OAKVIEW INVESTMENTS LTD

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GEOTECHNICAL SPECIALISTS

# 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  $1 \vee 3 H$ . 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/m3	16%	11.1%
In-situ CLAY	1.53t/m3	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 2004<sup>1</sup> 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.

<sup>&</sup>lt;sup>1</sup> 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 drawings<sup>2</sup>.

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.

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.</li>

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  $\gamma_{max}$  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.



<sup>&</sup>lt;sup>2</sup> 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)<sup>1</sup>. 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<sub>c1NCs-Sr</sub> 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 <sup>3</sup>	ф'	c', kPa	Undrained shear strength, su, kPa	τ/σ <sub>v</sub> ' ratio	Material Model
Non- liquefiable Crust	19	36	-	-	-	Mohr- Coulomb
Medium Dense Sand – Potentially liquefiable	19	36	-	-	0.25	Mohr – Coulomb (static)/ τ/σ <sub>v</sub> ' ratio (seismic)
Clay	18	23	5	40	-	Mohr- Coulomb (Static) / Undrained (seismic scenarios)

actor of

**Target Factor of** 

Safety 1.5

1.0

1.0

1.5

1.0

1.0

1.0

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

Cross Section	Scenario	Calculated
		Safety
East, 3.5 m high free	Static – Normal	3
face). Zone C ground	Groundwater	

During shaking

Static - Normal

During shaking, Pre-

During shaking, Post

Groundwater

liquefaction

Liquefaction Post shaking

Post shaking

Table 4-2 - Calculated Factors of Safety

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

1 3

3

1.2

0.2

2

- Bray and Travasorou 2007<sup>3</sup>; and
- Jibson 2007<sup>4</sup>.

conditions

West, 2.5 m high

free face. Zone E

ground conditions

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.

<sup>&</sup>lt;sup>3</sup> Bray, J.D. and Travasarou, T. (2007) "Simplified Procedure for Estimating Earthquake-Induced Deviatoric Slope Displacements,"

<sup>&</sup>lt;sup>4</sup> Jibson, Randall. (2007). Regression models for estimating coseismic landslide displacement.

### **Table 4-3 - Calculated Displacements**

			Calculated Calculated Displacements Displacements, pga) mm (full pga) mm					
Cross Section	Design Scenario	Yield Acceleration, g	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/Vs where Vs 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 Sequence<sup>5</sup>. 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.

<sup>&</sup>lt;sup>5</sup> 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 2<sup>nd</sup> 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 mm 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:

tombs

Bruno Souza Engineering Geologist

p.p

Report reviewed by:

POJ

Andy Pomfret Senior Geotechnical Engineer, Director



### Document control record

Report Ti	tle	Oakview Residential Development geotechnical Completion Report						
Initia Proj	ect	665-GCR						
Reference	е							
Client		Oakview Investments Ltd						
Revision	Date	Revision detail Author Reviewer Approv						
А	September	Final for submission to	B. Souza	A. Pomfret	A. Pomfret			
	2022	GDC						
Current R	levision	0						



# Appendix A Figures

As-built Cut/Fill plans As-built depth of fill plans





 Top of bank
 Top of bank

 Top of bank
 Top of bank

 Top of bank
 Top of bank





و - 	9.5 <sup>7</sup> 56 <b>19</b>	9.43 + Lot 20 Lot 20 	9.24 + Lot 22		ی اور	18	9.25 ANA A	9.07 9.01 8.94		9.05 8.93 Lot 7,1
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## 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/	Location	DD	WD	%	%	%	Comments
Test Number		Kg/m <sup>2</sup>	Kg/m <sup>2</sup>	Comp.	Moisture	AV	
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.





#### NUCLEAR DENSOMETER TEST RECORD SHEET

Comments:

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 <sup>2</sup>	WD Kg/m²	% Comp.	% Moisture	% AV	Fill required to finished level	Comments
L			-					
	Lot 57	1566	1733	95.50%	10.7%	18.7%	1.5m	
1	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%		





indicated above. Air voids slightly high in some areas. Will recalibrate the NDM when the lab results come back from WSP.

Generally good compaction and consistent moistiure content. Tests were carried out twice on each area one at 90 degrees to the original as

Project:	Oakview Re	esidential Subdivision								
Client:	Oakview In	vestments Ltd								
Location:	Corner of B	ack Ormond & Hanse	n Road	100	ישכ					
Material:	Fine Sand				JU					
Target MDD (kg/m2):	1600.00			Cive Cive	l Project Sulution	13				
Specified requirement:	05%									
Specified requirement.	7J/0 170/									
Talget Olvic.	1/%	_								
Fill Depth:	1.001 - 1.20	1								
			<b></b>	1	DD	W/D	0/	0/	0/	1
Depth	Lot 1		Date	Location			/0 Comp	/0 Moisturo	/0	Comments
400					Kg/m	Kg/m	comp.	woisture	AV	
100	0				1556	1688	94.9%	8.5%	29.6%	
200	0		16/08/2021	WSP Tested	1570	1703	95.7%	8.5%	29.0%	RL 8.72m
300	2				1619.5	1805.5	95.8	11.5	6.9	
400	5		13/09/2021	Lot 1						
500	7				1633	1945	96.6%	19.1%	-15.1%	wet under
600	10		23/09/2021	Lot 1 (plus 90deg)	1655	1975	97.2%	18.3%	-14.3%	foot
700	11									
800	13									
900	11									
1000	12									
1100	13									
1200	16									
1300	21									
1400										
1500										
1600										
1700										
1800										
1900										
2000										
			Com	monts						
			COIII	ments						
			(13/09/2021) Fi	rm underfoot, bette	r general co	ondition than ot	her lots.			
			(23/09/2021) Re	esults were consiste	nt with visu	al inpspection.	PR was gene	rally good bu	ut some lot	s too wet.
			Needs time							

Oakview Residential Subdivision Oakview Investments Ltd Corner of Back Ormond & Hansen Road Fine Sand 1690.00 95% 17%



100         0           200         1           300         4           400         9           500         10           600         10           700         13           800         14           900         13           1000         13           1100         13           1200         2           1300         8           1400         10           1500         14           1600         11           1700         10           1800         10           1900         11
200         1           300         4           400         9           500         10           600         10           700         13           800         14           900         13           1000         13           1100         13           1200         2           1300         8           1400         10           1500         14           1600         11           1700         10           1800         10           1900         11
300         4           400         9           500         10           600         10           700         13           800         14           900         13           1000         13           1100         13           1200         2           1300         8           1400         10           1500         14           1600         11           1700         10           1800         10           1900         11
400         9           500         10           600         10           700         13           800         14           900         13           1000         13           1000         13           1100         13           1200         2           1300         8           1400         10           1500         14           1600         11           1700         10           1800         10           1900         11
500         10           600         10           700         13           800         14           900         13           1000         13           1000         13           1100         13           1200         2           1300         8           1400         10           1500         14           1600         11           1700         10           1800         10           1900         11
600         10           700         13           800         14           900         13           1000         13           1000         13           1100         13           1200         2           1300         8           1400         10           1500         14           1600         11           1700         10           1800         10           1900         11
700         13           800         14           900         13           1000         13           1100         13           1200         2           1300         8           1400         10           1500         14           1600         11           1700         10           1800         10           1900         11
800         14           900         13           1000         13           1100         13           1200         2           1300         8           1400         10           1500         14           1600         11           1700         10           1800         10           1900         11
900         13           1000         13           1100         13           1200         2           1300         8           1400         10           1500         14           1600         11           1700         10           1800         10           1800         10           1900         11
1000         13           1100         13           1200         2           1300         8           1400         10           1500         14           1600         11           1700         10           1800         10           1800         10           1900         11
1100         13           1200         2           1300         8           1400         10           1500         14           1600         11           1700         10           1800         10           1900         11
1200         2           1300         8           1400         10           1500         14           1600         11           1700         10           1800         10           1900         11
1300         8           1400         10           1500         14           1600         11           1700         10           1800         10           1900         11
1400         10           1500         14           1600         11           1700         10           1800         10           1900         11
1500         14           1600         11           1700         10           1800         10           1900         11
1600         11           1700         10           1800         10           1900         11
1700         10           1800         10           1900         11
1800 10 1900 11
1900 11
2000

Date	Location	DD Kg/m <sup>2</sup>	WD Kg/m <sup>2</sup>	% Comp.	% Moisture	% AV	Comments
14/03/2022	Middle lot 2	1540	1717	91.1%	11.5%	20.1%	FL -800mm
14/03/2022	front lot 2/3	1599	1791	94.6%	12.0%	16.7%	FL -800mm
14/03/2022	Back of lot 2	1671	1976	98.9%	18.3%	8.1%	FL -800mm
		1					

Comments			

Oakview Residential Subdivision Oakview Investments Ltd Corner of Back Ormond & Hansen Road Fine Sand 1690.00 95% 17%



Depth	Lot 3
100	1
200	1
300	5
400	6
500	9
600	9
700	6
800	7
900	9
1000	7
1100	9
1200	13
1300	10
1400	10
1500	14
1600	12
1700	8
1800	12
1900	10
2000	

Date	Location	DD Kg/m <sup>2</sup>	WD Kg/m <sup>2</sup>	% Comp.	% Moisture	% AV	Comments
14/03/2022	Middle of lot 3	1577	1806	93.3%	14.5%	16.0%	FL -800mm
14/03/2022	front of lot 3	1690	1812	100.0%	7.2%	15.7%	FL -800mm
Comi	ments						
Comi	ments						

Oakview Residential Subdivision Oakview Investments Ltd Corner of Back Ormond & Hansen Road Fine Sand 1690.00 95%



Depth	Lot 4	Da
100	0	
200	1	
300	2	
400	8	
500	9	
600	9	
700	9	
800	10	
900	8	
1000	5	
1100	5	
1200	12	
1300	17	
1400	14	
1500		
1600		
1700		
1800		
1900		
2000		

17%

5410	Location	Kg/m <sup>2</sup>	WD Kg/m <sup>2</sup>	% Comp.	% Moisture	% AV	Comment
14/03/2022	Middle of lot 4	1466	1682	86.8%	14.7%	21.8%	FL -800mr
Com	ments						
Com	ments						
Com	ments						
Com	ments						
Com	ments						
Com	ments						
Com	ments						

17%

Oakview Residential Subdivision Oakview Investments Ltd Corner of Back Ormond & Hansen Road Fine Sand 1690.00 95%



%

Comp. 96.1% %

Moisture

10.5%

%

AV

16.5%

Comments

FL -800mm

Depth	Lot 5		Date	Location	DD Kg/m²	WD Kg/m <sup>2</sup>
100	1		14/02/2022	Front of lot F	1624	1795
200	2		14/03/2022	FIONE OF IOUS		
300	3	1				
400	6					
500	10	1				
600	14					
700	20					
800						
900						
1000						
1100						
1200						
1300						
1400						
1500						
1600						
1700						
1800						
1900						
2000						
					_	
			Com	monts		
			COIII	ments		

Oakview Residential Subdivision Oakview Investments Ltd Corner of Back Ormond & Hansen Road Fine Sand 1690.00 95% 17%



Depth	Lot 6
100	0
200	1
300	1
400	6
500	9
600	12
700	16
800	17
900	
1000	
1100	
1200	
1300	
1400	
1500	
1600	
1700	
1800	
1900	
2000	

Date	Location	DD Kg/m <sup>2</sup>	WD Kg/m <sup>2</sup>	% Comp.	% Moisture	% AV	Comments
14/03/2022	Front of lot 6	1733	2022	102.5%	16.7%	6.0%	FL -800mm
14/03/2022	middle of lot 5/6	1426	1694	84.4%	18.7%	21.2%	FL -800mm
14/03/2022	middle of lot 5/6	1449	1730	85.7%	19.4%	19.5%	- FL -800mm
_		<sup> </sup>	ļ	<u> </u>	<b>├</b> ───┤ ┼────┤	<b> </b>	-
Comr	ments	1					

Oakview Residential Subdivision Oakview Investments Ltd Corner of Back Ormond & Hansen Road Fine Sand 1690.00 95% 17%



Depth	Lot 7	
100	0	
200	1	
300	1	
400	4	
500	8	
600	12	
700	18	
800	20	
900	21	
1000		
1100		
1200		
1300		
1400		
1500		
1600		
1700		
1800		
1900		
2000		

Date	Location	DD Kg/m <sup>2</sup>	WD Kg/m <sup>2</sup>	% Comp.	% Moisture	% AV	Comme
14/03/2022	Front lot 7	1779	2047	105.2%	15.1%	4.8%	FL -800r
14/03/2022	Back of lot 7	1593	1833	94.3%	15.1%	14.7%	FL -800r
		├					
	<b></b>						
				-			
Com	monts	1					
Comi	nents						
Comi	ments	<u> </u>					
Comi	ments						
Comi	ments						
Com	ments	]					

