[p274]

Breakwater at Newcastle

[Alexander McLeay, Colonial Secretary to Mitchell]

Nº 33/31

Colonial Secretary's Office
8th January 1833

Sir,

I have the honor, by the direction of His Excellency the Governor, to request that you will examine what has been formerly done toward 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 in the Hunter's River District.

I have etc

/Sigd/ Alex McLeay

The Surveyor General

[Mitchell to Colonial Secretary]

Nº 33/137

Surveyor General's Office
15th February 1833

Sir,

I have had the honor to receive your letter No33/31, in which you request me to examine what has been formerly done towards forming Breakwater at Newcastle, and report my opinion as to the best mode of proceeding; also your letter 33/79, in which you transmit papers respecting the Breakwater for my information and guidance, and I 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 [p275] which it is composed, this being so soft and perishable that many of the high blocks in the Breakwater are already rounded nearly into the shape of Boulders. 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 wave: with a foundation thus exposed, the rapid decomposition of the stone above facilitates the demolition, the water penetration amongst the stones softens the clayey matters, and forms cavities, the upper stones sink, the water displaces others, the whole being thus liable to be undermined and carried away by the washing operation of the waters which come against them.

I regret it is not in my power to propose any mode of proceeding at all likely to ensure the completion of a permanent work of such a 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 Engineer on the spot, who ought to be capable of suggesting and contriving various means of facilitating the business and obviating the difficulties that may arise in its execution. I 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 unburnt limestone and coarse sharp sand, the whole being pointed with Puzzolana earth or Roman cement, by which [p276] such embankments become as solid as rock and fully resist the effect of water: but with the clayey stone in the Newcastle breakwater, it will be necessary to face the work with a harder material, especially on the side towards the sea, which should have an inclination of about 30 degrees. There is an immense quantity of flints 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 (see sketch) and a more durable material than this, could not be found for facing a sloped embankment toward 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 this, those stones of this kind which now form an enormous 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, is a serious and increasing evil to the port, it might be all thrown henceforward, on the outside of the Breakwater, so as to form in time a broad and permanent barrier against the sea.

In extending the work further, if the [p277] 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 on the inclined surface exposed to the sea, and for this purpose I would recommend the limestone, which can be obtained in abundance upon 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 flints 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 [sic], such as for instance the extension of a dyke of stones thrown in either loosely or in caissons, in the direction of (ABCD) to nearly the height of high water mark, when the space it enclosed would probably soon filled with sand, or if not, might be filled with ravel: a similar dyke (BE) might be extended to the mainland, by which the space outside the present Breakwater would be filled by the like sediment from the dead water, and on extending two similar dykes to Nobby the whole would probably form a neck of sand connecting the Island to the main, in the same manner as Baranjuey, a rock very like Nobby, in shape and position, is joined to the South Head of Broken Bay. The sea [p278] would probably throw up sand into the curve or Bay thus made, and form a beach similar and analogous to that immediately East of the Town of Newcastle, where hills of heterogeneous sand shew that this little Bay was also at one time a mouth or outlet of the Hunter.

If the Nobby were joined to the point by any means sufficient to separate the waters even temporarily, I am of the opinion that the sea would throw up a beach of sand which might assist materially in preserving the work, and completing the reunion 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 part now 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 dykes I have proposed, and rely on the co-operation 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 Harbour, to the front of the present Breakwater, this being most

desirable, while it [p279] would be ascertained also thus, how far this material laid loosely would answer the purpose proposed of defending the solid work from the violence of the waves.

I have etc
/sgd/ T L Mitchell

The Honorable
The Colonial Secretary.

