

**BEFORE A COMMISSIONER APPOINTED BY THE OTAGO REGIONAL  
COUNCIL AND THE CENTRAL OTAGO DISTRICT COUNCIL**

**IN THE MATTER OF**

the Resource Management Act 1991

**AND**

**IN THE MATTER OF**

applications by Cromwell Certified  
Concrete Limited for resource  
consents to expand Amisfield Quarry

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**STATEMENT OF EVIDENCE OF CEES BEVERS  
ON BEHALF OF CROMWELL CERTIFIED CONCRETE LIMITED**

**(ECOLOGY)**

Dated: 30 November 2021

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**GREENWOOD ROCHE**  
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## 1 INTRODUCTION

- 1.1 My full name is Cornelis (Cees) Martin Willem Filip Bevers. I have been a practicing ecologist for 20 years and I currently work as an ecologist at Landpro Limited (Landpro). Previously I worked through my own consultancy company, Oecologico Limited (Oecologico). Oecologico merged with Landpro in October 2017.
- 1.2 I hold a Bachelor of Science in Ecology (1996) and a Postgraduate Diploma in Wildlife Management (1998) from the University of Otago.
- 1.3 I have a broad range of ecological experience which includes working for the Department of Conservation (DoC) in several roles (including at the former Stratford Area Office as both a Programme Manager and Ranger undertaking Animal Threats pest control programmes and associated monitoring programmes). As a consultant, I have had significant experience in undertaking ecological impact assessments, bird count surveys and botanical surveys for a range of clients including conservation groups, the private sector and local government.
- 1.4 I was engaged by Cromwell Certified Concrete Limited (CCCL) in February 2020 to undertake an assessment of the ecological effects of the expansion of the existing Amisfield Quarry, including in relation to the Mahaka Katia Scientific Reserve which is administered by DoC and is located immediately north-east of the proposed quarry expansion land. I prepared an ecological impact assessment report which formed part of the AEE<sup>1</sup>.
- 1.5 I have visited the existing Amisfield Quarry, the proposed expansion land and the adjacent Mahaka Katia Scientific Reserve. My visit to the Reserve was limited to the Reserve's southern title, as it is that parcel of land which adjoins the proposed expansion area. I am also familiar with the surrounding wider area and the Cromwell Basin.

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<sup>1</sup> Cromwell Certified Concrete Limited, Amisfield Quarry Expansion, Luggate-Cromwell Road, Mt Pisa, Ecological Impact Assessment, October 2020.

1.6 In preparing this evidence, I have read and considered the following documents:

- (a) The AEE and its supporting technical reports in relation to noise and air quality;
- (b) Relevant submissions on the applications;
- (c) The conditions proposed by the applicant (as provided to the consent authorities on 10/11 November 2021);
- (d) The Section 42A reports prepared by Mr Whyte for the District Council and the Regional Council, and the evidence of Deborah Ryan, Donovan Van Kekem and Jeremy Trevathan; and
- (e) The following statements of evidence (in draft) on behalf of the applicant:
  - (i) Mr Dominic Sutton (CCCL);
  - (ii) Mr Travis Allison (CCCL);
  - (iii) Mr Jamie Exeter (Noise); and
  - (iv) Mr Roger Cudmore (Air Quality).

1.7 Whilst this is a Council hearing, I acknowledge that I have read and agree to comply with the Environment Court's Code of Conduct for Expert Witnesses, contained in the Environment Court Practice Note 2014. My qualifications as an expert are set out above. Other than where I state that I am relying on the advice of another person, I confirm that the issues addressed in this statement of evidence are within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

## 2 **SCOPE OF EVIDENCE**

2.1 My evidence addresses:

- (a) The site and its ecological context;

- (b) The ecological values of the site and the Mahaka Katia Scientific Reserve;
- (c) The potential ecological effects of the proposal and the mitigation measures proposed;
- (d) Submissions which raise ecological matters, being submissions by DoC and Hokonui Runanga and Te Runanga o Otakou (Kā Ruānaka);
- (e) The Section 42A report; and
- (f) Consent conditions.

### 3 **SUMMARY**

3.1 I have assessed the ecological effects of quarrying on the expansion land, including any effects of that quarrying on the adjacent 27 ha Reserve.

