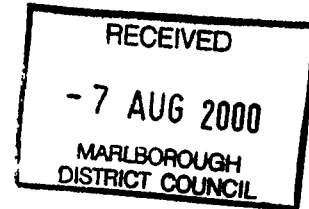




Our Ref: 6518

2 August 2000



RESOURCE CONSENT APPLICATION
WATER TAKE AND CONSTRUCTION OF INTAKE AND STORAGE DAMS

R H & A M Halliday
Section 3 Blk XI, Clifford Bay Survey District
Seaview Road, Seddon

1. INTRODUCTION

R H & A M Halliday own a 160 hectare property adjacent to Seaview Road in the lower Awatere Valley. It is proposed to establish grapes and olives on this property.

Rainfall in the area varies between an average of 37 mm in February to 73 mm in July. During the dry summer months long periods can sometimes pass without significant rainfall, and in order for grapes and olives to be established successfully irrigation will be required.

The Awatere River is the closest known water source with sufficient water to provide the irrigation requirements for a development of this size. It is proposed to source water from a seepage pond and surface channel on the south bank of the river.

The water allocation system operated under the Proposed Wairau Awatere Resource Management Plan means that water takes are likely to be restricted during the dry summer months, and hence storage is required to provide reliability of water supply. It is proposed to construct three storage dams in a hollow on the southern side of the property, adjacent to Seaview Road as shown on plan 6518 sheet 1 issue 'A' attached.

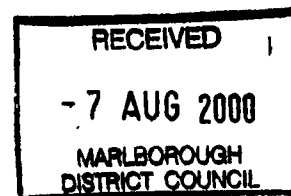
Class B water will be pumped to this storage via the road reserve.

2. IRRIGATION REQUIREMENTS

The peak water requirement for the trickle irrigation of grapes and/or olives is expected to be 2.2 mm per day. This gives a daily water usage for 160 hectares of 3,520 m³ per day (41 litres per second).

The average daily water usage over the five month irrigation period is normally significantly less than the peak amount.





REF: 6518

3. WATER TAKE/STORAGE MIX

We understand that all Class A water from the Awatere River is already allocated, but that there is still Class B water available. Class B water is fully available when the river flow is above 5.6 m³/s at the Awapiri recorder, reducing progressively to 0 as the river flow reduces to 2.3 m³/s.

Figure 1 shows the Awatere River flows, at the Awapiri recorder, over the last 10 years. Figure 2 shows these flows over the summer of 1997/98. This shows that Class B water, if fully allocated, would be restricted for much of the summer period.

It is intended to provide a combination of pumping and storage which would allow for full irrigation over a summer period with conditions equivalent to the 1997/98 summer.

Figure 3 shows the available water, for a Class B take of 3,520 m³ per day (41 litres per second), and the assumed irrigation requirement. This requirement is based on meter readings for irrigation of a vineyard in the Wairau Valley over the 1997/98 summer. This mix of water take and irrigation would require drawing approximately 250,000 m³ from storage., as shown in Figure 4. The net effect of rainfall, seepage and evaporation is likely to require an additional 35,000 m³ of storage.

A field survey has been carried out in the area of the proposed dams and a contour plan prepared. A preliminary design shows that three dams could be constructed as shown on plan 6518 sheet 2 issue 'A', giving a total volume of approximately 226,000 m³.

If the Class B take was increased to 5,150 m³ per day (60 litres per second), the demand from storage would be reduced to approximately 190,000 m³ (see Figures 5 and 6). With an allowance of 35,000 m³ for the net effect of evaporation, seepage and rainfall this would give a total storage requirement of approximately 225,000 m³, which balances the available storage.

The proposal is to take water from the Awatere River with a Class B Water Permit for a flow of 5,150 m³ per day (60 litres per second), with the provision of on site storage of approximately 225,000 m³.

