Categories) or observation as per agreement with
owner/developer Cabra Developments Limited

or other as described in CMW letter referenced AKL2016_0634AN Rev.0, dated 17 March 2020 services
(Extent of Engagement)

in respect of clause(s) B1 of the Building Code for the building work described in
documents relating to Building Consent No. BCO10285560 and those relating to

Building Consent Amendment(s) Nos. issued during the
course of the works. We have sighted these Building Consents and the conditions of attached to them.

Authorised instructions/variation(s) No. (copies attached)
or by the attached Schedule have been issued during the course of the works.

On the basis of this review these review(s) and information supplied by the contractor during the course of the works
and **on behalf of the firm** undertaking this Construction Review, **I believe on reasonable grounds** that
 All or Part only of the building works have been completed in accordance with the relevant requirements of the

Building Consent and Building Consent Amendments identified above, with respect to Clause(s) B1
of the Building Code. I also believe on reasonable grounds that the persons who have undertaken this construction review have
the necessary competency to do so.

I, Richard Knowles (AC Author #2342) am: CPEng 160049 # Reg Arch #
(Name of Construction Review Professional)

I am a member of: Engineering New Zealand NZIA and hold the following qualifications BE (civil), CMEngNZ, CPEng
The Construction Review Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than
\$200,000*.

The Construction Review Firm is a member of ACENZ:

SIGNED BY Richard Knowles (AC Author #2342) (Signature) 
(Name of Construction Review Professional)

ON BEHALF OF CMW Geosciences (NZ) Limited Partnership Date 18/3/20
(Construction Review Firm)

Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the
Design Firm only. The total maximum amount of damages payable arising from this statement and all other statements provided to the Building
Consent Authority in relation to this building work, whether in contract, tort or otherwise (including negligence), is limited to the sum of \$200,000*.

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

THIS FORM AND ITS CONDITIONS ARE COPYRIGHT TO ACENZ, ENGINEERING NEW ZEALAND AND NZIA



As Built Earthworks Legend

— 38.0 —	As built Contour (1m interval)
— 38.5 —	As built Contour (0.5m interval)
■ ■ ■ ■ ■	Extent of Stage 1A As Built works (Schoolside Road & Vintry Drive)



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- NOTES**
- Contours are finished ground levels as surveyed at 21/02/2019. Contour interval of 0.5m
 - Levels are in terms of LINZ Datum 1946.
 - Coordinates are in terms of NZTM.

I certify that these As-Built Plans are an accurate record of the works undertaken and that:

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

Signed: 
Registered Professional Surveyor

Date: 28/02/2019
Name: Tom Lemon
Phone: (09) 427 0072
Email: catobolam@catobolam.co.nz

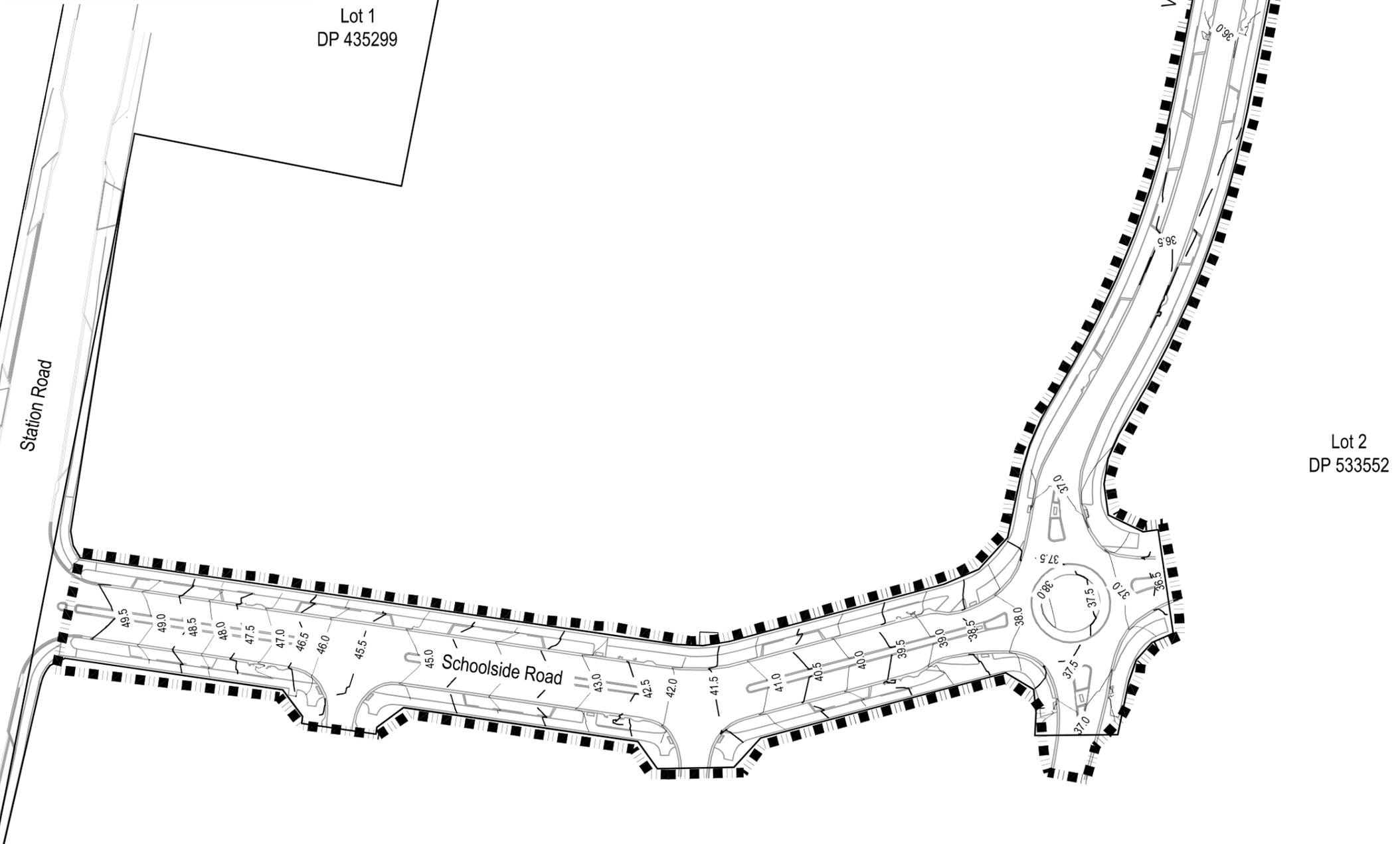


PROJECT
The Country Club Huapai
Station Road
Huapai

DRAWING TITLE
Stage 1A
Final Contours As Built
Plan

FOR COMPLETION

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Final Contours As Built Completion	BJ	21/02/2019
1	Final Contours As Built Completion	BJ	25/02/2019
2	Boundary change	BJ	28/02/2019
SURVEYED		LD	21/01/2019
DESIGNED			
DRAWN		AM	21/02/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE	
28/02/2019	1:1000	A3	
DRAWING NO.			REVISION
40353-DR-SU-9000			2



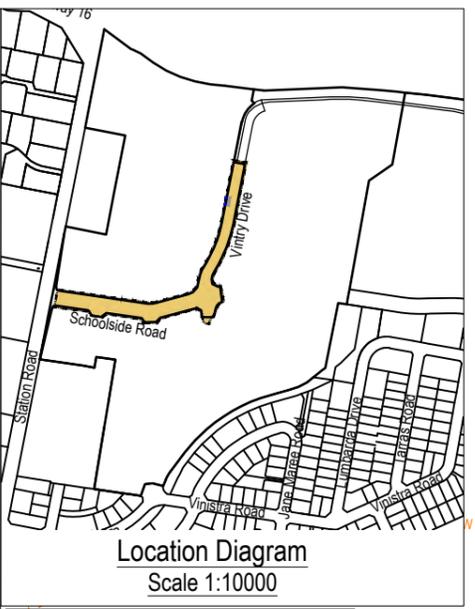
SUB 60321705/ BUN 60321703/ ENG 60068582 & ENG 60317337

Road As Built Legend

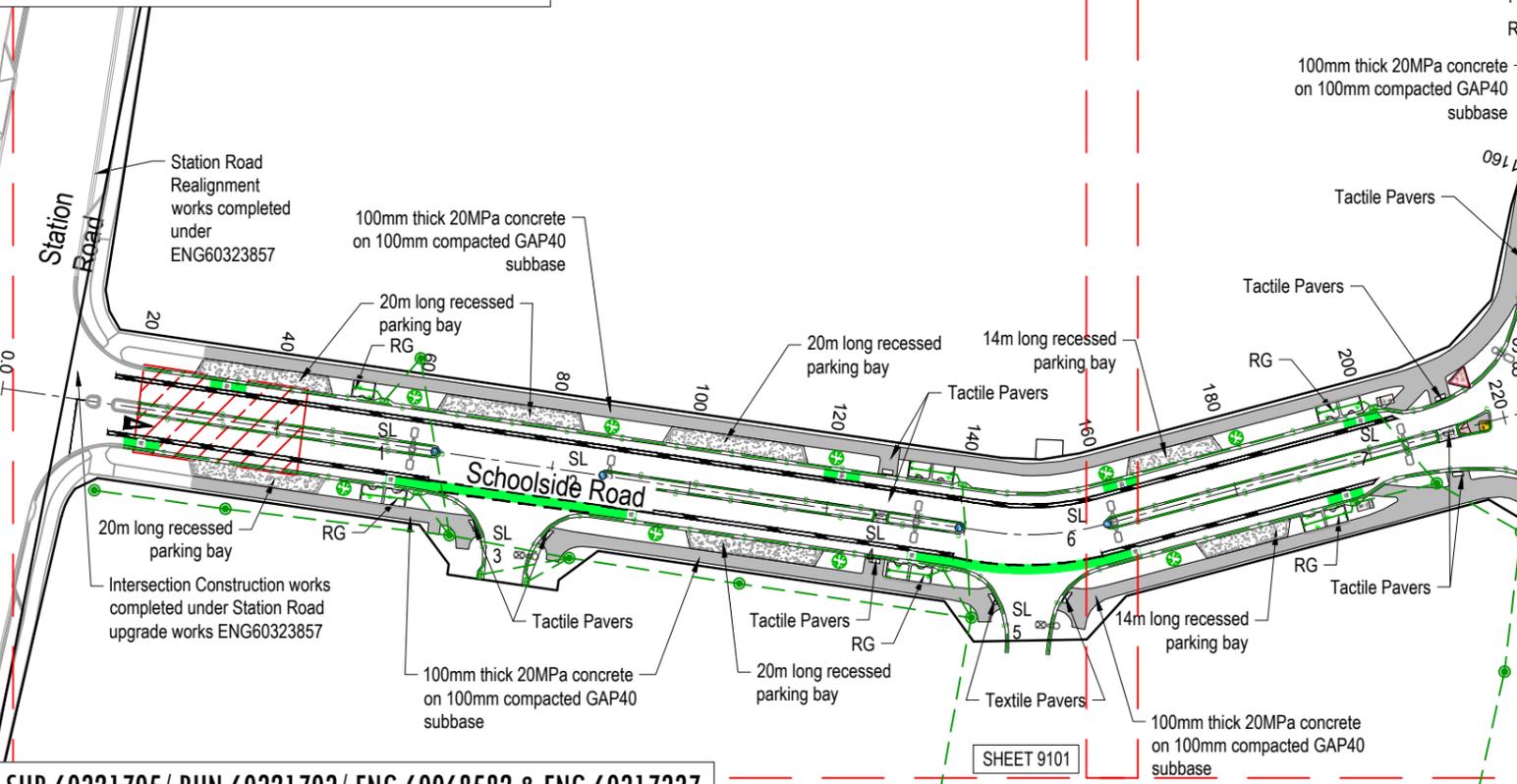
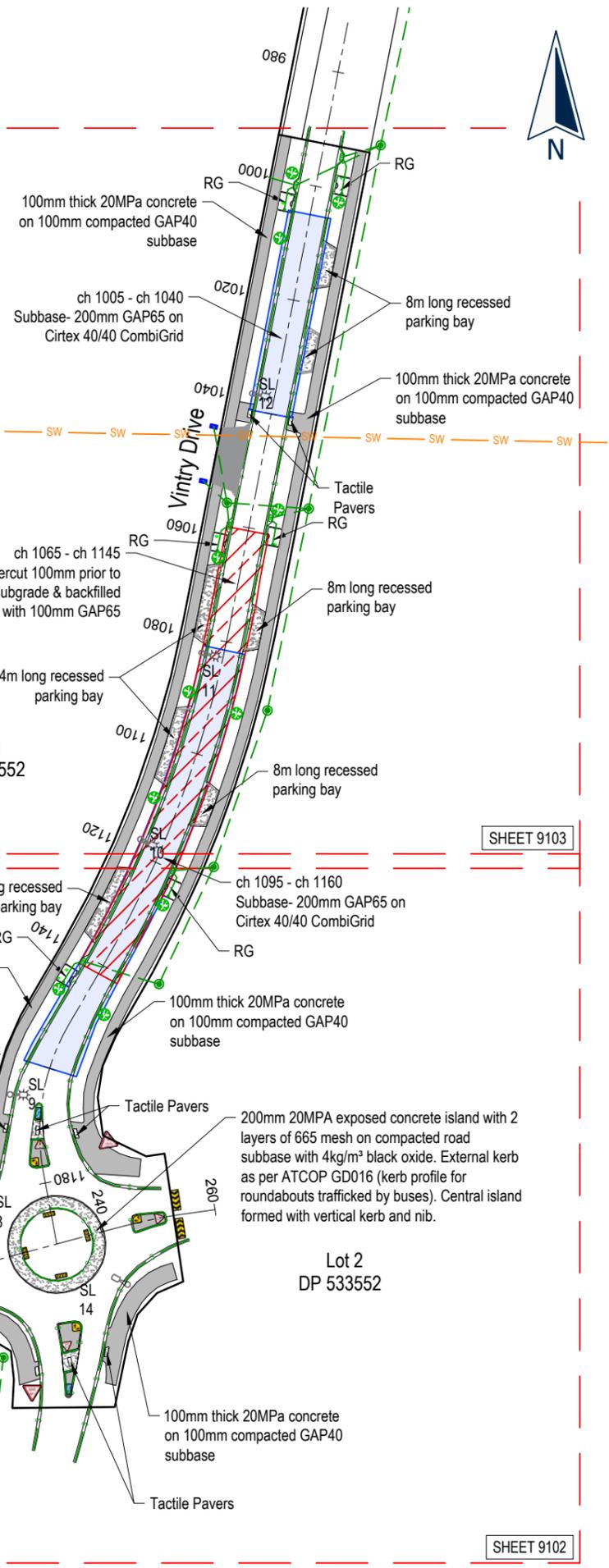
-  New Stormwater Manhole & Pipeline
-  Existing Stormwater Manhole & Pipeline
-  Stormwater Cesspit (Semi recessed)
-  Concrete Footpath / Vehicle Crossing
-  Rain Garden (RG)
-  Exposed Concrete Parking Bay
-  Schools Road
Street Lights Cree XSP1 IP66 T3ME 45W system 4000K version c on Vicpole round tapered 8m pole and 1m arm 0deg tilt in cental median.
-  Schools Road & Vintry Drive Intersection
Cree XSP1 IP66 T3ME 45W system 4000K version C on Vicpole Porchester 8m pole and 1m arm 0deg tilt (1m setback).
-  Vintry drive
Cree XSP1 IP66 T3ME 22W system 4000K version C on Vicpole Porchester 8m pole and 1 m arm 0deg tilt (1m setback) (G = 80 Candela = 270) (G = 62.5 max Candela = 1824).
-  Schools Road Streetlight 3 & 5
Cree XSP1 IP66 T3ME 22W system 4000K version C on Vicpole Porchester 8m pole and 1 m arm 0deg tilt (1m setback) (G = 80 Candela = 243)
-  Metrosideros Maori Princess (Schoolside Road)
-  Underchannel drain