3.2 It is important to note that the Reserve is located in a rural environment typical of Central Otago in that it includes a mix of productive rural land uses interspersed with rural lifestyle living. Notably, residential development exists or has been consented on six parcels of land that adjoin the Reserve and a number of these also support horticulture and viticulture developments. The surrounding environment provides for a baseline of environmental effects that the Reserve is exposed to, for example pest species (cats) associated with residential land and noise associated with a frost fan (approximately 150 m to the south). The Reserve is also open year round to the public.

#### *Expansion Land*

3.3 Ecologically, the proposed quarry expansion land is a highly disturbed site. It has been cultivated in the past (~60%) and is dominated by exotic plant species, although some native plant species are present in small numbers. Removal of these plants will have a no more than minor ecological effect.

3.4 Few bird species were encountered when I visited. Three banded dotterel (*Charadrius bicinctus*, classified as "Threatened - Nationally

Vulnerable") were observed foraging there. Habitat quality for banded dotterel within the expansion land is marginal/low, and use of that land by dotterel is highly likely to be limited to occasional foraging. Dotterel are unlikely to be reliant on this small area, given the much better habitat which is widely available elsewhere in the Cromwell Basin. Any disturbance of wildlife on the expansion land will have no more than a minor ecological effect.

- 3.5 Over time, the amount of habitat available for banded dotterel for occasional foraging within the quarry expansion land will be completely removed by quarrying activities. The removal of the marginal habitat on the quarry expansion land is unable to be mitigated. It is likely that this will have no more than a minor ecological effect, as the habitat quality within of the expansion site currently is low.

#### *Mahaka Katia Scientific Reserve*

- 3.6 The Reserve has high ecological values due its remnant native plant community. Three of the native plant species present in the reserve are classified as "Threatened – Nationally Vulnerable". Three plants are classified as "Threatened - Nationally Critical". Two plant species present are classified as "At Risk - Declining". Two plant species present are classified as "Data Deficient", but are likely threatened to some extent. Five species are classified as "At Risk – Declining". One plant species is classified as "At Risk - Naturally Uncommon". A lichen species present is classified as "naturally uncommon". The remaining 21 native species present are "Not Threatened".
- 3.7 The Reserve is also a known site for the breeding of banded dotterel and South Island pied oystercatchers. South Island pied oystercatchers are classified as "At Risk - Declining", and are also likely to use the proposed quarry expansion land from time to time.
- 3.8 There is potential for some disturbance to wildlife in the Reserve from quarrying operations (due to noise and the presence of machinery and people) but this is likely to be low particularly given the range of activities undertaken on other land nearby (which includes quarrying), and the conditions proposed which require bunds around the edge of the expansion land which will screen noise from quarrying. Construction of the bunds will be undertaken outside of the nesting

season, and no quarrying will occur within 50 metres of the Reserve during that period. Given the size and shape of the Reserve, there will be ample suitable undisturbed areas for wildlife within the Reserve, as well as a range of other favoured habitat across the Cromwell Basin. With the mitigation measures proposed, I consider that any potential effects of disturbance of wildlife within the Reserve will be less than minor.

- 3.9 With the operational controls proposed and based on the advice of Mr Cudmore, I consider that the potential effects of dust from quarrying the expansion land on native vegetation and wildlife within the Reserve will be minimal.
- 3.10 I understand that DoC is comfortable with the conditions proposed by the applicant and no longer wishes to be heard in relation to its submission on the proposal.

#### **4 THE SITE AND ITS ECOLOGICAL CONTEXT**

- 4.1 The proposed 9.8ha expansion land is located immediately to the north-eastern portion of the existing quarry at 1248 Luggate-Cromwell Road (SH8), Mt Pisa, Cromwell.
- 4.2 The expansion land is generally flat to rolling and approximately has been 60% cultivated. Adjacent land uses include a lifestyle block to the west, and a fruit orchard downslope on a lower terrace to the east. There are residential dwellings in the lifestyle blocks and the orchard. A range of activities are undertaken within those lifestyle blocks and the orchard, and I understand that the orchard uses a frost fan for frost-fighting.
- 4.3 The adjoining 27ha DoC Reserve is located immediately north-east of the proposed quarry expansion land, and has remnant native vegetation. The Reserve consists of a southern and northern title and rather unusually for a DoC reserve, there is a lifestyle block with a residential dwelling located between those two titles, at 20C Gilmore Road. There is public pedestrian access to the Reserve year round.

