ENGINEERING REPORT

House Site Stability

For

Mr Melvin Goodall

Moutapu Bay Road
Pelorus Sound

CONTENTS

John Smart
Consulting Engineer

26 April 2000

A. SYNOPSIS

1.0 SCOPE OF INVESTIGATION

1.1 Inspection of ground features around the proposed building site.

1.2 Slope measurements below and above the building site.

1.3 Inspection of cut bank soil profile.

1.4 Measurements to stream.

2.0 SUMMARY AND CONCLUSION

2.1 We confirm that the proposed section has a house site on stable ground slopes. In our opinion the site will remain stable with the addition of a house provided conditions and recommendations covered in this report are implemented.

2.2 The site has good access with adequate area for turning and parking vehicles.

2.3 Well designed and installed sewerage effluent, stormwater and water supply systems will ensure these services will cause very little problems at this site.

3.0 RECOMMENDATIONS

3.1 Clearance of bush and ground cover for driveway and house should be kept to a minimum especially above the site and alongside the stream. Ground plant cover should be re-established on exposed soils as soon as possible after earthworks.

3.2 The owners should ensure good design principles are applied to all aspects of the house and site planning.

B. REPORT

1.0 INTRODUCTION

1.1 This report has been prepared for Mr Melvin Goodall who wishes to subdivide a section from his property at 464 Moutapu Bay Road.

1.2 The property is located 4.64 kilometers from the Moutapu Bay Road turnoff from the Kenepuru Road and is West of Moutapu Bay. A location plan is attached – see Appendix A.

1.3 The existing property area is 11,830 square metres from which it is proposed to create a new section of about 3,700 sq m on which the existing homestead is sited.

1.4 The purpose of this report is to assess slope stability for a house site on the new section, check the practicality of vehicle access and parking and the requirements for stormwater control, sewer effluent disposal and water supply.

1.5 The legal description of the land is Lot 2 DP 5954 Blk V Linkwater.

1.6 The property was inspected with the owner on 18 April 2000.

2.0 DESCRIPTION

2.1 The property is part of the old farm homestead between the road and Sounds Foreshore Reserve. Road frontage distance is about 108m existing which would be approximately halved to form the new section.
A well formed driveway to the existing house would need a Right of Way easement to serve both existing and new house sites.

2.2 The section averages about 80m deep and a 20m wide reserve strip separates the north boundary from the shoreline.

2.3 The land below the Right of Way slopes down to the foreshore with a northerly aspect at moderate slopes and is mainly covered with tall manuka and some other native trees.
The land flattens out across the Foreshore Reserve and the remains of an old slipway runs at a slope of about 9° from the shoreline across the front of the section.

2.4 A small stream runs down the Eastern boundary.

2.5 The property has been subdivided in the past to give two sections to the East of 2640 sq m and 3660 sq m and one to the West of 2200 sq m, all of which have houses.

2.6 The coastline is overgrown and difficult to access but appears stable with not signs of erosion.

3.0 HOUSE SITE LAND STABILITY

3.1 This area is part of the zone classified by the Marlborough District Council's Resource Management Plan as "Natural Hazard" the land being unstable because of the weakly bonded schist layers that can give way with added weight of saturated soils and lubricating effect of water seeping into the weathered rock during heavy rain.

3.2 The Pelorus earthquake fault line runs approximately 0.3 km seaward of the section.

3.3 Souls are a thin topsoil over a yellow clay which contains an increasing amount of weathered rock debris. Underlying base rock is chlorite schist.

3.4 Ground surface slopes were measured taking an approximate line through the centre of the proposed section below the driveway. From a steep drop off on the driveway batter of 30° adjusting to 20° then 15° there is ample house site area on the moderate mid to lower slopes of 5° steepening to 18°. A representative cross section is shown on Appendix C.

3.5 There is a cut bank above the driveway about 3m high which has remained stable and is covered in ferns, bracken and manuka.

3.6 A house site envelope separated 10m from the stream on the East boundary is shown on the attached site plan Appendix B.
The site is on stable ground and in our opinion the addition of a house within this area of about 22m wide and 35m long will not affect ground stability.

