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ENGINEERING / RESOURCE MANAGEMENT / ARCHITECTS LTD

Lynskey Worker Accommodation

Engineering Report

On-Site Wastewater Management

239 New Renwick Road, Fairhall

8 August 2008

Lynskey Workers Accommodation
On-Site Wastewater Management
239 New Renwick Road
Fairhall

Job No: 1409

Contents

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Engineering Geologist

8 August 2008

1 Introduction

1.1 It is understood that R. Lynskey is proposing to convert the existing garage on his property located at 239 New Renwick Road, Fairhall, into accommodation for vineyard workers. It is understood that the completed building will comprise five bedrooms and will be serviced by a bore water supply source. Details of the proposed development are shown on the site plan in Appendix 1 of this report (drawing 1409-C10).

1.2 The purpose of this report is to present the results of site investigations carried out in relation to stormwater management and on-site wastewater treatment and land application. The site investigation was carried out on 6 August 2008.

2 Description

2.1 The site is located to the south of New Renwick Road within an area of rural and vineyard development. The existing garage is located in the northern part of the site and to the east of the existing dwelling on the site, as indicated on the appended site plan.

2.2 The legal description of the property is Lot 2 DP 5719, and the land area is 8.096 ha. The site is zoned as 'Rural 3' according to the Marlborough District Council Proposed Wairau / Awatere Resource Management Plan.

2.3 A stream is located in the southern part of the site, approximately 500m to the south of the building development.

2.4 The geological map for the area (Begg and Johnston 2000) indicates that the site is underlain by poorly to moderately sorted alluvial terrace gravels of Pleistocene age. The soils map for the area (Landcare Research 2004) indicates that the surficial soils at the site lie next to a boundary between poorly drained clayey alluvium of the Paynter series and well drained stony alluvium of the Renwick series.

2.5 The subsurface investigation reported in Section 3 generally confirms the stratigraphy as indicated on the foregoing maps, with the surficial soils comprising clay loam soils of the Paynter series which are inferred to be underlain by gravels at depth.

3 Wastewater Management

3.1 The proposed land application area for the converted garage is positioned to the north of the existing garage and car parking area at the site, as indicated on the appended site plan. The landform comprising the land application area is essentially flat and is vegetated in open paddock.

3.2 No open surface water bodies are located within 30m of the land application area. Groundwater was not encountered within the subsurface investigation reported herein and is expected to be located at a depth in excess of one metre below ground level.

3.3 The existing septic tank system associated with the existing dwelling at the site was identified on the south side of the dwelling, at the position shown on the site plan. Two pump sheds and inferred bores were identified during the site appraisal, one adjacent to the southeastern corner of the existing dwelling and one along the boundary with the neighbouring property to the east, as also shown on the site plan.

The proposed land application area has been positioned to be a minimum distance of approximately 30m away from the existing septic tank and pump shed locations.

3.4 Three test pits were dug by spade and hand auger at the site in the general proposed effluent disposal area and their locations are shown on the site plan. Based on the soil assessment carried out, an average drainage category of 4 has been adopted, being the underlying limiting soil factor. The representative soil properties are:

W1

Lower Depth (m)	Horizon or Layer and boundary	Genesis	Description							Drainage Category
			Colour	Field Texture	% + 2mm Fragments	Compactness	Consistency	Structure	Moisture condition	
0.2	A	Topsoil	Brown	Silt loam	2%	Loose	Firm	Strong	Wet	2
0.7	B1	Alluvial	Yellow-brown	Sandy Silt loam	None	Loose	Stiff	Weak	Wet	2.5
1.0	B2	Alluvial	Orange-brown	Silty Clay loam	None	Medium dense	Very Stiff	Weak	Moist	4

W2

Lower Depth (m)	Horizon or Layer and boundary	Genesis	Description							Drainage Category
			Colour	Field Texture	% + 2mm Fragments	Compactness	Consistency	Structure	Moisture condition	
0.2	A	Topsoil	Brown	Silt loam	2%	Loose	Firm	Strong	Wet	2
0.6	B1	Alluvial	Yellow-brown	Sandy Silt loam	None	Loose	Stiff	Weak	Wet	2.5
0.8	B2	Alluvial	Orange-brown	Silty Clay loam	None	Medium dense	Very Stiff	Weak	Moist	4