NOTES

- GENERAL**
- Levels are in terms of LINZ Datum 1946.
 - Coordinates are in terms of NZTM.
 - All infrastructure is public unless otherwise shown.
- Pavement Formation**
- Parking Bays**
175mm thick 20MPa exposed aggregate concrete with 4kg m³ black oxide, 1 layer of 665mesh on 100mm GAP65 sub-base.
- Road Footpaths**
1.8m wide, 100mm 20MPa concrete on 100mm GAP40 bedding
- Schoolside Road**
Subgrade - Stabilised with 12kg/m² of lime & 7kg/m² of cement to a depth of 300mm
Subbase - 200mm GAP65
Basecourse - 150mm TNZ AP40
Seal - 40mm hotmix on grade 4 chipseal membrane
- Vintry Drive**
Subgrade - Stabilised with 14kg/m² of lime & 7kg/m² of cement to a depth of 300mm
Subbase - 200mm GAP65
Basecourse - 150mm TNZ AP40
Seal - 40mm hotmix on grade 4 chipseal membrane
- Landscape Works**
Landscape works on Schoolside Road & Vintry Drive to be bonded and completed at a later stage.
- Pedestrian Refuge Island**
Tactile pavers with 175mm thick 20MPa exposed aggregate concrete with 4kg m³ black oxide, 1 layer of 665mesh on 100mm GAP65 sub-base



Streetlight Coordinate Table		
Name	mN	mE
SL 1	5928942.919	1737240.449
SL 2	5928938.420	1737268.691
SL 3	5928927.062	1737257.853
SL 4	5928931.063	1737312.83
SL 5	5928915.705	1737332.781
SL 6	5928930.555	1737341.416
SL 7	5928940.894	1737383.481
SL 8	5928954.196	1737396.696
SL 9	5928973.309	1737401.894
SL 10	5929016.847	1737425.197
SL 11	5929048.796	1737436.357
SL 12	5929093.317	1737445.874
SL 14	5928940.172	1737421.562



SUB 60321705/ BUN 60321703/ ENG 60068582 & ENG 60317337

I certify that these As-Built Plans are an accurate record of the works undertaken and that:

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

Signed: 
Registered Professional Surveyor

Date: 05/11/2019
Name: Tom Lemon
Phone: (09) 427 0072
Email: catobolam@catobolam.co.nz



PROJECT
The Country Club Huapai
Station Road
Huapai

DRAWING TITLE
Stage 1A
Road As Built Plan
Sheet 1 of 4

FOR COMPLETION

No.	REVISION (DESCRIPTIONS)	NAME	DATE
1	Road As Built Completion	BJ	21/02/2019
2	Boundary change	BJ	28/02/2019
3	Vehicle crossing and street trees added	DL	05/11/2019
SURVEYED		LD	21/01/2019
DESIGNED			
DRAWN		BJ	21/02/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE	
28/02/2019	1:1000	A3	
DRAWING NO.	40353-DR-SU-9100	REVISION	3



NOTES

GENERAL

1. Levels are in terms of LINZ Datum 1946.
2. Coordinates are in terms of NZTM.
3. All infrastructure is public unless otherwise shown.

Pavement Formation

Parking Bays
175mm thick 20MPa exposed aggregate concrete with 4kg m³ black oxide, 1 layer of 665mesh on 100mm GAP65 sub-base.

Road Footpaths
1.8m wide, 100mm 20MPa concrete on 100mm GAP40 bedding

Schoolside Road
Subgrade - Stabilised with 12kg/m² of lime & 7kg/m² of cement to a depth of 300mm
Subbase - 200mm GAP65
Basecourse - 150mm TNZ AP40
Seal - 40mm hotmix on grade 4 chipseal membrane

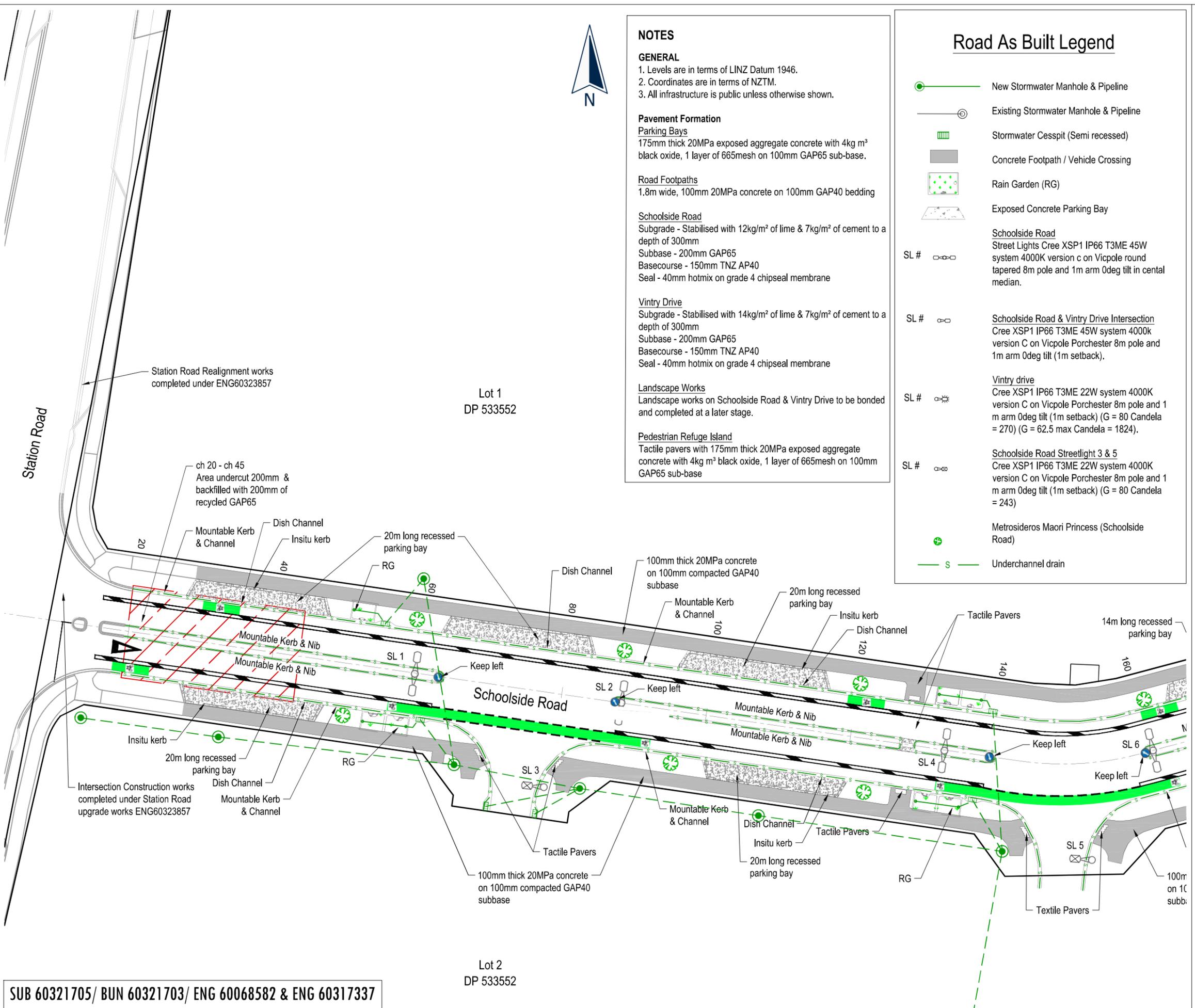
Vintry Drive
Subgrade - Stabilised with 14kg/m² of lime & 7kg/m² of cement to a depth of 300mm
Subbase - 200mm GAP65
Basecourse - 150mm TNZ AP40
Seal - 40mm hotmix on grade 4 chipseal membrane

Landscape Works
Landscape works on Schoolside Road & Vintry Drive to be bonded and completed at a later stage.

Pedestrian Refuge Island
Tactile pavers with 175mm thick 20MPa exposed aggregate concrete with 4kg m³ black oxide, 1 layer of 665mesh on 100mm GAP65 sub-base

Road As Built Legend

-  New Stormwater Manhole & Pipeline
-  Existing Stormwater Manhole & Pipeline
-  Stormwater Cesspit (Semi recessed)
-  Concrete Footpath / Vehicle Crossing
-  Rain Garden (RG)
-  Exposed Concrete Parking Bay
-  Schoolside Road Streetlights Cree XSP1 IP66 T3ME 45W system 4000K version c on Vicpole Porchester 8m pole and 1m arm 0deg tilt in cental median.
-  Schoolside Road & Vintry Drive Intersection Cree XSP1 IP66 T3ME 45W system 4000K version C on Vicpole Porchester 8m pole and 1m arm 0deg tilt (1m setback).
-  Vintry drive Cree XSP1 IP66 T3ME 22W system 4000K version C on Vicpole Porchester 8m pole and 1 m arm 0deg tilt (1m setback) (G = 80 Candela = 270) (G = 62.5 max Candela = 1824).
-  Schoolside Road Streetlight 3 & 5 Cree XSP1 IP66 T3ME 22W system 4000K version C on Vicpole Porchester 8m pole and 1 m arm 0deg tilt (1m setback) (G = 80 Candela = 243)
-  Metrosideros Maori Princess (Schoolside Road)
-  Underchannel drain



I certify that these As-Built Plans are an accurate record of the works undertaken and that:
 * The Coordinates (X, Y) are in terms of NZTM on NZGD(2000), and are within ± 50mm.
 * The levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within ± 10mm.

Signed: 
Registered Professional Surveyor

Date: 28/02/2019

Name: Tom Lemon

Phone: (09) 427 0072
Email: catobolam@catobolam.co.nz



PROJECT
**The Country Club Huapai
Station Road
Huapai**

DRAWING TITLE
**Stage 1A
Road As Built Plan
Sheet 2 of 4**

FOR COMPLETION

No.	REVISION (DESCRIPTIONS)	NAME	DATE
1	Road As Built Completion	BJ	21/02/2019
2	Boundary change	BJ	28/02/2019
SURVEYED		LD	21/01/2019
DESIGNED			
DRAWN		BJ	21/02/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE	
21/02/2019	1:500	A3	
DRAWING NO.			REVISION
40353-DR-SU-9101			2

SUB 60321705/ BUN 60321703/ ENG 60068582 & ENG 60317337

NOTES

GENERAL

1. Levels are in terms of LINZ Datum 1946.
2. Coordinates are in terms of NZTM.
3. All infrastructure is public unless otherwise shown.

Pavement Formation

Parking Bays
 175mm thick 20MPa exposed aggregate concrete with 4kg m³ black oxide, 1 layer of 665mesh on 100mm GAP65 sub-base.

Road Footpaths
 1.8m wide, 100mm 20MPa concrete on 100mm GAP40 bedding

Schoolside Road
 Subgrade - Stabilised with 12kg/m² of lime & 7kg/m² of cement to a depth of 300mm
 Subbase - 200mm GAP65
 Basecourse - 150mm TNZ AP40
 Seal - 40mm hotmix on grade 4 chipseal membrane

Vintry Drive
 Subgrade - Stabilised with 14kg/m² of lime & 7kg/m² of cement to a depth of 300mm
 Subbase - 200mm GAP65
 Basecourse - 150mm TNZ AP40
 Seal - 40mm hotmix on grade 4 chipseal membrane

Landscape Works
 Landscape works on Schoolside Road & Vintry Drive to be bonded and completed at a later stage.

Pedestrian Refuge Island
 Tactile pavers with 175mm thick 20MPa exposed aggregate concrete with 4kg m³ black oxide, 1 layer of 665mesh on 100mm GAP65 sub-base



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

Signed: 
 Registered Professional Surveyor

Date: 05/11/2019

Name: Tom Lemon

Phone : (09) 427 0072
 Email : catobolam@catobolam.co.nz

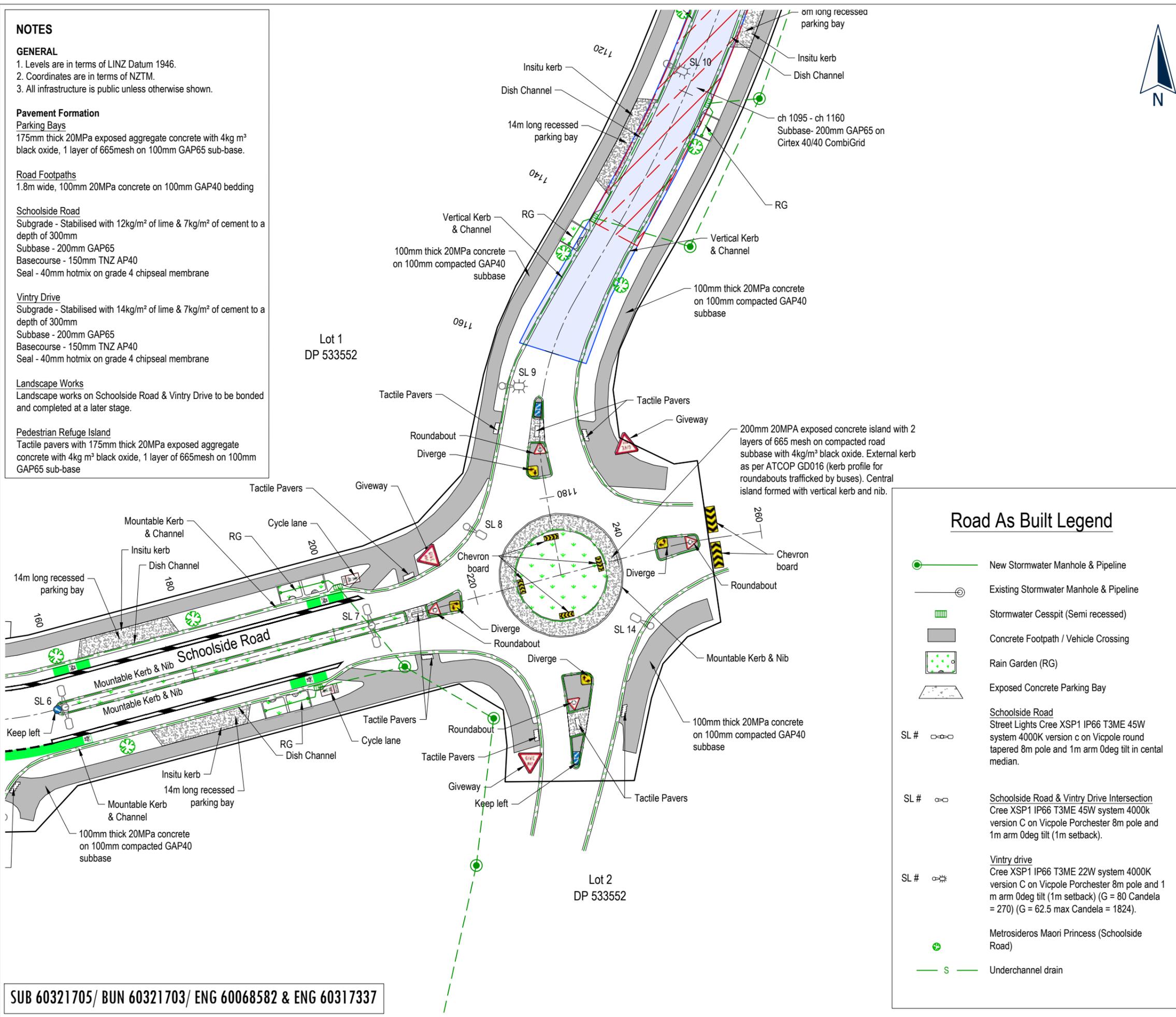


PROJECT
 The Country Club Huapai
 Station Road
 Huapai

DRAWING TITLE
 Stage 1A
 Road As Built Plan
 Sheet 3 of 4

FOR COMPLETION

No.	REVISION (DESCRIPTIONS)	NAME	DATE
1	Road As Built Completion	BJ	21/02/2019
2	Boundary change	BJ	28/02/2019
3	Street Trees added	DL	05/11/2019
SURVEYED		LD	21/01/2019
DESIGNED			
DRAWN		BJ	21/02/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE	
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DRAWING NO.		REVISION	
40353-DR-SU-9102		3	