3.7 The driveway above the site serves as a bench above the site and the formed legal road above the road boundary serves as another wide bench and added safety margin from any slips that may occur in the hills above the road.

3.8 Below the site the land flattens out to a slight 4° - 5° slope about 20m wide to the foreshore.

3.9 The soil bearing capacity at a depth of 300 – 400mm is over 100 KPa. Standard house foundations complying with NZS 3604 are acceptable. Pole frame platform foundations are an alternative involving less earthworks but will need engineering input for structural design.

4.0 ACCESS

4.1 A well formed driveway from the road gives access to the property at a grade of about 1 in 10 and this will also serve the new house site.

4.2 A turnoff at the proposed boundary can be formed to provide a bend with minimum internal radius of curvature of about 7m radius and gradient to the house site of about 1 in 10 where adequate parking and turnaround space can be designed. A photo of the existing drive at the proposed turnoff is attached (Appendix D).

4.3 The turnoff will have a wider formation width of about 5m which can narrow down to 3.3m sloping into the bank with a water table channel against the bank. This channel is to be continued above the parking/turnaround area to discharge to the stream on the Eastern boundary. A typical formation detail for the new driveway connection to the house site is shown on Appendix D.

4.4 The existing driveway is to have a water table channel properly formed connecting to a 300mm dia culvert pipe across the driveway to discharge into the new driveway water table (see Appendix D).

4.5 With some clearance of growth and driftwood near the stream outlet, good shoreline access for small boats is also available to the section.

5.0 STORMWATER CONTROL

5.1 It is recommended that roof rain water be filtered and stored in tanks for additional domestic water supply. The tank or tanks should have overflow pipes that lead to the stream.

5.2 The driveway water table channels with final discharge to the stream as defined in Section 4 above take care of stormwater control for the house site.

5.3 It is important that as much of the established bush be left intact as possible to prevent uncovered soils from being subject to erosion. Root systems help prevent local shallow soil slumps.

5.4 The new driveway and parking area cut and fill batters are to be protected with grass seeding as soon as possible to reduce heavy rain erosion of exposed soils.

6.0 WATER SUPPLY

6.1 The section is already served with a water supply and 7500 litre storage tank from which the existing house is fed via further storage tanks at the house.

6.2 The tank will remain and also feed into storage tanks at the new house site. Two or three 5000 litre tanks are recommended. The connecting pipe could be passed through the stormwater culvert which has sufficient waterway area for the small catchment and slope involved.

6.3 This water supply should also be supplemented as recommended above with filtered rain water from the roof.

7.0 SEWERAGE DISPOSAL

7.1 The medium dense clay soils provide moderate to poor water percolation characteristics. For a septic tank effluent field this Category C type soil would require a total overall length for shallow seepage trenching of 60m.

7.2 A 22m separation from open water is recommended so that this is the minimum distance the effluent trench should be from the stream and High Tide mark.

7.3 It is feasible to have a series of zig zag trenching in 15m legs along the slope contours ie 4 lengths of 15m to give 60m as shown on the site plan below the house site near the West boundary.

7.4 The effluent pipe should be laid in a shallow trench (450mm deep) in accordance with the details attached in Appendix F at a slight grade of 1 in 200 along the contour.

7.5 The approved, vented septic tank is to be over 3300 litre capacity and fitted with an approved outlet filter such as Biofilter or Zabel.

7.6 Alternatively there are several aerated tank systems on the market which allow for better treatment in the tank and irrigation system disposal. These methods are a little more expensive and require a regular maintenance contract to be vetted by the Marlborough District Council.
Also there are approved composting toilet methods.
More detailed information on these systems are available from Smart Associates should these alternative methods be preferred.

8.0 CONCLUSION

8.1 We confirm that the proposed section has a house site on stable ground slopes. In our opinion the site will remain stable with the addition of a house provided conditions and recommendations covered in this report are implemented.