W3

Lower Depth (m)	Horizon or Layer and boundary	Genesis	Description							Drainage Category
			Colour	Field Texture	% + 2mm Fragments	Compactness	Consistency	Structure	Moisture condition	
0.2	A	Topsoil	Brown	Silt loam	2%	Loose	Firm	Strong	Wet	2
0.5	B1	Alluvial	Yellow-brown	Sandy Silt loam	None	Loose	Stiff	Weak	Wet	2.5
0.8	B2	Alluvial	Orange-brown	Silty Clay loam	None	Medium dense	Very Stiff	Weak	Moist	4

3.5 An assessment of the best practical option has determined that primary treatment and shallow bed wastewater land application is appropriate and the most practical option for this property. The shallow beds should be dose pumped, as required by the MDC guidelines for category 4 soils.

3.6 A Primary Septic Tank Treatment System and dose pumped shallow bed effluent land application system is recommended. It is recommended that a Zabel outlet filter or equivalent be fitted to the septic tank system.

A primary treatment system such the system proposed will normally produce average effluent quality equal to or better than:

BOD after 5 days	< 100 g/m^3
Suspended solids	< 100 g/m^3

3.6 For the purposes of design it has been assumed that the proposed 5 bedroom dwelling to be constructed at the site will have a permanent occupancy of 10 people (as per MDC Guidelines for new on-site wastewater management systems) to calculate a design flow of 1,800 litres/day for the new dwelling. A minimum wastewater storage capacity of 4,500 litres is required.

A wastewater flow design allowance of 180 litres/person/day has been used in the design of the system. This allowance is in accordance with Appendix 4.2D of AS/NZS 1547:2000 and is based on a bore water supply source for the proposed dwelling.

3.7 The foregoing design flow combined with the flow from the existing dwelling at the site results in the maximum rate of discharge of 2,000 litres/day from any one property (Rural Rule 1.8.2), as identified by Keith Heather in the MDC letter dated 12 May 2008 (File Ref U080417).

As however the assessment reported herein has taken care to place the additional wastewater load from the development to ensure a minimum separation distance of 30m from the existing septic tank system and known bore locations in the vicinity of the land application area, then it is expected that there will be no adverse affects from the discharge arising from the cumulative effect on soil loading and groundwater quality.

3.7 Adopting a loading rate of 10mm per day, the total area of dose pumped shallow bed required is 180m^2, which equates to a minimum total length of 75m of 2.4m wide shallow bed (refer wastewater design sheets Appendix 3). It is recommended that this length of bed be constructed as 3 beds of 25m that are alternatively dosed via a sequencing valve. A recommended effluent shallow bed detail is provided on drawing 1409-C11 in Appendix 1.

Care should be taken during the construction of the driveway to ensure that the beds are placed outside the preferred driveway alignment and vice versa.

3.8 Prior to the proposed system becoming operational the system installer must certify that the system has been constructed according to the foregoing design and confirm that the system has been appropriately sized by the manufacturer and installed to meet the field design requirements. This certification must then be forwarded to Council.

3.9 Vehicular access to the system for maintenance will be available via the house access.

4 Recommendations

It is our opinion and recommendation that the wastewater management system for the proposed dwelling at the site comprise a primary septic tank treatment system fitted with a Zabel outlet filter or equivalent and dose pumped shallow bed effluent land application. Installation is to be in accordance with requirements and recommendations of NZS 1547:2000.

5 Limitations

This report is valid for two years from the date of issue and covers the design of a wastewater management system for the Lynskey workers accommodation at 239 New Renwick Road, Fairhall. Any other areas are outside the scope of this report.

