DavidsonPartners Ltd

Structural Engineering
Civil Engineering
Building Design
Project Management

Practising in association with Ayson and Partners, Registered Surveyors

Our Ref: 6699

26 July 2000

DEPARTMENT OF CONSERVATION
WASTEWATER TREATMENT AND DISPOSAL
SECTION 11 S.O. 5086
CAMP BAY, ENDEAVOUR INLET

1. INTRODUCTION

The Department proposes to upgrade the existing toilet block at the Camp Bay campsite, on the Queen Charlotte Walking Track. This entails replacement of the existing dry vault toilet system with flush units and a new wastewater management system.

Our brief was to assess site conditions and design and recommend an appropriate sustainable wastewater management solution given the physical and practical constraints of the site, and also comment on any relevant Resource Management issues.

A site investigation was undertaken by this office in accordance with the Draft AS/NZS 1547 'On Site Domestic Wastewater Management', The Auckland Regional Council's Technical Publication No. 58 and the Proposed Marlborough Sounds Resource Management Plan. The locations of the proposed system and other features are shown on the attached plans 6699 sheets C1-C3 issue 'A'.

2. INVESTIGATION

The site faces northeast and lies near the coastal edge of a gently to moderately sloped area of outwash material produced from movement in the two substantial gullies behind. It has very high exposure to the sun and wind. With this exposure, mature vegetation and good topsoil coverage the assistance of evapotranspiration to the disposal of treated effluent to the ground will be significant when its use is at its maximum (summer).

At least 200 mm of well rooted organic topsoil overlies moist firm brown silty clay. The soil category of the clay soil was assessed at 4.

There are no nearby disposal fields and groundwater contamination is not relevant at this site. However, the proposed disposal field is located within 30 metres of a watercourse and the sea. In addition, this property is included in the area of Camp Bay designated by Council as a Natural Hazards Zone due to known instability.

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Principals
Ron Melton, BE, M.IPENZ, REGD
Stephen Sheat, BE, M.IPENZ, REGD
Leigh McGlynn, BE, M.IPENZ, REGD

3. ASSESSMENT

In practical terms, a simple, passive, gravity-fed disposal system will be best suited to this application. The area downslope of the toilet block was then investigated for a potential disposal field location.

We consider the area shown on sheet C1 to be suitable for the shallow gravity trench disposal of septic tank and filter pretreated effluent, even though the disposal field is located within 30 metres of surface water and within a Hazard Zone. The following sections refer.

3.1 Proximity to Waterbodies

The closest waterbody is the sea, with approximately 12 metres from the nearest point of the disposal field to MHWS. We note that the legal boundary bears little resemblance to the actual position of MHWS in this area. There is also a watercourse within 30 metres of the proposed disposal field, being approximately 15 metres to the southeast.

The effects of discharging in close proximity to these surface waters are mitigated by:

(a) Good topsoil depth, vegetative cover and exposure, and the use of shallow trenches to maximise the assistance from evapotranspiration. The Department will also undertake to further plant the disposal area after construction.

(b) The near-flat nature of the disposal field site not encouraging the lateral movement of treated effluent discharged to the ground.

(c) The ability of the clays below the topsoil layer to remove bacteria within one metre of soil depth, using conservation application rates (Reference On-Site New Zealand Special Report - 97/2 by Ian Gunn).

(d) The use of an oversized septic tank with effluent filter, distribution box and very short trenches.

No effect on either of the neighbouring waterbodies is reasonably foreseeable.

3.2 Siting in a Hazard Zone

The location of site within an instability Hazard Zone such as this is not necessarily indicative of it being under threat from land movement. The proposed disposal field site is at the toe of a low frontal feature which affords it some protection, and the immediate area of and around the disposal field does not appear to have been subject to land movement in recent times. However, a catastrophic event in one of the large gullies behind would have the potential to effect the disposal field (and therefore the toilet block and campsite themselves). This would be a rare event but the toilet block and disposal system could be fully functional again after clearance.

4 SYSTEM

We have assessed the Long Term Acceptance Rate (LTAR) for the shallow trench disposal of filtered septic tank effluent at 15 mm per day.

