

# **K.G. Cantlay & Co.**

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Your Ref:  
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## **HIGHLAND REGIONAL COUNCIL**

### **Department of Planning**

#### **Military Road at Culachy, Fort Augustus**

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#### **REPORT**

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on

#### **Remedial Works After Flooding**

Ref: 237/KGC  
June 1993

HIGHLAND REGIONAL COUNCIL

Department of Planning

Military Road at Culachy, Fort Augustus

CONTENTS

1.00	SUMMARY	p2
2.00	INTRODUCTION	p2
3.00	SURVEY	p2
4.00	PROPOSED REMEDIAL WORKS	p3
5.00	COSTS	p4
6.00	CONCLUSIONS	p5

APPENDIX I - DRAWINGS

APPENDIX II - PHOTOGRAPHIC RECORD

Highland Regional Council  
Department of Planning

Military Road at Culachy, Fort Augustus

1.00 SUMMARY

K G Cantlay & Co were instructed to carry out a Feasibility Study and to report on proposed remedial works to the Old Military Road at Culachy, Fort Augustus, which had been washed out by flood water.

This report details the work involved and provides budget costs for the remedial works.

2.00 INTRODUCTION

The road is located to the south of the village of Fort Augustus. A Location Plan, Drawing No 237/1, is attached at Appendix I.

The damaged stretch is about 450 metres long and extends uphill from the gate at the junction of the road with the unclassified Ardachy public road.

The land is at present a right of way and is used by walkers and horse riders.

The brief calls for the reinstatement of the road surface and the reinstatement of the ditch and pipe system on the south side of the road.

3.00 SURVEY

A site survey was carried out on 24 and 25 May 1993. A record of the survey is shown on Drawing No 237/1 at Appendix I.

During severe rainfall, the drainage system had become choked and water had then run down the road. Several areas of the road have become gouged out forming channels up to 2.0 metres deep down the centre of the road. In some areas, most of the road surface had been washed away also.

A dry stone wall/

A dry stone wall is situated on the North side of the road, and at one location where the road had been washed out, this wall had become undermined and has collapsed.

#### 4.00 PROPOSED REMEDIAL WORKS

The remedial works fall into three categories; roadworks, drainage works and sundry items.

##### 4.01 Drainage

The ditch/drain running along the south side of the road not only drains the road but also takes watercourses from the hillside to the south. The ditch has become blocked in places over the years by the growth of vegetation, mostly whins, and by some small trees.

The ditch has been paved, both invert and sides and this is in satisfactory condition in some locations. In other places some of the sides of the ditches have fallen in, allowing scour.

Because of the flooding, some areas of ditch have become completely filled in by gravel debris. In some locations the ditch is in rock and, possibly because of this, it is reduced in size.

Culverts have been installed at some locations and these have deteriorated. The steel pipes have become corroded and concrete pipes have broken.

In order to overcome the existing difficulties we advise the replacement of the culverts with 500 dia. corrugated pipes, with the construction of associated headwalls. The ditch requires to be re-excavated in many locations and to be re lined in several places. The extent of the recommendations is noted on our Drawing No 237/2 at Appendix I.

##### 4.02 Roadworks

The work involved in remedial works to roadworks is largely self explanatory. Ruts require to be infilled with granular material up to formation level, and the surface reinstated.

We recommend the use of Sub-base Material Type 1 which consists of crushed rock or crushed sand and gravel, of size 40mm down.

Sub-base Type 1/

Sub-base Type 1 is a ready available material, being used extensively and gives better binding qualities than a natural sand & gravel. The cost would not be significantly more than the uncrushed variety and would be more cost effective.

The thickness of sub-base should be 100mm which would be adequate for the traffic envisaged.

In addition, we recommend that small offlet channels be cut through the road verge to the ditch so that rainfall is channelled from the road and large volumes of run-off will be prevented from accumulating.

#### 4.03 Sundry Works

Some sundry items are recommended to be carried out. The major item in this section is rebuilding the demolished section of dry stone wall. Other items include provision of a new gate at the public road, installation of some fencing and the provision of new signs at the public road.

### 5.00 COSTS

The costs of remedial work, exclusive of VAT are estimated to be as follows:-

1. Drainage	£ 6,100
2. Roadworks	£ 4,100
3. Sundry Items	£ 1,050
	-----
Total for Contract Works	£ 11,250
4. Fees and Supervision	£ 1,635
	-----
	£ 12,885
5. Allow 10% contingencies	£ 1,315
	-----
Total Estimated Cost	£ 14,200 =====

### 6.00 CONCLUSIONS /

## 6.00 CONCLUSIONS

It is recommended that the drainage ditch be replaced; that the scoured areas of road be refilled and a new surface of 100mm thick Sub-base Material Type 1 be installed and that some associated sundry items also be rebuilt or replaced.

The cost of carrying out these works is estimated at £14,200, inclusive of Engineering fees but exclusive of VAT.