### *Ecological Context*

- 4.4 The proposed quarry expansion land is adjacent to Lake Dunstan to the east, a man-made hydroelectricity generation lake created by the Clyde Dam. It is situated within the Cromwell Basin. Mountain ranges surround the Cromwell Basin, and include the Pisa Range to the west, and the Dunstan Mountains to the east, and the river delta area of the Clutha/Mata-Au River at the head of Lake Dunstan to the north.
- 4.5 The Reserve was created due to the presence of native cushion forming native plants and other uncommon native plants which are now rare in the Cromwell Basin.
- 4.6 Appendix 1 to my evidence shows the ecological context of the area in relation to the existing quarry, the proposed quarry expansion land, the Reserve, Lake Dunstan, and the Clutha River.

## **5 ECOLOGICAL VALUES**

### **Vegetation**

#### *Expansion land*

- 5.1 As I have noted, the majority (~60%) of the expansion site has been cultivated (refer to the below photographs as presented in the Ecological Assessment submitted with the AEE).



**Figure 1 Proposed Amisfield Quarry expansion land, to the north of current quarry, looking north.**



**Figure 2 Proposed quarry expansion land, looking south-east. Site is predominantly cultivated.**



- 5.2 In general, there are very few plant species currently on the expansion site. Native plants found on site include the cushion forming golden scabweed (*Raoulia australis*), a lichen called *Xanthoparmelia semiviridis*, creeping pohuehue (*Muehlenbeckia axillaris*), and dwarf bedstraw (*Galium perpusillum*). Scabweed is classified as "At Risk – Declining" in the New Zealand Threat Classification System (de Lange 2009, de Lange *et. al.* 2018a). The lichen is classified as "naturally uncommon" (de Lange *et. al.* 2018b). The creeping pohuehue and dwarf bedstraw are classified as "Not Threatened" (de Lange *et. al.* 2018a). The native plant species are in low abundance on the site, and widely scattered, with only a handful of scabweed cushion plants found on site in areas that have not been cultivated.
- 5.3 Exotic plants are most abundant on the expansion land, and include Scotch thistle (*Cirsium vulgare*), St. John's wort (*Hypericum perforatum*), moth mullein (*Verbascum virgatum*), viper's bugloss (*Echium vulgare*), scarlet pimpernel (*Anagallis arvensis* var. *arvensis*), and smooth catsear (*Hypochaeris glabra*).

#### *Mahaka Katia Scientific Reserve*

- 5.4 The Reserve has notable areas of native cushion plant communities, some sandy areas, and areas of native grasses and shrubs, but largely has sparse vegetative cover (refer to the photographs below as presented in the Ecological Assessment submitted with the AEE).



**Figure 3 Boundary between Mahaka Katia Scientific Reserve in distance, and proposed quarry expansion land in foreground**



