

Engineering Report

Marlborough Logistics Ltd (Ian Wiffen)

Vineyard Subdivision

at

Hardings Road, Riverlands

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Job No W04-1001

Table of Contents

Section		Page
1.	Synopsis	
1.1	Scope of the Investigation	2
1.2	Summary and Conclusions	2
1.3	Recommendations	2
1.4	Limitations	2
2.	Report	
2.1	Introduction	3
2.2	Property and Building Site Description	3
2.3	Foundations	5
2.4	Wastewater Control	6
2.5	Access	6
2.6	Water Supply	7
2.7	Storm Water Control	7
2.8	Power and Telephone	7
2.9	Conclusion	7
2.10	References	8
3.	Appendices	
A	Location and Site Plans	
B	Wastewater Design Sheets	
C	Penetrometer Results	
D	Stormwater Design Sheets	
E	Accessway Design Sheets	

1.0 Synopsis

1.1 Scope of the Investigation

This engineering report has been prepared for Ian Wiffen of Marlborough Logistics Ltd who is applying for resource consent to subdivide Lot 7 DP 12298, Hardings Road, Riverlands.

The purpose of this report is to present results of site investigations and to assess foundation requirements, access, stormwater control, water supply and wastewater disposal with regard to proposed house sites on Lots 1 – 12.

1.2 Summary and Conclusions

It is confirmed that all of the lots of the proposed subdivision have suitable building sites provided the conditions and recommendations covered in this report are implemented.

1.3 Recommendations

- 1.3.1 The building sites on both lots must be within the building envelopes indicated in this report.
- 1.3.2 The septic tank and irrigation system shall be designed and constructed to meet the requirements NZS 1547:2000, 'On-Site Domestic Wastewater Management'.
- 1.3.3 For lots 10, 11 and 12 specific foundation design carried out by a Chartered Engineer is recommended
- 1.3.4 The accessway for the subdivision shall be designed and constructed in accordance with MDC Code of Practice for Subdivision and Development and will be sealed to a width of 6 metres and 4 metres with 40mm wide timber edges. A total pavement thickness of 200mm is required.
- 1.3.5 Soakpits for stormwater disposal are recommended for lots 1 – 9 and shall have a minimum base area of 10 m² with a depth 1.2m. For lots 10 – 12 it is recommended that stormwater be piped into the nearby pond. Soakpits at 200metre intervals are recommended for the accessway apart from at the northern end where disposal can be via the piped system into the pond.

1.4 Limitations

This report is valid for two years from the date of issue and covers the inspection of the site in order to discuss house site location, foundation requirements, access, storm-water control, water supply and wastewater disposal, on behalf of Marlborough Logistics Ltd. Any other areas are outside the scope of this report.

The reliance by other parties on the information or opinions contained in the report shall, without our prior review and agreement in writing, be at such parties' sole risk.

2.0 Report

2.1 Introduction

This engineering report has been prepared for Ian Wiffen of Marlborough Logistics Ltd who is applying for resource consent to subdivide Lot 7 DP 12298, Hardings Road, Riverlands.

The purpose of this report is to present results of site investigations and to assess foundation requirements, access, stormwater control, water supply and wastewater disposal with regard to proposed house sites on Lots 1 – 12.

Site investigations were carried out by Jan Dimmendaal of this office on 3 and 4 February 2004 and also on 3 March 2004.

Current title owner(s):	Marlborough Logistics Ltd
Legal description, prior to subdivision:	Lot 3 DP 322082
Area:	29.244 Ha
Zoning:	Rural Three

2.2 Site Description / Discussion

The proposed subdivision is located on Hardings Road, with the existing access being approximately 100m from the intersection of Hardings Road and SH 1. The property boundary on the eastern side follows the toe of the Opawa River stopbank. The property is used as a commercial vineyard with the only buildings on the property being a large workshop/shed and an old farmhouse currently being used as a base for vineyard workers. The subdivision proposes that house sites on each lot are located amongst the existing vineyard and that the vineyard continues to operate on a commercial basis with the owner of each lot having a shareholding in a company set up to operate the vineyard.

In order to operate efficiently as a commercial vineyard there will be no boundary fences around the proposed lots so as to facilitate unimpeded travel of vineyard machinery up and down the rows.

Lot 1

Proposed lot 1 is a 2ha block situated in the southwest corner of the property with the western boundary being the current access to the property and the northern boundary being the Opawa River stopbank. Access to the lot is proposed via a shared driveway with adjoining lot 2. The Wairau/Awatere Resource Management Plan sets out a front and rear yard minimum requirement of 8 metres and side yard minimum requirements of 5 metres. The plan also requires that on-site sewage disposal be no closer than 30 metres from a surface water body or bore drawing ground water from an unconfined aquifer. A building envelope has been drawn taking these factors into account.

