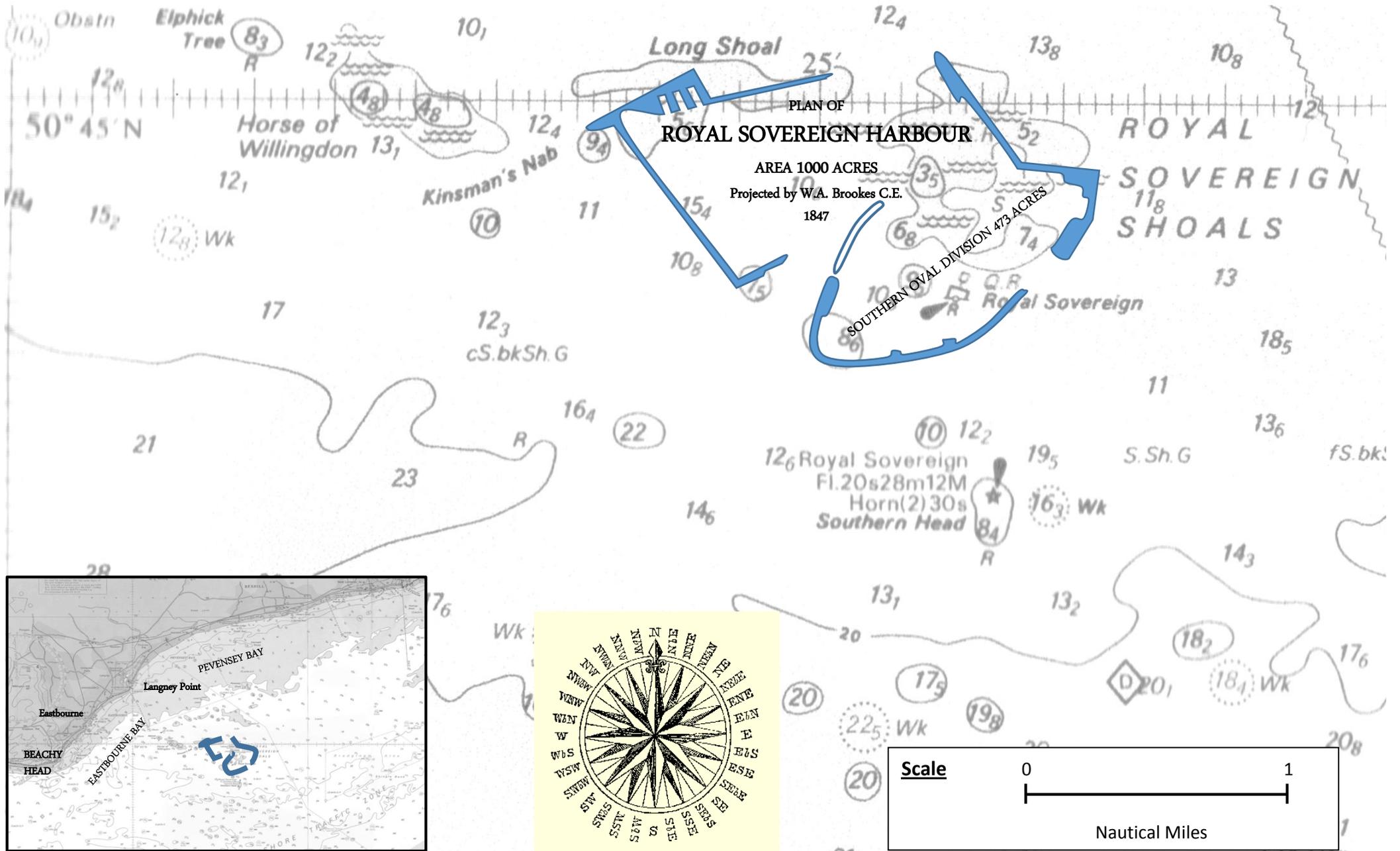


ROYAL SOVEREIGN HARBOUR

ON SOVEREIGN SHOALS

DESIGN FOR A HARBOUR 1847



Royal Sovereign Harbour on Sovereign Shoals
Design for a Harbour 1847

Mr. W. A. Brooks
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It is with these very shoals, known as "Kinsmans Nab", "Inner South Shoal", "Middle South Shoal", "East Shoal" and "Spot Shoal" that have on them at low waters depth of only from 3 to 5 fathoms, with deep water, of from 6 to 9 fathoms within and without them, which by availing myself of the natural advantages of their shoalness, that I am enabled to form my plan, as one which while it will save an expenditure of two million sterling, will also ensure possession of a permanent deep water harbour, in which the largest fleets may safely ride at their own moorings, and which may be approached or left with confidence in the darkest night, and most tempestuous weather. By a deep water harbour I mean that in this plan there is not the dread of a large structure being eventually found to be the means of arresting and accumulating the shingle which travels along the south eastern coast, on which subject I may add a few observations.