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

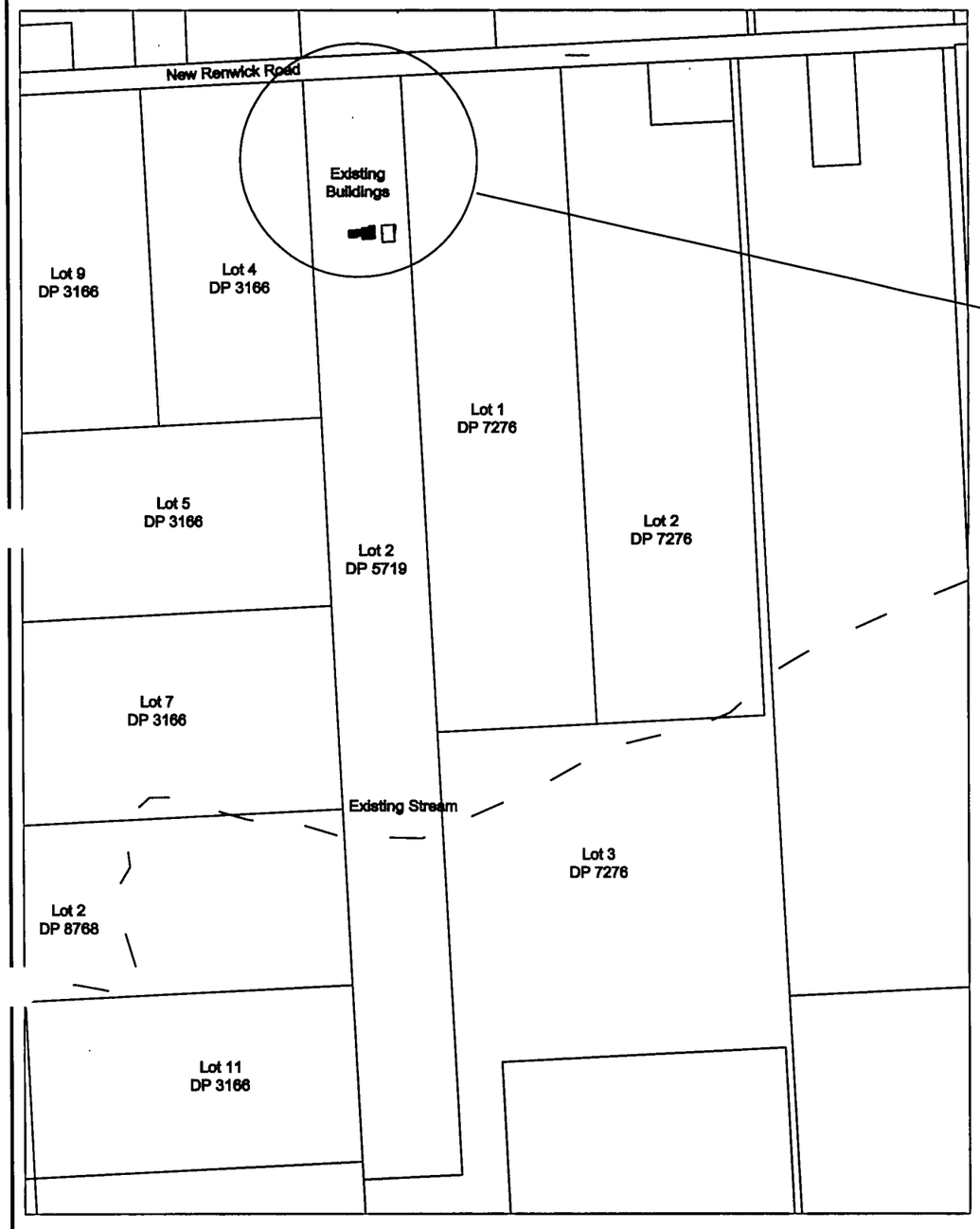
The conclusions and recommendations expressed herein have been prepared with respect to the proposed development at the site, and should not be taken out of context from the proposed development discussed herein or the remainder of this report.