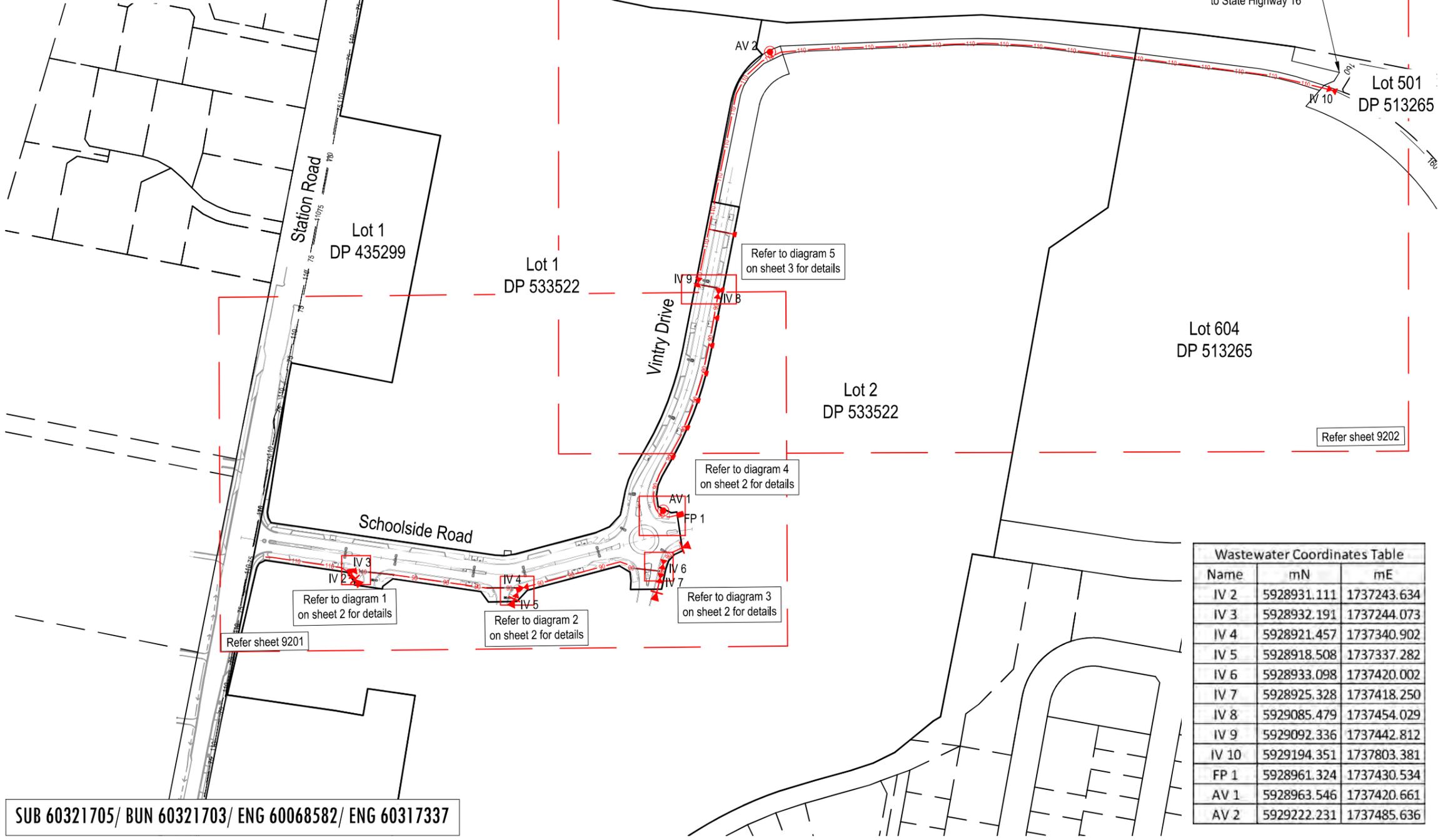
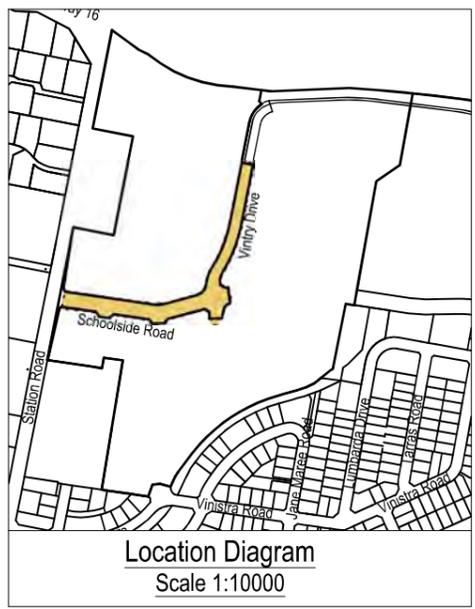


SUB 60321705/ BUN 60321703/ ENG 60068582 & ENG 60317337



Asbuilt Legend

Existing	New - Constructed under Stage 1A
75 PWC Sewer	50
110 PWC Sewer	90
	110
Isolation Valve	
Flushing Point	FP
Boundary Kit	BK



- NOTE
- Levels are in terms of LINZ Datum.
 - Coordinates are in terms of NZTM.
 - All pipework is PE100 PN16 with GAP7 bedding.
 - Depth of lines are approximately 0.6m below finished ground level.
 - Pipe sizes shown are outside diameter (50,63,75,90,110mm)

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Signed: 
Registered Professional Surveyor

Date: 28/02/2019

Name: Tom Lemon

Phone: (09) 427 0072
Email: catobolam@catobolam.co.nz



PROJECT

**The Country Club Huapai
Station Road
Huapai**

DRAWING TITLE

**Stage 1A
Waste Water Reticulation
As Built Plan
Sheet 1 of 3**

FOR COMPLETION

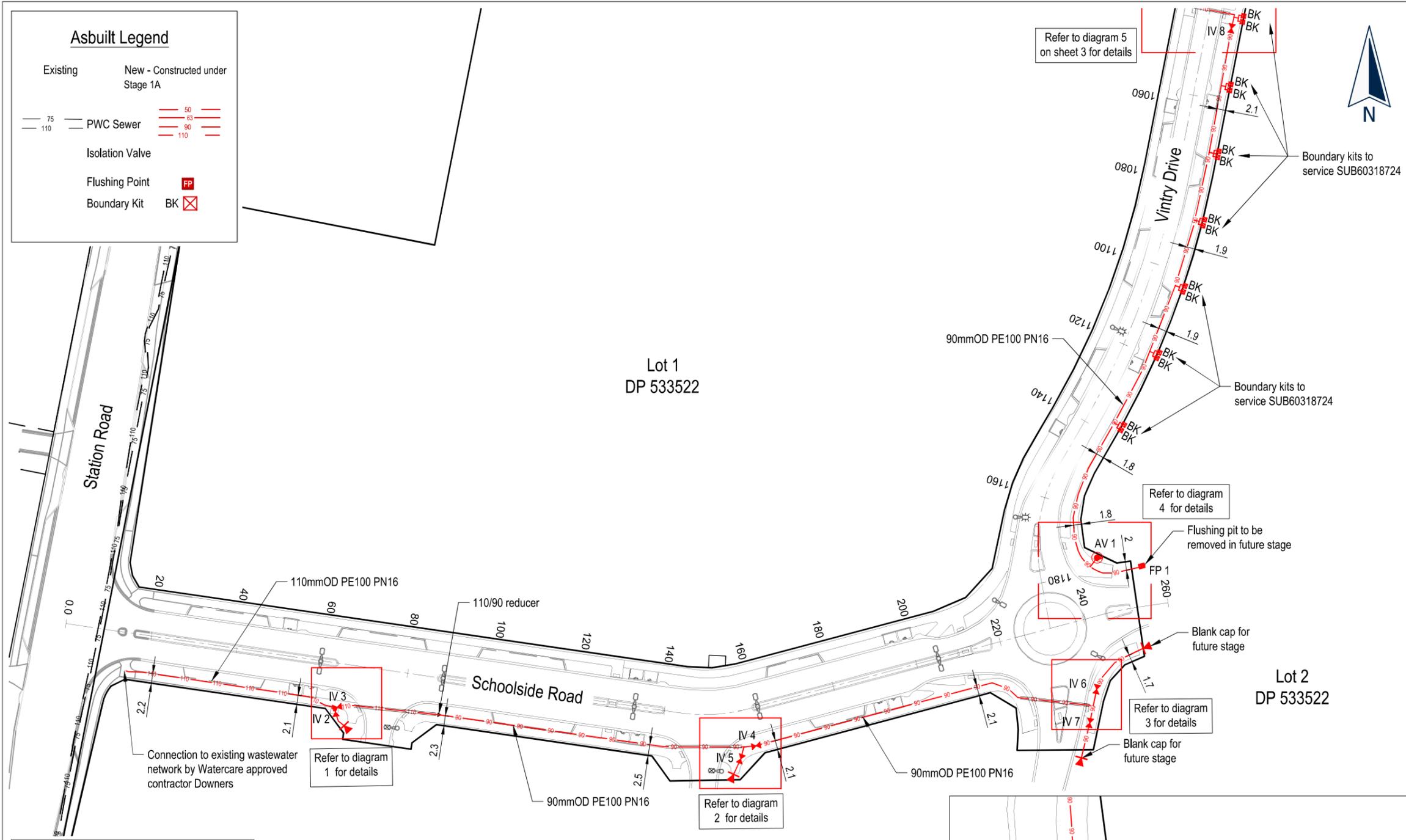
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1	Waste Water As Built Completion	BJ	21/02/2019
2	Boundary Kits added & Boundary change	BJ	28/02/2019
SURVEYED			
			LD 21/01/2019
DESIGNED			
			BJ 21/02/2019
DRAWN			
DATE		ORIGINAL SCALE	ORIGINAL SIZE
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DRAWING NO.			REVISION
40353-DR-SU-9200			2

Name	mN	mE
IV 2	5928931.111	1737243.634
IV 3	5928932.191	1737244.073
IV 4	5928921.457	1737340.902
IV 5	5928918.508	1737337.282
IV 6	5928933.098	1737420.002
IV 7	5928925.328	1737418.250
IV 8	5929085.479	1737454.029
IV 9	5929092.336	1737442.812
IV 10	5929194.351	1737803.381
FP 1	5928961.324	1737430.534
AV 1	5928963.546	1737420.661
AV 2	5929222.231	1737485.636

SUB 60321705/ BUN 60321703/ ENG 60068582/ ENG 60317337

Asbuilt Legend

- Existing New - Constructed under Stage 1A
- 75 — PWC Sewer
 - 110 — PWC Sewer
 - 50 —
 - 63 —
 - 90 —
 - 110 —
- Isolation Valve
- Flushing Point **FP**
- Boundary Kit **BK**



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NOTE

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2. Coordinates are in terms of NZTM.
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Signed: Registered Professional Surveyor

Date: 28/02/2019

Name: Tom Lemon

Phone : (09) 427 0072
Email : catobolam@catobolam.co.nz



PROJECT

The Country Club Huapai
Station Road
Huapai

DRAWING TITLE

Stage 1A
Waste Water Reticulation
As Built Plan
Sheet 2 of 3

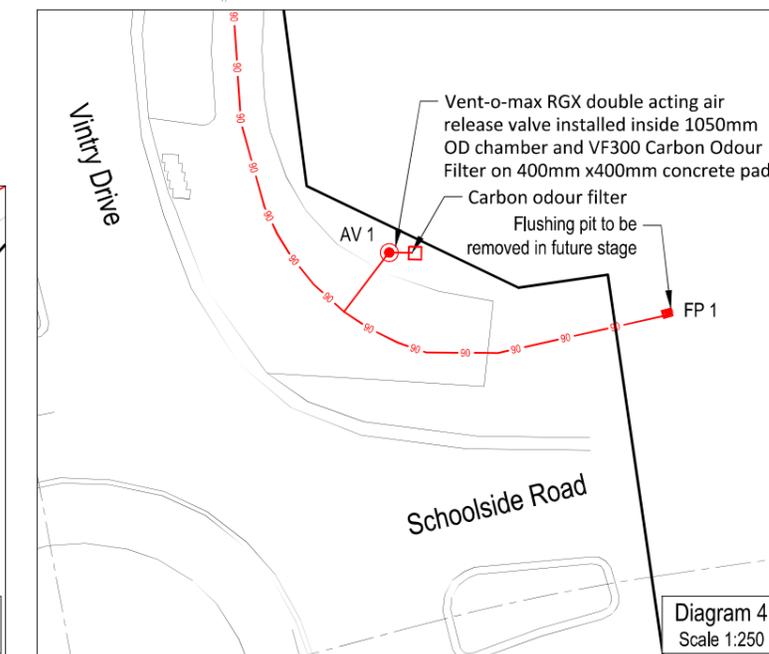
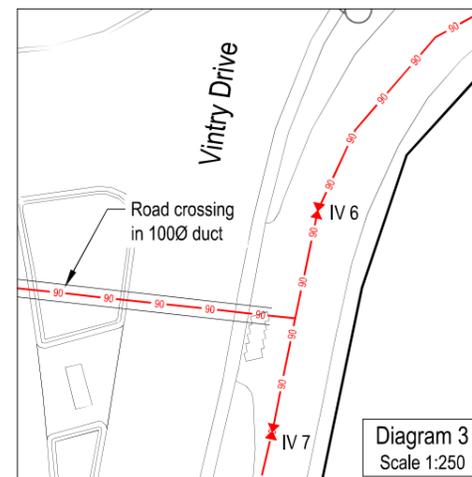
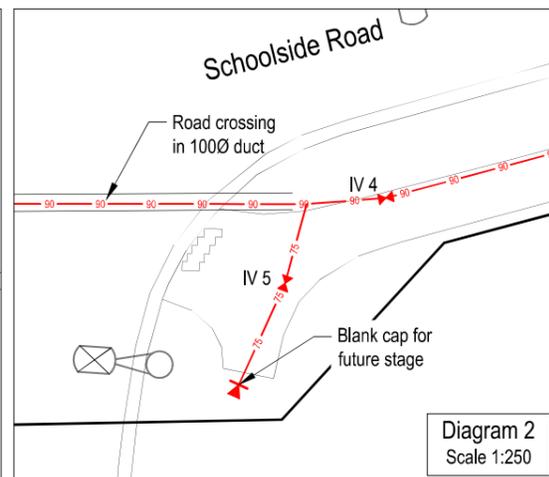
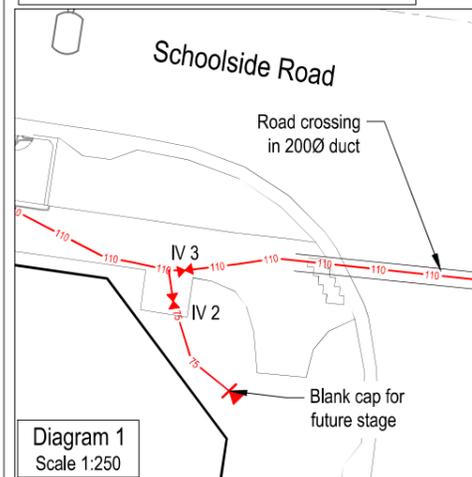
FOR COMPLETION

No.	REVISION (DESCRIPTIONS)	NAME	DATE
1	Waste Water As Built Completion	BJ	21/02/2019
2	Boundary Kits added & Boundary change	BJ	28/02/2019

