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Note: Breakwater at Newcastle

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Breakwater at Newcastle.

No 22/31

Colonial Secretaries Office
8th January 1853

To

Shaw the honour, by the direction of His Excellency the Governor, to request that you will examine what has been formerly done towards forming a Breakwater at Newcastle, and report your opinion as to the best mode of proceeding.

I am also to request that you will take an opportunity of inspecting the work, as you proceed to mark the road on the Hunter's River District.

Shaw the honour.

(Signed) Alex. M'C. Lay.

The Surveyor General.

No 33/129

Surveyor General's Office
10th February 1853.

Per

Have had the honour to receive your letter No 22/31, in which you request me to examine what has been formerly done towards forming a Breakwater at Newcastle, and report your opinion as to the best mode of proceeding; also your letter No 33/129, in which you transmit papers respecting the Breakwater for my information and guidance, and have the honour to state, that I recently examined the work accordingly, and found it in a state of dilapidation on the sea side from the violence of the breakers, and the perishable nature of the stone of
of which it is composed, this being so soft and perishable that many of the high blocks in the breakwater are already invaded nearly into the slope of Boulder. The bottom of the sea, consisting of stratified rock of the same formation, presents a smooth surface on which the very base of any such mass of cut stone is exposed to the action of the advancing and retiring waves. With a foundation thus exposed, the rapid decomposition of the stone above facilitates the demolition, the water penetrating amongst the stones softens the clayey matter, and some cavities, the upper stones sink, the waters displace others, the whole being thus liable to be undermined and carried away by the washing operation of the waters which come against them.

But it is not in my power to propose any mode of proceeding at all likely to secure the completion of a permanent work of such formidable nature, with the means likely to be afforded for the purpose. Much in all cases of this sort, depends also on the skill of the Engineers on the spot, who ought to be capable of suggesting and carrying various means of facilitating the business and of obviating the difficulties that may arise in its execution. Have the honor, however, to submit a few suggestions on the subject. To prevent the general decomposition of the stone, that kind of mortar cement might be used which has been employed in forming the new docks on the Thames; this mortar was formed from powdered whetstone and coarse sharp sand, the whole being pointed with Cyprian earth or Roman cement, by which such embankments become as solid and firm and fully resist the effect of water: but with the clayey stone in the Newcastle breakwater, it will be necessary to use the work with a harder material, especially on the side towards the sea, which should have an imitation.
of about 30 degrees. There is an immense quantity of flint of from 6 to 10 pounds weight forming banks to the great injury of the harbour; a great portion of these is dry at low water (ebb-tide) and a more durable material than this could not be found for facing a slipway embankment towards the sea, by embedding the stones well in mortar, but such work should only be placed over what is solid and not likely to give way, and therefore I could not recommend it for the portion of the breakwater which has been built. It might be advisable however to throw loosely in front of those stones of this kind which now form an immense mound beside the pier, and thus render it inaccessible on the east side to any vessels. Such loose materials are sometimes opposed to the sea with advantage in Holland; and they might, if laid in sufficient quantity, afford stability and protection to what has been done of the breakwater at Newcastle; and as the accumulation of this stone or gravel, which is brought by ships as ballast, in a serious and increasing evil to the Port, it might be all thrown towards the outside of the breakwater, and to form a broad and permanent barrier against the sea.