4. WATER INTAKE

4.1 Location

The location of the proposed intake structure and associated stream work is on the southern bank of the Awatere River, approximately 5.0 kilometres downstream from the Awatere Road/Rail bridge. The grid reference is:

Map Number	P28
N	595 2300
E	260 3200

4.2 Proposal

It is proposed to site a pumpshed at the toe of the bank, above flood level, with water being pumped from an intake pond excavated into the gravels adjacent to the toe of the bank. This pond will be approximately 10 metres by 5 metres by 3 metres deep, with battered sides.

REF: 6518



A shallow trapezoidal channel with a base width of 1-2 metres will be cut from this intake pond out to the main river channel, which is currently situated approximately 30 metres from the toe of the bank, to bring water back to the intake pond. This channel will be orientated at an angle of approximately 15° downstream so that it will not change the direction of river flow during flood events.

The intakes for the pumps (two expected) will be set in the intake pond. Entry screens, of the well screen type with 3 mm maximum slot size, will be constructed on each intake pipe to prevent fish from passing into the pumps. The screen will be sized so that the intake velocity is less than 0.3 metres per second to avoid impingement of native fish.

4.3 **Proposed Maintenance Work**

The Awatere River in this area is still moderately steep, with high energy levels. The river bed is relatively wide with the main channel approximately in the middle of the river bed. This however meanders around and although the main channel is well defined it can be expected to move within the limits of the river banks. Ongoing maintenance will be required to ensure that sufficient water is diverted to the water intake, especially after flood events when the diversion channel is expected to be filled due to bed movement of river gravels.

4.4 **Planning Issues**

The proposed intake is located on land which is zoned Rural 4 under the Proposed Wairau Awatere Resource Management Plan. Section 1.7.2 of this plan classifies the diversion of water within the Awatere River in excess of 500 m³ per day as a Discretionary activity for which a Resource Consent is required. The matters that Council reserves control over and may impose conditions with respect to are:

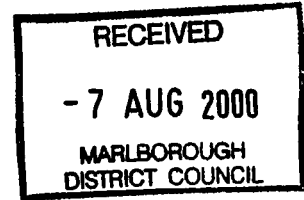
- (a) The extent of river bed disturbance.
- (b) The effect on river ecology.
- (c) The effects on hydraulic efficiency.

4.5 **Environmental Effects**

4.5.1 **Bird life**

From a survey conducted by the Department of Conservation 1997 the following bird species have been recorded on the lower section of the Awatere River (State Highway No. 1 Road/Rail bridge to the coast):

Banded dotterel	Little shag
Black fronted dotterel	South Island pied oystercatcher
White fronted tern	Pied stilt
Black fronted tern	Black billed gull
Caspian tern	Southern black backed gull
Canadian goose	White faced heron
Mallard duck	Pied shag
Paradise shelduck	



REF: 6518

Not recorded during this survey but also likely to occur are:

Red billed gull

Black shag

Most significant of these species are the banded dotterel and black fronted tern. Both these species inhabit the bare shingle river beds for feeding and nesting.

River flow in the area consists of a main channel with several shallow side channels fanning from the main channel. These channels, and to a lesser extent the main channel, continually shift within the river bed. Bird life inhabiting these riverbeds have adapted to these continuous shifts and the creation of a shallow channel to the proposed water intake will not alter or have a negative impact on the bird life or its habitat.

The peak nesting period for these birds is September to December. During this time diversion work within the riverbed may have an impact on breeding through disturbance or damage to nest sites. To mitigate disturbance through the breeding period it is recommended that opening up the channel be carried out in early September, and then immediately after any flood which fills the channel in, as this flooding will have destroyed nests.

4.5.2 Fish life

The following fish species have been recorded in the lower Awatere River and its tributaries.

Common bullies
Upland bullies
Torrent fish
Bluegill bully
Long finned eels

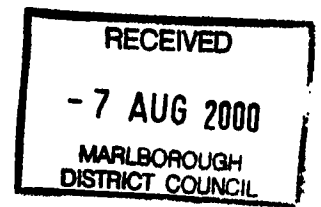
Giant bully
Inanga
Short finned eels
Brown trout
Common river galaxias

Many of these species migrate to or from the sea as part of their life cycle. The orientation and very low velocities in the diversion channel is such that migrating species would not be expected to be drawn into the channel.