Lot 2

Proposed lot 2 is a 2.13ha block with access to the lot proposed via a shared driveway with adjoining lot 1. The existing old farmhouse is located on this proposed lot as is the water supply bore currently being used for vineyard irrigation and proposed as the water supply source for the lots in the development. The Wairau/Awatere Resource Management Plan sets out a front and rear yard minimum requirement of 8 metres and side yard minimum requirements of 5 metres. The plan also requires that on-site sewage disposal be no closer than 30 metres from a surface water body or bore drawing ground water from an unconfined aquifer. A building envelope has been drawn taking these factors into account.

Lot 3

Proposed lot 3 is a 2.17ha block with access to the lot proposed via the main access road servicing lots 3 to 12. The lot shares a driveway with adjoining lot 4. The Wairau/Awatere Resource Management Plan sets out a front and rear yard minimum requirement of 8 metres and side yard minimum requirements of 5 metres. The plan also requires that on-site sewage disposal be no closer than 30 metres from a surface water body or bore drawing ground water from an unconfined aquifer. A building envelope has been drawn taking these factors into account.

Lot 4

Proposed lot 4 is a 1.57ha block with access to the lot proposed via the main access road servicing lots 3 to 12. The lot shares a driveway with adjoining lot 3. The Wairau/Awatere Resource Management Plan sets out a front and rear yard minimum requirement of 8 metres and side yard minimum requirements of 5 metres. The plan also requires that on-site sewage disposal be no closer than 30 metres from a surface water body or bore drawing ground water from an unconfined aquifer. A building envelope has been drawn taking these factors into account.

Lot 5

Proposed lot 5 is a 1.98ha block with access to the lot proposed via a separate driveway leading of the main access road servicing lots 3 to 12. The Wairau/Awatere Resource Management Plan sets out a front and rear yard minimum requirement of 8 metres and side yard minimum requirements of 5 metres. The plan also requires that on-site sewage disposal be no closer than 30 metres from a surface water body or bore drawing ground water from an unconfined aquifer. A building envelope has been drawn taking these factors into account.

Lot 6

Proposed lot 6 is a 1.89ha block with access to the lot proposed via the main access road servicing lots 3 to 12. The lot shares a driveway with adjoining lot 7. The Wairau/Awatere Resource Management Plan sets out a front and rear yard minimum requirement of 8 metres and side yard minimum requirements of 5 metres. The plan also requires that on-site sewage disposal be no closer than 30 metres from a surface water body or bore drawing ground water from an unconfined aquifer. A building envelope has been drawn taking these factors into account.

Lot 7

Proposed lot 7 is a 1.88ha block with access to the lot proposed via the main access road servicing lots 3 to 12. The lot shares a driveway with adjoining lot 6. The Wairau/Awatere Resource Management Plan sets out a front and rear yard minimum requirement of 8 metres and side yard minimum requirements of 5 metres. The plan also requires that on-site sewage disposal be no closer than 30 metres from a surface water body or bore drawing ground water from an unconfined aquifer. A building envelope has been drawn taking these factors into account.

Lot 8

Proposed lot 8 is a 1.78ha block with access to the lot proposed via the main access road servicing lots 3 to 12. The lot shares a driveway with adjoining lot 9. The Wairau/Awatere Resource Management Plan sets out a front and rear yard minimum requirement of 8 metres and side yard minimum requirements of 5 metres. The plan also requires that on-site sewage disposal be no closer than 30 metres from a surface water body or bore drawing ground water from an unconfined aquifer. A building envelope has been drawn taking these factors into account.

Lot 9

Proposed lot 9 is a 1.92ha block with access to the lot proposed via the main access road servicing lots 3 to 12. The lot shares a driveway with adjoining lot 8. The Wairau/Awatere Resource Management Plan sets out a front and rear yard minimum requirement of 8 metres and side yard minimum requirements of 5 metres. The plan also requires that on-site sewage disposal be no closer than 30 metres from a surface water body or bore drawing ground water from an unconfined aquifer. A building envelope has been drawn taking these factors into account.

