C.S.

C. W. D.

Roads

No. 218/24

1924.

Mr. Jno Hamilton

SUBJECT.

1922.

5th Dec

Road construction in marshy or mossy areas.

Previous Paper.

MINUTES.

L. from Mr. Alex Rugg. Wick.
to Mr. Jno Hamilton 5 Dec 1922 (1)

L. from Assistant Road Surveyor Wick
1 Dec 1922 (1a)

Y.E. Submitted
E.R.L. 13
Dir C/Sec
26 Febry 1924.

Will you please have the description of Mr Bingery Road and (1a) copied. Two copies will do

6 March 1924

E.E. Copies herewith
E.R.L. 07
Dir C/Sec
6 March 1924

Subsequent Paper.

Will you please send this to C.E. for his opinion as to the extent to which the methods described herein would be of use locally.

2 Gravel would I suppose be the chief difficulty in the camp but in the neighbourhood of Stanley the experience in Scotland could be made available. It is believed that the T.L.C. is making a road from Darwin to Stanley and only about the last ten miles from there would prove a difficulty for continuing to Stanley.

3 I am of the impression with regard to the layers of turf necessary for a road such as the Designs that the lower layer should be lengthways and the upper transverse

4 I would like the views of the C.E. early

25 March 24

Colonial Engineer.

Referred.

E.K.L.
D.C.S.
25 March 1924

The Hon. Col. Secy.,

Report herewith on separate sheet. (2)

R. Brasden
Colonial Engineer.

5/4/24.

Inside Minute Paper.

C.S.O. No. 218/24

Sheet No. 2.

Y. E.

Submitted

[illegible]
Overseer
5 April 1924.

The copies of the report have been abstracted.

[illegible] 5 April 24

Y. E.

Submitted for information. Does Y. E. consider that the instructions for road making are sufficiently useful for general publication? Mr. Hamilton is anxious that Mr. A. Rudd and the road surveyor should be thanked for the trouble they have taken.

[illegible]

H.C.S.

The instruction may prove useful and may be published.

2. Will you please thank Mr Rudd & Mr Macleod for the trouble they have taken.

[illegible]
6 June 1924.

(1a) when marked by blue pencil to be printed for Gazette.

6 June 22

Letter to W. A Legg. 28 June 1922 (2)

Haster Wick
5 Dec 1922

John Hamilton Esq.
Punta Loyola.

Dear Friend

I have got the enclosed particulars regarding Mossy Road construction at last. The delay was caused partly by not pushing him up owing to harvest work and partly by his time or at least his attention being taken up with his marriage.

Enclosed is a description which we selected as suiting your purpose, but we were not sure what kind of materials you had for the work. I made the remark that the roads might be wider with you than here so that the side drains (or as we call them ditches) might not drain it sufficiently to which he replied that in that case the cross drains would be needed and I would like to add if so they should be soled with long timber or flat stones. I can scarcely bear out his suggestion that moss to the depth of 4 to 6 feet should be cleared away to the hard as it would entail an enormous amount of labour to clear it out and then make it up at least partly with harder materials. I would say 2 to 3 feet should be sufficient but he says it is more difficult to make a road on wet shallow moss than

than where it is deeper
Although this is from the Assistant Surveyor he has been longer here and should know more about roads than the head Surveyor who is younger ~~than~~ and only newly appointed
I have also sent you a description of the farm road from Puldagon to Blingery which has lasted at least 60 years
If you want any more information I will be glad to try and get it for you
We received your P. C, this morning and are glad to here you have got a good voyage
Our girls had a letter from your girls about a month ago and they seem to be getting on all right
We have had a very long ~~long~~ wet harvest this year some of our corn being 5 or 6 weeks in stooks but although it was wet it was cold and we have got it in, in good order after all and a good crop.
hear there are some corn uncut in the later parts Caithness yet
With best love from us all ~~to~~ Mrs Hamilton and yourself

Yours faithfully
Alex Rugg

Blingery Road

The following is a discription of this road by Alex Bremner at which he was working when he was quite young

After opening the side ditches and leveling the ground they laid two long layers of turf (one each way) each about 4 inches thick then a layer of about 6 inches of heather when compressed then a layer of clay and on the top of it a layer of about 4 inches of gravel.