8.2 The site has good access with adequate area for turning and parking vehicles.

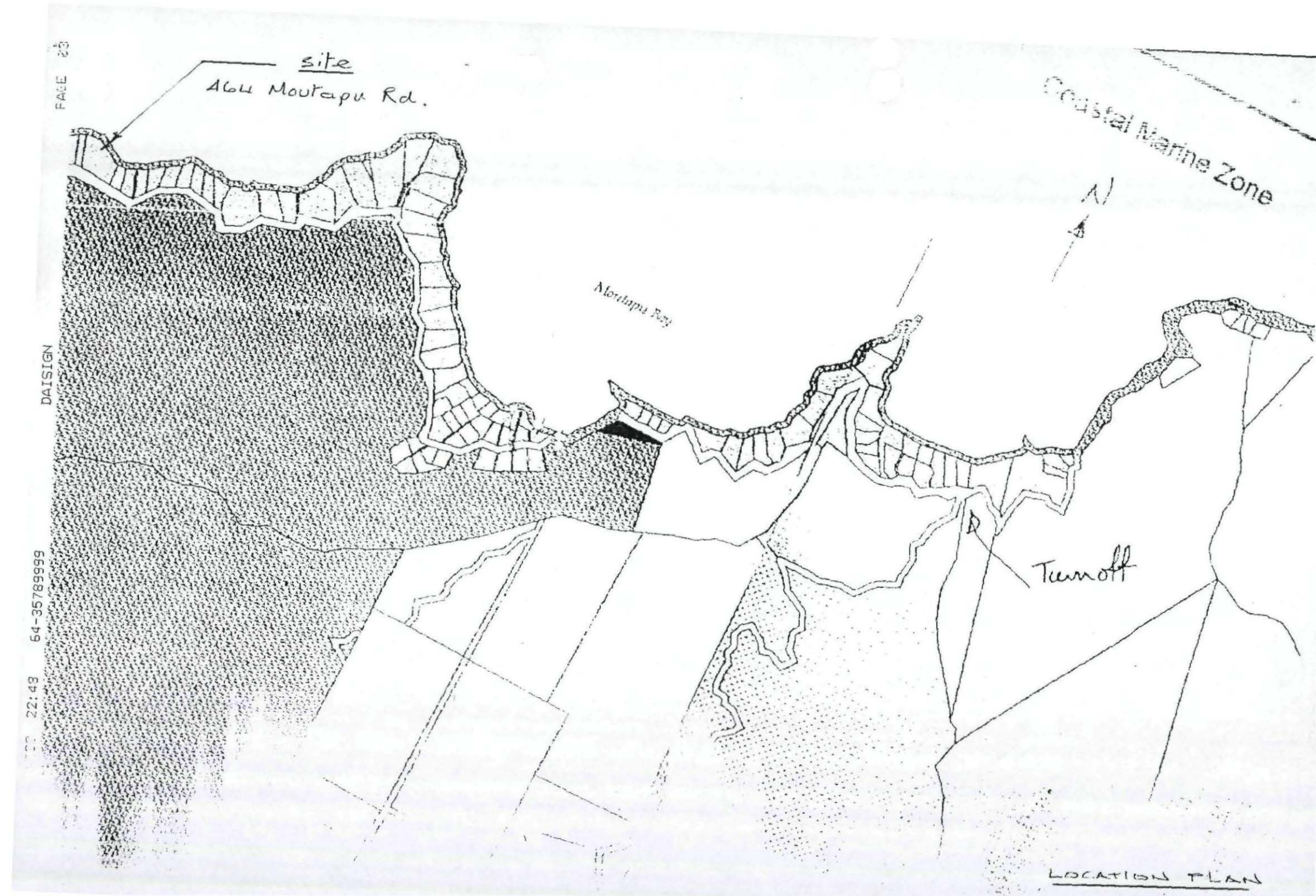
8.3 Well designed and installed sewerage effluent, stormwater and water supply systems will ensure these services will cause very little problems at this site.

