

Waitohi deepbanking above the confluence has been designed for 2000 cusecs plus two feet of freeboard.

The Proposed major outlet is an open channel. It can be... and still...

17th November, 1969.



Messrs. Ian Macallan and Co.,  
Consulting Engineers,  
P.O. Box 465,  
WELLINGTON.

ATTENTION: Mr. Ireland.

Dear Sir,

MARLBOROUGH HARBOUR BOARD  
WAITOHI STREAM DIVERSION

Further to our telephone conversation last week I summarise below various factors to be considered in designing these works. I reiterate that I collected the valuable information from the flood of 24.5.66. on the expectation that the Harbour Board would engage me on later design work and this is obvious from my letter to the Harbour Board of 9.6.66. which you will have now seen. In my letter of 6.8.69. to your firm I mentioned Mr. Crawley asking me to do further work in this capacity and I had in fact started to do this as he had emphasised there would be an urgency. I have received no reply to this letter from yourself or the Harbour Board and at no stage have I been contacted to ensure that my account in this matter was paid up before handing the Hydraulic Design over to you. The information below is supplied on your assurance that my costs in the matter to date would be met.

The following Technical Points are relevant in the design of this work:-

1. Immediately following the flood of 24.5.66. we obtained slope area measurements in order to determine discharges as closely as possible. The results were as follows:-

Waitohi Stream	1960 cusecs
Upper Kent Street Drain	360 cusecs
Lower Kent Street Drain	380 cusecs
Cemetery Drain	100 cusecs

(This last figure was mentioned to you in our letter of 14.4.69. in which we mentioned the flood of 24.5.66.)

2. Analysis of rainfall placed the flood of 24.5.66. as a 1 in 20 yr. frequency.
3. After consideration of various Times of concentration I considered the following design figures satisfactory for this frequency of flood. *20yr*

Waitohi Stream	2000 cusecs
Combined Kent Street Cemetery Drain	600 cusecs
Lower Waitohi Stream below Kent Street Confluence	150 cusecs
	2500 cusecs

*2300 / 50yr*

*2840 / 50yr*

4. It is not possible for the Kent Street total to reach the Kent Street Culvert under present channel conditions. However the two new road culverts have been designed...



5. Waitohi Stopbanking above the confluence has been designed for 2000 cusecs plus two feet of freeboard.
6. The Proposed major culvert structure for the Waitohi Outlet is an ultimate development and must be designed accordingly. It can never be upgraded in future as can stream channels and stopbanking. I suggest therefore that a fifty year frequency based on the above figures as twenty year frequency would give a sound basis.
7. You may be able to allow a slightly higher intake level but this depends on a complete analysis of the area including consideration of reclamation levels, football ground levels and so on.
- In this connection entry conditions to the culvert structure and consequent Head losses require some study.
8. As I am obviously unable to recommend to the Picton Borough that they approve of the present submission I will advise them generally of the position and ask them to await further details from you.
9. When submitting your final proposal it would assist me to make a recommendation to the Council if your plans show backwater curves from Outlet to Dublin Street both of the Main Stream and on Kent Street Drain together with your final reclamation levels and football ground levels.
10. Your Section BB on Plan 1680/3 attributed to me is correct from Dublin Street to the Cemetery drain but from there to the Waitohi my original design section in 1965 showed a fifty feet bottom width. In view of the limited Kent Street Drain channels mentioned in 4. above I had not felt justified in amending these lower channel sections. However in light of present major proposals this warrants some further consideration.
11. It will be necessary for the Harbour Board and Borough to determine future maintenance responsibilities in these waterways. Presumably the Harbour Board will maintain new channels and areas affected by the present works. You may wish to give this some consideration. I am particularly thinking of the Kent Street drain below Dublin Street, and the inlet and outlet areas of the new structure - and of course the structure itself.
- I trust these notes will assist you in arriving at a satisfactory and acceptable final design.

Yours faithfully,



C.C. Davidson.

CCD:jh  
c.c. The Chairman,  
Marlborough Harbour Board.

Picton Borough Council.