Project:	Oakview Re	esidential Subdivision								
Client:	Oakview Investments Ltd									
Location:										
Material:										
Target MDD (kg (m2))	File Sand									
Target MDD (kg/m2):	1690.00									
Specified requirement:	95%									
Target OMC:	17%									
Fill Depth:	1.2m - 1.4n	n								
<b>A H</b>					DD	WD	%	%	%	<b>.</b>
Depth	LOT 8	L	Date	Location	Ka/m <sup>2</sup>	Ka/m <sup>2</sup>	Comp.	Moisture	AV	comments
100	1	-			1/00	1604	00.7%	12.2%	25.7%	
100	2		16/08/2021	WSP Tested	1400	1401	01.1%	12.2%	25.770	RL 9.4m
200	3	-			1494	1091	91.1%	13.2%	23.4%	
300	3		23/09/2021	Lot 8	1662	1992	98.3%	19.9%	-17.0%	wet under
400	8				1672	2001	96.3%	18.6%	-15.3%	foot
500	8									
600	8									
700	9									
800	11									
900	12									
1000	22									
1100	22									
1100	21									
1200										
1300										
1400										
1500										
1600										
1700										
1800										
1900										
2000										
	1									
		-			r					
			Comi	ments						
			00111	nonto						
		(	23/09/2021) Re	esults were consiste	ent with visua	al inpspection. I	PR was gene	rally good bu	ut some lot	s too wet.
		1	leeds time							
		-								
Project:	Oakview Re	esidential Subdivision	1							
-----------------------	-------------------------	------------------------	-----------------	---------------------	----------------------	-------------------	-------------	---------------	--------------	-------------
Client:	Oakview In <sup>,</sup>	vestments Ltd								
Location:	Corner of B	ack Ormond & Hanse	en Road	No.	<b>74'</b>					
Material:	Fine Sand	dur officer of	ATTOC .		JI U					
Target MDD (kg/m2):	1690.00			G Ci	wil Project Sulution	J13				
Charified requirement	05%									
Targot OMC.	7J/0 170/									
Fill Dooth.	1 / 70									
Flii Deptn:	1.4111									
		1	·	<del></del>		14/0	0/			<del></del>
Depth	Lot 9	1	Date	Location	UU		%	%	%	Comments
		1		2000	Kg/m⁴	Kg/m <sup>2</sup>	Comp.	Moisture	AV	
100	5	4	16/08/2021	M/CD Tested	1579	1726	96.3%	9.3%	27.3%	0 207m
200	9	1	10/00/2021	War reaced	1577	1724	96.2%	9.3%	27.3%	NL 7.20111
300	9	4	22/00/2021	Lot 0	1717	1910	101.6%	11.2%	1.3%	
400	9	4	23/07/2021	LUI 9	1732	1919	99.6%	10.2%	1.0%	1 _
500	5	4		1	+	1	1	+	<u> </u>	†
600	5	4		1		í	+	+	1	1
700	6	4		1	+ +	í	+	+	+	+
800	7			1	++	í		+	+	1
900	6			+	+	1		-		
1000	10	4								
1100	20	1								
1200	19	1								
1200	16	I								
1400	17	ł — —								
1400	20	A								
1/00	10	4								
1700	17	4								
1/00	14	4								
1800	14	4								
1900	10	4								
2000		4								
		4								
		4								
		4								
		4								
		1			-					
		1	Com	monts						
		1	00111	Пента						
		1	(23/09/2021) Re	esults were consist	ent with visu	al inpspection.	PR was gene	erally good b	out some lot	(s too wet.
		1	Needs time							
		1								
		1								
		1								
		1								
		1								
		1								
		1								
		1								
		1								
		1								
		4								

Project:	Oakview Res	sidential Subdivisio	n							
Client:	Oakview Inv	estments Ltd								
Location:	Corner of Ba	ck Ormond & Han	sen Road	18	·μς					
Material <sup>.</sup>	Fine Sand				JIU					
Target MDD (kg/m2)·	1690.00			Ci	vit Project Solution	13				
Specified requirement:	05%									
	170/									
Fill Donth	1/70									
riii Deptii.	0.0111 - 1.0111									
						WD	0/.	0/	0/	
Depth	Lot 10		Date	Location	$V_{a}/m^{2}$	$\sqrt{m^2}$	Comp	Moisturo	^0 A\/	Comments
100	2				Kg/111	170/	04.00	0.10/	20.20/	
100	3		16/08/2021	WSP Tested	1578	1706	96.2%	8.1%	29.2%	RL 9.230
200	6				1592	1/21	97.1%	8.1%	28.6%	
300	10		23/09/2021	Lot 10	1694	1995	102.7%	18.5%	2.1%	
400	10				1712	2000	104.0%	16.8%	2.1%	
500	16									
600	14									
700	13									
800	13									
900	13									
1000	11									
1100	10									
1200	14									
1300	21									
1400										
1500										
1600										
1700										
1800										
1900										
2000										
					_					
			Com	monte						
			COITI	пенть						
			(23/09/2021) Re	sults were consist	ent with visua	al inpspection.	PR was gene	erally good bu	ut some lot	s too wet.
			Needs time							
			L							

Project:	Oakview Re	esidential Su	ubdivision								
Client:	Oakview In	ivestments L	Ltd			000					
Location	Corner of P	Back Ormone	d & Hansen I	Road	100	1°45					
Material:	Fine Sand					UIU					
Target MDD (kg/m2)·	1690.00					Civil Project Solution	15				
Specified requirement:	05%										
Target OMC:	170/										
Fill Donth:	0 (m out )	0.0m out									
Fill Deptil.	0.011 cut -	U.OITI CUL									
		1	Г				W/D	0/	0/	0/	r 1
Depth	Lot 11			Date	Location			70 Comm	70 Maioturo	70	Comments
•	-		_			Kg/m²	Kg/m²	comp.	woisture	AV	
100	3			23/09/2021	Lot 11	1562	1767	94.7%	10.2%	5.2%	_
200	5		_			1560	1745	95.1%	11.9%	6.4%	
300	7										
400	11		_								
500	11										
600	18										
700	13										
800	13										
900	10										
1000	10										
1100	8										
1200	8										
1300	9										
1400	11										
1500	14										
1600	11										
1700	11										
1800	14										
1900	12										
2000		•									
2000		•									
		•									
			Г			7					
				Comi	ments						
		•	-	(22/00/2021)	oulto woro oonoio	topt with view	linnonostion	DD was gone	rally good by	it come let	a taa wat
		•		(23/09/2021) RE	suits were consis	atent with visua	a inpspection.	PR was gene	erany good bu	it some io	s too wet.
				Needs time							
		-	-								

Project:	Oakview R	esidential Su	ubdivision								
Client:	Oakview Ir	vestments l	Ltd								
Location:	Corner of E	ack Ormon	nd & Hansen F	Road	No.	L'HZ					
Material:	Fine Sand					VI V					
Target MDD (kg/m2)·	1690.00					Civil Project Solution	18				
Specified requirement	05%										
Target OMC:	170/										
	1/%										
Fill Depth:	LOT IS IN CU	L									
		1	Г			DD	14/0	0/	0/	0/	
Depth	Lot 12		1	Date	Location	Kg/m <sup>2</sup>	Kg/m <sup>2</sup>	% Comp.	% Moisture	% AV	Comments
100	3										
200	3										
300	9										
400	11										
500	10										
600	9										
700	9										
800	6								1		
900	6										
1000	4										
1100	6										
1200	9										
1300	10										
1400	13										
1500	13										
1600	14										
1700	12										
1800	14										
1900	12										
2000	12										
2000											
-											
			Г	-		-					
				Com	nments						
			-								
	-		_								

Client:	Oakview In	vestments L	.td		The second	<u>nne</u>					
Location:	Corner of E	lack Ormono	d & Hansen	Road	12	1.62					
Material:	Fine Sand					Noil Bround Subdia	15				
Target MDD (kg/m2):	1690.00					bitin in reject salatio	10				
Specified requirement:	95%										
Target OMC:	17%										
Fill Depth:	0.4m cut to	0.2m fill									
			-								_
Depth	Lot 13			Date	Location	DD	WD	%	%	%	Comments
Boptii	20110			Bato	Eocution	Kg/m²	Kg/m²	Comp.	Moisture	AV	oominonto
100	1										
150	2										
200	1										
250	1										
300	3										_
350	4										
400	2										
450	2										
500	3										
550	3										
600	3										
650	3										
700	4										
750	3										
800	4										
850	4										
900	3										
950	3										
1000	4										
1050	3										
1100	3										
1150	3										
1200	3										
1250	3										
1300	4					-					
1350	4			Con	nments						
1400	4			001	monto						
1450	4										
1500	4										
1550	4										
1600											
1650											
1700											
1750											
1800											
1850											
1900											
1950											
2000											

Project:

Project:	Oakview Re	esidential Sub	division								
Client:	Oakview In	vestments Lto	k								
Location.	Corner of B	ack Ormond	& Hansen Road		100	<b>'U</b> S					
Material	Fine Sand					JIU					
Target MDD (kg/m2):	1690.00				Ci	vit Project Solutio	13				
Specified requirement:	05%										
	17%										
Fill Dopth:	0.2m 0.4m	~									
riii Deptii.	0.2111 - 0.41	11									
		1				מס	WD	%	%	%	
Depth	Lot 14		Date		Location	$Ka/m^2$	$Ka/m^2$	Comp	Moisture	AV	Comments
100	1					1626	1704	00.2%	0.7%	24.4%	
150	1		12/08/	2021	WSP Tested	1620	1704	77.2/0 00.1%	9.7%	24.470	RL 9.783m
100	1					1020	1703	99.170	9.1%	24.3%	
200	1										-
200	ו ר										
250	2										
300	2										
400	2	-									
400 E00	ა ე	-									
500	3 2	-									
400	2	-									
450	ა ე	-									
700	2 1	-									
700	1	-									
800	2 1	-									
000 950	1 2	-									
000	2										
900	3										
1000	3										
1050	3 2										
1100	2										
1150	3										
1200	4										
1200	1										
1200	3										
1350	3					1					
1400	3		C	omn	nents						
1400	2										
1400	5										
1500	5										
1400	5										
1600	5										
1000	C										
1750											
1/50											
1800											
1000											
1900											
1950											
2000		]									

Project:	Oakview Re	esidential Subdivision								
Client:	Oakview In	westments Ltd								
Location:	Corner of E	ack Ormond & Hansen	Road	No.	<b>.h</b> Z					
Material:	Fine Sand				JU					
Target MDD (kg/m2)	1690.00			Ci	vil Project Solution	15				
Specified requirement:	95%									
	17%									
Fill Donth:	0.5m									
i ili Deptil.	0.5111									
		1			מס	WD	0/2	0/	%	
Depth	Lot 15		Date	Location	$k_{\rm g}/m^2$	$Va/m^2$	Comp	Moisturo	AV	Comments
100	2				NY/111	17//	00.20/	0.404	25.20/	
100	2		12/08/2021	WSP Tested	1011	1700	98.3%	9.0%	25.3%	RL 9.815m
150	2				1014	1709	98.4%	9.0%	25.2%	
200	2									
250	3									
300	2									
350	3									
400	4		-							
450	4									
500	4									
550	4									
600	4									
650	5									
700	4									
750	5									
800	4									
850	5									
900	5									
950	4									
1000	4									
1050	4									
1100	4									
1150	4									
1200	4									
1250	3									
1300	4				_					
1350	3		Com	monts						
1400	4		COIII	IIIIIIIII						
1450	3									
1500	4									
1550	4									
1600	4									
1650	4									
1700	4									
1750	4									
1800	5									
1850	4									
1900	5	1								
1950	5	1								
2000	5	1								
2000		1								

Project:	Oakview R	esidential Subdivision								
Client:	Oakview Ir	ivestments Ltd								
Location:	Corner of E	ack Ormond & Hanse	n Road	No.	<b>.h</b> Z					
Material:	Fine Sand				JUU					
Target MDD (kg/m2)	1690.00			Ci	vil Project Salutio	18				
Specified requirement:	05%									
Target OMC:	7J/0 170/									
	1/%									
Fill Depth:	0.5M									
		1			DD	W/D	0/	0/	0/	
Depth	Lot 16		Date	Location			/o	/0 Moioturo	/0	Comments
					Kg/m⁻	Kg/m=	comp.	woisture	AV	
100	1		12/08/2021	WSP Tested	1534	1700	93.6%	10.8%	27.0%	RL 9.910m
150	1				1541	1707	93.9%	10.8%	26.7%	
200	1									
250	1									
300	2									
350	3									
400	3									
450	4									
500	4									
550	5									
600	5									
650	5									
700	5									
750	6									
800	6									
850	6									
900	6									
950	5									
1000	5									
1050	3									
1100	2									
1150	2									
1200	2									
1250	2									
1300	4									
1350	6		2		1					
1400	5		Com	ments						
1450	5	1								
1400	5	1								
1500	5 E									
1000	0									
1600	6									
1050	6									
1700	6	-								
1750	6									
1800	5									
1850	6									
1900	5									
1950	5									
2000										

Project:	Oakview R	esidential Subdivision								
Client:	Oakview In	vestments Ltd			200					
Location:	Corner of F	ack Ormond & Hansen	Road	No.	<b>' 4'</b>					
Material:	Fine Sand				JU					
Target MDD (kg/m2):	1690.00			Ci	al Project Sulutio	113				
Specified requirement:	05%									
Target OMC:	7J/0 170/									
	1/%									
Fill Deptn:	0.4M									
		1		1	DD	W/D	0/	0/	0/	1
Depth	Lot 17		Date	Location		WD	%	%	%	Comments
					Kg/m²	Kg/m²	comp.	Noisture	AV	
100	1		12/08/2021	WSP Tested	1296	1588	79.0%	22.5%	23.2%	RI 9 195m
150	3		12/00/2021	Wor rested	1302	1595	79.4%	22.5%	22.8%	RE 7.17011
200	3									
250	3									
300	3									
350	2									
400	2									
450	2							1		
500	2									
550	2									
600	4									
650	7									
700	2									
700	2									
/50	3									
800	3									
850	3									
900	4									
950	4									
1000	4									
1050	5									
1100	5									
1150	5									
1200	5									
1250	5									
1300	5				_					
1350	5		Com	monte						
1400	5		Com	IIIGHII2						
1450	6	1			-					
1500	5	1								
1550	5									
1600	5									
1650	5									
1700	5									
1750	5									
1/30	5 E									
1000	5									
1850	5									
1900	6									
1950	7									
2000										





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inc	HANI	EN BOAT	2.	6		
6	MET	100.40 9	in di Lin	00 a.ee 01	1.4.62	
-	-serat	141 M4 L44	SS. Landa	Getti	LITTR	2 <sup>1.00</sup>
		01	040.53	0		Aura
	Lin		0.0	2.01.48	1	3.0172
ø	Antan Z	(Things	9	Labah.		111
65	544.84	640	000	111.84	5 of 12	JAN .
5	1,644,85	0.0004	2.0	inn.		1 T
	Cullene	Sares	8.0	15,01,01		1.
2	10		a serel	a	e	2