Information we have from Department of Conservation staff is that in peak season less than 50 people per day come through this part of the Track and only a proportion of those would use the toilet block. We have conservatively allowed for 40 users of the toilet block per day, with a per person water use of 10 litres. The Department also indicated a preference for an oversized septic tank for better treatment and a longer period between servicings.

The recommended wastewater treatment and disposal systems consist of the following:

(a) A 5,000 litre septic tank.

(b) An effluent filter fitted to the outlet of the septic tank (such as a Zabel or Biotube).

(c) A distribution box.

(d) Four 10 metre shallow disposal trenches.

Refer to drawing 6699 sheets C2 and C3 for details.

5. SUMMARY

(a) A simple, practical solution is available for the disposal of treated effluent from the upgraded Camp Bay toilet block as proposed utilising a filtered septic tank and shallow gravity fed soakage trenches.

(b) The potential effects of locating the effluent disposal field within 30 metres of a watercourse and the sea are sufficiently mitigated by the characteristics of the site and the treatment and disposal system such that there will not be any measurable impact on these waters.

6. REFERENCES

6.1 Marlborough Sounds Resource Management Plan (Proposed).

6.2 AS/NZS 1546.1 "On Site Domestic Wastewater Treatment Units, Part 1: Septic Tanks".

6.3 Draft AS/NZS 1547 "On Site Domestic Wastewater Management".

6.4 ARC Environment, Technical Paper No. 58, Second Edition "On Site Wastewater Disposal From Households and Institutions".

6.5 R J Potts "Small Sewage Treatment Plants".

6.6 R Crites and G Tchobanoglous "Small and Decentralised Wastewater Management Systems".

6.7 NZ Aerial Mapping Ltd stereoscopic photographs number 2923/53 and 54 flown 1 February 1960.

DAVIDSON PARTNERS LTD

R W Davis

pp W L McGlynn

RWD:RLF

north

Lot 2
DP 11112

Sec 23
SO 4389
(foreshore reserve)

CREEK

Sec 10
SO 5086
(foreshore reserve)

CAMP
BAY

MEAN HIGH WATER SPRINGS (APPROX)

Sec 11
SO 5086
(foreshore reserve)

5000L SEPTIC TANK WITH EFFLUENT FILTER ON OUTLET

CREEK

SOLID WASTE PIT TO BE CLEANED OUT AND DECOMMISSIONED

TRACK

LEGAL BOUNDARY

APPROXIMATE LOCATION OF TOILET BLOCK, TO HAVE FLUSH TOILETS INSTALLED

CAMP BAY CAMPSITE

CREEK

Sec 7 Blk VII
GORE SD
(recreation reserve)

DISTRIBUTION BOX

4 x 10M SHALLOW DISPOSAL TRENCHES.

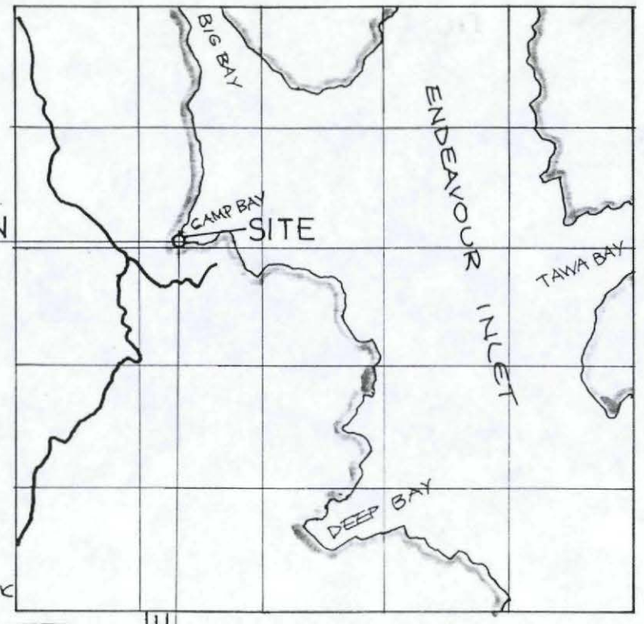
CREEK

Sec 24
SO 4389
(foreshore reserve)

Sec 6 Blk VII
GORE SD
(recreation reserve)