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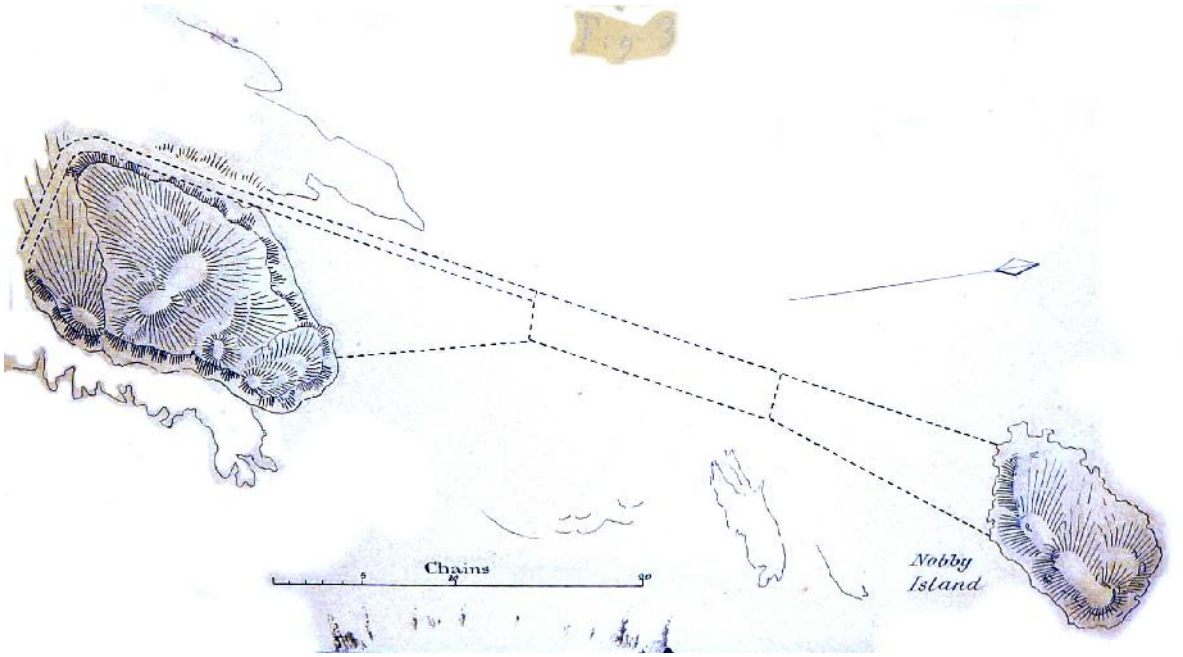
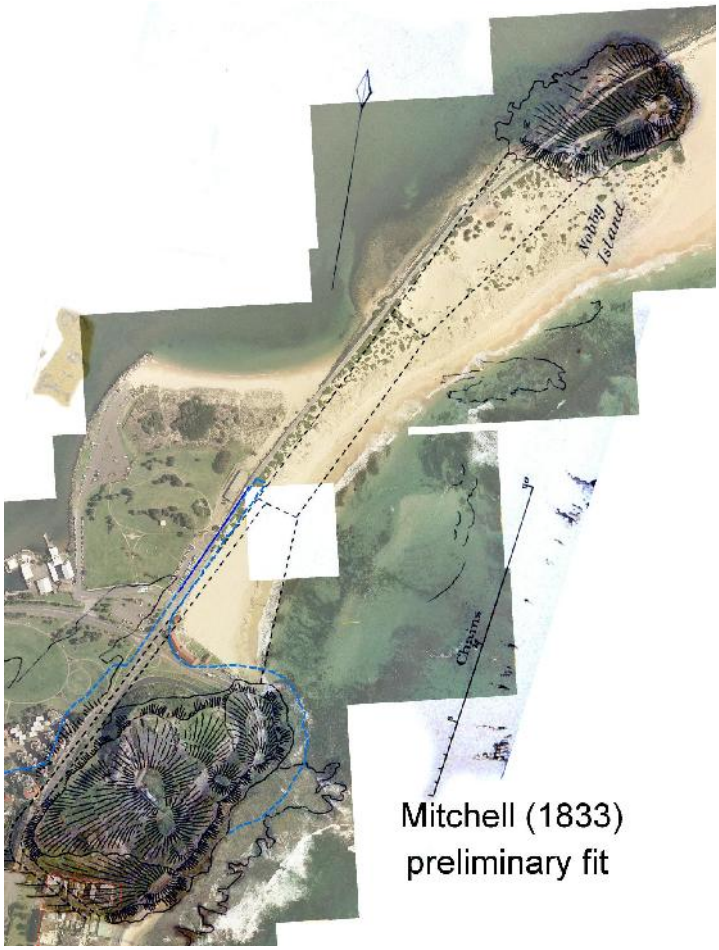


p277: Breakwater at Newcastle (pencil annotation: Fig 3)(this image has been cropped to remove the backing page and glue marks)



Preliminary fit of Mitchell sketch map to 2006 air-photo

[Mitchell to Mr Charles Hopwood]

Nº 33/116

Surveyor General's Office
Sydney 2nd April 1833

Sir,

I have received your letter dated Newcastle, March the 25th, and with reference to your proposal to carry on a wall from the breakwater to the present wharf as a measure of precaution, I have to observe that I do not consider such a work necessary, although finally it would be an improvement to the Port, to extend a Quay 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 sort of letter you have written me, if you can accomplish this, without attempting a quay at the same time: and I cannot but express 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 on, 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 [p280] 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 single high hill) to the work of demolition; whereas if carried out to be used in the mole, one removal only would be necessary, and instead of roundly proposing such operations, it was for you to say in what way you would set about the work pointed out in my instructions - the manner of beginning to take down Nobby - as to when you could commence etc. Thus it would be necessary to form first, a way from the point nearest to Newcastle of that Island (A) to the lowest part of the hill to be removed (B). I enclose a sketch shewing 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 more into the sea, I have to observe that the plan furnished you in my last letter shews the true position of the old Breakwater, and that your rough sketch supplies no information on the subject.

Your requisition for tools etc appears 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 [p281] ask 300 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 operation 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 it 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 was never intended or understood that you are to be allowed rations at all.

I am etc

/sgd/ T L Mitchell

Mr Charles Hopwood

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[Breakwater at Wollongong]