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13/09/2021



Project:	Oakview Re	sidential Subdivision								
Client:	Oakview Inv	estments Ltd								
Location:	Corner of B	ack Ormond & Hansen	Road	No.	<b>INN</b>					
Material:	Fine Sand				JIU					
Target MDD (kg/m2):	1600.00			C	vil <b>P</b> roject Solatio	15				
Creating and requirements	1090.00									
specified requirement:	95%									
Target OIVIC:	17%									
Fill Depth:	Cut									
				-						
Depth	Lot 23		Date	Location	DD Kg/m <sup>2</sup>	WD Kg/m <sup>2</sup>	% Comp.	% Moisture	% AV	Comments
100	1									
150	1									
200	2									
250	2									
300	3									
350	4									
400	3									
450	5									
500	4									
550	6									
600	5									
650	5									
700	4									
750	5									
800	4									
850	4									
900	5									
950	5									
1000	5									
1050	4									
1100	4									
1150	5									
1200	5									
1250	4									
1300	6				_					
1350			Com	monts						
1400			COIII	пспіз						
1450										
1500										
1550										
1600										
1650										
1700										
1750										
1800										
1850										
1900										
1950										
2000										
								1		1

Project:	Oakview Re	esidential Subdivision								
Client:	Oakview In	vestments Ltd								
Location:	Corner of B	ack Ormond & Hanser	Road	No.	<b>.h</b> Z					
Material:	Fine Sand				JU					
Target MDD (kg/m2):	1690.00			Ci	ril Project Sulutio	13				
Specified requirement:	05%									
Target OMC:	7370									
	17%									
Fill Depth:	Cut									
			r							
Depth	Lot 24		Date	Location	DD Kg/m <sup>2</sup>	WD Kg/m <sup>2</sup>	% Comp.	% Moisture	% AV	Comments
100	1									
150	1									
200	2									
250	2									
300	3									
350	4							1		1
400	3							1 1		11
450	5									
500	4									
550	6									
600	5									
650	5									
700	4									
760	5									
730	) 1									
800	4									
000	4									
900	о Г									
950	5									
1000	5									
1050	4									
1100	4									
1150	5									
1200	5									
1250	4									
1300	6				1					
1350			Comi	ments						
1400			00111	nonto						
1450										
1500										
1550										
1600										
1650										
1700										
1750										
1800										
1850										
1900										
1950										
2000										
2000		l								1

Comments
Comments
,

Project:	Oakview Re	esidential S	ubdivision								
Client:	Oakview In	vestments	Ltd								
Location:	Corner of B	ack Ormon	nd & Hansen R	oad	No.	1°45					
Material <sup>.</sup>	Fine Sand					UIU					
Target MDD (kg/m2):	1600.00				c and c	ivit Project Solutio	15				
Specified requirements	0.00										
Target OMC:	9070										
Target Olvic:	1/%										
Fill Depth:	Cut										
		1	F		1			1			1
Depth	Lot 26		C	Date	Location	DD Kg/m <sup>2</sup>	WD Kg/m <sup>2</sup>	% Comp.	% Moisture	% AV	Comments
100											
150											
200											
250											
300											
350											
400											
450											
500											
550											
600											
650											
700											
750											
800											
850											
900											
950											
1000											
1050											
1100											
1150											
1200											
1250											
1300											
1350			Г	0		1					
1400		1		Com	ments						
1450			F								
1500											
1550			_								
1600											
1650			_								
1700											
1750											
1800											
1850											
1000			_								
1900			_								
2000			_								
2000		l	L								

Client: Location: Material: Target MDD (kg/m2): Specified requirement: Target OMC: Fill Depth:	Oakview Inv Corner of B. Fine Sand 1690.00 95% 17% Cut	vestments Ltd ack Ormond & H	Hansen Road		CPS Giril Project Sole	utions				
Depth	Lot 27		Date	Location	DD Kg/m <sup>2</sup>	WD Kg/m <sup>2</sup>	% Comp.	% Moisture	% AV	Comments
100					5	5				1
150										7
200										
250										7
300										
350										
400										
450										
500										
550										
600										
650										
700										
750										
800										
850										
900										
950										
1000										
1050										
1100										
1150										
1200										
1250										
1300					_					
1350			Co	mmonts						
1400			00	minents						
1450										
1500										
1550										
1600										
1650										
1700										
1750										
1800										
1850										
1900										
1950										
2000										

Project:

Project:	Oakview R	esidential Su	ubdivision								
Client:	Oakview In	vestments l	Ltd			000					
Location:	Corner of E	ack Ormon	d & Hansen R	load	No.	L'HZ					
Material:	Fine Sand										
Target MDD (kg/m2)	1690.00					aval Project Sulution	13				
Specified requirement:	95%										
Target OMC.	17%										
Fill Donth:	Cut										
пп Бертп.	cui										
		1	Г			חח	WD	%	%	%	
Depth	Lot 28		[	Date	Location	$Ka/m^2$	$ka/m^2$	Comp	Moisture	AV	Comments
100			_			кулп	Kg/III	oomp.	Wolstare	,	-
150											-
200						1					
250											
300											
350											
400						1 1					
450											
500											
550											
600											
650											
700											
750											
800											
850											
900											
950											
1000											
1050											
1100											
1150											
1200											
1250											
1300			-			-					
1350				Com	ments						
1400				00111	monto						
1450											
1500											
1550											
1600											
1650											
1700											
1750											
1800											
1850			_								
1900			_								
1950											
2000		l									

Project:	Oakview Residential Subdivision
Client:	Oakview Investments Ltd
Location:	Corner of Back Ormond & Hansen Road
Material:	Fine Sand
Target MDD (kg/m2):	1690.00
Specified requirement:	95%
Target OMC:	17%
Fill Depth:	Cut
-	



Depth         Lot 29           100         -         -         -         -         AV         Co           200         -	II Depth:	Cut									
100       Image: state in the	Depth	Lot 29	]	Date	Location	DD Kg/m <sup>2</sup>	WD Kg/m <sup>2</sup>	% Comp.	% Moisture	% AV	Comments
150       I	100										
200       Image: Control of the second	150										
250       Image: Section of the section o	200										
300       Image: state in the	250										
350       Image: Section of the section o	300										
400          450          500          550          600          600          600          600          700          700          700          800          850          900          950          950          950          950          1000          1150          1200          1350          1400          1450          1550          1600          1550          1600          1550          1600          1550          1750          1800          1800          1900	350										
450          500          550          600          650          700          750          880          900          950          1000          1100          1200          1350          1400          1550          1600          1550          1600          1600          1850          1850          1850          1850          1850          1850          1850          1850          1850          1850          1850          1850          1850          1850          1850          1850          1850	400										
500       I         600       I         650       I         700       I         750       I         800       I         800       I         900       I         950       I         1000       I         1150       I         1200       I         1300       I         1300       I         1450       I         1450       I         1450       I         1550       I         1600       I         1600       I         1600       I         1700       I         1700       I         1800       I         1800 <td>450</td> <td></td>	450										
550       Image: Solution of the solut	500										
600       6	550										
650       Image: constraint of the second of t	600										
700       Image: Control of the control o	650										
750       Image: Control of the control o	700										
800       6         850       6         900       6         950       6         1000       6         1050       6         1100       6         11200       6         1250       6         1300       6         1450       6         1550       6         1600       6         1600       6         1600       6         1750       6         1700       6         1750       6         1800       6         1800       6         1900       6	750										
850       0         900       0         950       0         1000       0         1050       0         1100       0         1200       0         1250       0         13300       0         1400       0         1450       0         1550       0         1600       0         1600       0         1750       0         1750       0         1750       0         1850       0         1900       0	800										
900       950         950       900         1000       900         1050       900         1100       900         1150       900         1150       900         1150       900         1150       900         1150       900         1150       900	850										
950         1000         1050         1100         1150         1200         1250         1300         1350         1400         1500         1500         1500         1600         1600         1650         1600         1750         1850         1850         1900	900										
1000         1050         1100         1150         1200         1250         1300         1350         1400         1500         1500         1500         1500         1500         1500         1500         1500         1500         1500         1500         1500         1500         1500         1500         1600         1800         1800         1800         1800         1900	950										
1050         1100         1150         1200         1250         1300         1350         1400         1450         1500         1550         1600         1600         1600         1750         1850         1800         1850         1850         1850	1000										
1100       Integration         1150       Integration         1200       Integration         1250       Integration         1350       Integration         1450       Integration         1450       Integration         1500       Integration         1500       Integration         1500       Integration         1500       Integration         1500       Integration         1600       Integration         1600       Integration         1700       Integration         1750       Integration         1800       Integration         1850       Integration         1900       Integration	1050										
1150         1200         1250         1300         1350         1400         1450         1500         1500         1600         1600         1650         1700         1750         1800         1850         1900	1100										
1200       Instant         1250       Instant         1300       Instant         1450       Instant         1500       Instant         1600       Instant         1650       Instant         1700       Instant         1750       Instant         1850       Instant         1850       Instant         1900       Instant	1150										
1250         1300         1350       Comments         1400       Image: Comments         1450       Image: Comments         1500       Image: Comments         1500       Image: Comments         1600       Image: Comments         1600       Image: Comments         1750       Image: Comments         1750       Image: Comments         1800       Image: Comments         1900       Image: Comments	1200										
1300       Image: Comments         1400       Image: Comments         1450       Image: Comments         1500       Image: Comments         1500       Image: Comments         1500       Image: Comments         1500       Image: Comments         1600       Image: Comments         1600       Image: Comments         1650       Image: Comments         1700       Image: Comments         1750       Image: Comments         1800       Image: Comments         1850       Image: Comments         1900       Image: Comments	1250										
1350       Comments         1400       Image: Comments         1450       Image: Comments         1500       Image: Comments         1500       Image: Comments         1500       Image: Comments         1600       Image: Comments         1600       Image: Comments         1600       Image: Comments         1750       Image: Comments         1800       Image: Comments         1850       Image: Comments         1900       Image: Comments	1300					_					
1400     Comments       1450     Image: Comments       1500     Image: Comments       1500     Image: Comments       1500     Image: Comments       1500     Image: Comments       1600     Image: Comments       1650     Image: Comments       1750     Image: Comments       1800     Image: Comments       1850     Image: Comments       1900     Image: Comments	1350			Com	monte						
1450       Image: Constraint of the second of	1400			COIII	пень						
1500       1550         1550       1600         1600       1600         1700       1750         1800       1850         1850       1900	1450										
1550       Image: Control of the control	1500										
1600       160         1650       160         1700       160         1750       160         1800       1850         1900       1850	1550										
1650     Image: Constraint of the second of th	1600										
1700     Image: Constraint of the second of th	1650										
1750       1800       1850       1900	1700										
1800         1850           1900         1900	1750										
1850 1900 1900 1900 1900 1900 1900 1900 19	1800										
1900	1850										
	1900										
1950	1950										
2000	2000		]								

Project:	Oakview Re	esidential Su	ubdivision								
Client:	Oakview In	vestments l	Ltd								
Location:	Corner of E	ack Ormon	nd & Hansen R	oad	No.	<b>14</b>					
Material:	Fine Sand					UIU					
Target MDD (kg/m2):	1600.00				c and a	wil Project Sulutio	15				
Target MDD (kg/112).	1090.00										
specified requirement:	95%										
Target UNIC:	17%										
Fill Depth:	Cut										
			_		-						
Depth	Lot 30		C	Date	Location	DD Kg/m <sup>2</sup>	WD Kg/m <sup>2</sup>	% Comp.	% Moisture	% AV	Comments
100						Ů	0				
150											
200											
250											
300			-			1			1		
350											
400						Ì					
450											
500											
550											
600											
650											
700											
750											
800											
850											
900											
950											
1000											
1050											
1100											
1150											
1200											
1250											
1300											
1350			Г	Care		1					
1400				Com	ments						
1450											
1500											
1550											
1600											
1650			_								
1700											
1750											
1800											
1850			_								
1000			_								
1900			_								
2000			_								
2000		]	L								

Project:	Oakview Re	esidential S	ubdivision								
Client:	Oakview In	vestments	Ltd								
Location:	Corner of B	ack Ormon	nd & Hansen F	load	100	<b>' 4</b> '					
Material	Fine Sand					UI U					
Target MDD (kg/m2):	1600.00				C C	vil Project Solutio	178				
Specified requirement:	05%										
Target OMC:	7J/0										
Target Olvic:	17%										
Fill Depth:	Cut										
	1	1	F		1						
Depth	Lot 31		I	Date	Location	DD Kg/m <sup>2</sup>	WD Kg/m <sup>2</sup>	% Comp.	% Moisture	% AV	Comments
100											
150											
200											
250											
300											
350											
400											
450											
500											
550											
600											
650											
700											
750											
800											
850											
900											
950											
1000											
1050											
1100											
1150											
1200											
1250											
1300			-			-					
1350				Com	monts						
1400				COIII	ments						
1450											
1500											
1550											
1600											
1650											
1700											
1750											
1800											
1850											
1900											
1950											
2000											
		1	L					1	1		

Project:	Oakview R	esidential Subdivision								
Client:	Oakview In	vestments Ltd			<u> </u>	<b>.</b>				
Location.	Corner of F	Back Ormond & Hanser	n Road	See.	PDY					
Material	Fine Sand		- Houd		ULI					
Target MDD (kg/m2)	1600.00				Civil Project So	detions				
Caracifical as avviages and	1090.00									
specified requirement:	95%									
Target OMC:	17%									
Fill Depth:	Cut									
									-	
Depth	Lot 211		Date	Location	DD	WD	%	%	%	Comments
Boptil	201211		Bato	Location	Kg/m <sup>2</sup>	Kg/m <sup>2</sup>	Comp.	Moisture	AV	00111101110
100	0.5									
150	0.5									T I
200	2									
250	2									1
300	5									
350	5									1
400	4									
450	4									
500	3									
550	J 4									
600	4									
600	3									
000	3									
700	3									
750	4									
800	5									
850	5									
900	4									
950	4									
1000	4									
1050	3									
1100	3									
1150	2									
1200	3									
1250	4									
1300	4									
1350	4		Com							
1400			Com	nents						
1450										
1500										
1550										
1600										
1/50										
1050		1								
1700		1								
1750										
1800										
1850		1								
1900		1								
1950										
2000										