Lot 10

Proposed lot 10 is a 3.6ha block with access to the lot proposed via the main access road servicing lots 3 to 12. The lot shares a driveway with lots 11 and 12. The lot is bi-sected by the newly constructed section of stopbank. A landscape pond is being constructed on the north side of the new stopbank and extends across the lot the between the east and west boundaries. The Wairau/Awatere Resource Management Plan sets out a front and rear yard minimum requirement of 8 metres and side yard minimum requirements of 5 metres. The plan also requires that on-site sewage disposal be no closer than 30 metres from a surface water body or bore drawing ground water from an unconfined aquifer. A building envelope has been drawn taking these factors into account.

Lot 11

Proposed lot 11 is a 3.6ha block with access to the lot proposed via the main access road servicing lots 3 to 12. The lot shares a driveway with lots 10 and 12. The lot is bi-sected by the newly constructed section of stopbank. A landscape pond is being constructed on the north side of the new stopbank and extends across part of the lot the between the east and west boundaries. The Wairau/Awatere Resource Management Plan sets out a front and rear yard minimum requirement of 8 metres and side yard minimum requirements of 5 metres. The plan also requires that on-site sewage disposal be no closer than 30 metres from a surface water body or bore drawing ground water from an unconfined aquifer. A building envelope has been drawn taking these factors into account.

Lot 12

Proposed lot 12 is a 4.6ha block with access to the lot proposed via the main access road servicing lots 3 to 12. The lot shares a driveway with lots 10 and 11. The lot is bi-sected by the newly constructed section of stopbank. The Wairau/Awatere Resource Management Plan sets out a front and rear yard minimum requirement of 8 metres and side yard minimum requirements of 5 metres. The plan also requires that on-site sewage disposal be no closer than 30 metres from a surface water body or bore drawing ground water from an unconfined aquifer. A building envelope has been drawn taking these factors into account.

2.3 Foundations

Penetrometer tests were carried out at representative sites throughout the proposed subdivision (Refer Appendix D).

Sites 1 to 9 are considered suitable lots for a building constructed in accordance with the foundation requirements of NZS 3604: 1999. For lots 10, 11 and 12 specific foundation design carried out by a Chartered Engineer is recommended when the building footprint has been determined. In accordance with NZS 3604, clause 3.3.8 a minimum of 4 soil bearing capacity (scala penetrometer) test sites are required for a building of 200 m² size. Located on lot 12 is a small area used as a solid fill disposal site. This area is indicated on the plan and needs to be avoided with regard to the location of a dwelling on the lot.

2.4 Wastewater Treatment and Disposal

The septic tanks and drainage field systems must be designed to meet the requirements of the current wastewater standard NZS 1547:2000, 'On-Site Domestic Wastewater Management'.

The preliminary design of the wastewater systems (Appendix B) is based on a three bedroom (5 person) home. The table below sets out the design parameters and recommendations for each lot.

Lot	Soil Category (AS/NZS 1547:2000)	Design Irrigation Rate (DIR) (mm/week)	Indicative Perm. (Ksat) (m/d)	Recommended System	Disposal Field Area (m ²)
1	3	28	1.84	Innoflow AdvanTex AX10, low profile textile treatment plant and irrigation system	175
2	3	28	1.34		175
3	3	28	1.23		175
4	4	28	1.23		175
5	4	25	0.44		196
6	4	25	0.48		196
7	4	25	0.48		196
8	4	25	0.95		196
9	4	25	0.95		196
10	4	25	0.30		196
11	4	25	0.31		196
12	4	25	0.31		196

The discharge of effluent from a domestic on-site treatment system onto or into land is a permitted activity within the Wairua/Awatere Resource Management Plan subject to the effluent discharge being more than 30 metres from any surface water body. This is achievable on all of the twelve lots. Council also requires that the disposal area be located a minimum of 30 metres from any bore drawing water from an unconfined aquifer. This is relevant for lot 2, which has on it the water supply bore that will be serving the twelve lots. Test augers drilled at the same time as the permeameter tests found the watertable to be at a minimum depth of 1300mm confirming that effluent disposal will be possible at a level above the minimum 600mm separation from ground water level.

For all the lots the system recommended is the Innoflow Technologies Advantex AX 10, which produces an effluent quality that is suitable for irrigation system disposal. The benefit of this irrigation effluent disposal system is a lesser disposal area requirement. It is intended that the irrigation lines be installed between the grape vines adjacent to each of the lots. The irrigation system details are provided in Appendix B.

2.5 Access

Access to the existing block is via a driveway formed on legal road (not formed) of Hardings Road, a short distance from the SH 1 intersection. As part of the subdivision this existing entrance is to be closed. A new entrance, servicing the proposed lots is to be constructed approximately 150 metres east from the existing entrance. The proposed access will be sealed to a width of 6 metres and 4 metres with 40mm wide timber edges. The driveways to the individual lots are to be constructed to a similar standard. The proposed entranceway layout is as per Figure 13, Wairua/Awatere resource Management Plan (refer Appendix E).