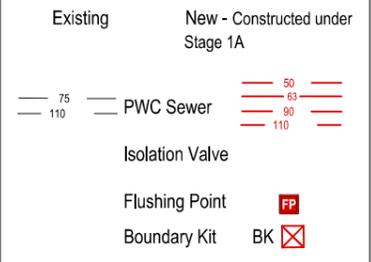
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DESIGNED			
DRAWN		BJ	21/02/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE	
28/02/2019	1:1000	A3	

DRAWING NO. **40353-DR-SU-9201** REVISION **2**

SUB 60321705/ BUN 60321703/
ENG 60068582/ ENG 60317337



Asbuilt Legend



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NOTE

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2. Coordinates are in terms of NZTM.
3. All pipework is PE100 PN16 with GAP7 bedding.
4. Depth of lines are approximately 0.6m below finished ground level.
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Signed:
Registered Professional Surveyor

Date: 28/02/2019
Name: Tom Lemon
Phone : (09) 427 0072
Email : catobolam@catobolam.co.nz



PROJECT
The Country Club Huapai
Station Road
Huapai

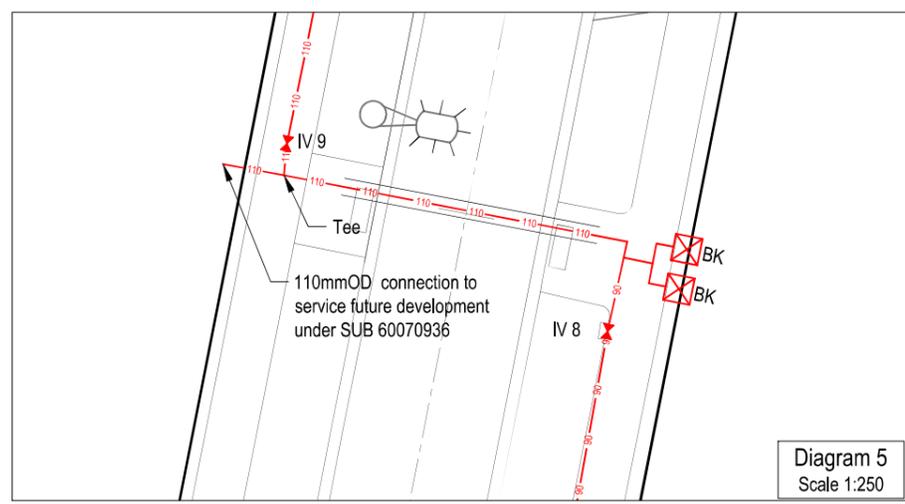
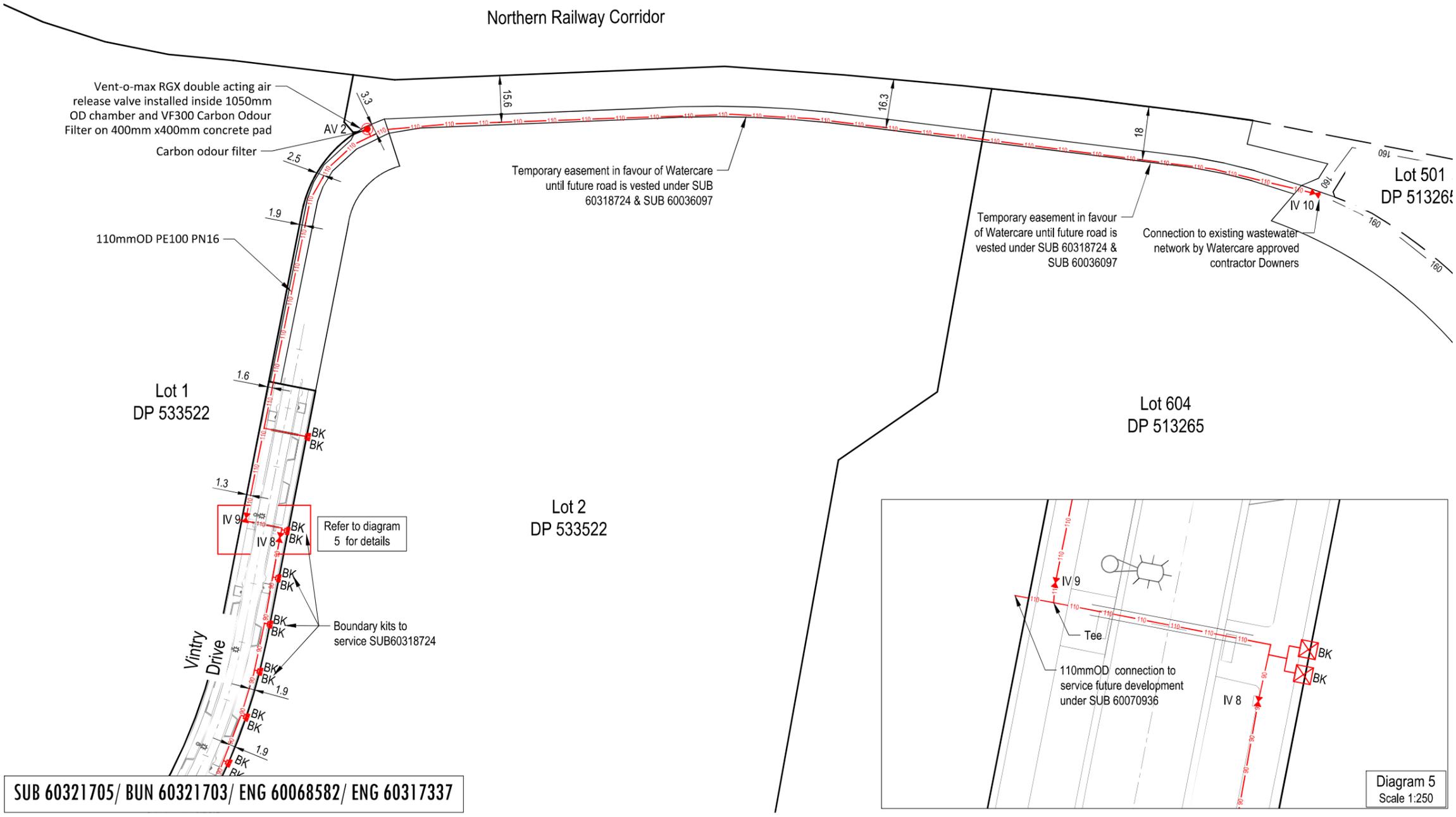
DRAWING TITLE
Stage 1A
Waste Water Reticulation
As Built Plan
Sheet 3 of 3

FOR COMPLETION

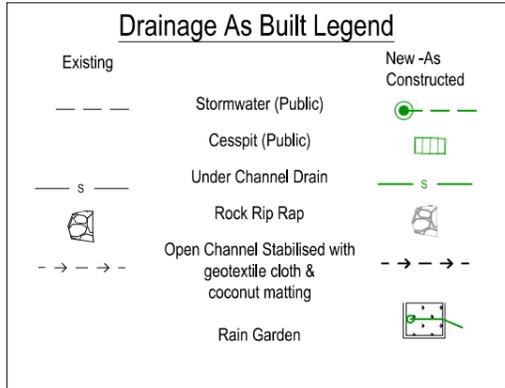
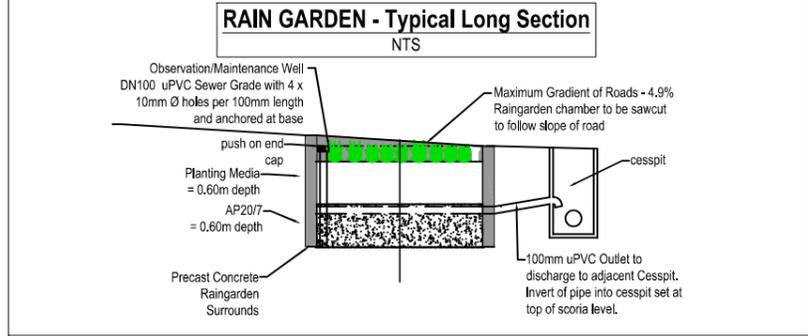
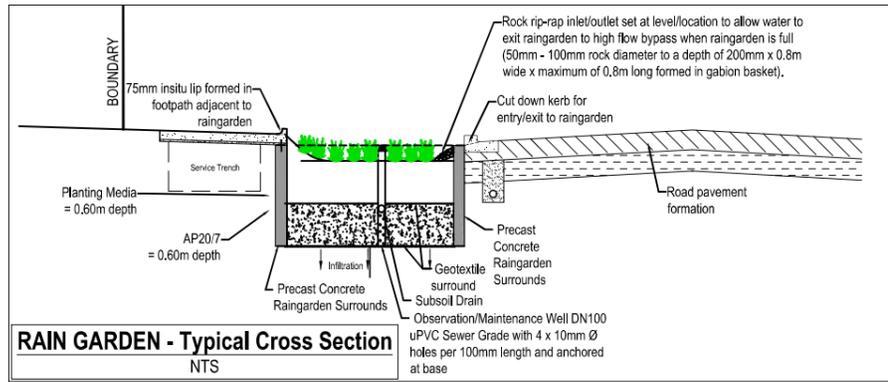
No.	REVISION (DESCRIPTIONS)	NAME	DATE
1	Waste Water As Built Completion	BJ	21/02/2019
2	Boundary Kits added & Boundary change	BJ	28/02/2019

SURVEYED		LD	21/01/2019
DESIGNED			
DRAWN		BJ	21/02/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE	
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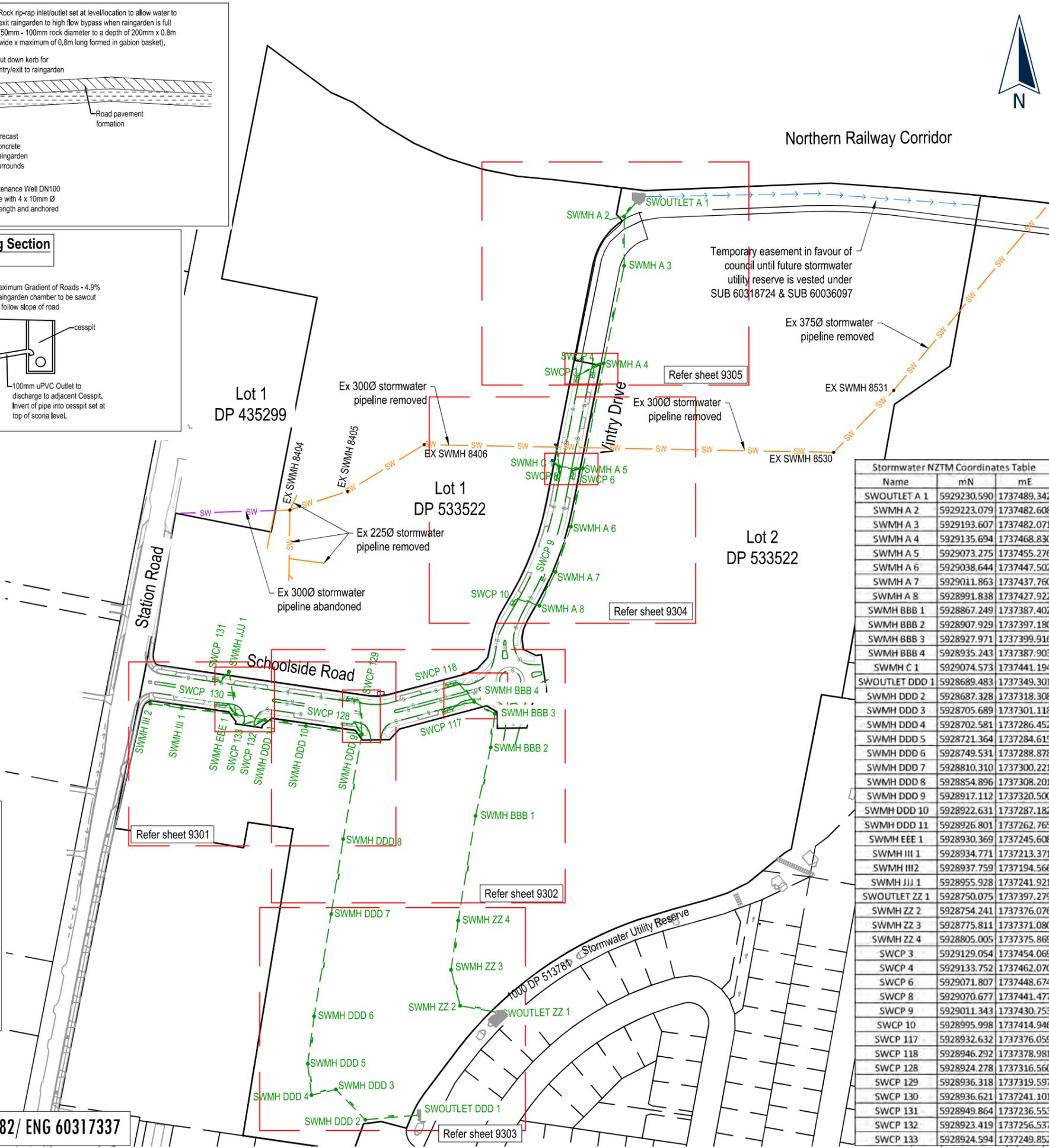
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SUB 60321705/ BUN 60321703/ ENG 60068582/ ENG 60317337



SUB 60321705/ BUN 60321703/ ENG 60068582/ ENG 60317337



Name	mN	mE
SWOUTLET A 1	5929230.590	1737489.342
SWMH A 2	5929223.079	1737482.608
SWMH A 3	5929193.607	1737482.071
SWMH A 4	5929135.694	1737468.830
SWMH A 5	5929073.275	1737455.276
SWMH A 6	5929038.644	1737447.502
SWMH A 7	5929011.863	1737437.760
SWMH A 8	5928991.838	1737427.922
SWMH BBB 1	5928867.249	1737387.402
SWMH BBB 2	5928907.929	1737397.180
SWMH BBB 3	5928927.971	1737399.916
SWMH BBB 4	5928935.243	1737387.903
SWMH C 1	5929074.573	1737441.194
SWOUTLET DDD 1	5928689.483	1737349.301
SWMH DDD 2	5928687.328	1737318.308
SWMH DDD 3	5928705.689	1737301.118
SWMH DDD 4	5928702.581	1737286.452
SWMH DDD 5	5928721.364	1737284.615
SWMH DDD 6	5928749.531	1737288.878
SWMH DDD 7	5928810.310	1737300.221
SWMH DDD 8	5928854.896	1737308.201
SWMH DDD 9	5928917.112	1737320.500
SWMH DDD 10	5928922.631	1737287.182
SWMH DDD 11	5928926.801	1737262.765
SWMH EEE 1	5928930.369	1737245.608
SWMH III 1	5928934.771	1737213.371
SWMH III 2	5928937.759	1737194.566
SWMH JJJ 1	5928955.928	1737241.921
SWOUTLET ZZ 1	5928750.075	1737397.279
SWMH ZZ 2	5928754.241	1737376.076
SWMH ZZ 3	5928775.811	1737371.080
SWMH ZZ 4	5928805.005	1737375.869
SWCP 3	5929129.054	1737454.069
SWCP 4	5929133.752	1737462.070
SWCP 6	5929071.807	1737448.674
SWCP 8	5929070.677	1737441.477
SWCP 9	5929011.343	1737430.753
SWCP 10	5928995.998	1737414.946
SWCP 117	5928932.632	1737376.059
SWCP 118	5928946.292	1737378.981
SWCP 128	5928924.278	1737316.560
SWCP 129	5928936.318	1737319.597
SWCP 130	5928936.621	1737241.101
SWCP 131	5928949.864	1737236.553
SWCP 132	5928923.419	1737256.537
SWCP 133	5928924.594	1737249.852



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NOTES

GENERAL

1. Levels are in terms of LINZ Datum 1946.
2. Coordinates are in terms of NZTM.
3. 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.
2. Bedding is H2 type unless otherwise stated.
3. All catchpits are 675mm x 450mm cycle friendly grate lids semi recessed unless otherwise shown.

