25th Congress, 3d Session. | Doc. No. 223. | Ho. of Reps. War Dept.

LITTLE EGG HARBOR.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

The information required by a resolution of the House of Representatives of the 14th ultimo, in relation to the Improvement of Little Egg Harbor.

FEBRUARY 26, 1839.

Read, and laid upon the table.

WAR DEPARTMENT, *February* 25, 1839.

SIR: In answer to the resolution of the House of Representatives of the 14th ultimo, calling upon the Secretary of War for statements in relation to the improvement of Little Egg Harbor, I have the honor to transmit, herewith, a report of the Chief Engineer, dated the 22d instant, together with the several documents therein referred to.

Very respectfully, your most obedient servant,

J. R. POINSETT.

Hon. J. K. POLK,
Speaker of the House of Representatives.

ENGINEER DEPARTMENT,
Washington, February 22, 1839.

SIR: In answer to the resolution of the House of Representatves of the 14th January, on the subject of the improvement of Little Egg Harbor, referred to this department, and herewith returned, I have the honor to communicate the copy of a letter from Major J. L. Smith, accompanied by copies of contracts, and a tabular statement of quantities, kinds, and prices of materials. A copy of a report of Lieutenant Colonel De Russy, dated February 10, 1839, of an inspection made by him, about the 1st instant, of the works in question, is also communicated; together with a copy of a letter from Lieutenant Colonel De Russy, February 18, 1839, on the same subject.

I am, sir, very respectfully, your obedient servant,

JOS. G. TOTTEN,
Colonel Topographical Engineers.

Hon. J. R. POINSETT, *Secretary of War.*

AUTHENTICATED U.S. GOVERNMENT INFORMATION GPO

GOVERNOR'S ISLAND, N. Y.,
January 30, 1839.

SIR: In obedience to your order of the 17th instant, to furnish the information, respecting the improvement of Little Egg Harbor, required by the first part of the resolution of the House of Representatives of the 14th instant, viz: the information concerning contracts and accounts, with a tabular statement of the quantities and kinds of materials applied to the said improvement, the prices paid for them, the names of the persons to whom payments had been made out of the appropriations for the said improvement, and the amounts paid to them, respectively, I submit the following report:

The contracts entered into for the execution of the works required to effect the improvement referred to were—

1st. With Willits and Adams, on the 20th June, 1837, for building three brush breakwaters and 3,000 feet of brush fence, and for furnishing the materials.

2d. With Wm. French, on the 20th June, 1837, for building one brush breakwater and 2,000 feet of brush fence, and for furnishing the materials.

3d. With Wm. French, on the 11th October, 1837, for building 3,000 feet of brush fence, and furnishing the materials.

4th. With Stephen Willits, jr., on the 22d August, 1838, for repairing four brush breakwaters, and building between six and seven thousand feet of brush fence of a large size, and between one and two thousand feet of brush fence of a small size.

The first, second, and third of these contracts have been fulfilled in a satisfactory manner. The third was not a regularly drawn contract, but simply a proposal, and a letter accepting it. The fourth has been fulfilled in part, the complete fulfilment having been prevented by unusual and continued inclemency of the weather, and other difficulties that had not been anticipated. The contractor having made judicions arrangements for the prosecution of the work, and having employed a force adequate to its completion within the time stipulated, his failing to fulfil his engagement was attributable, not to the lack of due exertion on his part, but to untoward events, that could not have been foreseen or guarded against; and, therefore, he was exonerated from the penalties to which he had become liable in consequence of his failure. He is to finish the fences that have been partially built; and, when they shall be finished, he is to be paid for them at the contract price; but he is not to go on with any work, provided for by the contract, that has not been begun, and, therefore, he is not to repair the breakwaters, although he has collected materials on the spot for that purpose.

It is too late now to make these repairs, except to one of the breakwaters—the northernmost. The southernmost has been entirely destroyed, and the two next north of it have been so much injured as to be unworthy of repair. The fences built under the contract were not injured by the late storm, on the 26th instant, although it was perhaps the most violent, for the time it lasted, that had ever been known on that part of the coast. I was on the beach the day after it happened; the wind had been blowing off the land about 20 hours, and, as the usual effect of such a wind is to reduce the level of the sea, and especially in the vicinity of the shore, I had provided means for taking soundings on the outside of

the beach. It is probable the effect referred to had been produced in a degree, but the sea was yet so high and turbulent as to exhibit the appearance of breakers as far as it could be seen. Several experienced persons who were with us on the beach, and who had often observed the sea there during hurricanes, declared they had never before seen so rough a sea there. The person who resides on the beach said that, during the storm, the sea rose 7 feet in one hour. It certainly rose higher than the tops of the large fences, which are 7 feet above ordinary high water; for we found piles lodged on the tops of them, that had been floated there. We observed a remarkable instance of the strength of these large fences: gaps had been left in them, about 20 feet wide, to allow the passage of carts from the back part of the island to the front beach, with materials for repairing the breakwaters. The slight temporary barricade with which these gaps had been closed, when the operations were suspended, had soon yielded to the force of the sea, and it must have rushed through them with great force, yet the fence on each side of the gap was not undermined or otherwise injured. Before the gale, the large fence is said to have collected sand, (to the tops of the parts finished,) which sloped on each side, with a base so large, in proportion to the height, that a cart was driven over the top of the fence. The greater part of the slope was washed away during the gale, but between the rows of stakes there remained a sufficient body of sand to serve as ballast to the brush base, and preserve its stability.

The tabular statement, sent herewith, furnishes all the information required by the resolution respecting accounts, except the accounts themselves; they are on file in the office of the Third Auditor, and would be furnished, I presume, if applied for.

Copies of the four contracts referred to are sent herewith.

Respectfully submitted.

JNO. L. SMITH,
Major, Corps of Engineers.

Colonel J. G. TOTTEN,
Chief Engineer, City of Washington.

Copy of contract with Willits and Adams, for improvement of Little Egg Harbor—June 20, 1837.

