ENGEO

Expect Excellence

Bulk Earthworks Specification

Manapouri Grove
Kelson
Lower Hutt

These documents must be retained on site. Inspections may not be carried out if they are not.

BUILDING CONSENT

GRANTED
28/03/2022

HUTT CITY COUNCIL

HUTT CITY
TE AWA KAIRANGI

Submitted to:
Genesis Residential Ltd
C/- Trishn Nand
Wellington

ENGEO Limited
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12.11.2019
15777.000.000_28

ACENZ

Contents

ENGEO Document Control:

Report Title	Bulk Earthworks Specification			
Project Address	Manapouri Grove, Waipounamu Drive, Lower Hutt			
Project No.	15777.000.000	Document ID	28	
Client	Genesis Residential	Client Contact	Trishn Nand	
Distribution (PDF)	Trishn Nand			
Date	Revision Details/Status	WP	Author	Reviewer
12/11/2019	Issue for Information	BK	AS	AW

1 Introduction

ENGEO Limited has been requested to provide a Bulk Earthworks Specification for the earthworks at the Manapouri Grove subdivision, located between Kaitangata Crescent and Waipounamu Drive Kelson, Lower Hutt. It is proposed to excavate from the surrounding topography creating a cut to fill balance. The material excavated is thought to be predominantly Wellington Greywacke, with a thin overlying veneer of residual soils, colluvium and alluvium. The majority of the moderately weathered Greywacke rock will be used as structural fill within six Reinforced Soil Slopes (RSS), with the residual soils and colluvium blended with varying grades of rock to be used as bulk fill, outside of geogrid reinforcement areas.

2 General

2.1 Scope of Work

The works outlined in this specification include site clearances, stripping of topsoil and unsuitable material, stockpiling, subsoil drainage, construction of the final earthworks grades through cutting and filling, and shall be in compliance with the earthworks plans and this specification.

The Contractor is to adhere to the earthworks plans provided by Macro Ventures Ltd and this specification. Deviation from the earthworks plans or this specification shall be under the specific written permission of Macro Ventures or the Geotechnical Engineer, and failure to adhere to this will result in corrective re-work, at the Contractor's expense.

2.2 Standards and Specifications

All works shall comply with the specifications set out within this document and with the relevant requirements of the following standard specifications:

- NZS 4402 (1986) - Methods of Testing Soils for Civil Engineering Purposes
- NZS 4404 (2010) - Land Development and Subdivision Infrastructure
- NZS 4431 (1989) - Code of Practice for Earth Fill for Residential Development
- NZS 3604 (2011) - Timber-framed Buildings Standard
- NZTA Specification TNZ F/1 (1997) - Specification for Earthworks Construction
- NZTA Specification TNZ F/2 (2000) - Specification for Pipe Subsoil Drain Construction
- NZTA Specification TNZ F/6 (2000) - Specification for Geotextile Wrapped Aggregate Subsoil Drain Construction
- NZTA Specification TNZ F/7 (2000) - Specification for Geotextiles

2.3 Definition of Terms

Key terms referred to in this document are defined below:

- **Contractor**: Keith Bullock Contracting Ltd
- **Civil Engineer**: Macro Ventures Ltd
- **Geotechnical Engineer**: ENGEO
- **NDM**: Nuclear Density Meter
- **Principal**: Genesis Residential (Client)

2.4 Inspection Schedule

General inspections of the earthworks including cutting, filling, battering, subgrade preparation, drainage channels, shear key construction, fill certification, subsoil drain installation etc., shall be undertaken by the Geotechnical Engineer not less than three days a week during the bulk of the earthworks. Additional inspections may be requested as necessary by the Contractor, at additional cost to the Principal, subject to their approval.

3 Earthworks Materials

3.1 General

All materials other than those classified as unsuitable by the Geotechnical Engineer shall be conditioned as necessary and compacted to the standards outlined in this specification.

Before new fill is placed in any area on site, the Geotechnical Engineer shall be notified so that they may inspect the subgrade prior to fill being placed. No construction of fill may be undertaken until satisfactory inspection and approval is given by the Geotechnical Engineer.

3.2 Stockpiling

Temporary stockpile sites shall be the responsibility of the Contractor. Any such stockpile shall be developed to ensure the stability of the stockpiled material and underlying soils. Stockpiles must be located in such a way that they do not interfere with drainage lines and watercourses. Dust nuisance must be mitigated by either wetting the material or by covering the material (refer to the Civil Engineer for further detail if required).

3.3 Removal of Topsoil

All topsoil (as defined by the Geotechnical Engineer) shall be removed and stockpiled (or removed off site) in a planned manner in select areas within the site boundaries under the supervision of the Geotechnical Engineer. Care shall be taken during removal of the topsoil to avoid any contamination of the topsoil as it is intended to reuse the topsoil in garden and other soft landscaping areas – it is not acceptable to use topsoil as engineered fill. Topsoil stockpiling shall be managed in such a way as to mitigate degradation of the topsoil.

Mulch from any clearing works shall be stockpiled separately from clean topsoil and re-distributed on site under the guidance of the Civil Engineer at the completion of the earthworks.

3.4 Unsuitable Material

The Geotechnical Engineer shall determine which materials will be classified as “unsuitable” for use as bulk fill or topsoil. All unsuitable material within areas to be filled shall be removed as directed by the Geotechnical Engineer prior to filling works commencing. It is at the discretion of the Principal whether unsuitable material is stockpiled for alternative use or removed off site.

Care shall be taken such that unsuitable material and material suitable for filling are not mixed during excavation, transportation or stockpiling.

3.5 Subsoil Drains

We recommend that subsoil drains are installed at the boundary of the residual cut level and the new fill placed on site, while also being placed in any gully location requiring bulk fill works. Subsoil drainage shall be designed to prevent the possible future build-up of hydrostatic pressures beneath the fill which could potentially cause slope instability. Subsoil drain placement / fall and construction observation should be undertaken by the Civil Engineer to the project.

Sub-soil drains associated with the RSS embankments are discussed within the RSS Specification.

Sub-soil drainage location falls under the authority of the Civil Engineer.

The Civil Engineer shall inspect and confirm the construction of all subsoil drains prior to backfilling.

3.6 Engineered Fill Materials

Material to be used for engineered Bulk fill shall be sourced primarily from the earthwork cuttings into Colluvium, and Greywacke rock from on site excavation. Due to the likely variability of the material excavated from the site, we recommend that any high fines material (material greater than 35% passing a 0.075 mm sieve) is blended on site with rock fill in order to reduce the potential compressibility of the engineered fill material.

Filling requirements for the RSS embankments are provided in the RSS specification.

