Primary Battery File

National Archives, Washington D.C.

Record Group 77

Correspondence of the Chief of Engineers

Entry 103

File, Fort, Battery:

10372
15920
13127
51781
Ft. Monroe
Betty Anderson-Ruggles

SUBJECT: Mortar Battery, Fort Monroe, Va.

United States Engineer Office,

601 Eighteenth Street, N. W.,

Washington, D. C., October 5, 1895.

Brig. Gen. W. P. Craighill,

Chief of Engineers, U. S. Army,

Washington, D. C.

General:

In compliance with instructions contained in Department letter of March 12, 1895, (10372-E.D.), I have the honor to submit the following report upon the mortar battery to be constructed at the northern extremity of the spit north of Fort Monroe, Va., accompanied by detailed drawings of the battery, including proposed drainage and ventilation, and an estimate of the cost of construction.

Accompanying the letter of instructions above referred to was a blue-print showing "Modifications of the Mounting of Mortars in the Typical Battery, Proposed by the Board of Engineers in letter dated July 30, 1894." In the typical mortar battery as originally designed the mortar platforms and the floors of the magazines and passage-ways were all on the same level, but in the modification of July 30, 1894, the mortar platforms were raised 4 feet one inch above the floors of the magazines and of the passage-ways, the difference in level being overcome by a ramp of 1/9 at the rear of each mortar pit. Drawings were prepared embodying this change and the report was completed when I learned through unofficial sources that the Board of Engineers

would soon have a report ready and I was advised to wait until I could study that report. The Report referred to is that of August 5,1895, "On the Revised Type of Mortar Battery." On the drawings accompanying the report the ramp is done away with and the old plan of level connections restored,which necessitated the preparation of new drawings.

The following drawings accompany this report:

Sheet No.1. Topographical map of site,showing proposed location of battery.

Sheet.No.2. Plan of battery.

Sheet No.3. Horizontal section of battery.

Sheet No.4. Vertical sections through battery.

Sheet No.5. Borings at site of battery.

On sheet No.1,the plan of the battery drawn in outline shows the typical battery of July 30,1894. As the location remains unchanged it was not deemed necessary to make a new drawing or to attempt to make the necessary corrections on this sheet.

SURVEY AND BORINGS.

A topographical survey of the site was first made and upon its completion borings were made at the points indicated on the topographical map marked Boring Nos.1 to 6. The results of these borings are shown on sheet No.6. Borings Nos.1,2,3 and 4 were made within the site proposed for the battery,one being located approximately at each mortar pit. It will be observed that in these four borings the line of saturation ranges 1.6 feet to 3.2 feet above low tide,while quicksand is met with at depths from 7.8 feet to 11.2 feet

below low tide. Overlying the quicksand are strata of mud and clay and on top of these layers of sand and gravel up to the natural surface of the ground varying in thickness from 11 feet upward.

REFERENCE OF MAGAZINE FLOORS,MORTAR PITS AND FOUNDATIONS.

The General level of the natural surface of the ground along the lines of the galleries and magazines is but a little above reference 5,so that footings of considerable depth for the walls of the magazines and galleries will be required. It is important that these footings should not rest on filled ground and their base should therefore be below the natural surface. At the same time it is important that the footings should be above the line of permanent saturation as American cement concrete absorbs water and dampness of the walls would result if they were founded at or very near the water line. In view of these considerations the base of the footings of these walls was placed at reference 4,about one foot below the natural surface and nearly a foot above the maximum line of saturation. This gives a depth of from 9.5 to 11.4 feet of sand and gravel above blue clay and mud overlying the quicksand and it is believed will afford a safe foundation without piling. This brings the floors of the mortar pits,magazines and passage-ways to reference 12 feet and of course considerably increases the quantity of concrete over that shown on the plans of the typical battery.

MEANS OF TRANSPORTATION.