Agreement between John L. Smith, of the corps of engineers, in behalf of the War Department of the United States of America, of the first part, and Stephen Willits, junior, of Tuckerton, and Isaiah Adams, of Bass river, in the State of New Jersey, of the other part, as follows:

The said Willits and Adams undertake to build, or cause to be built, three breakwaters, and three thousand feet of brush fence, for the protection of the beach at Tucker's island, in the manner set forth and explained in the annexed description; and to furnish at their own expense all materials, or whatever else may be requisite therefor; and agree to complete all these several operations by the first of October next ensuing; moreover, they agree that the materials shall be of a suitable kind, and the work shall be done in a substantial and proper manner. It is understood that the breakwaters are to be commenced at a position

which has been pointed out to them, and which will again be pointed out by the said Smith, or by some person duly authorized by him to do it. The position pointed out is two hundred yards southwest of a sand hill, for the first or northernmost breakwater; and for the other two, eight hundred feet southwest of the first for the second, and eight hundred feet further southwest of the second for the third. The length of these breakwaters to depend upon the slope of the beach, as specified in the description; but the length is not to exceed fifty-four feet for each, respectively, of the portions of the breakwater having three stakes in a row, four in a row, and five in a row, nor less than thirty-six feet for either of these of its divisions. The brush fence is to be built in the manner described, at such place or places as shall be pointed out by the said Smith, or such person as shall be duly authorized by him to point them out. The greater part of the length specified will, however, be required to be built on the seashore, between and contiguous to the breakwaters aforesaid. And the said Smith agrees to inspect or cause to be inspected any one of the said breakwaters, as soon as notice shall be given that they are ready for inspection; and further agrees that, after being inspected, if approved, they shall be at the risk of the War Department; and he likewise agrees to inspect or cause to be inspected any portion or portions of the brush fence that are completed, as soon as notified that they are ready to be inspected; provided, that to be considered complete shall require that they extend along the space between two of the breakwaters, or fill up some other space of a similar kind. And it is agreed, by and between the parties aforesaid, that the price to be paid for executing the breakwaters aforesaid shall be five dollars a cord, of one hundred and twenty-eight cubic feet, for the breakwaters, and eighteen dollars for every hundred feet of the brush fence, or rather double brush fence, the two rows of the fence being regarded as equivalent only to one fence. And it is further agreed, that payment shall be due after the inspection is made, if it be favorable, and shall be made upon the presentation at New York of the certificate of said inspection; with this proviso, that only three fourths of the value of work done, as declared in the certificates, shall be paid for until after the completion of the whole; and with this further proviso, that the sums so retained shall be forfeited for the benefit of the United States aforesaid, upon the failure of the parties of the second part to complete their engagements under this contract in a faithful manner or within the time specified.

Signed in duplicate, and exchanged, at Tucker's island, this 20th of June, 1837.

JNO. L. SMITH,
Major, Corps of Engineers.

STEPHEN WILLITS, Jr.
ISAIAH ADAMS.

In presence of the signing, the attaching the sheets, and the exchange:

HENRY B. RENWICK.
JOHN HORNER.

Description, referred to in the annexed contract, of materials required and work to be done for the preservation of the beach at Tucker's island.

The wasting of the beach by the abrasion of the surf is to be counteracted by projecting breakwaters, from high water towards low-water mark. The wasting of the sand above high water, by being drifted or blown into the sea, is to be checked by brush fences.

The breakwaters are to be formed in this way: Their direction, as above stated, is to be across the beach, from high towards low water. Their substance will be brush, ballasted with sand sufficiently to prevent it from being floated upwards, and secured by stakes, to prevent it from being moved sideways. In the first instance, the stakes are to be driven, three feet apart from centre to centre, to the depth of six feet, through sand or sod, or both, as may happen. When driven to that depth, their tops must be five feet above high water. They are to be driven in rows. Three is the smallest number admissible for a row; that number may answer at high-water mark, and from that down the slope of the beach to three feet below the level of high water, because there the shock of the surf will be comparatively weak. Four in a row must be used between the level of three feet and five feet below high water, and five in a row when the level of the beach is lower than five feet below high water. The mean thickness of the stakes in the middle must be at least four inches when there are to be three in a row, four and one half inches for four in a row, and five inches for five in a row. As each row is driven, it must be secured at the top by a strip of plank one and a quarter inch thick, and five inches wide, nailed on edgewise, with 30*d.* nails, as a cross-tie. The planks may be refuse stuff or slabs. When several rows are driven, they are to be secured lengthwise by strips of the same kind, nailed on edgewise on the outside of the inside stakes. The outside stakes of every third row to be at least six inches thick in the middle, and their tops to be three feet higher than the tops of the other stakes. They should be driven at least eight feet deep. Their distance apart, in the direction of the length of the breakwater, will be nine feet. The inner stakes to be secured lengthwise by strips nailed flat on their tops. When the frame formed by driving the stakes in the ground and the securing their tops in the manner just described is ready, the brush is to be laid in it in the following manner: For the convenience of transportation, the brush will of course be brought to the spot tied up in bundles. The bundles must be opened before the brush is laid. The laying is done by drawing out the bundles lengthwise, until the thickness is reduced from twelve inches or more to about four inches. When so drawn out, the length of the bundle would be increased three-fold or thereabout, and the ends of the brush would be lapped and interlaced, so that the bundle would hold together the whole length, as if it had been composed of brush of the full length. The brush is not to be laid lengthwise or crosswise, but in an oblique or diagonal direction, in layers of four or five inches thick, crossing each other at right angles. When several layers of brush are placed, equal to a thickness of twelve or eighteen inches, sand is to be spread over, to the thickness of one half to one third the thickness of brush so laid, to serve as ballast, and prevent the brush from being floated upwards, as has been stated.