Project:	Oakview Re	esidential Su	ubdivision								
Client:	Oakview In	vestments l	Ltd								
Location:	Corner of B	ack Ormon	d & Hansen R	load	No.	ITHX.					
Material:	Fine Sand					UI U					
Target MDD (kg/m2)	1690.00					ivit Project Solution	13				
Specified requirement:	95%										
Target OMC.	17%										
Fill Donth:	Cut										
пп Бертп.	cui										
		1	Г			חח	WD	0/2	%	%	
Depth	Lot 212		C	Date	Location	$Va/m^2$	VD	Comp	Moisture	Λ\/	Comments
100			-			кулп	Kg/III	oomp.	Wolstare	,	
150											-
200											
250											-
300											
350											
400											
450											
500											
550											
600											
650											
700											
750											
800											
850											
900											
950											
1000											
1050											
1100											
1150											
1200											
1250											
1300			г			٦					
1350				Com	ments						
1400			-								
1450											
1500											
1600			-								
1650											
1700											
1750											
1800											
1850											
1900											
1950											
2000											
2000		I	L								

Project:	Oakview Re	esidential S	ubdivision								
Client:	Oakview In	vestments	Ltd			000					
Location:	Corner of E	ack Ormon	nd & Hansen F	load	No.	I PN					
Material:	Fine Sand										
Target MDD (kg/m2)	1690.00					avit Project Solution	15				
Specified requirement:	95%										
	17%										
Tal yet Olvic.	1770 Cut										
Fill Depth:	Cui										
		1	г		1		MD	0/	0/	0/	1
Depth	Lot 213		[	Date	Location		VVD	% Comp	% Maiatura	% • • • •	Comments
			_			Kg/m²	Kg/m²	comp.	woisture	AV	
100											_
150						+					-
200											_
250			_								
300											_
350											
400											
450											
500											
550											
600											
650											
700											
750											
800											
850											
900											
950											
1000											
1050											
1100											
1150											
1200											
1250											
1300			_			_					
1350			Γ	Com	monte						
1400				COIII	ments						
1450			Г								
1500											
1550											
1600											
1650											
1700											
1750											
1800		1									
1850		1									
1900		1									
1950		1									
2000											
2000		J	L								

Project:	Oakview Re	esidential Su	ubdivision								
Client:	Oakview In	vestments l	Ltd								
Location:	Corner of B	ack Ormon	d & Hansen I	Road	NO.	:HZ					
Material:	Fine Sand					JU					
Target MDD (kg/m2):	1690.00				Ci.	il <b>P</b> roject Solutions	:				
Specified requirement	95%										
Target OMC:	17%										
Fill Denth:	Cut										
r in Deptil.	out										
		1	Г			חח	WD	%	%	%	
Depth	Lot 214			Date	Location	$ka/m^2$	$ka/m^2$	Comn	Moisture	Δ\/	Comments
100	1		-			Ny/III	ку/ш	comp.	Wibisture	Av	
100	1										-
150	1		-								
200	1										
250	3		-		-	+ +					
300	2								-		_
350	3										
400	2										
450	3										
500	3										
550	5										
600	4										
650	3										
700	4										
750	4										
800	4										
850	3										
900	4										
950	5										
1000	6										
1050	6										
1100	5										
1150	3										
1200	3										
1250	4										
1300	4										
1350	5		ſ	Com	monte						
1400	3			COIL	ments						
1450	4										
1500	5										
1550											
1600											
1650											
1700											
1750											
1800											
1850											
1000											
1900											
1950											-
2000			L								



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-			FR		Let B	1.01.94					fue.

13/09/2021

Client:	Oakview Reside									
uient:	Oakview Investr	nents Lta	- De e d	- B	ene.					
	Corner of Back	Jrmond & Hanse	n Road		PL9					
Material:	Fine Sand				Civil Project Solution	112				
Target MDD (kg/m2):	1690.00									
Specified requirement:	95%									
Target OMC:	17%									
Fill Depth:	Cut									
			r			14/5	0/	0/	0/	
Depth	Lot 18		Date	Location	DD Kg/m <sup>2</sup>	WD Kg/m <sup>2</sup>	% Comp.	% Moisture	% AV	Comments
100	0.5									
150	0.5									
200	2									
250	2									
300	5									
350	5									
400	4									
450	4									
500	3									
550	4									
600	3									
650	3									
700	3									
750	4									
800	5									
850	5									
900	4									
950	4									
1000	4									
1050	3									
1100	3									
1150	2									
1200	3									
1250	4									
1300	4				_					
1350	4		Corr	monte						
1400			COIL							
1450										
1500										
1550										
1600										
1650										
1700										
1750										
1800										
1850										
1900										
1950			i							
2000			i							
2000			L							

client:	O alguiante la gasta	nonto I tel								
	Carrier of Deals	nents Lto	- De e d	100	nne.					
ocation:	Corner of Back (	Drmond & Hanse	en Road		rra.					
Material:	Fine Sand				Sail Project Solution	10				
Target MDD (kg/m2):	1690.00					10				
Specified requirement:	95%									
Target OMC:	17%									
Fill Depth:	Cut									
Depth	Lot 19		Date	Location	DD Kg/m <sup>2</sup>	WD Kg/m <sup>2</sup>	% Comp.	% Moisture	% AV	Comments
100	1									
150	2									
200	2									
250	2									
300	2									
350	3									
400	2									
450	3									
500	4									
550	3									
600	3									
650	5									
700	4									
750	3									
800	4									
950	4									
0.111										
900	4									
900	4									
900 950 1000	4									
900 950 1000	4 3 2 3									
900 950 1000 1050	4 4 3 2 3 2 3									
900 950 1000 1050 1150	4 3 2 3 3 3									
900 950 1000 1050 1100 1150 1200	4 3 2 3 3 3 3									
900 950 1000 1050 1100 1150 1200 1350	4 3 2 3 3 3 4 4									
900 950 1000 1050 1100 1150 1200 1250 1300	4 3 2 3 3 3 4 4 5									
900 950 1000 1050 1100 1150 1200 1250 1300	4 3 2 3 3 3 3 4 4 4 4 5									
900 950 1000 1050 1100 1150 1200 1250 1300 1350	4 3 2 3 3 3 3 4 4 4 5 5 4		Com	ments	]					
900 950 1000 1050 1100 1150 1200 1250 1300 1350 1400	4 3 2 3 3 3 3 4 4 4 5 4		Com	ments	]					
900 950 1000 1050 1100 1150 1200 1250 1300 1350 1400 1450	4 3 2 3 3 3 3 4 4 4 5 4		Com	ments						
900 950 1000 1050 1100 1150 1200 1250 1300 1350 1400 1450 1500	4 3 2 3 3 3 3 4 4 4 5 4		Com	ments	1					
900 950 1000 1050 1100 1150 1200 1250 1300 1350 1400 1450 1550	4 3 2 3 3 3 3 3 4 4 4 4 5 4 4		Com	ments						
900 950 1000 1050 1100 1150 1200 1250 1300 1350 1400 1450 1550 1550 1600	4 3 2 3 3 3 3 3 4 4 4 5 4 4 5		Com	ments						
900 950 1000 1050 1100 1150 1200 1250 1300 1350 1400 1450 1550 1550 1600 1650	4 3 2 3 3 3 3 4 4 4 5 4		Com	ments						
900 950 1000 1050 1100 1150 1200 1250 1300 1350 1400 1450 1550 1600 1650 1700	4 3 2 3 3 3 3 3 4 4 4 4 5 4		Com	ments						
900 950 1000 1050 1100 1150 1200 1250 1300 1350 1400 1450 1550 1550 1600 1650 1700 1750	4 3 2 3 3 3 4 4 5 4 4 5 4 1 1 1 1 1 1 1 1 1 1 1 1 1		Com	ments						
900 950 1000 1050 1100 1150 1200 1250 1300 1350 1400 1450 1550 1550 1600 1650 1700 1750 1800	4 3 2 3 3 3 3 3 4 4 4 5 4 4 5 4		Com	ments						
330           900           950           1000           1050           1100           1150           1200           1250           1300           1350           1400           1450           1500           1550           1600           1650           1700           1750           1800	4 3 2 3 3 3 4 4 4 5 4 		Com	ments						
330           900           950           1000           1050           1100           1150           1200           1250           1300           1350           1400           1450           1500           1550           1600           1650           1700           1750           1800           1850           1900	4 3 2 3 3 3 4 4 4 5 4 4 5 4 1 1 1 1 1 1 1 1 1 1 1 1 1		Com	ments						
330           900           950           1000           1050           1100           1150           1200           1250           1300           1350           1400           1450           1500           1550           1600           1650           1700           1750           1800           1850           1900           1950	4 3 2 3 3 3 4 4 5 4 4 5 4 1 1 1 1 1 1 1 1 1 1 1 1 1		Com	ments						

Drojoct:	Opkyiow Posidopt	tial Subdivision							
Cliopt:									
chent:	Oakview investing		Sec.	пс	•				
Location:	Corner of Back Or	mond & Hansen Road		66.9					
Material:	Fine Sand			Civit Protect: Substit	115				
Target MDD (kg/m2):	1690.00								
Specified requirement:	95%								
Target OMC:	17%								
Fill Depth:	Cut								
Depth	Lot 20	Date	Location	DD Ka/m²	WD Ka/m²	% Comp.	% Moisture	% AV	Comments
100	1			J	ý				
150	2								
200	2								
250	2								
300	2								
350	2								1
400	2								
400	2								
450	3								
500	4								
500	2								
600	3								
700	5								
700	4								
/50	3								
800	4								
850	4								
900	4								
950	3								
1000	2								
1050	3								
1100	3								
1150	3								
1200	4								
1250	4								
1300	5								
1350	4	Co	mmonts						
1400		00	minents						
1450									
1500									
1550									
1600									
1650									
1700									
1750									
1800									
1850									
1900									
1950									
2000									
2000									

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Project:	Oakview Re	esidential SL	IDDIVISION								
client:	Oakview In	vestments L	.ta								
Location:	Corner of E	Back Ormon	d & Hansen F	Road		RV -					
Material:	Fine Sand										
Target MDD (kg/m2):	1690.00				Lavie -	melact generatious					
Specified requirement:	95%										
Target OMC:	17%										
Fill Depth:	Cut										
		1	ſ			חח	WD	%	%	%	
Depth	Lot 21			Date	Location	00 Kar/ar <sup>2</sup>	VVD	Comn	Moisturo	70 AV/	Comments
100	1		-			Kg/m	Kg/m	comp.	moisture	Λv	
100	1										
150	1										
200	1										
250	1										
300	1										
350	3										
400	4										
450	4										
500	3										
550	4										
600	5										
650	3										
700	1										
760											
730	3										
800	3										
850	3										
900	3										
950	4										
1000	4										
1050	2										
1100	2										
1150	3										
1200	4										
1250	4										
1300	6										
1350	5		1	Cam	ma a mata	1					
1400				Com	ments						
1450											
1500											
1550											
1600											
1/50											
1000											
1700											
1750											
1800											
1850											
1900											
1950											
2000											

Project: Client: Location: Material: Target MDD (kg/m2): Specified requirement: Target OMC: Fill Depth:	Oakview Re Oakview Inv Corner of B Fine Sand 1690.00 95% 17% Cut	isidential Subdiv vestments Ltd ack Ormond & I	vision Hansen Road		CPS Civil Pirinat Solu	ur era				
Depth	Lot 22		Date	Location	DD Kg/m <sup>2</sup>	WD Kg/m <sup>2</sup>	% Comp.	% Moisture	% AV	Comments
100	1					0				
150	1									Ţ
200	1									
250	1									
300	1									1
350	3									
400	4									
450	4									
500	3									
550	4									
600	5									
650	3									
700	4									
750	3									
800	3									
850	3									
900	3									
950	4									
1000	4									
1050	2									
1100	2									
1150	3									
1200	4									
1250	4									
1300	0				-					
1350	5		Cor	nments						
1400										
1450										
1500										
1550										
1000										
1050										
1700										
1000										
1800										
1850										
1900										
1950										
2000										

Project:	Oakview Re	esidential Subdivision								
Client:	Oakview In	vestments Ltd								
Location:	Corner of B	ack Ormond & Hansen	Road	3	<b>' 4 '</b>					
Material	Fine Sand				U U					
Target MDD (kg/m2)·	1690.00				vil Project Solutio	1115				
Specified requirement:	95%									
Target OMC:	17%									
Fill Donth	1770 1.0m 1.4m	2								
riii Deptii.	1.2111 - 1.41	11								
						14/D	0/	0/	0/	
Depth	Lot 51		Date	Location		VVD	70	<i>7</i> 0	70	Comments
					Kg/m²	Kg/m²	comp.	woisture	AV	
100	2		30/07/2021	WSP Tested	1636	1872	99.8%	14.4%	16.3%	RL 8.51m
200	3				1625	1859	99.1%	14.4%	16.9%	
300	5		12/08/2021	WSP Tested	1488	1799	90.7%	20.9%	14.2%	RI 8 48m
400	6		12/00/2021	Wor rested	1481	1791	90.3%	20.9%	14.6%	NE 0. IOIII
500	9		12/00/2021	Lot 51	1717	1871	101.1%	9.0%	10.8%	
600	12		13/09/2021	LOUGT						
700	12		22/00/2021	Lot 51(plus	1375	1845	81%	34.2%	-9.2%	Munit
800	11		23/09/2021	90deg)	1366	1866	80%	36.2%	-10.1%	v. wet
900	10			0,				11		·
1000	12									
1100	15									
1200	13									
1300	10									
1400										
1400										
100										
1000										
1700										
1800										
1900										
2000										
			Com	monto	1					
			Com	nents						
			(13/09/2021) Fir	m underfoot, bett	er general co	ondition than off	her lots.			
			(,							
			23/09/2021) Res	sults were consiste	ont with visua	al innenection P	R was dener	ally good bu	t some lots	too wet
			Noods time			ai inpopeetion. I	it was gener	any good bu	1 301110 1013	100 WC1.
			Neeus time							