**Figure 4 Mixture of native cushion forming plants, native grasses, open sandy areas and exotic weeds in Reserve.**

- 5.5 DoC carries out regular monitoring of the plant communities within the Reserve (Murdoch 2003). According to that monitoring, there are a number of threatened native plants found within the Reserve, as classified by de Lange *et. al.* (2018a), using the New Zealand Threat Classification System. There are several categories of threat status, and the plants within each category are listed below.
- 5.6 Native plants found within the Reserve classified as "Threatened – Nationally Vulnerable" are Buchanan's orache (*Atriplex buchananii*), trailing bindweed (*Convolvulus verecundus*), and fan-leaved mat daisy (*Raoulia monroi*). Native plants found in the Reserve classified as "Threatened - Nationally Critical" are the woollyhead *Craspedia* (a) (CHR 511522; Clutha River), Maniototo peppercross (*Lepidium solandri*), and *Leptinella* (a) (CHR 515297; Clutha). Two native plant species found in the Reserve are classified as "Data deficient", the sedge *Carex decurtata* and *Rytidosperma maculatum*, are likely to be threatened (de Lange *et. al.* 2018a). Species that are found in the Reserve and classified as "At Risk – Declining" are golden scabweed (*Raoulia australis*), desert broom (*Carmichaelia petriei*), pin cushion (*Colobanthus brevisepalus*), *Raoulia beauverdii*, and celadon mat daisy (*Raoulia parkii*) (de Lange *et. al.* 2018a). There is one species found in the Reserve classified as "At Risk - Naturally Uncommon"; the perennial herb *Myosotis uniflora* (de Lange *et. al.* 2018a). There is a lichen species found in the Reserve, *Xanthoparmelia semiviridis*, which is classified as "Naturally Uncommon" (de Lange *et. al.* 2018b).
- 5.7 Native plant species found within the Reserve classified as "Not Threatened" (de Lange *et. al.* 2018a) are; dwarf pincushion grass (*Agrostis muscosa*), grassland sedge (*Carex breviculmis*), *Carex resectans*, *Crassula colligata* subsp. *colligata*, willowherb (*Epilobium hectorii*), *Epilobium microphyllum*, *Epilobium rostratum*, dwarf bedstraw (*Galium* (c) (8 aff. *Galium perpusillum*; Clutha)), *Geranium brevicaule*, patotara (*Leucopogon fraseri* complex (mountain ecotype)), adders tongue fern (*Ophioglossum coriaceum* agg.), silver tussock (*Poa cita*), blue tussock (*Poa colensoi*), desert poa (*Poa maniototo*), *Puccinellia* sp., *Raoulia apicinigra*, *Rytidosperma pumilum*, the cushion plant *Scleranthus uniflorus*, *Spergularia media*, slender chickweed (*Stellaria gracilentia*), and white fuzzweed (*Vittadinia australis*) (Patrick, Barkla & Thorsen 2020).

- 5.8 Additional records of native plants in the Reserve were found on iNaturalist website ([www.inaturalist.org](http://www.inaturalist.org)), which is a crowd sharing platform for plant and animal location records frequently used by professional scientists and amateurs. Only the observations for the Reserve categorised as "Research Grade" on the inaturalist website are used here, and include native dandelion (*Taraxacum magellanicum*), creeping pohuehue (*Muehlenbeckia axillaris*), scabweed mat daisy (*Raoulia hookeri* var. *hookeri*), which are all classified as "Not threatened" (de Lange *et. al.* 2018a).
- 5.9 The cushion plants scabweed and *Scleranthus uniflorus*, are a distinct and abundant feature of the vegetation cover of the Reserve land, in contrast to the quarry expansion land, where only scabweed is present as a few scattered individual cushions.
- 5.10 Exotic plants found in the Mahaka Katia Scientific Reserve include sheeps bur (*Acaena agnapila* var. *aequispina*), silvery hair grass (*Aira caryophyllea* subsp. *caryophyllea*), yellow gromwell (*Amsinckia calycina*), parsley piert (*Aphanes inexpectata*.), viper's bugloss (*Echium vulgare*), long storkbill (*Erodium botrys*), musky storkbill (*Erodium moschatum*), Californian poppy (*Eschscholzia californica*), tussock hawkweed (*Hieracium lepidulum*), mouse-eared hawkweed (*Hieracium pilosella* subsp.), St John's wort (*Hypericum perforatum*), *Logfia minima*, dwarf mallow (*Malva neglecta*), horehound (*Marrubium vulgare*), *Muehlenbeckia ephedroide*, grassland forget-me-not (*Myosotis discolor*), cotton thistle (*Onopordum acanthium*), sweet briar (*Rosa rubiginosa*), sheep's sorrell (*Rumex acetosella*), dandelion (*Taraxacum officinale*), suckling clover (*Trifolium dubium*), clustered clover (*Trifolium glomeratum*), gorse (*Ulex europaeus*), woolly mullein (*Verbascum thapsus*), moth mullein (*Verbascum virgatum*), spring speedwell (*Veronica verna*), and vulpia hair grass (*Vulpia myuros* var. *megalura*) (Patrick, Barkla & Thorsen 2020, and records from [www.inaturalist.org](http://www.inaturalist.org))

## **Birds**

### *Expansion land*

- 5.11 A total of three banded dotterel (*Charadrius bicinctus*) were seen foraging within the proposed quarry expansion land when I visited.