Sec 65 Blk VII
GORE SD

plan
1:500



locality plan
1:50,000
NZMS 260/P27

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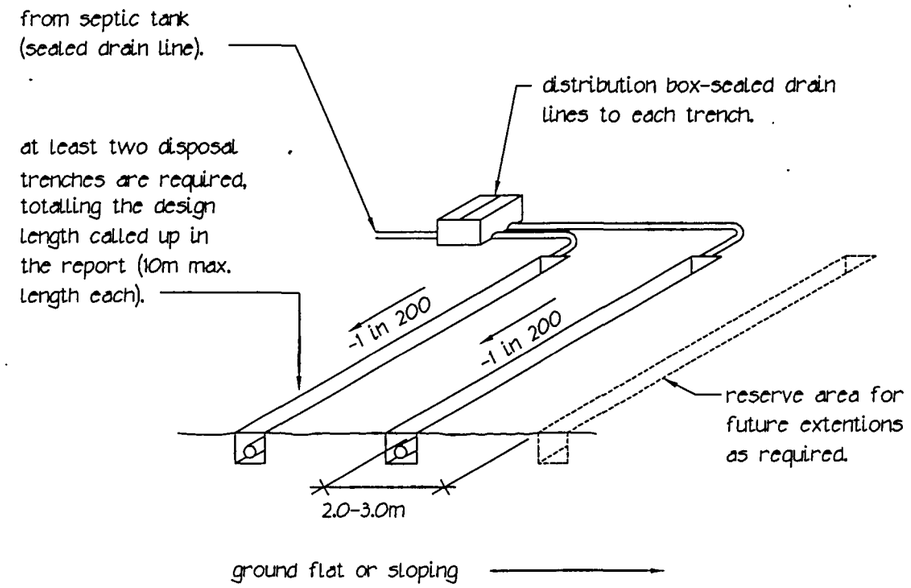
DEPARTMENT OF CONSERVATION
EFFLUENT DISPOSAL UPGRADE
CAMP BAY, ENDEAVOUR INLET
QUEEN CHARLOTTE SOUND