*Kenneth G. Cantlay*

Ref 237/KGC

4 June 1993

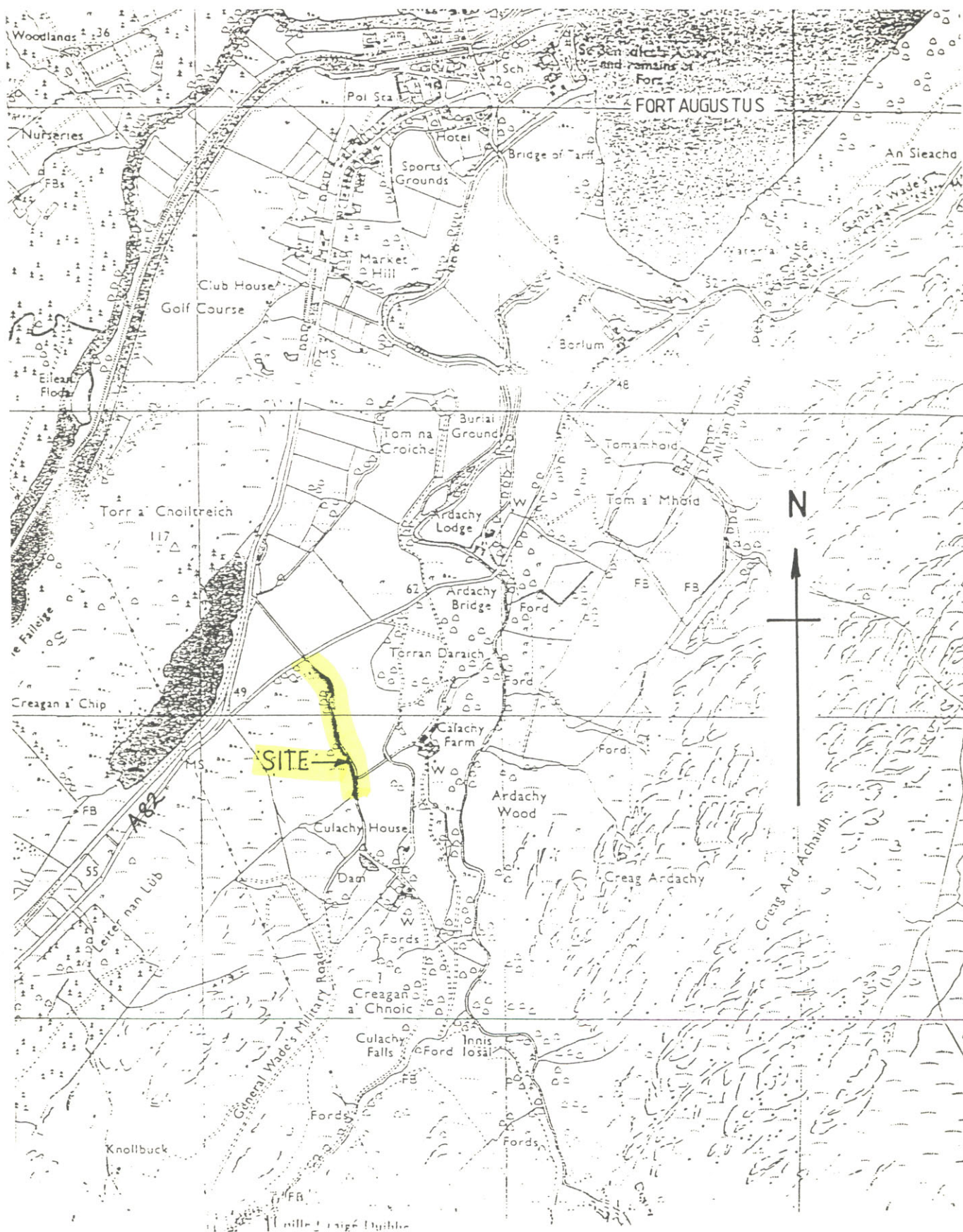
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APPENDIX I - DRAWINGS

Drawing No 237/1	-	Location Plan
Drawing No 237/2	-	Site Survey and Proposed Remedial Works

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June 1993

Military Road at Culachy,  
Fort Augustus



HIGHLAND REGIONAL COUNCIL  
DEPARTMENT OF PLANING  
MILITARY ROAD AT  
CULACHY, FORT AUGUSTUS  
LOCATIO PLAN

SCALE  
N.T.S.

DATE  
3 JUNE 1993

DRAWN  
RDR

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PROJECT No.  
237

DRG No.  
1

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APPENDIX II - PHOTOGRAPHIC RECORD

Ref: 237/KGC  
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Military Road at Culachy,  
Fort Augustus



1. Looking downhill to public road. Showing road surface washed away and start of deep ruts.



2. Deep ruts at Ch. 50



Ref: 237/KGC



·3. Existing road surface with minor rutting. Ch 70



·4. Paved ditch in good condition. Ch. 90

Military Road at Culachy,  
Fort Augustus.





5. Ruts and ditch, at Ch. 130, looking uphill to collapsed wall.



6. Collapsed wall at Ch. 150, looking downhill.





7. Deep ruts at Ch. 145, looking uphill.



8. Deep ruts at Ch. 145 looking downstream.





9. Washed out surface, with bedrock and rut, Ch. 210. Sides of ditch collapsed.



10. Washed out surface with bedrock showing. Ch. 230.