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

Signed: 
Registered Professional Surveyor

Date: 28/02/2019

Name: Tom Lemon

Phone : (09) 427 0072
Email : catobolam@catobolam.co.nz



PROJECT

The Country Club Huapai
Station Road
Huapai

DRAWING TITLE

Stage 1A
Stormwater Reticulation
As Built Plan
Sheet 1 of 6

FOR COMPLETION

No.	REVISION (DESCRIPTIONS)	NAME	DATE
1	Stormwater As Built Completion	BJ	22/02/2019
2	Boundary change	BJ	28/02/2019

SURVEYED		LD	21/01/2019
DESIGNED			
DRAWN		BJ	22/02/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE	
28/02/2019	1:2500	A3	

DRAWING NO.	40353-DR-SU-9300	REVISION	2
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Refer to Plan 9300 Sheet 1 for Legend & Notes

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Signed: _____
Registered Professional Surveyor

Date: 28/02/2019

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Phone: (09) 427 0072
Email: catobolam@catobolam.co.nz

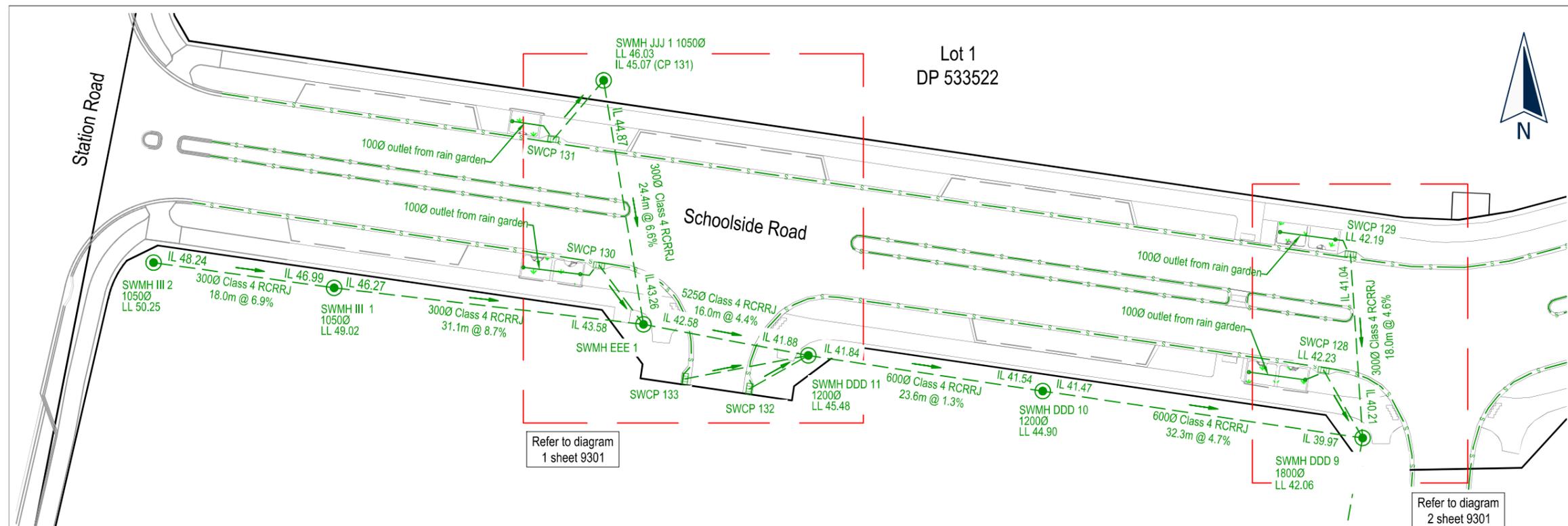


PROJECT
**The Country Club Huapai
Station Road
Huapai**

DRAWING TITLE
**Stage 1A
Stormwater Reticulation
As Built Plan
Sheet 2 of 6**

FOR COMPLETION

No.	REVISION (DESCRIPTIONS)	NAME	DATE
1	Stormwater As Built Completion	BJ	22/02/2019
2	Boundary change	BJ	28/02/2019
SURVEYED		LD	21/01/2019
DESIGNED			
DRAWN		BJ	22/02/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE	
28/02/2019	1:500	A3	
DRAWING NO.	40353-DR-SU-9301		REVISION
			2



Refer to diagram 1 sheet 9301

Refer to diagram 2 sheet 9301

SUB 60321705/ BUN 60321703/ ENG 60068582/ ENG 60317337

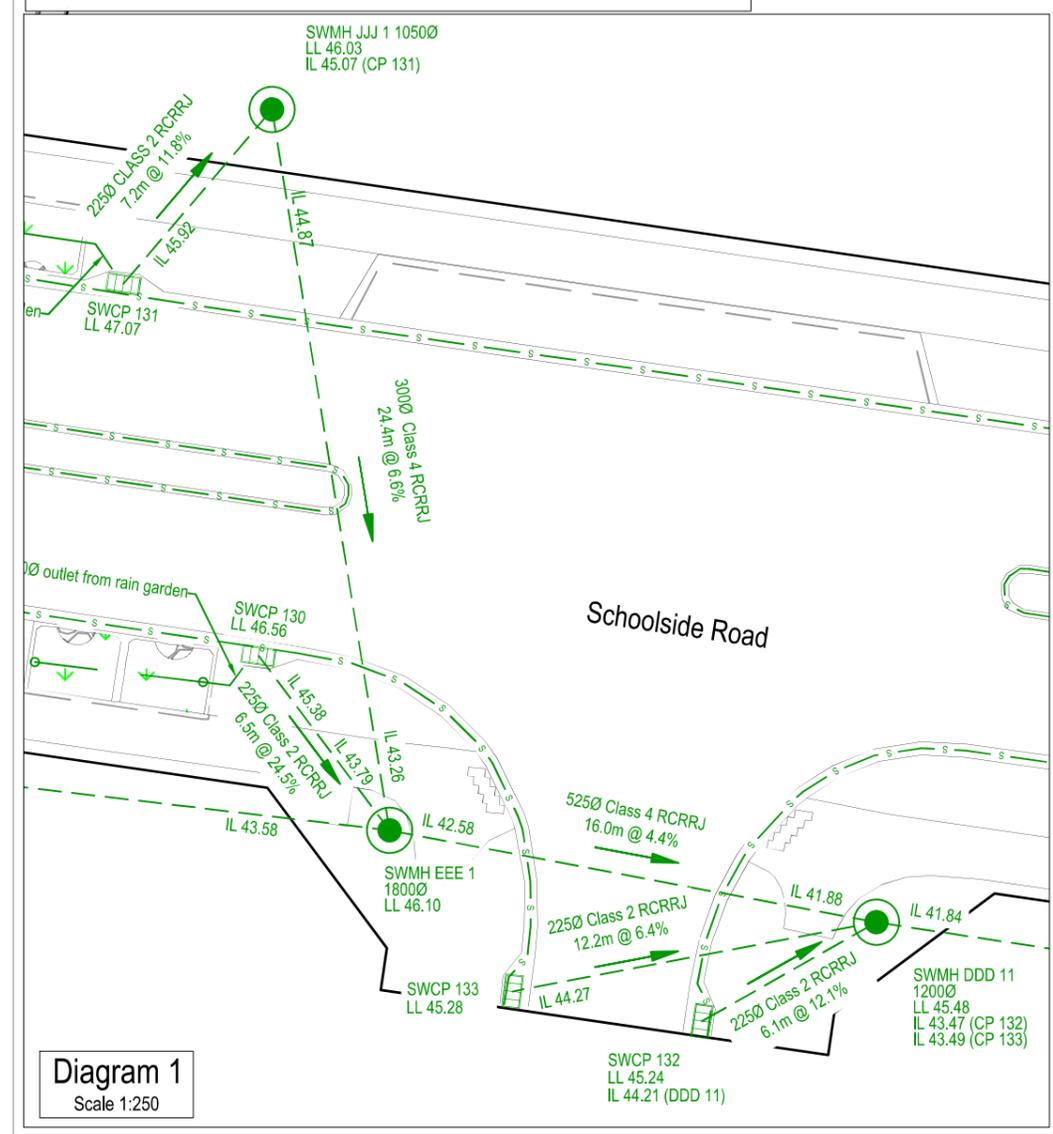


Diagram 1
Scale 1:250

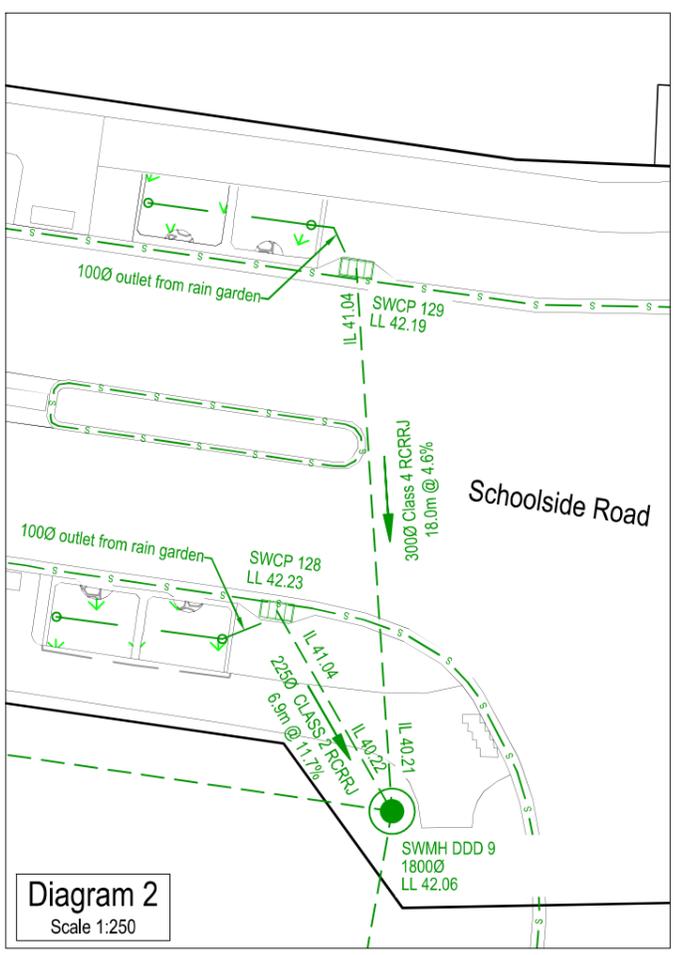


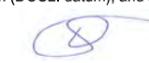
Diagram 2
Scale 1:250

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Signed:  Registered Professional Surveyor