site & locality plans

DATE	ORIGINAL SIZE	DRAWING No.	SHEET	ISSUE
7/00	A3	6699	C1	A

DES R.W.D | DRN M.P | CK | CAD

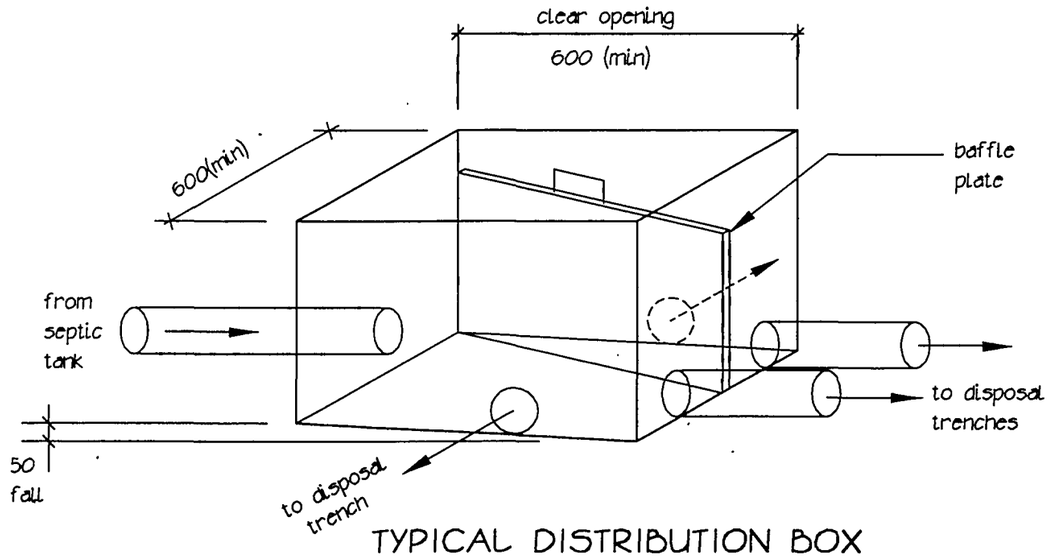
0mm 100mm



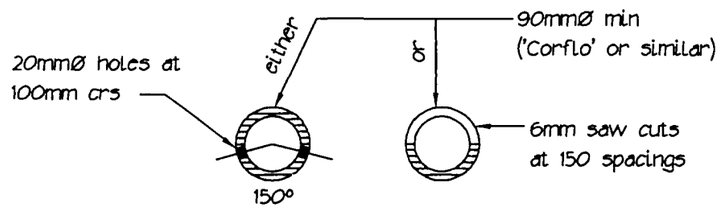
TYPICAL TRENCH LAYOUT

NOTES-

(1) Inlet and outlet pipes 90-100mm diameter.
(2) Lid to be made up flush with ground level.
(3) Construction to be of approved materials.
(4) Baffle plate to be used for alternation of loading and resting cycles. It should be removed when system is fully loaded.
(5) Distribution pipes to be 90mm diameter min.
(6) Distribution pipes to be laid flat or at gradient not greater than 1 in 200.

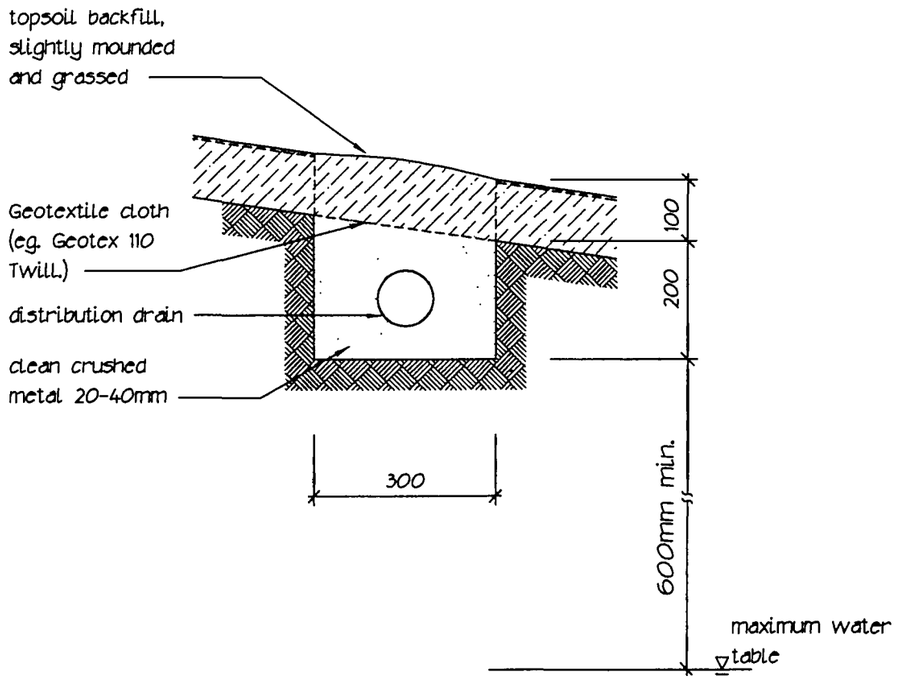


TYPICAL DISTRIBUTION BOX



DISTRIBUTION DRAINS

(for gravity feeding only.)



SHALLOW DISPOSAL TRENCH

CURRENT AS OF: 13/7/00

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DEPARTMENT OF CONSERVATION
EFFLUENT DISPOSAL UPGRADE
CAMP BAY, ENDEAVOUR INLET
QUEEN CHARLOTTE SOUND

effluent disposal field
typical details

DATE	ORIGINAL SIZE	DRAWING No.	SHEET	ISSUE
7/00	A3	6699	C3	A

DES L.M. | DRN D.M. | APP RJ | CAD

north

Lot 2
DP 11112

Sec 23
SO 4389
(foreshore reserve)

CREEK

Sec 10
SO 5086
(foreshore reserve)

CAMP
BAY

MEAN HIGH WATER SPRINGS (APPROX)

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5000L SEPTIC TANK WITH EFFLUENT FILTER ON OUTLET

TRACK

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Sec 7 Blk VII
GORE SD
(recreation reserve)

DISTRIBUTION BOX

4 x 10M SHALLOW DISPOSAL TRENCHES.

