SMART ASSOCIATES LTD
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4 August 2003

The General Manager
Marlborough District Council
PO Box 443
Blenheim

Statement Of Professional Opinion As To Land Stability

Description of Work: **Proposed Subdivision of Lot 5 DP305478**
Kakapo Bay Port Underwood

I **John Innes Smart** hereby confirm that:

I am a Registered Engineer experienced in the field of **soils engineering** and more particularly **land and foundation** stability and am authorised by Smart Associates Limited who are formally recognised by the Marlborough District Council. I am familiar with and understand the purpose of the Marlborough District Council's Engineers reporting standards. This professional opinion is furnished to the Marlborough District Council for the purpose of aiding its evaluation of this proposal

A site investigation report formatted as required is attached.

Site investigations have been carried out under my direction and are described in our engineering report dated April 2003 (Revised May 2003).
The following professional opinion is based on the assumption that the data obtained from these investigations is representative of the whole area under consideration. In my professional opinion having examined the site it is reasonable for Council to assume that the data referred to above is representative of the whole area under consideration.

In my professional opinion and having regard to the specifics of the site which I have investigated to the extent that acceptable engineering practices require, the plans and specifications are in accordance with acceptable engineering principles and practices and that a construction in accordance with such plans and specifications will meet proper engineering standards.

These works should be implemented under the guidance of a Registered Engineer experienced in soils engineering and slope stability. The work should be subject to a requirement, from the builder, of a Producer Statement (Construction), and, from the Engineer, of a Producer Statement (Construction Review).

This opinion remains valid for two years from this date.

John Smart, Director, Smart Associates
Registered Engineer

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UPDATED ENG REPT

Lynley, Copy for your information
Regards, Graeme Hayes.

4 August 2003

Mr G M Haymes
Gilbert Haymes & Associates Ltd
PO Box 380
Blenheim

COPY

Dear Graeme

Resource Consent Application U030469
Matthew Montgomery – Kakapo Bay, Port Underwood
Project M2002-672

The letter from Lynley Fletcher of Connell Wagner Ltd dated 22 July 2003 asks that I respond with the necessary information requested so that the application can be accepted for processing.

With reference to the Statement of Professional Opinion as to Land Stability, we are in error stating that we relied on the previous reports and plans listed. Certainly these plans and reports were referred to and then thoroughly reviewed. Most of the material in those reports supplied to us by our client still applies, but it is up to us to take responsibility for reference to them and their relevance to this application.

Accordingly we withdraw the Statement dated 27 May 2003 and replace it with the amended one of 31 July 2003, and advise that such information has been assessed for relevance in our report.

We have concluded that stream bank protection using gabion baskets is required along the north bank of the stream flood level. It is acknowledged that this becomes a non-complying activity for which resource consent is required. A revised application is to be made through Mr Haymes. We have discussed the effect of stream flood flows as suggested with Roger Fitzgerald at MDC.

As a result of these discussions:

1. we have made adjustments to refine the building site areas and locations. The objective here is to allow greater clearance from the secondary flood flow channel along the base of the hill

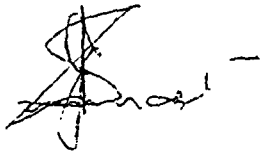
2. the gabion armour protection is amended to a series of 4m long gabion basket armour heads sloping down into the channel. The locations of the five gabion basket armour heads are shown on the site plan.

The comments of the Council's Rivers and Drainage Engineer have been noted. We agree that braced pole frame foundations allowing unimpeded temporary flow in a situation where detritus movement may dam and divert water toward the house sites. We think that 500mm is a safe minimum level but acknowledge their experience and recommendation to increase this by 1m to 1.5m.

The stream was dry when we visited (see photo attached to report). The average width of the stream bed is about 1.5m.

Our amended Statement and report are enclosed, with a copy of brief description for resource consent of structural stream protection works.

Yours sincerely



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ENGINEERING REPORT

Proposed House Sites for Subdivision at

Kakapo Bay, Port Underwood

For Mr Matthew Montgomery

John Smart
Registered Engineer
Smart Associates Ltd
April 2003 (Revised August 2003)

Job No M2002-672

CONTENTS

A SYNOPSIS

1.0 Scope of the Investigation

This report has been prepared for Mr Matthew Montgomery, solely for the purpose of providing an engineering report in regard to the proposed subdivision at Kakapo Bay on the Port Underwood Road.

The report covers the inspection of the site and soil characteristics in order to discuss site stability, flooding, foundation requirements, access, stormwater control and wastewater disposal only.

2.0 Summary and Conclusions

We confirm that the proposed subdivision is on stable ground slopes and that the site is suitable for the subdivision into two residential lots. A house site is available for each proposed lot, provided the conditions and recommendations covered in this report are implemented.

3.0 Recommendations

3.1 Structural items outside the scope of NZS 3604:1999, for the construction of any proposed dwelling, should be designed by a registered engineer.

3.2 House foundations are to be braced timber pole platforms cast into concrete footings with minimum floor height above ground of 1.5m.

An on-site inspection by a registered engineer should be carried out following excavation of the post-holes and prior to concrete backfill, to ensure adequate bearing material into stable sub-strata is found.

3.3 Established vegetation should be left intact to prevent uncovered soils from being subject to erosion. Any existing root systems will help prevent local shallow soil slumps.

3.4 We recommend that a potable water supply be taken from the existing stream. This supply should be augmented by filtered roof water collected in storage tanks with a minimum volume of 30,000 litres.

