



INITIA

GEOTECHNICAL SPECIALISTS

OAKVIEW INVESTMENTS LTD

OAKVIEW RESIDENTIAL DEVELOPMENT

GEOTECHNICAL COMPLETION REPORT

INITIA REF 665-GCR REV 0

OCTOBER 2022

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1. Introduction

Bulk earthworks (cut/fill) have been undertaken to prepare the approximately 20 Ha site for development. The site is legally described as Lot 2 DP 424055 and situated between Hansen Road and Back Ormond Road as indicated on C & R Surveyors Subdivision Consent Plan 6376-variation1 shown below. A copy of this plan is also contained within Appendix A.



The development is to comprise 160 residential lots and a series of commercial buildings. A detention pond is proposed as part of the stormwater management plan for the subdivision. The pond depth is approximately 3.5 with batter slopes in the order of 1 V : 3 H. The location of the pond in relation to the proposed subdivision is shown as Stage 2A on the plan above.

This report summarises and collates the results of all the investigations, testing and monitoring associated with the bulk earthworks that have been undertaken to prepare the site for development of residential dwellings. Due to the potential variability in size and loading, commercial structures should be subject to site specific investigations and foundation design.

It should be noted that this Completion Report only relates to the following lots on the subdivision:

- Stage 1 = Lots 1 - 23, 32 - 51, 53 - 57, 211, and 214
- Stage 2 = Lots 24, 52, 58 - 72, and 201 - 209

The scope of this report is limited to:

- Bulk earthworks for the residential lots;
- Bulk earthworks for the road subgrade. The road pavement is to be certified by others; and
- Geotechnical recommendations for future dwelling design.

All Civil Engineering Design and construction observations (roads, stormwater, service trenches, overland flow paths etc) have been carried out by others.

2. Background

2.1 Site History

Prior to the bulk earthworks the site was undeveloped and for grazing cattle.

2.2 Geotechnical Investigations and Reporting

Geotechnical investigations and analyses were undertaken between July 2020 and January 2021 and comprised:

- 8 no. Machine Boreholes (MBH) to depths between 9 m and 9.45 m below existing ground level at the time of the investigations (begl);
- 42 no. CPT to depths between 2 m and 22 m begl; and
- 9 no. Test Pits to depths between 1.8 and 4 m begl.

The results of the investigations, assessment of geohazards and earthworks recommendations were presented in Initia report ref. 665 dated February 2021. This report was peer reviewed by Wentz-Pacific Ltd. A copy of the peer review report is attached in Appendix D

2.3 Resource Consent

Resource Consent (Ref GS-2022-110234-01, LU-2022-110235-01 and NC-2022-110236-01) for the development was granted by Gisborne District Council (GDC) on 16 May 2022 and are appended to this Completion Report in Appendix E

The key geotechnical conditions are summarised as follows:

- Undertake an assessment of the potential deformation associated with the pond along with recommendations to mitigate any potential effects; and
- On completion of the earthworks provide a geotechnical completion report.

2.4 Earthworks Plans

As built plans showing the final finished levels and the areas of cut and fill are shown on Plans ref J1027-01-EW1 to 3 and J1027-01-EWV1 to EWV3 prepared by Civil Project Solutions Limited.

Copies of all these plans are attached in Appendix A.

3. Earthworks

3.1 General

The bulk of the earthworks have been undertaken Earthwork Solutions Ltd between July and December 2021. Additional minor earthworks were completed on Lots 1 to 9 in July 2022

3.2 Site Observations

Periodic site observations were undertaken by Geotechnical Engineers from Initia to ensure that earthworks were undertaken in general accordance with the requirements of NZS 4404:2010 and NZS 4431:1989.

Earthworks testing has been undertaken by Civil Project Solutions Ltd (CPS) and Opus Ltd.

In addition, consolidation settlement has been monitored using precision survey with ± 1 mm accuracy.

3.3 Compaction Testing

Compaction testing was undertaken under the direction of Initia. Testing was undertaken using a combination of:

- Nuclear densometer test NZS 4407 : 2015 Test 4.2; and
- Scala Penetrometer Tests

The specification adopted for the compaction testing was as follows:

Laboratory tests on bulk samples of the fill are attached in Appendix B and are summarised in Table 1 below.

Table 1 - Summary of Laboratory Compaction Test

Sample Id	Maximum Dry Density	Optimum Water Content	Natural Water Content
SAND, traces of clay	1.69t/m ³	16%	11.1%
In-situ CLAY	1.53t/m ³	23%	39.6%

The results of compaction testing undertaken are attached in Appendix xxx.

3.4 Consolidation Settlement Monitoring

The results of consolidation settlement monitoring due to the placement of engineered fill are attached in Appendix C. Monitoring indicates measured total settlement ranges between 0 mm and 40 mm. The majority of the recorded settlement on each lot is less than 20mm.

We note that Lots 1 to 8 only have 4 monitoring visits to date but so far and the settlement is less than 5mm. It is considered based from the settlement data on the other lots that settlement due to the fill placement on Lots 1 to 8 will be less than 20mm regardless of the monitoring period.

4. Engineering Considerations

4.1 General

Recommendations and opinions in this report are based on the data and observations at point locations. It must be appreciated that actual conditions could vary from the assumed model.

It is important that Initia be informed immediately if conditions vary from the assumed model.

4.2 Site Stability

Apart from the land adjacent to the detention pond, the site is flat and accordingly static stability is not considered to be an issue.

Stability to adjacent to the pond is discussed in Section 4.3 with recommendations in Section 5. This assessment has been peer reviewed by Wentz-Pacific (review comments appended to this report in Appendix D).

4.3 Liquefaction Potential and Effects

As outlined in Initia report ref 665 rev A, the site was divided into 5 no. zones (A – E) to account for the variability in the ground conditions. These zones are illustrated on Figure 665-001 in Appendix A.

Across all zones, insignificant effects of liquefaction are expected under SLS levels of shaking.

Under ULS levels of shaking, mild to moderate effects (as per the definitions in MBIE Earthquake Engineering Module 3) are expected in all zones except Zone C. The key consequences of liquefaction that will need to be mitigated are:

- Vertical settlement which based on the assessed values in Initia Report ref 665 can be mitigated using appropriately designed foundations outlined in Section 5 below; and
- Lateral deformations adjacent to the pond. Further discussion on lateral spreading and pond slope stability is provided below.

Lateral Spreading and Pond Stability

Lateral spreading is generally defined as horizontal displacement of blocks of material towards an open slope face (e.g., stream banks) as a result of liquefaction on the underlying soils. The presence of a continuous liquefiable layer of reasonable thickness is required for significant lateral spreading to occur. Generally, the effects of lateral spreading decrease with distance from the free face.

Lateral displacements have been estimated using the following:

- An empirical method developed by Zhang, Robertson and Brachman 2004¹ and the results of our CPT based analyses; and
- Limit Equilibrium slope stability analyses.

It should be noted that both procedures have been developed based on limited case histories and actual performance may vary.

4.3.1 Lateral Displacement Index

The procedure by Zhang et al. is summarised in Figure 4-1 and calculated results in Figure 4-2 below.

¹ Zhang, G. & Robertson, P. (2004). Estimating Liquefaction-Induced Lateral Displacements Using the Standard Penetration Test or Cone Penetration Test.



We have assumed a free face height of 2.5 m (western and northern sides of the pond) based on Aspire Ltd drawings².

We have limited our analyses to twice the height of the free face on the assumption that liquefiable material below this depth is sufficiently constrained laterally.

$$LD = 6 (L/H)^{-0.2} LDI$$

where:

- LD = Lateral displacement (m);
- L = Length to free face (m);
- H = Height of free face (m);
- LDI = Lateral displacement index (m); and
- The range over which the equation is valid is $4 < L/H < 40$.

This approach utilises CPT data to estimate liquefaction potential at the site and calculate a lateral displacement index (LDI), where the LDI is:

$$LDI = \int_0^{z_{max}} \gamma_{max} dz$$

Where γ_{max} is the maximum cyclic shear strains and z_{max} is the maximum depth below all the potential liquefiable layers.

Figure 4-1 - Lateral Displacements from Zhang and Robertson 2004

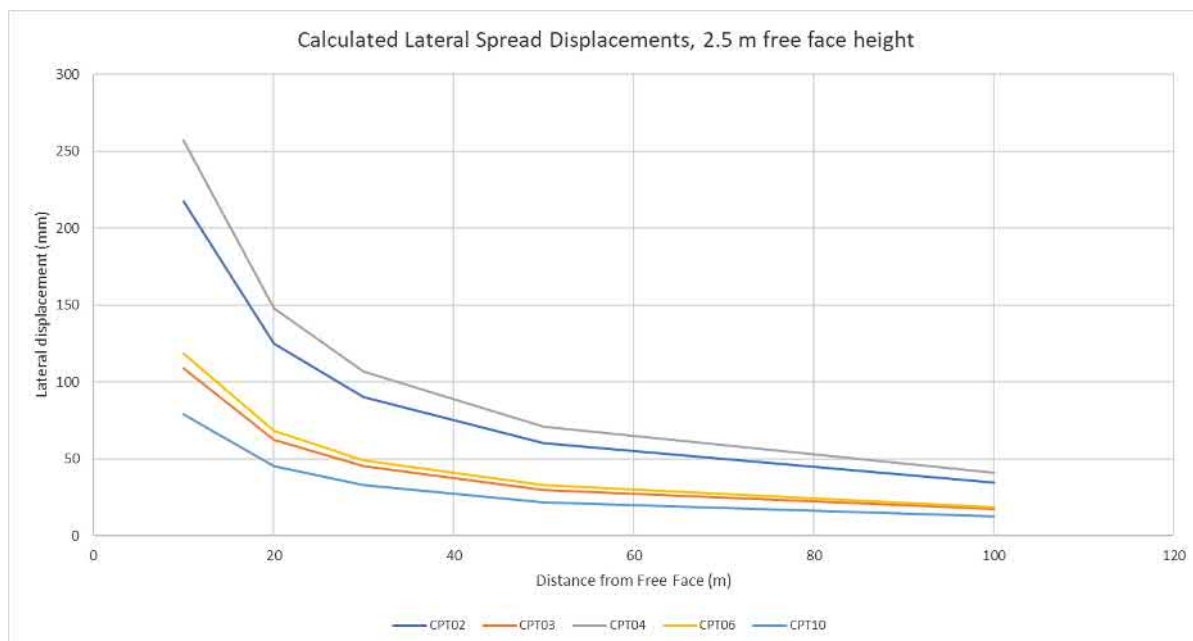


Figure 4-2 - Calculated Lateral Displacements, 2.5 m free face height

For the 2.5 m high free face calculated displacements range between 75 and 260 mm near the free face decreasing to between 50 and 150 mm about 15 m from the free face. As previously noted, transition layers (sand/clay interface) have not been excluded from our analyses and accordingly, the estimated deformations are likely overestimated. Of the CPTs analysed, CPT4 is within the pond and material is to be excavated.

² Aspire Consulting Engineers 1517RC dated February 2021

Analyses also indicate that while some lateral movement is possible beyond 15 m, significant differential displacement which could induce foundation stretch is not expected beyond about 15 m from the free face.

4.3.2 Limit Equilibrium Analyses

Pseudo-static analyses have also been undertaken using the limit equilibrium software package Slide2. To allow for the variation in encountered ground conditions analyses have been undertaken on 2 no. cross sections (on the Eastern and Western sides of the pond).

The following scenarios have been assessed:

For the western side of the pond:

- Static – non-liquefied strengths;
- During shaking, pre-liquefaction i.e., full PGA, non-liquefied strengths;
- During shaking, post liquefaction i.e., full PGA with liquefied soil strengths; and
- Post shaking, post liquefaction i.e., no PGA, liquefied strengths.

For the eastern side of the pond:

- Static – non-liquefied strengths;
- During shaking, full PGA and undrained strengths; and
- Post shaking, no PGA, undrained strengths.

Models have been constrained to assess shallow block type failure mechanisms and to assess displacements at about 15 m from the pond face. It should be noted that this method of analyses models a single block while the lateral spreading mechanism generally comprises a series of blocks that progressively 'shuffle' towards a free face.

Material properties adopted in analyses are presented in Table 4-1 below. These properties have been derived as follows:

- Static strengths, correlations with insitu strengths obtained during the investigation;
- Liquefied strengths, using the procedures recommended by Boulanger and Idriss (2014)¹. For the purposes of our analyses, we have assumed void redistribution effects could be significant. However, given the low free face, and relatively thin liquefiable layers this is likely conservative. Equivalent Clean Sand Normalized Tip Resistances, $q_{c1NCs-Sr}$ plots are provided in Appendix C.
- Peak undrained shear strength values measured during the investigation (as outlined in Table 2-1) have been reduced by 20% to allow for potential softening under cyclic loading.

Table 4-1: Soil Parameters Adopted in Analyses

Soil Unit	Unit Weight, γ , kN/m ³	ϕ'	c' , kPa	Undrained shear strength, s_u , kPa	τ/σ_v' ratio	Material Model
Non-liquefiable Crust	19	36	-	-	-	Mohr-Coulomb
Medium Dense Sand – Potentially liquefiable	19	36	-	-	0.25	Mohr – Coulomb (static)/ τ/σ_v' ratio (seismic)
Clay	18	23	5	40	-	Mohr-Coulomb (Static) / Undrained (seismic scenarios)

Calculated factors of safety from the stability analyses are presented in Table 4-2.

Table 4-2 - Calculated Factors of Safety

Cross Section	Scenario	Calculated Factor of Safety	Target Factor of Safety
East, 3.5 m high free face). Zone C ground conditions	Static – Normal Groundwater	3	1.5
	During shaking	1	1.0
	Post shaking	3	1.0
West, 2.5 m high free face. Zone E ground conditions	Static – Normal Groundwater	3	1.5
	During shaking, Pre-liquefaction	1.2	1.0
	During shaking, Post Liquefaction	0.2	1.0
	Post shaking	2	1.0

Where analyses indicate Factors of Safety less than 1, possible displacements have been estimated using the following simplified empirical methods:

- Bray and Travasarou 2007³; and
- Jibson 2007⁴.