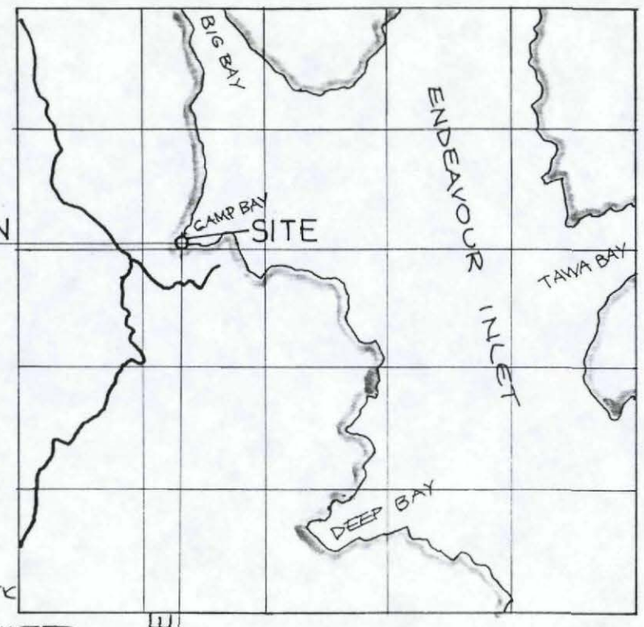
Sec 6 Blk VII
GORE SD
(recreation reserve)

CREEK

Sec 24
SO 4389
(foreshore reserve)

Sec 65 Blk VII
GORE SD

plan
1:500



locality plan NZMS 260/P27
1:50,000

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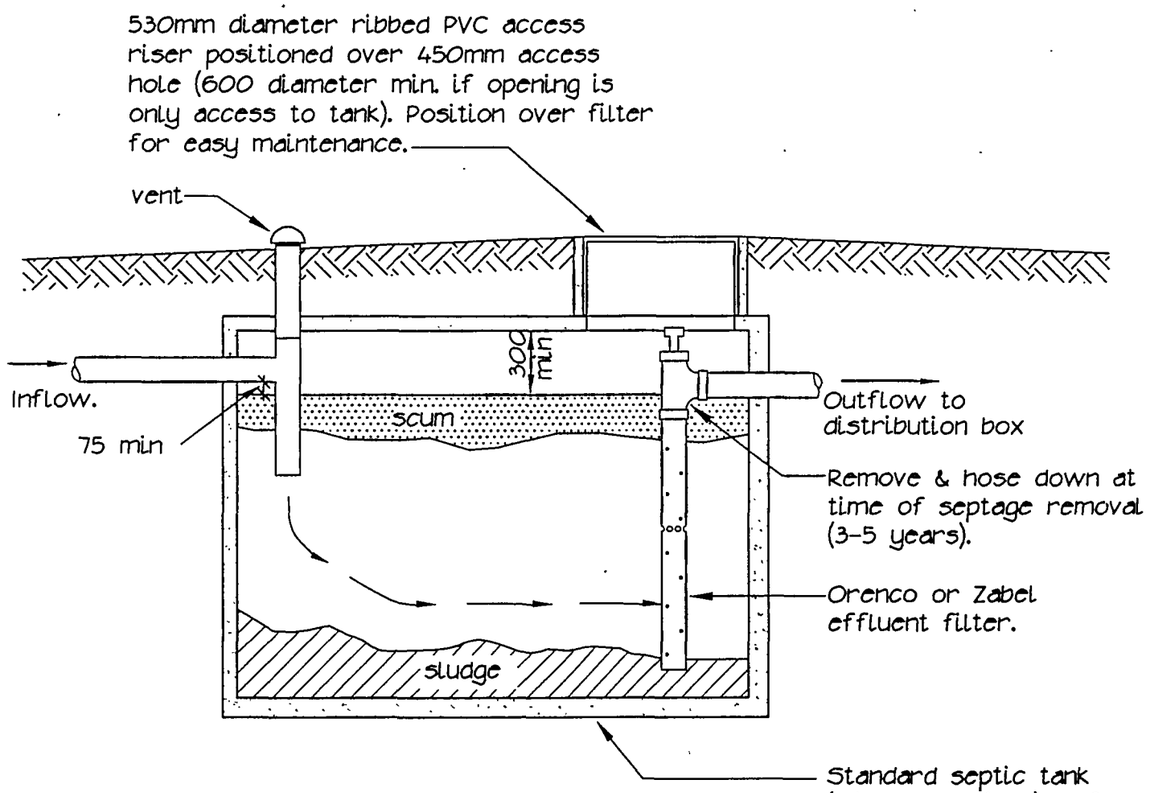
DEPARTMENT OF CONSERVATION
EFFLUENT DISPOSAL UPGRADE
CAMP BAY, ENDEAVOUR INLET
QUEEN CHARLOTTE SOUND