All fill shall be free of organic matter and any other unsatisfactory material, and of such quality that it will compact thoroughly without excessive voids or weaving when watered and rolled.

Rocks of greatest dimension in excess of two-thirds of the lift thickness shall be removed from any fill or crushed to a lesser size. The Geotechnical Engineer shall immediately be notified of any significant variations to the fill composition as further laboratory compaction testing will be required to provide effective on site validation of fill placement.

3.7 Fill Batter Gradients and the use of Geogrid

Geogrid is to be installed under the guidance of the Geotechnical Engineer where permanent proposed slopes are greater than the following criteria for a given soil type:

- Topsoil (planted): 1V:3H (18°)
- Existing Fill (cohesive): 1V:2.5H (22°)
- Existing Fill (granular): 1V:2H (26°)
- Engineered Fill (unreinforced): 1V:2H (26°)

Geogrid specification and placement shall be under the design and guidance of the Geotechnical Engineer.

4 Filling

4.1 General

It is intended that all materials, other than those classed as unsuitable by the Geotechnical Engineer, be conditioned as necessary and compacted to the specifications in this document.

No filling operation shall be undertaken until inspection and approval of the subgrade by the Geotechnical Engineer is received.

4.2 Fill Foundation Surfaces

Foundation surfaces for engineered fill shall be proof rolled, and inspected by the Geotechnical Engineer prior to filling.

Foundation surfaces shall not be wet or saturated prior to filling. Additional drainage may be required to drain the foundation surfaces; this shall be specified by the Geotechnical Engineer as necessary on inspection of the foundation surfaces.

4.3 Over Excavation

The Contractor shall direct his operation to avoid excavating beyond the designated profiles set out in the earthworks plan. Any over-excavation shall be remedied under the guidance of the Geotechnical Engineer and at the Contractor's cost, with the compacted fill meeting the requirements provided in this specification.

4.4 Compaction Specification for Engineered Fill

The standard of compaction and method of determination shall be as set out in NZS4431 and NZS4402. Laboratory proctor testing is required on newly sourced fill to determine the optimum moisture content and Maximum Dry Density characteristics for compaction verification.

The Contractor is responsible for arranging the Geotechnical Engineer to undertake compaction certification as works progress allowing at least five working days to complete the laboratory testing.

All fill shall be compacted in layers with a loose thickness no greater than 300 mm. Fill at depths greater than 1 m below finished grade shall be compacted to 95% Maximum Dry Density. Fill at a depth less than 1 m below finished grade or within 4 m of an unreinforced fill slope edge shall be compacted to 98% Maximum Dry Density.

Fill material shall be tested at a minimum rate of one NDM test per 4,000 m^3 placed or one NDM test per 1.5 m rise in fill level as per NZS4431, or as directed and required by the site Geotechnical Engineer. The initial 4,000 m^3 or 1.5 m of fill shall be tested more frequently, as outlined in NZS3604, to the satisfaction of the Geotechnical Engineer. The use of Scala probe and hand shear vane equipment is permitted to supplement but not replace NDM data.

The earthworks will not be passed nor certified until the Geotechnical Engineer is satisfied the fill has achieved the appropriate compaction criteria, as defined above, including the satisfactory completion of any settlement monitoring required.

4.5 Compaction Trial

A compaction trial shall be undertaken on site to ensure the compaction specification described above can be achieved. The trial shall involve the placement and compaction of site derived fill placed on existing fill in layers with a thickness of no greater than 300 mm up to 0.9 m in total thickness across a minimum area of 50 m^2. The initial 600 mm of the fill is to be compacted to 95% of Maximum Dry Density and is to be tested by the Geotechnical Engineer. The final 300 mm of fill shall be compacted to 98% of Maximum Dry Density and is to be tested by the Geotechnical Engineer.

Should the tests fail, it is the responsibility of the Geotechnical Engineer and Contractor to arrive at a solution to achieve the appropriate compaction specification set out in Section 4.5.

4.6 Settlement Monitoring Program

As part of the proposed on site QA/QC for the earthworks construction process, a settlement monitoring programme is required, and is described in the RSS specification.

No services or permanent infrastructure shall be placed within the fill of RSS structures until the recorded settlement, over a three-month period, indicates the fill settlement is within tolerable limits and this must be confirmed in writing by the Geotechnical Engineer.

4.7 Placement of Topsoil

On completion of earthworks to the satisfaction of the Geotechnical Engineer, topsoil shall be spread evenly on completed lots, verges and green-ways to the depths shown on the Earthworks Plan. The upper 20 mm of the topsoil layer shall be loose and ready for the application of seed and planting of vegetation. Topsoil below this layer shall be firmly compacted.

Topsoil shall not be placed on soil slopes greater than 1V:3H without approval from the Geotechnical Engineer.

4.8 Finalised Lot Fill Verification

Completed lots shall be verified by the Geotechnical Engineer in general accordance with the NZS3604 “good ground” requirement in order to provide a Geotechnical Completion Report (GCR). The number of tests undertaken on completion of the earthworks shall be determined by the Geotechnical Engineer. If an area does not meet the requirements of “good ground” the Geotechnical Engineer shall instruct the Contractor to undertake remedial works until “good ground” is achieved. Alternatively, a condition may be placed on the Lot Title stating that ‘specific engineering design’ is required for building foundations.

“Good ground” shall be determined using Scala Penetrometer tests in accordance with NZS3604 Clause 3.3.2(a) where the number of blows per 100 mm depth of penetration at each test site exceeds:

- Five down to a depth of 600 mm; and
- Three at greater depths.

Providing the set blow is relatively uniform, the number of blows per 100 mm may be obtained by averaging the number of blows for depths not exceeding 300 mm.

IMPORTANT: It should be noted that any geotechnical testing of the finished earthworks does not constitute suitability for Building Consent purposes and the Builder (and their Engineer) will be responsible for completing appropriate soils testing at the location of the proposed dwelling structure.

5 Cutting

5.1 General

Construction of batter slopes in cuttings must be in accordance with the Earthworks Plan or as determined by the Geotechnical Engineer following a site inspection. Completed cut slope profiles shall be inspected, mapped and approved by the Geotechnical Engineer.

5.2 Excavation

The Contractor shall excavate all soil and rock in accordance with the Earthworks Plan and this Specification. Permanent and over-steepened temporary batters in either rock or soil shall be inspected and approved by the Geotechnical Engineer.

Cut faces shall be cleared of loose or unstable material progressively as the excavation proceeds.

5.3 Batter Tolerances and Angles

Cut batter slopes shall be in accordance with the Earthworks Plan and shall not exceed 45° in competent rock. Permanent cuts in soil shall not exceed 1V:2H (26°), unless reinforced by geogrid. This shall be designed and specified by the Geotechnical Engineer.