6 References

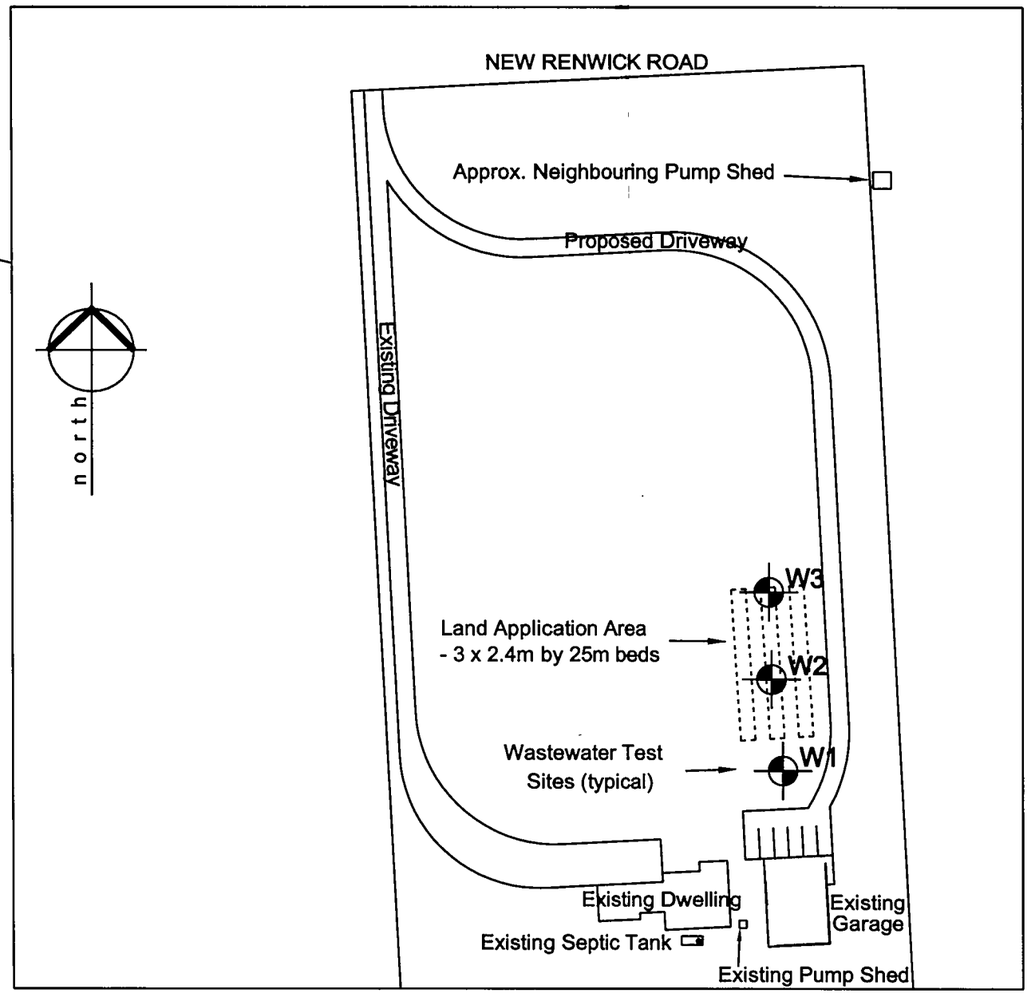
1. Begg, J.G. and Johnston, M.R. (compilers) 2000. New Zealand Geological Map 10: Geology of the Wellington area, 1:250,000.
2. Landcare Research 2004: Soils of the Wairau Plain.
3. NZS 1547:2000 On-site Domestic Wastewater Management.
4. Marlborough District Council Guidelines for new on-site wastewater management systems, July 2005.