An over-flow pipe should be installed to discharge into the adjacent stream bed.

3.5 Right of way easements will be required to provide access along the access road for both proposed sections.

3.6 We recommend that an AWTS system be used for each dwelling, designed in accordance with requirements and recommendations of AS/NZS1547:2000.

3.7 The AWTS system should be designed for a minimum Design Irrigation Rate (DIR) of 35mm/week, indicative of a Category 2 weakly structured sandy loam. Our calculations (Section C14.0) find that a 3 bedroom (5 person) building would require 180m of dripper line and therefore a minimum 180m ^{2} drainage field, using an AWTS system.

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

3.9 Prior to subdivision some of the existing stream bends will require reinforcement, as indicated on the attached site plan (refer SK 001A), to ensure the banks remain stable and do not 'creep' towards the house sites.

3.10 Gabion baskets forming armour heads are considered suitable for bank stabilisation works.

Ongoing maintenance of gabion baskets and existing banks will be required of the property owners.

4.0 Limitations

The report covers the inspection of the site and soil characteristics in order to discuss site stability, foundation requirements, access, storm water control and wastewater disposal for the proposed subdivision as shown on the proposed subdivision plan by Gilbert Haymes & Associates Ltd only. Any other areas are outside the scope of this report.

This report is applicable to the site specified in the report only, on behalf of Mr Matthew Montgomery, and is valid for two years from issue.

B REPORT

5.0 Introduction

This report has been prepared for Mr Matthew Montgomery, solely for the purpose of providing an engineering report for the proposed subdivision of his Kakapo Bay property on the Port Underwood Road, to provide two separate titles with approved house sites.

The report covers the inspection of the site and soil characteristics in order to discuss site stability, foundation requirements, access, stormwater control and wastewater disposal in relation to the proposed extension works only.

A site visit was made on 26 March 2003 by John Smart and Matthew Harris, of Smart Associates Ltd.

Current title owner(s) representative:	Matthew Montgomery
Legal description, prior to subdivision:	Lot 5 DP305478
Area, prior to subdivision:	18627m²
Zoning:	Sounds Residential overlooking Coastal Marine Zone 1

6.0 Site Description / Discussion

The property is situated south and southeast of the Port Underwood Road in Kakapo Bay.

The existing site is approximately square in shape and prior to the proposed subdivision, is bounded by titles on its northwest and southwest sides, by the Port Underwood Road on its northeast side and the foreshore reserve to the southeast.

The main area of the property generally slopes down to the foreshore reserve with a southeasterly aspect at moderate slopes and is mainly covered with grass; however the northeast side of the property forms the base of the adjacent hills and climbs up to the Port Underwood Road.

Access is from the Port Underwood Road via an access road running southeast down the southwest edge of the property.

A stream currently runs through the property over the southwest side of the site, flowing generally in a southeasterly direction. Usually only flowing with a small volume, the stream shows a history, by inspection of its profile, of carrying substantial flood water quantities during extreme storm events. This is due to its large catchment area in the hills above Kakapo Bay.

A smaller watercourse also exists parallel to the stream on the northeast side of the property, which runs dry most of the year.

At the time of writing this report the section does not connect into any existing reticulated water supply and sewerage systems.

The property owners wish to subdivide the existing section into two lots as shown on the attached proposed subdivision plan (refer section C11.0).

Specific construction items will need to be addressed for this work to be carried out as follows:

Specific Items

6.1 Foundations

The soil bearing capacity of the ground around the areas of the proposed house site is considered to be consistently greater than 100 kPa at depths over 200mm, lending itself to the use of pole frame/piled platform foundations designed by a registered engineer.

Due to the slight risk of flood water inundation across the site during very rare and extreme storm water events we recommend that the finished ground floor level of any building be built at least 1.5m above adjacent ground level.

House foundations are to be braced timber poles cast into concrete footings.

Timber pole foundations should be cast into concrete footings, following on-site inspection by a registered engineer, to ensure adequate bearing material into stable sub-strata is found.

6.2 Wastewater Control

No reticulated wastewater system is connected to the site.

Due to the relatively small areas for drainage fields together with the close proximity of a watercourse, which may flood for short periods of time in the rare circumstances of extreme storm events, an AWTS system is considered best.

It is considered that an AWTS system would have a shorter recovery time following a short-term flood than a conventional septic tank drainage field.

An AWTS system used on either of the proposed subdivided sections should be designed to meet the requirements of the current waste water standard NZS1547:2000 'On-site domestic wastewater management'.

Our on-site soil permeability tests show that both of the proposed sections should be designed for a minimum Design Irrigation Rate (DIR) of 25mm/week, indicative of a category 4 clay loam soil.

AS/NZS1547:2000 uses the number of bedrooms in a dwelling as the basis for assessing the number of persons to be considered in any design. Accordingly, the AWTS system capacity and drainage field size for the two proposed lots should be confirmed when the size of any proposed housing is known.

The system should be designed in accordance with the requirements and recommendations of AS/NZS1547:2000.

Standard or full water reducing fixtures may be considered for use at the design stage in order to reduce the size of the specified minimum drainage area.

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

6.3 Access

Access to the site is provided via an existing rough access road running southeast from the Port Underwood Road.

The access road is constructed of hard fill and stones which will require maintenance to remove vegetation which has grown through low traffic use.

A Right of Way easement will need to be created to provide access to both sites along this existing access road. We understand that easements will also be created to allow access for all parties down to the foreshore reserve. Vehicle access and parking will be provided on the south side of the stream.

Permanent pedestrian access, from the access road over the existing stream, in order to get to the house sites will need to be provided.