This sand, when the water gets to it, will sift through the interstices of the brush, and thus the whole mass will become compact and comparatively solid. The sand to be used in this way may be taken from the beach in the vicinity of the breakwater, but not so near as to endanger the stability of the outside stakes. The distance of six or eight feet would guard against that, and would yet be near enough to admit of the sand being pitched on the breakwater as it might be excavated with a shovel. The layers should be carried up level; and, therefore, the laying should be commenced at the lowest point of the beach of the space to be filled with brush. The brush should extend eighteen inches beyond the outside stakes, and, as far as practicable, should be drawn out so as to extend from outside to outside. When the laying has been carried up a few feet, the flat strips that are nailed on the top of the inside stakes would interfere with it. When that happens, they may be removed, or they may be removed before the laying is commenced. The cross-ties are also to be removed, and transferred to the heads of the long stakes; one to be laid flat on the top, and one edgewise on each side, but it would be better not to disturb them until the laying of the brush has been carried to within two or three feet of the top of the stakes. The strips running lengthwise on the outside of the outside stakes are not to be removed at all. It has been stated that the large stakes are to be three feet higher than the others. These three feet of their height are to be laid with boards or strips nailed on the inside of the stakes lengthwise, so as to form a continuous casing on the top of the breakwater. The case is to be filled partly with brush and partly with sod, and the brush is to be laid across, with the small ends resting on the top of the casing. If brush was laid diagonally or lengthwise in this part of the breakwater, it would lodge against the cross-ties or strips, and be prevented from settling. The brush being laid across, as has been stated, to the height of eighteen inches or two feet, with two or three layers of sand for the interstices, after settling into them, sods such as are found on the beach are to be placed on top of the brush so laid. The sods used for this purpose should be as large as possible, and the largest should be laid on the outside, next the casing, and, if practicable, laid something like a pavement. The advantage of having sods for ballast on top of the breakwater, instead of sand, arises from its greater compactness and fitness to resist the wash of the sea. Before the top covering of brush and sods is laid, some little time should be allowed for the settling of the lower part, which will probably amount to one sixth, or perhaps one fifth, in order that it may be raised again to the proper height after the settling is over. There will be no necessity for large stakes or a top covering where there are but three stakes in a row. The large stakes are to be so driven that the inner sides of them will range with the outer sides of the small stakes, and admit of the securing to their inner sides the strips nailed edgewise on the outsides of the small stakes; and, as the cross-ties of the small stakes are to be transferred to the large stakes, care must be taken to have them long enough to fulfil that arrangement.

The drifting or blowing of the sand is to be checked by brush fences. These brush fences are to be formed by driving stakes a foot apart, and wattling brush upon them as closely as practicable; each layer of brush to be passed around the stakes on the side opposite to the side around

which the previous layer had been passed. The stakes to be two inches thick and six feet long. Three feet of their length is to be driven into the ground, and the brush is to be wattled up to the height of 2½ feet above ground. Two rows prepared in this way, and placed at two feet apart, will be a brush fence of the kind referred to in the contract. The brush must be long, slender, and tough, or it cannot be wattled as closely as it ought to be. The brush of the breakwater must also be flexible and tough. Pine brush, or any other that is rigid or brittle, would not answer for the brush fence or the breakwaters.

Copy of contract with William French, for improvement of Little Egg Harbor—June 20, 1837.

Agreement between John L. Smith, of the corps of engineers, in behalf of the War Department of the United States of America, of the first part, and William French, of Bass river, in the State of New Jersey, of the second part, as follows:

The said French agrees to build, or cause to be built, one breakwater and two thousand feet of brush fence, for the preservation of the beach at Tucker's island, in the manner set forth and explained in the annexed description, and to furnish, at his own expense, all materials or whatever else may be requisite therefor; and agrees to complete all these several operations by the first of September next ensuing. Moreover, he agrees that the materials shall be of a suitable kind, and the work shall be done in a substantial and proper manner. It is understood that this breakwater is to be commenced at a position which has been pointed out to him, and which will again be pointed out by the said Smith, or by some person duly authorized by him to do it. The position pointed out is two hundred yards northeast of a sand hill, which is at the southern extremity of a gap of twelve hundred yards in width, where the sand hill has been washed away from the front of the beach, and it is eight hundred feet distant from the southernmost of the breakwaters to be built by Willits and Adams. The length of this breakwater is to depend upon the slope of the beach, as specified in the description already referred to. But the length of that part of it having a width of three stakes is not to exceed fifty-four feet, nor to be less than thirty-six feet; and the same remark is applicable to the parts, respectively, having widths of four stakes and five stakes.

The brush fence is to be built in the manner described, at such place or places as shall be pointed out by the said Smith, or such person as shall be duly authorized by him to point them out. Nearly one half the length will be contiguous to the breakwater aforesaid. And the said Smith agrees to inspect, or cause to be inspected, the said breakwater, as soon as notice shall be given that it is ready for inspection; and further agrees, that after being inspected, if approved, it shall be at the risk of the War Department aforesaid; and he likewise agrees to inspect, or cause to be inspected, any portion or portions of the brush fence that are complete, as soon as notified that they are ready to be inspected; provided that to be considered complete shall require that they fill some space that may be clearly defined. And it is agreed, by and between

the parties aforesaid, that the price to be paid for executing the breakwater aforesaid shall be at the rate of five dollars a cord, of one hundred and twenty-eight cubic feet of the solid contents thereof, above the level of the beach, and the price for the brush fence to be at the rate of eighteen dollars for every hundred feet thereof. What is regarded as a brush fence in this agreement being actually a double fence, or a fence consisting of two rows each, within two feet of the other. And it is further agreed that payment shall be due after the inspection is made, if it be favorable, and shall be made upon the presentation, at New York, of the certificate of said inspection; with this proviso, that only three fourths of the value of work done, as declared in the certificate, shall be paid for until after the completion of the whole; and with this further proviso, that the sums so retained shall be forfeited for the benefit of the United States aforesaid, upon the failure of the party of the second part to complete his engagements under this contract in a faithful manner or within the time specified.

Signed in duplicate, and exchanged, at Tucker's island, this 20th of June, 1837.

JNO. L. SMITH,
Major, Corps of Engineers.
WILLIAM FRENCH.

In presence of the signing, the attaching of the sheets, and the exchanging:

HENRY B. RENWICK.
JOHN HORNER.

The description referred to in this contract is the same as appended to the contract with Willits and Adams.

Copy of proposal and acceptance of William French, for improvement of Little Egg Harbor—October 11, 1837.

BASS RIVER, *October* 10, 1837.

SIR: I will build the brush fence on Buck's beach for twelve and a half cents per foot, and take the whole at that price.

Yours, respectfully, &c.
WILLIAM FRENCH.

Mr. HENRY B. RENWICK.

TUCKERTON, *October* 11, 1837.