Appendix 1 – Drawings

- 1409-C10: Site Plan
- 1409-C11: Drainage Field Specification



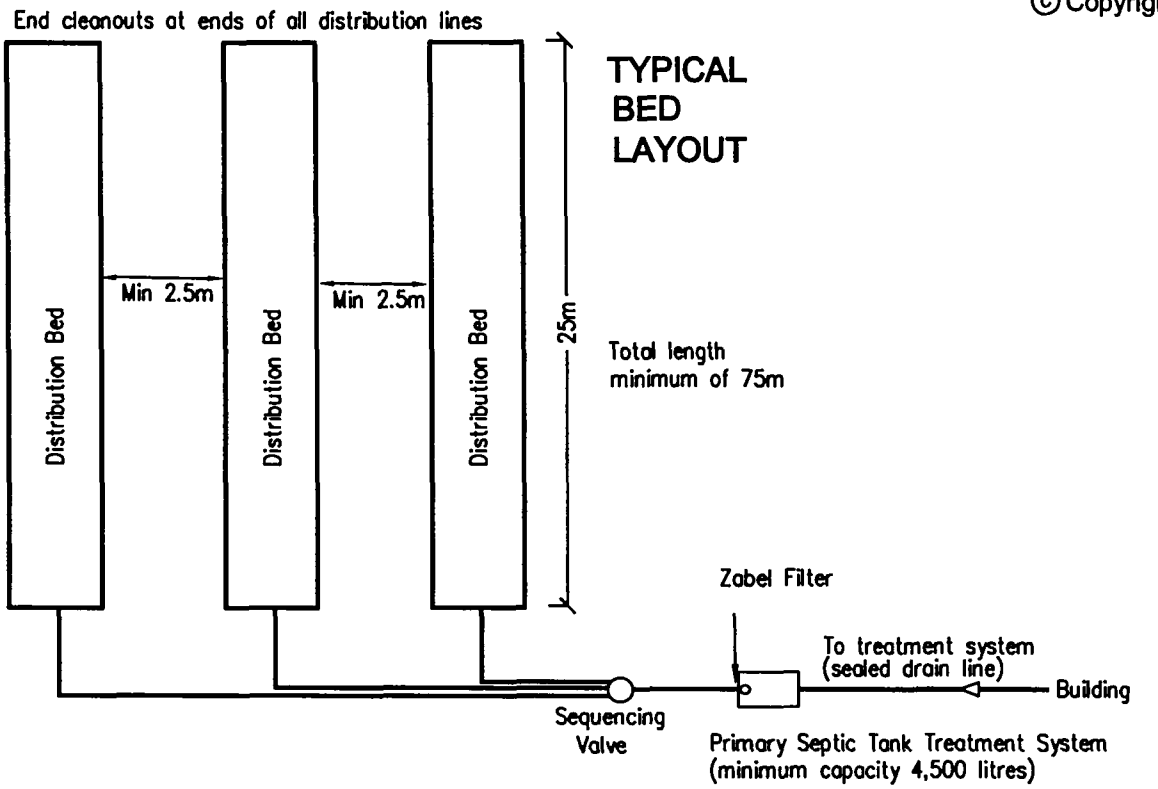
1. **SITE PLAN A**
1:5000



2. **SITE PLAN B**
1:1000

A3

AMENDMENT DATE DETAILS	AMENDMENT DATE DETAILS	smartalliances ENGINEERING / RESOURCE MANAGEMENT / ARCHITECTS LTD TEL. 03 579 6211 FAX 03 579 6233 PO BOX 546 BLENHEIM NEW ZEALAND	CLIENT LYNSKEY	PROJECT PROPOSED WORKERS ACCOMMODATION DRAWING SITE PLAN	DWG NO. 1409-C10 AMENDMENT DATE 05.08.08 SCALE As Shown CAD FILE REF: DRAWN DD APPROVED DD



SYSTEM USE & MAINTENANCE

1. The household sewage should not contain anything other than human waste and toilet paper, and food material such as may go down a kitchen sink drain. Garbage grinders are not recommended, although they need not be forbidden. More frequent de-sludging of the system may be needed if a garbage grinder is used.

Normal use in the house of soaps, detergents, bleaches, plumbing fixture cleaners, drain cleaners and disinfectants will not harm the functioning of the system or the soil absorption system.

2. Prohibited discharge to the system
- Oil/grease from a deep frier (for example).
- Stormwater or any drainage other than sewerage generated in the house.
- Petrol, oil or other flammable/explosive substances
- Garden, garage, and workshop chemicals (e.g. pesticides, paint cleaners, photographic chemicals, motor oil or trade waste.
- Disposable nappies & sanitary napkins.

3. It is an MDC requirement that any wastewater treatment system be regularly serviced and maintained by a contractor experienced in this field.

