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CONDEMNATION

OF

Land Reclamation

AT

LYTTELTON.

BY JOSHUA LITTLE,

Member of the Lyttelton Harbour Board.

CHRISTCHURCH, SEPTEMBER, 1913.



To the Citizens of Christchurch.

As one of the members elected to represent you on the Lyttelton Harbour Board, I deem it my duty to draw your attention to what I consider a wrongful spending of the funds of the Board in the reclamation of land at Lyttelton. I am forced to issue this pamphlet, because the said Board refuses to give consideration to my reasons for objecting to the said reclamation. I gave the proper notice of motion that the reclamation should be stopped, and that a better system of disposing of the silt should be considered. I furnished reports and figures to support my contention, and begged that they might be supplied to the members in ample time so that they would be the better able to deliberate upon the question when it came before them.

I received a letter from the Chairman stating that he regretted he could not comply with my wish, but that every facility would be given me to speak on the matter. I was, however, interrupted whilst reading an important letter I had sent to the Board in June, 1911, and only read a portion of it, and other attempts were made to prevent me having a fair hearing. I ask why was this attitude of resistance taken by the Board to enquiry? It can only be interpreted as an attempt to hide negligence or wrongdoing.

I now furnish you with all the information that is necessary to enable you to come to a sound conclusion on the matter.

I now ask you to read carefully the reports on the Engineers :—

EXTRACTS FROM THE REPORTS OF CIVIL ENGINEERS MADE TO THE LYTTELTON HARBOUR BOARD ON THE SUBJECT OF RECLAIMING LAND WITH DREDGED SILT.

8th May, 1903—Page 5.
RECLAMATION BETWEEN SENIOR POINT AND THE WESTERN MOLE.

“The nett cost of the 56 acres would be £47,783, or about £853 per acre.” Except for its conveniences as a depositing ground for dredgings from the inner harbour, which convenience would cease as soon as the area was filled, and the land became available for use—the interim cost would be money lying idle for some years, six at least. Also, this land could never, on account of its position, assist materially in easing the congestion of traffic likely to occur in future in the station yard.

“In face of the fact that the reclaimed land between No. 7 Jetty and the dock has lain idle, except as a recreation ground, for about 20 years, the Board would hardly, in my opinion, be justified in going to such an expense, to add to the area of flat ground at Lyttelton, though with the above information before them, they do not require to be engineers to decide this point for themselves; such decision, however, should be wholly based on the question, whether the land so reclaimed, will be likely to be occupied in the near future, and the issue should not be confused

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by any suggestion that such reclamation is necessary in the interests of dredging."

Annual Report for 1903—Page 1.

"There are no places at Lyttelton where reclamations with dredgings would be profitable in the near future."

Annual Report for 1904—Page 3.

"The question of the best place and manner of deposit for the dredging spoil, still seems to exercise the minds of some persons. In this connection I have only to say, that whatever difference of opinion there may be, about the future benefits to be derived from reclamations at Lyttelton, one thing is certain, that any practicable way of depositing the material lifted from the outer channel to form reclamation would add to the immediate cost of the work, and make the present population pay for prospective future benefits, which might never be realised."

Annual Report, 1905—Page 8.

"In this connection it is well to bear in mind that any present disabilities do not come from the waterside, but are on the land side, and as trade increases this position will be more pronounced. Lyttelton station yard is infinitely more congested when business is brisk than the waterside is likely to be for many years. One relief for this state of affairs would be to cut back into the tunnel, sweeping in with a suitable curve from the most northerly line of rails, making this the passenger line; to remove the present railway station, No. 6 shed, and the shed in front of the Sailors' Home, and by these means, increase the effective width of the railway yard, by six or seven more lines of rails, besides adding to the effective length. If the Board had control of the traffic and the handling of goods, this is the direction in which a movement should be made, rather than in visionary schemes of Land Reclamation in situations where the land would be of little value, except as a playground."

Annual Report for 1907—Page 2.

"The great difficulty has always been to find a place for making reclamations where they can be any benefit to the future development of the Port."

F. G. Wilson's Report (Coode, Son & Matthews), 12th February, 1907—Page 2.

"Having regard to the foregoing it would be for the Board to consider whether the value of any land proposed to be reclaimed would be such, as to justify the necessary expenditure upon the retaining bank and pumping plant, together with the probable addition of 1d. or more per cubic yard to the cost of raising and disposing of the dredgings in this manner as compared with taking them to sea. Assuming that the Board do not consider that the cost in connection with utilising the material for the purpose of reclamation would be justified, I would recommend that they

should be carried to sea and deposited say three miles outside the heads."