As the site of the mortar battery cannot be reached by vessels of the size needed for the transportation of the materials required for construction,it will be necessary to land them at the Engineer wharf

and transport them up the beach to the site,a distance of 7,900 feet, or about a mile and a half. There is no road up the beach and to handle the material economically will require a railroad. Such a road was built for the transportation of concrete material from the Engineer wharf to the Redoubt and was found to serve the purpose very satisfactorily. The cars are still available but a new locomotive will be required. The materials for the five single gun emplacements to be built on the beach between the mortar battery and the old fort will need to be transported in the same manner. After the completion of the mortar battery and the emplacements some efficient and rapid means of serving them will be required and this service can be best accomplished by means of a permanent railroad,which can be laid along the rear of the beach and ballasted with oyster shells,and in the future by widening can be made the basis of a compact shell road for ordinary vehicles and the marching of troops.

For present purposes the temporary track to the Redoubt could be utilized but with a view to future needs the new track required should be laid for a permanent road.

It is therefore recommended that a permanent railroad track of 60-lb. steel rails on oak ties be laid between the site of the mortar battery and the Engineer wharf.

DRAINAGE.

The system of drainage proposed is shown in plan on Sheet No.3, by red dotted lines. It consists of a six-inch cast iron pipe draining the mortar pits,the magazines and the central passage-way and leading out through the rear entrance of the battery and connecting outside with an eight-inch vitrified drain pipe discharging into the

salt water marsh in the rear. Manholes and silt basins are placed along the line as shown on the plan.

WATER SUPPLY.

Whatever may be the future source of the water supply at Fort Monroe, whether an Artesian well, or the pumping-plant of the Quartermaster's Department on the west side of Mill Creek, it was thought best to lay the pipes for the service of the battery and for this purpose it is proposed to put in a one-inch galvanized iron pipe, as shown in blue on Sheet No.3, with stop-cocks marked H on the plan, the connection with the source of supply to be made at the rear entrance to the battery.

VENTILATION.

The ventilation of the magazines and passage-way is shown in plan on Sheet No.3, marked V in red, and in section on Sheet No.4, on sections C-D and I-K. The ventilators are 8-inch cast-iron pipes with elbows and hoods as shown and are not it is believed too numerous to ventilate the long narrow passage-way and the magazines in the humid air at Fort Monroe. Although the magazines and passage-way are to be lighted by electricity, lamp recesses for occasional use when the electric light plant is not in operation have been provided for marked L R on Sheet No.3. There are two in each long magazine and in each of the other magazines and one at each end of the long passage-way. These are all connected by 3-inch pipes with the ventilating system, as shown on Sheet No.4.

ELECTRICAL APPLIANCES.

It is understood that the carriage of the disappearing gun is to be traversed by electricity and the magazines lighted by the same

agent. Just below the mortar battery there are to be five single gun emplacements and the electricity for this portion of the proposed armament must be provided for. The best place for the power house would seem to be the mortar battery and a dynamo and boiler room of sufficient capacity have been provided for, which, in case it is deemed desirable, might furnish electrical power for the service of the permanent railway along the beach for the service of the batteries.

ESTIMATE OF COST.

The following is the estimate of cost of constructing the mortar battery complete.

Railroad track, 1 1/2 miles @ $9,000	$13,500
Concrete 22,300 cubic yards @ $5.50	122,650
Embankment 210,000 cubic yards @ 40¢	84,000
Steel I beams 158,000 lbs. @ 30¢	4,740
Iron plates 24,500 lbs. @ 3¢	735
Drainage system	1,550
Cut stone masonry 80 cubic yards @ $50	4,000
Moving concreting plant, setting up same and rebuilding bins for material	5,000
New locomotive	2,500
Ventilators	1,125
Water pipe	125
Railroad track in battery	970
Electric light plant	3,500
Contingencies about 10%	24,440
Total	$268,835

It will be observed that one large item of expense in the above estimate is the cost of the embankment. The quantity is so large that it is thought to be inadvisable to take it from the beach in front of the battery, so that the sand will probably have to be dredged in the bay carried ashore in pipes by the hydraulic method and after it has dried out put in place by cars or any of the usual methods.

PROJECT FOR THE EXPENDITURE OF THE ALLOTMENT.