Banded dotterel are classified as "Threatened - Nationally Vulnerable" under the New Zealand Threat Classification System (Robertson *et. al.* 2017). A native harrier hawk (*Circus approximans*) was also seen flying over the land, a species classified as "Not Threatened" (Robertson *et. al.* 2017).

- 5.12 It is likely that the banded dotterel were passing through the proposed quarry expansion land and were not resident, as there was little cover present for shelter for roosting. No evidence of nesting could be seen, although it was outside of the breeding season when I visited the site, which is likely to be from August to December inclusive in Central Otago (Heather & Robertson 2005). The expansion land is unlikely to be used for nesting because it is disturbed by cultivation, and these birds prefer consolidated substrates like sand, shingle, shell and dirt, with or without prostrate vegetation (Heather & Robertson 2005).
- 5.13 Habitat quality within the expansion land is low for banded dotterel, as they prefer braided riverbeds and river terraces for breeding and feeding. They will feed on pasture and tilled ground for invertebrates, and will also use lakeshores and mudflats for feeding (Heather & Robertson 2005). Several of these habitat types occur nearby in the Cromwell Basin. It is unlikely that the banded dotterel rely on the relatively small and already ecologically disturbed quarry expansion land for feeding.
- 5.14 A flock of introduced European greenfinch (*Carduelis chloris*) were also seen on the land. An introduced California quail (*Callipepla californica*) was seen on an adjacent property when travelling from the expansion land.

#### *Mahaka Katia Scientific Reserve*

- 5.15 Banded dotterel are known to nest in the Mahaka Katia Scientific Reserve, as signposted on the DoC signage for the Reserve. South Island pied oystercatcher (*Haematopus finschi*) are also known to nest within the Reserve and are classified as "At Risk - Declining" (Robertson *et. al.* 2017). Oystercatchers may also visit the expansion land from time to time.

## **Mammals**

5.16 A feral cat (*Felis catus*) was seen on the proposed quarry expansion land on my site visit. Cats (feral and domestic) are a predator of banded dotterel, and pose a significant conservation threat to the species (Heather & Robertson 2005). European rabbits (*Oryctolagus cuniculus*) were seen on both the quarry expansion land and the Reserve, and were abundant. Widespread signs of rabbit browsing and digging is evident.

## **6 POTENTIAL EFFECTS**

### **Expansion Land**

#### *Vegetation clearance within quarry expansion land*

6.1 Clearance of the plant species found on the expansion land over time will have a no more than minor ecological effect. The site has been cultivated in the past and therefore is highly ecologically disturbed. It is dominated by exotic weed species and the few native plants found onsite are in low abundance and scattered. No specific mitigation is required to address effects associated with the removal of plant species on the land.

#### *Wildlife disturbance*

6.2 The proposed quarrying activities may disturb wildlife visiting the expansion land either due to noise or the movement of machinery and people within the quarry however I consider effects would be no more than minor.

#### *Habitat removal*

6.3 Over time, the amount of habitat available for banded dotterel for occasional foraging within the quarry expansion land will be completely removed by quarrying activities. The removal of the marginal habitat on the quarry expansion land is unable to be mitigated. It is likely that this will have no more than a minor ecological effect, as the habitat quality within of the expansion site currently is low, and banded dotterel are highly unlikely to be reliant on this small area,

with better habitat being widely available nearby in the Cromwell Basin.