The proposed intake screen details are such that fish will not be drawn into the pump, or sucked on to the screen.

The most significant potential effect of the proposed construction and maintenance work on fish life is expected to be from discolouration of the water. To minimise the effects of water discolouration, any work will be carried out in an upstream direction, using an excavator. This will operate from out of the water channel. The excavated gravel will be deposited next to the channel to allow any eels to return to the water.

The low flows in the side channel (< 0.5 m³/s) when this work is carried out means that suspended settlement will be expected to settle quickly and not reach the main channel in significant quantities.



REF: 6518

4.6 Hydraulic Efficiency

The proposed work will have no significant effect on river flood levels in this area. Water diversion works will be in the form of a shallow wide channel which will not alter the flow path of the main channel. It is not expected that the diversion measures will affect or alter the course of the main channel and as such will not increase the risk of scour to the river banks.

5. CONSTRUCTION OF EARTH STORAGE DAMS

5.1 General

The three earth storage dams proposed will be constructed across an un-named gully as shown on attached plan 6518 sheet 2.

Preliminary design and calculations show that storage volumes for the dams are in the order of:

	MAXIMUM HEIGHT	STORAGE VOLUME
Dam 1	7.0 metres	33,000 m ³
Dam 2	8.5 metres	85,000 m ³
Dam 3	9.0 metres	108,000 m ³

The gully below the dam crosses Seaview Road and runs through the Marfell property to Station Creek. There are no buildings in this waterway area so minimal downstream damage would be expected if there was a failure.

These dams will all be classed as 'Low Hazard' in accordance with the Dam Safety Guidelines of the New Zealand Society of Large Dams.

The dams will be constructed predominantly from on site materials. Bulk material required for the dam construction will be excavated from within the storage areas of the dams. Gravel for toe drains and erosion protection will be obtained from the Awatere River.

Access to the dams will be over private property with no right of public access.

5.2 Planning Issues

The proposed dams are located on Section 3 Block XI of Clifford Bay District. Under the Proposed Wairau Awatere Resource Management Plan the property is zoned as Rural 4. The dams do not comply with the following conditions in respect of a permitted activity and are classified as discretionary activities.

- (a) More than 20,000 m³ of water will be impounded by individual dams.
- (b) Dam heights will exceed 4.0 metres in height.
- (c) Closer than 500 metres to a road.

5.3 Dam Construction

The proposed dams will be constructed from suitable material excavated from within the storage basin. The amount of material which would be required for the three dams will be approximately 57,000 m³. Preliminary tests on the in situ materials have shown permeabilities to be in excess of 2.9×10^{-9} which will be suitable for dam construction. The material was not dispersive.



REF: 6518

Plan 6518 sheet 3 issue 'A' shows the typical construction details proposed for the dams.

The area around the dam sites consists of grass covered land with gentle slopes and no signs of instability. The dams will be founded on and keyed into the in situ clay and with the provision of cutoff trenches and toe drains should result in a well sealed, stable dam.

Any gravel lenses exposed by excavation for fill material will be sealed with low permeability material.

The dam, embankment and other disturbed areas will be topsoiled and sown down at the earliest practical time after construction to minimise scour.

Further site investigation and full design will be required for construction.

The gully that the dams will be constructed in conveys stormwater from a relatively small catchment and only runs during high storm events. Mr Halliday has indicated that from his experience for water to run down the gully in excess of 50 mm of rain has to fall when the ground is wet. Existing stockwater dams would only get water in them on average every third winter. Rainfall in the catchment upstream of the proposed dams will have a very limited contribution to replenishment of water stored in the dams.