It is proposed to build the magazines and covered galleries complete,to put in the drainage system,water pipes and ventilators, the cost of which will be as follows:

Magazines and galleries,10,855 cubic yards @ $5.50	$59,703
Railroad track	13,500
Moving and setting up concrete plant and building bins for concrete material	5,000
New locomotive	2,500
Drainage,water pipes and ventilators	2,800
Steel I beams and iron plates	5,475
Contingencies including amount already expended	11,022
	$100,000

Although my works at Fort Monroe were transferred to Captain T.L.Casey,Corps of Engineers,on September 30,1895,this report was so nearly finished it was thought best to complete it rather than to turn the incomplete data over to Capt.Casey.

Very respectfully,

Your obedient servant,

Major,Corps of Engineers.

Through Colonel Peter C.Hains,
Corps of Engineers,Division Engineer,
Southeast Division,Baltimore,Maryland.

5 inclosures
1250
F.M.

OFFICE OF CHIEF OF ENGINEERS

OCT 17 1895

10372
9

WAR DEPARTMENT.

Washington, D. C.
October 5, 1895.

ajor C. E. L. B. Davis.

s. 10-14 in Map Files, Dr. 53, Shee 245.

OFFICE CHIEF OF ENGRS. bk JAN 8 1896
comp'g Enc. 17.

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2 " Nov. 29/95 (1 tracing)

k
g'r Office, Balto. Nov 22 1895
d. by Div. Engr.

OFFICE CHIEF OF ENGRS. bk NOV 29 1895
s 10-14 & add'l mg (15-16) accomp'g
herewith
/E.O. Norfolk, Va Oct. 21, 1895

k
g'r Office, Balto. Oct 18 1895

g'r Office, Balto. Oct 8 1895

1st. Indorsement.
U.S. Engineer Office, 9 Pleasant St.
Baltimore, Md. Oct. 11, 1895.

Respectfully transmitted to the Chief of Engineers. The Division Engineer is of the opinion that the increased cost due to raising the footing courses of the concrete above the level of permanent saturation is not justified on the ground of dampness being absorbed by the walls. That can be prevented by other means if necessary.

The entrances to the battery would be safer if they opened to the westward.

Nothing is provided in the way of defensive arrangements against sudden attack by boat parties. This is an important consideration in the case of this particular battery for it is peculiarly liable to such attack.

The question of a power-house for dynamo, &c. can well be deferred as it is doubtful whether or not the mortar battery is a good place in which to install it.

The concrete walls of magazines and passages are constructed of the thickness designated in the typical plan of the Board of Engineers. It is thought however that where the only function of the wall is to carry a quiescent load, the thickness can be materially reduced.

The other suggestions of the District Engineer seem to be well considered and are recommended for approval.

Peter C. Hains

Col., Corps of Engineers, U.S.A.
Division Eng'r. S.E. Division.

2d Indorsement

Office, Chief of Engineers,
U. S. Army,
October 17, 1895.

Respectfully referred to Capt. Thomas L. Casey Corps of Engineers, through Col. Peter C. Hains, Corps of Engineers, Division Engineer of the Southeast Division, for reconsideration with a view to a diminution of cost.

Attention is invited to the remarks of the Division Engineer, in the 1st indorsement, and to the following:

1. Considering the location of the channel and the probable sector of fire of attack, need cover be placed completely around the pits?

2. If cover is not needed entirely around the pits, might not a more economical (and equally efficacious) arrangement of the groups of mortars be made by placing the groups in line, or nearly so, with magazines and bomb-proofs in the traverses and ch[illegible]ment, and thus take full advantage of the line of sand dunes along the front, reducing the volume of sand required and enabling the magazines and platforms to be placed at a higher reference?

3. Can not sand be pumped from the bay directly into place, or nearly so, by the use of stop-planks, hurdles, and temporary bulkheads, and thus avoid rehandling?

By command of Brig. Gen. Craighill:

W. M. Black
Captain, Corps of Engineers.

Incl. 9 of 10372.
Inclos. 10-14 in a separate roll.

3d. Indorsement.

U.S.Engineer Office,
9 Pleasant Street,
Baltimore, Md. Oct.18,1895

Respectfully transmitted to
Capt. Thos.L.Casey, Corps of Engineers.