### **Mahaka Katia Scientific Reserve**

#### *Wildlife disturbance*

- 6.4 There is some potential disturbance effect from quarrying the expansion land on the use of the Reserve by banded dotterel and South Island pied oystercatcher, but it is likely to be low. The Reserve has open access to the public all year round, and there are two residential dwellings immediately adjacent to the Reserve to the north and west, creating a base level of disturbance of wildlife.
- 6.5 Once established, the proposed 3 m high earth bunds along the boundary of the expansion land within the Reserve will screen the quarrying activities to mitigate potential noise effects on wildlife. Where the source of the noise cannot be seen by wildlife when foraging or nesting on the ground, the impact of the noise is generally reduced. Seeing the source of a noise (i.e. moving machinery and people) can compound the level of disturbance from the actual noise itself.
- 6.6 There is potential for disturbance of banded dotterel nesting within the Reserve, but this likely to be low given that no quarrying will occur within 50 m of the Reserve during nesting, and all bunds will be formed outside of the nesting season.
- 6.7 The level of potential disturbance, and its 'reach' over the Reserve will depend on the "flight zone" of banded dotterel and the pied oystercatchers, which is the proximity distance at which they feel impacted by noise or the presence of people or operating machinery, and take flight and leave the site. It is likely there are areas within the Reserve which are far enough away from the boundary with the proposed quarry expansion land where these birds will feel comfortable enough to stay and nest, as the Reserve is relatively large at 27 ha.
- 6.8 DoC has (in its submission) suggested some conditions to mitigate effects on wildlife in the Reserve. Conditions which address the matter raised by DoC have been proposed by the applicant, and I understand that DoC is comfortable with those conditions. With those conditions,

I consider potential effects on wildlife in the Reserve to be less than minor.

## **Dust**

### *Mahaka Katia Scientific Reserve*

6.9 There is potential for dust from quarrying to affect native vegetation and wildlife within the Reserve if not adequately controlled. Mr Cudmore's evidence (and the draft Dust Management Plan appended to his evidence) describes a range of dust control and mitigation measures. With those measures in place, I consider that any effects of dust on vegetation or wildlife in the Reserve will be minimal.

## **7 SUBMISSIONS**

7.1 Two of the submissions on the proposal raise ecological effects. I understand that the DoC is comfortable that the conditions proposed address the matters raised in its submission. The submission by Kā Ruŋaka Kā Ruŋaka seeks that noise and dust effects be appropriately managed and suggests that a condition be imposed which requires any nests within the expansion land to be re-located if present. However this is impractical and highly likely to be ineffective, if any nests were to be found (which I consider unlikely).

7.2 The conditions proposed which have been agreed with DoC appropriately control the timing and location of quarrying activities in relation to the bird nesting season.

## **8 SECTION 42A OFFICERS' REPORT**

8.1 There are no matters arising in the s42A reports in relation to ecological effects on which I need to comment. Those reports agree that overall, with the conditions proposed, overall, ecological effects will be less than minor.

## **9 CONSENT CONDITIONS**

9.1 I reviewed the conditions of consent proposed by the applicant and provided to the consent authorities on 10/11 November and confirm that they are appropriate, reflect my recommendations and address the submissions by DoC and Kā Ruŋaka.



## 10 CONCLUSION

- 10.1 The ecological effects of the clearance of what little vegetation exists on the expansion land will be no more than minor given the land is highly disturbed and the vegetation is of low ecological value. Habitat quality for banded dotterel within the expansion land is marginal/low, and use of that land by dotterel is highly likely to be limited to occasional foraging. Therefore quarrying of the expansion land (and removal of that habitat over time) will have no more than a minor ecological effect. Dotterel are unlikely to be reliant on this small area, given the much better habitat which is widely available elsewhere in the Cromwell Basin.
- 10.2 There is potential for some disturbance to wildlife in the Reserve from quarrying operations (due to noise and the presence of machinery and people) but this is likely to be low, particularly given the range of activities undertaken on other land nearby (such as the use of a frost fan) and the conditions proposed. With the conditions proposed, these effects will be reduced to less than minor. Given the size and shape of the Reserve, there will still be ample suitable undisturbed areas for wildlife within the Reserve, as well as a range of other favoured habitat across the Cromwell Basin.
- 10.3 With the controls mitigation measures proposed, any potential effects of dust from the expansion land on native vegetation and wildlife within the Reserve will be minimal.

**Cees Bevers**

**November 2021**

## **Appendix 1**



Digital map data sourced from Land Information New Zealand (LINZ).  
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Client  
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## ECOLOGICAL CONTEXT PLAN

Rev.	Date	Revision Details	By	Surveyed	Signed	Date	Job No.	Drawing No.
-	-	-	-	-	-	-	19474	01
				Drawn	Signed	Date	Scale	1:4000 @ A1
				SLB		4.6.20		1:8000 @ A3
				Designed	Signed	Date	Datum & Level	Rev.
							NZTM 2000 & MSL	-



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