If a batter is over-excavated beyond the recommended design laid out in the Earthworks Plan, then the batter must be inspected and approved by the Geotechnical Engineer. Should remedial works be required, the Geotechnical Engineer shall provide recommendations to the Contractor and the works will be completed at the Contractor's expense.

5.4 Soils within cut slopes

If completely weathered rock or soil is uncovered within the proposed cuts on site, the following batters must be adhered to:

Table 1: Cut Batter Angles

Unit	Permanent Cut Batter Angle	Temporary Cut Batter Angle	Comments
Topsoil	1V:3H (18°)	1V:2H (26°)	
Alluvium - Cohesive	1V:3H (18°)	1V:1.5H (34°)	
Alluvium - Granular	1V:2.5H (22°)	1V:1.5H (34°)	
Colluvium - Cohesive	1V:3H (18°)	1V:2H (26°)	
Colluvium - Granular	1V:2.5H (22°)	1V:1.5H (34°)	
Residual Soil	1V:2H (26°)	1V:1H (45°)	
Completely Weathered Greywacke	1V:1.5H (34°)	1V:0.7H (55°)	
Highly or Moderately Weathered Greywacke	1V:1H (45°)	1V:0.6H (60°)	

We also understand that if soils are uncovered within the cut faces, that a design solution utilising RSS slopes may be used; this will be a site specific design undertaken as required.

5.5 Remediation of Cut Instability

The Geotechnical Engineer shall observe the general stability of all cut slopes during earthworks and identify any obvious potential sources of instability within the cut slopes. Sources of potential instability may include shattered rock, shear zones, unfavourable defects, soft rock etc. The Geotechnical Engineer shall provide specific remediation design solutions as required for the Contractor to implement to achieve the appropriate standard of stability for the slope.

The cost of design and remediation of any unstable slopes shall be met by the Principal.

5.6 Drainage of Cut Slopes

All cut slopes over a height of 4 m shall have cut-off drainage ditches constructed above and below the slope to divert surface water away from the cut face.

Drains above the cut slopes shall follow the slope contour and discharge either into the gullies or into an approved stormwater system. Drains at the base of the cut slope shall discharge into an approved stormwater system.

Drainage ditches shall be in accordance with the Cut Slope Drainage Plan and Specification.

5.7 Vegetation of Cut Slopes

The Contractor shall ensure final cut slope profiles are left in sub-vertical furrows. Hydro-seed (within hydro-mulch) shall then be sprayed onto the cut face achieving 100% coverage. The hydro-mulch system shall be viscous and adhesive enough so as not to run off the slope after application in the event of rainfall.

The Geotechnical Engineer and Contractor shall inspect the cut slopes after hydro-seeding to ensure adequate coverage and thickness of the material on the cut faces.

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Wellington 5022
Macroventures.co.nz

Technical Memo – Expected ground conditions for stage 2

Project Name: **Manapouri Grove**
Project Number: **P0246**
TM No: **02**
Date: **17 March 2022**

Introduction

This memo has been prepared for Prime Designs to satisfy their queries about the expected ground parameters for stage 2 of the Manapouri Grove subdivision. Please note that these are inferred based on our previous experience with the site and are not definite until confirmed on site.

Engineering Discussion

From the comparison between the finished ground level and the design level we can see that all of stage 2A will be in cut ground between 2 -12m in depth, from our current observations of the site as it is presently we infer that the lots in stage 2A will likely be founding in greywacke rock and have a high probability of being good ground as defined by NZS3604.

Stage 2B has a mixture of cut and fill, the majority of these lots are in cut and we infer that these will likely meet the requirement of NZS3604 to be considered good ground. The lots constructed on fill 66-68, 73-79 wil found predominantly on fill.
We are confident in the filling methodology and the material being compacted that these lots will also meet the requirements of good ground, however given the nature of soils and compaction this is an inferrance only and not a guarantee.

Our inferences are based on the results attained from stage 1 of this project, the earthworks plan attached, the approved Resource consent earthworks plans and the RSS design report by ENGEO, attached at the rear of this document.

Refer to Table 1 (below) for a detailed description of the lots and the expected ground conditions at finished ground level.

Lot number(s)	Site description
40	Platform level is approximately 2m below original ground level with no fill on this lot, from conditions encountered on site we expect this to be competent rock.
41	As per lot 40
42	As per lot 40
43	As per lot 40, up to 6m below original ground level.
44	As per lot 40, up to 8m below original ground level.
45	As per lot 40, up to 10m below original ground level.
46	As per lot 40, up to 10m below original ground level.
47	As per lot 40, up to 10m below original ground level.
48	As per lot 40, up to 10m below original ground level.
49	As per lot 40, up to 10m below original ground level.
50	As per lot 40, up to 10m below original ground level.
51	As per lot 40, up to 6m below original ground level.
52	As per lot 40, up to 2m below original ground level.
53	As per lot 40, up to 2m below original ground level.
54	Platform level is between 0-2m below original ground level with a small section of fill on this lot from filling a drainage channel, from conditions encountered on site we expect this to be predominately competent rock. Further testing will be required to confirm the conditions of the fill.

Lot number(s)	Site description
55	As per lot 40
56	As per lot 40, up to 4m below original ground level.
57	As per lot 40, up to 4m below original ground level.
58	Platform level is between 0-2m below original ground level a small section of fill is shown on the earthworks plans, from conditions encountered on site we expect this to be predominately competent rock. Further testing will be required to confirm the conditions of the fill.
59	Platform level is between 0-2m below original ground level a small section of fill is shown on the earthworks plans, from conditions encountered on site we expect this to be predominately competent rock. Further testing will be required to confirm the conditions of the fill.
60	Platform level ranges from approximately 2-8m below original ground level with no fill on this lot, from conditions encountered on site we expect this to be competent rock.
61	As per lot 60
62	As per lot 60
63	As per lot 60
64	As per lot 60
65	Platform level ranges from approximately 2-8m below original ground level with up to 4m of fill on this lot, from conditions encountered on site we expect the cut to be competent rock, the fill will require further confirmation testing upon completion of construction.
66	Platform level ranges from approximately 2-6m below original ground level yo up to 10m of fill on this lot with the majority of the lot being in fill. The fill will require further confirmation testing upon completion of construction.
67	As per lot 66 with up to 12m of fill.
68	As per lot 66.
69	As per lot 60
70	Platform level is between 0-6m below original ground level a small section of fill is shown on the earthworks plans, from conditions encountered on site we expect this to be predominately competent rock. Further testing will be required to confirm the conditions of the fill.
71	As per lot 70
72	Platform level is between 0-6m below original ground level from conditions encountered on site we expect this to be predominately competent rock.
73	Platform level ranges from approximately 0-4m below original ground level with up to 6m of fill on this lot, this lot is predominately fill and will require further confirmation testing upon completion of construction.
74	The finished platform is on 2-14m of fill, this will require confirmation testing to confirm bearing capacity upon the completion of construction.
75	As per Lot 74 with up to 18m of fill.
76	As per lot 74
77	As per lot 74 with up to 10m of fill.
78	Platform level ranges from approximately 0-4m below original ground level with up to 10m of fill on this lot, this lot is predominately fill and will require further confirmation testing upon completion of construction.
79	As per lot 78
80	Platform level ranges from approximately 0-10m below original ground level no fill on this lot, we expect this lot to comprise of competent rock.
81	As per lot 80
82	As per lot 80
83	As per lot 80
84	As per lot 80
85	As per lot 80
86	As per lot 80
87	As per lot 80
88	As per lot 80
89	As per lot 80