The results of these analyses are presented in Table 4-3 below. We note that there is a low probability that full peak ground acceleration coincides with liquefied strengths. For comparison we have presented calculated displacements assuming both 100% PGA and 80% PGA. The displacements for 80% PGA have been adopted in our assessment of implications on the proposed subdivision.

³ Bray, J.D. and Travasarou, T. (2007) “Simplified Procedure for Estimating Earthquake-Induced Deviatoric Slope Displacements,”

⁴ Jibson, Randall. (2007). [Regression models for estimating coseismic landslide displacement.](#)



Table 4-3 - Calculated Displacements

Cross Section	Design Scenario	Yield Acceleration, g	Calculated Displacements, (full pga) mm		Calculated Displacements, (80% pga) mm	
			Bray and Travasorou 2007 (Notes 1 to 2)	Jibson 2007 (Note 1)	Bray and Travasorou 2007 (Notes 1 to 2)	Jibson 2007 (Note 1)
Western side of pond	During Shaking, post liquefaction	0.12	400 – 600	300 – 500	100 - 200	100 - 200

1 – Mean displacements presented for both procedures and calculated assuming full PGA 0.66g, 80% PGA 0.52g and Mw 7.5.

2 – Initial Fundamental Period calculated assuming $T = 4 H/V_s$ where V_s of block = 150 - 200 m/s

3 - Spectral Acceleration assumed to be equivalent to the peak ground acceleration given the relatively shallow failure surfaces.

Analyses indicate the following:

- Along the eastern side of the pond negligible displacement is expected.
- Along the western cross section, where the thickness of liquefiable material is between 100 mm and 200 mm, calculated displacements about 15 m from the slope crest range between 100 mm and 200 mm.

It is expected that the estimated displacements will reduce with distance from the crest of the pond.

On the proposed subdivision the analyses outlined in Sections 3 and 4 indicate the potential for deformation under seismic loading. The estimated magnitudes of deformation however are minor to moderate based on those observed during the Canterbury Earthquake Sequence⁵. This is likely due to the relatively thin potentially liquefiable layers on the western side of the pond and undrained shear strengths on the eastern side of the pond.

Accordingly, limited measures will be required to mitigate the effects of lateral spreading and cyclic softening structures and services. Based on the analyses in Sections 3 and 4 it would be prudent these measures be implemented within 15 m of the pond. While the ground conditions over the eastern portion of the pond are better than the western side, it is recommended that these measures be implemented over the eastern side, nonetheless. At distances greater than 15 m displacements may occur, however the magnitudes of displacements (particularly differential displacements/stretch) are likely to be minor and mitigation in addition to the proposed raft type (TC2) foundations is not considered necessary for residential dwellings.

Measures to mitigate the risk of lateral deformations on the proposed residential dwellings are outlined in Section 5 below.

⁵ Cubrinovski, Misko & Robinson, Kelly. (2016). Lateral spreading: Evidence and interpretation from the 2010–2011 Christchurch earthquakes.

4.4 Earthworks

The engineered fill has been tested by CPS and WSP Opus using a combination of NDMs and Scala Penetration testing. Typically, a NDM test and a Scala test has been carried out on all lots within fill areas and on every second 2nd shared boundary within the cut areas the majority of the lots.

In general, the NDM recorded compaction in excess of 95% of the Maximum Dry Density (MDD) target. If values were below 95% the fill material was re-compacted and retested to ensure compliance with the specification.

Scala penetration testing was also carried out on the areas specified above, and it indicated that the fill had been placed to achieved 100 kPa Geotechnical Allowable Bearing capacity, with the exception of the upper 100mm which is often slightly loose in sandy soils as it is not confined.

4.5 Expansive Soils

Founding soils are typically sandy, accordingly, are not considered expansive.

5. Foundation Recommendations

Foundation Recommendations for the proposed dwellings are outlined below.

Stage 1 = Lots 1 - 23, 32 - 51, 53 - 57, 211, and 214 and Stage 2 = Lots 24, 52, 58 -67, 70 and 71, and 201 - 209

It is recommended that residential dwellings be constructed on TC2 type reinforced concrete rib raft or raft type foundations designed in accordance with the loss of support criteria outlined in NZGS Earthquake Engineering Guidelines Module. Foundations could bear directly on the natural ground (below the topsoil) or proposed engineered fill.

Based on the Scala penetrometer testing undertaken during the earthworks, it appears that a Geotechnical Allowable Bearing Capacity of 100 kPa is available for design of the foundations.

It is understood that on each lot, Gisborne District Council require shallow investigations comprising hand auger boreholes and Scala penetrometer tests to confirm the bearing capacities are consistent with the recommendations above.

Lots 68, 69 and 72 (adjacent to the pond)

In addition to the TC2 type rib raft foundations recommended for Lots xxx to xxx,

- Either a no build zone of 15 m from the crest of the pond; or
- A no build zone from the crest of the pond of 10 m along with minor ground improvements in for dwelling foundations within 15 m of the crest of the pond. Ground improvements could comprise approximately 1.20 m thick gravel rafts reinforced with 2 layers of geogrid. This will provide additional tensile capacity to resist stretch which may result from the anticipated deformations. We recommend the ground improvements are undertaken under individual dwellings as opposed to entire lots to minimise gravel volumes. Alternatively, crushed concrete blended with silt could be considered. Ground improvements will need to extend a minimum of 1 m (in plan) past a dwelling footprint. If this is adopted further detail will be provided in an earthwork's specification prior to construction; and
- Critical services be located outside the setback zone and services within the setback zone be detailed using flexible materials at relatively shallow depths to allow quick repair if deformations are to occur as a result of lateral spreading or slope instability.

6. Statement of Professional Opinion as to the Suitability of Land for Building Development

6.1 Statement

Development: Oakview Residential Subdivision

Developer: Oakview Investments Limited

Location: Hansen Rd and Ormond Rd, Gisborne

I, Andrew David Pomfret (BEng (Hons) MEng NZ, FGS) hereby confirm that:

1. I am a geo-professional as defined in clause 1.2.2 of NZS 4404:2010 and was retained by the developer as the geo-professional on the above development.
2. The extent of my preliminary investigations is described in my Report(s) number P-000665 Rev A dated February 2021, and the conclusions and recommendations of that/those documents(s) have been re-evaluated in the preparation of this report. The extent of my inspections during construction and the results of all the tests and/or re-evaluations carried out are as described in my Geotechnical Completion Report Ref P-000665 – GCR Rev A dated September 2022.
3. In my opinion, not to be construed as a guarantee, I consider that:
 - a. The earth fills shown on the attached Plan Nos J1027-01-EW1 to 3 and J1027-01-EWV1 to EWV3 have been placed in compliance with the requirements of the Gisborne District Council and to the earthwork's specification.
 - b. The completed works take into account land slope and foundation stability considerations, subject to the appended foundation recommendations and
 - c. Subject to 3(a) and 3(b) of this Schedule, the original ground not affected by filling is suitable for the erection of buildings designed in accordance with Section 5 of this GCR according provided that:
 - i. TC2 type foundations are constructed for Lots 1 – 24, 32 – 51 -67, 201-209, 211 and 214.
 - ii. For Lots 68, 69 and 72, a 1.2m geogrid reinforced gravel raft is constructed beneath the dwelling in addition to a TC2 type foundation.
 - d. Subject to 3(a) and 3(b) of this Schedule, the filed ground is suitable for the erection of buildings designed according with Section 5 of this GCR according provided that :
 - i. TC2 type foundations are constructed for Lots 1 – 24, 32 – 51 -67, 201-209, 211 and 214.
 - ii. For Lots 68, 69 and 72, a 1.2m geogrid reinforced gravel raft is constructed beneath the dwelling in addition to a TC2 type foundation.
 - e. The original ground not affected by filling and the filled ground are not subject to erosion, subsidence, or slippage in accordance with the provisions of Section 106 of the Resource Management Act 1991 because the site is flat. Seismic stability of the detention pond is addressed in section 4.3 of the GCR
4. This professional opinion is furnished to the Gisborne District Council and the developer for their purposes alone on the express condition that it will not be relied upon by any other person and does not remove the necessity for the normal inspection of foundation conditions at the time of erection of any building.
5. This certificate shall be read in conjunction with my geotechnical report referred to in clause 2 above and shall not be copied or reproduced except in conjunction with the full geotechnical report.



6.2 Unexpected Ground Conditions

Our assessment is based on interpolation between site observations and earthworks control by others. Local variations in ground conditions may occur leading to unfavourable ground conditions. It is important that we are contacted in this eventuality, or if any variation of subsoil conditions from those described in this report are found.



7. Applicability

This report has been prepared for our client, Oakview Investments Ltd, with respect to the brief provided to us. The advice and recommendations presented in this report should not be applied to any other project or used in any other context without prior written approval from Initia Limited.

We note that only a representative sample of the earthworks were reviewed by Initia, and we are relying on the contractor's Producer Statement (PS3) for compliance. No liability is accepted for any omissions represented by those documents.

The liquefaction susceptibility and lateral spread analyses have been undertaken using empirical procedures developed from various liquefaction databases and case histories. Earthquakes are unique and impose different levels of shaking on different sites. The results of the liquefaction analyses and estimates of consequences presented within this report are based on published analyses methods. It is important to recognise that actual performance may vary from that calculated.

Report prepared by:



p.p

Bruno Souza
Engineering Geologist

Report reviewed by:



Andy Pomfret
Senior Geotechnical Engineer, Director

Document control record

Report Title		Oakview Residential Development geotechnical Completion Report			
Initia Project Reference		665-GCR			
Client		Oakview Investments Ltd			
Revision	Date	Revision detail	Author	Reviewer	Approved by
A	September 2022	Final for submission to GDC	B. Souza	A. Pomfret	A. Pomfret
Current Revision		0			

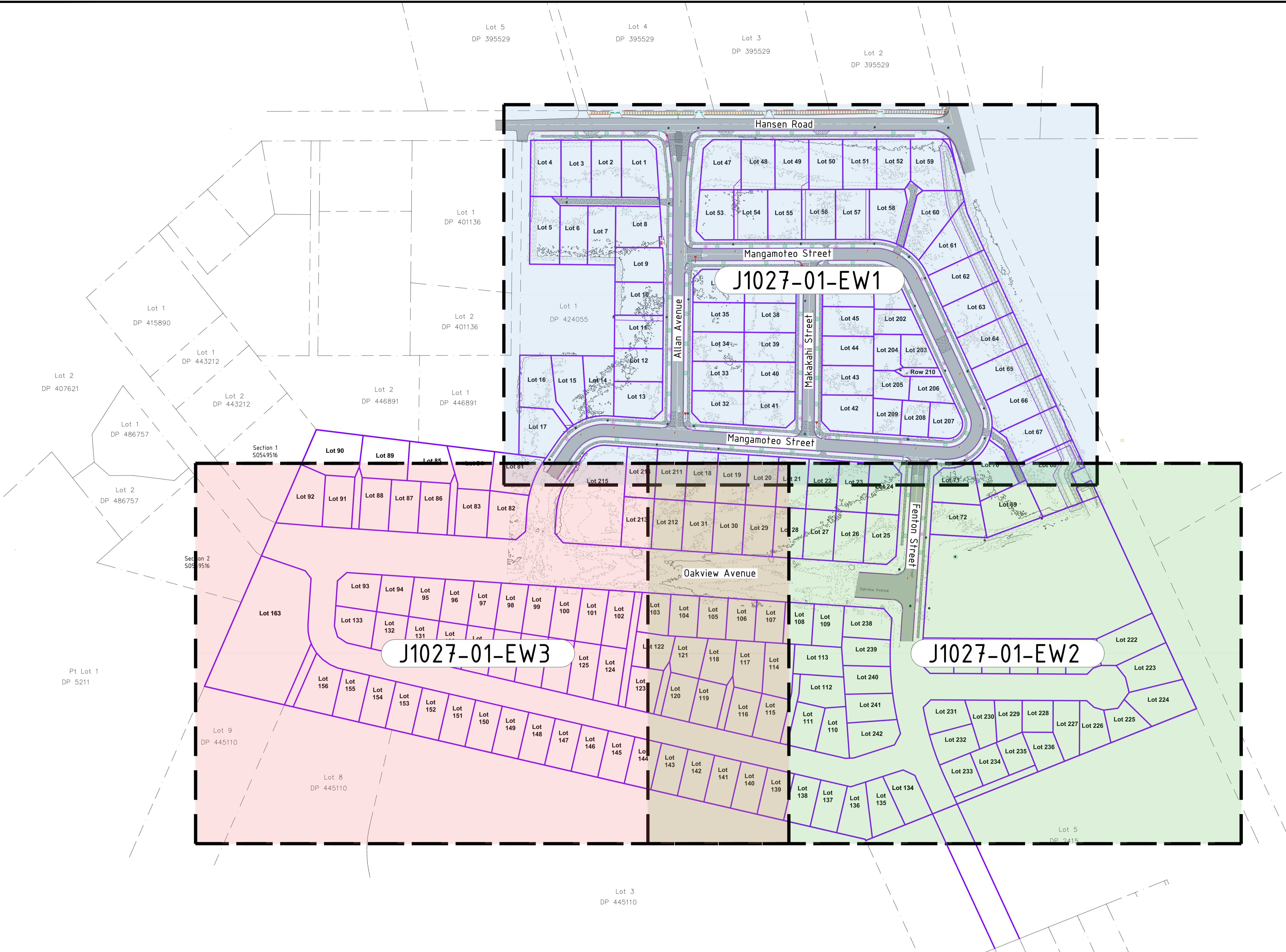
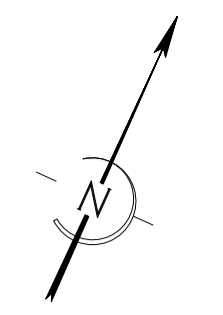


Appendix A Figures

As-built Cut/Fill plans

As-built depth of fill plans





CPS
Civil Project Solutions

1 Te Maanga Drive
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0800 PROJECT
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GENERAL NOTES
 1. Coordinates in terms of : Poverty Bay Circuit 2000.
 2. Elevations in terms of : NZVD 2016.
 3. Contour interval is : 0.20m

