1889.

NEW ZEALAND.

SURVEYS OF NEW PLYMOUTH HARBOUR

(REPORTS OF), BY THE CHIEF SURVEYOR, NEW PLYMOUTH.

Presented to both Houses of the General Assembly by Command of His Excellency.

MEMORANDUM from the CHIEF SURVEYOR, New Plymouth, to the SURVEYOR-GENERAL, Wellington.

New Zealand Survey Department, 1st April, 1889.

I HAVE the honour to forward the enclosed report on the soundings taken in the vicinity of the breakwater. The tracing is sent by separate parcel.

THOMAS HUMPHRIES,
Chief Surveyor.

The Surveyor-General, Wellington.

REPORT ON SOUNDINGS TAKEN AT NEW PLYMOUTH BREAKWATER WITH A VIEW OF ASCERTAINING THE EXTENT OF SAND-ACCUMULATION IN THE VICINITY.

THE original intention was to survey the sandspit at the entrance of the harbour, and determine its limits in such a manner that its future progress, both as regards direction and mass, might from time to time be ascertained. I very soon found that the spit was the visible result of a more extensive trouble, and that any survey limited to the spit would be of little service or value if the evil of which it was but the outcome was not examined. The survey has therefore been much more exhaustive than at first intended.

It will be necessary to make a few explanatory remarks on the map which accompanies this report. First, all depths of water shown on it are in feet, and are the results of soundings taken by myself on the 17th, 20th, and 28th instant, and are consequently on the top of any sand-accumulation. Second, the spit and vicinity are shown in contour-lines, each representing a certain depth of water. This depicts the shape of the spit more clearly than a mass of soundings, and is far more comprehensive and less confusing. Third, the area over which sand has deposited since Mr. Jones's survey in 1877 is shown, and thickness is shown in red figures—*i.e.*, so much less water at those places than in 1877, before the breakwater had commenced.

It will be noticed that the bank of sand inside of the breakwater, known as the spit, extends 800ft. due south from the end, and at 250ft. out is 300ft. in width between the 6ft. low-water lines, and 200ft. at the outer end. On the inner side—that is, against the wharf—the bank is very steep, shoaling from 12ft. to 6ft. in a boat's length. It is also abrupt against the channel, but shelves away very slowly on the outside out to the 3 and 4 fathom lines, 1,000ft. from the inner edge. In other words, the base of the spit is about 800ft. in length and a little over 1,000ft. at its widest part. There is now a clear channel of 450ft. in width between its end and the "Hawea" wreck, with a depth across of from 12ft. to 10ft. at low water, spring-tides. Along the centre of this channel (now used by the steamers) right up to the wharf there is nothing less than 12ft. On the inside of the breakwater, and close to it, there is a deposit 15ft. near the outer end, decreasing to 8ft. opposite the wharf. This is of no great width—some 30ft. or 40ft.—and has probably been washed over from the outside in heavy weather. Around the wharf and inshore it has shoaled about 2ft.; but this undoubtedly took place some years ago. It appears to be chiefly a mud deposit —*débris* from the railway and stockyard embankments, and spoil-heaps, which were injudiciously tipped below high-water mark inside the harbour. The amount of sand and mud deposited at the spit and inside the breakwater is calculated at 260,000 cubic yards.

The soundings outside have disclosed the forming of another spit, or deposit of sand, running directly out to sea due north from the end of the breakwater for 1,400ft. At 1,000ft. out the deposit is 4ft. 6in. thick, but, being in 5- and 6-fathom water, will not be disturbed again. Out from the end of the breakwater, and in the direction of the proposed ultimate extension, the sand-deposit is thin, and runs out at 900ft. On the outer or seaward side of the breakwater the sand is banked up against it—at the outer end as much as 15ft. above the base, and rarely in any case less than 10ft. throughout the whole length, leaving no more than 2ft. 6in. of water a few feet from it for the whole of the outer 1,200ft. Nearer in it is, of course, less. This bank slopes seaward, running out about 500ft.

The accumulation outside of the breakwater and its proposed extension, back as far as the Mikotahi bank, I calculate at 400,000 cubic yards. For years past a bank has been forming between Mikotahi and the mainland, where formerly the sea at almost low water rushed through, carrying with it enormous quantities of sand on to the breakwater. On this bank, which had mounted to the top of high water, spring-tides, prison-labour has all but completed a wall of rough blocks of stone, which will effectually cut off both sea and sand from coming that way. The beneficial effect of this work is very apparent, as, on the south side of it, the beach in the bay between Mikotahi and the Fishing Rock is now being piled up with sand that would otherwise have been driven through, to the further injury to the harbour. This sandbank, together with that driven up on the beach of the Fishing Rock bay, is estimated at 110,000, and will remain permanently in its present position, to the protection of harbour-works.

I have taken a line of soundings directly between Mikotahi and the Lion Rock, and find this passage to have a sandy bottom throughout, with the exception of a small patch of rocks near the former, and another, with only 4ft. of water upon it at low tide, 500ft. from the latter. The shallow flat north and south of this passage, as well as the Fishing Rock bay, is also sand bottom, with an occasional rock. These localities were not sounded by Mr. Jones in 1877, so no comparison can be made; but I feel confident that no change of any importance has taken place. I mention it, as the nature of the bottom of these shallow flats, over which the heavy seas of the west and south-west gales run, must have an important place in any discussion on the cause and cure of the sand difficulty.