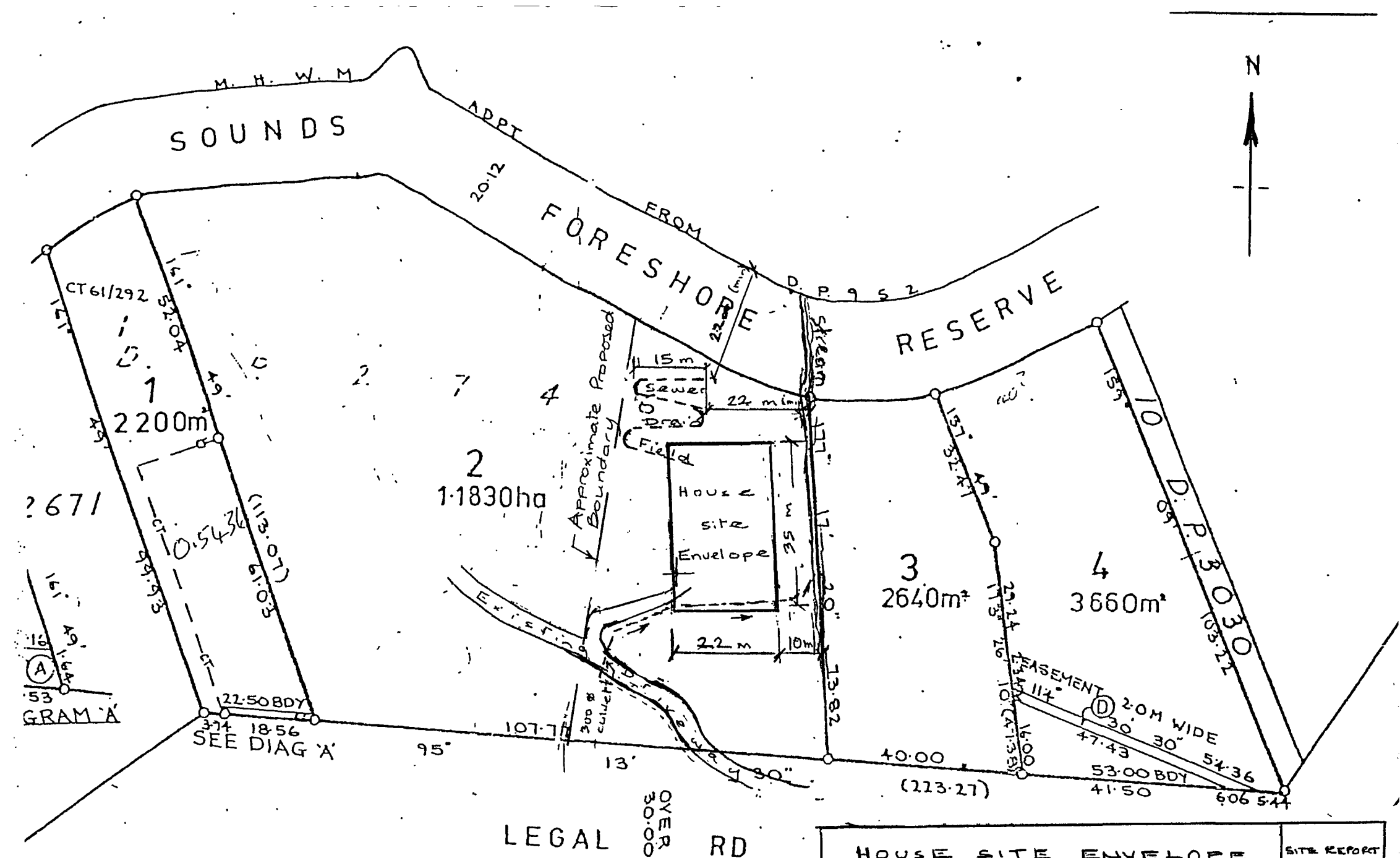
9.0 LIMITATIONS

9.1 This report has been prepared solely for the benefit of Mr Melvin Goodall as our client with respect to the brief. 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.

9.2 Opinions and judgements expressed herein are based on our understanding and interpretation of current regulatory standards, and should not be construed as legal opinions. Where opinions or judgements are to be relied on they should be independently verified with appropriate legal advice.

