

RECEIVED 10 APR 1975

County Surveyor's Office,
BRORA.

9th April, 1975.

G.F. Trowbridge, Esq.,
Town Clerk & Chamberlain,
Town Clerk's Chambers,
Dornoch.

Dear Sir,

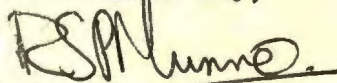
Dornoch Burn Improvement

Thank you for your letter of 21st March, 1975, enclosing cheques to the value of £275.62 being the cost of survey and design work carried out by Mr. B.S. Goodman and myself.

Mr. Edmond has advised me to recommend the following action to your Council. In that his position in the new Regional Authority deals only with roads and transport, he recommends that the Town Council write to Mr. Watson, Director of Water and Sewerage, before the date of regionalisation saying that the scheme has been designed by staff from the County Surveyor's department, with a request that it be included in the Region's programme for the coming year.

Mr. Edmond further advises that a copy of the letter should be sent to your Regional Councillor.

Yours faithfully,


R.S.P. Munro.

21st March, 1975

R.S.P. Munro Esq.,
County Surveyor's Office
Brora

Ref. 1A

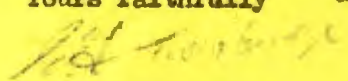
Dear Sir,

Dornoch Burn Improvement

I refer to your letter of 13th February, 1975 and now enclose two cheques, each for £137.81 making a total of £275.62 being the cost of work carried out by yourself and Mr. B.D. Goodman in respect of the survey of the proposed invert etc., of the Dornoch Burn. Please acknowledge receipt.

Would you please advise me whether you have yet arranged with Mr. Edmond regarding the matter being referred to the Regional Highland Council.

Yours faithfully



Town Clerk.

County Surveyor's Office,
BRORA.

13th February, 1975.

G.F. Trowbridge, Esq.,
Town Clerk and Chamberlain,
Town Clerk's Chambers,
Dornoch.

Dear Sir,

Dornoch Burn Improvement

Thank you for your letter of 12th February intimating the Councils approval of our plans. I will follow your suggestion and approach Mr. Edmond regarding the proposed scheme and explain the principles behind it.

In reply to your request for information on payment of fees. I would prefer the total fee to be equally divided between myself and Mr. B.S. Goodman and sent to the above address.

Yours faithfully,

R.S.P. Munro.

R.S.P. Munro.

12th February, 1975

R.S.P. Munro Esq.,
County Surveyors Office
County Offices
Brora

Dear Sir,

Dornoch Burn - Proposed Invert etc.

I refer to your letter of 14th January, 1975 and plans regarding the proposed inverts and retaining walls suggested to improve the condition of the Dornoch Burn from the Station site (Old Railway Station) to a point at the Slaughterhouses.

Your report was submitted to the Town Council at their meeting on 4th February, 1975 when they approved in principle of the scheme generally. However, there is no money in the estimates for the capital expenditure, and accordingly have agreed that the matter might be submitted to and discussed with the appropriate authorities. Perhaps you would have a word with Mr. Edmond and if necessary call at this office to discuss the matter before proceeding further. It is suggested that Mr. Edmond, in his connection with the new Regional authority might be the right person to approach at this stage.

Authority has been granted for payment of the fees of £275.62 and I shall be glad to know to whom payment should be made.

Yours faithfully,

John Town Clerk

Town Clerk.

ROADS DEPARTMENT

J.G. Edmonds, M.I.C.E.
County Surveyor

County Surveyor's Office,
Brora, KW9 6QN

14th January, 1975.

Mr. G.F. Trowbridge,
Town Clerk and Chamberlain,
Town Clerk's Chambers,
High Street,
DORNOCH.