6.4 Water Supply

The existing stream is considered to be the best source of water for the two sites. The annual rainfall is believed to be approximately 1300mm, which should supply enough water if each dwelling uses sufficient storage. We recommend that each dwelling should be able to store a minimum of 30,000 litres.

The storage tanks should be fitted with an over-flow pipe set up to discharge into the adjacent stream bed.

The existing stream flow should be tested to ensure it provides a potable water supply in accordance with the requirements of Marlborough District Council's drinking water standards.

6.5 Stormwater Control and Flooding

Established vegetation is to be left intact to prevent uncovered soils from being subject to erosion from any extreme storm water events during and following construction. Existing root systems will help prevent local shallow soil erosion.

Prior to subdivision some of the existing stream bends will require reinforcement, as indicated on the attached site plan (SK001A and SK 002A), to ensure the banks remain stable. A review of Davidson Partners Ltd assessment, dated 26 June 1996, confirms that the catchment for this stream under a 50 year peak flow would be in the order of 3.6 cumecs.

Gabion baskets forming armourheads placed at 45° to the north bank line are considered suitable for stabilising the channel at the bends facing towards the house sites. No other special measures are considered necessary to control bed degradation. As the beach provides a natural level control and the channel length will not be shortened, the bed slope is not considered to be likely to increase and hence scour potential is not likely to increase.

Ongoing maintenance of this new bank protection and those existing banks not 'upgraded' will be required. Debris left in the channel after flooding should be cleared by property owners.

A previous report by Davidson Partners Ltd, dated 30 April 1996, noted that when the culvert under Port Underwood Road blocks, water backs up and travels down towards the Guards' house and flows around the northern side and back to the existing stream channel. However, we believe that road and culvert works have been carried out since this previous report, to make allowance for this.

A smaller water course also exists parallel to the stream on the northeast side of the property which intercepts seepage and runoff water from the slopes between the Port Underwood Road and the valley floor; it appears to flow with water during storm events only and is not considered significant, being dry for most of the year.

Although no significant flood threat to the house sites is likely to present itself following the stream improvement works discussed above, we recommend that a minimum clearance of 1.5m be used between the existing ground level and any finished residential floor levels in case of blockages and temporary diversion of flow.

6.6 Wastewater Treatment

Due to the close proximity of the adjacent stream and because the separation between the two effluent fields is below 50m, an AWTS system should be used. The AWTS system should be designed in to AS/NZS 1547:2000, using a Design Irrigation Rate (DIR) of 35mm/week, indicative of a Category 2, weakly structured sandy loam.

Please refer to Section C14.0 of this report for our AWTS calculations, which show that a 3 bedroom (5 person) building would require a minimum of 180m of dripper line and therefore a minimum 180m^2 drainage field (using an AWTS system).

7.0 Geotechnical Investigations

The following tests/readings were carried out:

i) Ground Penetrometer test in location of proposed house sites.

ii) Visual inspection and permeameter tests of site & soil conditions in the location of proposed effluent drainage fields, in order to assess the soil drainage category in accordance with AS/NZS1547:2000.

Refer section C.13 and C.14 for results.

8.0 Geotechnical Assessment

The existing section is zoned as 'Sounds Residential' and is outside any areas zoned as a 'Natural Hazard' by the Marlborough District Councils Resource Management Plan. These hazard areas are classified as such due to the inherent instability of weakly bonded schist layers that can give way with added weight of saturated soils and the lubricating effect of water seeping into the weathered rock during heavy rain. A visual inspection confirmed Marlborough District Council's assessment that these sections should not be classified as within a natural hazard area.

The soils generally comprise a thin topsoil gravel loam which contains an increasing amount of weathered rock debris over the underlying base rock of what is likely to be greywacke stone.

The foreshore reserve is formed by a beach with relatively little vegetation and is of a suitable slope that stability is unlikely to be problematic. The beach appears stable with no clear visible signs of erosion.

The soil bearing capacity of the ground around the areas of the proposed house site is considered to be consistently greater than 100 kPa at depths over 200mm.

We concur with the report dated 30 April 1996 by Davidson Partners Ltd that the steep slopes from Port Underwood Road to the north appear very stable. Some shallow slipping in fill material from the road construction has apparently moved in the past but travelled very short distances and is not considered to pose a threat to the building sites.

9.0 Control or Implementation Measures

Refer to our recommendations (Section A3.0) which summarise our requirements for the proposed subdivision.

A structural monitoring schedule should be issued by a registered engineer to confirm the requirement of any structural inspections necessary, in order for that engineer to be able to issue a producer statement (PS4) to cover the construction of the specific engineering design carried out for the proposed structures on this section.

10.0 References

1. Marlborough District Council Resource Management Plan.
2. Proposed Subdivision plan prepared 14 March 2003 by Gilbert Haymes & Associates Ltd.
3. Report dated 30 April 1996 by Davidson Partners Ltd.
4. Engineering Assessment dated 26 June 1996 by Davidson Partners Ltd.
5. NZS 1547:2000 On-site Domestic Wastewater Management
6. NZS 1546.3:2001 On-site Domestic Wastewater Treatment Units (Part 3: Aerated Wastewater Treatment Systems).