NO	DATE	REVISION	BY	CHK	APP

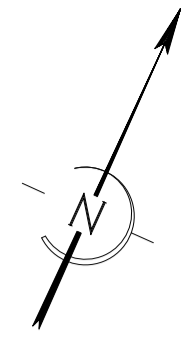
PRINCIPAL

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DISTRICT COUNCIL
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SURVEYED	ESL / CPS	09/2022
DRAWN	P.FLAUGERE	28/09/2022
CHECKED		
APPROVED		

SCALE: 1:1250 @A1
ORIGINAL SIZE: A3

TITLE	OAKVIEW INVESTMENTS LIMITED RESIDENTIAL SUBDIVISION EARTHWORKS AS BUILT PLANS - SHEETS SUMMARY
DRAWING No	J1027 - 01 - 000
REVISION	0



- Keys**
- Kerb + Invert line + Edge of seal
 - Existing Boundary
 - Subdivision Boundary
 - Concreted areas
 - Trees
 - Stormwater sump
 - Stormwater manhole
 - Sewer manhole
 - Street lights



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GENERAL NOTES

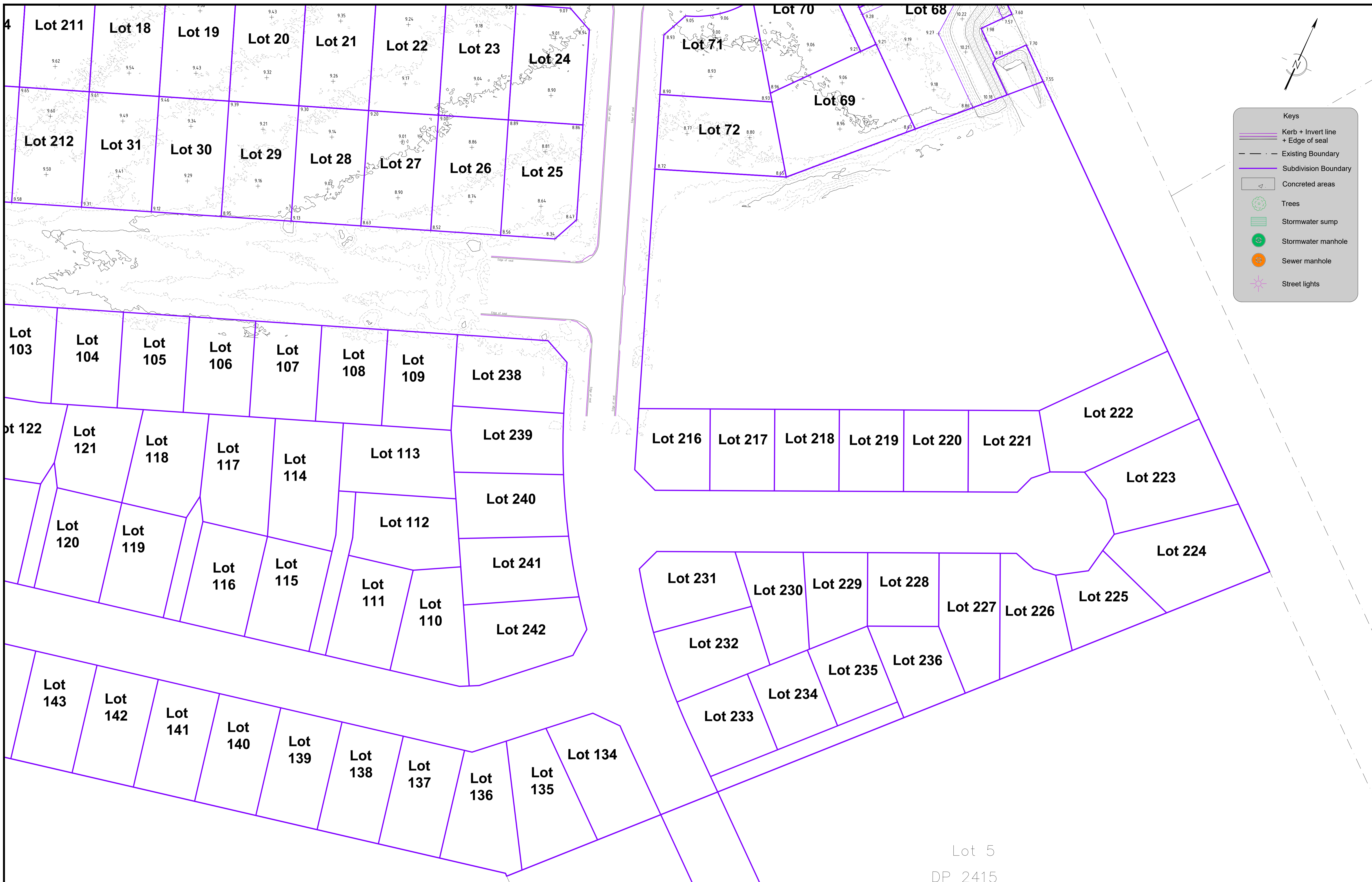
- Coordinates in terms of : Poverty Bay Circuit 2000.
- Elevations in terms of : NZVD 2016.
- Contour interval is : 0.20m

NO	DATE	REVISION	BY	CHK	APP

PRINCIPAL

GISBORNE
DISTRICT COUNCIL
Te Kaunihera o Te Tairāwhiti

SURVEYED	ESL / OPS	09/2022	TITLE	OAKVIEW INVESTMENTS LIMITED RESIDENTIAL SUBDIVISION AS BUILT - EARTHWORK CONTOUR PLAN	REVISION
DRAWN	P.FLAUGERE	28/09/2022	DRAWING No		J1027 - 01 - EW1
CHECKED					
APPROVED					
SCALE	ORIGINAL SIZE				
1:500	@A1	A3			0



Keys


- Kerb + Invert line
- Edge of seal
- Existing Boundary
- Subdivision Boundary
- Concreted areas
- Trees
- Stormwater sump
- Stormwater manhole
- Sewer manhole
- Street lights

Lot 5
DP 2415




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GENERAL NOTES
 1. Coordinates in terms of : Poverty Bay Circuit 2000.
 2. Elevations in terms of : NZVD 2016.
 3. Contour interval is : 0.20m



NO	DATE	REVISION	BY	CHK	APP

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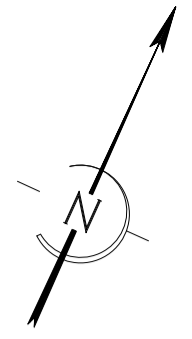


SURVEYED	ESL / CPS	09/2022
DRAWN	P.FLAUGERE	28/09/2022
CHECKED		
APPROVED		

SCALE: 1:500 @A1
ORIGINAL SIZE: A3

TITLE: **OAKVIEW INVESTMENTS LIMITED**
RESIDENTIAL SUBDIVISION
AS BUILT - EARTHWORK CONTOUR PLAN

DRAWING No: J1027 - 01 - EW2
REVISION: 0



tion 2
49516

Lot 9
DP 445110

Lot 8
DP 445110

Keys

- Kerb + Invert line
+ Edge of seal
- Existing Boundary
- Subdivision Boundary
- Concreted areas
- Trees
- Stormwater sump
- Stormwater manhole
- Sewer manhole
- Street lights

GENERAL NOTES
 1. Coordinates in terms of : Poverty Bay Circuit 2000.
 2. Elevations in terms of : NZVD 2016.
 3. Contour interval is : 0.20m

NO	DATE	REVISION	BY	CHK	APP

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SURVEYED	ESL / CPS	09/2022
DRAWN	P.FLAUGERE	28/09/2022
CHECKED		
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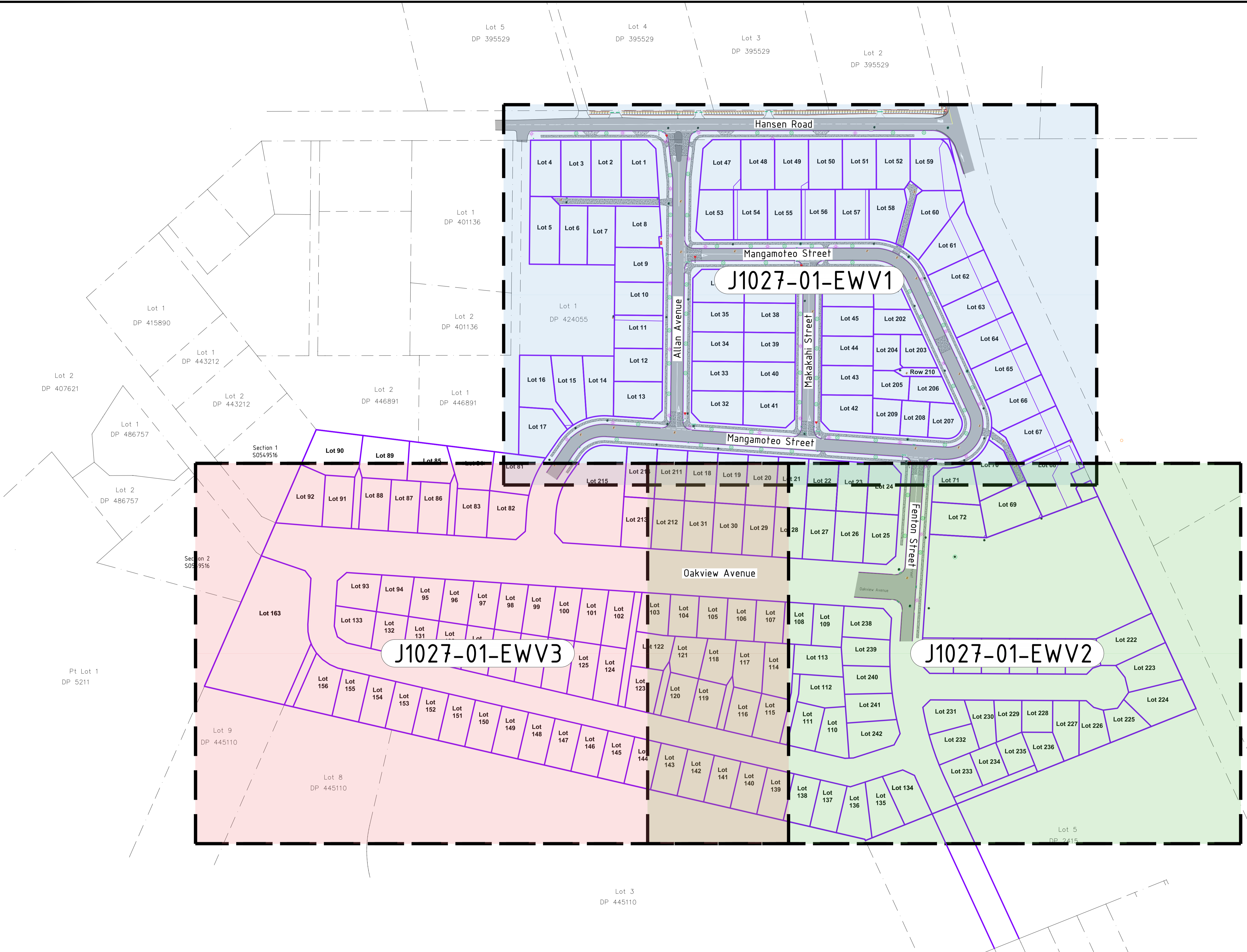
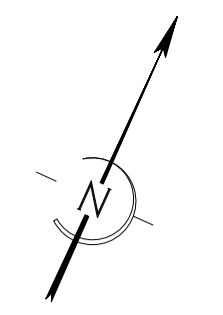
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AS BUILT - EARTHWORK CONTOUR PLAN

REVISION

0

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GENERAL NOTES
 1. Coordinates in terms of : Poverty Bay Circuit 2000.
 2. Elevations in terms of : NZVD 2016.
 3. Contour interval is : 0.20m

NO	DATE	REVISION	BY	CHK	APP

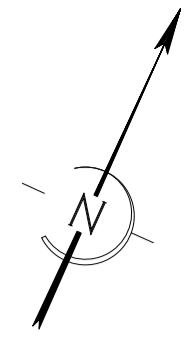
PRINCIPAL

GISBORNE
DISTRICT COUNCIL
Te Kaunihera o Te Tairāwhiti

SURVEYED	ESL / CPS	09/2022
DRAWN	P.FLAUGERE	28/09/2022
CHECKED		
APPROVED		

SCALE: 1:1250 @A1
ORIGINAL SIZE: A3

TITLE		OAKVIEW INVESTMENTS LIMITED RESIDENTIAL SUBDIVISION EARTHWORKS AS BUILT PLANS - SHEETS SUMMARY	
DRAWING No	J1027 - 01 - 000	REVISION	0



Keys

- Kerb + Invert line
- Edge of seal
- Existing Boundary
- Subdivision Boundary
- Concreted areas
- Trees
- Stormwater sump
- Stormwater manhole
- Sewer manhole
- Street lights



1 Te Maanga Drive
PO Box 460
Gisborne, NZL
Project Management
Specialists
0800 PROJECT
www.civilprojects.co.nz

GENERAL NOTES

1. Coordinates in terms of : Poverty Bay Circuit 2000.
2. Elevations in terms of : NZVD 2016.
3. Contour interval is : 0.20m

NO	DATE	REVISION	BY	CHK	APP

PRINCIPAL

GISBORNE
DISTRICT COUNCIL
Te Kaunihira o Te Tairāwhiti

DATE	BY	DESCRIPTION
09/2022	ESL / CPS	SURVEYED
28/09/2022	P.FLAUGERE	DRAWN
		CHECKED
		APPROVED

SCALE	ORIGINAL SIZE	DRAWING No	REVISION
1:500 @A1	A3	J1027 - 01 - EWW1	0

OAKVIEW INVESTMENTS LIMITED
RESIDENTIAL SUBDIVISION
EARTHWORK INITIAL VS AS BUILT - CONTOUR PLAN



Keys

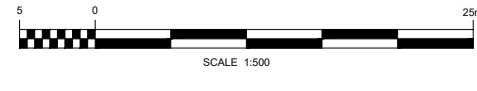
- Kerb + Invert line
- Edge of seal
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- Subdivision Boundary
- Concreted areas
- Trees
- Stormwater sump
- Stormwater manhole
- Sewer manhole
- Street lights

Lot 5
DP 2415



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GENERAL NOTES
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 2. Elevations in terms of : NZVD 2016.
 3. Contour interval is : 0.20m