It is desirable that the site of this proposed battery be visited by the District and Division Engineer in company, and a consultation be held before definite plans are decided on.

Capt. Casey is asked to suggest an early date for this inspection.

Peter C. Hains

Col., Corps of Engineers, U.S.A.
Div.Eng'r S.E. Division.

Rec'd E.O. Norfolk, Va., Oct. 21/1895.

4th indorsement
U.S. Engineer Office
Norfolk, Va., Nov. 25, 1895.

Respectfully returned to the Chief of Engineers, U.S. Army, through Colonel Peter C. Hains, Corps of Engineers, Division Engineer Southeast Division, with the accompanying report.

5th Indorsement.

U. S. Engineer Office,
9 Pleasant street,
Baltimore, Md.
November 27, 1895.

Respectfully submitted to the Chief of Engineers, U.S.A.

It is not understood how the lowering of the reference-plane two feet will effect a reduction in cost of the battery. If all the references above zero be reduced two feet, as ~~his~~ the tracing indicates, a reduction will be effected, and this, it is supposed, is what the District Engineer means. With this understanding the recommendation is concurred in.

That the entrances to the battery be left in their original position is also recommended for approval, but it is thought that they should be bent in two places, as indicated approximately in pencil, to prevent a shell passing directly into the mortar pits.

That the question of defense against boat parties be left until the breaking out of hostilities, I do not concur in. This battery occupies the extreme left flank of the line of defense. The first and foremost undertaking of an enemy making a naval attack will be the disablement of this mortar battery. The site is peculiar-

fusion incident thereto, is to invite disaster. Without advocating any particular method of securing the work against such catastrophe, it seems to me essential that the plan for it should be considered and settled now. If wire entanglement is to be used, the plans should show how and where. It would not be necessary to put such entanglement in place, but it should be procured when the mortars are mounted, and kept on hand for use according to some well-digested plan.

The fourth suggestion of the District Engineer, that the question of power for dynamo and drainage pump be dropped for the present, is recommended for approval.

The reduction to five feet of the thickness of concrete for magazines and passages is believed to be too great. The walls of the magazines might be reduced to six feet, but the walls of the mortar pits and open passages must be heavy enough to stand the horizontal thrust whatever it may be.

I concur with the District Engineer that in this case the quadrangular form of battery is best suited to this locality, and while some reduction might safely be made in the earthen cover on the west end of the emplacement, the amount would [illegible] considerable

of that material available, it would seem that an economical method of procuring it would be from a ditch a little beyond the exterior slope. No revetments need be used. If it should fill up with drifting sand it would do no harm. But a ditch does stand very well in front of the two-gun battery of the redoubt and would be somewhat of an obstacle for an attacking party.

I would suggest that the battery be set back about 150 feet farther from the beach. The latter is liable to erosion and some protecting works may be necessary.

It is supposed that the District Engineer has submitted this report in order to obtain the definite instructions of the Department in regard to the points touched on, and that he will then submit revised drawings and a revised estimate to correspond.

Peter C. Hains

Col. Corps of Engineers, U.S.A
Div. Engineer, S.E. Division.

SUBJECT: Mortar Battery, Fort Monroe, Va.

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601 Eighteenth Street, N. W.,

Washington, D. C., October 5, 1895.

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Very respectfully,

Your obedient servant,

Chas. E. L. B. Davis,
Major, Corps of Engineers.

Through Colonel Peter C. Hains,
Corps of Engineers, Division Engineer,
Southeast Division, Baltimore, Maryland.

5 inclosures
1250
F.M.

OFFICE OF CHIEF OF ENGINEERS

OCT 10372 1895
9

WAR DEPARTMENT.

Washington, D. C.
October 5, 1895.

Major C. E. L. B. Davis.

Enclos. 10-14 in Map Files, Dr. 58, Sheet 245.

REC'D OFFICE CHIEF OF ENGRS. bk JAN 8 1896
accompg Enc. 17.