Lot number(s)	Site description
90	Platform level ranges from approximately 0-8m below original ground level with up to 4m of fill on this lot, this lot is predominately cut and will comprise of competent rock.

Inspection Schedule and Construction Monitoring Guide

The contractor is to arrange for the engineering inspections, as detailed below, as and when required. A minimum of 48 hours advance notice is to be provided prior to scheduled inspection.

Inspection Items

Please tick the inspection items that applies for the building described in Form 2A		Comment
☑	Site soil verification	
☐	Inspection of backfill	
☐	Pile inspection	
☐	Pre-pour inspection of concrete foundation	
☐	Slab pre-pour inspection	
☐	Block-wall pre-pour inspection	
☐	Steel beams/ posts and connections	
☐	Bracing systems	
☑		

Construction Monitoring Services

Level		Review	Comment
☐	**CM1**	Monitor the outputs from another party's quality assurance programme against the requirements of the plans and specifications. Visit the works at a frequency agreed with the client to review important materials of construction critical work procedures and/or completed plant or components. Be available to advise the constructor on the technical interpretation of the plans and specifications	This level is only a secondary service. It may be appropriate where: • For the design consultant when another party is engaged to provide a higher level of construction monitoring or review during the period of construction or • When the project works are the subject of a performance-based specification and performance testing is undertaken and monitored by others.
☐	**CM2**	Review, preferable at the earliest opportunity, a sample of each important work procedure, material of construction and component for compliance with the requirements of the plans and specifications and review a representative sample of each important completed work prior to enclosure or completion is appropriate. Be available to provide the constructor	This level of service is appropriate for smaller projects of a routine nature being undertaken by an experienced and competent constructor and where a higher than normal risk of non-compliance is acceptable. It provides for the review of a representative sample of work procedures and materials of construction. The assurance of compliance of the finished

		with technical interpretation of the plans and specification.	work is dependent upon the constructor completing the work to at least the same standard as the representative sample reviewed.
☑	**CM3**	Review, to an extent agreed with the client, random samples of important work procedures, for compliance with the requirements of the plans and specifications and review important completed work prior to enclosure or on completion as appropriate. Be available to provide the constructor with technical interpretation of the plans and specifications.	This level of service is appropriate for medium sized projects of a routine nature being undertaken by an experienced constructor when a normal risk of non-compliance is acceptable.
☐	**CM4**	Review, at a frequency agreed with the client, regular samples of work procedures, materials of construction and components for compliance with the requirements of the plans and specifications and review the majority of completed work prior to the enclosure or on completion as appropriate.	This level of services is appropriate for projects where a lower than normal risk of non-compliance is required.
☐	**CM5**	Maintain personnel on site to constantly review work This level of service is appropriate for - Major projects - Projects where Construction Monitoring Services Page 3 of 5 procedures, materials of construction and components for compliance with the requirements of the plans and specifications and review completed work prior to enclosure or on completion as appropriate. the consequences of failure are critical - Projects involving innovative or complex construction procedures.	The level of service provides the client with the greatest assurance that the completed work complies with the requirements of the plans and specifications.

Disclaimer

While we have no reason to believe that the ground conditions will differ from what we expect, the nature of geology is unpredictable and our expectations are in no way a guarantee of the actual ground conditions on site..

Regards

Cameron Rogers
Civil Engineer – BE (hons)

BUILDING CONSENT

GRANTED
28/03/2022

HUTT CITY COUNCIL

BC220141

macroVentures

EARTHWORKS 2022 SEASON

64 WAIPOUNAMU DRIVE,
KELSON, LOWER HUTT
GENESIS RESIDENTIAL LTD

PROJECT REF:P0246

LOCALITY PLAN
SCALE: 1:5000

SUMMARY OF GRANTED CONSENTS:
Greater Wellington Regional Council Consent [34846] [35170] – Stream works
Greater Wellington Regional Council Consent [34845] [34848] – Earthworks
Greater Wellington Regional Council Consent [34847] – Reclamation

SCHEDULE OF DRAWINGS

SHEET #	TITLE	REV
C000-STG2	COVER SHEET	1
C100-STG2	EARTHWORKS SEASON 2022 PLAN	1
C101-STG2	BULK EARTHWORKS CUT/FILL PLAN	1
C102-STG2	CROSS SECTION 01	1
C103-STG2	CROSS SECTION 02	1
C104-STG2	CROSS SECTION 03	1

REV.	REVISION DETAILS	DRAWN	APP.
1	1ST ISSUE	18-02-2022 JM	-

macroVentures

| www.macroventures.co.nz |

PROJECT DETAILS
GENESIS RESIDENTIAL LTD
DEVELOPMENT OF
64 WAIPOUNAMU DRIVE, KELSON, LOWER HUTT

TITLE
COVER SHEET

0 50 100 150 200 250m
SCALE 1:5000 AT ORIGINAL SIZE

DATE CREATED	REF NO
18/02/2022	P0246

DRAWN	DESIGNED	APPROVED
JM	AP	TSN

SCALE	REVISION
1:2000 @ A3	1

DWG NUMBER	SERIES
C000-STG2	100

BUILDING CONSENT GRANTED 28/03/2022 HUTT CITY COUNCIL

BC220141

LEGEND:

- EXISTING CONTOURS
- PROPOSED CONTOURS
- **EXTENT OF WORKS**
- APPROVED STG 1 EW CONSENT
- EXTENT OF CUT
- EXTENT OF FILL

BULK EARTHWORKS NOTES:

1) VOLUMES BASED ON DEC 2021 DRONE SURVEY AND AS-BUILT DATA FROM SHL DRWG S19-0774-T11A STAGE 2 EARTHWORKS
2) TOPSOIL NOT ALLOWED FOR.
3) BULKING FACTORS NOT ALLOWED FOR.