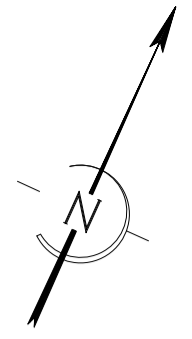
NO	DATE	REVISION	BY	CHK	APP

PRINCIPAL



GISBORNE
DISTRICT COUNCIL
Te Kaunihera o Te Tairāwhiti

SURVEYED	ESL / CPS	09/2022	TITLE	OAKVIEW INVESTMENTS LIMITED RESIDENTIAL SUBDIVISION EARTHWORK INITIAL VS AS BUILT - CONTOUR PLAN
DRAWN	P.FLAUGERE	28/09/2022	SCALE	
CHECKED	ORIGINAL SIZE	
APPROVED	DRAWING No	
1:500 @A1			A3	J1027 - 01 - EWW2
				REVISION
				0



tion 2
49516

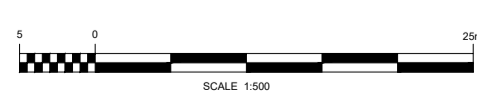
Lot 9
DP 445110

Lot 8
DP 445110

Keys

- Kerb + Invert line
+ Edge of seal
- Existing Boundary
- Subdivision Boundary
- Concreted areas
- Trees
- Stormwater sump
- Stormwater manhole
- Sewer manhole
- Street lights

GENERAL NOTES
 1. Coordinates in terms of : Poverty Bay Circuit 2000.
 2. Elevations in terms of : NZVD 2016.
 3. Contour interval is : 0.20m



NO	DATE	REVISION	BY	CHK	APP



1 Te Maanga Drive
 PO Box 460
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PRINCIPAL



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 Te Kaunihera o Te Tairāwhiti

SURVEYED		ESL / CPS	09/2022	TITLE	
DRAWN	P.FLAUGERE	28/09/2022	OAKVIEW INVESTMENTS LIMITED RESIDENTIAL SUBDIVISION		
CHECKED			EARTHWORK INITIAL VS AS BUILT - CONTOUR PLAN		
APPROVED			SCALE	ORIGINAL SIZE	DRAWING No
			1:500 @A1	A3	J1027 - 01 - EWW3
					REVISION
					0

Appendix B Earthworks Testing Records

Compaction testing results and Laboratory test results

Scala Penetrometer results



NUCLEAR DENSOMETER TEST RECORD SHEET

Project: Oakview Residential Subdivision
 Client: Oakview Investments Ltd
 Location: Corner of Back Ormond & Hansen Road
 Material: Fine Sand
 Target MDD: 1640.00
 Specified requirement: 95%

Test Ref: 1
 Test Date: Friday, 2 July 2021
 Sheet No.: 1
 Target OMC: N/A

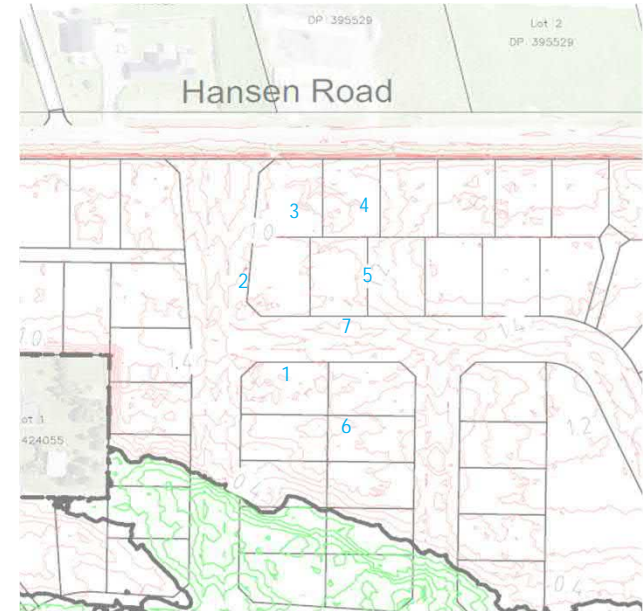


Chainage/ Test Number	Location	DD Kg/m ²	WD Kg/m ²	% Comp.	% Moisture	% AV	Comments
1	North, Lot 36	1887	1888	96.7%	18.8%	8.3%	
2	West of Lot 53	1646	1829	100.4%	11.1%	11.1%	
3	Central, Lot 47	1558	1882	95.0%	20.8%	8.4%	
4	South East, Lot 48	1032	1787	99.5%	9.5%	13.1%	
5	West, Lot 55	1606	1798	97.9%	11.8%	12.7%	
6	North West, Lot 38	1847	1913	97.4%	19.8%	6.9%	
7	South of Lot 54	1597	1811	97.6%	17%	11.9%	
Averages		1596	1844	97.8%	15.6%	10.3%	

Comments: Weather was warm and fine. Soft under foot due to recent rain. Good consistent level of compaction throughout. Consistent sand colouration and texture.

Tested By: Zac Borrie

Signed:



NUCLEAR DENSOMETER TEST RECORD SHEET

Project: Oakview Residential Subdivision
 Client: Oakview Investments Ltd
 Location: Corner of Back Ormond & Hansen Road
 Material: Fine Sand
 Target MDD: 1640.00
 Specified requirement: 95%
 Lift: First 500mm

Test Ref: 2
 Test Date: Wednesday, 7 July 2021
 Sheet No.: 2
 Target OMC: N/A



Chainage/ Test Number	Location	DD Kg/m ²	WD Kg/m ²	% Comp.	% Moisture	% AV	Fill required to finished level	Comments
1	Lot 57	1566	1733	95.50%	10.7%	18.7%	1.5m	
	Lot 57 (90 deg)	1587	1730	96.8%	9.0%	15.9%		
	Lot 57 (Road Edge)	1551	1746	94.6%	12.6%	15.1%	1.2m	
2	Lot 57 (90 deg)	1545	1728	94.2%	11.8%	15.9%		
	(Next to) Lot 46	1490	1717	90.8%	18.3%	16.8%	1.2m	
3	Lot 46 (90 deg)	1492	1648	91.0%	13.6%	17.6%		
	(Corner of) Lot 45 & 46	1488	1824	90.7%	27.6%	11.3%	1.2m	
4	Lot 45 & 46 (90 deg)	1520	1828	97.7%	20.3%	11.1%		
	Lot 158	1624	1777	99.0%	9.4%	13.6%	1.0m	
5	Lot 158 (90 deg)	1642	1771	100.1%	7.9%	13.4%		
	Lot 158	1566	1780	95.5%	13.7%	17.4%	770mm	
6	Lot 158 (90 deg)	1568	1759	95.6%	12.2%	14.4%		
	Lot 44	1603	1798	97.7%	12.2%	12.8%	438mm	
7	Lot 44 (90 deg)	1622	1808	98.9%	11.3%	12.2%		
	Lot 45	1561	1729	95.2%	10.7%	15.9%	740mm	
8	Lot 45 (90 deg)	1606	1759	97.9%	9.5%	14.5%		
	Lot 46	1580	1801	96.4%	13.9%	12.4%	1m	
9	Lot 46 (90 deg)	1549	1781	94.4%	15.0%	13.4%		
	Lot 56	1607	1824	98.0%	13.5%	11.3%	1.2m	
10	Lot 56 (90 deg)	1603	1842	97.7%	14.9%	10.4%		
	Lot 37	1645	1900	100.3%	15.5%	7.6%	400mm	
11	Lot 37 (90 deg)	1621	1856	98.8%	14.5%	9.7%		
	Lot 38	1601	1903	97.6%	18.9%	7.4%	400mm	
12	Lot 38 (90 deg)	1599	1898	97.5%	18.7%	7.7%		
	Averages	1577	1789	96.3%	14.0%	13.2%		

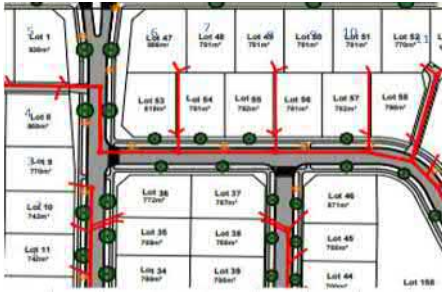
Comments: Generally good compaction and consistent moisture content. Tests were carried out twice on each area one at 90 degrees to the original as indicated above. Air voids slightly high in some areas. Will recalibrate the NDM when the lab results come back from WSP.

Tested By: Zac Borrie

Signed:



23/09/2021



2/07/2021



7/07/2021



21/07/2021



22/07/2021



29/07/2021



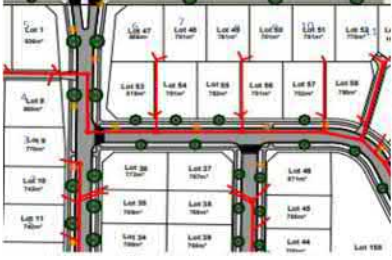
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13/09/2021



23/09/2021



2/07/2021



7/07/2021



21/07/2021



22/07/2021



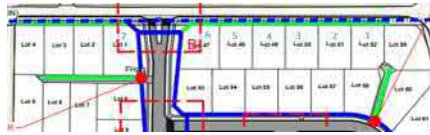
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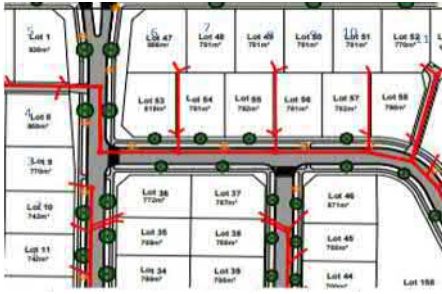
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23/09/2021