Dear Sir,

Dornoch Burn

I refer to your letter of 23 January 1973 and enclose a report with three copies each of drawing numbers P1/1 and P1/2. The proposed scheme can be broken into three parts:-

<u>Gainages</u>	<u>Nature of Improvement</u>	<u>Approx. Cost</u>
0-40 to 2+70 Railway Station to Police Station	Construct new invert.	Invert : £7,800
2+70 to 3+60 Police Station to Slaughterhouse	Construct new invert and two new retaining walls.	Invert : £2,200 Walls : £5,000
3+60 to 4+60 Slaughterhouse and below	Construct new invert and one new retaining wall.	Invert : £2,500 Wall : £2,900

If it is required that the scheme go out to tender I will be pleased to provide you with a more accurate breakdown of costs and quantities or meet you to discuss these proposals.

Our work done to date has been valued at £275.62 (details attached).

Yours faithfully

(sgd) R.S.P. Munro.

Dornoch Burn - Breakdown of Survey and Design Costs

R.S.P. Munro and B.S. Goodman have worked 73.5 hours each between 17th February, 1973, and 12th January, 1975 at a rate of £1.87½ per hour.

i.e. $2 \times 73.5 \text{ hours} @ £1.87\frac{1}{2} = £275.62$

DORNOCH BURN IMPROVEMENT

The section of the Dornoch Burn under consideration stretches from the Old Railway Station Site to the Slaughterhouse.

At present the bed is generally composed of gravel or cobbles covered with a layer of silt to a depth of 150mm. This fine soil supports vegetation which causes a reduction in the Burn's velocity. The Burn carries particles of soil scoured from higher reaches in suspension and at low rates of flow precipitates these as silt. Many forms of effluent are discharged into the Burn and although not necessarily constituting a health hazard they do lower the general amenity and if controls are not stiffened the problem will exist in the future.

Problems

At present the velocity under dry weather flow conditions is very low and results in the precipitation of fine suspended solids. These solids tend to accumulate, decay and so pollute the Burn.

A paved invert would substantially increase the velocity of flow and so reduce the build up of decaying solids. At times of storm the scouring velocity in the burn will be similarly increased thus more effectively clearing the watercourse of accumulated debris.

(see appendix A, typical section A)

Where the existing channel has no definite shape i.e. where it has untrained banks, improvement of the invert will, at moderate discharges, accelerate the velocity of the Burn and hence further tend to erode the banks. Therefore, if an upgrading of the invert is accepted in these regions the decaying banks should be replaced with non erodible walls.

(see appendix B, typical section B)

Proposals

A non erodible concrete invert should be constructed in the Burn thereby increasing the flow velocity in the Burn.

This invert should be shaped, so that for a given discharge in the Burn the velocity is maximised.

The banks of the Burn between chainage 2+75 and chainage 3+55 should be cut back and supported by mass concrete training walls to allow a waterway width of 4m.

Appendix A: Low Discharges

Normal dry weather flow = 0.0038 cum/sec

Required self cleansing velocity 0.8 m/s

(i) Existing Channel:

Manning's 'n' = 0.024

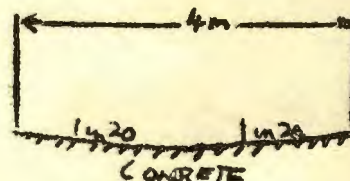
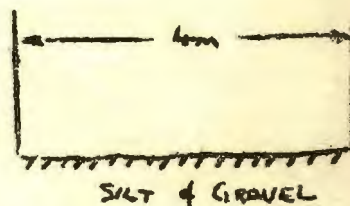
Predicted velocity = 0.08 m/s

(ii) Proposed Channel:

Manning's 'n' = 0.013

Predicted velocity = 0.8 m/s

i.e. At low flows a substantial increase in velocity is gained by the proposed channel



Appendix B: Storm Discharges

From consideration of the catchment area of the Dornoch Burn and tributaries, using the Transport and Road Research Laboratory's Report LR 565, the storm water runoff for a 100 year return storm is 7.54 cum/sec.

This can be taken by the existing burn from chainage 0+00 to chainage 2+40 but from chainage 2+40 onwards flooding of the banks would develop. The suggested arrangement of retaining walls should have a freeboard of 200mm at 100 year storm flows. (see typical section B)