Proiect:	Oakview Res	sidential Subdivision								
Client;	Oakview Inv	estments Ltd								
Location	Corner of Ba	ock Ormond & Hanse	n Road	100	DC					
Material:	Fine Sand		intodu		ΓU					
Target MDD (kg/m2)	1600.00			Civil I	Project Solutions					
Coosified requirements	1090.00									
	95%									
Target ONU:	1/%									
Fill Depth:	1.2m - 1.6m									
Depth	Lot 52		Date	Location	DD	WD	%	%	%	Comments
Boptii	20102		Batto	Eboation	Kg/m <sup>2</sup>	Kg/m²	Comp.	Moisture	AV	oominionto
100	1		30/07/2021	WSP Tested	1451	1683	88.5%	16.0%	23.4%	RI 7 79m
200	4		00/0//2021	Wor rested	1438	1640	87.7%	16.0%	24.1%	NE 7.7 711
300	6		12/08/2021	M/SD Tostod	1517	1789	92.5%	17.9%	17.1%	PL 8 463m
400	10		12/00/2021	W3I TESteu	1511	1781	92.1%	17.9%	17.4%	NE 0.403111
500	8		12/00/2021	Lot E2	1540	1831	93.5%	18.5%	8.4%	
600	13		13/09/2021	LUI 52						†
700	12		22/00/2021	1-+ 50	1833	1666	99%	10.1%	-8.5%	Dryer than
800	12		23/09/2021	LOT 52	1845	1701	99%	9.3%	-9.0%	sureounding
900	12									lots
1000	17									
1100	19									
1200	17									
1300										
1400										
1500										
1600										
1700										
1900										
1000										
2000	1									
2000	1									
			· · · · · · · · · · · · · · · · · · ·		7					
			Com	ments						
			(13/09/2021) F	rm underfoot, bette	er general cono	dition than oth	er lots.			
			(23/09/2021)Re	esults were consiste	nt with visual i	inpspection. PF	? was genera	lly good but	some lots t	oo wet. Needs
			time							

Project:	Oakview R	esidential Subdivision								
Client:	Oakview In	vestments Ltd								
Location	Corner of F	ack Ormond & Hanse	n Road	See.	יטפ					
Material:	Fine Sand		in nous		JEQ					
Target MDD (kg/m2)	1600.00				linco: bio	\$				
Specified requirement:	05%									
Torgot OMC:	170/									
Talget Olvic:	1/%									
riii Deptri:	1.0m									
	1			1	00	100	0/	0/	0/	1
Depth	Lot 53		Date	Location		WD	70	70	70	Comments
					Kg/m*	Kg/m*	comp.	woisture	AV	51 1 500
100	3		2/07/2021	West of Lot 53	1646	1829	100.4%	11.1%	11.1%	First 500mm
200	8									lift
300	16		21/07/2021	Middle lot 53	1561	1748	92.4%	12.0%	15.0%	ļ l
400	15				1524	1715	90.2%	12.5%	16.6%	
500	14		22/07/2021	Middle lot 53	1623	1822	95%	13.6%	11.4%	full height
600	16				1623	1815	96%	11.8%	11.7%	
700	15		30/07/2021	WSP Tosted	1639	1795	100.0%	9.5%	24.2%	PL 0 74m
800	19		30/01/2021	wor restou	1647	1804	100.5%	9.5%	23.8%	NE 7.7411
900	18									
1000	17									
1100										
1200										
1300										
1400										
1500										
1600										
1700										
1800										
1900										
2000										
	-									
			-		i i					
			Com	ments						
			(02/07/202	<ol> <li>Weather was was</li> </ol>	rm and fine	. Soft under foo	t due to rec	ent rain. Goo	od consiste	ent level of
				compaction	throughout	. Consistent san	d colouratio	on and textu	re.	
			(21/07/2021)	After confering wi	th Nathan fr	om Initia the te	st was deen	ned a fail, Or	h behalf of	Initia, Angus
			instructed the	contractr that tes	t sites did no	ot "pass" and to	o alow time	to dry furthe	er and carr	y out further
					ro	lling where pos	sible.			
			(22/07/2021)	This set of tests w	as deemed a	i fail. On behalf	of Initia, CP	S has instuct	ed contrac	tor to allow
			1	more	e time for m	aterial to dry be	fore testrin	g again.		
			1							
			1							
			1							
			1							

## Project: Oakvi Client: Oakvi Location: Corne Material: Fine S Target MDD (kg/m2): 1690. Specified requirement: 95% Target OMC: 17% Fill Depth: 1.0m

Oakview Residential Subdivision Oakview Investments Ltd Corner of Back Ormond & Hansen Road Fine Sand 1690.00 95%



Depth	Lot 54
100	6
200	13
300	15
400	12
500	12
600	13
700	11
800	14
900	14
1000	14
1100	10
1200	10
1300	7
1400	4
1500	
1600	
1700	
1800	
1900	
2000	

		DD	WD	%	%	%	
Date	Location	Kg/m <sup>2</sup>	Kg/m <sup>2</sup>	Comp.	Moisture	AV	Comments
2/07/2021	South of Lot E4	1597	1811	97.6%	17%	11.9%	First 500mm
2/07/2021	300111 01 L01 54						Lift
21/07/2021	Middle lot 54	1520	1734	91.0%	15.0%	13.5%	
21/07/2021	Wildule Iot 34	1502	1739	88.9%	15.8%	15.4%	
22/07/2021	Middle lot E4	1530	1765	90.6%	15.0%	14.4%	full height
22/07/2021	Wildule IOt 54	1497	1737	88.6%	16.1%	15.5%	
20/07/2021		1542	1759	94.0%	14.1%	21.6%	DL 0 70m
30/07/2021	war resteu	1555	1774	94.8%	14.1%	20.9%	KL 9.7011

#### Comments

(02/07/2021) Weather was warm and fine. Soft under foot due to recent rain. Good consistent level of compaction throughout. Consistent sand colouration and texture.

(21/07/2021) After Confering with Nathan from Initia the test was deemed a fail, On behalf of Initia, Angus instructed the contractr that test sites did not "pass" and to alow time to dry further and carry out further rolling where possible.

(22/07/2021) This set of tests was deemed a fail. On behalf of Initia, CPS has instucted contractor to allow more time for material to dry before testring again.

## Project: Oakview Res Client: Oakview Inve Location: Corner of Bai Material: Fine Sand Target MDD (kg/m2): 1690.00 Specified requirement: 95% Target OMC: 17% Fill Depth: 1.2m - 1.6m

Oakview Residential Subdivision Oakview Investments Ltd Corner of Back Ormond & Hansen Road Fine Sand 1690.00 95%



Depth	Lot 55
100	5
200	16
300	19
400	21
500	20
600	19
700	
800	
900	
1000	
1100	
1200	
1300	
1400	
1500	
1600	
1700	
1800	
1900	
2000	

Date	Location	DD Kg/m <sup>2</sup>	WD Kg/m <sup>2</sup>	% Comp.	% Moisture	% AV	Comments
2/07/2021	West, Lot 55	1606	1798	97.9%	11.8%	12.7%	First 500mm
01/07/0001		1559	1803	92.3%	15.6%	12.3%	LIII
21/07/2021	IVIIddle lot 55	1522	1735	90.0%	16.2%	13.1%	
22/07/2021	Middle let FF	1551	1779	91.8%	14.7%	13.5%	full height
22/07/2021	IVIIdale lot 55	1524	1744	90.2%	14.4%	15.2%	
20/07/2021	WSP Tested	1608	1751	98.0%	8.9%	26.6%	RL 9.65
30/07/2021		1592	1734	97.1%	8.9%	27.3%	
							_

#### Comments

(02/07/2021)Weather was warm and fine. Soft under foot due to recent rain. Good consistent level of compaction throughout. Consistent sand colouration and texture.

(21/07/2021) After confering with Nathan from Initia the test was deemed a fail, On behalf of Initia, Angus instructed the contractr that test sites did not "pass" and to alow time to dry further and carry out further rolling where possible.

(22/07/2021)This set of tests was deemed a fail. On behalf of Initia, CPS has instucted contractor to allow more time for material to dry before testring again.

## Project: Oakvi Client: Oakvi Location: Corne Material: Fine S Target MDD (kg/m2): 1690. Specified requirement: 95% Target OMC: 17% Fill Depth: 1.6m

Oakview Residential Subdivision Oakview Investments Ltd Corner of Back Ormond & Hansen Road Fine Sand 1690.00 95%



Depth	Lot 56
100	4
200	8
300	10
400	13
500	10
600	13
700	12
800	12
900	12
1000	9
1100	10
1200	12
1300	12
1400	
1500	
1600	
1700	
1800	
1900	
2000	

Date	Location	DD Ka/m <sup>2</sup>	WD Ka/m <sup>2</sup>	% Comp	% Moisture	% AV	Comments
7/07/0004	1.154	1607	1824	98.0%	13.5%	11.3%	1.2m to
//0//2021	Lot 56	1603	1842	97.7%	14.9%	10.4%	height
21/07/2021	Middle let E/	1597	1794	94.5%	12.3%	12.8%	1.0m to
21/0//2021	Ivildule lot 56	1614	1804	95.5%	11.8%	12.3%	height
20/07/2021	WSP Tested	1707	1884	104.1%	10.4%	19.5%	RL 8.45m
30/07/2021		1687	1862	102.8%	10.4%	20.5%	
12/09/2021	WSP Tested	1613	1895	98.3%	17.5%	12.5%	RL 9.123
12/06/2021		1616	1899	98.5%	17.5%	12.3%	

### Comments

(07/07/2021)Generally good compaction and consistent moistiure 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.

(21/07/2021) After confering with Nathan from Initia the test was deemed a fail, On behalf of Initia, Angus instructed the contractr that test sites did not "pass" and to alow time to dry further and carry out further rolling where possible.

# Project: Oakvi Client: Oakvi Location: Corne Material: Fine S Target MDD (kg/m2): 1690. Specified requirement: 95% Target OMC: 17% Fill Depth: 1.6m

Oakview Residential Subdivision Oakview Investments Ltd Corner of Back Ormond & Hansen Road Fine Sand 1690.00 95%



Depth	Lot 57
100	3
200	6
300	10
400	15
500	13
600	15
700	13
800	13
900	17
1000	15
1100	10
1200	12
1300	13
1400	12
1500	
1600	
1700	
1800	
1900	
2000	

Location	DD	WD	%	%	%	Commonte
	Kg/m <sup>2</sup>	Kg/m <sup>2</sup>	Comp.	Moisture	AV	comments
Lot 57 (Road	1551	1746	94.6%	12.6%	15.1%	1.2m
Edge)	1545	1728	94.2%	11.8%	15. <b>9</b> %	1.2111
Lot 57	1566	1733	95.50%	10.7%	18.7%	1.5m
LUI 57	1587	1730	96.8%	9.0%	15.9%	
WSD Tostod	1662	1921	101.3%	15.6%	13.0%	RL 8.44m
WSP Tested	1651	1908	100.6%	15.6%	13.6%	
WSP Tested	1509	1695	92.0%	12.3%	25.9%	RL 8.48m
	1513	1699	92.3%	12.3%	25.8%	
	Location Lot 57 (Road Edge) Lot 57 WSP Tested WSP Tested	Location Kg/m <sup>2</sup> Lot 57 (Road 1551 Edge) 1545 Lot 57 1566 1587 WSP Tested 1662 1651 WSP Tested 1509 WSP Tested 1513 4 1509 1513	Location         Kg/m²         Kg/m²           Lot 57 (Road         1551         1746           Edge)         1545         1728           Lot 57         1566         1733           Lot 57         1662         1921           WSP Tested         1651         1908           WSP Tested         1509         1695           1513         1699         161	Location         Kg/m²         Kg/m²         Comp.           Lot 57 (Road Edge)         1551         1746         94.6%           Lot 57         1545         1728         94.2%           Lot 57         1566         1733         95.50%           Lot 57         1587         1730         96.8%           WSP Tested         1662         1921         101.3%           WSP Tested         1509         1695         92.0%           1513         1699         92.3%         92.3%	$\begin{tabular}{ c c c c c c } \hline Location & Kg/m^2 & Kg/m^2 & Comp. & Moisture \\ \hline Kg/m^2 & Kg/m^2 & Comp. & Moisture \\ \hline Lot 57 (Road 1551 1746 94.6% 12.6% \\ \hline Edge) & 1545 1728 94.2% 11.8% \\ \hline 1566 1733 95.50\% 10.7\% \\ \hline 1587 1730 96.8\% 9.0\% \\ \hline MSP Tested & 1662 1921 101.3\% 15.6\% \\ \hline 1651 1908 100.6\% 15.6\% \\ \hline 1651 1908 100.6\% 15.6\% \\ \hline MSP Tested & 1509 1695 92.0\% 12.3\% \\ \hline 1513 1699 92.3\% 12.3\% \\ \hline \\ $	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$