2/07/2021



7/07/2021



21/07/2021



22/07/2021



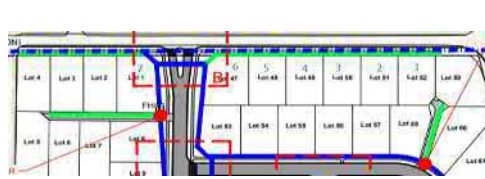
29/07/2021



9/09/2021



13/09/2021



Appendix C Consolidation Settlement Monitoring Records



Oakview Settlement Lot Spike Survey
Civil Project Solutions

Setup Survey 2021/09/27

Pt #	North (m)	East (m)	RL GVD1926	Name	Survey 2 2021/10/04			Survey 3 2021/10/18			Survey 4 2021/11/01			Survey 5 2021/11/15			Survey 6 2021/11/30 AE			Survey 7 2021/10/04			Survey 8 2022/01/10		
					RL	Diff to S1	Diff to last	RL	Diff to S1	Diff to last	RL	Diff to S1	Diff to last	RL	Diff to S1	Diff to last	RL	Diff to S1	Diff to last	RL	Diff to S1	Diff to last	RL	Diff to S1	Diff to last
1000	798968.54	409389.38	9.056	LOT 71	9.061	0.005		9.059	0.003	-0.002	9.055	-0.001	-0.004	9.059	0.003	0.004	9.092	0.036	0.033	9.056	0.000	-0.036	9.053	-0.003	-0.003
1001	798948.40	409399.99	8.894	LOT 72	8.901	0.007		8.895	0.001	-0.006	8.897	0.003	0.002	8.899	0.005	0.002				8.776	-0.118	8.776	8.771	-0.123	-0.005
1002	798970.44	409423.41	9.031	LOT 69	9.040	0.009		9.032	0.001	-0.008	9.033	0.002	0.001	9.031	0.000	-0.002	9.057	0.026	0.026	9.036	0.005	-0.021	9.03	-0.001	-0.006
1003	798986.65	409407.30	9.167	LOT 70	9.164	-0.002		9.152	-0.015	-0.012	9.156	-0.010	0.004	9.154	-0.012	-0.002	9.186	0.020	0.032	9.159	-0.007	-0.027	9.152	-0.015	-0.007
1004	799000.38	409436.96		LOT 68	9.311			9.302	-0.009	-0.009				9.307	-0.004	0.005	9.328	0.017	0.021	9.302	-0.009	-0.026	9.3	9.300	-0.002
1005	799019.53	409421.44	9.368	LOT 67	9.370	0.002		9.364	-0.003	-0.006	9.365	-0.002	0.001	9.362	-0.005	-0.003	9.389	0.021	0.027	DISTROYED			DISTROYED		
1006	799034.92	409401.30	9.393	LOT 66	9.397	0.004		9.386	-0.007	-0.011	9.392	-0.001	0.006	9.387	-0.006	-0.005	9.427	0.034	0.040	9.398	0.005	-0.029	9.388	-0.005	-0.010
1007	799049.03	409384.60	9.457	LOT 65	9.463	0.006		9.456	-0.001	-0.007	9.455	-0.002	-0.001	9.455	-0.002	0	9.500	0.043	0.045	9.456	-0.001	-0.044	9.454	-0.002	-0.002
1008	799064.72	409366.98	9.499	LOT 64	9.500	0.002		9.498	-0.001	-0.002	9.493	-0.005	-0.005	9.494	-0.005	0.001	9.543	0.044	0.049	9.498	-0.001	-0.045	9.491	-0.008	-0.007
1009	799080.66	409348.93	9.535	LOT 63	9.537	0.002		9.533	-0.002	-0.004	9.528	-0.007	-0.005	9.531	-0.004	0.003	9.590	0.055	0.059	9.534	-0.001	-0.056	9.525	-0.010	-0.009
1010	799095.57	409331.71	9.617	LOT 62	9.618	0.002		9.615	-0.002	-0.003	9.621	0.005	0.006	9.619	0.002	-0.002	9.683	0.066	0.064	9.620	0.003	-0.063	9.612	-0.005	-0.008
1011	799109.21	409315.55	9.678	LOT 61	9.684	0.006		9.678	0.000	-0.006	9.678	0.000	0	9.679	0.001	0.001	9.745	0.067	0.066	9.680	0.002	-0.065	9.674	-0.004	-0.006
1012	799123.19	409296.25	9.750	LOT 60	9.757	0.007		9.747	-0.003	-0.010	9.746	-0.004	-0.001	9.746	-0.004	0	9.820	0.070	0.074	9.746	-0.004	-0.074	9.741	-0.009	-0.005
1013	799118.01	409269.73	9.718	LOT 58	9.716	-0.002		9.717	-0.001	0.001	9.714	-0.004	-0.003	9.719	0.001	0.005	9.797	0.079	0.078	9.718	0.000	-0.079	9.71	-0.008	-0.008
1014	799109.12	409248.61	9.844	LOT 57	9.834	-0.010		9.836	-0.008	0.002	9.836	-0.008	0	9.839	-0.005	0.003	9.916	0.072	0.077	9.838	-0.006	-0.078	9.83	-0.014	-0.008
1015	799099.17	409228.39	9.892	LOT 56	9.894	0.002		9.894	0.002	0	9.893	0.001	-0.001	9.895	0.003	0.002	9.975	0.083	0.080	9.894	0.002	-0.081	9.888	-0.004	-0.006
1016	799090.26	409208.62	9.956	LOT 55	9.951	-0.005		9.952	-0.004	0.001	9.954	-0.002	0.002	9.955	-0.001	0.001	10.042	0.086	0.087	9.955	-0.001	-0.087	9.945	-0.011	-0.010
1017	799079.25	409186.17	9.996	LOT 54	9.993	-0.002		9.999	0.004	0.006	9.997	0.002	-0.002	10.002	0.007	0.005	10.085	0.090	0.083	9.999	0.004	-0.086	9.989	-0.006	-0.010
1018	799068.37	409164.33	10.039	LOT 53	10.030	-0.009		10.037	-0.002	0.007	10.034	-0.005	-0.003	10.039	0.000	0.005	10.124	0.085	0.085	10.035	-0.004	-0.089	10.024	-0.015	-0.011
1019	799026.04	409185.71	10.075	LOT 36	10.069	-0.005		10.067	-0.008	-0.002	10.067	-0.008	0	10.066	-0.008	-0.001	10.143	0.069	0.077	10.069	-0.005	-0.074	10.055	-0.020	-0.014
1020	799005.95	409194.98	10.127	LOT 35	10.124	-0.003		10.124	-0.003	0	10.125	-0.002	0.001	10.126	-0.001	0.001	10.195	0.068	0.069	10.125	-0.002	-0.070	10.113	-0.014	-0.012
1021	798988.16	409203.79	9.997	LOT 34	9.996	0.000		9.996	0.000	0	9.995	-0.002	-0.001	9.997	0.001	0.002	10.810	0.814	0.813	9.999	0.003	-0.811	9.988	-0.008	-0.011
1022	798972.18	409211.91	9.982	LOT 33	9.988	0.006		9.985	0.003	-0.003	9.989	0.007	0.004	9.988	0.006	-0.001	10.068	0.086	0.080	9.982	0.000	-0.086	9.976	-0.006	-0.006
1023	798953.35	409218.55	9.829	LOT 32	9.827	-0.002		9.828	-0.001	0.001	9.829	0.001	0.001	9.829	0.001	0	9.905	0.076	0.076	9.830	0.002	-0.075	9.819	-0.009	-0.011
1024	798963.91	409250.98	9.649	LOT 41	9.647	-0.002		9.644	-0.005	-0.003	9.642	-0.007	-0.002	9.641	-0.008	-0.001	9.713	0.064	0.072	9.643	-0.005	-0.070	9.633	-0.016	-0.010
1025	798987.51	409242.48	9.660	LOT 40	9.653	-0.007		9.657	-0.003	0.004	9.659	-0.001	0.002	9.662	0.002	0.003	9.736	0.076	0.074	9.656	-0.004	-0.080	9.648	-0.012	-0.008
1026	799002.92	409234.80	9.659	LOT 39	9.658	-0.001		9.663	0.004	0.005	9.662	0.003	-0.001	9.665	0.006	0.003	9.742	0.083	0.077	9.660	0.001	-0.082	9.656	-0.003	-0.004
1027	799022.46	409226.05	9.782	LOT 38	9.781	-0.001		9.787	0.005	0.006	9.784	0.002	-0.003	9.783	0.001	-0.001	9.868	0.086	0.085	9.784	0.002	-0.084	9.773	-0.009	-0.011
1028	799040.06	409218.49	9.807	LOT 37	9.813	0.006		9.811	0.004	-0.002	9.808	0.001	-0.003	9.807	0.000	-0.001	9.901	0.094	0.094	9.808	0.001	-0.093	9.797	-0.010	-0.011
1029	799059.70	409266.32	9.784	LOT 46	9.781	-0.003		9.788	0.004	0.007	9.784	0.000	-0.004	9.784	0.000	0	9.854	0.070	0.070	9.788	0.004	-0.066	9.78	-0.004	-0.008
1030	799040.62	409273.93	9.721	LOT 45	9.717	-0.004		9.721	0.000	0.004	9.720	-0.001	-0.001	9.725	0.004	0.005	9.790	0.069	0.065	9.726	0.005	-0.064	9.72	-0.001	-0.006
1031	799021.65	409283.95	9.628	LOT 44	9.626	-0.002		9.628	0.000	0.002	9.628	0.000	0	9.632	0.004	0.004	9.693	0.065	0.061	9.632	0.004	-0.061	9.629	0.001	-0.003
1032	799003.71	409293.04	9.536	LOT 43	9.541	0.005		9.537	0.002	-0.004	9.535	-0.001	-0.002	9.539	0.003	0.004	9.597	0.061	0.058	9.540	0.004	-0.057	9.536	0.000	-0.004
1033	798984.62	409303.13	9.442	LOT 42	9.436	-0.006		9.443	0.001	0.007	9.439	-0.003	-0.004	9.441	-0.001	0.002	9.497	0.055	0.056	9.442	0.000	-0.055	9.436	-0.006	-0.006
1034	799010.68	409337.15	9.424	LOT 158 A	9.415	-0.009		9.417	-0.007	0.002	9.413	-0.011	-0.004	9.416	-0.008	0.003	9.467	0.043	0.051	9.416	-0.008	-0.051	9.413	-0.011	-0.003
1035	799048.56	409310.95	9.593	LOT 158 B	9.591	-0.002		9.593	0.000	0.002	9.595	0.002	0.002	9.597	0.004	0.002	9.659	0.066	0.062	9.596	0.003	-0.063	9.581	-0.012	-0.015
1036	798946.39	409345.64	9.056	LOT 24	9.062	0.006		9.055	-0.001	-0.007	9.056	0.000	0.001	9.061	0.005	0.005	9.103	0.047	0.042	9.060	0.004	-0.043	9.051	-0.005	-0.009
1037	798939.44	409325.66	9.191	LOT 23	9.191	0.000		9.187	-0.004	-0.004	9.186	-0.005	-0.001	9.190	-0.001	0.004	9.239	0.048	0.049	9.193	0.002	-0.046	9.185	-0.006	-0.008
1038	798931.74	409305.79	9.335	LOT 22	9.328	-0.007		9.333	-0.002	0.005	9.333	-0.002	0	9.331	-0.004	-0.002	9.386	0.051	0.055	9.333	-0.002	-0.053	9.329	-0.006	-0.004
1039	798925.09	409286.62	9.411	LOT 21	9.409	-0.002		9.410	-0.001	0.001	9.408	-0.003	-0.002	9.412	0.002	0.004	9.462	0.051	0.050	9.414	0.003	-0.048	9.407	-0.004	-0.007
1040	798918.59	409266.66	9.530	LOT 20	9.521	-0.008		9.529	-0.001	0.008	9.528	-0.002	-0.001	9.532	0.002	0.004	9.585	0.056	0.053	9.530	0.000	-0.055	9.523	-0.007	-0.007
1041	798910.74	409247.93	9.602	LOT 19	9.596	-0.005		9.596	-0.005	0	9.595	-0.006	-0.001	9.603	0.002	0.008	9.658	0.056	0.055	9.602	0.001	-0.056	9.593	-0.008	-0.009
1042	798903.07	409227.85	9.713	LOT 18	9.716	0.003		9.711	-0.002	-0.005	9.711	-0.002	0	9.712	-0.001	0.001	9.774	0.061	0.062	9.716	0.003	-0.058	9.705	-0.008	-0.011
1043	798896.01	409208.67	9.801	LOT 161 A	9.801	0.001		9.800	0.000	-0.001	9.799	-0.002	-0.001	9.803	0.003	0.004	9.861	0.061	0.058	9.802	0.002	-0.059	9.793	-0.008	-0.009
1044	798889.82	409189.78	9.894	LOT 161 B	9.892	-0.002		9.893	-0.001	0.001	9.893	-0.001	0	9.893	-0.001	0	9.957	0.063	0.064	9.897	0.003	-0.060	9.881	-0.013	-0.016
1045																									

Setup Survey 2022/08/09

Setup Survey 2022/08/09				Survey 2 2022/08/16				Survey 3 2022/08/30			Survey 4 2022/09/07		
Pt #	North (m)	East (m)	RL GVD192	Name	RL	Diff to S1	Diff to last	RL	Diff to S1	Diff to last	RL	Diff to S1	Diff to last
1050	409159.341	798952.881	10.026	LOT 12	10.026	0.000		10.026	0.000	0.000	10.024	0.002	0.002
1051	409151.698	798974.721	10.090	LOT 11	10.090	0.000		10.091	-0.001	0.000	10.088	0.001	0.002
1052	409142.589	798995.671	10.098	LOT 10	10.098	0.000		10.099	-0.001	-0.001	10.098	0.000	0.001
1053	409132.917	799016.706	10.156	LOT 9	10.157	0.001		10.158	-0.002	-0.001	10.157	0.000	0.001
1054	409119.229	799039.930	9.945	LOT 8	9.945	0.000		9.945	-0.001	0.000	9.945	-0.001	0.000
1055	409100.121	799025.056	10.013	LOT 7	10.013	0.000		10.013	0.000	0.000	10.013	0.000	0.000
1056	409085.817	799019.157	9.954	LOT 6	9.953	-0.001		9.953	0.001	0.001	9.952	0.002	0.000
1057	409065.357	799011.993	9.947	LOT 5	9.948	0.001		9.947	0.001	0.002	9.946	0.001	0.000
1058	409047.306	799052.380	9.604	LOT 4	9.604	0.000		9.604	0.000	0.000	9.604	0.000	0.000
1059	409065.491	799059.401	9.568	LOT 3	9.567	-0.001		9.567	0.001	0.000	9.567	0.001	0.000
1060	409085.383	799066.600	9.656	LOT 2	9.655	-0.001		9.656	0.000	-0.001	9.657	-0.001	-0.001
1061	409105.415	799074.116	9.581	LOT 1	9.581	0.000		9.582	0.000	-0.001	9.583	-0.002	-0.002

Appendix D Wentz Pacific Peer Review





19 February 2021

Oakview Investments Ltd
PO Box 460
Gisborne 4040

c/ Lennon Wiltshire – Project Manager, Civil Project Solutions

Dear Lennon

Hansen Road Block Residential Subdivision – Peer review of geotechnical investigation and assessment by Initia Ltd (review #1)

As requested by you, Wentz-Pacific Ltd (WP) has completed a review of the following report:

- *Geotechnical Investigation – Hansen Block – Proposed Subdivision (draft for peer review)*, ref: 665 rev 0, 05 February 2021.

WP understands that the peer review was commissioned to help expedite the processing of a consent for subdivision application to be made to the Gisborne District Council.

Review Comments –

1. Section 2 – Geotechnical Investigations: The number and spatial distribution of the geotechnical investigations is considered to be appropriate for subdivision consent. The further investigations recommended to be done during design are also considered appropriate, and we suggest that Initia consider the following suggestions for refining the additional investigations:
 - One of the machine-drilled boreholes should be advanced through the proposed location of one of the stormwater detention pond slopes. The objective would be to collect representative samples of the soils that will form the slopes for visual assessment, and if appropriate, laboratory index / strength testing.
 - Additional test pit investigations within the within the areas of the site requiring cuts of 1m + may be beneficial to confirm the nature of the near-surface soils in this area, and to refine the proposed plan to increase the depth of cut to construct the shallow ground improvement for mitigation of liquefaction hazard (i.e., increasing non-liquefiable crust thickness).
2. Section 3.2 – The groundwater levels in the standpipe piezometers should be measured to confirm that the water levels assumed for design in this report are appropriate. The final report should include the water level measurements.
3. Sections 4.2 and 4.3 – We agree with Initia’s use of the higher earthquake ground motions (M_w , PGA) from a yet-to-be published study (of seismic hazard in select locations along the east coast of the North Island including Gisborne) to assess the potential effect that these motions will have on the site liquefaction hazard. It might be useful to point out that a primary driver of the higher hazard is the inclusion of the contribution of the Hikurangi subduction zone which is not included in the NZTA hazard. Some commentary on the implications of

the higher motions to the hazard – beyond reporting of the computed index settlements and LSN values – would be helpful to provide context. There should also be a clear statement of which values are being used for design.

Noting that ULS-liquefaction appears to be largely triggered by the smaller NZTA Bridge Manual values, the predicted extent of liquefaction triggering throughout the soil profile appears to be greater when using the higher ground motions – hence slightly higher predicted ground surface damage (i.e., higher LSN values) in some areas.

It is also noted that a considerably larger ULS magnitude (7.5 vs 6.4) may result in a greater magnitude of lateral spreading around the proposed detention basin because of the longer duration of strong ground shaking. See also later comment regarding lateral spreading hazard.

4. Section 4.3.2 – A groundwater level of 2 m bgl was used for design, however groundwater levels were reportedly measured at depths as shallow as 1.6 and 1.9 m. Refer to comment #2 and confirm that the groundwater level assumed for design is still appropriate.
5. Section 4.3.3 Table 3 – The characterisation of LSN values of 30+ being characterised as indicative of “moderate” ground damage is unconservative for design – potentially significantly so. Noting that Table 3 includes the qualifying statement “...acceptable performance under ULS conditions”, there should be some commentary about the types of damage that may occur (as illustration, the Christchurch Residential Red Zone has typical LSN values of 30+). Similarly, showing a LSN of 20 resulting in only “minor” ground surface settlement / damage and acceptable SLS performance could be argued as taking a most optimistic view.

We recommend that the ranges in LSN value, and associated descriptions of ground surface damage shown in Table 5.1 of NZGS Module 3 be reviewed, and Table 3 of the report be revised to be generally consistent with Module 3. Particular attention should be given to Notes 1 and 2 of Table 5.1 in the context of shallow liquefaction and lateral spreading.