Signed

JOHN SMART
Registered Engineer

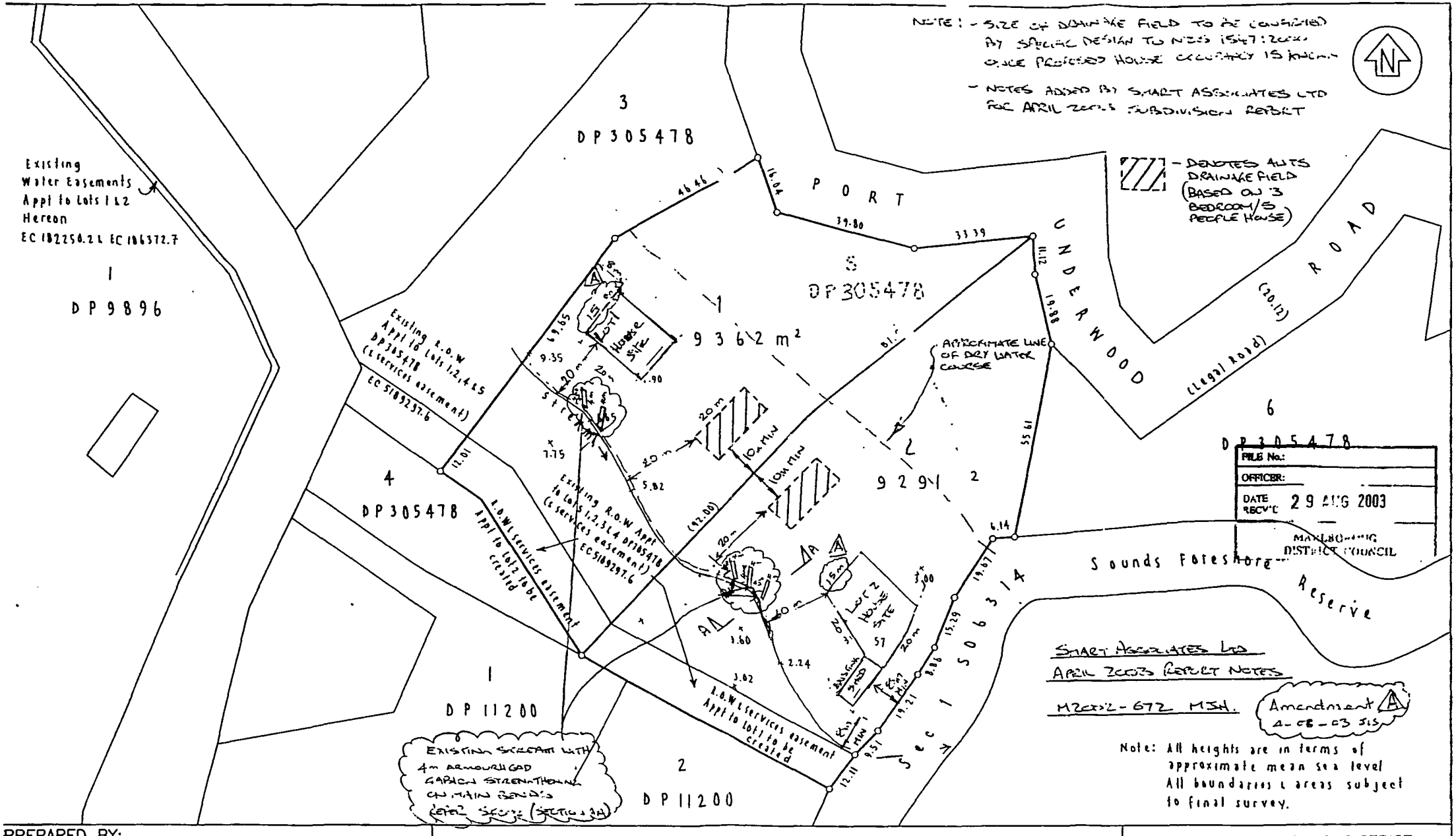
MATTHEW HARRIS
Design Engineer

for
Smart Associates Ltd

April 2003 (Revised August 2003)

C PLANS & DETAILS

11.0 Site Plan



PREPARED BY:
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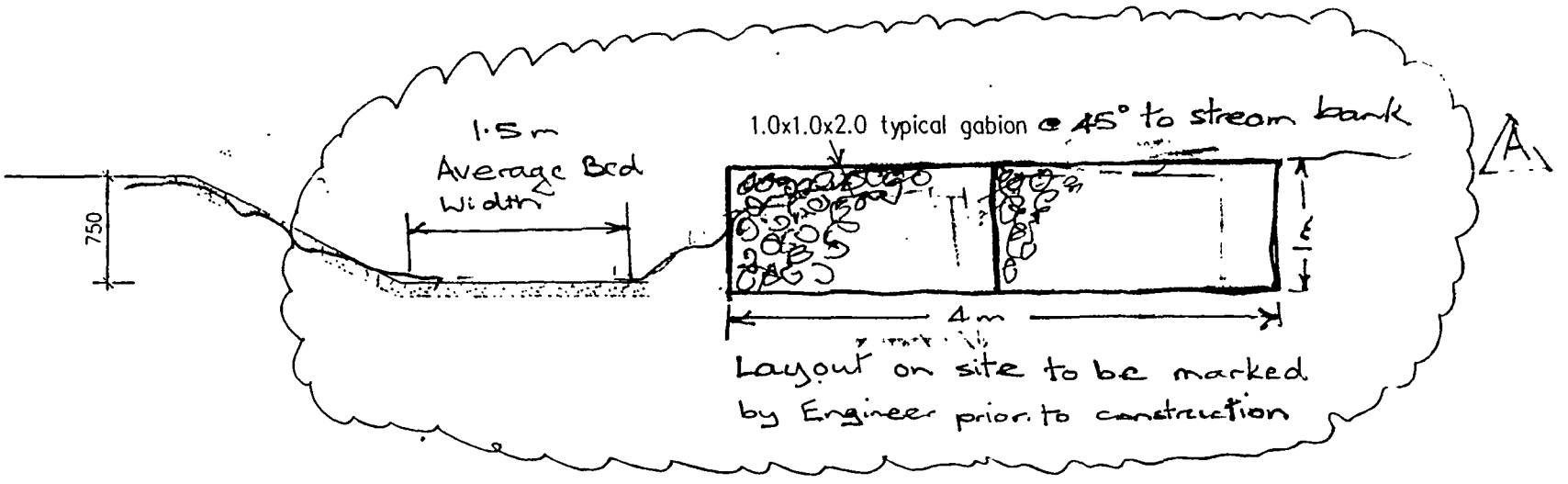
PROPOSED SUBDN OF LOT 5 DP 305478

