
TREATMENT OF DRIFT-SAND

As applied to the
BONDI SAND DUNES.

TREATMENT OF DRIFT-SAND, AS APPLIED TO THE BONDI SAND DUNES.

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HAVING been asked by the Society to give some particulars of the effect on sand dunes of judiciously arranged breakwinds or fascine fences so placed as to intercept or divert prevailing wind currents, the request is met with pleasure, especially as a most successful work—which could have almost been described as an experiment—has, within the last two years, been completed by the the Public Works Department, in the construction of a road across Bondi Beach, the success of which work, nay, its very existence, depends entirely on the fascine protecting fence along the shore line at Bondi Bay.

In dealing with this question of sand dunes for settlement or residential purposes, the one object to be gained is to fix the surface and so permit of its utilisation. Should these dunes not be continuously fed from a powerful source such as the ocean or a sand desert, the spreading of soil, ashes, leaves, manure, or in fact any substance which will protect the sand surface from the wind, can at once be made the agency of converting an arid sand area into grass lands suitable for carrying stock, but when these sand areas are facing the ocean and subject to the full blast of prevailing ocean winds, the matter of subduing these unstable hills to usefulness becomes a more difficult task. Enormous sums of money have been expended in coping with these coastal drifts and in few instances with success, but it is now hoped that the biggest effort yet attempted in New South Wales, viz: to master the sand drift at Bondi will be successful, and should this be fully realised, the success can be described as remarkable.

The following is a history of the attempts made so far to cross the sand hills by a road both for military and commercial purposes:—

In 1862, Mr. O'Brien, of Bondi, connected the valuable columnar white-metal quarries, near the Bondi Sewer Outfall, by a tramway with Waverley, and crossing the hill along A, B on sketch. The tramway was in use for three years when it was abandoned and portions of it became completely covered with drift-sand to a great depth. The Government, about 1885, constructed a road down to the beach on either side, approximately on the lines shown by C—D, but this work was partly destroyed by the sand drifting away from under it, when it

fell in and was washed away, and all that now remains is the northern end. In 1889, the Military Road—E, F—was completed at a great cost over the line of sewer, the idea apparently being that the danger to which the first roads, C—D, were subjected would not be encountered in connection with this line, but it was doomed to as great a failure as the others, for within three years it was covered with twenty-six feet of sand, while to-day the sand over a portion of it, as shown in No. 1 photograph, is about sixty feet high. In spite of these failures, the public agitation still continued for direct communication between the North and South sides of Bondi Bay, and successive governments had sums voted on the Estimates, but it was not till 1900 that the present Minister for Works decided to carry out the scheme then submitted to him and which has since been carried out by the author. Photo. No. 2. It was considered by many officers of the Department that it would not be a success, and the Minister was warned against undertaking the risk, but decided nevertheless to carry it out. Photo. No. 3. The roadway consists of a sand embankment thirty-six chains long and nine feet high over the flat portions of the beach and running almost parallel with high water mark, and approximately 150 feet from it. The top of this embankment is coated with shale and a metalled road constructed over it. The Batters are also covered with shale to prevent their destruction by weather, children or stock.

The one danger to the work was, and is of course, the drift-sand straight from the ocean. To guard against this, a double row of fascine fences are built as near high water mark as they can be with safety—a big storm bringing the waves up to within a few feet of them. The object of this situation being that the immediate source of supply from the ocean is intercepted and the marginal space between the fence and the water is made as narrow as possible, while this sand being covered with water twice in every twenty-four hours does not ever become really hot and dry; under these circumstances, the exposed area from which the sand could drift directly from the sea is kept in that condition by which the ordinary drifting is reduced to a minimum; but in order to give a greater security to the road and the country beyond, marram grass is being planted along this marginal space between the fences and the sea.

It is hoped that as the sand gradually drifts up towards the fence, instead of its occasionally being carried back into the sea, the grass will hold it and continually grow up through each fresh addition to this sand, resulting, ultimately, in a slope being established along the beach of that height and inclination over which drift-sands will not pass any more.

In other words, a sea-wall built by nature of two materials which in combination will form a very strong embankment, and when this inclination is attained, it is hoped that any sand which may be brought in by one storm or tide may be carried out to sea again by succeeding ones. This is not a mere theory, as from observations at the Newcastle and Bondi drifts it has been seen that an occasional storm will almost denude the beach of sand, so that if the ordinary drift-sands can be prevented from rising over the embankment just described, it is reasonable to suppose that this embankment will be periodically relieved of any accumulations on the ocean side of it.