6. Section 4.3.3 Table 4 – It appears that some average values may be missing.
7. Section 4.3.3 – Crust Thickness – We note that there is a cut of up to 1.4 m proposed within Zones B and E. This section states that extending the cut to a depth of about 2.5 m and replacement with non-liquefiable engineered fill “should be considered.” Noting that non-liquefiable crust thicknesses of 3 m or less were shown in the Christchurch earthquakes to often result in notably more severe ground surface damage, we recommend that Initia assess the potential effect of the proposed cuts on computed LSN values (incorporating reasonable possible variations in groundwater level to assess sensitivity) and make a firm recommendation if additional cut and replacement with engineered fill is considered necessary.
8. Section 4.3.3 – Lateral Spreading – CPT-03 and -04 show ULS level liquefaction occurring over the same depth, and in the case of CPT-04 over an interval of about 2m (using higher ULS ground motion). Therefore, the conclusion that the lateral spreading risk to the proposed detention basin is low due to “generally thin and non-continuous” liquefiable layers is questionable. We recommend that a CPT-based lateral spreading assessment be done using CPT-03 and -04 to allow some quantification of the potential for lateral spread/stretch. Reference to the 2012 MBIE Canterbury repair guidelines for guidance may also be of use.
9. Seismic Stability of Detention Basin Slopes – Given that the basin slopes are nearly 4 m high, we recommend that as part of preliminary design, the seismic stability of the pond slopes be assessed using a conventional general limit equilibrium (GLE) approach. We recommend that analysis use a pseudo-static coefficient derived from the higher ULS PGA of 0.66g (i.e.,



in the order of 0.33 to 0.44g). The computed factors of safety should meet the minimum GDC requirements or alternatively, 1.1. If a suitable factor of safety is not achievable, a simple deformation analysis can be used to determine whether a lower value may still result in tolerable slope deformation.

10. Section 4.4 – Consolidation Settlement – The recommendation is for settlement monitoring to be undertaken at the end of earthworks. It might be more useful for monitoring to be performed beginning at the start of the earthworks to confirm the settlement behaviour of the site throughout, and after, fill placement.
11. Section 4.5 – Provide reference for the use of “TC2.”
12. Section 4.5 – Referring to comment #7 above, this section makes the additional undercut to a depth of 2.5 m a recommendation which is good. It would be useful to link the amount of required undercut (i.e., over-excavation) to achieving a minimum thickness of non-liquefiable crust.
13. Section 4.5 – The minimum “no-build zone” around the pond should be checked via the additional analyses recommended in comments 8 and 9 above.
14. Detention Basin Slopes – At some point in the design, slope erosion protection measures will presumably be needed (unless the pond is to be lined with plastic).
15. Section 4.7 – NZS 4404:2010 does not really contain specific earthworks requirements (for benching, fill placement/compaction, etc). Recommend that the report also recommend following NZS 4431:1989.

Limitations

This letter was prepared solely for the exclusive use of Oakview Investments Ltd (the Client) with respect to the particular brief given to WP. No other entity or person shall use or rely upon this letter, or any of WP’s work products without prior review and written agreement by us.

WP’s services consist of professional opinions and conclusions developed in accordance with generally accepted geotechnical engineering principles and practices and relied exclusively upon the information provided to us as part of this project. There is no other warranty, either expressed or implied.

Regards,

Wentz-Pacific, Ltd.



Frederick J. Wentz, CPEng, IntPE, CMEngNZ
Principal Engineer

Item - Ref Wentz- Pacific
Geotechnical Engineers letter ref
Peer review of geotechnical
investigations and assessment by
Initia Ltd (review #1) dated
19/2/2021. Attached

Initia Ltd Response

- 1 The recommendations for additional investigations will be considered during detailed design and undertaken if there is potential to optimise/refine/enhance analyses and earthworks plans based on current data.
- 2 Presentation of the groundwater levels has been amended within each zone, however, further readings since the investigation have not been obtained. On going monitoring is proposed.
- 3 Comment included confirming, that our recommendations to mitigate the seismic hazard are based on anticipated performance under the yet to be published levels of shaking.
- 4 Confirming that the groundwater level assumed for design is still appropriate.
- 5 Commentary amended to reference to NZGS Module 3.
- 6 Amended
- 7 Reviewed and amended to "is recommended".

- 8 Analyses reviewed and commentary revised to indicate potential for spreading around the pond. A range of mitigating options have also been provided. Quantitative analyses and design of mitigation measures will be undertaken during detailed design. An addendum, peer reviewed report will be provided ahead of engineering approval.

- 9 Commentary on slope stability has been included. Analyses to quantify the hazard will be undertaken during detailed design and results presented in the report referenced in 8 above.
- 10 Amended to include beginning, during and following fill placement.
- 11 Reference to TC2 type included
- 12 Revised crust thickness following undercut and replacement is provided.
- 13 Can be confirmed following detailed design.
- 14 Can be confirmed following detailed design.
- 15 Amended to include reference to NZS 4431:1989

Appendix E GDC Resource Consent Conditions



Date:	06/08/2021	Application Number:	SG-2021-110234-00 LU-2021-110235-00 & NC-2021-110236-00
Reporting Planner:	Kimberley Morete	Site Visit:	19 March 2021

Related Application(s):	LL-2021-110301-00 NC-2021-110420-00
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Applicant:	Oakview Investments Limited
Property Address:	Back Ormond Rd/Hansen Rd
Legal Description:	Lot 2 DP 424055 contained in Record of Title 493431
District Plan:	Te Papa Tipu Taunaki o Te Tairāwhiti – Tairāwhiti Resource Management Plan
Zone:	General Residential
Overlays:	Taruheru Block Structure Plan Area, Eastland Network 110kV line, Land Overlay 1
Activity Status:	Discretionary

1.0 Resource Consent Decision

Pursuant to Sections 104, 104B, 106 and 108 of the Resource Management Act 1991, Gisborne District Council **grants** the application by Oakview Investments Limited, **subject to the Conditions below.**

1.1 The Approved Activity

Resource consent is sought by Oakview Investments Limited for the subdivision of Lot 2 DP 424055 to create 155 Residential sites, 4 super lots for future residential development, roads to vest, Local Purpose Reserve (drainage) to vest, one lot for future commercial development, pedestrian access lots to vest and Jointly Owned Access Lots (JOAL).

While the site is zoned General Residential, it is located within the Taruheru Block Structure Plan Area which specifies a minimum lot size of 800m². Therefore, Land Use consent will enable construction of a single dwelling on those residential lots that are less than 800m². The Land Use consent does not authorise development of the Super Lots or the Commercial Lot. Individual Land Use consent(s) will be required once the development specifics for each Lot is known. The Land Use consent also does not authorise non-compliance of any of the other General Standards applicable to residential development such as (but not limited to) yard setback, height and site coverage.

Overall the status of the activity is Discretionary.

1.2 Approved Plans

Document	Prepared by:	Reference No.	Sheet No.	Date:
Lots 1 to 173 being a Proposed Subdivision of Lot 2 DP424055	C & R Surveyors Limited	6376_SP_1 to 6376_SP_11	1 to 11	19 February 2021
Oakview Landscape Plans	Kamo Marsh Landscape Architects	5109 Oakview Revision A	1001 to 1015	25 February 2021
Detailed Site Assessment with National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health	EAM NZ LTD – Environmental Consultants	EAM2062-REP-01	-	January 2021
Site Remedial Action Plan	EAM NZ LTD – Environmental Consultants	EAM2062-REP-02-RAP	-	February 2021
Infrastructure Design Report And as updated by:	Aspire	REPORT 1517 – 3 1517-RC-RD306 to 307 1517-RC-SW401 to 404 1517-RC-WW501 to 504	- Rev A	February 2021 14 June 2021
Stormwater Management Report And as updated by: Oakview Investments Limited, Proposed Wetland design for residential subdivision.	Aspire	REPORT 1517- 2 1517 M2 1517 M3	-	February 2021 9 June 2021 29 July 2021
Geotechnical Investigation Report	Initia Geotechnical Specialists	REF 665 REV A	-	February 2021
Oakview Subdivision TIA	TEAM	Z:\2020_PROJECTS\20443 - HANSEN ROAD DEVELOPMENT\DOCS\OAKVIEW RESIDENTIAL SUBDIVISION DRAFT.DOCX	-	25 February 2021

Freshwater Ecology Classifications – Hansen Road and Back Ormond Road, Gisborne	Bioresearches	64029	-	26 January 2021
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Please note that the plans which are approved are stamped Approved Plan and attached to this consent.

2.0 Conditions

Pursuant to Section 108 of the Resource Management Act 1991 this consent is granted subject to the following conditions:

General Conditions

1. The proposal shall proceed in general accordance with the information and plans submitted by the consent holder in support of application number SG-2021-110234-00, LU-2021-110235-00 and NC-2021-110236-00 officially received by the Council on 2 March 2021 and all further information received by 30 July 2021. The approved drawings are listed in the table in section 1.2 of this report. If a conflict arises between any conditions of this consent and the application, the conditions of this consent will prevail.
2. Pursuant to section 36 of the Resource Management Act 1991, the consent holder shall pay the actual and reasonable costs incurred by the Council when monitoring the conditions of this consent.

Provision of Power and Telephone:

3. Power shall be provided to the boundary of all residential Lots (including Super Lots and to the net area of Lot 16 and Lot 77), excluding Lots 157, 161, 162 and 172. Prior to requesting approval under Section 224 of the Resource Management Act 1991 the consent holder shall provide evidence from the relevant network utility provider that power is available at the boundary of all residential Lots, excluding Lots 157, 162 and 172.
4. Telecommunications shall be provided to the boundary of all Lots, excluding Lots 157, 162 and 172. Prior to requesting approval under Section 224 of the Resource Management Act 1991 the consent holder shall provide evidence from the relevant network utility provider that telecommunications are available at the boundary of all Lots, excluding Lots 157, 162 and 172, or alternatively, that wireless technology is available
5. The existing easement rights to convey electricity and telecommunications & computer media created by Easement Instrument 8699682.3 shall be cancelled.

Staging:

6. The subdivision may be undertaken in stages as shown on the Overall Staging Plan prepared by C&R Surveyors Limited (reference: Job No. 6376_SP_1 to SP 11 and dated 8 March 2021). If the subdivision is implemented in stages, the stages may be undertaken in any order or combination of stages. All conditions required to be met for each stage shall be completed to enable the issue of the s224 Certificate for that particular stage.

7. Prior to requesting approval under Section 224 of the Resource Management Act 1991 for each stage, the consent holder shall submit a written statement from a suitably qualified professional, that:
 - a) The physical works have been carried out in accordance with the certified engineering plans.
 - b) The physical works meet Gisborne District Council's Engineering Code of Practice 2000 or as otherwise agreed in writing by the Council's Development Engineer.(Form Schedule 1C of NZS 4404:2010) shall be completed and submitted along with the written statement.

Lapse Period:

8. The period within which effect shall be given to the subdivision, shall be extended to 8 years from the date of issue.

Amalgamation Conditions (Request ID 1741742)

9. Lot 164 hereon to be held as to six undivided one-fifth shares by the owners of Lots 2 to 7 hereon.
10. Lot 165 hereon to be held as to four undivided one-fourth shares by the owners of Lots 52 & 58 to 60 hereon.
11. Lot 166 hereon to be held as to four undivided one-fourth shares by the owners of Lots 67 to 70 hereon.
12. Lot 167 hereon to be held as to four undivided one-fourth shares by the owners of Lots 83 to 86 hereon.
13. Lot 168 hereon to be held as to four undivided one-fourth shares by the owners of Lots 88 to 91 hereon.
14. Lot 169 hereon to be held as to five undivided one-fifth shares by the owners of Lots 111 to 115 hereon.
15. Lot 170 hereon to be held as to four undivided one-fourth shares by the owners of Lots 116 to 119 hereon.
16. Lot 171 hereon to be held as to four undivided one-fourth shares by the owners of Lots 120 to 123 hereon.

Vesting Condition

17. The survey dataset shall be prepared to show:
 - a) Lot 80 to vest in the Council as Road
 - b) Lot 157 shall be a minimum of 20m wide.
 - c) Lot 162 to vest in the Council as Local Purpose Reserve (Drainage)
 - d) Lot 172 to vest in the Council as Accessway

General Construction Conditions

18. The consent holder shall ensure that all noise arising from construction work activities on the site are managed in such a way that they do not exceed the noise limits specified in Table below, when measured 1m from the most exposed façade of any building that is occupied during the works. Construction noise levels must be measured and assessed in accordance with New Zealand Standard 'NZS 6803:1999 Acoustics – Construction noise'.

Time of week	Time Period	Maximum noise level (dBA)	
		L _{eq}	L _{max}
Weekdays	6:30am - 7:30am	60	75
	7:30am - 6:00pm	75	90
	6:00pm - 8:00pm	70	85
	8:00pm - 6:30am	45	75
Saturdays	6:30am - 7:30am	45	75
	7:30am - 6:00pm	75	90
	6:00pm - 8:00pm	45	75
	8:00pm - 6:30am	45	75

L_{eq}(t) = 15 mins

Note: The consent holder is reminded of their general obligation under section 16 of the Resource Management Act 1991 to adopt the best practicable option to ensure that the emission of noise does not exceed a reasonable level.

Where external measurement of construction noise is impractical or inappropriate, the upper limits for the noise measured inside the building will be 20dB less than the relevant levels specified in the condition.

For a project involving a total duration of construction work that is more than 20 weeks the noise limits in Table 1 above shall be decreased by 5dB in all cases.

19. The consent holder shall ensure that all construction generated vibration levels arising from construction activity on the site do not exceed 2 mm/s peak particle velocity in occupied buildings in any axis when measured in the corner of the floor of the storey of interest for multi-storey buildings, or within 500 mm of ground level at the foundation of a single storey building).

If measured or predicted vibration from construction activities exceeds 2 mm/s PPV at occupied buildings, the Consent Holder shall consult with the affected receiver to:

- (a) Discuss the nature of the works and the anticipated days and hours when the exceedances are likely to occur; and
- (b) Determine whether the exceedances could be timed or managed to reduce the effects on the receiver.

The Consent Holder must maintain a record of these discussions and make them available to Council on its request.