This is a road only suitable for light work such as farm carts or light motors but if there was a good layer of say 6" of broken metal added to it I have no doubt but it would make a road strong enough for heavier traffic.

This road is quite near the hard at both ends but on very deep moss in the centre

I got a similar description from a road surface man but he said brushwood was used sometimes instead of heather. this was also for a side road. I have failed as yet to get a reliable description of some of the oldest main roads as it is so long since they were constructed.

1a

Surveyor's Office,
WICK, 1st Decr., 1922.

Mr Rugg,
Haster, WICK.

Dear Mr Rugg,

Road Construction in marshy or mossy areas.

With reference to our recent conversation on this subject, I am appending hereto a text-book extract on this subject which you may find to be of some use. At the same time, you will recollect that I pointed out to you the difficulty of laying down any precise specification when the particular circumstances of the locality in question are not known. In the course of my own work, while I find that the conventional methods described in the text-book are of service in their general principles, the details vary greatly in accordance with local conditions and conveniences. Much depends on the ingenuity of the Surveyor in matters of this kind in utilizing the materials at hand. Another very important point to remember in road construction is the kind of road which is to be laid out, or in other words, the class of traffic which it shall be expected to sustain. This is the all important factor when the matter of bottoming is taken into consideration. In Caithness, as you know, most of the roads were laid originally for a very light class of traffic, mechanically propelled vehicles not being under sonsideration at that time. Consequently the method of dealing with roads over a mossy area that has been customary in this county would not suffice for areas where a large amount of heavy traffic was anticipated. Those matters, and many other similar ones will at once be apparent to a practical road-maker, so that when reading the appended notes he will be able at once to decide as to the points of reservation he shall make.

Roughly speaking, I should say, if at all possible, moss should be excavated and cleared to the hard. The original cost of this will be made good in the long run. If, however, the moss is of too great depth to permit clearing it away (in this county we make about 4 to 6 feet the maximum for such clearance) then the method described below may be used, which, if carried out in a proper manner, should give satisfactory results. I may mention that while I do not under-rate the importance of drainage, I have frequently see in the roads of this county which are laid over moss that they are stronger in wet weather than in dry, due, I have taken it, to the superior resilience of the moss in a wet condition. Let it be understood, of course, that this is no argument for allowing the road crust itself to retain water.

I shall be glad to give you any other information you wish on this matter.

Yours faithfully,

Angus Maclure

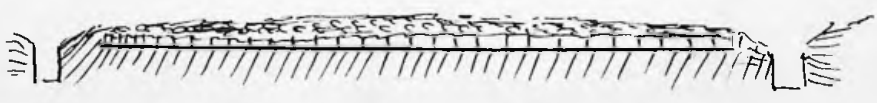
Assistant Road Surveyor.

Notes in connection with the formation of Roads over marshy or mossy areas.

In forming a macadamised road, if the ground is firm and dry, the only/

the only preparation required is to bring its surface to a true level; should it, however, be at all wet or of a marshy character, the portion upon which the road is to be formed should be first carefully and thoroughly drained, which may usually be most effect-:ively done by cutting deep drains running parallel to the intended course of the road on either side of it, and, if it is found necessary, forming cross-drains between them having a fall each way. The ground having been thus drained, a covering of turf or of bruchwood, the latter not less than 6 inches in thickness when compressed, should be laid over the surface of the soft ground and upon this should be spread a covering of not less than three or four inches of clean gravel, the upper surface of which should be level. The foundation of the road should now be formed by laying a kind of rough pavement as shown in section (See Sketch). consisting of rough stones of any kind that can be most readily procured, laid carefully by hand with their broadest faces on the ground. These stones should not be less than 7 inches in depth in the centre of the road, gradually diminishing to three inches in depths at the sides, and the interstice s between them should be carefully filled in with chippings, so that the upper surface when finished shall form a regular curve with a convexity of about four inches. The material for forming the surface of the road should then be laid on, forming a uniform coat 6 inches in thickness. For the centre portion of the road care should be taken to select a stone which is hard and not friable; granite, whinstone, and the harder limestones are the best suited for the purpose, and they should be broken not larger than 2½ inches, that is to say, they should pass through a 2½ inch ring. For the sides of the road, well cleansed, strong gravel may be used. A good binding of clean gravel perfectly free from earth and clay about 2 inches in depth should then be laid over the entire surface of the road. It is better to put only four inches of the broken stone at first, and after this has become consolidated by the traffic, then to lay on the remaining 2 inches, care being taken, however, to fill up any ruts which may have been formed.