MARLBOROUGH LAND DISTRICT
MARLBOROUGH DISTRICT COUNCIL

SCALE 1:1000
DATE 14 MAR 2003
JOB REF. M2002-672 | JOB SK. 001

AMENDMENTS



1 TYPICAL SECTION A-A
Scale 1:50

Amendment A
JLS 4/8/03

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PROPOSED_SUBDIVISION_OF_LOT5_DP305478
KAKAPO_BAY_PORT_UNDERWOOD
FOR_MR_MATTHEW_MONTGOMERY

PROJECT No. M2002-672

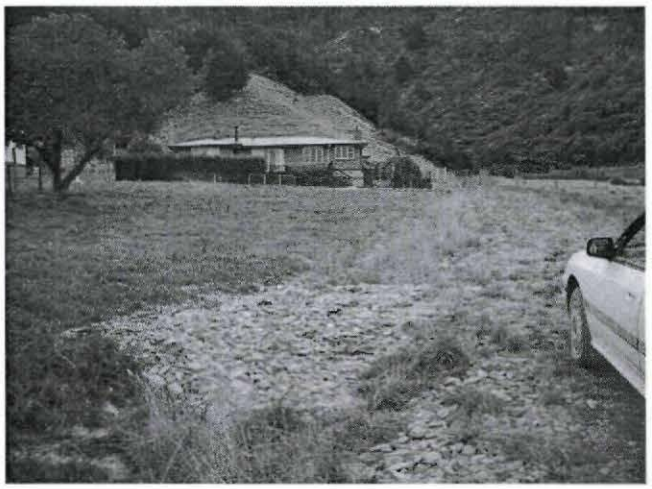
BANK_REINFORCEMENT_DETAILS

DRAWING No SK001

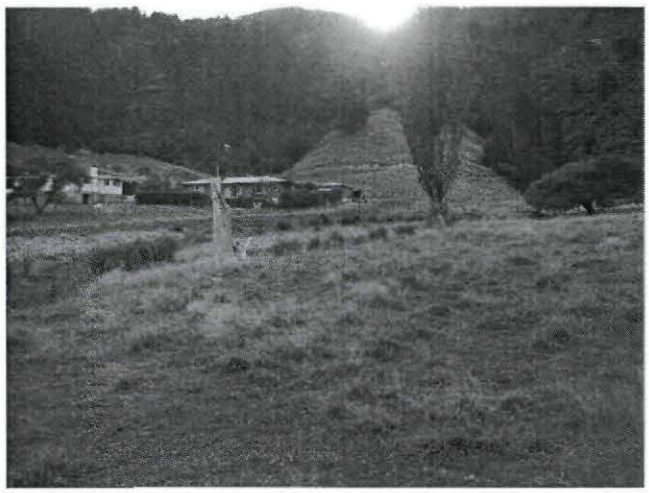
DRAWN MJH | CHECKED | SCALE 1:50 | DATE 03/04 | REVISION

COMPUTER FILE: GWP_FILE

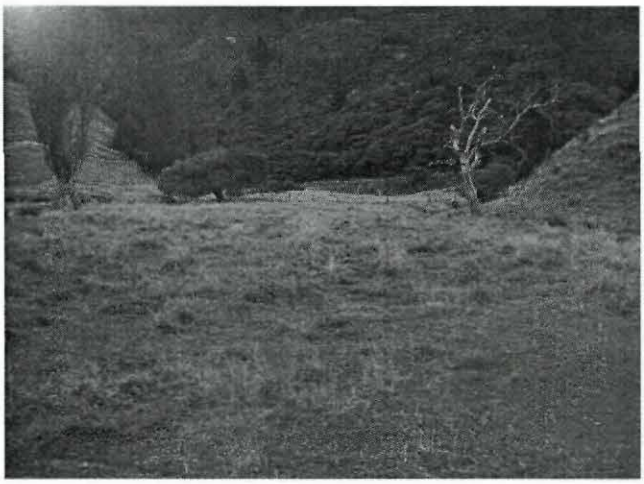
12.0 Site Photos



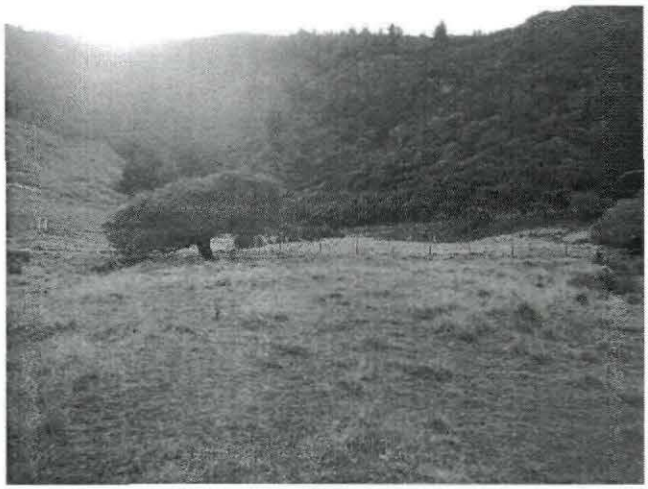
View looking North West up access road



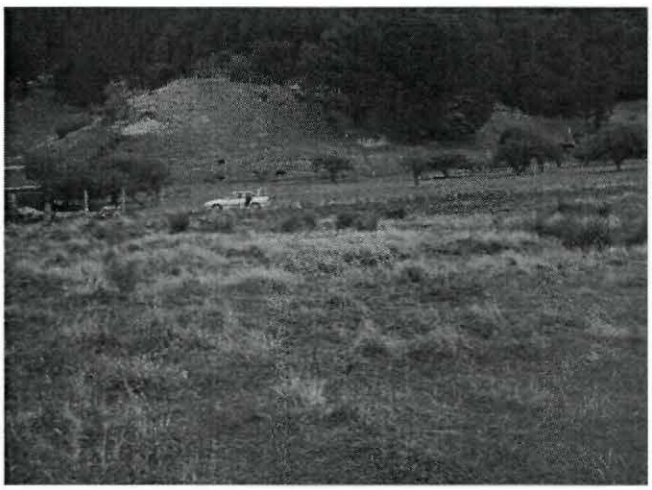
View looking South West from center of site



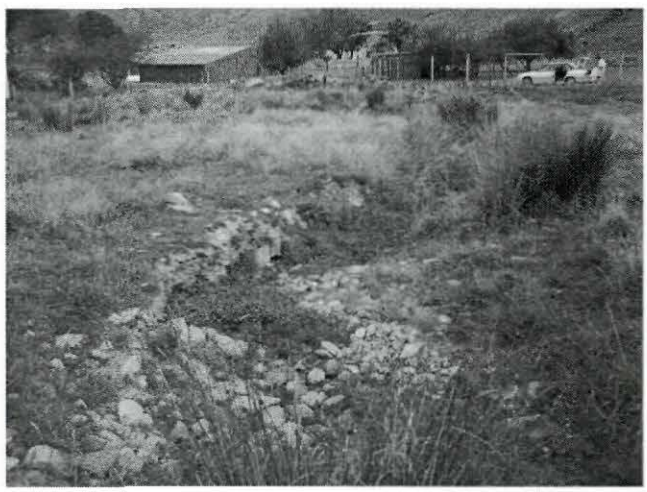