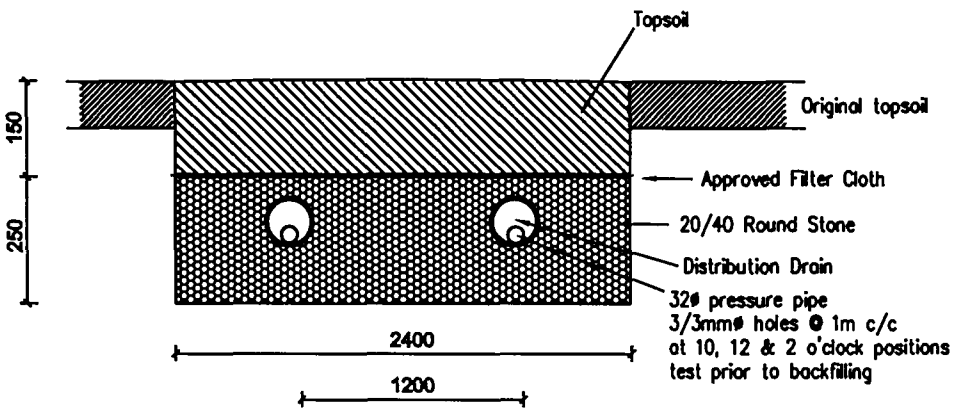
NOTES – BEDS

(1) Bed spacing 2.5m minimum between edges

(2) Distribution drains to be U-PVC 90mmø perforated pipe with perforations comprising at least 2% of surface area. (6mmø slots at 100mm centres from 4 to 8 o'clock positions).

(3) Distribution pipes to be laid flat.

(4) Sides & base of trench to be carefully scratched with a pointed tool before laying filter media.



TYPICAL BED CONSTRUCTION

A4

AMENDMENT DATE DETAILS	PROJECT LYNSKEY WASTEWATER 239 NEW RENWICK ROAD DRAWING DRAINAGE FIELD SPECIFICATION	smartalliances ENGINEERING / RESOURCE MANAGEMENT / ARCHITECTS LTD TEL 03 579 6211 FAX 03 579 6233 PO BOX 848 BLENHEIM NEW ZEALAND CAD FILE REF: DRAWN DD APPROVED DD	DWG NO. AMENDMENT DATE 08.08.08 SCALE NTS ISSUE

Appendix 2 – Wastewater Design Sheets

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WASTEWATER SYSTEM DESIGN SHEET

To AS/NZS 1547:2000

Client: Lynskey, 239 New Renwick Road, Fairhall **File No: 1409**

Proposed 5 Bedroom Dwelling

Intended water Supply:

~~*Public Supply*~~ *Bore/Stream/Dam* ~~*Rain water (roof collection)*~~

Local experience with existing on-site systems:

Septic Tank or similar (Primary treatment): *OK when installed properly with a correctly sized level drainage area and maintained.*

Secondary treatment: *Produce high quality effluent suitable for irrigation.*

Recommendation for this site: *Primary treatment system with dose pumped shallow land application beds*

DRAINAGE CONTROLS:

Need for surface water collector / cut-off drains?

AVAILABILITY OR RESERVE / SETBACK AREAS

Reserve area available for extensions, % of design area: *100%*

Setback distance? (between development and disposal system): *Min. as required by Resource Management Act*

Ksat, (m/day): ESTIMATED SOIL CATEGORY: *Category 4 - Imperfectly drained clay loam*

Design

RECOMMENDED D.I.R. *10.0* mm/day

(NOTE: Where DIR is 10mm/week or less, ETA/ETS trenches to Fig 4.5A7 NZS1547:2000 should be specified to enable the utilisation of such soils)

Occupancy: **10** L/person/day: *180* = **1800** L/day from Appendix 4.2D AS/NZS 1547:2000

DESIGN DAILY FLOW: **1800** L/day

SEPTIC TANK SIZE (MIN): *4500*

AREA REQUIRED: **180** m²

LENGTH REQUIRED: **75** m with **2.4** metre wide beds

RESERVE AREA REQUIRED: *100%* of specified drainage area

RECOMMENDATION :

Primary treatment system and 2.4m wide dose pumped land application beds to be a minimum total length of 75m (Pump sized by manufacturer).