With such low and infrequent gully flows, it is proposed to make provision for them by generous free board, and constructing a surface overflow channel around the hillside, and then spilling this water down a natural slope to the next dam. Any significant flow would be expected to cause scour of the hill slope, but this would be infrequent and easily repaired.

5.4 Environmental Effects

The area covered by the proposed dams is approximately 7.5 hectares. The area is currently covered by pasture. The area, being farmland, has been much modified in the past and little natural value is thought to exist.

The proposed dams are expected to enhance the attractiveness of the area, and provide a habitat for aquatic bird life.

There is the potential for sediment laden runoff from exposed areas during and after construction until grass on batters and other disturbed areas is established. These exposed areas will be resown with grass as soon as possible. The gully below the proposed works is grass covered and with no stream flow there will be no impact on water quality of downstream water bodies. No specific silt control measures are proposed.

DAVIDSON PARTNERS LTD


R.J. Melton

JPB:JEN

Encl



DavidsonPartnersLtd

Structural Engineering
Civil Engineering
Building Design
Project Management

Practising in association with Ayson and Partners, Registered Surveyors

Our Ref: 6518

4 August 2000

Marlborough District Council
P O Box 443
BLLENHEIM

ATTENTION: H Woodward

**re: RESOURCE CONSENT APPLICATION -
R.H & A.M HALLIDAY, SEAVIEW ROAD, SEDDON**

Please find enclosed a Resource Consent application form and report for the Water Take and Construction of Intake and Storage Dams for the above applicant.