20. Construction activities shall only be undertaken on Monday through to Saturday between the hours of 7:00am to 6:00pm. There shall be no work on Sundays.
21. Prior to the commencement of any activities associated with this consent, the consent holder shall submit a Construction Management Plan (CMP) for certification of Council's Compliance Monitoring & Enforcement Manager (**compliance.admin@gdc.govt.nz**). The CMP shall be prepared by a suitably qualified person and include specific details relating to avoiding, remedying or mitigating adverse dust, noise and vibration effects on neighbouring properties from construction, and management of all works associated with this development as follows:

- a. Contact details of the appointed contractor or project manager (phone number, e-mail, postal address);
 - b. A general outline of the construction programme for each stage of development;
 - c. Applicable site noise and vibration limits set out in these conditions;
 - d. How dust will be managed from the site activities;
 - e. Programme of works and hours of operation;
 - f. Identification of surrounding noise and/or vibration sensitive receivers;
 - g. Programme of neighbour consultation and engagement;
 - h. A noise and vibration monitoring program to demonstrate consented noise and vibration limits are met;
 - i. Details about the works, including:
 - i. when the higher noise and vibration levels can be expected;
 - ii. the likely sources or causes of noise and vibration;
 - iii. methods for monitoring and reporting on noise and vibration;
 - iv. working hours;
 - v. a contact phone number for any concerns regarding noise and vibration; and
 - vi. when works could be scheduled to avoid the worst of the effects on the receivers.
22. The consent holder shall implement and maintain the measures outlined in the CMP required by condition 21 throughout the entire construction period.
23. All operations on the site shall be carried out in such a manner as to avoid the generation of objectionable or offensive dust travelling beyond the boundary of the site.
24. Should offensive or objectionable dust be observed beyond the boundary of the property, the activities on site generating the dust shall cease immediately and must not restart until such time as condition 23 can be complied with.
25. At least 10 working days prior to the commencement of activities on site, the consent holder shall provide written advice (via letterbox drop) of the proposed commencement date to owners and occupants of all properties directly adjacent to or on the opposite side of Hansen Road and Back Ormond Road from the site, and the Cameron Road link.
- As a minimum, the written advice shall include:
- a) An overview of the construction works;
 - b) The mitigation measures to be implemented eg hours of operation and dust control;
 - c) A contact phone number for any concerns regarding noise and vibration, construction traffic, dust, or any other matter associated with the works.
26. The consent holder shall maintain a complaints register, which shall be kept on-site at all times, and be available to Council compliance monitoring staff on request.

Any complaints pertaining to the construction activities shall be recorded by the consent holder and shall include:

- a) The date, time and nature of the complaint;
 - b) Name, phone number and address of the complainant unless the complainant wishes to remain anonymous;
 - c) Action taken by the consent holder to remedy the problem;
 - d) The weather conditions at the time, including wind direction, wind strength and temperature, and;
 - e) Date and name of the person making the entry.
27. Details of any complaint shall be provided to the Gisborne District Council's Compliance Monitoring & Enforcement Manager within 24 hours of the complaint/s being made or the next working day.
28. Prior to requesting approval under Section 224 of the Resource Management Act 1991 the consent holder shall submit a Site Validation Report (SVR) for the entire site for review and acceptance by the Council confirming that the land has been remediated to levels suitable for its intended purpose. The SVR shall be prepared by a suitably qualified and experienced person (SQEP) and in accordance with the Contaminated Land Management Guidelines No. 1 – Reporting on Contaminated Sites in New Zealand (Revised 2021).

Prior to s224 of the Resource Management Act 1991 Approval

Infrastructure Conditions

29. The consent holder shall provide complete engineering drawings in accordance with Gisborne District Council's Engineering Code of Practice 2000 (see note below), detailing all bulk earthworks, proposed new or altered public assets including stormwater, wastewater and water services, for the total proposed subdivision. These drawings shall be submitted for acceptance and approval to the Council's Development Engineer, Environmental Services & Protection confirming that the design is in accordance with the Code of Practice, or otherwise agreed to by Council's Consent Manager or as specified within this consent.

The engineering drawings shall include but not be limited to:

- a) Roading – full base and construction layers including surface treatment (AC and/or Chipseal where proposed).
- b) All right of ways – full design
- c) All infrastructural services
- d) Street lighting including provision of a specific Street Light Design Plan for acceptance by Council's Capital Manager (Journeys)

Note: The proposed streetlights must be in accordance the current suite of lights and poles accepted by Council. Colour powder coating options for the poles can be considered as well as other pole and light types provided these are approved by Council's Capital Manager (Journeys).

- e) Proposed road name signage.
- f) Stormwater design & control/treatment structures within the subdivision to the relevant outlet points

- g) Intersection design at the new road interface with Hansen Road
- h) Roadmarking
- i) All streetscape and proposed planting
- j) The design and location of all footpaths. (Note that Councils preference is for footpaths to be 1.5m in width)

Note: The designs for roading may reference NZT4404:2010 or Austroads for standards where the Engineering Code of Practice is lacking guidance. All infrastructure materials shall comply with relevant standards acceptable to GDC. The consent holder should check these standards with relevant Council staff.

30. The consent holder shall submit to Council's Development Engineer, Environmental Services & Protection, a Stormwater Management Plan (SWMP) for the entire subdivision for certification. This is to be based on attenuation and treatment for the 10% AEP storm event and in compliance with the provisions of the Tairāwhiti Resource Management Plan including the Fresh water Plan and in accordance with Auckland Council GD01. Overland pathway for the 1% AEP storm event is to be identified and kept free from possible buildings and structures, these should be on public land.
31. The consent holder shall provide a stormwater reticulation system and connections to service each lot and the entire subdivision. This system shall be based on the approved Stormwater Management Plans submitted for acceptance and the full infrastructure engineering plans submitted also.
32. The consent holder shall comply with all sanitisation and pressure testing of the relevant wastewater/stormwater and water mains. The consent holder shall arrange for Council Utilities inspector to be on site to witness the testing.
33. Lots 1 to 79, Lots 81-156, Lots 158-161 and Lot 163 shall be provided with human wastewater connection points to the proposed human wastewater reticulation system and also potable water connections within the proposed subdivision in accordance with the Engineering Code of Practice 2000. The consent holder shall provide written confirmation that the connections have been completed as per the Engineering Code of Practice 2000, or otherwise as agreed with Council's Development Engineer, Environmental Services & Protection. The connections shall be constructed in accordance with the wastewater and water design for the subdivision as separately conditioned for engineering drawings.
34. The consent holder shall provide complete engineering drawings in accordance with Gisborne District Council's Engineering Code of Practice 2000 (unless otherwise agreed by Council's Consent Manager) for any upgrading or works including pavement and footpaths within Hansen Road. These drawings shall be submitted for approval to Council's Development Engineer, Environmental Services & Protection,

Note: Kerb & Channel will be required on both sides of Hansen Road, from the subdivision entrance to the Back Ormond Road intersection. This may be included in a Developer Agreement with Council with regards to utilisation of funds available to deliver the required infrastructure. In addition to the Code of Practice, the developer may design in accordance with Austroads or NZS4404:2010 (Form Schedule 1A of NZS 4404:2010) shall be completed and submitted along with the drawings.

35. The consent holder shall construct new vehicle crossings to all right of way (ROW) accessways serving Lots 2-7, Lots 84-85, Lots 89-90, Lots 52, 59, Lots 67-69, Lots 112-114, Lots 117-118, Lots 121-122 and Lot 162 in accordance with the subdivision application,

and to meet Gisborne District Council's Engineering Code of Practice 2000 for new residential crossings. The vehicle crossings shall be formed with concrete/sealed between the kerb and property boundary.

36. Prior to requesting approval under Section 224 of the Resource Management Act 1991 for Stages 5 and 7, the consent holder shall provide complete engineering drawings in accordance with Gisborne District Council's Engineering Code of Practice 2000 or as otherwise agreed by the Consent Manager (see note below), detailing all bulk earthworks, proposed services infrastructure (stormwater, wastewater, water services, gas, power, telecom), for the Cameron Road link. These drawings shall be submitted for certification to the Council's Development Engineer, Environmental Services & Protection.

The engineering drawings shall include but not be limited to:

- a) Roading – full base and construction layers including surface treatment (AC and/or Chipseal where proposed).
- b) All infrastructural services.
- c) Street lighting – including light standards and type of bulb as approved by Council's Journeys Team.
- d) Proposed road name signage.
- e) Stormwater design & control/treatment structures within the subdivision to the relevant outlet points.
- f) Intersection design at the new road interface with Cameron Road.
- g) Roadmarking.
- h) All streetscape and proposed planting.
- i) The design and location of all footpaths. (Note that Council's preference is for footpaths to be 1.5m in width).

Note: The designs for roading may reference NZT4404:2010 or Austroads for standards where the Engineering Code of Practice is lacking guidance. All infrastructure materials shall comply with relevant standards acceptable to GDC. The consent holder should check these standards with relevant Council staff.

37. The consent holder shall construct all infrastructure in accordance with accepted and approved drawings submitted in accordance with conditions 29, 31, 34 and 36. All work shall be completed to the satisfaction of Council's Consents Manager, Environmental Services & Protection, and shall be at the consent holder's expense.

38. The consent holder shall submit a written statement from a suitably qualified professional, that:

- a) The physical works have been carried out in accordance with the condition 37 and the accepted and approved engineering plans.
- b) The physical works meet Gisborne District Council's Engineering Code of Practice 2000 or as otherwise agreed in writing by the Council's Development Engineer.

Note: (Form Schedule 1C of NZS 4404:2010) shall be completed and submitted along with the written statement.

39. The consent holder shall submit completed 'as built' plans and RAMM data to Council's Development Engineer, Environmental Services & Protection in accordance with

Gisborne District Council's Engineering Code of Practice 2000. The plans shall include but not be limited to:

- a) All public and private infrastructural assets within the subdivision and showing connections to relevant services outside the subdivision.
- b) Measurements shall be shown to relevant boundaries and physical features to assist location in future years.
- c) The applicant shall contact the Council's asset manager (four waters) for relevant data recording standards expected on the as-builts.
- d) The applicant shall contact Council's Journeys team for standards and requirements for capture and submitting of RAMM data for the roading assets created.

Geotechnical Conditions

40. Prior to construction of civil infrastructure and buildings the consent holder shall undertake cyclic softening assessment on the proposed batter slope and assessment of potential deformation associated with the pond. To mitigate the risk associated with cyclic softening the following matters shall be considered:

- a) Setbacks from the stormwater pond and recommendation for appropriate foundations
- b) Appropriate ground improvement techniques
- c) Use of appropriate slope angles
- d) No-build zone

41. Prior to the construction of the stormwater pond, the consent holder shall provide complete engineering drawings (detailing all including setbacks from the pond, no-build zone, pond batters, slope erosion protection methods, etc.) for the same pond in accordance with the relevant New Zealand Standard. These drawings shall be submitted for certification by Council's Development Engineer, Environmental Services & Protection that the design is in accordance with the Code of Practice, or otherwise agreed to by Council's Consent Manager, Environmental Services & Protection.

(Form Schedule 1A of NZS 4404:2010) shall be completed and submitted along with the drawings.

42. Prior to requesting approval under Section 224 of the Resource Management Act 1991, the consent holder shall submit a written statement from a Chartered Professional Engineer, that:

- a) The physical works (construction of stormwater pond) have been carried out in accordance with the engineering plans in condition 41.
- b) The physical works meet Gisborne District Council's Engineering Code of Practice 2000 or as otherwise agreed in writing by the Council's Consent Manager.

(Form Schedule 1C of NZS 4404:2010) shall be completed and submitted along with the written statement.

43. A geotechnical completion report prepared by a qualified geo-professional, who has monitored the work, shall be submitted after the earthwork process to the Gisborne District Council's Development Engineer, Environmental Services & Protection: attesting to the suitability of the land for its intended purpose. The form in Schedule 2A of NZS 4404:2010 shall be completed and submitted along with the geotechnical completion

report, and this report may be subjected to independent peer review at the applicants cost.

Note: It is desirable to monitor throughout the earthwork process and after fill placement to confirm the settlement behaviour, rather than only at the end of earthworks.

44. Localised additional excavation and replacement with engineered fill shall be required in Zones B and E, to maintain a reasonable crust of non-liquefiable material contingent on observed groundwater levels.

Landscaping Conditions

45. The Consent Holder shall submit for certification to Council's Liveable Spaces Manager a final Landscape Planting Plan, prepared by a suitably qualified landscape architect, based on the Landscape Concept plans prepared by KamoMarsh Landscape Architects (reference: Ref No.5109, dated 25 February 2021 Revision A). The landscape planting plan shall include the following detail:

- a) A description of the proposed planting
- b) A schedule of species to be planted which includes the botanical and common name of the species
- c) Quantity of plants required for each site
- d) The size of plants at the time of planting
- e) The mature size of plants
- f) Any effect on underground or overhead services
- g) Staking requirements
- h) Ongoing maintenance programme
- i) The qualifications and experience of the person preparing the plan

Note: The person preparing the plan should liaise with Council's Liveable Communities team to discuss appropriate species and any other requirements (such as root barriers) that they may have. Planting plans may be prepared in stages relating to any stages the subdivision is proposed to be implemented in.

46. Prior to requesting approval under Section 224 of the Resource Management Act 1991, the Consent Holder shall implement the landscape planting in accordance with the Landscape Plan(s) required by condition 45.
47. The consent holder shall maintain the planting required under condition 46 in good health and condition for a minimum of two years after section 224 approval unless they are assessed by an arborist experienced in the assessment of plant health, as being a danger to life or property. Any dead, dying or diseased plants shall be replaced in the subsequent planting season so as to maintain the mitigation planting intended by these conditions.

Note: Council's Liveable Communities team will undertake a review of the plantings (during and after planting) to highlight any areas of concern early on, so that it can be remedied. There will also be a walkover of the site done before the Defects Liability Period ends to ensure that Council are happy to accept the plantings/trees.

48. Prior to requesting approval under Section 224 of the Resource Management Act 1991, the Consent Holder shall submit detailed design(s) of the fencing to be constructed along the rear boundary of sites which back onto the stormwater pond. The fencing design(s) shall be certified by Council's Liveable Communities team prior to construction.