JOHN SMART
REGISTERED ENGINEER

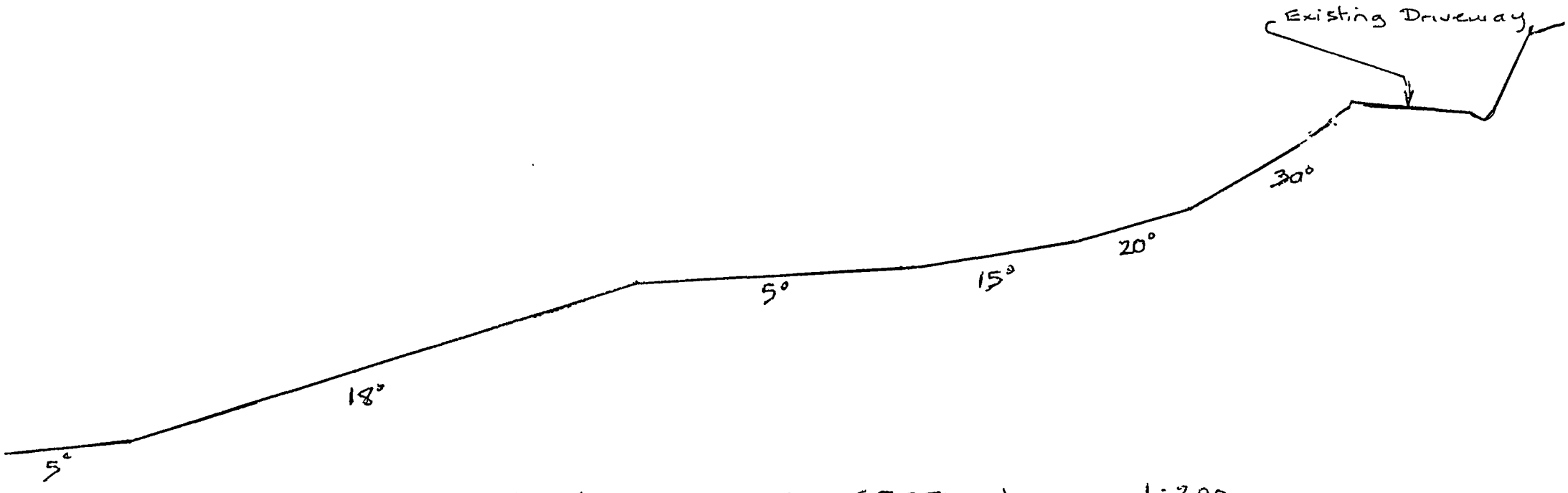

site
464 Moutapu Rd.
Coastal Marine Zone
Moutapu Bay
Turnoff
LOCATION PLAN
FACE 23
DAISIGN
64-35789999
22:43



SITE PLAN 1:1000 (approx)