DAVIDSON PARTNERS LTD

Jen

AP **R.J Melton**

RJM:JEN

Encl

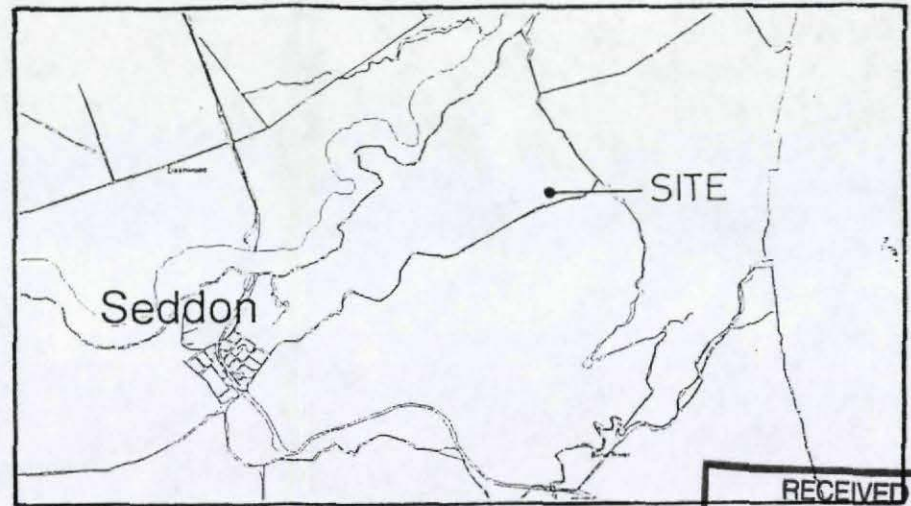
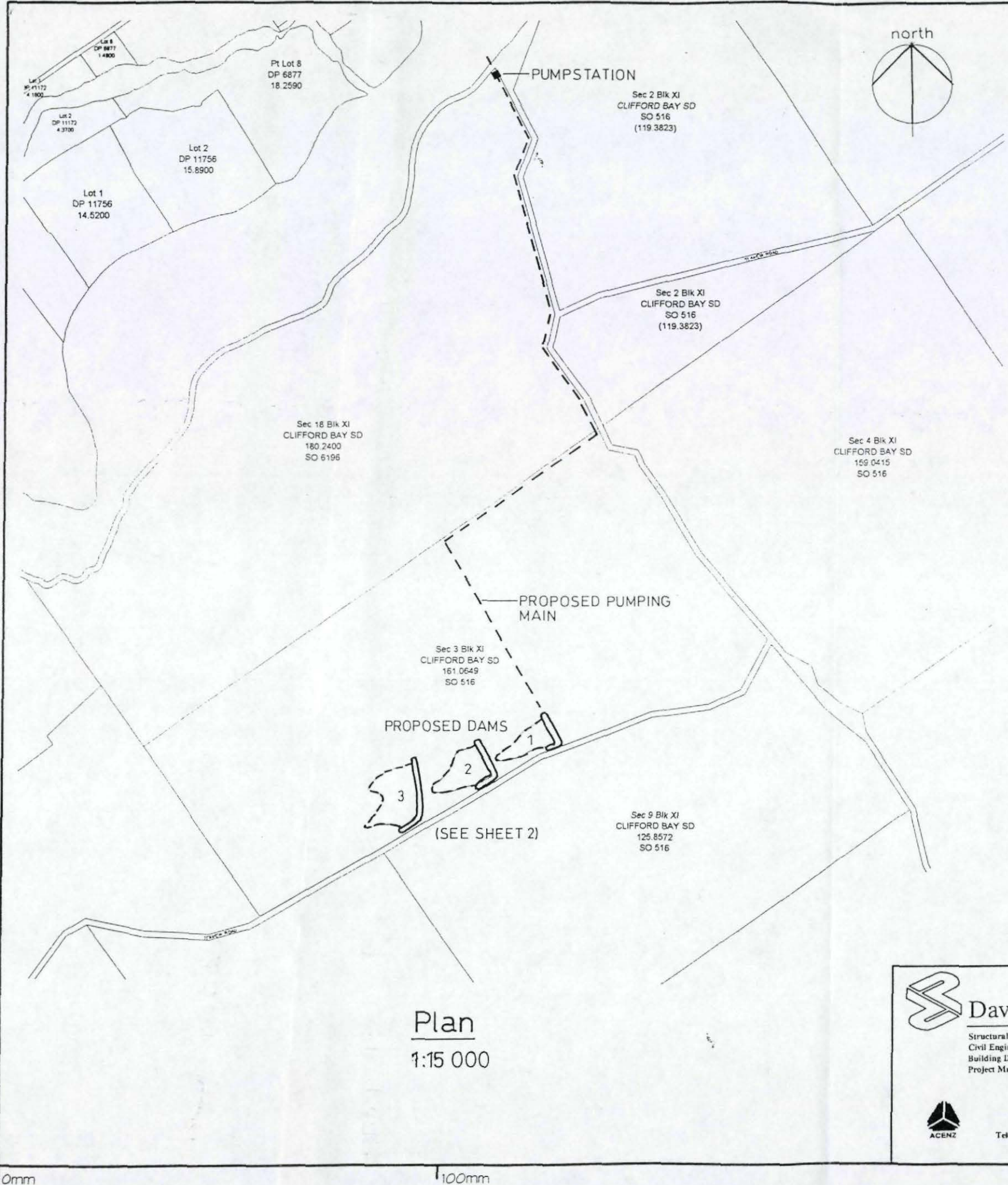
FILE No.:
OFFICER:
DATE RECV'D 07 AUG 2000
MARLBOROUGH DISTRICT COUNCIL



Davidson Ayson House, 4 Nelson Street,
P.O. Box 256, Blenheim, New Zealand
Telephone 03 578 7029 Fax 03 578 7028
Email: davidson.partners@xtra.co.nz

Principals


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



Location plan
1:100 000

RECEIVED
- 7 AUG 2000
MARLBOROUGH
DISTRICT COUNCIL

Plan
1:15 000

 **DavidsonPartnersLtd**
Structural Engineering
Civil Engineering
Building Design
Project Management



Davidson Ayson House
4 Nelson Street, P.O. Box 256
Blenheim, New Zealand
Telephone 03 578 7029 Fax 03 578 7028