site & locality plans

DATE	ORIGINAL SIZE	DRAWING No.	SHEET	ISSUE
7/00	A3	6699	C1	A

DES R.W.D DRN M.P CK CAD

0mm 100mm



TYPICAL CROSS SECTION

1:25

SUGGESTED OPERATION AND MAINTENANCE SEPTIC TANK

1. The inflowing 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 disinfectants will not harm the functioning of the septic tank or the soil absorbtion system.

2. Prohibited discharges to the septic tank include:-
   Oil/grease from e.g. a deep fryer.
   Stormwater and any drainage other than sewage generated in the house.
   Petrol, oil and other flammable/explosive substances.
   Household, garden, garage, and workshop chemicals (e.g. pesticides paint cleaners, photographic chemicals, motor oil and trade waste).
   Disposable nappies and sanitary napkins.

3. Septic tanks need to be pumped (septage removed when the scum layer comes 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 at no longer than five year intervals.

EFFLUENT FILTER

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

2. The filter shall be cleaned at the same time as normal septic tank servicing (3-5 years).

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

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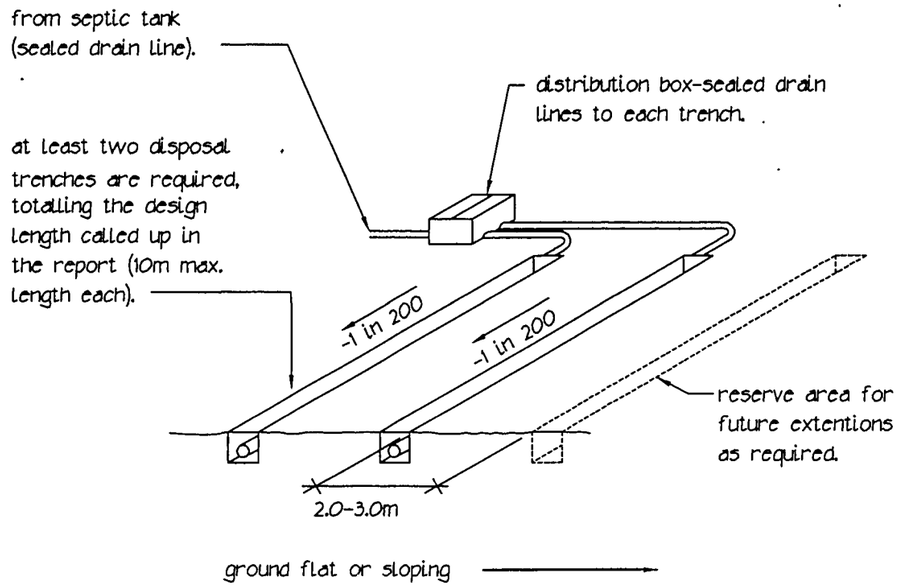
effluent disposal
typical septic tank details