Section 221 of the Resource Management Act 1991 Consent Notice Conditions

49. Pursuant to Section 221 of the Resource Management Act 1991 a consent notice condition shall be imposed on the Records of Title of all lots (excluding Lots 158-163) advising as follows:

- a) Any application(s) for building consent to erect any new habitable building shall include a 'Site Specific Bearing Capacity Report' prepared by a geo-professional specialising in the field of geotechnical engineering, which is in accordance with the recommendations in the Geotechnical Report prepared by INITIA Reference: 665 Rev A, dated February 2021, which shall include but not limited to:
 - i. Certification to the satisfaction of the Consent Authority that the design of the foundations of the proposed building are suitable with respect to the bearing strength of the supporting ground (In accordance with the relevant New Zealand Standard); and
 - ii. Addresses any potential for expansive soils, non-engineered fill and if appropriate liquefaction or differential settlement that may need to be incorporated into the foundation design for new buildings; and.
 - iii. Specifies as appropriate, any remedial works or mitigation measures to be undertaken to protect the development from natural hazards.

The building shall be constructed in accordance with the recommendations in the submitted Geotechnical Report.

Note: Reference should be made to the minimum requirements outlined in the Gisborne District Council 'Bearing Capacity & Geotechnical Investigation Requirements' pamphlet.

50. Pursuant to Section 221 of the Resource Management Act 1991 a consent notice condition shall be imposed on the Record of Title of Lot 161 advising as follows:

- a) Any application(s) for building consent to erect any commercial building and/or structure shall include a 'Site Specific Geotechnical Report' prepared by a geo-professional specialising in the field of geotechnical engineering, which is in accordance with the recommendations in the Geotechnical Report prepared by INITIA Reference: 665 Rev A, dated February 2021, which shall include but not limited to:
 - i. Certification to the satisfaction of the Consent Authority that the design of the foundations of the proposed building are suitable with respect to the bearing strength of the supporting ground (In accordance with the relevant New Zealand Standard); and
 - ii. Addresses any potential for expansive soils, non-engineered fill and if appropriate liquefaction or differential settlement that may need to be incorporated into the foundation design for new buildings; and.
 - iii. Specifies as appropriate, any remedial works or mitigation measures to be undertaken to protect the development from natural hazards.

The building shall be constructed in accordance with the recommendations in the submitted Geotechnical Report.

Note: Reference should be made to the minimum requirements outlined in the Gisborne District Council 'Bearing Capacity & Geotechnical Investigation Requirements' pamphlet.

51. Pursuant to Section 221 of the Resource Management Act 1991 a consent notice condition shall be imposed on the Records of Title of Lots 158, 159, 160, and 163 advising as follows:

- a) Any application(s) for building consent to erect any new building and/or structure shall include a 'Site Specific Geotechnical Report' prepared by a geo-professional specialising in the field of geotechnical engineering, which is in accordance with the recommendations in the Geotechnical Report prepared by INITIA Reference: 665 Rev A, dated February 2021, which shall include but not limited to:
 - i. Certification to the satisfaction of the Consent Authority that the design of the foundations of the proposed building are suitable with respect to the bearing strength of the supporting ground (In accordance with the relevant New Zealand Standard); and
 - ii. Addresses any potential for expansive soils, non-engineered fill and if appropriate liquefaction or differential settlement that may need to be incorporated into the foundation design for new buildings; and.
 - iii. Specifies as appropriate, any remedial works or mitigation measures to be undertaken to protect the development from natural hazards.

The building shall be constructed in accordance with the recommendations in the submitted Geotechnical Report.

Note: Reference should be made to the minimum requirements outlined in the Gisborne District Council 'Bearing Capacity & Geotechnical Investigation Requirements' pamphlet.

52. A consent notice condition shall be imposed on the Records of Title of all lots (excluding Lot 157, Lot 158, Lot 159, Lot 160, Lot 161, Lot 162, Lot 163, and Lots 164 - 172) advising as follows:

- a) Due to wastewater capacity constraints no further subdivision of the lots shall be undertaken and development shall also be limited to one habitable building per lot, unless additional capacity is confirmed by Council. .

53. A consent notice condition shall be imposed on the Record of Title of Lot 1, Lots 8-16, Lots 17-51, Lots 53-58, Lots 60-66, Lots 70-79, Lots 81-83, Lots 86-88, Lots 91-111, Lots 115-116, Lots 119-120, Lots 123-156, Lot 158, Lots 159-161 and Lot 163 advising as follows:

- a) At building consent stage a vehicle crossing shall be constructed to the subject Lot to meet Gisborne District Council's Engineering Code of Practice 2000 for new residential crossings. The vehicle crossing shall be formed with concrete /sealed between the kerb and property boundary.

Note: Where appropriate vehicle crossing may be provided from a Jointly Owned Access Lot (JOAL) or the adjacent road e.g. Lot 58

54. A consent notice condition shall be imposed on the Records of Title of Lots 68-69, Lot 72 and Lot 160 advising as follows:

- a) Any fencing constructed along the common boundary with the stormwater pond shall be in accordance with the agreed fencing style required by condition 48 of Subdivision and Land Use consent decision SG-2021-110234-00, LU-2021-110235-00 and NC-2021-110236-00.

55. A consent notice condition shall be imposed on the Record of Title of Lot 161 advising as follows:

- a) If a playground is to be installed on Lot 161, then the design of this shall be undertaken in conjunction with Council's Liveable Communities team who can provide approvals and guidance as required.
56. A consent notice condition shall be imposed on the Records of Title of Lots 59-68, Lot 160 and Lot 162 advising as follows:
- a) Bund planting shall be maintained in good health and condition unless plantings are assessed by an arborist experienced in the assessment of plant health, as being a danger to life or property. Any dead, dying or diseased plants shall be replaced in the subsequent planting season so as to maintain the mitigation planting intended by these conditions. Any replacement planting shall be in accordance with the Landscape Planting Plan required by condition 45 of Subdivision and Land Use consent decision SG-2021-110234-00, LU-2021-110235-00 and NC-2021-110236-00. Under no circumstances shall Agapanthus, or any other plants that are identified in the Regional Pest Management Plan, be planted as they will spread rapidly and potentially overwhelm the slower growing native species.
57. A consent notice condition shall be imposed on the Records of Title of Lots 59-68 and Lot 160 advising as follows:
- a) Dwellings shall be constructed in compliance with Rule C11.2.15.5 (acoustic protection for arterial roads) of the Tairāwhiti Resource Management Plan. An acoustic design certificate shall be provided with the building consent application to show how Rule C11.2.15.5 is met using appropriate noise mitigation measures.
58. A consent notice condition shall be imposed on the Record of Title of Lot 161 advising as follows:
- a) Wired power services are not installed to the net area of the site. Connection to this service will be at the full cost of the land owner.
59. A consent notice condition shall be imposed on the Record of Title for Lot 157 advising as follows:
- a) This Lot shall not be developed or built upon until it is determined whether the land is required for a road connection. If the land is required for a road connection the road shall be formed and then vested to Gisborne District Council. If the land is not required for a road connection this shall be confirmed in a written statement from Gisborne District Council and this consent notice discharged enabling development of the site.

ADVICE NOTES

- a) This subdivision resource consent lapses 8 years after the date of commencement of the consent unless the consent is given effect to or an application is made and granted for an extension of time. A subdivision is given effect to when a survey plan in respect of the subdivision has been submitted to the Council under section 223, but shall lapse if the survey plan is not deposited in accordance with section 224. In accordance with section 224(h) no survey plan shall be deposited unless less than 3 years has elapsed since the Council has approved the survey plan.
- b) All work or discharge to or within the road reserve requires a Corridor Access Request (CAR). This includes any upgrades to vehicle crossings and the installation of infrastructure and services. A CAR can be made via the BeforeUDig website or directly

to Gisborne District Council. A traffic Management Plan shall be submitted with the CAR.

- c) The Applicant may enter into a Developer Agreement with Council with regards to utilisation of funds available and to deliver the required infrastructure. Any Developer Agreement will override conditions of this consent requiring infrastructure to be provided at the Consent Holder's cost.
- d) The Consent Authority may as part of the s224 sign off or at any other stage of the development process, seek Professional Assistance to Interpret Engineering Information that is contained within earthworks completion reports or Peer Review of any other documentation that is supplied, at the applicants cost.
- e) The development contribution estimated for this proposal is **\$1,606,504.00**. This contribution is to be paid to Council prior to applying for a certificate pursuant to section 224 of the Resource Management Act 1991.
- f) The Land Use consent does not specifically authorised development of the Super Lots or the Commercial Lot. Individual Land Use consent will be required to be obtained once the development specifics for each Lot is known.
- g) The Land Use consent also does not authorise non-compliance of any of the other General Standards applicable to residential development such as (but not limited to) yard setback, height and site coverage.
- h) The Consent Holder is responsible for ensuring that all contractors carrying out works under this consent are made aware of the relevant consent conditions, plans and associated documents.
- i) The Consent Holder is advised that non-compliance with consent conditions may result in enforcement action against the Consent Holder and/or their contractors and any landowner.
- j) The Consent Holder is advised that this consent does not in itself give any authority to enter or carry out work on private land nor does it imply any exclusive right to operate over the area allotted to the holder. It also does not excuse the holder from obtaining all other legal and statutory requirements for instance the legal access through private land and the Health and Safety Act.
- k) Given the possibility for both vertical and lateral deformations as a result of liquefaction under seismic loading, it is recommended that:
 - 1. Critical services be located away from the western or southern sections of the proposed stormwater pond; and
 - 2. Flexible materials and connections shall be used to allow efficient repair if damage was to occur as a result of liquefaction; and
- l) No archaeological sites whether recorded or unrecorded under Subpart 2 of the Heritage New Zealand Pouhere Taonga Act 2014 can be destroyed, damaged or modified without the consent of Heritage New Zealand. In the event that an archaeological site(s) and/or koiwi are unearthed, the Consent Holder is advised to immediately stop work on the part of the site that the archaeological site(s) is located, and contact Heritage New Zealand and all relevant iwi/hapu for advice. Heritage New Zealand contact details: email - infolowernorthern@heritage.org.nz; phone - 07 577 4530. The Gisborne District Council is able to advise of the contact details for the relevant iwi and hapu in this area.

- m) The naming of roads must be in accordance with Gisborne District Council Road Naming Guidelines.
- n) Once the section 224C completion certificate has been issued by Council for this subdivision, Council will advise the consent holder of property number(s). Entrances are required to be accurately numbered in accordance with the Rural and urban addressing standard, AS/NZS4819:2011. To conform to the above standard, the existing property numbering may need to change.

REASONS FOR DECISION

Section 113(4) of the Resource Management Act 1991, requires that every decision on a resource consent that has not been notified shall be in writing and state reasons for the decision.

1. The actual and potential effects created by the proposal are considered acceptable because development of this nature is anticipated through the residential zoning of the site and the scale of the development is appropriate for the zoning. All lots will be serviced adequately with regards to power, water, wastewater and stormwater, and a network of roads will be constructed. The creation of the wetland and the reserve within the Commercial Lot, along with the proposed street trees, will provide for a high level of residential amenity. Gisborne is in the midst of a housing crisis and the proposal will help to relieve some of this housing pressure by providing a variety of housing options through the stand-alone lots and the Super Lots. Conditions imposed as part of this consent will avoid, remedy or mitigate any potential adverse impact on the environment.
2. The proposal is consistent with the relevant objectives and policies in the Tairāwhiti Resource Management Plan and all other relevant matters.
3. Overall the proposal meets the purpose (Section 5) and principles (Sections 6-8) of the Resource Management Act 1991.

Please note that a copy of the Planning Officer's Report, which explains further the reasons given above, can be forwarded to you on request and is also available at the Council office to view.

Under delegated authority,



Sarah Hunter

CONSENT MANGER

Dated at Gisborne this 17th day of August 2021.

Appendix F Contractors PS3



Schedule 6 – Form of Producer Statement – Construction

ISSUED BY Earthwork Solutions Ltd (Contractor)
TO Oakview Investments Ltd (Principal)
IN RESPECT OF earthworks and infrastructure works for the Oakview residential development. (Stages 1 & 2) (Description of Contract Works)
AT Lot 2 DP 424055, corner of Back Ormond Road and Hansen Road, Gisborne. (Address)

Earthwork Solutions Ltd (Contractor) has contracted to Oakview Investments Ltd (Principal)
to carry out and complete certain building works in accordance with a Contract titled Contract No. 1517
('the Contract')
(Project)

I Matt Mead (Duly Authorised Agent)
a duly authorised representative of Earthwork Solutions Ltd (Contractor)
believe on reasonable grounds that Earthwork Solutions ltd (Contractor)
has carried out and completed:

- All
Part only as specified in the attached particulars of the contract works in accordance with the Contract

(Signature of Authorised Agent on behalf of)

Date 03/10/2022

Earthwork Solutions Ltd
(Contractor)
Unit 2, 64 Aerodrome Road, Matawhero, Gisborne
(Address)

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SCHEDULE 1B

CONTRACTOR'S CERTIFICATE UPON COMPLETION OF LAND DEVELOPMENT/SUBDIVISION

ISSUED BY: Earthwork Solutions Ltd
.....
(Contractor)

TO: Oakview Investments Ltd
.....
(Principal)

TO BE SUPPLIED TO: Gisborne District Council
.....
(Territorial authority)

FOR: Stages 1 & 2 of the Oakview Residential Development
.....
(Description of land development/subdivision)

AT: Lot 2 DP 424055, corner of Back Ormond Road and Hansen road, Gisborne.
.....
(Address)


Earthwork Solutions Ltd has contracted to Oakview Investments Ltd
.....
(Contractor) *(Principal)*

to carry out and complete certain land development and/or subdivision construction in accordance with a contract, titled Contract No. 1517 for ('the contract').

I Matt Mead a duly authorised representative of Earthwork Solutions Ltd
.....
(Duly authorised agent) *(Contractor)*

hereby certify that Earthwork Solutions Ltd
.....
(Contractor) has carried out and completed

the construction, other than those outstanding works listed below, in accordance with the contract and in accordance with approved engineering drawings and specifications.


.....
(Signature of authorised agent on behalf of)

Date 03/10/2022
.....

.....
(Contractor)
Earthwork Solutions Ltd
.....
Unit 2, 64 Aerodrome Road, Matawhero, Gisborne
.....
(Address)

Outstanding works
.....
.....
.....

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