SIR: You proposal to build and furnish all materials for building 3,000 feet of brush fence, such as described in the advertisement, and at the rate of 12½ cents per foot, on Buck's beach, as it is the lowest, is accepted. You will, therefore, if you please, prepare your materials, and be ready to commence work on the beach in the space of twelve or fourteen days; as, from the lateness of the season, it is desirable that the work should be done as soon as possible. It will require 3,100 feet of fence to fill up all the gaps on the beach; and you may either build that quantity, or the quantity which you propose for, as you please.

Yours, respectfully,
H. B. RENWICK.

Mr. WILLIAM FRENCH.

Copy of contract of Stephen Willits, jr., for improvement of Little Egg Harbor—August 22, 1838.

Agreement between Major John L. Smith, of the corps of engineers, in behalf of the War Department of the United States of America, of the first part, and Stephen Willits, junior, of Tuckerton, in the State of New Jersey, of the second part, as follows:

The said Willits agrees to repair or cause to be repaired the four brush breakwaters which were constructed on Tucker's beach, between the old and new inlets of Little Egg Harbor, during the summer and fall of last year, by building a bulkhead at the seaward extremity of each, as explained and set forth in the annexed description, and by putting such repairs upon the old breakwaters as are specified to be necessary in the description referred to; and, also, agrees to build or cause to be built between six and seven thousand feet of brush fence of a large size, having three rows of stakes in the width, and the height of six feet above the ground, and between one and two thousand feet of brush fence of a smaller size, such as was built last year; these two kinds of brush fence being fully explained in the annexed description. And he agrees to furnish, at his own expense, all materials or whatsoever else may be requisite for carrying on the several operations, and to do the work in a substantial and proper manner, and to finish the same on or before the tenth of October next ensuing. The brush fences are to be built in the manner set forth in the annexed description, and at such places as shall be pointed out by the said Smith, or such person as shall be duly authorized by him to point them out. And the said Smith agrees to inspect the repairs of the breakwaters aforesaid, or cause them to be inspected, as soon as notice shall be given that they have been completed and are ready for inspection; and further agrees, that after having been so inspected, if the inspection has proved in all respects satisfactory, and they have been approved, they shall be at the risk of the War Department aforesaid; and he likewise agrees to inspect or cause to be inspected any portion or portions of the brush fences, when they are finished, and notice is given that they are ready to be inspected; provided that the portion or portions referred to shall extend throughout spaces the extremities of which may be clearly defined. And it is agreed, between the parties aforesaid, that the prices to be paid for repairing the breakwaters, as aforesaid, shall be at the rate of five dollars a cord of one hundred and twenty-eight cubic feet of solid contents of the brush work, included in the said repairs; and, also, so much of the solid contents of the sod work used for ballast of the bulkheads as may be below the level of the top of the stakes thereof; and the prices of the brush fences to be at the rate of sixty cents a lineal foot of the larger fence of the height of six feet, and the width of three rows of stakes, and at the rate of twelve cents a foot for the smaller fence of the height of three feet, and the width of two rows of stakes. And it is further agreed, between the parties aforesaid, that although the result of the inspection referred to may be entirely satisfactory, and the work inspected may appear to be in all respects completely finished, there shall be a second inspection of the work before it shall be finally accepted; and this second inspection shall be deferred until time enough shall have elapsed to show any defect in the work that might result from careless or imperfect construction; and, also,

to allow of the filling up of such settling of the brush work as would be likely to take place, however carefully and faithfully executed it may have been in the first instance; besides the correction of any other defect that may be discovered. And it is agreed that the interval between the two inspections shall not be less than one month. And it is agreed that payments for work done shall be as follows, viz: three fourths of the amount appearing to be due after the first inspection will be paid at the engineer's office on Governor's island, in the harbor of New York, on the certificate of the person making the inspection, declaring the amount and value of the work finished in a satisfactory manner; and the remaining fourth will be paid in the same manner, on a certificate of the same kind, declaring the conditions of the second inspection to have been complied with. But it is also understood and agreed, that if any part of the work shall not be finished so that it may receive the first inspection by the thirty-first day of October next, being twenty days after the time agreed upon for finishing all the work to be done under this contract, any claim to payment for the same shall be void; and any sums reserved from the payments on the first inspection, and which would be due on the compliance with the conditions of the second inspection, shall be forfeited for the benefit of the United States aforesaid; and it is likewise understood and agreed, that if the work shall be in a condition for receiving the first inspection at any time before the thirty-first of October aforesaid, the conditions of complete payment shall be complied with; provided that five dollars a day shall be deducted for the first ten days of delay beyond the time of completion agreed upon, and ten dollars a day shall be deducted for all further delay, until the thirty-first of October aforesaid; and provided, also, that the same rates per day shall be allowed to the party of the second part for anticipating the time of completion during the corresponding periods of time; it being understood that the penalties and forfeitures within stated will be strictly enforced, although it will be competent to the said Smith to relax or remit them, in part or in whole, if the delays shall appear to have resulted from unavoidable interruptions, and that every proper exertion had been made by the said Willits to comply with the terms of the contract in a faithful and satisfactory manner.

Signed in duplicate, and exchanged, at Tucker's island, this twenty-second day of August, 1838.

STEPHEN WILLITS, Jr.
JOHN L. SMITH,
Major, Corps of Engineers.

The signing, the attaching of the sheets, and the exchange, in the presence of

JOHN HORNER.
HENRY B. RENWICK.

Description of the breakwaters to be repaired and the brush fences to be built for the preservation of the beach of Tucker's island, referred to in the contract between Major J. L. Smith and Stephen Willits, jr., this 22d of August, 1838.

The breakwaters already built are to be repaired, and additional brush fences to be built.