In extending the work further, if the breakwater is to be constructed in the best manner, the mortar, such as I have described, might be used both in setting the large stones in the body of the work, and in embedding the smaller stones on the inclined surface exposed to the sea; and for this purpose I would recommend the Limestone, which can be obtained in abundance on the Williams River. A coat of gravel should also be laid on the surface or roadway as the work proceeds, having been previously covered with the first embedded in the manner already mentioned. But as the
proper construction of a work to be raised from under a considerable depth of sea exposed to prevailing winds, is one of the most difficult and expensive of all, it might be perhaps advisable in this country with our present means, to adopt some plan requiring less art and ingenuity, but more manual labor, such as for instance the extension of dykes of stone—(shown in either loosely or in caissons, in the direction of ABED) to nearly the height of high water mark, when the space enclosed would be probably soon filled with sand, or first might be filled with gravel: a similar dyke (ABE) might be extended to the main land, by which the space outside the present Breakwater would be filled by the like sediments from the dead water, and on extending two similar dykes to CY the whole would probably form a neck of sand connecting the Island to the main, in the same manner as Forangie a rock very like Nobby in shape and position, is joined to the South Head of Broken Bay. The sea would probably throw up sand into the curve on Bay thus made, and form a land similar and analogous to that immediately East of the Town of Newcastle, where beds of heterogeneous sand show that this little Bay was also at one time a mouth or chert of the River of the Nobby now joined to the point by any means sufficient to separate the water on temporarily, from my opinion that the sea would throw up a beach of sand which might aesthetically improve the work, and completing the re-union of Nobby to the land. It seems to me therefore to deserve consideration, with reference to the means at the disposal of government, whether the present Breakwater should be extended to Nobby according to the best mode of construction, disposing the gravel or discharged ballast before the piers.
standing for its preservation, or to carry on the work somewhat in the same manner in which it has been commenced, throwing the ballast from shipping in the face of it to protect the structure from the waves, (in which case also a sandy beach might be formed by the sea, and afford additional protection), or whether, finally, it would be expedient to restore the natural structure more exactly by the method I have proposed, and rely on the cooperation of the sea. As a work for the immediate employment of the prisoners now at Newcastle, I would recommend the removal of the stones and gravel accumulated about the Wharf and Harbours, to the front of the present breakwater, the being most advisable, while it would be ascertained also, how far this material laid loosely would answer the purpose proposed of defending the solid work from the violence of the waves.

I have the honour to be,

The Honourable
The Colonial Secretary

No. 3916.

Surveyor General's Office
Sydney 27th April 1833

I have received your letter dated Newcastle, 13th inst., and with reference to your proposal to carry on a wall from the breakwater to the present wharf as a precaution, I have to observe that I do not consider such a work necessary, although it would be an improvement to the Port, to extend a Wharf in that direction. Your attention, however, was directed by my instructions to the formation of the Breakwater, and I shall be very well satisfied after the receipt of your letter.
letter you have written me, if you can accomplish this, without attempting a quarry at the same time; and cannot but carry my surprise at the kind of sketch you have sent to this office as compared with those which are deposited here, as your performance. I must however refer to the sketch in my last letter, and say that I approve of your carrying out, as you propose, with large blocks of stone from E to B first, to throw the current off towards Nobby. I should have no objection to your employing a party in taking down the upper part of Nobby, provided the line from thence to C or D could be carried out at the same time with the single iron gang, which is impossible, for as to merely having the materials ready without applying them as excavated, it must be obvious that they would soon form an obstruction (as the Island is but one high hill) to the work of demolition; whereas if carried out to be used on the spot, one removal only would be necessary, but instead of spoil being proposing such operations, it was for you to say in what way you would cut out the work pointed out in my instructions, the manner of beginning to take down Nobby as to when you would commence so. Thence it would be necessary to form a spur, a way from the point needed to Newcastle of that Island A, to the lowest part of the hill to be removed B, and lowest as a sketch showing these two points, and according to which, if you were to do anything at all on Nobby, I desire that you will proceed.

As to the present Breakwater not being in a line with Nobby, as you say I may see by the plan you have marked with a pen; and that it should have been carried once into the sea, I have to observe that the plan furnished you in my last letter, shows the true position of the old Breakwater, and that your rough sketch supplies no information on the subject.

Your
Your requisition for tools to appear made without any attention to what I said in my letter respecting the means to be applied to the performance of this work, and for a number of men which the Government has no intention to place there. To ask 200 additional men after what I have stated, and in the present circumstances of this Colony is quite absurd; you will therefore make out a requisition of tools for 100 men only, to begin with and confine their operations to the work on the Newcastle side.

As to giving you power to retain a good workman after he has served his time, I can only say, in answer to your request, that I have not myself, and therefore could not give it to you; and as to your observation that I have forgot to tell you how you are to get the rations allowed you, I have merely to say that it never was intended or understood that you were to be allowed rations at all.

Yours, &c.

J. C. Mitchell

At the request of Charles Depwood.

**Breakwater at Wollongong.**

When the town of Wollongong was planned by the Surveys General in the year 1834, with the concurrence and sanction of Governor Sir Richard Bourke, it was impossible to estimate the extent of its probable growth without taking into consideration the possibility of forming a harbour. The direction of a reef of rocks seemed to indicate the line along which a sheltering work might be erected. This is shown on the original design for the town at page 317 of the document. The convict labour, however, by means of which this work was intended...