Date: 28/02/2019

Name: Tom Lemon

Phone: (09) 427 0072
Email: catobolam@catobolam.co.nz



PROJECT

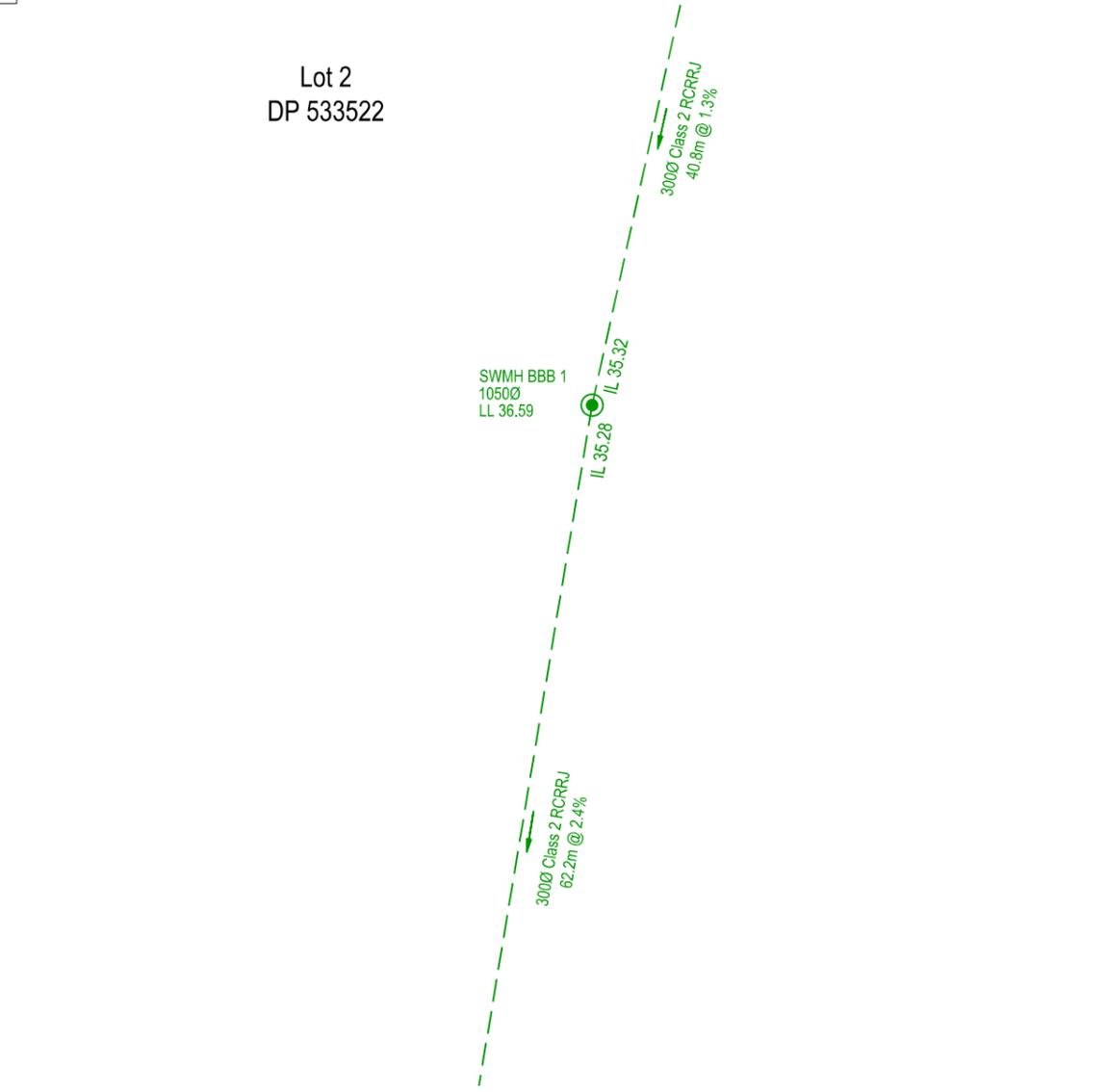
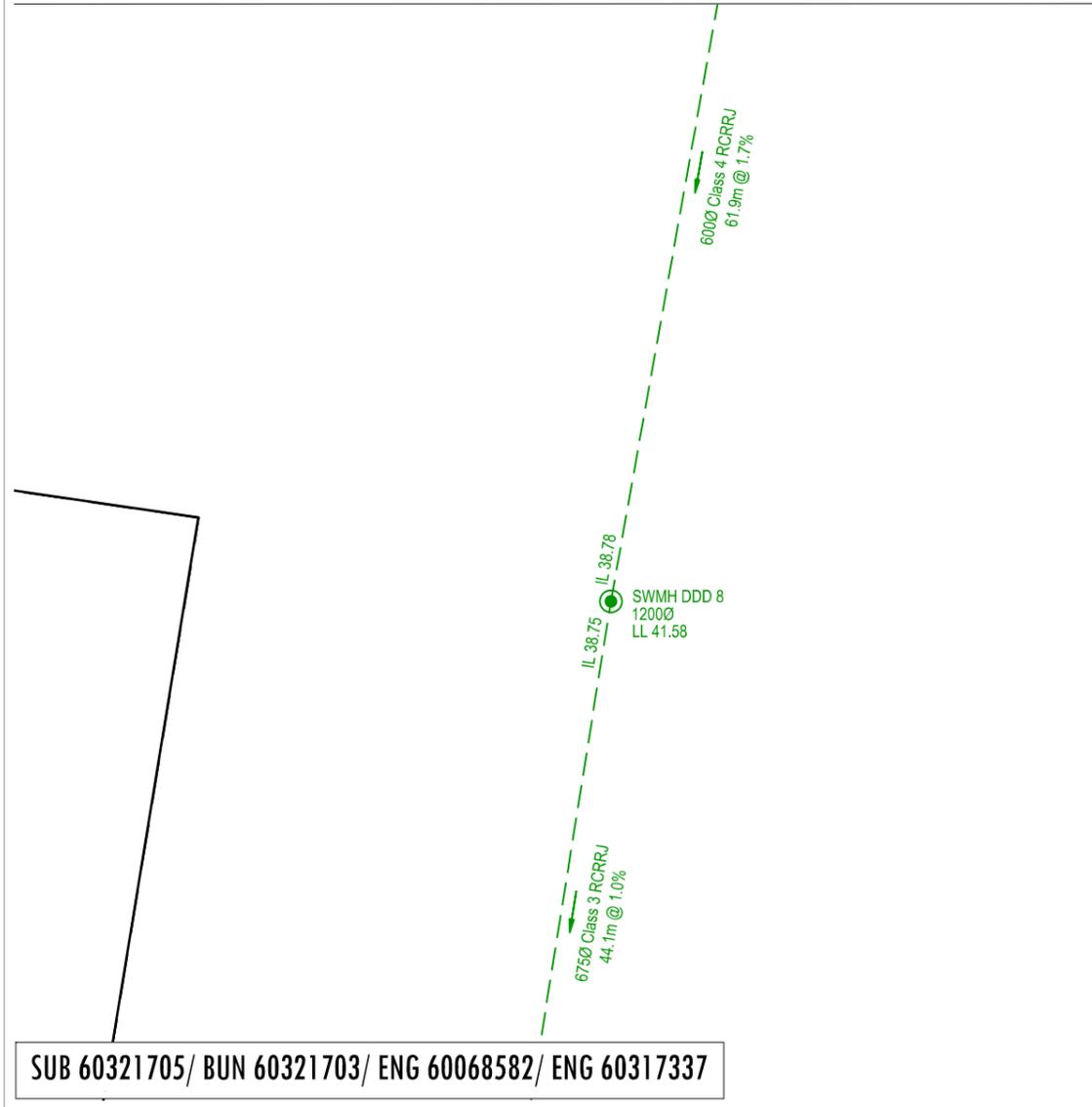
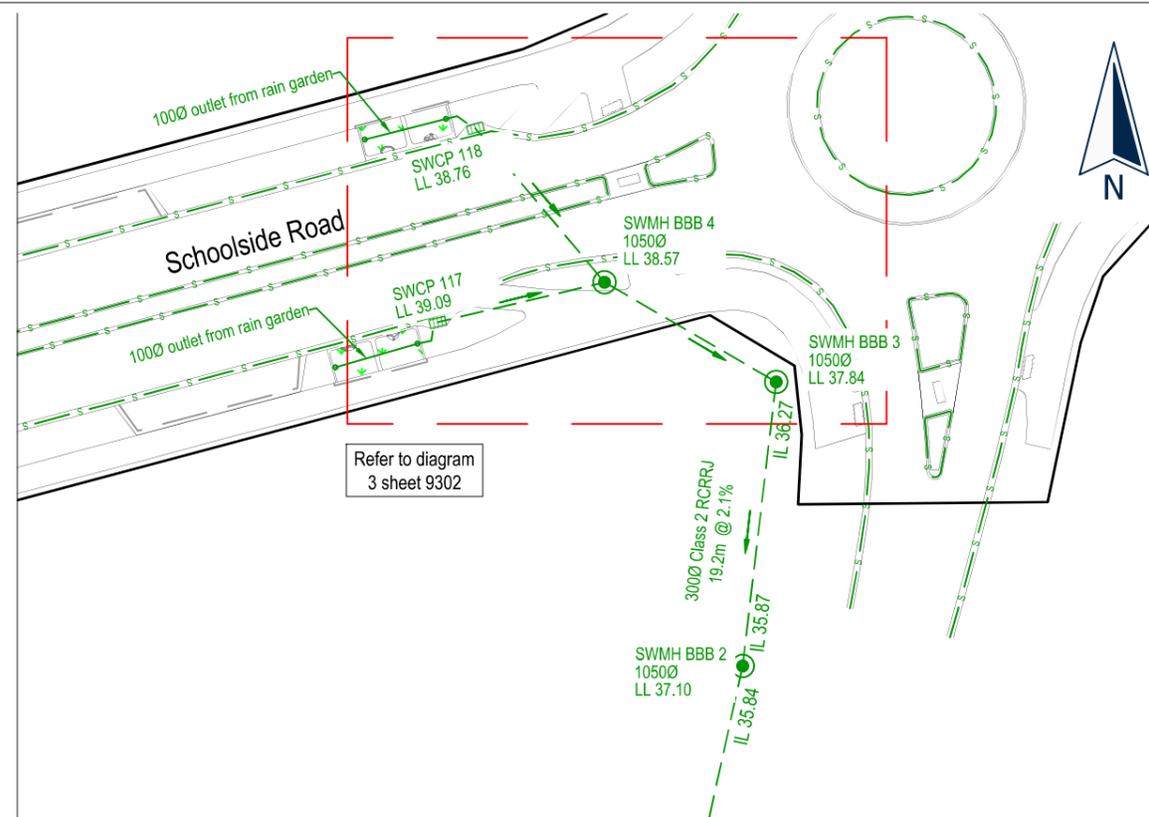
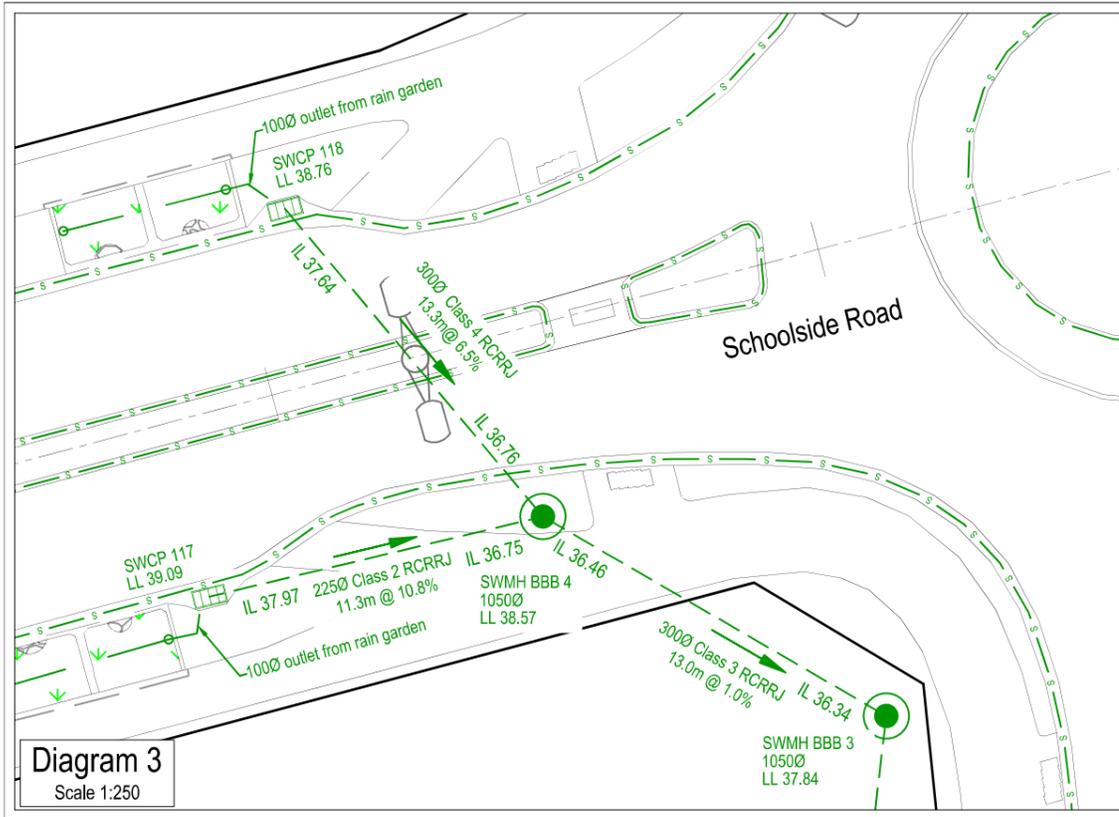
The Country Club Huapai
Station Road
Huapai

DRAWING TITLE

Stage 1A
Stormwater Reticulation
As Built Plan
Sheet 3 of 6

FOR COMPLETION

No.	REVISION (DESCRIPTIONS)	NAME	DATE
1	Stormwater As Built Completion	BJ	22/02/2019
2	Boundary change	BJ	28/02/2019
SURVEYED		LD	21/01/2019
DESIGNED			
DRAWN		BJ	22/02/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE	
28/02/2019	1:500	A3	
DRAWING NO.			REVISION
40353-DR-SU-9302			2



SUB 60321705/ BUN 60321703/ ENG 60068582/ ENG 60317337

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Refer to Plan 9300 Sheet 1 for Legend & Notes

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Signed:  Registered Professional Surveyor

Date: 28/02/2019

Name: Tom Lemon

Phone : (09) 427 0072
Email : catobolam@catobolam.co.nz

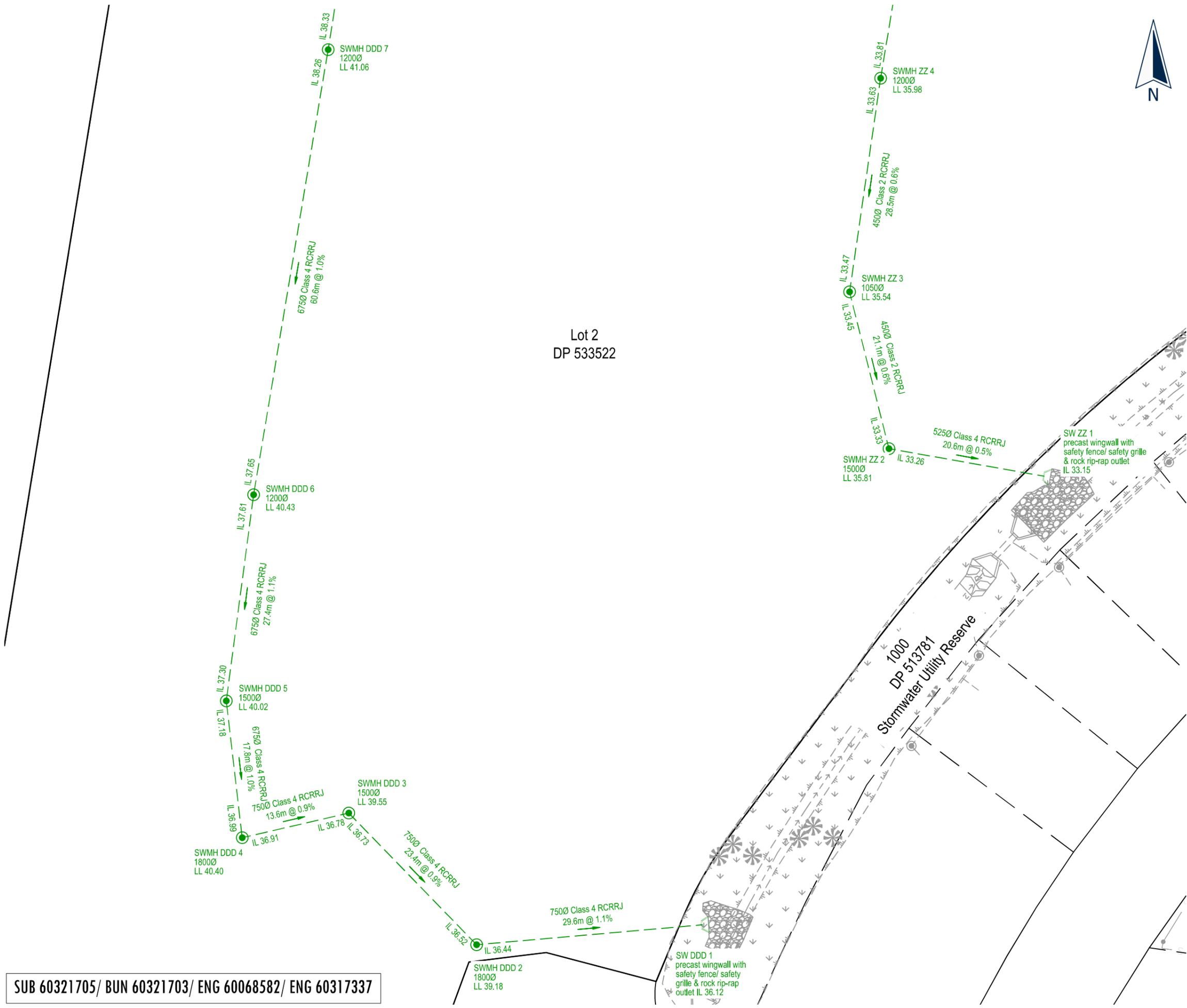


PROJECT
**The Country Club Huapai
Station Road
Huapai**

DRAWING TITLE
**Stage 1A
Stormwater Reticulation
As Built Plan
Sheet 4 of 6**

FOR COMPLETION

No.	REVISION (DESCRIPTIONS)	NAME	DATE
1	Stormwater As Built Completion	BJ	22/02/2019
2	Boundary change	BJ	28/02/2019
SURVEYED		LD	21/01/2019
DESIGNED			
DRAWN		BJ	22/02/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE	
28/02/2019	1:500	A3	
DRAWING NO. 40353-DR-SU-9303			REVISION 2



Lot 2
DP 533522

SUB 60321705/ BUN 60321703/ ENG 60068582/ ENG 60317337

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Refer to Plan 9300 Sheet 1 for Legend & Notes