The repairs of the breakwaters will consist of a bulkhead, to be built at the present head or seaward extremity of each breakwater, and connected with it by building up the latter with brush work to its original height; and, also, of repairs to the landward extremity, where the brush has settled between two and three feet in that part of it having three stakes in the width, by raising the brush work to its original height, and replacing ties where necessary. No repairs will be required for that part of the breakwater having a covering of sods, further than to replace ties that have been removed. The bulkheads are to be built in the same manner as the breakwaters were built, so far as relates to the direction and distance apart of the stakes, and the placing of brush and ballasting it with sand. In constructing them, the brush must be interlaced with that of the breakwater, otherwise the connexion will not be as complete as it ought to be. They are to be three feet higher than the highest part of the breakwater. The stakes are to be at least seven inches thick in the middle, clear of the bark, which will make them about eleven inches thick at the larger end. They are to be driven nine feet, if practicable, but not less than eight and a half feet, into the sand and sods. There will be forty-nine stakes in each bulkhead, arranged so as to form a square; consequently, there will be seven in the width and seven in the length. The present head of the breakwater has five stakes in the width. The bulkhead will project one row of stakes beyond the breakwater, on each side. The top of the bulkhead is to be ballasted with sods; and, to prevent them from falling out on the outside, boxes or cradles, or old crockery crates, must be arranged between the exterior row of stakes and the row next to it, for receiving the sods that are to be laid at the outside. The brush must be laid to the top of the stakes before the sods are put on; because, however compact it may seem to be when first laid, it invariably settles more or less, and sometimes as much as one half of its depth. Besides the four ties lengthwise and the four ties crosswise, there must be diagonal braces of plank, one inch and a half or two inches thick, and seven to eight inches broad, secured with one six-inch spike and two 30*d*. nails, flat or horizontal on the heads of the stakes; or one 1½ inch treenail, ten inches long, may be substituted for the spike. These diagonal braces must be placed on every other diagonal row of stakes, in one direction, and the heads of the stakes must be sawed off to the depth of the thickness of the plank, so that the top of the plank will be flush with the heads of the stakes in the alternate row; and the other diagonal braces are to be laid at right angles to those first laid upon the stakes of the alternate row referred to. Wherever two braces cross each other, they are to be secured together with two 20*d*. nails. All the ties used for the bulkhead must be of stuff, one inch and a half to two inches thick, and seven to eight inches wide, and the ties are to be secured to each stake with at least two spikes or three 30*d*. nails. This remark

respecting the ties and the mode of securing them is also applicable to the breakwater.

The brush fence built last year consisted of stakes, two inches thick and six feet long, driven three feet into the ground, at the distance of twelve inches from centre to centre, in two rows, two feet apart, and wattled to the top. There will be between one and two thousand feet of that kind to be built this season.

But the principal brush fence to be built this season will have three rows of stakes, thirty inches apart; the stakes twelve feet long and three inches thick, to be driven six feet into the ground, and to have eighteen inches of height next above the ground filled with brush, laid diagonally, in the same manner as the breakwaters. The remainder of the height, being four feet and a half, to be wattled in each row, the stakes of which are to be fifteen inches from centre to centre. The brush to be laid as the base of this fence must extend eighteen inches outside of the stakes; and, as the rows are to be thirty inches apart, the extreme distance between the outside stakes would be five feet; consequently, the width of the brush work would be eight feet. It will be necessary that the brush to be laid in this way should be thoroughly soaked, so that it may be as limber as possible. In that case, it is probable the height of eighteen inches of compact brush work, which will be required, will be obtained by laying the brush to the height of two feet, and then pressing it down to eighteen inches by loading it with sand. But the height of finished brush work must be at least eighteen inches, after it has settled as much as it will. There will be required between six and seven thousand feet of fence of the kind just described.

Tabular statement of the quantities and kinds of materials used in the works for the improvement of Little Egg Harbor, and the prices of the same, together with the names of the persons to whom payments have been made out of the appropriation for the said improvement, and the amounts paid to them, respectively.

Names of persons to whom payments have been made.	Quantity and kinds of materials.								Contingencies.					
	Brush breakwater.		Brush fences.				Sod walls.		Travelling allowance.		Per diem, as authorized by Eng. Department, October 25, 1836.		Superintendence.	
			Small.		Large.									
	Quantity—cords.	Price.	Quantity—lineal feet.	Price per foot.	Quantity—lineal feet.	Price per foot.	Cubic yds.	Cost.	Distance—miles.	Price per m.	No. of days.	Price.	No. of days.	Price.
Willits & Adams, -	–	–	892 1-2	18 cts.										
William French, -	145 7-8	$5	2,032 8-12	18										
Willits & Adams, -	135 52-100	5	603	18										
Willits & Adams, -	144 32-100	5												
Henry B. Renwick, -	–	–	–	–	–	–	–	–	–	–	–	–	92	$2 00
Major J. L. Smith, -	–	–	–	–	–	–	–	–	1,704	10 cts.	20	$1 50		
Willits & Adams, -	163 7-8	5	1,525	18										
William French, -	–	–	3,215	12 1-2										
Henry B. Renwick -	–	–	–	–	–	–	–	–	–	–	–	–	37	2 00
Major J. L. Smith, -	–	–	–	–	–	–	–	–	284	10				
Henry B. Renwick, -	–	–	–	–	–	–	–	–	35					
Henry B. Renwick, -	–	–	–	–	–	–	–	–	–	–		–	31	2 50
Henry B. Renwick, -	–	–	–	–	–	–	–	–	–	–		–	30	2 50
Major J. L. Smith, -	–	–	–	–	–	–	–	–	852	10	20	1 50		
Stephen Willits, jr. -	–	–	–	–	2,452	60 cts.								
John Horner,* -														
Stephen Willits, jr. -	–	–	–	–	691 1-2	60	40	$12 84						
Henry B. Renwick, -	–	–	–	–	–	–	–	–	–	–	–	–	85	2 50

* Collecting 300 fence stakes, that had been scattered by storms, and depositing them on the sand hills for safety. Cost, $15.

STATEMENT—Continued.