The Shoals referred to above, surround "The Royal Sovereign Shoal" a small patch having about 10 feet 6 ins at low water, on which I propose to construct a redoubt, commanding the entrances to the proposed harbour, as well as to build on it an inner or high lighthouse which with the addition of low lights at the entrances, will serve to lead ships in.

One important feature of my plan is, that before its completion, or in fact before one-fourth or the cost of the whole harbour shall have been completed, it will be found that the execution of a portion of the works will have produced a useful rendezvous for Steam Frigates if required to protect the channel. Thus the formation of the breakwater, delineated on the inner and middle south shoals, and the short gap between them will shut out all seas from the N.N.E. round to the westward as far as S.S.E. , or between twenty points

of the compass, from which shelter is most required in the channel, but should the wind fly round to any point between S.S.E. and E, a breakwater constructed on the four fathom shoal, called the east shoal, will give ample security to Steam Frigates, or any other ships well found in moorings. The remaining six points are sufficiently sheltered by the land. I have preferred a harbour of a very large area, as I am aware of the necessity which creates of two features being comprehended in a plan for a first rate Naval Station and harbour of refuge with ample space to allow a separation or separate localities for Queen's ships and Merchant vessels to moor in, also sufficient space for a line of Battleships to get under command of sail before running out.

Should however these objects be obtained without carrying out my plan to its full extent, which would entail an expenditure of Four Millions, I am prepared to show that the execution of the southern or oval division will not cost more

than 2¼ million of money, (or about: the estimate of expenditure recommended for a Naval Station at Dover) and that will give an area of 472 acres of harbour space, having an average depth of 7 fathoms at low water (the four Fathoms ground in the immediate vicinity of the Royal Sovereign Shoal not being included in the above calculation of 472 acres, or that 1,000 acres previously mentioned) . Whereas the same amount of money, viz. 2¼ millions, will only give a sheltered area of some 300 acres to the Three fathom edge at Dover, or less than 300 acres having 5 fathoms at low water.

To form a ready conception of the cost of the harbour now proposed by me abreast of Langney Point, east of Beachy Head, I have made corresponding calculations of the cost of forming the breakwater at Seaford and the work at Dover, as per plans appended to Harbour of Refuge Commissioners. The sectional areas in equal depths being supposed a like with the exception of that portion of the breakwater in my plan on Kinsman's Nab, which form being only expected to a sea range of from 4 to 6 miles, I have assumed as necessary to have merely that sectional area which 3,504 square feet of material will give in a depth of 4 fathoms at low water; and 6,320 square feet of stone will make if deposited where the depth is 7 fathoms at low water.

The Breakwater is proposed at Seaford to be 6,000 feet in length, and made in 7 fathoms at low water of spring tides, each running foot containing a sectional area of 12,103 feet, or allowing one-fourth for voids, containing 9,115 square feet of stone, the same will require about 64,690,000 cubic feet of stone which at the estimate of the Refuge Harbour Commission, of £1,250,000 for that Naval Station, will be about 5½d for every cubic foot of material used . The Breakwater at Seaford, if constructed, would only give a sheltered area of about 120 acres having 5 fathoms at low water, and, although the breakwater is well planned for the locality, yet there is only a depth of 8 fathoms at two cables' length from it, or to the leeward of that end of it, or outlet which ships must clear when the wind is from the westward, or anywhere from that direction which produces the greatest surf upon the shore.

Comparing the cost of the scheme proposed by me with that a harbour at Seaford, with which it directly competes, I find that the Southern or Oval division before referred to as having an area of 472 acres, will require 100,933,200 cubic feet of stone, which at 6d per cubic foot, will amount to £2,520,830; so that for double the outlay my plan will give four times the extent of deep water refuge, (with the advantage of security from an accumulation of shingle) . While at the same time the harbour can be entered, or left with perfect safety from whatever quarter the gale may blow.

The larger harbour of 1,000 acres in area will require for the formation of its breakwater will require 157,324,620 cubic feet of stone, which at 6d per cubic foot will amount to £3,933,115, or, in round numbers, to four million.

Applying the same calculations to the proposed Breakwater at Dover according to plan which accompanies my report to the Refuge Harbour Commission, I find that the 300 acres have not less than 5 fathoms, or 520 acres to low water mark will require 8,537,480 cubic feet of stone, which, at 7d per cubic foot, will give the £2,500,000, forming the amount of the estimate of the Honourable Commissioners for Refuge Harbour.