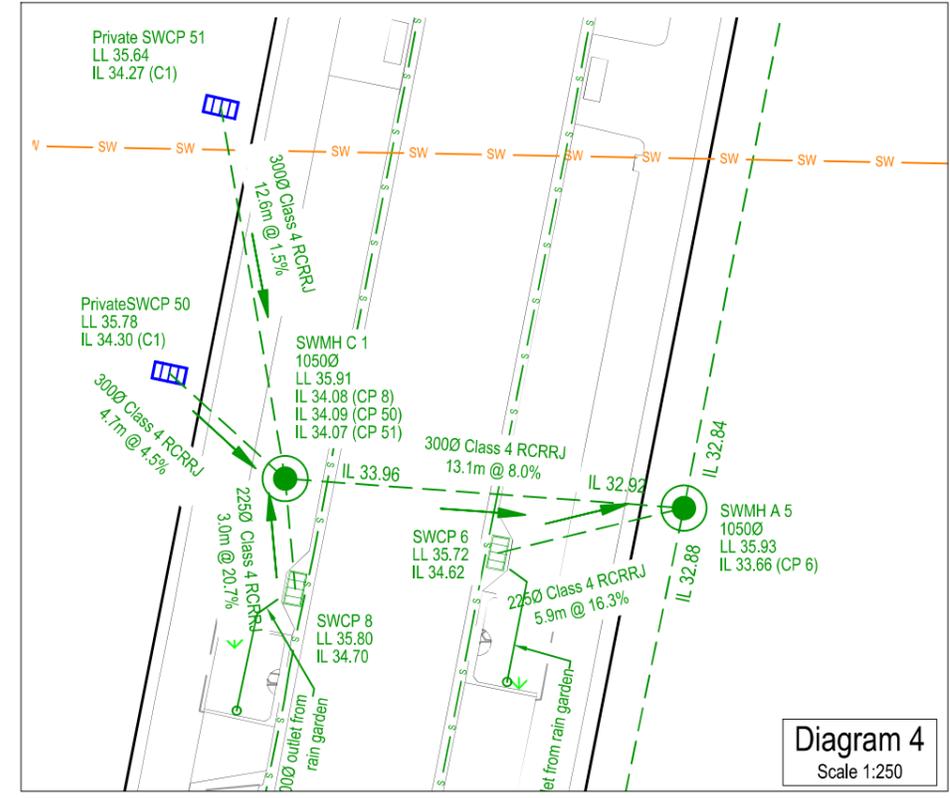
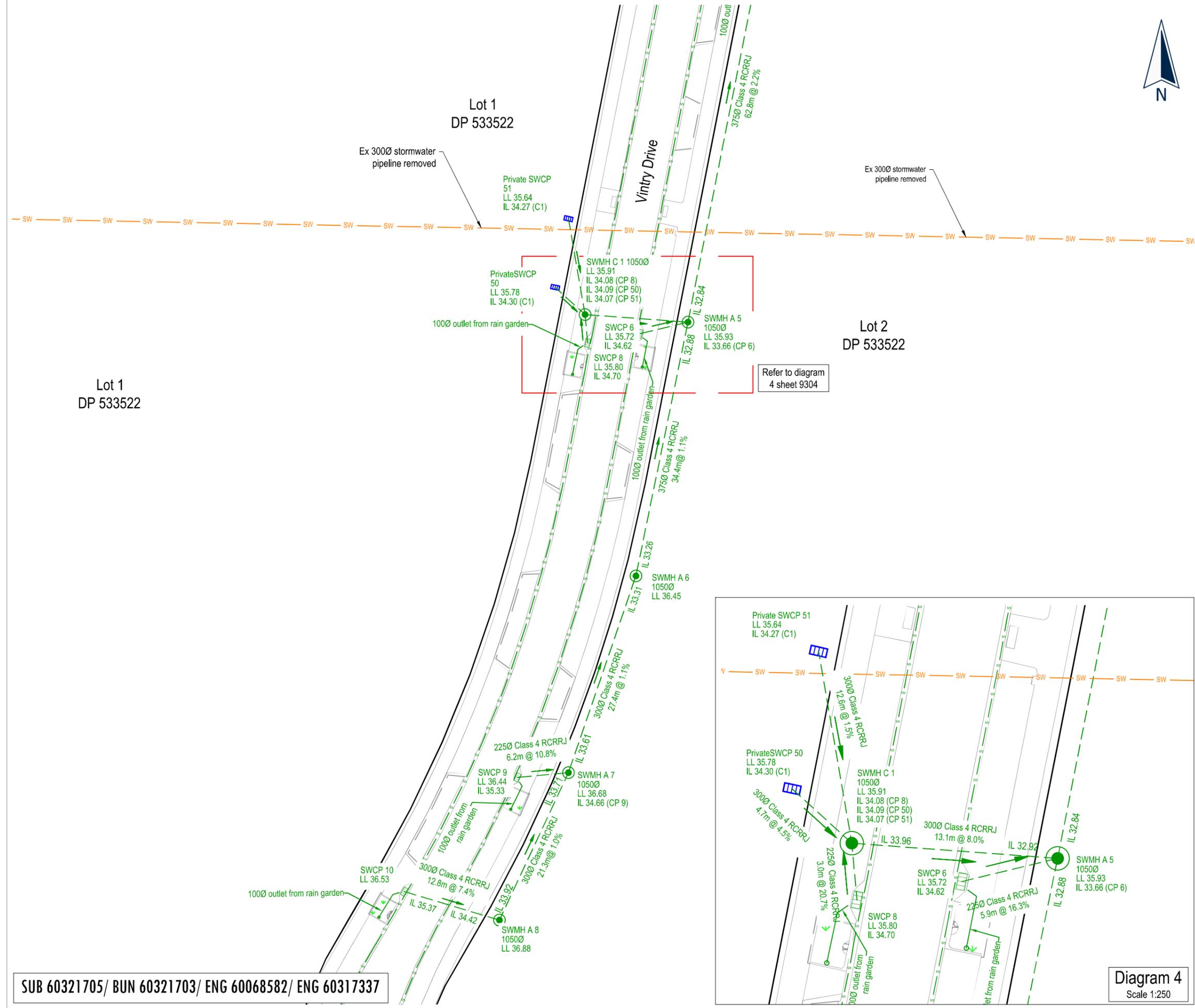


Diagram 4
Scale 1:250

SUB 60321705/ BUN 60321703/ ENG 60068582/ ENG 60317337

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Signed: 
Registered Professional Surveyor

Date: 28/02/2019

Name: Tom Lemon

Phone : (09) 427 0072
Email : catobolam@catobolam.co.nz



PROJECT
**The Country Club Huapai
Station Road
Huapai**

DRAWING TITLE
**Stage 1A
Stormwater Reticulation
As Built Plan
Sheet 5 of 6**

FOR COMPLETION

No.	REVISION (DESCRIPTIONS)	NAME	DATE
1	Stormwater As Built Completion	BJ	22/02/2019
2	Boundary change	BJ	28/02/2019

SURVEYED		LD	21/01/2019
DESIGNED			
DRAWN		BJ	22/02/2019

DATE	ORIGINAL SCALE	ORIGINAL SIZE
28/02/2019	1:500	A3

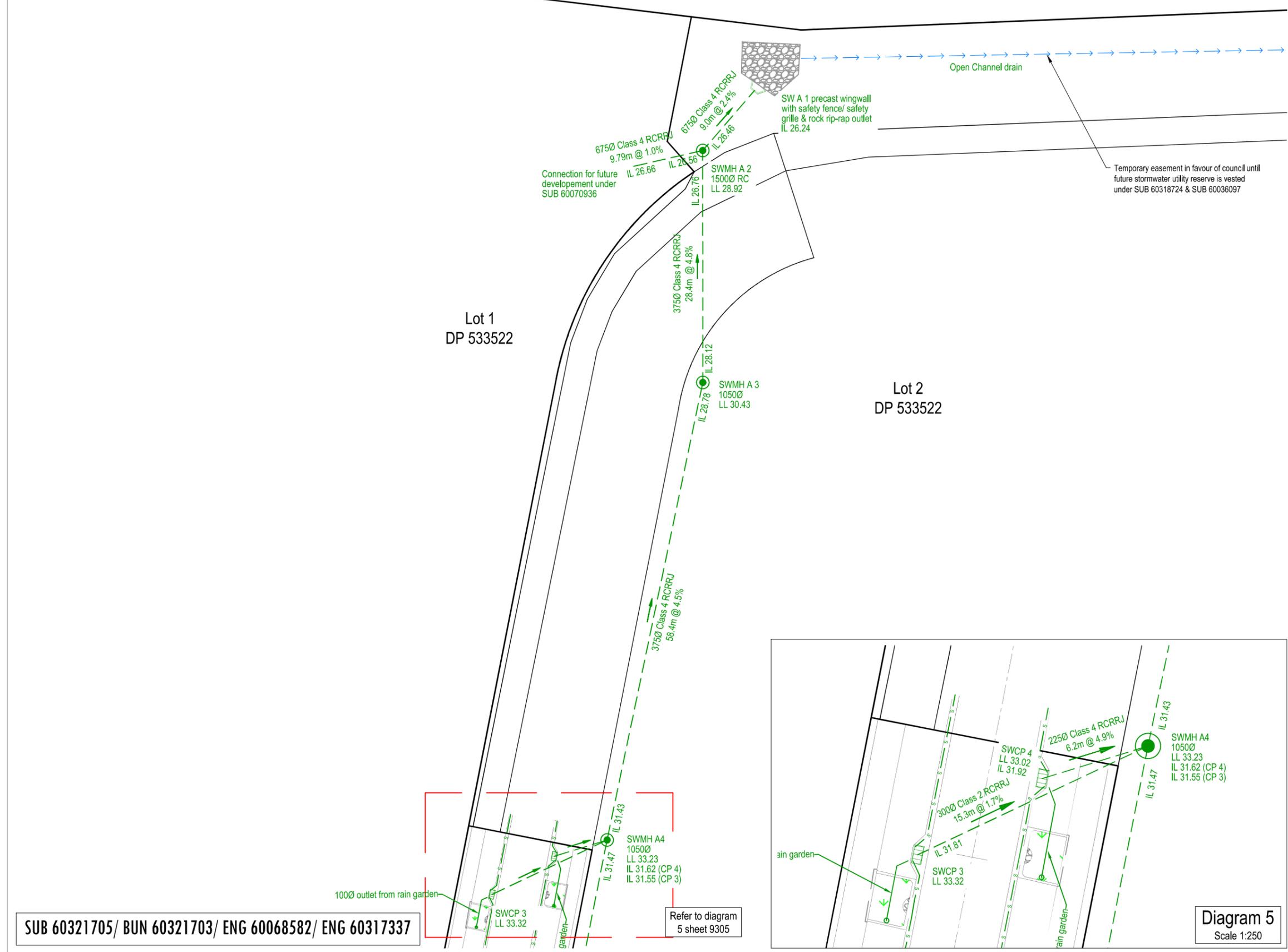
DRAWING NO.	REVISION
40353-DR-SU-9304	2

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Refer to Plan 9300 Sheet 1 for Legend & Notes



Northern Railway Corridor



I certify that these As-Built Plans are an accurate record of the works undertaken and that:
 * The Coordinates (X, Y) are in terms of NZTM on NZGD(2000), and are within ± 50mm.
 * The levels (Z) are in terms of the Auckland 1946 (MSL) LINZ datum (DOSLI datum), and are within ± 10mm.

Signed: 
 Registered Professional Surveyor

Date: 28/02/2019
 Name: Tom Lemon
 Phone: (09) 427 0072
 Email: catobolam@catobolam.co.nz



PROJECT
**The Country Club Huapai
 Station Road
 Huapai**

DRAWING TITLE
**Stage 1A
 Stormwater Reticulation
 As Built Plan
 Sheet 6 of 6**

FOR COMPLETION

No.	REVISION (DESCRIPTIONS)	NAME	DATE
1	Stormwater As Built Completion	BJ	22/02/2019
2	Boundary change	BJ	28/02/2019

SURVEYED		LD	21/01/2019
DESIGNED			
DRAWN		BJ	22/02/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE	
28/02/2019	1:500	A3	

DRAWING NO. **40353-DR-SU-9305** REVISION **2**

SUB 60321705/ BUN 60321703/ ENG 60068582/ ENG 60317337

Refer to diagram 5 sheet 9305

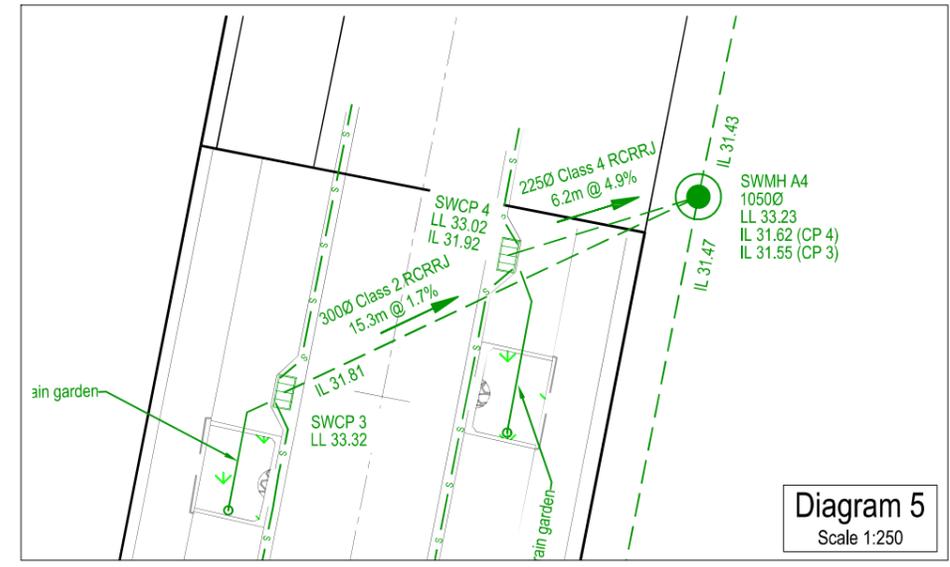
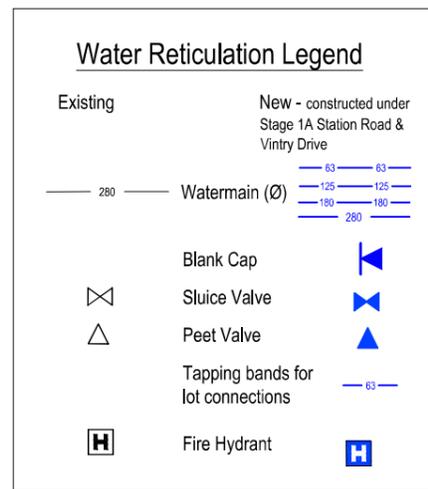
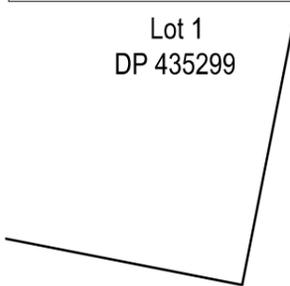
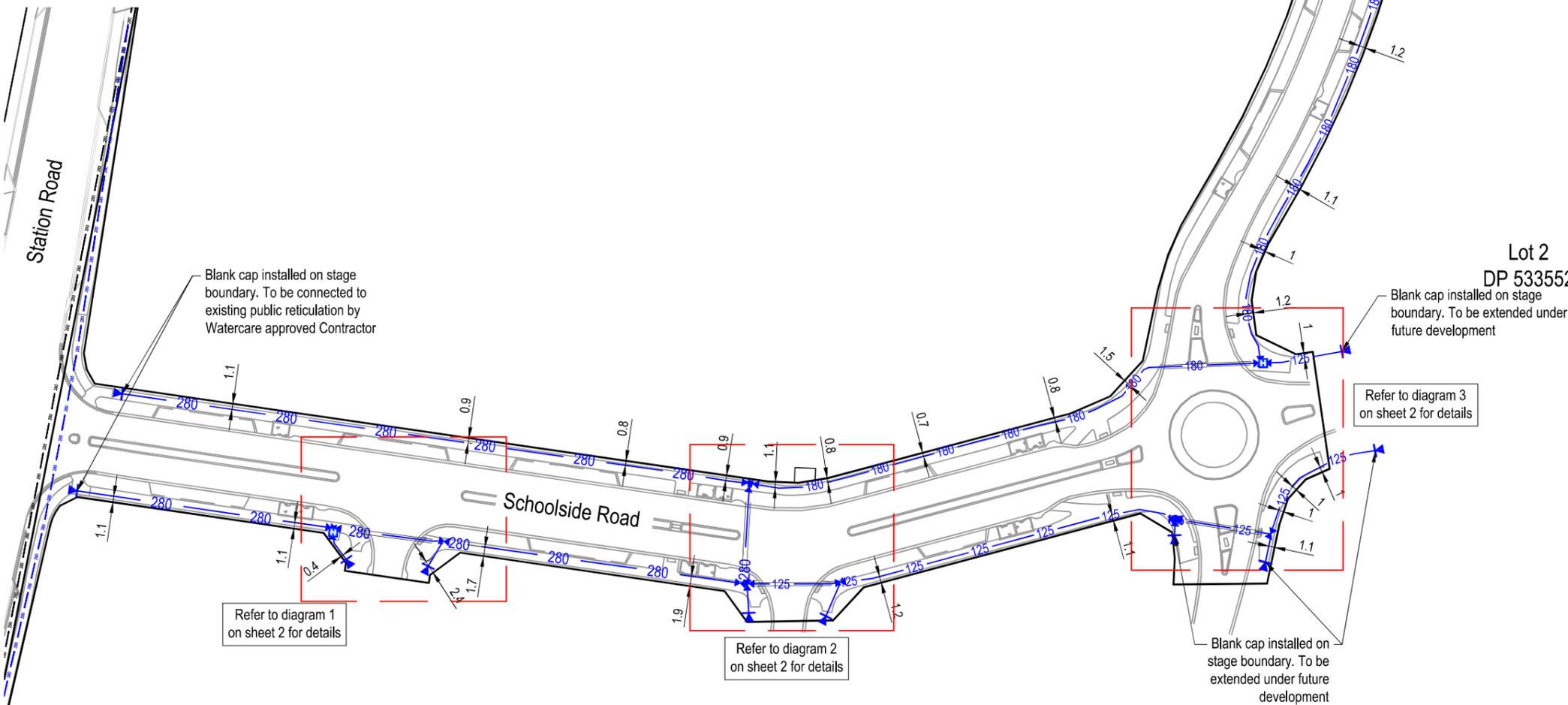