Names of persons to whom payments have been made.	Amount paid to them.	Date of payments.	Vouchers showing payments. No.	Qr.	Year.	Date of contracts under which payments have been made.	Remarks.
Willits & Adams, -	$160 65	Aug. 23, 1837,	1	3d	1837	June 20, 1837.	
William French, -	1,095 25	Sept. 9, "	2	3d	"	June 20, "	
Willits & Adams, -	786 14	Sept. 26, "	3	3d	"	June 20, "	
Willits & Adams, -	721 60	Sept. 30, "	4	3d	"	June 20, "	
Henry B. Renwick, -	184 00	Sept. 30, "	5	3d	"		
Major J. L. Smith, -	200 40	Sept. 30, "	6	3d	"		
Willits & Adams, -	1,093 87½	Oct. 22, "	1	4th	"	June 20, 1837.	
William French, -	401 87	Nov. 16, "	2	4th	"	Oct. 11, 1837.	
Henry B. Renwick, -	74 00	Dec. 13, "	3	4th	"		
Major J. L. Smith, -	28 40	Dec. 31, "	4	4th	"		
Henry B. Renwick, -	35 00	May 12, 1838,	1	2d	1838	- -	This charge is for travelling expenses, and time occupied in making a journey from New York to Little Egg Harbor, and back to New York.
Henry B. Renwick, -	77 50	Sept. 7, "	1	3d	"		
Henry B. Renwick, -	75 00	Sept. 30, "	2	3d	"		
Major J. L. Smith, -	115 20	Sept. 30, "	3	3d	"		
Stephen Willits, jr. -	1,103 40	Dec. 1, "	1	4th	"	Aug. 22, 1838,	One-fourth the amount of this voucher retained until the work should be approved, agreeably to the stipulations of the contract.
John Horner, -	15 00	Dec. 20, "	2	4th	"		
Stephen Willits, jr. -	795 54	Dec. 24, "	3	4th	"	Aug. 22, 1838,	The amount retained, as stated in the above remark, is included in the amount here stated.
Henry B. Renwick. -	212 50	Dec. 24, "	4	4th	"		
	$7,175 32						

Amount of appropriation for 1836, - - - - - - -	$5,000	$15,000 00
Amount of appropriation for 1838, - - - - - - -	10,000	
Amount expended, per statement, - - - - - - -	7,175 32	7,275 32
Amount of expenses incurred and not paid,* about - - - - -	100 00	
		$7,724 68

* Some part of the amount of expenses referred to not yet ascertained.

FORT MONROE, VIRGINIA,
February 10, 1839.

SIR: In pursuance of your instructions of the 11th ultimo, I have made a careful inspection of the works for the protection of Little Egg Harbor, New Jersey, then in progress, under the direction of Major J. L. Smith, of the corps of engineers, and have the honor to lay before you the following statement, which I believe embraces all the particulars required by the department.

The plan proposed by Major Bache, in 1829, for the improvement of Little Egg Harbor, is confined solely to the protection of Tucker's island from the encroachment of the sea, and consisted of a line of brush fence, running nearly parallel with the exterior shore of the island, and at a distance from it of about two hundred feet. The brush was to be laid ten feet wide, five feet high, and secured by three rows of stakes, disposed in quincunx; and the length of the brush work was computed at seven thousand eight hundred and seventy feet.

From 1829 to 1836, nothing was attempted for the improvement of that harbor; the island during that time altered its shape, and evidently lost more on the north and east than it gained on the south and west.

In 1836, Major Smith was charged by the Engineer department with the superintendence of the improvement of Little Egg Harbor; and, instead of laying brush agreeably to the plan suggested by Major Bache, commenced by making four brush breakwaters on the outer beach of the island, where the sea had evidently most impaired it, and constructed a brush fence about fifty feet from high-water mark, consisting of two rows of stakes, six feet long, driven three feet in the ground, placed one foot apart in the rows, and wattled with brush to the height of three feet. The base of the fence, to the height of eighteen inches, was filled with brush, laid diagonally. These two rows, which were placed thirty inches apart, constituted what was denominated the "surf fence." In addition to this, and nearly parallel with it, a large fence was constructed, upon the site, or nearly so, of the one proposed originally by Major Bache. This fence, which was commenced last summer, is very nearly completed; it consists of three rows of stakes, thirty inches apart; the stakes twelve feet long, four inches thick, and driven six feet in the ground, fifteen inches from centre to centre; eighteen inches above the ground is filled in with brush, laid diagonally, and projecting about two feet on either side of the rows; the remainder of the height, or four and a half feet of it, is tightly wattled, in each row, with pliable hard-wood brush, which, before being used, was soaked, and worked in the best manner possible; long pliable brushes were used as ties to connect the three rows together. This fence is made to abut against such sand hills as were found in its course, and covers with them a front of perhaps six thousand feet. About three thousand feet of this fence is completed, eight hundred feet ready for the wattling, and on the last seven hundred feet, terminating on the south at Small point, the stakes only are driven.

Independent of this range of high fences are a number of smaller sized fences, interspersed on the low lands in the interior of the island, between the sand hills. These, as well as the larger fences, are intended to gather the drifting sand, thereby preventing the surf from breaking over the island. In many places, the desired effect has been produced;

and I am of opinion that the system at present adopted will, when completed, gradually collect and secure the drifting sand, (which otherwise is almost continually shifting its surface and losing itself in the sea,) provided that pine brush be scattered upon the surface of the lowlands, and between the fences already constructed. Pine brush can be obtained in a loose state for about one dollar per cord, and one cord of it would cover, in the way proposed, a surface of sixteen feet square; the surface to be covered would not exceed eight hundred thousand feet; the cost, therefore, would amount to three thousand one hundred and twenty-five dollars.

I arrived at the island on the 27th ultimo, the day after the severe gale which raged along the coast, and had a fair opportunity of witnessing the effects of it upon the works.

The breakwaters, with the exception of the northernmost one, were entirely demolished; the remaining part of the surf fence, which had withstood former storms, was much injured, and some portion of it entirely swept away; but the high fence resisted most effectually the effects of the storm, and although many of the sand hills dividing this fence were washed away, and gave ingress to the raging sea, no part of the fence yielded to the action of the surf which lashed its base from one end to the other.

Opposite to Tucker's cove, where the high fence had not been completed, the sea broke over the island, and its violence was such that it washed, to the distance of at least two hundred feet, a pile-driving machine, to which were affixed two rams, each weighing one hundred and sixty pounds. I mention this fact as a proof of the strength of the high fence just described.

At the time Major Smith constructed the breakwaters, he was of opinion that they would last long enough to accumulate the sand which generally settles on the beach, when like impediments are thrown in the way of the current; but, from observation, I am induced to believe that the desired effect has not been produced. On the north side of the island, in the old inlet, a sand bar is fast making, which I have traced in the accompanying sketch; but I doubt the agency of the breakwaters in its formation; the surf fence, which is now pretty much all destroyed, may have been of some service while it lasted; but I could see only slight indications of it at this time. Obstructions of this kind, however, have been frequently found to answer the purposes for which they were constructed; and when stone cannot be procured, brush and sand, secured by piles, are usually resorted to.