R H HALLIDAY
PROPOSED WATER STORAGE
SEAVIEW ROAD, SEDDON

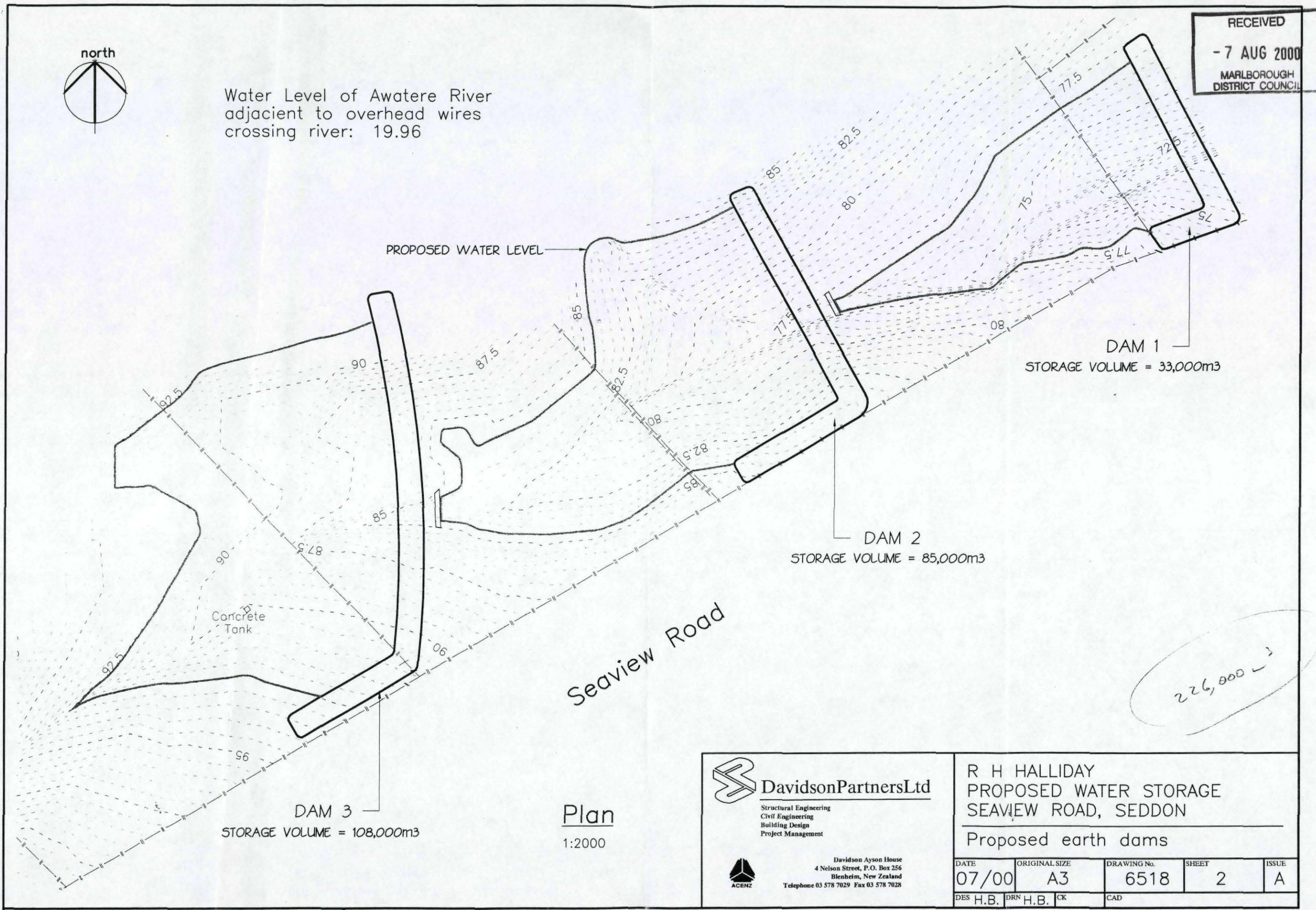
Plan

DATE	ORIGINAL SIZE	DRAWING No.	SHEET	ISSUE
07/00	A3	6518	1	A
DES H.B.	DRN H.B.	CK	CAD	

RECEIVED
- 7 AUG 2000
MARLBOROUGH
DISTRICT COUNCIL



Water Level of Awatere River
adjacent to overhead wires
crossing river: 19.96



DAM 1
STORAGE VOLUME = 33,000m³

DAM 2
STORAGE VOLUME = 85,000m³

DAM 3
STORAGE VOLUME = 108,000m³

Concrete Tank

Seaview Road

226,000

Plan
1:2000

 **DavidsonPartnersLtd**
Structural Engineering
Civil Engineering
Building Design
Project Management

Davidson Ayson House
4 Nelson Street, P.O. Box 256
Blenheim, New Zealand
Telephone 03 578 7029 Fax 03 578 7028