View looking North West from center of site



View looking North West from Permeameter test site no. 2



View looking South from Permeameter test site no. 2



View of stream bed

13.0 Site Investigation Results

PENETROMETER TEST RESULTS

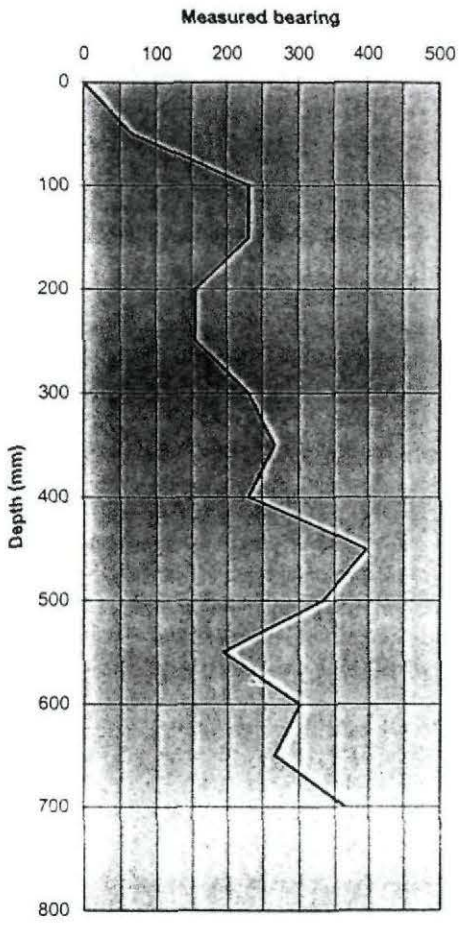
Client: Mr. Matthew Montgomery
Project: Site Subdivision Report
Site: Kakapo Bay, Port Underwood Road

Date: 03/26/03
Investigators: John Smart
Matthew Harris

Notes: Test locations refer to drawing.
Test 1:Centre of Lower Site 1

Test No 1

blows/50mm)	e (mm/blow)	Soil bearing resistance Kpa	depth (mm)
	0	**0**	0
1	50	**66**	50
5	10	**231**	100
5	10	**231**	150
3	17	**155**	200
3	17	**155**	250
5	10	**231**	300
6	8	**266**	350
5	10	**231**	400
10	5	**396**	450
8	6	**333**	500
4	13	**194**	550
7	7	**300**	600
6	8	**266**	650
9	6	**365**	700



Notes:

PENETROMETER TEST RESULTS

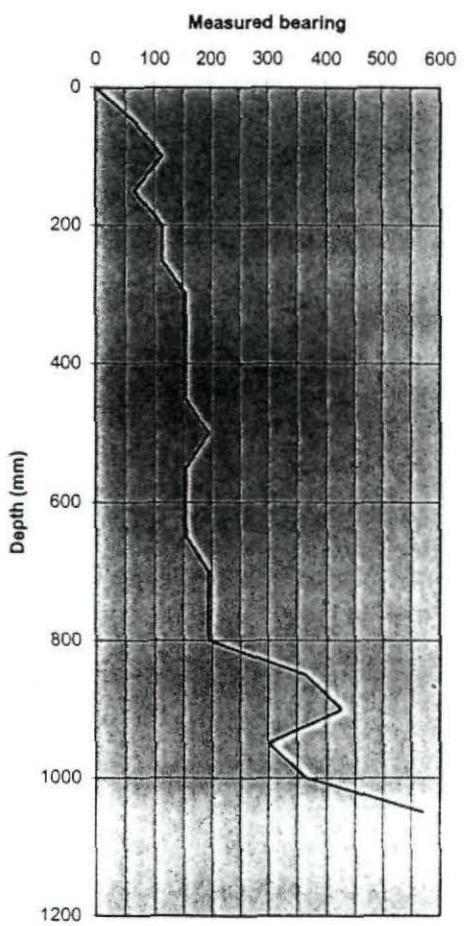
Client: Mr. Matthew Montgomery
Project: Site Subdivision Report
Site: Kakapo Bay, Port Underwood Road

Date: 03/26/03
Investigators: John Smart
Matthew Harris

Notes: Test locations refer to drawing.
Test 1:Centre of Upper Site 2

Test No 2

blows/50mm)	e (mm/blow)	Soil bearing resistance Kpa	depth (mm)
	0	**0**	0
1	50	**66**	50
2	25	**113**	100
1	50	**66**	150
2	25	**113**	200
2	25	**113**	250
3	17	**155**	300
3	17	**155**	350
3	17	**155**	400
3	17	**155**	450
4	13	**194**	500
3	17	**155**	550
3	17	**155**	600
3	17	**155**	650
4	13	**194**	700
4	13	**194**	750
4	13	**194**	800
9	6	**365**	850
11	5	**427**	900
7	7	**300**	950
9	6	**365**	1000
16	3	**571**	1050



Notes:

14.0 Wastewater Design Sheet

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SOIL PERMEABILITY ASSESSMENT / EFFLUENT DESIGN SHEET

To AS/NZS 1547:2000

1.0 Site Information

Sheet No: WW01

Date: 03/26/03

Eng: John Smart & Matthew Harris

Job No.: M2002-672

Project Title: Proposed Subdivision Kakapo Bay Port Underwood Road

Legal Description: Lot 5 DP 305478

2.0 Soil Investigation

Vegetation at test site: Mostly grass

Soil Profile at test site: Loam with many gravelly pebble stones

Soil moisture: Slightly damp

Depth of auger hole (D):	24	cm
Depth of water in auger hole (H):	24	cm
Average radius of auger hole (r):	6.5	cm
Depth to any impermeable layer (S):	-	cm
Time elapsed between first filling and start of measurement:	1	Minute(s)

General comments (any indications of seasonal waterlogging soil structure, biological pores, etc.): Adjacent water course

3.0 Permeameter Test Results (in accordance with AS/NZS 1547:2000 Appendix4.1F

Test No. 1 - Lower Site

Time	Level in tube	Drop in level	Drop (mm) /min
0	304		
20	197	107	
38	81	116	387
0	280		
22	160	120	
44	120	40	109
0	300		
23	200	100	
46	100	100	261
0	330		
22	225	105	
44	120	105	286

Test No. 1 Continued

Time	Level in tube	Drop in level	Drop (mm) /min

Average Drop / min (last 3 readings) =	219	
Q =	893	cm³/min
Ksat =	0.48	cm/min
Ksat =	6.98	m/day

Recommendation: Category 2 Weakly Structured Sandy Loam
DIR for AWTS system: 35mm/week

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SOIL PERMEABILITY ASSESSMENT / EFFLUENT DESIGN SHEET

To AS/NZS 1547:2000

1.0 Site Information

Sheet No: *WW01*

Date: *03/26/03*

Eng: *John Smart & Matthew Harris*

Job No.: *M2002-672*

Project Title: *Proposed Subdivision Kakapo Bay Port Underwood Road*

Legal Description: *Lot 5 DP 305478*

2.0 Soil Investigation

Vegetation at test site: *Mostly grass*

Soil Profile at test site: *Loam with many gravelly pebble stones*

Soil moisture: *Slightly damp*

Depth of auger hole (D):	*25*	cm
Depth of water in auger hole (H):	*25*	cm
Average radius of auger hole (r):	*7.5*	cm
Depth to any impermeable layer (S):	-	cm
Time elapsed between first filling and start of measurement:	*1*	Minute(s)

General comments (any indications of seasonal waterlogging soil structure, biological pores, etc.): *Adjacent water course*

3.0 Permeameter Test Results (in accordance with AS/NZS 1547:2000 Appendix4.1F

Test No. 2 - Upper Site

Time	Level in tube	Drop in level	Drop (mm) /min
0	*335*		
10	*230*	*105*	
19	*125*	*105*	*700*
0	*300*		
12	*180*	*120*	
27	*60*	*120*	*480*
0	*310*		
12	*205*	*105*	
23	*100*	*105*	*573*
0	*320*		
18	*200*	*120*	
34	*80*	*120*	*450*
0	*320*		
12	*240*	*80*	
26	*160*	*80*	
40	*80*	*80*	*343*