HOUSE SITE ENVELOPE ACCESS & DRAINAGE FIELD AT 464 MOUTAPU BAY RD.	SITE REPORT for M. GOODALL by J SMART 21-4-06

APPENDIX C

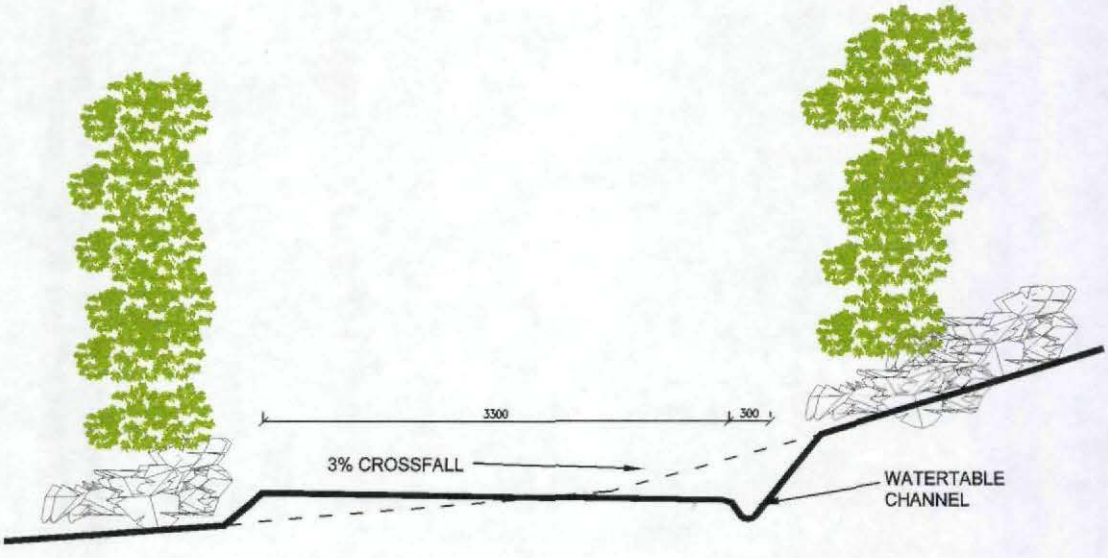


TYPICAL SITE CROSS - SECTION — 1:200

M. GOODALL SUBDIVISION MAUTAPU BAY RD PELORUS HOUSE SITE TYPICAL SECTION
J.I.S. SMART ASSOCIATES LTD 27-4-00

APPENDIX D

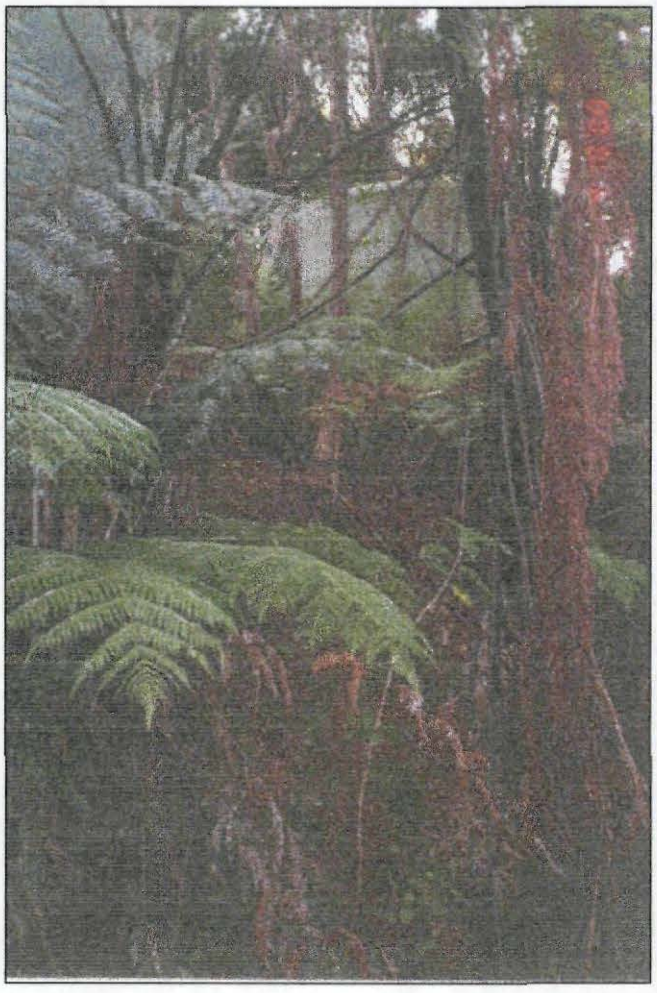
EXISTING DRIVEWAY AT PROPOSED TURN-OFF TO HOUSE



PROPOSED DRIVEWAY - CROSS SECTION

JIS - 24/04/00

APPENDIX E



CUT BANK ABOVE EXISTING
DRIVEWAY - WATER TANK

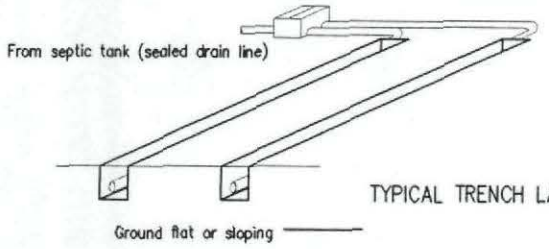
HOUSE SITE - TYPICAL SIDE VIEW

JIS - 24/04/00

APPENDIX F

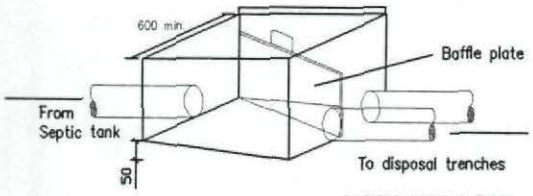
ALL DIMENSIONS TO BE CHECKED ON SITE. DO NOT SCALE OFF DRAWING. ANY DISCREPANCIES TO BE REPORTED.