Comments										
Project:	Oakview R	esidential Subdivision								
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Client:	Oakview Ir	ivestments Ltd								
Location:	Corner of F	ack Ormond & Hansen	Road	No.	'Y'					
Material:	Fine Sand				JUU					
Target MDD (kg/m2):	1600.00			Ci-	ril Project Solutio	118				
Target WDD (kg/112).	1090.00									
specified requirement:	95%									
Target ONC:	17%									
Fill Depth:	1.6m									
		-								-
Donth	Lat E0		Data	1 +	DD	WD	%	%	%	Commonto
Depth	LOI 58		Date	Location	Ka/m <sup>2</sup>	Ka/m <sup>2</sup>	Comp.	Moisture	AV	comments
100	2			-	1553	1738	94 7%	11.9%	24.4%	
200	0		30/07/2021	WSP Tested	1557	17.30	0/ 0%	11.0%	24.470	RL 7.89m
200	9				1475	1/42	74.7/0	20.40/	24.270	
300	8		12/08/2021	WSP Tested	1473	1094	09.9%	20.4%	3.9%	RL 8.58m
400	8				1468	1885	89.5%	28.4%	4.3%	
500	10									_
600	9									
700	10									
800	10									
900	14									
1000	16									
1100	16									
1200	10									
1200	12									
1300	15									
1400										
1500										
1600										
1700										
1800										
1900										
2000										
			Comi	ments						
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Proiect:	Oakview F	Residential Subdivis'	sion							
	Oakview Ir	nvestments Ltd	.0.1							
Location	Corner of /	Rack Ormond & Hz	anson Road	1 Star	<b>7U</b> 7					
Material	Fine Sand	Jack officing a	1130H NOGU		UTU					
Target MDD (kg/m2)	1400 00				Civil Project Sulution	J13				
Creating requirement:	1070.00 0E%									
Target OM/C.	9070 170/									
Target Oivic.	1.0~~									
Fill Depin:	1.8m									
		7	г <del>т</del>	·		ם/אי	0/	0/	0/.	τ
Depth	Lot 59		Date	Location		۷۷レ ۰۰۰, 2	70 Comp	70	70	Comments
					Kg/m <sup>-</sup>	Kg/m <sup>-</sup>	Comp.	Moisture	Av	
100	5		30/07/2021	Lot 59	1451	1632	88.5%	12.5%	28.5%	RI 7.87m
200	12			L	1458	1640	88.9%	12.5%	28.2%	THE FIGE.
300	14		12/08/2021	Lot 59	1500	1797	91.5%	19.8%	15.2%	RI 8 400m
400	20		12/00/202.	LOUGT	1483	1777	90.4%	19.8%	16.1%	NE OPTOST.
500	20			ı		·	$\uparrow\_$	† <u> </u>		·
600	19	1		ı		·	<u>+-</u> _	<u>†                                    </u>		1'
700	14			ı		·		† <u> </u>		†,
800	8			ı		·	+	†'	<u> </u>	1 _'
900	8			1				-		
1000	14									
1100										
1200										
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1500										
1600		4								
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Project:	Oakview R	esidential Subdivision								
Client:	Oakview Ir	nvestments Ltd								
Location:	Corner of F	Back Ormond & Hanser	n Road	C.	<b>NA</b>					
Material:	Fine Sand				JI U					
Target MDD (kg/m2)	1400 00			Ci	vil Project Solutio	1.13				
Charling requirement	05%									
Specifieu requirement.	90/0 1 70/									
Target Uivic:	1/%									
Fill Depth:	1.6m									
		-		-	<u> </u>				• • • •	<u>.</u>
Denth	Lot 60		Data	Location	DD	WD	%	%	%	Comments
Deptil	LOUG		Date	LUCATION	Kg/m <sup>2</sup>	Kg/m <sup>2</sup>	Comp.	Moisture	AV	COmments
100	6	1	20/07/2021	WCD Testad	1384	1651	84.4%	193%	22.4%	
200	14		30/07/2021	WSP Testea	1387	1655	84.6%	19.3%	222.0%	RL 8.08m
300	21	4		t	1575	1817	96.0%	15.4%	17.9%	<b>├</b> ───┤
400	10	4	12/08/2021	WSP Tested	15.81	1874	06.4%	15.4%	17.5%	RL 8.500m
500	10	A	·  '	+	1001	1024	70.470	10.470	17.070	·
500	10	4		1	$\vdash$	·	<u> </u>	'	───	י
600	14	4	- <b> </b> '	<b></b>	<b>↓</b>	<b></b>	<b>_</b>	'	<b></b>	ļ'
700	11	4		1		<b>.</b>	<u> </u>		<u> </u>	י 1
800	16			<u> </u>		L				<u> </u>
900	<b>F</b>					·				
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1300										
1400										
1500		4								
1600		A								
1700										
1000		A								
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1900	4	4								
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Project:	Oakview R	esidential Subdivis	ion							
Client:	Oakview Ir	vestments Ltd			000					
Location:	Corner of F	Back Ormond & Ha	insen Road	No.	<b>741</b>					
Material:	Fine Sand				U U					
Target MDD (kg/m2):	1600.00			C C	wil Project Solutio	15				
Charling the service ment	050.00									
specified requirement:	95%									
Target OIVIC:	17%									
Fill Depth:	1.4m									
		-		1						1
Denth	Lot 61		Date	Location	DD	WD	%	%	%	Comments
Doptii	LOUUT		Dute	Location	Kg/m <sup>2</sup>	Kg/m <sup>2</sup>	Comp.	Moisture	AV	comments
100	6		20/07/2021		1520	1716	92.7%	12.9%	24.5%	DL 0 220m
200	14		30/07/2021	WSP Tested	1526	1723	93.1%	12.9%	24.2%	RL 8.22011
300	21				1			1		1
400	23									
500	20				1 1			1		1
600	20	-								-
700				Į			-		<u> </u>	
200										
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900										
1000										
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Project	Oakview R	esidential Sub	division								
Client:	Oakview In	vestments I t	d								
Location:	Corpor of P	lack Ormond	e. Hanson	Poad	- Star	nne.					
Material:	Eine Sand		a nansen	Noau		UT J					
	1 110 201				c c	ivil Project Solutio	18				
Target IVIDD (kg/m2):	1690.00										
Specified requirement:	95%										
Target OMC:	17%										
Fill Depth:	1.2m										
	-										
Depth	Lot 62			Date	Location	DD Ka/m <sup>2</sup>	WD Ka/m <sup>2</sup>	% Comp	% Moisture	% AV	Comments
100	6					Kg/III	Kg/III				
200	19								1 1		
300	10					1 1			1		
400	20										-
500	20										
600	20					-			1		
700											
700		-									-
800		-									
900		-									
1000		_									
1100		_									
1200		_									
1300											
1400											
1500											
1600											
1700											
1800											
1900											
2000											
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				Com	ments						
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Project:	Oakview R	esidential Subdivisio	on							
Client:	Oakview Ir	vestments Ltd								
Location.	Corner of F	Back Ormond & Han	isen Road	19	<b>'U</b> C					
Material:	Fine Sand		loonnouu		JU					
Target MDD (kg/m2)	1600.00			Ci	vil Project Sulution	13				
Specified requirements	050.00									
specified requirement:	95%									
Target OMC:	17%									
Fill Depth:	1.4m									
	1	1		r			01	04		r
Depth	Lot 63		Date	Location	DD	WD	%	%	%	Comments
Boptii	201 00		Butto	Eocation	Kg/m²	Kg/m²	Comp.	Moisture	AV	oonnionto
100	8		20/07/2021		1504	1695	91.7%	12.7%	25.6%	DL 9 420m
200	17		30/07/2021	WSF Testeu	1504	1695	91.7%	12.7%	25.6%	KL 0.43011
300	14									
400	15									
500	12									
600	11									
700	17				1 1					
800	1/									-
000	14									
1000	10									
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100										
1200										
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1600										
1700										
1800										
1900										
2000										
			Carra		1					
			Com	ments						
		1								
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Project:	Oakview Residential Subdivision
Client:	Oakview Investments Ltd
Location:	Corner of Back Ormond & Hansen Road
Material:	Fine Sand
Target MDD (kg/m2):	1690.00
Specified requirement:	95%
Target OMC:	17%
Fill Depth:	1.0m



Depth	Lot 64
100	6
200	12
300	12
400	10
500	10
600	15
700	15
800	10
900	10
1000	4
1100	9
1200	11
1300	13
1400	12
1500	10
1600	6
1700	14
1800	10
1900	11
2000	16

Data		DD	WD	%	%	%	Commente
Date	Location	Kg/m <sup>2</sup>	Kg/m <sup>2</sup>	Comp.	Moisture	AV	comments
20/07/2021	Middle lot 64	1461	1704	86.5%	16.6%	17.1%	
27/07/2021	Wildule lot 04						
30/07/2021	W/SP Tested	1494	1667	91.1%	11.6%	27.8%	RI 8.48m
30/07/2021	W5i Testeu	1499	1673	91.4%	11.6%	27.5%	RE 0.40III

# Comments

(29/07/2021) A lot of inconsistancy underfoot. Lennon consulted with contractror and settled upon remedial action for the rest sites. Platform to be disced and reworked.

Project:	Oakview R	esidential Subdivision				
Client:	Oakview Ir	nvestments Ltd				
Location:	Corner of E	Back Ormond & Hanse	n Road	No.	:PN	
Material:	Fine Sand					
Target MDD (kg/m2):	1690.00				vii Project Sulation	5
Specified requirement:	95%					
Target OMC:	17%					
Fill Depth:	1.0m					
Danth	1-+/5	1	Data		DD	W
Depth	LUI 00		Date	Location	Kg/m <sup>2</sup>	Kg/
100	6		20/07/2021	Middle lot 65	1476	
200	10		29/07/2021	Wildule lot 05		
300	13		20/07/2021		1649	18
400	19		30/07/2021	war resteu	1639	17
500						
600		1				
700					1	

100       6         200       100         300       13         400       19         500       1649         100       1639         100       1639         100       1639         100       1639         100       1639         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         1000       1000         1000       1000         1000       1000         1000       1000         1000       1000         1000       1000         1000       1000         1000       1000         1000       1000	Depth	Lot 65	Date	Location	Kg/m <sup>2</sup>	Kg/m <sup>2</sup>	% Comp.	% Moisture	% AV	Commen
200       10         300       13         400       19         500       1649       1809       100.6%       9.7%       23.4%       Rt.8.2         600       100       100.6%       9.7%       23.8%       Rt.8.2         600       1000       100.6%       9.7%       23.8%       Rt.8.2         600       1000       100.6%       9.7%       23.8%       Rt.8.2         900       1000       100.6%       9.7%       23.8%       Rt.8.2         1000       1000       100.6%       9.7%       100.6%       9.7%       100.6%         1000       1000       100.6%       100.6%       100.6%       100.6%       100.6%       100.6%       100.6%         1000       1000       100.6%       100.6%       100.6%       100.6%       100.6%       100.6% <td>100</td> <td>6</td> <td>00/07/0001</td> <td></td> <td>1476</td> <td>1656</td> <td>87.3%</td> <td>12.3%</td> <td>19.5%</td> <td></td>	100	6	00/07/0001		1476	1656	87.3%	12.3%	19.5%	
300       13         400       19         500       1639       1798       99.9%       9.7%       23.8%       Rt. 8.2         600       100       100.9%       9.7%       23.8%       Rt. 8.2         600       100       100.9%       9.7%       23.8%       Rt. 8.2         600       100       100       100       100       100         1000       1000       100       100       100       100         1100       1000       100       100       100       100       100         1200       1000       100       100       100       100       100       100         1200       1000       10	200	10	29/07/2021	IVIIdale lot 65						
400       19         500       60         600       600         700       1639       1798       99.9%       97.%       23.8%       Rt 8.2         800       90       1       1       1       1       1       1         800       90       1	300	13	20/07/2021		1649	1809	100.6%	9.7%	23.4%	DL 0.00-
500       00 <t< td=""><td>400</td><td>19</td><td>30/07/2021</td><td>WSP Tested</td><td>1639</td><td>1798</td><td>99.9%</td><td>9.7%</td><td>23.8%</td><td>RL 8.231</td></t<>	400	19	30/07/2021	WSP Tested	1639	1798	99.9%	9.7%	23.8%	RL 8.231
600       Image: Contract or and settled upon remediation for the rest sites. Platform to be disced and reworked.	500									
200       100       100       100         1000       1100       100       100         1300       100       100       100         1300       100       100       100         1300       100       100       100         1300       100       100       100         1400       100       100       100         1800       100       100       100         1800       100       100       100         1900       100       100       100         1900       100       100       100         1900       100       100       100         1900       100       100       100       100         1900       100       100       100       100         1900       100       100       100       100         1900       100       100       100       100       100         1900       100       100       100       100       100       100         1900       100       100       100       100       100       100       100         1900       100       100       1	600									
800       100       100       100         1100       100       100       100         1200       100       100       100         1400       100       100       100         1800       100       100       100         1800       100       100       100         1800       100       100       100         1800       100       100       100         1800       100       100       100         1800       100       100       100         1800       100       100       100       100         1800       100       100       100       100         1800       100       100       100       100         1800       100       100       100       100         1800       100       100       100       100       100         1800       100       100       100       100       100       100         1800       100       100       100       100       100       100       100         1800       100       100       100       100       100       100       100	700									
900       1000         100       1100         1200       1300         1300       1500         1600       1         1700       1800         1900       2000         1900	800									
1000 1100 1200 1200 1200 1200 1400 1500 1500 1500 1700 1700 1700 1700 17	900									
1100         1200         1200         1400         1400         1500         1600         1700         1800         1900         2000         1900 <t< td=""><td>1000</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	1000									
1200   1300   1400   1500   1600   1600   1700   1800   1900   2000	1100									
1300         1400         1500         1500         1600         1700         1800         1900         2000         1900 <t< td=""><td>1200</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	1200									
1400         1500         1600         1700         1800         1900         2000 <t< td=""><td>1300</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	1300									
1500   1600   1700   1800   1900   2000   1900   2000   1900   2000   1900   2000   1900   2000   1900   2000   1900   2000   1900   2000   1900   2000   1900   2000   1900   2000   1900   2000   1900   2000   1900   2000   1900   2000   1900   2000   1900   2000   1900   2000   1900   2000	1400									
1600   1700   1800   1900   2000	1500									
1700         1800         1900         2000         1900 <t< td=""><td>1600</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	1600									
1800   1900   2000   2000   2000	1700									
1900 2000 Comments (29/07/2021) A lot of inconsistancy underfoot. Lennon consulted with contractror and settled upon remedia action for the rest sites. Platform to be disced and reworked.	1800									
2000  Comments  (29/07/2021) A lot of inconsistancy underfoot. Lennon consulted with contractror and settled upon remedia action for the rest sites. Platform to be disced and reworked.	1900									
Comments     (29/07/2021) A lot of inconsistancy underfoot. Lennon consulted with contractror and settled upon remedia     action for the rest sites. Platform to be disced and reworked.	2000									
Comments (29/07/2021) A lot of inconsistancy underfoot. Lennon consulted with contractror and settled upon remedia action for the rest sites. Platform to be disced and reworked.										
Comments (29/07/2021) A lot of inconsistancy underfoot. Lennon consulted with contractror and settled upon remedia action for the rest sites. Platform to be disced and reworked.										
Image: Second										
Image: Comments   Image: Comments <td></td>										
Comments (29/07/2021) A lot of inconsistancy underfoot. Lennon consulted with contractror and settled upon remedi action for the rest sites. Platform to be disced and reworked.										
CONTINENTS         (29/07/2021) A lot of inconsistancy underfoot. Lennon consulted with contractror and settled upon remediation for the rest sites. Platform to be disced and reworked.         Image:			Comr	monte						
(29/07/2021) A lot of inconsistancy underfoot. Lennon consulted with contractror and settled upon remedi action for the rest sites. Platform to be disced and reworked.			COIIII	nems						
action for the rest sites. Platform to be disced and reworked.			(29/07/2021) A I	lot of inconsistanc	y underfoot.	Lennon consulte	d with cont	ractror and	settled upo	n remedial
Image: state stat			action for the re	st sites. Platform t	o be disced a	and reworked.				