P. N. RUSSELL
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SKETCH PLAN
OF
BONDI SAND HILLS

Walter A. Smith

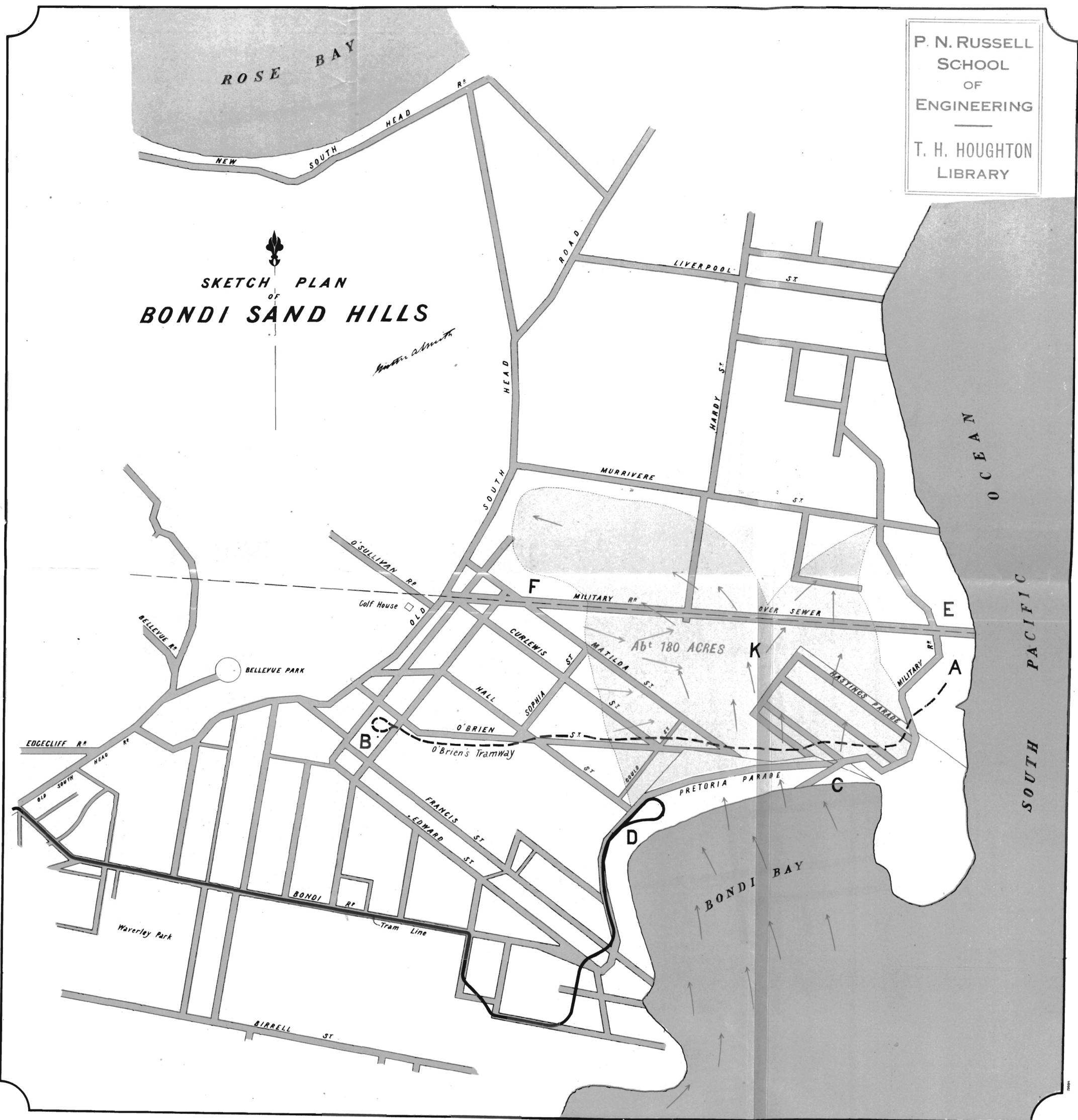


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SOUL PRINTER
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MARRAM GRASS.



PHOTO. TAKEN 26/8/02 AT POSITION MARKED K. IT, HOWEVER, FAIRLY REPRESENTS THE SAND HILLS FRONTING THE SEA AS THEY APPEARED IN 1900.