Distribution box – sealed drain lines to each trench



TYPICAL TRENCH LAYOUT

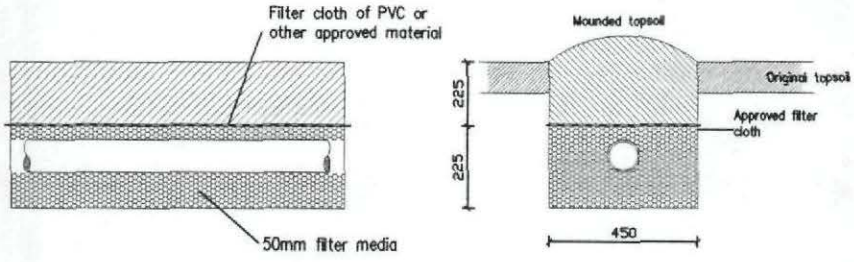
NOTE – TRENCHES
(1) Design length split into a minimum of two trenches to enable alternation of loading
(2) Trench spacing 2m. minimum between edges



DISTRIBUTION BOX

NOTE – DISTRIBUTION BOX
(1) Inlet & outlet pipes 100mm diam.
(2) Lid to be made up flush with ground level.
(3) Construction to be galvanised steel plate or concrete (80–100mm thick).
(4) Baffle plate to be used for alternation or loading & resting cycles.

NOTE:
(1). Distribution drains to be 100mm diameter perforated pipeline (Novaflo or similar), of approved material with perforations comprising at least 2% of surface area.
2. Distribution pipes to be laid flat or at a gradient not greater than 1 in 200.
(3). Sides & base of trench to be carefully scratched with a pointed tool before laying filter media.



TYPICAL TRENCH CONSTRUCTION

SEPTIC TANK SUGGESTED OPERATION & 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 septic tank may be needed if a garbage grinder is used.

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

2. Prohibited discharge to the septic tank
* Oil ' ase from a deep frier (for example).
* S ater or any drainage other than sewerage generated in the house.
* Pe.. , 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. Septic tanks need to be pumped (septage removed when the scum layer comes down to within 75mm of the bottom of the outlet tee or when sludge and scum have accumulated to the extent that the clear space (between scum and sludge) has a volume less than 1000 litres. Septage removal may need to be done as often as every three years but no longer than five years.

ZABEL FILTER OR BIOFILTER (FITTED TO OVERFLOW PIPE)

1. The septic tank should be pumped prior to removal of the filter to prevent any solids from escaping to the trenches when cartridge is removed for cleaning.

2. The Zabel filter shall be cleaned (removed & hosed down) at the same time as normal septic tank servicing (3 – 5 years).

3. Remove disc cartridge and rinse off with a garden hose, being careful to rinse all septage material back into the tank. It is not necessary that the discs be cleaned 'spotless'. The biomass growing on the filter aids in the pre–treatment process and should be left in the discs.

1 SEPTIC TANK DETAILS
not to scale

PROJECT
MELVIN GOODALL - MOUTARA BAY RD. PELORUS SOUND - SUBDIVISION.