The foregoing, which is quoted from a recent and reliable Manual on Civil Engineering, is a method which has received general approval from Surveyors for this particular class of road. It will be noticed that there is no reference to steam rolling, and is wisely so, I think, as it is not advisable to roll a road of this kind until a sufficiently heavy crust has formed by successive coats of metal.



Cross-section of Road

Described above

(M/P 218/24)

REPORT ON ROAD CONSTRUCTIONS OVER CAMP.

The method described is in accordance with the general practice when dealing with a mossy or marshy bottom. Moss forms a natural web in soft ground and when the sub-soil is drained the moss is capable of bearing a certain amount of distributed weight. Moss is not found to any large extent in this Colony. The growth over peat areas is of a fibrous nature, matted in the ground for a depth of from 2 to 4 inches and capable when dry of withstanding considerable pressure.

With regard to the construction of roads over the camp, the method could in many instances be adopted but the great difficulty would be to procure at an economical rate the necessary broken stone and top dressing: this has been the hindrance in the past as road building on a large scale cannot be carried out without suitable plant.

I am of the opinion that with very few exceptions routes across the camp could be marked out which would only require the top soil (i.e. peat etc.) to be removed for a depth of from 2 to 3 feet to clay and hard bottom. Peat areas would undoubtedly be met with and, if found impracticable to go round them, the roads can be built over them. The surface of bank not being cut this surface can be strengthened with bush growth and layers of turf: Clay and stone will be found anywhere on any route in the Falklands.

The plant required is a light road-roller, portable stone-crusher and a motor lorry. With this plant it would be possible economically and rapidly to build roads. The surface of road should be such as to withstand motor traffic as riders would not use the hard road-way other than as a guide or over soft places. A rough macadamised road would be of little service for riders and the cart traffic to outlying stations would be practically nil, consequently the broken stone would not become consolidated by the traffic. It is essential for the durability of a road-way that it be given

a suitable

a suitable camber with a smooth and waterproof surface and, in my opinion, this can only be obtained by rolling. With a portable stone-crusher both large stones and surface dressing can be readily procured and the plant can be moved forward as the work progresses: The motor lorry would, in addition to the ordinary work, be used for the conveyance of the workmen.

2. With the provision of suitable roads to outlying farms it is very probable that motor traffic would much increase and so place a heavier demand on the roads in the Township: At present many sections of the roads in Stanley are laid on peat and, in my opinion, the peat should be removed as it will be most difficult to consolidate the road surface on so spongy a foundation and, further, it would be most difficult to provide adequate drainage.

3. With regard to the laying of the turf on brush-wood, I agree that the first layer should be lengthways and the second transverse.

W. B. Baseley.
Colonial Engineer.
5/4/24.

(3)

218/24.

28th June, 24.

Sir,

I am directed by the Governor of the Falkland Islands to inform you that Mr. J. Hamilton of Punta Soyola, Patagonia, and this Colony, has placed at the disposal of this Government, certain notes which were forwarded to him by you, on the construction of roads over marshy areas. I am desired by His Excellency to thank you for the useful information contained in these notes, which is a matter of general interest in the Colony.

I am,

Sir,

Your obedient servant,

H. Henniker-Heaton,
Colonial Secretary.

Alex. Rugg, Esq.,
Haster Wick,
Scotland.