Diagram 5
 Scale 1:250

Coordinates Table		
Name	mN	mE
SV 1	5929088.350	1737455.974
SV 2	5929089.397	1737456.185
SV 3	5929088.714	1737455.698
SV 4	5928932.887	1737242.718
SV 5	5928932.802	1737243.640
SV 6	5928931.662	1737243.061
SV 7	5928929.943	1737263.995
SV 8	5928939.001	1737327.719
SV 9	5928921.025	1737319.658
SV 10	5928920.901	1737321.316
SV 11	5928920.638	1737320.959
SV 12	5928939.660	1737322.491
SV 13	5928939.840	1737321.324
SV 16	5928960.676	1737419.537
SV 17	5928961.001	1737418.512
SV 18	5928960.711	1737418.158
SV 19	5929091.510	1737444.624
SV 29	5928920.840	1737338.505
SV 30	5928931.531	1737401.687
SV 31	5928931.482	1737402.231
SV 32	5928931.228	1737401.873
SV 33	5928928.449	1737419.811
FH 1	5928932.036	1737243.149
FH 2	5929089.029	1737456.120
FH 3	5928960.664	1737418.981
GV 7	5928929.552	1737263.504
GV 8	5928920.400	1737338.351
GV 10	5928927.833	1737419.776



Lot 1
DP 533552



SUB 60321705/ BUN 60321703/ ENG 60068582/ ENG 60317337



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NOTES

GENERAL

1. Coordinates are in terms of NZTM 2000.

WATER RETICULATION

1. Cover for water reticulation.
 - a) Mains under grass berms and footpaths 600mm
 - b) Mains under road carriageway 900mm
2. Watermain 125, 180 & 280 OD - PE100 PN12.5
3. All rider mains 63 OD - PE80 PN12.5
4. Stainless Steel bolts and nuts used for flanged connections.
5. Metallic Detector Tape provided above all water mains and rider mains

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Signed:
Registered Professional Surveyor

Date: 28/02/2019

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Phone: (09) 427 0072
Email: catobolam@catobolam.co.nz



PROJECT

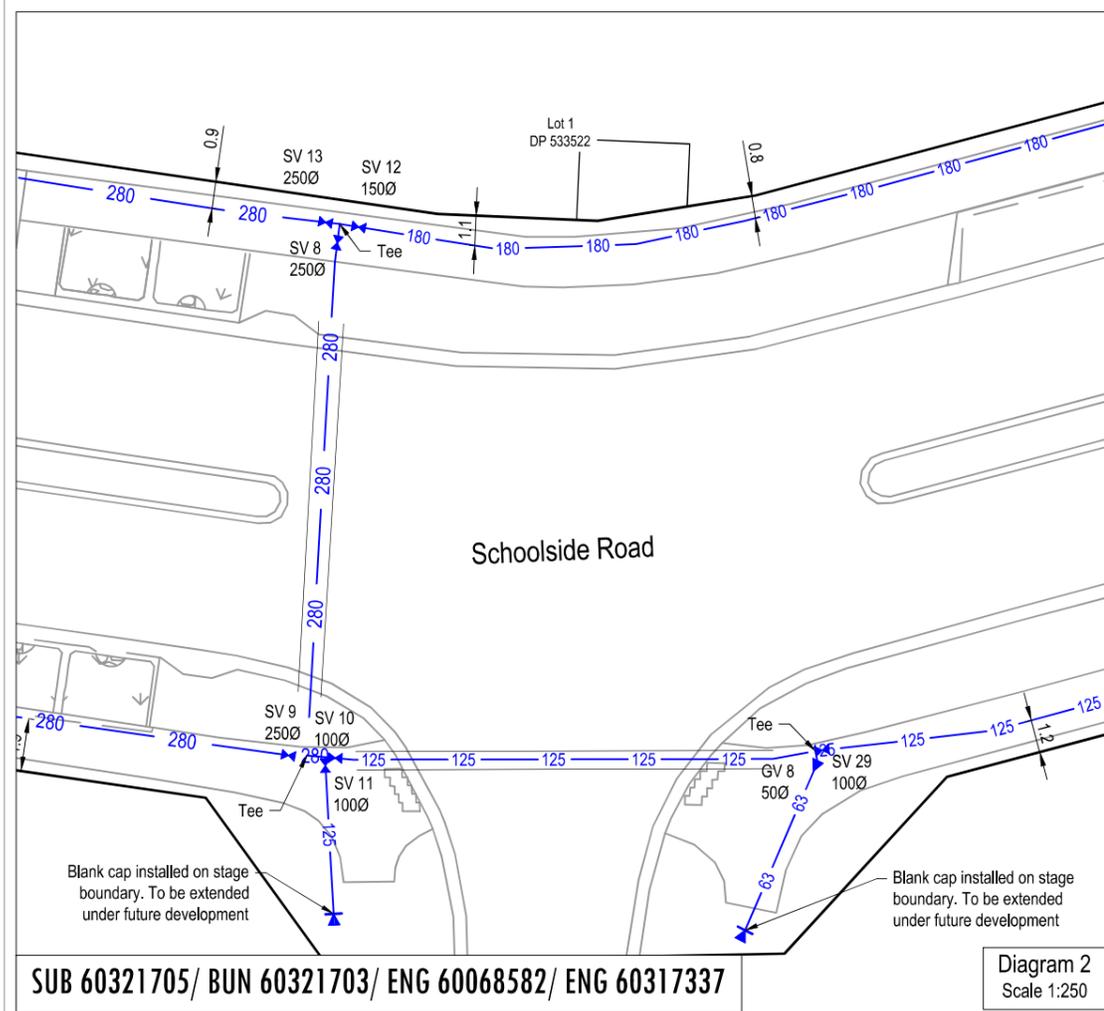
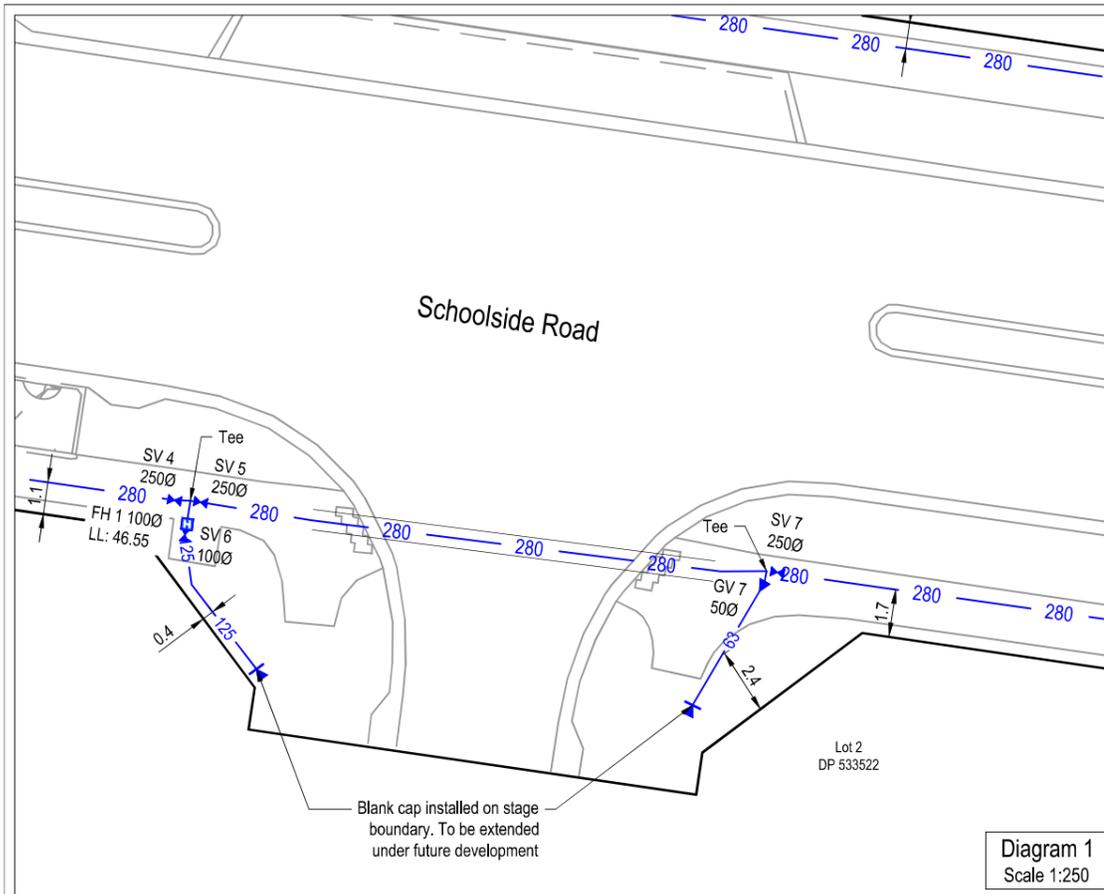
The Country Club Huapai
Station Road
Huapai

DRAWING TITLE

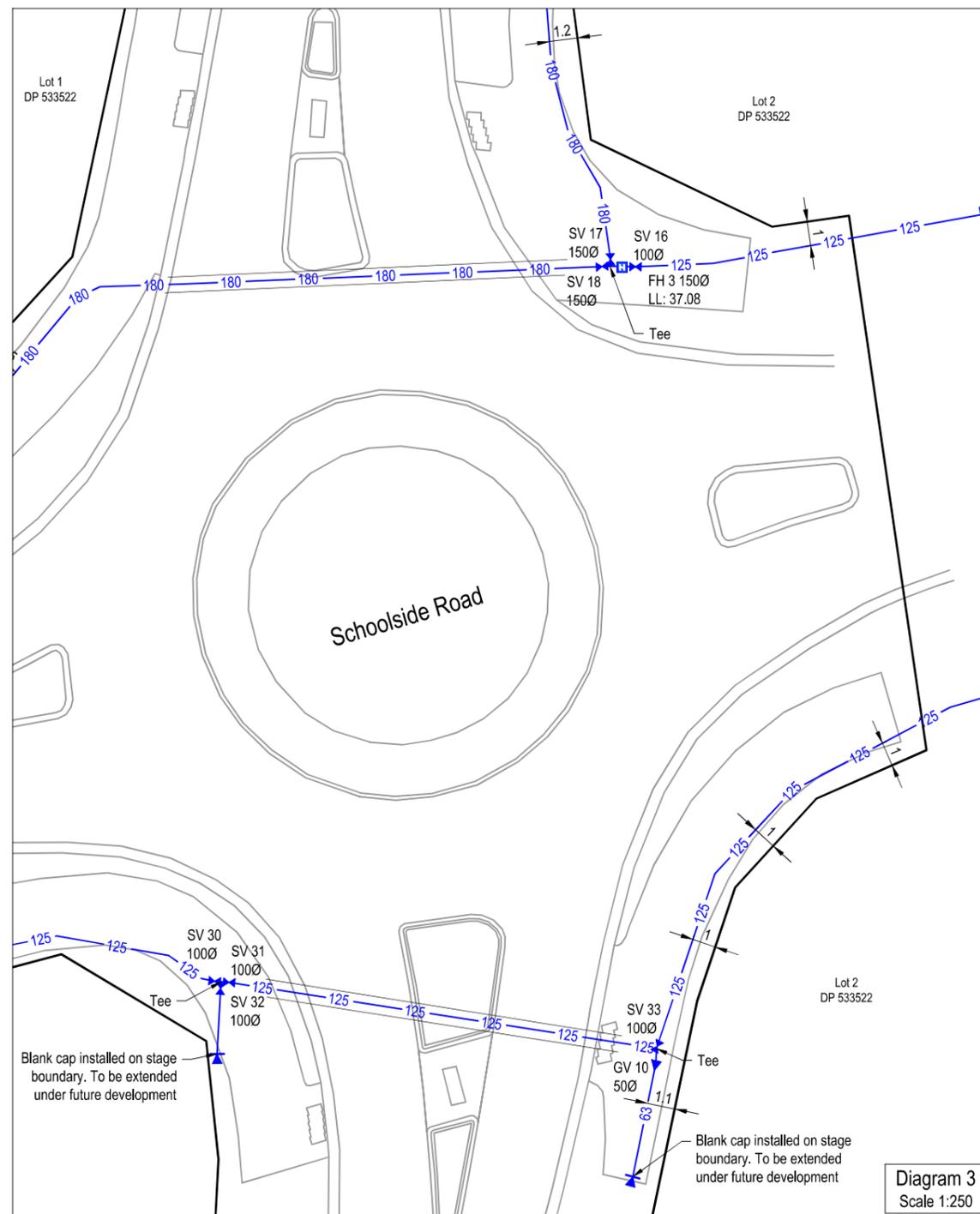
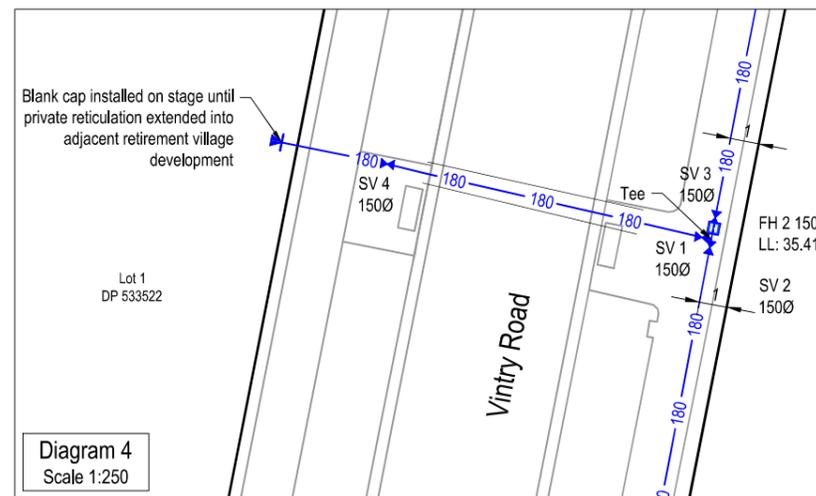
Stage 1A
Water Reticulation
As Built Plan
Sheet 1 of 2

FOR COMPLETION

No.	REVISION (DESCRIPTIONS)	NAME	DATE
1	Water As Built Completion	BJ	21/02/2019
2	Boundary change	BJ	28/02/2019
SURVEYED		LD	21/01/2019
DESIGNED			
DRAWN		BJ	21/02/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE	
28/02/2019	1:1000	A3	
DRAWING NO.			REVISION
40353-DR-SU-9400			2



SUB 60321705/ BUN 60321703/ ENG 60068582/ ENG 60317337



Refer to Sheet
1 for Legend

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PROJECT

The Country Club Huapai
Station Road
Huapai

DRAWING TITLE

Stage 1A
Water Reticulation
As Built Plan
Sheet 2 of 2

FOR COMPLETION

No.	REVISION (DESCRIPTIONS)	NAME	DATE
1	Water As Built Completion	BJ	21/02/2019
2	Boundary change	BJ	28/02/2019
SURVEYED		LD	21/01/2019
DESIGNED			
DRAWN		BJ	21/02/2019
DATE	ORIGINAL SCALE	ORIGINAL SIZE	
28/02/2019	1:250	A3	
DRAWING NO.	40353-DR-SU-9401		REVISION
			2