Test No. 2 Continued

Time	Level in tube	Drop in level	Drop (mm) /min

Assumed Design Drop / min =		*343*
Q =	*1,616*	cm³/min
Ksat =	*0.78*	cm/min
Ksat =	*11.21*	m/day

Recommendation: *Assume test site not saturated, use results from lower site - Category 2 Weakly Structured Sandy Loam, DIR for AWTS system: 35mm/week*

FILE No.:
OFFICER:
DATE RECV'D 29 AUG 2003
MARLBOROUGH DISTRICT COUNCIL

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AGENZ

SOIL PERMEABILITY ASSESSMENT / EFFLUENT DESIGN SHEET - AWTS SYSTEM

To AS/NZS 1547:2000

1.0 Permeameter Test Evaluation

Sheet No: *WW02*

Intended water Supply:

~~*Public Supply*~~ ~~*Rainwater (roof collection)*~~ *Bore/Well/Dam*

Local experience with existing on-site systems:

Septic Tank or similar (Primary treatment):	AWTS or similar (Secondary treatment):
OK when installed properly with a correctly sized drainage drainage area and maintained	*Work very well in domestic use except under intermittent loading for which a Zues (primary treatment) system would be more useful*

Recommendation for this site: *AWTS system*

DRAINAGE CONTROLS:

Need for surface water collector / cut-of drains? *No*

AVAILABILITY OR RESERVE / SETBACK AREAS

Reserve area available for extensions, % of design area: *0%, OK as AWTS designed to NZS 1547:2000*

Setback distance? (between development and disposal system): *10m between systems only, therefore resource consent will be required*

Ksat, (m/day): *6.98* ESTIMATED SOIL CATEGORY: *Category 2 - Weakly structured sandy loam*

2.0 Design for AWTS System

RECOMMENDED D.I.R. *35* mm/week for AWTS system

Bedrooms: *2 Double, 1 Single* People: *5* Septic tank size (min): *3000* (Table 4.3A1)

DESIGN DAILY FLOW: *180* L/day from Appendix 4.2D AS/NZS 1547:2000

SETOUT AREA REQUIRED: *180.0* m² for AWTS system (Secondary Treatment).

LENGTH REQUIRED: *180.0* m for AWTS system (Secondary Treatment). Lines at 1m centres.

IF STANDARD WATER REDUCING FEATURES ARE USED LENGTH REQUIRED REDUCES TO: *147.9* m for AWTS system (Secondary Treatment)
Thus MINIMUM SETOUT AREA REQUIRED BECOMES: *147.9* m²

IF FULL WATER REDUCING FEATURES ARE USED LENGTH REQUIRED REDUCES TO: *102.9* m for AWTS system (Secondary Treatment)
Thus MINIMUM SETOUT AREA REQUIRED BECOMES: *102.9* m²

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

RECOMMENDATION (for AWTS System):

Aerated AWTS System with dripper lines. Min 3000litre capacity system and minimum total length of dripper lines of 180m, Lines to be laid at 1.0m centres to follow contours (i.e. flat). Min setout area required will be 180m². Pump to be sized by manufacturer.

3.0 Notes

1. Standard water-reduction fixtures include dual fush 11/5.5 litre water closets, shower-flow restrictors, aerator faucets (taps) and water-conserving automatic washing machines.
2. Full water-reduction fixtures include the combined use of reduced flush ~~6/3 litre water closets~~, shower-flow restrictors, aerator faucets, front-load washing machines and low/pressure control valves on all water-use outlets. Additionally water reduction

NOTE: - SIZE OF DRAINAGE FIELD TO BE CONFIRMED BY SPECIFIC DESIGN TO NZS 1547:2000 ONCE PROPOSED HOUSE CERTAINTY IS KNOWN

- NOTES ADDED BY SMART ASSOCIATES LTD FOR APRIL 2003 SUBDIVISION REPORT

- DENOTES ALTS DRAINAGE FIELD (BASED ON 3 BEDROOM/5 PEOPLE HOUSE)

Existing Water Easements Appt to Lots 1 & 2 Hereon EC 182250.2 & EC 186372.7

1 DP 9896

3 DP 305478

4 DP 305478

1 DP 11200

2 DP 11200

5 DP 305478

6 DP 305478

Sec 1 SO 6314

Existing R.O.W Appt to Lots 1,2,4 & 5 DP 305478 (& services easement) EC 5189297.6

R.O.W Services easement Appt to Lots 1 & 2 to be created

Existing R.O.W Appt to Lots 1,2,3 & 4 DP 305478 (& services easement) EC 5189297.6

R.O.W & services easement Appt to Lot 1 to be created

Lot 1 House Site 9362 m²

Lot 2 House Site 9291 m²

Lot 57 House Site

Existing Shed

APPROXIMATE LINE OF DRY WATER COURSE

EXISTING STREAM WITH 4m ARMOURED GABION STRENGTHENING ON MAIN BENDS refer Sketch (Section 3.4)

UNDERWOOD ROAD (Legal Road)

Sounds Foreshore Reserve

PORT

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SMART ASSOCIATES LTD
APRIL 2003 REPORT NOTES
M2002-672 MJH.

Amendment A 4-08-03 JLS

Note: All heights are in terms of approximate mean sea level
All boundaries & areas subject to final survey.

PREPARED BY:
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PROPOSED SUBDN OF LOT 5 DP 305478

MARLBOROUGH LAND DISTRICT
MARLBOROUGH DISTRICT COUNCIL

SCALE 1:1000

DATE 14 MAR 2003

JOB REF. M2002-672 | JOB SK. 001