NOTES:

1) EXISTING CONTOURS AT 1.0m INTERVALS
2) PROPOSED CONTOURS AT 1.0m INTERVALS

STAGE 2 VOLUME CALCS

STAGE	CUT m^3	FILL m^3	AREA m^2
STAGE 2A	114,775	305	16,050
STAGE 2B	71,625	29,275	14,085
RESIDUAL OUTSIDE STAGE 2A & 2B	34,090	160,220	27,665
TOTAL	220,490	189,800	57,800

REV.	REVISION DETAILS	DRAWN	APP.
1	1ST ISSUE	18-02-2022 JM	-

macroVentures

| www.macroventures.co.nz |

PROJECT DETAILS

GENESIS RESIDENTIAL LTD
DEVELOPMENT OF
64 WAIPOUNAMU DRIVE, KELSON, LOWER HUTT

TITLE

EARTHWORKS SEASON 2022 PLAN

0 15 30 45 60 75m

SCALE 1:1500 AT ORIGINAL SIZE

BUILDING CONSENT
GRANTED
28/03/2022
HUTT CITY COUNCIL

DATE CREATED	REF NO
18/02/2022	P0246

DRAWN	DESIGNED	APPROVED
JM	AP	TSN

SCALE	REVISION
1:1500 @ A3	1

DWG NUMBER	SERIES
C100-STG2	100

BC220141

N

STAGE 03

STAGE 02A

STAGE 02B

LEGEND:

- EXISTING CONTOURS
- **EXTENT OF WORKS**
- APPROVED STG 1 EW CONSENT
- EXTENT OF CUT
- EXTENT OF FILL
- DEPTH CONTOURS

BULK EARTHWORKS NOTES:

1) VOLUMES BASED ON DEC 2021 DRONE SURVEY AND AS-BUILT DATA FROM SHL DRWG S19-0774-T11A STAGE 2 EARTHWORKS
2) TOPSOIL NOT ALLOWED FOR.
3) BULKING FACTORS NOT ALLOWED FOR.

NOTES:

1) EXISTING CONTOURS AT 1.0m INTERVALS
2) DEPTH CONTOURS AT 2.0m INTERVALS

STAGE 2 VOLUME CALCS

STAGE	CUT m^3	FILL m^3	AREA m^2
STAGE 2A	114,775	305	16,050
STAGE 2B	71,625	29,275	14,085
RESIDUAL OUTSIDE STAGE 2A & 2B	34,090	160,220	27,665
TOTAL	220,490	189,800	57,800

REV.	REVISION DETAILS	DRAWN	APP.
1	1ST ISSUE	18-02-2022 JM	-

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PROJECT DETAILS

GENESIS RESIDENTIAL LTD
DEVELOPMENT OF
64 WAIPOUNAMU DRIVE, KELSON, LOWER HUTT

TITLE

BULK EARTHWORKS CUT/FILL PLAN

0 15 30 45 60 75m

SCALE 1:1500 AT ORIGINAL SIZE

BUILDING CONSENT GRANTED 28/03/2022 HUTT CITY COUNCIL

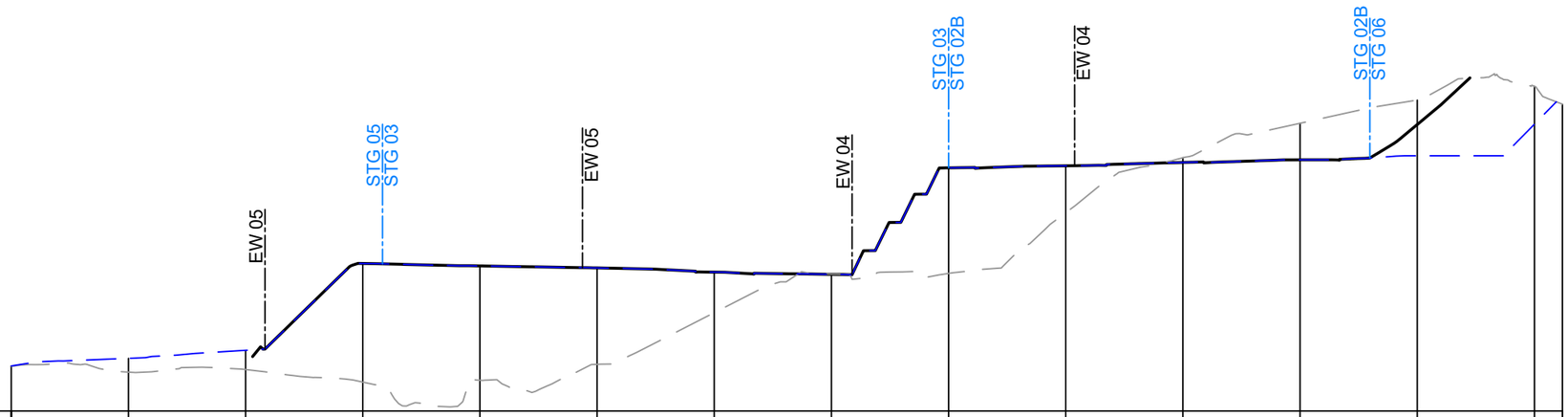
DATE CREATED	REF NO
18/02/2022	P0246

DRAWN	DESIGNED	APPROVED
JM	AP	TSN

SCALE	REVISION
1:1500 @ A3	1

DWG NUMBER	SERIES
C101-STG2	100

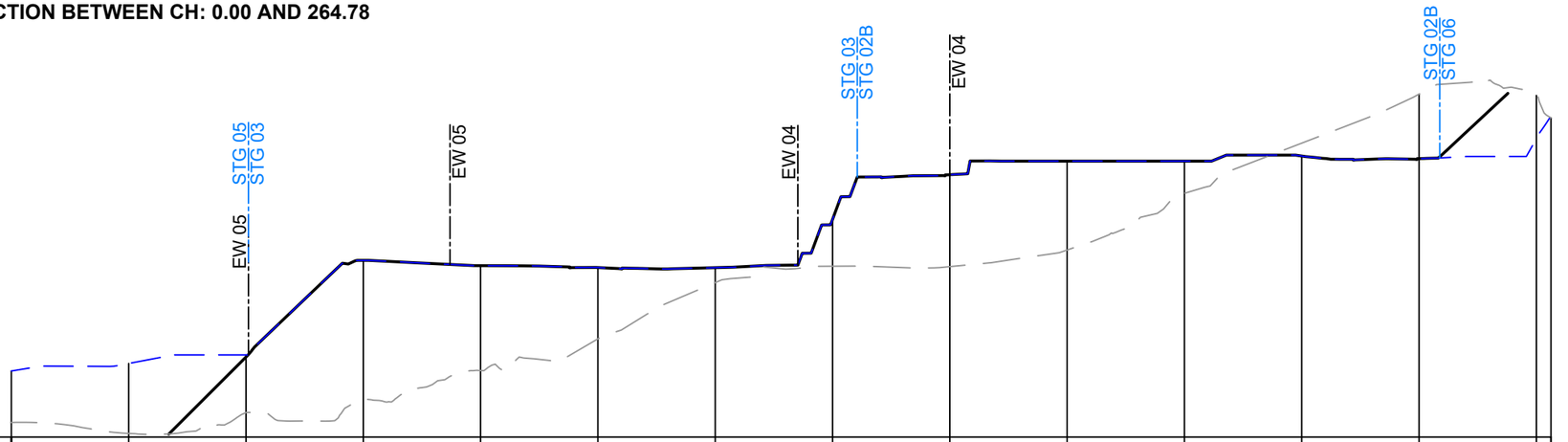
DATE PLOTTED: Friday, 18 February 2022 4:34:32 PM FILE PATH: D:\MACROVENTURES Dropbox\MACRO\200-PROJECT\P0246 Manapouri Grove\CAD\Drawing Sheets\Earthworks 2022\P0246 Earthworks 2022 Season.dwg