The information now obtained and recorded will be of great service in the future for comparison. The spit should be surveyed occasionally to ascertain the changes, more especially after heavy weather. Once in six months will probably be often enough for the outside, as, through its being spread over so large an area, any marked change will necessarily be slow, and not easily detected at short intervals.

In conclusion, to form a channel through the present spit, straight out from the end of the wharf, of 150ft. in width, and giving 8ft. at low spring-tides, would require the removal by dredging of 8,000 cubic yards of sand.

THOMAS HUMPHRIES,
Chief Surveyor.

30th March, 1889.

[*Approximate Cost of Paper.*—Preparation, nil; printing (1,200 copies), £1.]

By Authority: GEORGE DIDSBURY, Government Printer, Wellington.—1889.

D.4

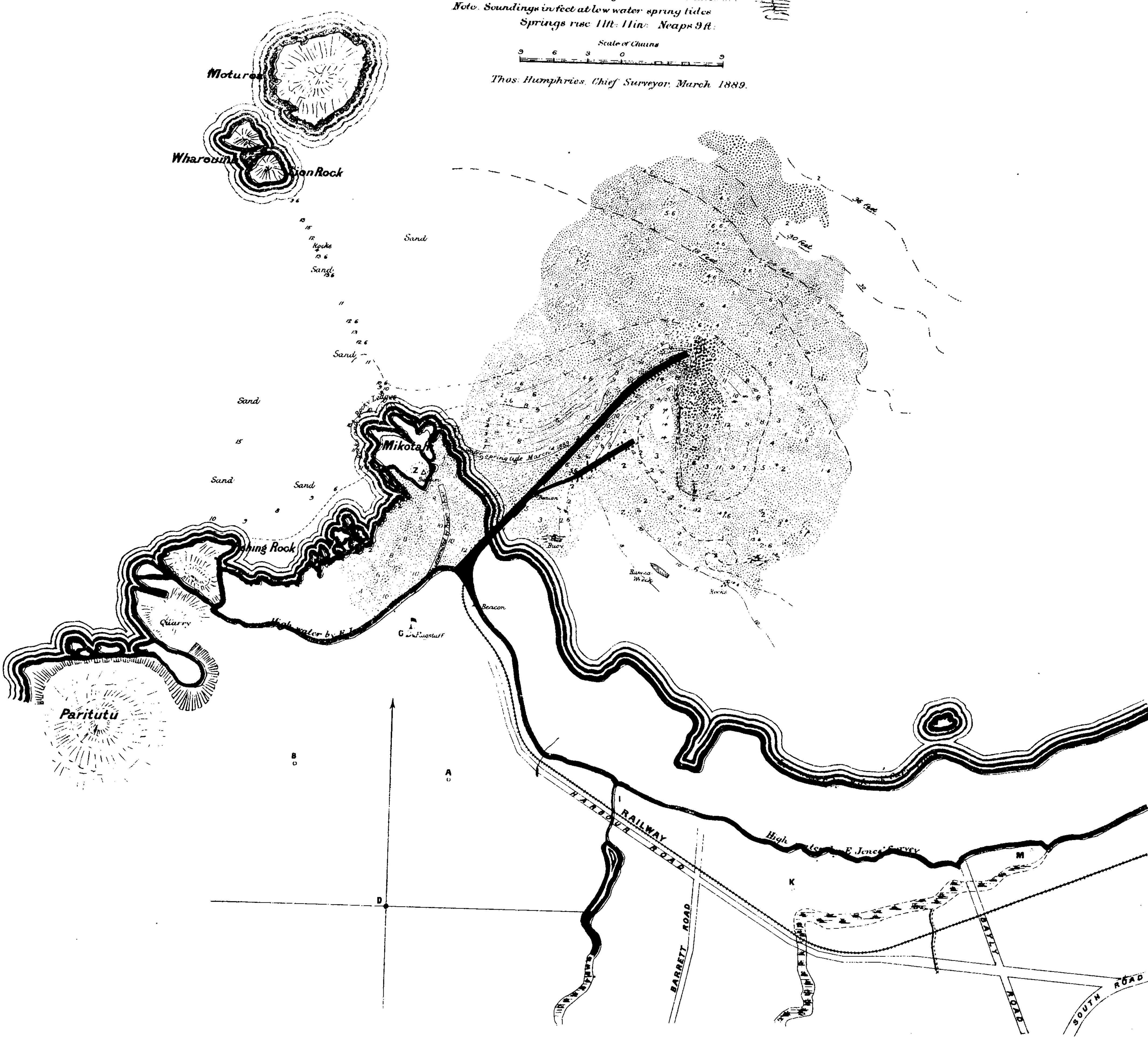
NEW PLYMOUTH HARBOUR

Result of soundings taken March 23rd 1889

Sand deposits since 1877
Depth of sand deposited since E. Jones' survey in 1877 … red figures
Present depth of water … Black figures & contour lines
Note. Soundings in feet at low water spring tides
Springs rise 11ft 11in. Neaps 9ft.

Scale of Chains

Thos. Humphries. Chief Surveyor. March 1889.



Photolithographed at the General Survey Office, Wellington, N.Z. December 1889