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Comments

RL 8.23m

Project:	Oakview Residential Subdivision
Client:	Oakview Investments Ltd
Location:	Corner of Back Ormond & Hansen Road
Material:	Fine Sand
Target MDD (kg/m2):	1690.00
Specified requirement:	95%
Target OMC:	17%
Fill Depth:	0.8m - 1.2m



Depth	Lot 66
100	5
200	13
300	11
400	13
500	10
600	12
700	21
800	
900	
1000	
1100	
1200	
1300	
1400	
1500	
1600	
1700	
1800	
1900	
2000	

Date	Location	DD	WD	% Comp	%	%	Comments
		Kg/m²	Kg/m²	comp.	woisture	AV	
20/07/2021	East corpor lot 66	1446	1683	85.6%	16.3%	18.2%	
29/07/2021	Last corner lot oo	1446	1683	85.6%	16.3%	18.2%	
20/07/2021	Middle let 44	1662	1931	98.3%	16.7%	5.7%	
29/07/2021	IVIIddle lot 66	1662	1931	98.3%	16.7%	5.7%	
20/07/2021	W/CD Tostod	1525	1731	93.0%	13.5%	23.3%	23.3%
30/07/2021	1 WSP Tested	1537	1744	93.7%	13.5%	22.8%	KL 0. TOTT

(29/07/2021) A lot of i	nconsistancy underf	oot. Lennon cons	ulted with con	tractror and settl	ed upon remedial
action for the rest site	s. Platform to be dis	ced and reworked	d.		

Project:	Oakview Re	sidential Subo	division						
Client:	Oakview Inv	estments Ltd	1						
Location:	Corner of Ba	ack Ormond &	& Hansen Road	You	:HZ				
Material:	Fine Sand				JU				
Target MDD (kg/m2)·	1690.00			Civ	nt Project Sulutio	113			
Specified requirement	05%								
	17%								
Fill Donth:	0.0m 1.0m	, ,							
r in Deptri.	0.011 - 1.011	I							
Dauth	1-+ (7		Data		DD	WD	%	%	%
Depth	LOI 67		Date	Location	Kg/m <sup>2</sup>	Kg/m <sup>2</sup>	Comp.	Moisture	AV
100	5		30/07/2021	W/SP Tostod	1705	1705	95.4%	9.0%	28.4%
200	6		30/07/2021	Wor rested	1713	1713	95.8%	9.0%	28.1%
300	9		0/00/2021	Middle of Lot 67	1315	1635	79.0%	22.5%	3.4%
400	10		110112021	Wildule of Lot 07	1315	1635	79.0%	22.5%	3.4%
500	13								
600	12								
700	10								
800	10								
900	12								
1000	12								
1100	15								
1200	15								
1300									
1400									
1500									
1600									
1700									
1800									
1900									
2000									
			Com	monts					

(09/09/2021) Ground felt frim under foot in some areas but much softer in lownlying lots, especially Lots 67 and 68. Results were consistent with past testing and the ground conditions onsite. Plan to carry out multiple scalars next week.

Comments RL 6.62m

roject: lient: ocation: Aaterial: arget MDD (kg/m2): pocifical cognizement:	Oakview Re Oakview In Corner of B Fine Sand 1690.00	esidential Subdivision vestments Ltd lack Ormond & Hanser	n Road		CPS Il Project Solutio	113
arget OMC:	<del>3</del> 5% 17%					
ill Depth:	1.0m - 1.8r	n				
Depth	Lot 68		Date	Location	DD Kg/m²	WD Kg/m <sup>2</sup>
100	6		20/07/2021	W/SD Tostod	1557	1700
200	12		30/07/2021	WSF Tested	1565	1709
300	15		9/09/2021	Middle of Lot 68	1504	1702
400	17		//0//2021	Wilduic Of EOT OD		
500	14					
600	17					
700	18					

800

16

Comments	
Comments	

(09/09/2021) Ground felt frim under foot in some areas but much softer in lownlying lots, especially Lots 67 and 68. Results were consistent with past testing and the ground conditions onsite. Plan to carry out multiple scalars next week.

%

Comp. 94.9%

95.4%

88.6%

%

Moisture

9.2%

9.2%

13.4%

%

AV

28.4%

28.1% 7.1% Comments

RL 7.48m

Client:	Oakview In	vestments Lt	d	100	ODC	14 C				
Location:	Corner of B	ack Ormond	& Hansen Road		1.23					
Material:	Fine Sand				Civil Project Solu	<b>r</b> inns				
Target MDD (kg/m2):	1690.00				g binningett den	10.00				
Specified requirement:	95%									
Target OMC:	17%									
Fill Depth:	1.0m cut - 1	1.2m fill								
Donth	Lot 40		Data	Logation	DD	WD	%	%	%	Commonto
Depth	LOI 09		Date	Location	Kg/m <sup>2</sup>	Kg/m <sup>2</sup>	Comp.	Moisture	AV	comments
100	1				Ű	0				
150	1									
200	1									
250	2									1
300	2							1		1
350	3							1		1
400	5							· · · · ·		
450	7									
500	7	-								
550	5									
600	5									
650	5									
700	3									
750	4									
800	3									
850	3	-								
900	2									
950	2									
1000	2									
1050	2									
1100	2									
1150	1									
1200	1									
1250	2									
1300	3									
1350	4		C	ommonto						
1400	4			JUILIEURS						
1450	4									
1500	4									
1550	4									
1600	4									
1650	3									
1700	3									_
1750	3									
1800	3									
1850	2									
1900	3									
1950	4									
2000										
2000		1	L							_

Project:

Project:	Oakview Re	esidential Subdivis	ion							
Client	Oakview In	vestments I td			000	•				
Location:	Corner of P	ack Ormond & Ha	insen Road	8	PUS					
Material	Fine Sand		insen reduc	P	UIU	)				
Torget MDD (kg/m2)	1400.00				Civil Project Solo	itio-is				
Tal yet IVIDD (Ky/III2).	1090.00									
Specified requirement:	90%									
Target OIVIC:	17%									
Fill Depth:	0.6M									
		I.		- 1			01			r
Depth	Lot 70		Date	Location	DD	WD	%	%	%	Comments
-					Kg/m²	Kg/m²	Comp.	Noisture	AV	
100	1									
150	1									
200	2									
250	1									
300	2									
350	1									
400	2									
450	1									
500	1									
550	1									
600	2									
650	2									
700	3									
750	3									
800	5									
850	5									
900	5									
950	6									
1000	5									
1050	3									
1100	3									
1150	5									
1200	9									
1250	7									
1300	5									
1350	3		0							
1400	3		Cor	nments						
1450	2									
1500	4									
1550	3									
1600	4									
1650	3									
1700	4									
1750	3									
1800	1									
1850	4									
1000	4									
1900	5									
1950	5									
2000										

Project:	Oakview Residential Subdivision
Client:	Oakview Investments Ltd
Location:	Corner of Back Ormond & Hansen Road
Material:	Fine Sand
Target MDD (kg/m2):	1690.00
Specified requirement:	95%
Target OMC:	17%
Fill Depth:	Cut

Depth

Lot 71

Date	Location	DD Kg/m <sup>2</sup>	WD Kg/m <sup>2</sup>	% Comp.	% Moisture	% AV	Comment

100	0
150	0.5
200	0.5
250	1
300	1
350	2
400	1
450	2
500	3
550	4
600	3
650	4
700	3
750	2
800	2
850	2
900	1
950	2
1000	
1050	
1100	
1150	
1200	
1250	
1300	
1350	
1400	
1450	
1500	
1550	
1600	
1650	
1700	
1750	
1800	
1850	
1900	
1950	
2000	

Comments			



Project:	Oakview Re	esidential Subdivi	ision							
Client:	Oakview In	vestments Ltd			000	<b>N</b> "				
Location:	Corner of E	ack Ormond & H	lansen Road	10	I:PN					
Material:	Fine Sand				UIU	•				
Target MDD (kg/m2):	1690.00				Civil Project Solu	itions				
Specified requirement	95%									
Target OMC.	17%									
Fill Donth	1770 Cuit									
гш рерш.	Cui									
		1	<b></b>	T	חח	W/D	0/	0/	0/	T
Depth	Lot 72		Date	Location	., 2	VVD	70 Comp	70 Maisturo	70	Comments
					Kg/m <sup>-</sup>	Kg/m <sup>-</sup>	comp.	NUUSLULE	AV	
100	1									
150	1									
200	2									
250	1									
300	2									
350	3									
400	4									
450	5									
500	5									
550	5									
600	6									
650	6									
700	6									
750	6									
800	5									
850	5									
900	5									
950	6									
1000										
1050										
1100										
1150										
1200										
1250										
1200										
1250					٦					
1300			Cor	nments						
1400										
1450										
1500										
1550										
1600										
1650										
1700										
1750										
1800										
1850										
1900										
1950										
2000										







22/07/2021

125	HAN					
5	Yanari B	1.10 M	as de la Les	00 Let 01	Lane 1	
9	147	Lat 94 100	a lista	(009)	Service -	1
	0	0.0	640.1.		- E	Antes
10	Len st	-	0.0	10.41		CHAT.
4	ter tr 2	W LIND	0.0	Nab 1		
10	Ger 24	100000	920	LUI 44	14/102	14
9	) (14.88	Cit/+>	0.0	Lat \$3.		14
	Lini na	Laist	0.0	) Net Pr		10
	10 T	10		<u>я</u>	P. 10	

T/07/2021





13/09/2021



#### Project: Client: Location: Material: Target MDD (kg/m2): Specified requirement: Target OMC: Fill Depth:

Oakview Residential Subdivision Oakview Investments Ltd Corner of Back Ormond & Hansen Road Fine Sand 1690.00

95% 17% 0.8m



Depth	Lot 47	
100	1	
200	4	
300	8	
400	13	
500	12	
600	11	
700	15	
800	11	
900	1	
1000	2	
1100	2	
1200	2	
1300	3	
1400	3	
1500		
1600		
1700		
1800		
1900		
2000		

Data		DD	WD	%	%	%	Commente
Date	Location	Kg/m <sup>2</sup>	Kg/m <sup>2</sup>	Comp.	Moisture	AV	comments
2/07/2021	Central Lot 47	1558	1882	95.0%	20.8%	8.4%	First 500mm
2/0//2021	Contral, EOU 47						11131 5001111
21/07/2021	Middle lot 47	1563	1807	92.5%	15.6%	12.1%	
21/0//2021	Wildle lot 47	1543	1774	91.3%	15.0%	13.7%	
22/07/2021	Middle lot 47	1606	1803	95%	12.3%	12.3%	full height
22/07/2021	Wildle lot 47	1583	1779	94%	12.3%	13.5%	
30/07/2021	W/SP tostod	1631	1805	99.4%	10.7%	22.6%	PI 0 /17m
30/07/2021	WSF tested	1639	1814	99.9%	10.7%	22.6%	KE 7.47111
13/00/2021	Lot 47	1657	1900	<b>98</b> .1%	14.4%	12.4%	
13/0//2021	20147						
23/00/2021	Lot 47	1656	1972	98.0%	19.1%	-16.7%	half of lot v.
23/07/2021	20147	1698	2011	98.9%	18.5%	-15.0%	wet

Comments	
(02/07/2021) Weather was warm a	and fine. Soft under foot due to recent rain. Good consistent
level of compaction throughout. C	onsistent sand colouration and texture.
(21/07/2021) After confering w	ith Nathan from Initia the test was deemed a fail, On behalf of Initia, Angus
instructed the contractr that tes	t sites did not "pass" and to alow time to dry further and carry out furhther
	rolling where possible.
22/07/2021) This set of tests was o	deemed a fail. On behalf of Initia, CPS has instucted contractor
to allow more time for material to	dry before testring again.
(13/09/2021) Firm underfoot, bett	er general condition than other lots.
(23/09/2021) Results were consist	ent with visual inpspection. PR was generally good but some
lots too wet. Needs time	

# Project: Oakvi Client: Oakvi Location: Corne Material: Fine S Target MDD (kg/m2): 1690. Specified requirement: 95% Target OMC: 17% Fill Depth: 0.8m

Oakview Residential Subdivision Oakview Investments Ltd Corner of Back Ormond & Hansen Road Fine Sand 1690.00 95%



Depth	Lot 48
100	2
200	3
300	5
400	7
500	10
600	15
700	17
800	20
900	
1000	
1100	
1200	
1300	
1400	
1500	
1600	
1700	
1800	
1900	
2000	

Date	Location	DD	WD	%	%	%	Comments
σιε	Location	Kg/m <sup>2</sup>	Kg/m <sup>2</sup>	Comp.	Moisture	AV	Ourmente
2/07/2021	South East, Lot	1032	1787	99.5%	9.5%	13.1%	First 500mm
2/0//2021	48						111000000
21/07/2021	Middle lot 48	1576	1789	93.2%	13.5%	13.0%	
		1559	1765	92.2%	13.3%	14.1%	
22/07/2021	Middle lot 48	1562	1796	92%	15.0%	12.6%	full height
	-	1522	1748	90%	14.9%	15.0%	ļ
30/07/2021	WSP Tested	1617	1834	99%	13.4%	18.9%	RL 9.44m
		1608	1824	98%	13.4%	19.3%	
13/09/2021	Lot 48	1659.5	1888	98.1%	13.7%	11.5%	4
	Lot 48(plus	1628	1871	96%	14 0%	10.7%	
23/09/2021		1625	1902	97%	14.070	-9.5%	
Com	ments 21) Weather was wa	arm and fine.	. Soft under for	ot due to rec	ent rain. Goc	od consiste	nt level of
21/07/2021) instructed the (22/07/2021) Th	compaction ) After confering wi e contractr that test	throughout. th Nathan fro t sites did not	. Consistent sa om Initia the te t "pass" and te	nd colouratio est was deem o alow time f	on and textur ed a fail, On to dry further	e. behalf of li r and carry	nitia, Angus out furhther

(13/09/2021)Firm underfoot, better general condition than other lots.