Could anything be said more distinct and emphatic in condemnation of land reclamation at Lyttelton? After I had read these extracts I remarked what was true then was true now. A rejoinder was made that the utilisation of the new suction dredge had altered the position altogether. Is it not amazing that such a thoughtless remark should be made. Because the only difference between the bucket dredge and the suction one is that the bucket dredge has to lift beside the silt an endless chain of heavy buckets thus causing a needless waste of power, whereas the suction dredge lifts only water and mud. The cost in power in putting the silt into hoppers is consequently much greater in the one case than the other, but once the silt is in the hoppers—there is no difference between the two systems—the expense of depositing the silt is the same. I call attention to this because it shows that the members of the Harbour Board are quite unqualified to deliberate on such matters. After such a firm opinion has been given by the engineers there is no getting away from the fact that no blame can be thrown on them, and that the Harbour Board must shoulder the whole responsibility in departing from their instructions.

Now let me ask you to read carefully the letter which I sent to the Lyttelton Harbour Board, dated 19th June, 1911. It is bringing the subject up-to-date and showing that the Fruhling dredge is not a carrier and is wasting her time when employed as such.

CHRISTCHURCH,

JUNE 19TH, 1911.

THE CHAIRMAN OF THE
LYTTELTON HARBOUR BOARD,
CHRISTCHURCH.

SIR,—

I have the honour to address you on the subject of the disposal of dredged silt.

In a report by Mr. Cyrus Williams, dated 10th September, 1908, it is stated "that a reclamation area outside the Western Mole would be about 56 acres and would contain about 3,630,555 tons silt, or say provision for 8 years' work."

There appears to be some discrepancy here, seeing that during the year 1908, 1909, 1910, a quantity of 2,309,052 tons silt was raised or an average of 769,000 tons per annum. Then the amount of silt to be raised will increase as time goes on, as deeper water will be required to float the ever increasing size of steamers that will visit the port. I may here very properly quote Mr. Cyrus Williams' report, dated 8th May, 1903 (page 4): "These figures indicate that the silting up in the channel dredged periodically outside the Moles has been at the rate of 1 foot per annum, but as there are decided indications that as the depth is increased the silting up is more rapid, I anticipate that a good deal

more dredging for maintenance purposes will be necessary in the future than in the past."

Such being the case, I am forced to the conclusion that the reclamation area of 56 acres will only suffice for the reception of dredgings for little over 4 years (to be exact it works out at 4.7 years), instead of 8 years as before mentioned.

The question then arises would it not be more economical to abandon the scheme of reclamation and resort to the plan of dumping the silt into the sea 3 miles outside the heads.

Would it not be better to invest a portion of the money in steam tenders, so that the Fruhling dredge could be kept constantly at work? She is alleged to be able to raise 2,000 tons silt per hour, which if it were taken from her without delay by tenders, would enable her to earn (2,000 tons at 2.8 pence) £236s. per hour, whereas as a mere freight carrier of 1,428 tons in her hoppers and doing about three trips a day would only enable her to earn only £8 6s. per hour. Then as regards the time aspect of the question, she could dredge 18,000 tons per day of 9 hours with tenders instead of 4,284 tons without them. Working this out as regards the passage outside the moles and assuming that about 700,000 tons would have to be dredged to give 30 feet depth at low water, that could be done with the help of tenders in about 40 days as compared with 168 days if done by the dredge alone. And I work it out that 50 acres of the inner harbour could be dredged to 30 feet at low water in about 32 days jointly with tenders as compared with about 134 with the dredge single handed. This hastening to obtain deep water appears to me to be a very important matter as it would at an early date enable Lyttelton to be the last port of call for the largest steamers coming to New Zealand.

I claim no originality in opposing the reclamation of land as a method of disposing of dredging silt. It is condemned strongly by Mr. Cyrus Williams in his report dated 13th April, 1905, and again by Mr. Maurice F. G. Nelson, of the firm of Coode, Son & Mathews, in report dated 12th February, 1907.