DATUM R.L. 142.00

CUT/FILL				20.22	19.49	16.44	6.91	-0.05	17.99	7.99	-0.81	-6.23	-4.17		
EXISTING LEVEL	149.60	148.62	149.06	146.92	147.23	149.95	158.75	165.34	165.45	175.80	185.17	191.04	194.99	197.34	194.28
STG 2 LEVEL				167.15	166.72	166.39	165.66	165.29	183.44	183.79	184.36	184.81	190.82		
DESIGNED LEVEL	149.67	150.97	152.34	167.15	166.72	166.39	165.66	165.29	183.44	183.79	184.36	184.81	185.50	190.88	
CHAINAGE	0.00	20.00	40.00	60.00	80.00	100.00	120.00	140.00	160.00	180.00	200.00	220.00	240.00	260.00	264.78

Section A
LONGITUDINAL SECTION BETWEEN CH: 0.00 AND 264.78



DATUM R.L. 138.00

CUT/FILL			9.47	23.81	17.87	12.14	2.54	7.96	15.67	15.13	5.48	-2.19	-10.99		
EXISTING LEVEL	140.48	138.60	142.16	144.29	149.33	154.73	164.31	167.10	167.03	169.87	179.52	188.07	196.43	196.21	192.40
STG 2 LEVEL			151.62	168.10	167.20	166.87	166.85	175.06	182.70	185.00	185.00	185.88	185.44		
DESIGNED LEVEL	149.24	150.53	152.00	168.10	167.20	166.87	166.85	175.06	182.70	185.00	185.00	185.88	185.44	188.83	
CHAINAGE	0.00	20.00	40.00	60.00	80.00	100.00	120.00	140.00	160.00	180.00	200.00	220.00	240.00	260.00	262.49

SECTION B
LONGITUDINAL SECTION BETWEEN CH: 0.00 AND 262.49

LEGEND:

- STAGE 02 DESIGNED GROUND SURFACE
- DESIGNED FINISH LEVELS
- DEC 2021 COMBINED SURVEYED SURFACE (DEC 2021 SHL AND DEC 2021 DRONE SURVEY)

REV.	REVISION DETAILS	DRAWN	APP.
1	1ST ISSUE	18-02-2022 JM	-

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PROJECT DETAILS

GENESIS RESIDENTIAL LTD
DEVELOPMENT OF
64 WAIPOUNAMU DRIVE, KELSON, LOWER HUTT

TITLE

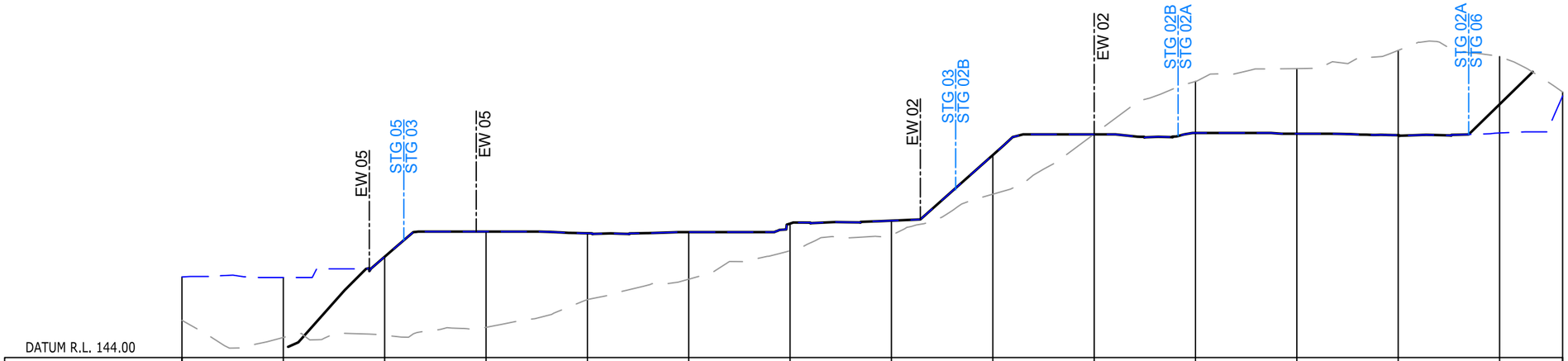
CROSS SECTION 01

0 10 20 30 40 50m

SCALE 1:1000 AT ORIGINAL SIZE

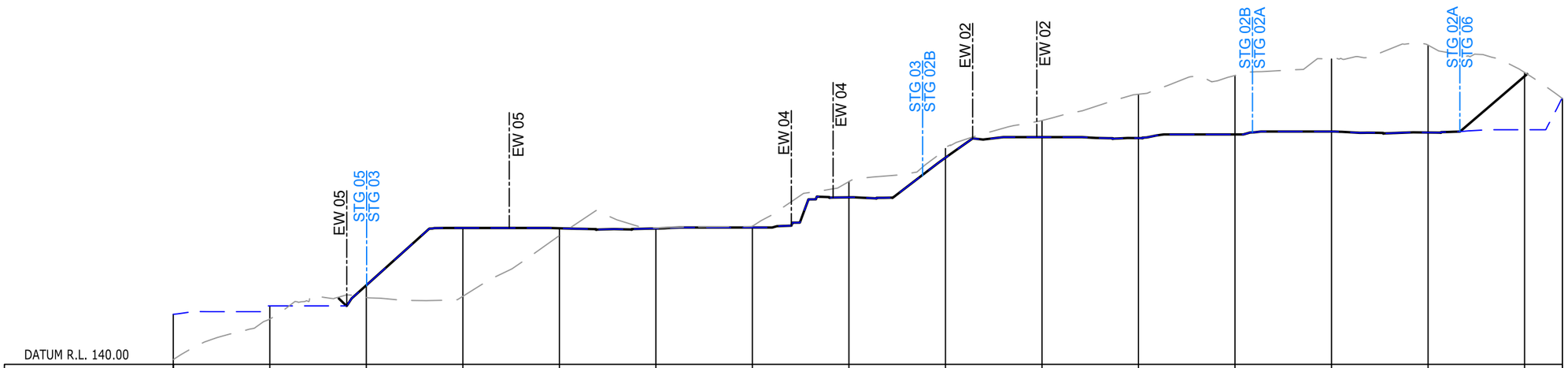
DATE CREATED	REF NO
18/02/2022	P0246
DRAWN	DESIGNED	APPROVED
JM	AP	TSN
SCALE	REVISION
1:1000 @ A3	1
DWG NUMBER	SERIES
C102-STG2	100