The high fence has withstood as severe a storm as it perhaps may have to encounter for some years; and it affords me pleasure to say that, from the large accumulation of sand about it, it must in every way fulfil the double object for which it was constructed.

In comparing the strong and permanent manner in which this structure is put together with the plan proposed by Major Bache, I must give it a decided preference; in the one case, every twig binds the work together, whilst in the other, the brush was to be laid loose between piles three and a half feet apart; and although Major Smith's fence is only one half the width of the one proposed by Major Bache, it contains twice as many piles in the same length.

All that remains to be done to the fences will not occupy the contractor more than twenty or thirty days, when he resumes his work in the spring.

I have made particular inquiries in the neighborhood, as to the price of the materials used in the construction of the improvements; there is very little difference in the answers received. One dollar and a half a cord for what is called hard-wood brush, from six to eight cents apiece for piles twelve feet long and four inches thick, delivered at the landing, appears to be the acknowledged worth of the materials; the labor is worth from one dollar to one dollar and twenty-five cents per day; pine brush can be had for one dollar per cord, or even less. This kind of wood grows immediately in the vicinity, but the *hard-wood brush* is scarce, and some of that used at the island has been received in scows from a distance of twenty miles.

The brush used in the breakwaters was tied up in the shape of fagots, and built between the piles and casing, with alternate layers of sand, which reduced the brush to full one half its measurement previous to use. This will account for the difference of price between the brush and the cost of the work per cord, when finished.

With regard to the mode of advertising for contracts, I have to state that there is no newspaper published within forty miles of Tuckerton. The usual custom practised by the sheriff, surrogate, and other officers, in the vicinity of Tuckerton, is, to place their notices on boards appropriated for that purpose, in the post offices, stores, and taverns, in the neighborhood; this plan was resorted to when the contract was advertised. Mr. Renwick, between the 3d and 6th of August last, put up ten notices in and about Tuckerton, and in the neighborhood of Bass river and West creek; and, from what I could learn, the fact that proposals would be received on the 20th of that month was generally understood. Independent of this mode of giving notice, Mr. Renwick rode round the country for a distance of ten miles, and gave general notice to those who were likely to make proposals.

The present contractor (a Mr. Willits) appears to be an active and industrious man, possessing all the requisites for the faithful performance of his contract; he has lately, and a second time, been appointed commissary of wrecks for the town of Tuckerton, where he has, for some time, been a justice of the peace; he is a man of property and intelligence, and seems to enjoy the confidence of most of those who are not immediately biased by the Tucker family, with which he has lately clashed.

From what I could learn, this Mr. Willits preferred charges against Mr. G. W. Tucker, then collector of the port of Tuckerton; in consequence of these charges, an examination took place, by direction of the Secretary of the Treasury, the result of which has never been published, but can be obtained, if deemed necessary, from the Treasury Department. I believe that to be the cause of the abuse lately heaped upon him by Mr. E. Tucker, the father of the former collector. Mr. Willits was originally highly recommended to Major Smith, by Mr. Burke, at that time owner of Tucker's island.

It would appear that Mr. E. Tucker has used every means within his reach to stay the engineer operations on the island; he has, in connexion

with some members of his family, endeavored to persuade Mr. Burke to forbid his land from being made use of for Government works; and he has so far given way to his feelings as to grossly misrepresent, or cause to be misrepresented, the feelings of the people of Tuckerton, by forwarding to Washington a document, purporting to be "proceedings of a meeting in Little Egg Harbor, N. J., in relation to a breakwater on Tucker's island;" by which it is made to appear that, "*at a large and respectable meeting of ship owners and others*, citizens of the port of Tuckerton, in the district of Little Egg Harbor, N. J., at Lippincott's hotel, on the 10th of April, 1838, Isaac Jenkins was chosen chairman, and Wm. S. Lippincott secretary; when the following preamble and resolutions were unanimously adopted," &c. (See document No. 333, 25th Congress, 2d session.) Whereas, according to the secretary's (Mr. W. S. Lippincott's) statement to me, not more than four individuals (perhaps five) were present, although, as he says, general notice had been given in Tuckerton, Bass river, and other places, of the time and place of the meeting. The landlord, (Mr. Lippincott,) at whose house the meeting is said to have been held, told me that he recollected no such meeting. Mr. Lippincott, however, says that the landlord had been for some time unwell, and was slumbering on a chair in the room where the meeting was held. Mr. Isaac Jenkins, the chairman of the meeting, was absent when I returned from the island, else I would have procured his statement in regard to the matter. The circumstances just alluded to may seem uncalled for in a statement of this kind; but they are so immediately connected with the complaints made in regard to the improvements of Little Egg Harbor, that I have felt it my duty to represent them to the department.

In conformity with your instructions, I offer my own views of securing, in a permanent manner, the object contemplated. The fences already constructed upon the island, as well as those in contemplation, particularly when assisted by the pine brush already described, will, no doubt, secure, in a great measure, the surface of the island, by collecting and retaining the drifting sand; but the great difficulty apprehended by me does not consist in the waste of the sand, so much as in the undermining of that part of the island which appears to be formed by alluvial deposites. That portion of the beach which is fast wasting away is a low meadow, the surface of which is but little above high-water mark, and extends, through the centre of the island, from shore to shore. The turf with which this meadow is covered is from a foot to eighteen inches deep, and the roots are so tightly matted together that the action of the sea has but little or no effect upon it. Below this stratum of turf, however, is a tough, black, marsh mud, to the depth of from three to six feet—perhaps more—which yields easily to the action of the surf, and which must, unless protected, eventually cause the water to find its way through the island, by first undermining and by degrees breaking up its surface. I witnessed, when there, the effects of the last gale upon this part of the island, and have no doubt that, in some parts of the shore upon which this marsh borders, no less than from thirty to forty feet of it was undermined, and the surface broken up in large masses, which were scattered on the beach; this extended, in various places, some two or three hundred feet along the shore. It would seem to me that the only remedy to this encroachment will be found in a permanent stone sea

wall, erected in front of this alluvial deposite, and resting upon the bed of sand which probably forms a sub-stratum to it. The inclemency of the weather, while I was on the island, prevented any minute examination upon this subject; I can therefore form no estimate of the probable cost of such an improvement.