DATE	ORIGINAL SIZE	DRAWING No.	SHEET	ISSUE
7/00	A3	6699	C2	A

DES L.M. | DRN L.R. | CK RD | CAD



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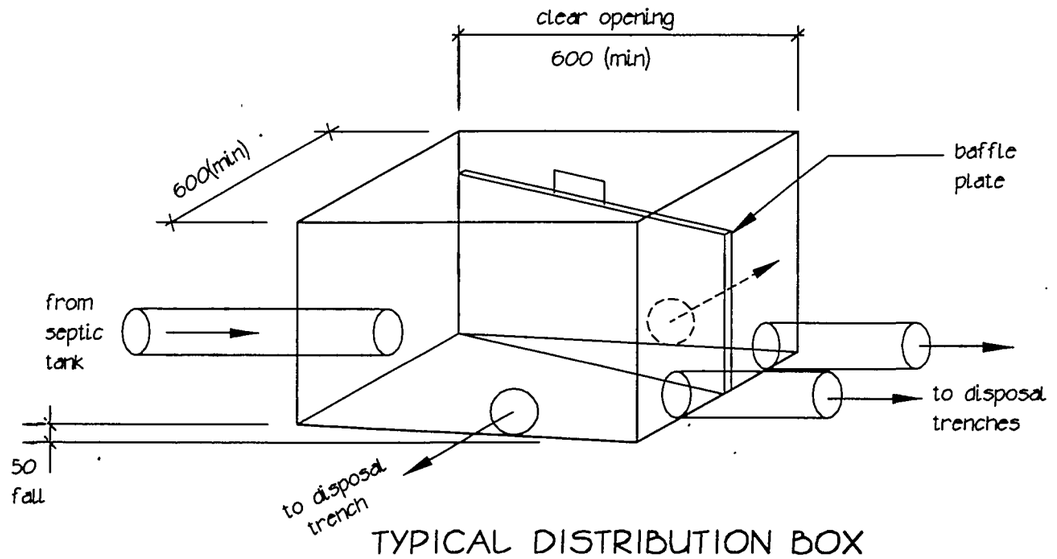
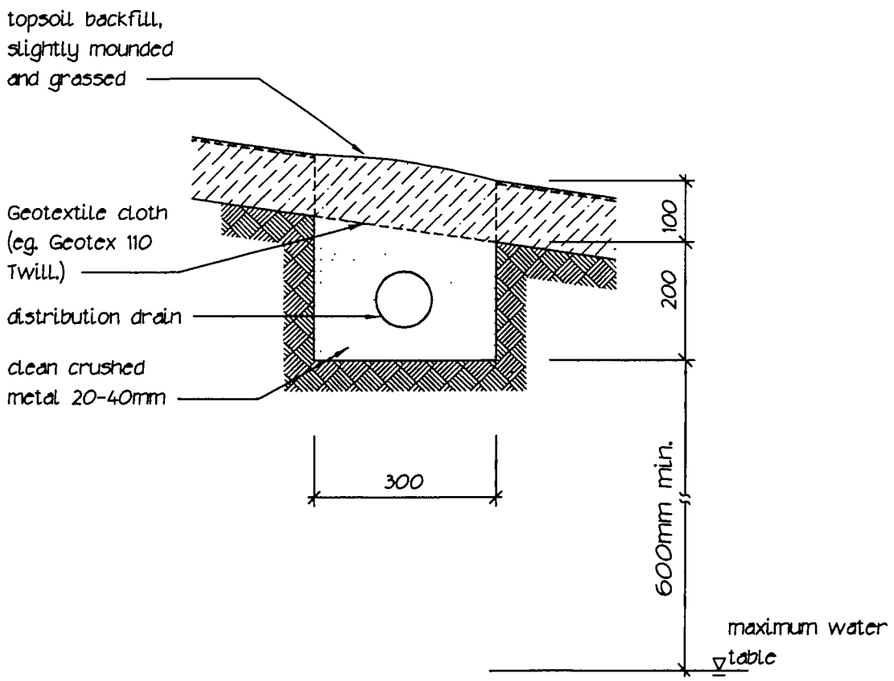
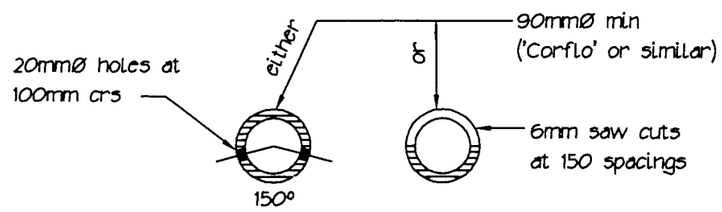


TYPICAL DISTRIBUTION BOX



SHALLOW DISPOSAL TRENCH



DISTRIBUTION DRAINS

(for gravity feeding only.)

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QUEEN CHARLOTTE SOUND

effluent disposal field
typical details

DATE	ORIGINAL SIZE	DRAWING No.	SHEET	ISSUE
7/00	A3	6699	C3	A

DES L.M. | DRN D.M. | APP | CAD