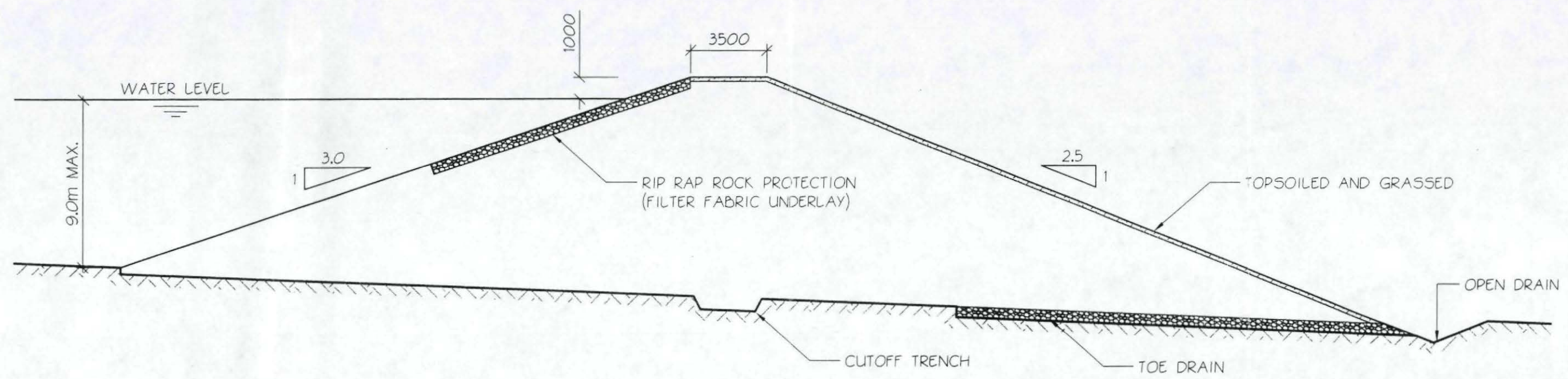
 ACENZ

R H HALLIDAY
PROPOSED WATER STORAGE
SEAVIEW ROAD, SEDDON

Proposed earth dams

DATE	ORIGINAL SIZE	DRAWING No.	SHEET	ISSUE
07/00	A3	6518	2	A
DES H.B.	DRN H.B.	CK	CAD	

RECEIVED
 - 7 AUG 2000
 MARLBOROUGH
 DISTRICT COUNCIL



DavidsonPartnersLtd
 Structural Engineering
 Civil Engineering
 Building Design
 Project Management

Davidson Ayson House
 4 Nelson Street, P.O. Box 256
 Blenheim, New Zealand
 Telephone 03 578 7029 Fax 03 578 7028

R H HALLIDAY
 PROPOSED WATER STORAGE
 SEAVIEW ROAD, SEDDON

typical cross section of dams

DATE	ORIGINAL SIZE	DRAWING No.	SHEET	ISSUE
07/00	A3	6518	3	A
DES H.B.	DRN H.B.	CK	CAD 500mmx:\ACAD\6518\6518XS2	