The sand bar which is fast making opposite the north end of the island, in the old inlet, can easily be connected to the island by a slight breakwater, made of piles, brushwood, and stone. This structure would not cost much, and would, it is believed, contribute materially to the future enlargement of the island on the north side, and, by narrowing the passage into the old inlet, deepen and render it of great use, without in the least interfering with the advantages afforded to navigation by the new inlet.

In conclusion, I have to remark that, from the best information I could obtain, the operations upon the island have been conducted, throughout, with great zeal, by those connected with them; that the prices paid for labor and materials have been fair, and generally within the prices at which the original estimates were made; that a fair competition was excited for the contracts, by notices exposed at public places in the neighborhood. In support of this fact, I will inform the department that nine proposals were received for the work advertised; and, finally, that the contractor is, in all respects, competent to perform his engagements.

The alterations exhibited in the accompanying sketch could not be accurately represented, without a resurvey of the island; they, consequently, are only approximating.

Most respectfully submitted.

R. E. DE RUSSY,
Lieutenant Colonel of Engineers.

Lieut. Col. J. G. TOTTEN,
Chief Engineer.

FORT MONROE, VIRGINIA,
February 18, 1839.

SIR: In answer to your letter of the 14th instant, and in conformity with that part of the resolution of the Senate on the subject of the Little Egg Harbor works, calling for information as to "whether the partial destruction of the improvements by storms, and the cost of the same beyond the original estimate, are not owing, in a great measure, to the departure of the said engineer from the plan of the improvement originally proposed, or, if not, to what cause the same may be attributed," I have the honor to state, as my opinion, that the breakwaters and surf fence constructed on the beach of Tucker's island could not be strictly considered as a part of the original plan, and, consequently, that the expenses incurred in their construction have added to the cost of the improvement as originally proposed and contemplated. It is also my opinion that, had these improvements been placed beyond the immediate action of the sea, they would not have been so liable to injury.

As I have, however, said in my report, the object of the engineer in placing them there was to collect the sand upon the beach, and thereby to prevent the wash on that part of the island.

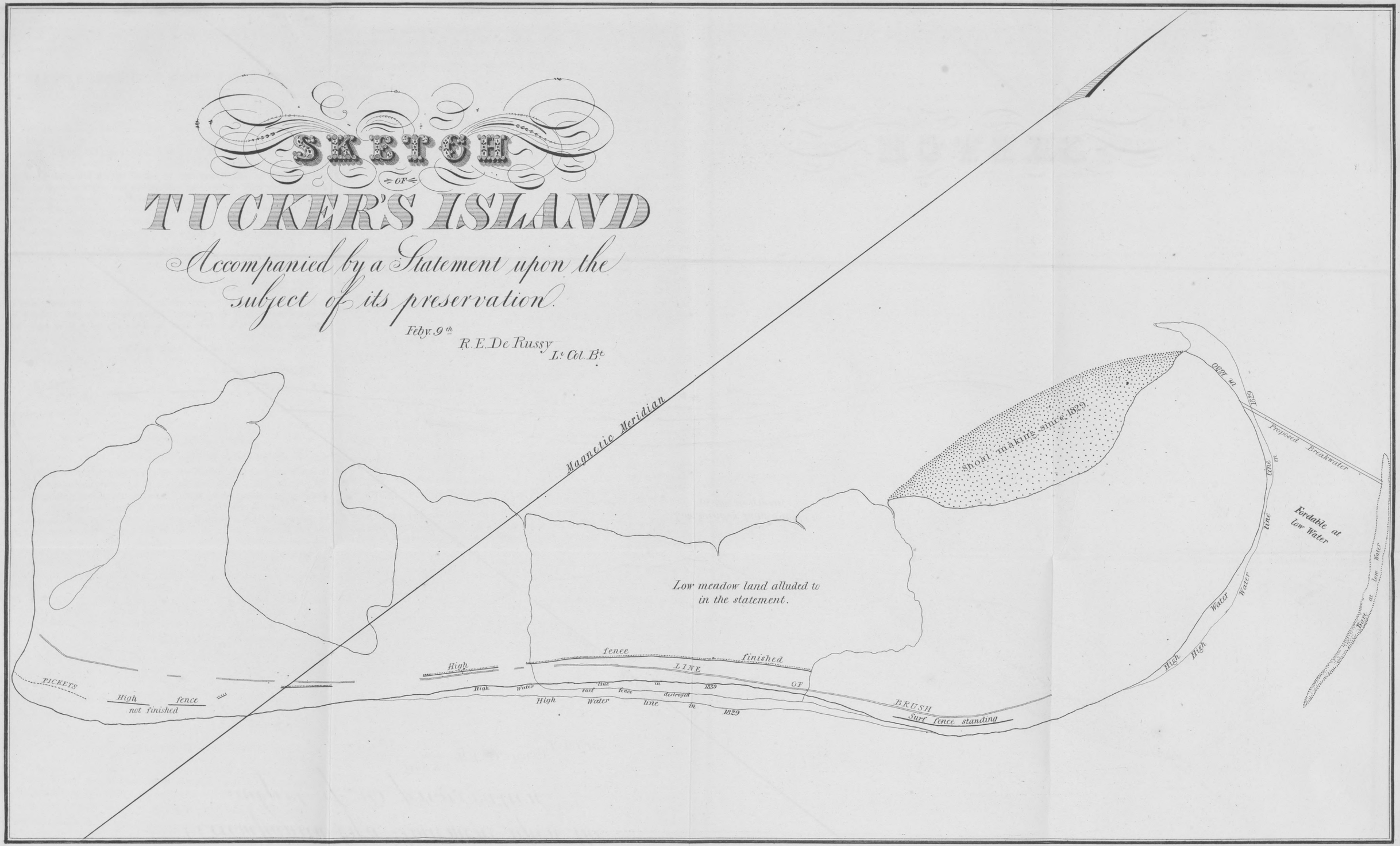
With the highest respect, I have the honor to be, sir, your obedient servant,

R. E. DE RUSSY,
Lieutenant Colonel, brevet.

To Col. Jos. G. Totten,
Chief Engineer.

SKETCH
OF
TUCKER'S ISLAND

Accompanied by a Statement upon the subject of its preservation.

Feby. 9th

R. E. De Russy
Lt. Col. Bt.