PROJECT No. 2000-101

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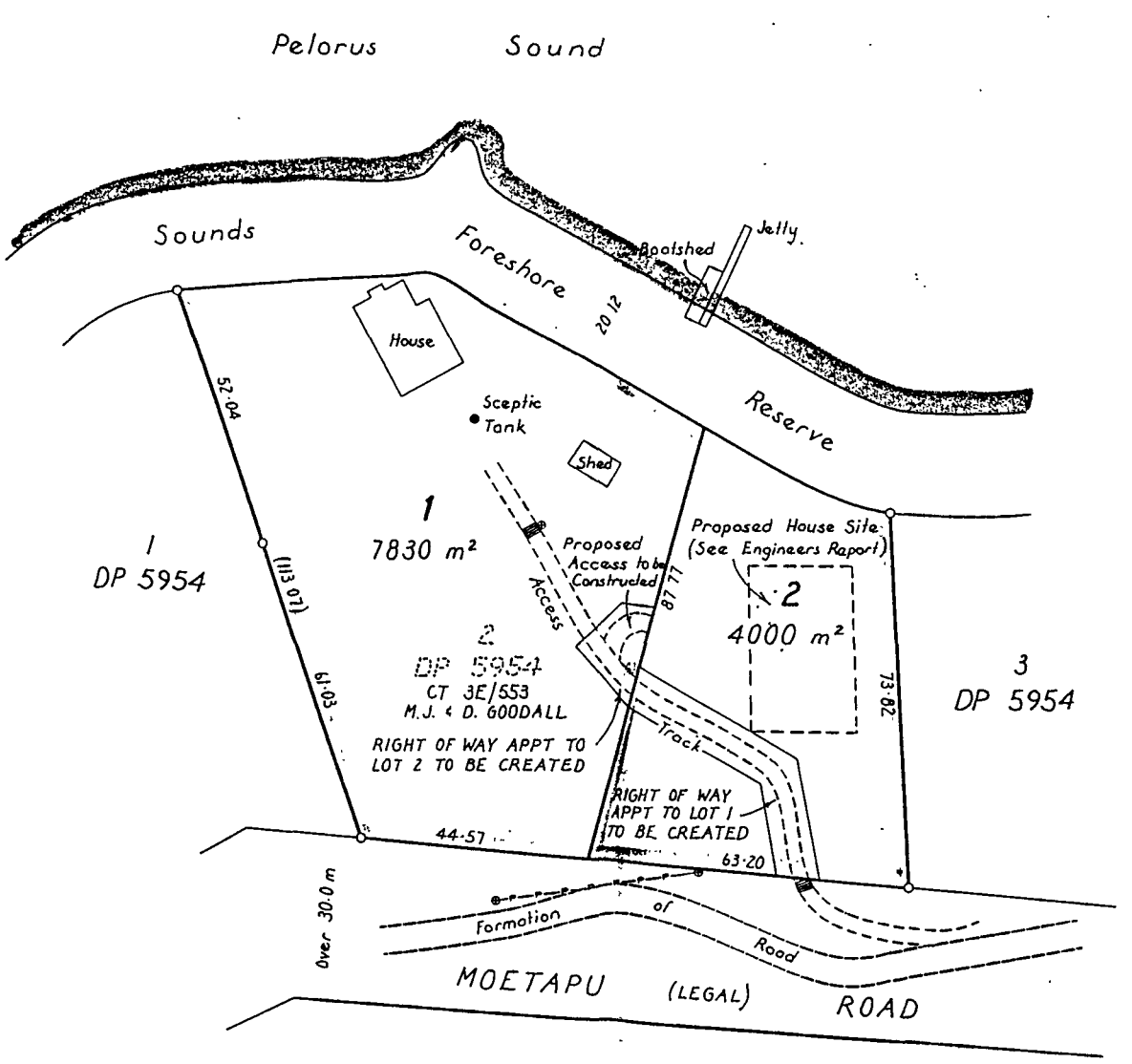
TITLE		DRAWING No.
SEPTIC TANK DETAILS		...
DRAWN ccp	CHECKED	SCALE nts. / DATE 27/4/00
COMPUTER FILE: DRAWINGS\septic_1		REVISION /



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- 1 AUG 2000
MARLBOROUGH DISTRICT COUNCIL

NOTES:

1. Boundaries & Areas are Subject to Final Survey.
2. Topographical Information obtained from Low Accuracy G.P.S. fixes.

G M HAYMES
REGISTERED SURVEYOR

MARLBOROUGH LAND DISTRICT
MARLBOROUGH DISTRICT CL

PROPOSED SBDN OF LOT 2 DP 5954

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PHONE (03)5787984 – FAX (03)5787709

SCALE 1:1000

DATE 31 MAY 2000

JOB REF. 4803