BUILDING CONSENT
28/03/2022
HUTT CITY COUNCIL



DATUM R.L. 144.00														
CUT/FILL		15.49	18.90	13.08	9.28	5.34	2.80	7.72	-0.07	-10.17	-12.85	-16.73	-9.42	
EXISTING LEVEL	151.35	147.97	148.40	149.96	155.44	159.47	165.10	168.21	176.24	188.11	198.49	201.02	204.62	203.39	196.40
STG 2 LEVEL			163.89	168.86	168.53	168.75	170.44	171.02	183.96	188.04	188.32	188.17	187.88	193.97	
DESIGNED LEVEL	159.91	159.80	163.89	168.86	168.53	168.75	170.44	171.02	183.96	188.04	188.32	188.17	187.88	188.32	195.62
CHAINAGE	0.00	20.00	40.00	60.00	80.00	100.00	120.00	140.00	160.00	180.00	200.00	220.00	240.00	260.00	272.44

Section D
LONGITUDINAL SECTION BETWEEN CH: 0.00 AND 272.44



DATUM R.L. 140.00														
CUT/FILL		2.52	14.14	1.50	-0.10	-0.27	-3.26	-1.90	-3.43	-9.07	-12.19	-15.00	-18.07	-0.80	
EXISTING LEVEL	141.00	149.38	153.85	154.08	166.65	168.21	168.58	177.81	184.65	190.44	195.89	199.76	203.17	206.04	200.40	195.00
STG 2 LEVEL			156.37	168.22	168.16	168.11	168.31	174.55	182.75	187.01	186.81	187.57	188.17	187.97	199.60	
DESIGNED LEVEL	150.36	152.10	156.37	168.22	168.16	168.11	168.31	174.55	182.75	187.01	186.81	187.57	188.17	187.97	188.54	
CHAINAGE	0.00	20.00	40.00	60.00	80.00	100.00	120.00	140.00	160.00	180.00	200.00	220.00	240.00	260.00	280.00	287.84

SECTION C
LONGITUDINAL SECTION BETWEEN CH: 0.00 AND 287.84

LEGEND:

STAGE 02 DESIGNED GROUND SURFACE

DESIGNED FINISH LEVELS

DEC 2021 COMBINED SURVEYED SURFACE (DEC 2021 SHL AND DEC 2021 DRONE SURVEY)

REV.	REVISION DETAILS	DRAWN	APP.
1	1ST ISSUE	18-02-2022 JM	-

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PROJECT DETAILS

GENESIS RESIDENTIAL LTD
DEVELOPMENT OF
64 WAIPOUNAMU DRIVE, KELSON, LOWER HUTT

TITLE

CROSS SECTION 02

0 10 20 30 40 50m

SCALE 1:1000 AT ORIGINAL SIZE

DATE CREATED	REF NO
18/02/2022	P0246

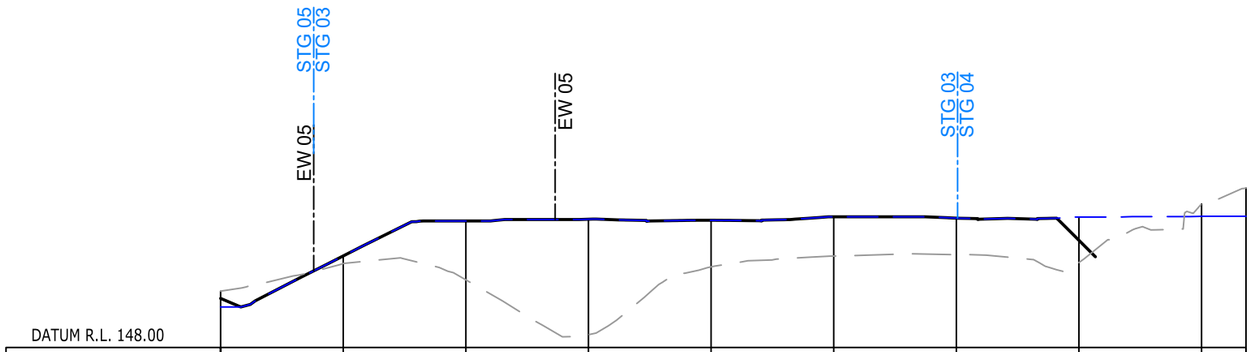
DRAWN	DESIGNED	APPROVED
JM	AP	TSN

SCALE	REVISION
1:1000 @ A3	1

DWG NUMBER	SERIES
C103-STG2	100

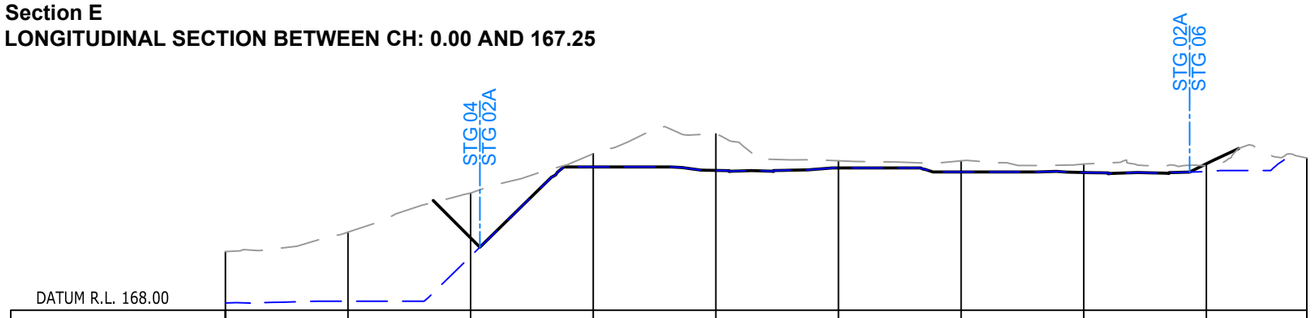
LEGEND:

- STAGE 02 DESIGNED GROUND SURFACE
- DESIGNED FINISH LEVELS
- DEC 2021 COMBINED SURVEYED SURFACE (DEC 2021 SHL AND DEC 2021 DRONE SURVEY)



CUT/FILL	-1.19	1.24	9.61	18.83	7.61	6.40	5.94	3.62		
EXISTING LEVEL	157.19	161.68	159.02	150.08	161.14	162.90	163.14	161.84	171.41	174.00
STG 2 LEVEL	156.00	162.93	168.63	168.91	168.74	169.30	169.08	165.46		
DESIGNED LEVEL	154.60	162.93	168.63	168.91	168.74	169.30	169.08	169.26	169.38	169.39
CHAINAGE	0.00	20.00	40.00	60.00	80.00	100.00	120.00	140.00	160.00	167.25

Section E
LONGITUDINAL SECTION BETWEEN CH: 0.00 AND 167.25



CUT/FILL		-7.31	-2.15	-5.95	-1.16	-1.82	-1.38	0.32	
EXISTING LEVEL	177.54	180.72	187.09	193.50	196.73	192.35	192.35	191.82	191.55	192.79
STG 2 LEVEL			179.78	191.35	190.78	191.19	190.53	190.44	191.87	
DESIGNED LEVEL	169.17	169.46	176.79	191.35	190.78	191.19	190.53	190.44	190.62	
CHAINAGE	0.00	20.00	40.00	60.00	80.00	100.00	120.00	140.00	160.00	176.38

SECTION F
LONGITUDINAL SECTION BETWEEN CH: 0.00 AND 176.38

REV.	REVISION DETAILS	DRAWN	APP.
1	1ST ISSUE	18-02-2022 JM	-

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PROJECT DETAILS

GENESIS RESIDENTIAL LTD
DEVELOPMENT OF
64 WAIPOUNAMU DRIVE, KELSON, LOWER HUTT

TITLE

CROSS SECTION 03

0 10 20 30 40 50m

SCALE 1:1000 AT ORIGINAL SIZE

DATE CREATED	REF NO
18/02/2022	P0246

DRAWN	DESIGNED	APPROVED
JM	AP	TSN

SCALE	REVISION
1:1000 @ A3	1

DWG NUMBER	SERIES
C104-STG2	100

BC220141

WORKS WITHIN THE RECREATION ZONE:
AREA: 1920m²
VOLUME: 650m³ (FILL), 9,500m³ CUT

WORKS WITHIN THE RECREATION ZONE:
AREA: 701m²
VOLUME: 5,571m³ (FILL), 0m³ CUT

SPEEDYS STREAM

RECREATION RESERVE
Lot 2
DP 91313

Lot 8
DP 54673

300
1.7ha

STAGE 01

STAGE 02

STAGE 03

STAGE 04

STAGE 05
RESIDUAL LAND SUBJECT TO FUTURE RESOURCE CONSENT

STAGE 06
RESIDUAL LAND SUBJECT TO FUTURE RESOURCE CONSENT

4 A
4 B
4 C
4 D
4 E

ROAD 01
ROAD 02
ROAD 03
ROAD 04
ROAD 05
ROAD 06
ROAD 07

KAITANGATA CRESCENT
MAJOR DRIVE
WAIPOUNAMU DRIVE
OTIRA GROVE
CRESCENT
CHRISTCHURCH

Lot 565 DP 45541
Lot 566 DP 45541
Lot 567 DP 45541
Lot 568 DP 45541
Lot 569 DP 45541
Lot 570 DP 45541
Lot 571 DP 45542
Lot 572 DP 45542
Lot 573 DP 45542
Lot 574 DP 45542
Lot 575 DP 45542
Lot 576 DP 44501
Lot 577 DP 44501
Lot 578 DP 44501
Lot 579 DP 44501
Lot 580 DP 44501
Lot 581 DP 44501
Lot 582 DP 44500
Lot 583 DP 44500
Lot 584 DP 44500
Lot 400 DP 44500
Lot 399 DP 44500
Lot 398 DP 44500
Lot 397 DP 44500
Lot 396 DP 44500
Lot 395 DP 44500
Lot 394 DP 44500
Lot 393 DP 44499
Lot 392 DP 44499
Lot 390 DP 44499
Lot 389 DP 44499
Lot 388 DP 44499
Lot 387 DP 44499
Lot 386 DP 44499
Lot 274 DP 42106
Lot 275 DP 42106
Lot 327 DP 42407
Lot 328 DP 42407
Lot 329 DP 42407
Lot 330 DP 42407
Lot 333 DP 42406
Lot 334 DP 42406
Lot 335 DP 42406
Lot 336 DP 42405
Lot 337 DP 42405
Lot 381 DP 44409
Lot 382 DP 44409

15B OTIRA GROVE
LOT 326, DP 41407.

KEY:

- CUT CONTOUR
- FILL CONTOUR
- 0 CONTOUR LINE (NO CUT/FILL)
- LOT 301 — PROPOSED WETLAND

QUANTITIES:
TOTAL BULK EARTHWORKS CUT TO FILL = 412,000m³

TOTAL SITE AREA TO BE DISTURBED AND VEGETATION REMOVED = 11.98 HA
STAGE 1 APPROVED AS PART OF STAGE 1 CONSENT IS = 7.19 HA
STAGE 2 TOTAL AREA AND VEGETATION REMOVABLE REQUIRED = 4.79 HA

REV.	REVISION DETAILS	DRAWN	APP.
B	REV B.	21 JULY 19	
		BY	TN
A	1ST ISSUE		

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PROJECT DETAILS
GENESIS RESIDENTIAL LTD
DEVELOPMENT OF
64 WAIPOUNAMU DRIVE

TITLE
EARTHWORKS VOLUME

0 20 40 60 80 100m
SCALE 1:2000 AT ORIGINAL SIZE

DATE CREATED	REF NO
16/8/2019	P1
DRAWN: TSN	DESIGNED: ----
APPROVED: ----	
SCALE: 1:2000 @ A3	STATUS: FOR CONSENT
DWG NUMBER: 03	REVISION: B

BUILDING CONSENT
GRANTED
28/08/2019
HUTT CITY COUNCIL

DATE PLOTTED: Friday, 30 August 2019 12:12:06 PM FILE PATH: C:\Users\trish\MACROVENTURES Dropbox\MACRO\200-PROJECT\P0001 Manapouri Grove\CAD\ss\Resource COnsent\17-016-RC-RevB.dwg