Penetrometer tests were carried out at various locations along the proposed access road and the results used as a basis for the design of the access road pavement. A typical cross-section of the proposed access road is included in Appendix E.

The penetrometer test results were converted to CBR values using a relationship determined by Karunaprema & Edirisinghe, 2002, and show the subgrade CBR values to be well above the minimum value of 7 specified in MDC Code of Practice for Subdivision and Development (Fig. 9) as being required for an accessway sub-base. The total pavement thickness of 200mm was determined using the flexible pavement design chart (Fig.3) in the code.

2.6 Water Supply

Water supply for the proposed subdivision is to be sourced from an existing bore on the property, which is currently being used for irrigation only. A reticulation network design has been carried out by Cuddons Engineering, and provides for a trickle supply to each lot. For water supply network details refer to a separate report.

Water for fire-fighting purposes should satisfy the New Zealand Fire Service Code of Practice for Fire Fighting Water Supplies. In the case of this subdivision, the Opawa River being at close proximity to all the proposed lots is considered to be a suitable source of supply. Should lot owners wish to provide increased fire protection for their homes a domestic sprinkler system could be incorporated into the design of the new structure, connected to the water storage tank (25,000 litre size recommended).

2.7 Stormwater Control

The Marlborough District Council Code of Practice for Subdivision and Development requires that a 50-year return period be used for the design of stormwater systems to protect residential property. The contour of the land is basically flat with a slight fall towards the northern end of the property. A pond has been constructed on the north side of the recently relocated stopbank.

The proposed design is based on the assumption that the vineyard land surrounding each of the lots has its own existing drainage system (sub-soil and open drain). Stormwater from the individual house sites (roof and hardstand area) has been calculated using an allowance of 300m², a 50-year return period and a 30 minute storm duration. For lots 1 – 9, it is proposed that this water be disposed of using soakpits constructed on each lot. The soakpits are required to have a minimum base area of 10 m² with a depth 1.2m. Soakage tests carried out resulted in a lesser infiltration rate for lots 10 – 12 and it is proposed that stormwater from these lots be piped into the nearby pond. Soakage test results and detail of the soakpits are attached in Appendix D. Stormwater runoff from the accessway is proposed to be channelled into soakpits constructed at 200m intervals on either side of the high point apart from at the northern end where a catchpit will be connected to the piped system discharging to the pond.

2.8 Power and Telephone

Details of power and telephone services for the proposed subdivision are covered in a separate report.

2.9 Conclusion

It is confirmed that all of the lots of the proposed subdivision have suitable building sites provided the conditions and recommendations covered in this report are implemented.

With regard to building foundations sites 1 to 9 are considered suitable lots for a building constructed in accordance with the foundation requirements of NZS 3604: 1999. For lots 10, 11 and 12 specific foundation design carried out by a Chartered Engineer is recommended. For all the lots the wastewater treatment and disposal system recommended is the Innoflow Technologies Advantex AX 10, which produces an effluent quality that is suitable for irrigation system disposal.

The proposed accessway for the subdivision will be designed and constructed in accordance with MDC Code of Practice for Subdivision and Development and will be sealed to a width of 6 metres and 4 metres with 40mm wide timber edges. The total pavement thickness of 200mm was determined using the flexible pavement design chart (Fig.3) in the code.

For lots 1 – 9, it is proposed that stormwater be disposed of using soakpits constructed on each lot. The soakpits are required to have a minimum base area of 10 m² with a depth 1.2m. Soakage tests carried out resulted in a lesser infiltration rate for lots 10 – 12 and it is proposed that stormwater from these lots be piped into the nearby pond. Runoff from the accessway is proposed to be channelled into soakpits constructed at 200m intervals on either side of the high point apart from at the northern end where a catchpit will be connected to the piped system discharging to the pond.

2.10 References

1. Marlborough District Council Resource Management Plan
2. NZS 1547:2000 On-site Domestic Wastewater Management
3. NZS 1546.3:1998 On-site Domestic wastewater Treatment Units (Part1: Septic Tanks).
4. K.A.K Karunaprema, Department of Civil Engineering, University of Peradeniya, Peradeniya, Sri Lanka and A.G.H.J. Edirisinghe, Senior Lecturer, Department of Civil Engineering, University of Peradeniya, Peradeniya, Sri Lanka, A Laboratory Study to Establish Some Useful Relationships for the Use of Dynamic Cone Penetrometer, EJGE paper 2002-0228

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