But what appears to me to be the strongest argument against it is that it is **so short sighted**. When the area is filled are we to go on reclaiming? to the injury of this beautiful natural harbour by interfering with the tidal scour. I can, here again, appropriate quote Mr. Cyrus Williams in his report dated 8th May, 1903, as follows: "Any reclamation in the upper Bays beyond the Moles will have the effect of reducing the tidal capacity, and consequently the velocity of the tidal stream so rendering the maintenance of the channel between Lyttelton and the sea more difficult, a work which will be found costly enough as it is, consequently I would not be in favour of this way of disposing of dredgings were it apparently profitable to do so."

I have, therefore, to respectfully request that you will bring this letter under the serious consideration of your Board.

I have the honour to be, Sir,

Your obedient servant,

JOSHUA LITTLE.

This letter was treated by the Board with contempt, and not acknowledged or replied to. It therefore ranks with the Engineer's report as a protest against land reclamation, and the Board in ignoring these protests have taken a responsibility which they cannot throw off.

In my letter, calculations were supplied of comparative costs of the two systems based on the expected working results of the Fruhling dredge. I now do the same on separate sheets, but based on the actual working results as given in the Annual Report for 1912, and these show what an immense saving can be effected in depositing the silt at sea.

Almost any child could grasp my contention, because in reclaiming land you have your mole to construct—a lengthy, expensive operation—which incurs a charge for compound interest till it is finished, and then there is the cost of filling in—as yet an unknown item.

Whereas by depositing silt at sea it is simply carried there and falls out of the barge by gravitation when the doors of the floor are opened.

It is indisputably shown by these figures, which I supply at the end of the pamphlet, that in attaining a depth of 40 feet in the inner harbour and outer passage—by this means a saving can be effected of approximately £102,900, and by crediting the barge with the freight earned carrying the silt, her cost will be more than paid for.

I now proceed to reply to anticipated objections.

(1) It is alleged by some that it is unpracticable for the dredge to work alongside of the barge and pump silt into her. In reply, I say I have the evidence of experts that it is quite practicable, except in rough weather when the barge could then lie in the Inner Harbour and the dredge could pump the silt into her instead of into the reclamation area. There would thus be a loss of time incurred but no cessation of work. How often would that happen? However, during August it is stated in the Engineer's report that the dredge could not discharge silt into the area on account of the heavy wave action in the Inner Harbour, so that in each case the objection obtains.

But why all this argument? In the Annual Report for 1911 (Return No. 5) it states that "Dredging by dredge and two steam hopper barges was carried on from 1877 to 1890." That settles the question of practicability, and it must be noted that the cost of raising and depositing silt by that means works out at 4.35 per ton, as compared with the present cost of depositing into the reclamation area as shown by my figures of 6.25 per ton, which is less by nearly 2d. per ton, so it comes to this, that if it is a condition that the Fruhling dredge must so get rid of her silt as is done at present, then she is a robber and should be blown up by the suffragettes.

What results do we get from the two different systems? Answer: if we reclaim land with silt we get 70 acres at an approx-

imate cost of ¹⁰⁰⁰ £70 per acre—having no earning value, yet chargeable with compound interest, local rates, and land tax.

If we dump the silt into the sea we have approximately £70,000 in cash, less the cost of the steam barge, whilst if we make the comparison after the 40 foot depth of water is obtained we will have over £100,000 saved and the steam barge paid for.

It may be contended that the land will advance its value. Quite so. Then wait till land is proved to be valuable before reclaiming it. There will always be plenty of silt available for the purpose. There will then be no need for regret to be expressed at looking at an unfinished structure, because there will be a feeling of satisfaction that it may be made useful some time.

(2.) **Increased cost of dredging means increased levying of wharfrage rates.**

In 1910, the first year of the construction of the mole, wharfrage was raised and deputations applied to the Board to abate the increase. The expenditure on the mole has averaged £6,000 per annum since. If this was stopped and the silt was deposited at sea, assume that the annual quantity raised would be 1,000,000 tons, then the money saved at 3½d. per ton would amount to £14,100, which could be abated on wharfrage.

But the present Reclamation Scheme cannot be carried out. The mole won't be finished till 1919. It will hold only 4½ years' dredged silt. What are they going to do then? But long before that they will have to stop pumping silt in, for even now it is beginning to float out.