To simplify the comparison, I have supposed that rubble, or sloping breakwaters are to be used in each, though for some parts of my own plan, I consider that nearly vertical walls will be preferable.

Comparing the proposed Royal Sovereign Harbour, with that intended at Dover, I find that the same outlay of 2½ million will give 472 acres of deep water at the former place, and 800 acres at the latter. While an additional outlay of 1½ millions will complete the harbour designed by me East of Beachy Head of 1,000 acres, or give more than three times the space.

As the material for the formation of the breakwater will have to be obtained from the westward, the addition of one penny per foot for the extra freight to Dover will probably be thought not enough. I have entered into rather fully into the comparison between the cost of works having natural advantages towards their construction, and then without them.

That an apprehension has generally existed as to the shoaling up by the deposit of shingle, which would result from the construction of piles connected with any portion of the shore of the south-eastern coast, (or wherever there is travelling shingle beach), is but too evident, and become the adoption of the system of isolated works or breakwaters and is that proposed off the Seaford shore. This is only putting off the evil day (but paying dearly for it) for most assuredly the ultimate result will be the stoppage of the shingle, which now travels along the coast, propelled by the surf of the prevailing on shore gales.

Having filled up the space between the breakwater and the shore, the shingle will again resume its onward easterly course, which it will do along the outer face of the costly breakwater, or new shore formed for it to travel along. The next step towards destruction will be the accumulation of shingle at the eastern end of the breakwater, which will soon be connected with the main land by a shingle beach. These observations will apply to any harbour situated on a coast subject to travelling beach, and to suppose that the shingle travels only between low and high water mark is at once to conclude that the ruin of such a harbour will be the more rapid.

We know that the shingle travels from the impulse of the surface waves, and therefore to place a long line of breakwater so as to overlay the shore, or shelter it from the surf is clearly the most efficient mode to accumulate shingle under the lea, such a breakwater being in fact a perfect shingle trap in such a situation.

Even in the example of the plan of the Royal Sovereign Harbour I doubt whether it would be prudent to construct any additional breakwater or works upon such rocky ground, the Horse of Willingdon, because of the tendency of such a construction to arrest the progress of the shingle in its eastward course.

Along the whole of the south-eastern coast, though great are the irregularities of its contour, the same inconvenience from shingle is experienced, and the shingle end is only found near Sandown Bute where the Goodwin Sands overlapping the shore, check the progress of the shingle by the shelter afforded from the surf to which the whole westward coast is exposed.

It is from this wholesome dread of the evil effects to be anticipated from travelling shingle, that I have turned my attention to the advantage to be derived of having on our south-eastern coast Harbour of Refuge, or Naval Stations established in isolated positions, or at such reasonable distance from the shore as shall secure their not being in themselves the means of stopping the travelling of the shingle, or of creating suicidal operations, for such may be termed the condition of harbours, which certain in themselves the ailments to work out their own destruction.

At Dover it is clear that the preservation of a harbour there will depend on the continued seaward extension of gigantic miles to arrest the shingle on the west side and the value of the position of Dover may warrant this annual expenditure.

In the professional observations and evidence which have been advanced in respect to the condition of several positions which have enquired into as to their eligibility as sites for a Harbour of Refuge .

And no reference into the causes which have produced their condition, and observation that the cause of the eastern side of Beachy Head the more shoal than the Western side, or the existence of the Holywell rocks and general more shoal ground in Eastbourne Bay, than at equal distance from the shore on the west side of Beachy Head, arise from the fact of the eastern side being out of the true run of the flood-tide, the state of the tide being deflected outwards by the projection of Beachy Head, and therefore the west side of Beachy Head irrespective of the protection from the prevailing gales, is the best natural position for deep water in the present condition . I find that no attention has been directed to the existence of similar influences at Dover, where the Bay on the east is found to be more shoal than on the west from the very same

causes, and in the case of Portland Harbour, or Roadstead, the same influence have been again together overlooked, and that there has been no enquiry made.

I have already observed that the best natural position for deep water must be on that side of any bay which is exposed to the direct action of the flood tide. Practical knowledge will furnish numerous instances to prove the truth of this statement. Having mentioned the instances of Portland, I will add a few remarks in reference to that situation, because of it being an example where the difference as to the depth exists in a remarkable degree.

In the bay on the west side of Portland we find in the presence of soundings from 12 to 20 fathoms at low water within half a mile of the shore, evidence of the powerful action of the flood tide to keep that coast or side of the bay clear of deposit. From the difference of level between the current on the west side and that on the east side of Portland, we ascertain the cause of the small depth which is found in the Portland Roads.