(23/09/2021)Results were consistent with visual inpspection. PR was generally good but some lots too wet. Needs time

# Project: Oakview Res Client: Oakview Invo Location: Corner of Ba Material: Fine Sand Target MDD (kg/m2): 1690.00 Specified requirement: 95% Target OMC: 17% Fill Depth: 1.2m - 1.6m

Oakview Residential Subdivision Oakview Investments Ltd Corner of Back Ormond & Hansen Road Fine Sand 1690.00 95%



Depth	Lot 49
100	1
200	1
300	2
400	2
500	5
600	8
700	8
800	11
900	9
1000	9
1100	11
1200	8
1300	10
1400	
1500	
1600	
1700	
1800	
1900	
2000	

Data	Levetter	DD	WD	%	%	%	Commont	
Date	Location	Kg/m <sup>2</sup>	Kg/m <sup>2</sup>	Comp.	Moisture	AV	comment	
21/07/2021	Middle let 40	1499	1735	88.7%	12.7%	15.6%		
21/0//2021	Wildule lot 47	1522	1715	90.1%	12.9%	16.6%		
22/07/2021	Middle let 40	1521	1774	89.6%	17.2%	13.7%	full boigh	
22/07/2021	Wildule IOT 49	1521	1753	90.0%	15.3%	14.8%	runneign	
20/07/2021	W/SP Tostod	1606	1784	97.9	11.1	23.1	DL 0.4m	
30/07/2021	WSF Testeu	1610	1789	98.2	11.1	22.9	KL 7.4111	
12/00/2021	Lot 40	1585	1812	93.8%	13.8%	7.6%		
13/07/2021	LUI 49							
22/00/2021	Lot 10	1564	1868	92.6%	19.8%	-10.5%		
23/09/2021	LUI 49	1598	1892	94.2%	19.2%	-9.9%		

#### Comments

(21/07/2021) After confering with Nathan from Initia the test was deemed a fail, On behalf of Initia, Angus instructed the contractr that test sites did not "pass" and to alow time to dry further and carry out furthther (22/07/2021)This set of tests was deemed a fail. On behalf of Initia, CPS has instucted contractor to allow more time for material to dry before testring again.

(13/09/2021) Firm underfoot, better general condition than other lots.

(23/09/2021) Results were consistent with visual inpspection. PR was generally good but some lots too wet. Needs time

#### Project: Client: Location: Material: Target MDD (kg/m2): Specified requirement: Target OMC: Fill Depth:

17%

1.2m - 1.6m

Oakview Residential Subdivision Oakview Investments Ltd Corner of Back Ormond & Hansen Road Fine Sand 1690.00 95%



Data	1	DD	WD	%	%	%	Commente	
Date	Location	Kg/m <sup>2</sup>	Kg/m <sup>2</sup>	Comp.	Moisture	AV	COMMENTS	
21/07/2021	Middle lot 50	1541	1720	91.2%	11.6%	16.4%	1.0m to	
21/07/2021	Wildule Iot 50	1588	1734	94.0%	9.2%	15.6%	height	
22/07/2021	NIW corpor lot EQ	1583	1768	93.7%	11.7%	14.0%	full boight	
22/07/2021	NW COTTEL IOL SU	1562	1746	92.4%	11.8%	15.1%	Tun neigin	
20/07/2021	WSD Tostod	1556	1860	94.9%	19.5%	12.4%	DI 9.27m	
30/07/2021	war resteu	1562	1867	95.3%	19.5%	12.1%	KL 0.27111	
12/00/2021	WSD Tostod	1325	1751	80.8%	32.2%	8.7%	DL 0 020m	
12/00/2021	wor resteu	1324	1750	80.8%	32.2%	8.7%	KL 0.030111	
12/00/2021	Lot E0	1647.5	1879	97.5%	14.1%	10.7%		
13/07/2021	LUI JU							
22/00/2021	Lot 50 (plus	1575	1898	94.0%	20.5%	-12.3%	V. spongy	
23/09/2021	90deg)	1589	1905	94.9%	19.2%	-9.2%	under foot	

CPS

### Comments

(21/07/2021) After confering with Nathan from Initia the test was deemed a fail, On behalf of Initia, Angus instructed the contractr that test sites did not "pass" and to alow time to dry further and carry out further rolling where possible.

(22/07/2021) This set of tests was deemed a fail. On behalf of Initia, CPS has instucted contractor to allow more time for material to dry before testring again.

(13/09/2021)Firm underfoot, better general condition than other lots.

(23/09/2021) Results were consistent with visual inpspection. PR was generally good but some lots too wet. Needs time

# Appendix C Consolidation Settlement Monitoring Records



#### Oakview Settlement Lot Spike Survey Civil Project Solutions

Setup Surv	urvey 2021/09/27		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									
Pt#	North (m) Ea	ist (m)	RL GVD1926	Name	RL	Diff to S1	Diff to last	RL	Diff to S1	Diff to last	RL	Diff to S1 D	iff 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	LUI 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	9.017	LOT 62	9.018	0.002		9.010	-0.002	-0.003	9.021	0.000	0.006	9.019	0.002	-0.002	9.083	0.000	0.004	9.020	0.003	-0.003	9.012	-0.005	-0.008
1011	799109.21	409315.55	9.078	LOT 60	9.004	0.000		9.070	-0.000	-0.000	9.076	-0.004	-0.001	9.079	-0.001	0.001	9.745	0.007	0.000	9.000	-0.002	-0.003	9.074	-0.004	-0.005
1012	799118.01	409269 73	9 718	LOT 58	9 716	-0.002		9 717	-0.003	0.010	9 714	-0.004	-0.001	9 719	0.004	0.005	9 797	0.079	0.074	9 718	0.004	-0.079	9 71	-0.007	-0.003
1013	799109.12	409248.61	9.844	LOT 50	9.834	-0.010		9.836	-0.008	0.002	9.836	-0.008	0.005	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	01002	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 20	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
1020	799002.92	409234.80	9.009	LOT 39	9.008	-0.001		9.003	0.004	0.005	9.002	0.003	-0.001	9.000	0.000	0.003	9.742	0.083	0.077	9.000	0.001	-0.082	9.000	-0.003	-0.004
1027	799022.40	409220.03	9.702	LOT 30	9.701	0.001		9.707	0.003	-0.000	9.704	0.002	-0.003	9.703	0.001	-0.001	9.000	0.080	0.005	9.704	0.002	-0.004	9.773	-0.009	-0.011
1020	799059.70	409266.32	9.784	LOT 46	9,781	-0.003		9,788	0.004	0.002	9.784	0.000	-0.003	9.784	0.000	0.001	9.854	0.070	0.070	9,788	0.004	-0.066	9.78	-0.004	-0.008
1027	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 20	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	798910.39	409200.00	9.550	LOT 20	9.321	-0.006		9.329	-0.001	0.006	9.520	-0.002	-0.001	9.032	0.002	0.004	9.000	0.056	0.055	9.000	0.000	-0.055	9.020	-0.007	-0.007
1041	798903.07	409227.85	9 713	LOT 18	9 716	0.003		9 711	-0.003	-0.005	9 711	-0.000	0.001	9 712	-0.002	0.000	9 774	0.050	0.055	9 716	0.001	-0.058	9 705	-0.008	-0.007
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	798916.25	409101.89	10.345	LOT 16	10.343	-0.002		10.34	-0.005	-0.003	10.344	-0.001	0.004	10.341	-0.004	-0.003	10.434	0.089	0.093	10.348	0.004	-0.086	10.324	-0.021	-0.024
1046	798883.82	409113.22	10.310	LOT 17	10.302	-0.008		10.306	-0.004	0.004	10.303	-0.006	-0.003	10.293	-0.017	-0.010	10.382	0.072	0.089	10.290	-0.003	-0.092	10.271	-0.038	-0.019
1047	798924.04	409121.08	10.244	LOT 15	10.240	-0.004		10.245	0.001	0.005	10.241	-0.003	-0.004	10.242	-0.002	0.001	10.331	0.087	0.089	10.244	0.000	-0.087	10.227	-0.017	-0.017
1048	798930.14	409140.17	10.145	LOT 14	10.140	-0.005		10.139	-0.006	-0.001	10.139	-0.006	0	10.143	-0.002	0.004	10.224	0.079	0.081	10.146	0.001	-0.078	10.129	-0.016	-0.017
1049	798932.65	409169.31	9.991	LOT 13	9.984	-0.007		9.988	-0.003	0.004	9.987	-0.004	-0.001	9.986	-0.005	-0.001	10.062	0.071	0.076	9.986	-0.005	-0.076	9.98	-0.011	-0.006
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	/98974.721	10.090	LUI 11	10.090	0.000		10.091	-0.001	0.000	10.088	0.001	0.002	├										<del> </del>	
1052	409142.589	798995.671	10.098		10.098	0.000		10.099	-0.001	-0.001	10.098	0.000	0.001												
1053	409132.917	700020 020	10.156		10.15/	0.001		0.045	-0.002	-0.001	0.045	0.000	0.001											<del>_</del>	
1054	409100 101	799025 054	7.740 10 012	LOT 7	7.743	0.000		7.740	0.001	0.000	7.740	0.001	0.000											—— <del> </del>	
1055	409085 817	799019 157	9.95/	LOT 6	9.952	-0.001		9.952	0.000	0.000	9 952	0.002	0.000												
1050	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												
																						-			

Setup Surv	ey 2022/08/09				Surv	ey 2 2022/C	08/16	Surv	ey 3 2022/0	08/30	Sur	/ey 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



WENTZ - PACIFIC GEOTECHNICAL ENGINEERS

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<sub>w</sub>, 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 at 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 5 6 7	Confirming that the groundwater level assumed for design is still appropriate. Commentary amended to reference to NZGS Module 3. Amended 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	LL-2021-110301-00
Application(s):	NC-2021-110420-00

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 800m<sup>2</sup>. Therefore, Land Use consent will enable construction of a single dwelling on those residential lots that are less than 800m<sup>2</sup>. 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	Aspire	REPORT 1517 – 3	-	February 2021
And as updated by:		1517-RC-RD306 to 307 1517-RC-SW401 to 404 1517-RC-WW501 to 504	Rev A	14 June 2021
Stormwater Management Report And as	Aspire	REPORT 1517- 2	-	February 2021
updated by: Oakview Investments Limited, Proposed Wetland design for residential subdivision.		1517 M2 1517 M3		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	Bioresearches	64029	-	26
Ecology				January
Classifications –				2021
Hansen Road				
and Back				
Ormond Road,				
Gisborne				

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**

- 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.

<u>Staging:</u>

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	Time Desied	Maximum noise level (dBA)			
week	Time Period	Leq	L <sub>max</sub>		
	6:30am - 7:30am	60	75		
Mashdava	7:30am - 6:00pm	75	90		
vveekdays	6:00pm - 8:00pm	70	85		
	8:00pm - 6:30am	45	75		
	6:30am - 7:30am	45	75		
0.1	7:30am - 6:00pm	75	90		
Saturdays	6:00pm - 8:00pm	45	75		
	8:00pm - 6:30am	45	75		
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#### $L_{eq(t)} = 15 mins$

**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 Tairawhiti 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 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.

- 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 Councils 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, nobuild 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:
  - 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 geoprofessional 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 Tairawhiti 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
- I) 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 - <u>infolowernorthern@heritage.org.nz</u>; 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,

Heith 2-

Sarah Hunter
CONSENT MANGER

Dated at Gisborne this 17<sup>th</sup> day of August 2021.

# Appendix F Contractors PS3



## Schedule 6 – Form of Producer Statement – Construction

ISS	Earthwork Solutions Ltd		(Contractor)
то	Oakview Investments Ltd		(Principal)
IN F	RESPECT OF earthworks and infrast	tructure works for the Oakview residential development. (Development)	ages 1 & 2) escription of Contract Works)
AT	Lot 2 DP 424055, corner of Back Ormond Road and Hansen Road, Gisborne.		
			(Address)
Ear	thwork Solutions Ltd	. (Contractor) has contracted to	Ltd (Principal)
to c	arry out and complete certain bu	ilding works in accordance with a Contract titled.	Contract No. 1517
	****	<u> </u>	('the Contract')
(Proj 11	ect) Matt Mead		(Duly Authorised Agent)
a duly authorised representative of , believe on reasonable grounds that		Earthwork Solutions Ltd	
		Earthwork Solutions ltd	
has	carried out and completed:		
7	All		
	Part only as specified in the att	ached particulars of the contract works in accord	ance with the Contract
(Sign	And Agent on behalt of	Date	
Ear	thwork Solutions Ltd	·	
(Con Uni	tractor) it 2, 64 Aerodrome Road, Matawhero, (	Gisborne	
		4	

(Address)

SCHEDULE 1B			
CONTRACTOR'S CERTIFICATE UPON COMPLETION OF LAND DEVELOPMENT/SUBDIVISION			
Earthwork Solutions Ltd			
(Contractor)			
Oakview Investments Ltd			
(Principal) Gisborne District Council TO BE SUPPLIED TO:			
(Territorial authority) Stages 1 & 2 of the Oakview Residential Development			
(Description of laпd development/subdivision)			
AT:			
(Address)			
Earthwork Solutions Ltd Das 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. <sup>1517</sup> for			
Matt Mead Earthwork Solutions Ltd			
(Duly authorised agent) (Contractor)			
hereby certify that			
the construction, other than those outstanding works listed below, in accordance with the contract and in accordance with approved engineering drawings and specifications.			
24 03/10/2022 Date			
(Signature of authorised agent on behalf of)			
(Contractor) Earthwork Solutions Ltd Unit 2, 64 Aerodrome Road, Matawhero, Gisborne			
(Address)			
Outstanding works			
Copyright waived			