What is the remedy? Simply this, that if the Lyttelton Harbour Board is not amenable to moral suasion then the Mayor of Christchurch should apply to the Supreme Court for a **mandamus to compel the Board to stop wasting the public money.** Contemporaneously with this there should be a vigorous effort made to get a Bill passed giving Christchurch an **equitable representation on the Board** so as to **prevent wasteful expenditure in the future.**

FIGURES SUPPLIED TO SUBSTANTIATE STATEMENTS MADE IN THE BODY OF THE PAMPHLET.

Estimated cost of constructing a mole to enclose the area to be reclaimed by depositing dredged silt, cost of depositing silt therein, and compound interest on the money paid during construction.

Length of proposed mole	3,400 feet	
Area enclosed thereby	70 acres	
Estimated quantity of silt contained therein	4,538,200 tons	
Commenced tipping on the mole 8th November, 1909.		
	feet.	Cost.
Constructed up to November, 1911	903	£13,030
Constructed during 1912	297	5,818
Total	1,200	£18,848

Balance to construct at estimated cost of		
£20 per foot	2,200	44,000
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	3,400	

Estimated cost of filling in with 4,538,200 tons at 1.76 pence per ton	33,280
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	96,128

Compound Interest on £9,612, being one-tenth of cost for 10 years, as per Inwood's tables	21,986
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Estimated cost of reclaimed land	£118,114
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Estimated Time of Construction of Mole.

Constructed during 1912: 297 feet. The assessed rate of construction for the remaining 2,200 is taken at 300 feet per annum. This is assumed to be reasonable, bearing in mind that the depth of water increases as the work proceeds. Thus the 2,200 feet is assumed to be completed in 7 years—say by the end of 1919, or 10 years time for the whole construction.

The reclamation area being estimated to contain 4,538,200 tons at a cost of £118,114—the cost per ton works out at 6.24 pence per ton.

Now compare this with the cost of depositing silt at sea three miles outside the Heads.

Cost of pumping into the hoppers of the dredge and steam barge alongside her is taken at .58 pence, being one-third of the cost, 1.76 pence per ton, stated in the Annual Report for 1912—for raising and depositing the silt in the reclamation area—thus58
Cost of conveying silt to sea 7 miles as per Annual Report, 1912 (page 12), .3 pence per ton per mile	2.1
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Balance saved by depositing at sea	3.56
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Total cost per ton depositing in the area	6.24

In order to get an idea of the saving that would accrue to the Lyttelton Harbour Board by depositing the dredged silt at sea instead of reclaiming land with it an estimate should be made of the probable quantity of silt to be raised in order to get 40 feet depth of water in the Inner Harbour and Outer Passage. That being the goal we should first contend for.

Assume then that the following are the approximate areas :—

	Square Feet.
Inner Harbour (108 acres) assumed	4,705,000
Outer Passage (scaled measurements from map) ..	6,500,000
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Assumed present depth 30 feet	11,205,000
To obtain 40 feet therefore this amount must be multiplied by 10, thus making in cubic feet ..	112,050,000
Silting up of Inner Harbour at 6 inches per annum (see Report 8th May, 1903), say for 4 years, 2 feet	9,410,000
Silting up of Outer Passage 1 foot per annum (same report) for say 4 years, i.e., 4 feet ..	26,000,000
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(Say 148,00,0000 cubic feet)	147,460,000

Assume weight of 1 cubic foot of solid silt is 105 lbs., so that the said number of cubic feet would work out **6,937,500** tons. The saving on this of 3.56 pence per ton as previously shown runs into the sum of **£102,906**.

But besides this there has to be taken into account the profits accruing from the earnings of the steam barge in carrying silt to sea at 2.1 per ton, thus :—

These figures are supplied for illustration on the assumption that two trips per day will be made.

Total quantity carried as above, 6,937,500 tons ; proportion carried by barge, thus, 6,880 tons (carried by dredge and barge) ; 5,200 tons carried by barge : 6,937,500 tons, i.e., 5,243,459 tons at 2.1 per ton ..	45,880
Deduct working expenses same as Tug " Lyttelton " (see Annual Report, 1912, page 43), £2,770, 4 years	11,080
Interest on barge (assumed cost £25,000), 4 years at 4½%	4,500
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Balance being profit	£30,300
Thus the barge is paid for.	

153 HEREFORD ST., CHRISTCHURCH,
SEPTEMBER 17TH, 1913.

I have checked the various calculations set out in the foregoing statement, and certify them to be correct.

GEORGE W. HULME,
FELLOW PUBLIC ACCOUNTANT.