Report upon the mortar battery proposed at the northern extremity of the spit north of Fort Monroe, Va. Est. of cost $268,833

5 Inclos. E. D. (drawings)
2 " " Jno. 29/95 (1 tracing)

BK
Rec'd Eng'r Office, Balto. Nov 22 1895
Fwd by Div Engr

RECD. OFFICE CHIEF OF ENGRS. bk NOV 29 1895
Inclos. 10-14 & addlng (15-16) accompg
B.B. Henriquez

Rec'd C. O. Norfolk, Va. Oct 21, 1895
BK
Rec'd Eng'r Office, Balto. Oct 18 1895
Rec'd Eng'r Office, Balto. Oct 5 1895

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The other suggestions of the District Engineer seem to be well considered and are recommended for approval.

Peter C. Hains

Col., Corps of Engineers, U.S.A.
Division Eng'r, S.E. Division.

2d Indorsement.

Office Chief of Engineers,
U. S. Army,
October 17, 1895.

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By command of Brig. Gen. Co

W. W. Ba

Captain, Corps of E

Inds. 9 of 10372.
Inclos. 10-14 in a separate

Capt. THOS. L. CASBY,
Corps of Engineers, U. S. A.

U. S. ENGINEER OFFICE,
106 GRANBY STREET,

Norfolk, Va., November 20, 1895.

Brig. Gen. William P. Craighill,
Chief of Engineers, U. S. Army,
Washington, D. C.

General,-

In answer to the 2nd indorsement on a report by Major C.E.L.B.Davis, Corps of Engineers, dated Washington, October 5, 1895 (10372--9) and describing a proposed mortar battery on the Government reservation at Fort Monroe, Va., near the northern boundary of the same, I have the honor to state: that on Saturday, November 9th, I visited and inspected the proposed site, in company with Col. Peter C. Hains, Division Engineer Southeast Division, Lieut. Flagler and Mr. Ware.

The most important point to be considered was the change of plan from the quadrangular to the single line of pits, suggested in the indorsement referred to. It seemed to be more evident, upon actual inspection, that it possibly could be otherwise, that the compact quadrangular form of battery recommended by Major Davis is the best adapted to this particular site. An extension of the pits in a single line along the beach would entail perceptibly greater expense in clearing the land of the dense forest now covering the entire region, and such an extended battery could be less easily protected in the rear against the attack of boat parties, and from oblique rear fire from Hampton Roads, in case the enemy should succeed in passing Fort Monroe. Finally, the mortars would be less under central control and less

readily pointed simultaneously, this being a general consideration in favor of the quadrangular form. It does not appear that the expense of building the battery in extended line would be materially less and other considerations of expediency weigh against such a form in this particular case.

I would, however, recommend that the reference of the footings of the concrete be lowered two feet; that is, to one foot below the permanent level of ground water, it being improbable that sufficient moisture would be absorbed under these circumstances to render the magazines damp, especially if their inner surfaces be saturated with paraffine and painted with asphalt. On the other hand, it would be injudicious to sink the concrete deeper than this, as it is possible that there might be too little firm sand between the footings and the clay and quick-sand strata beneath, not to mention the increasing difficulty of laying concrete in greater depths of water. This depression of two feet in the reference plane of the battery would effect a saving of 16,000 cubic yards of sand, and bring the total required for the battery to 137,000 cu.yds., exclusive of the portion of the front parapet included in the dunes. The approximate saving in expense would be not more than $3,500. In this form, the reference of the magazine floors would be +10 ft., or two feet above extreme storm tides, and under these circumstances the mortar beds would still have natural drainage; the drains should not be carried directly into the back bay, however, because of frequent liability to flooding in season of extraordinary tides or storms, but into an intermediate tank having free egress to the bay in ordinary

weather, but which could be closed against storm tides, the tank to be then emptied by a small pump run by the boiler supplying the lighting plant.

It is thought that all the sand embankment can be obtained from the surrounding dunes by extending the available area along the outer sides of the dunes bounding the cemetery seaward; this would not interfere with the internal arrangements of the cemetery and would avoid the necessity of dredging sand from the bay. If, however, this is not permissible, the extra sand required can be pumped directly from the bay, and at less cost per cubic yard, although such sand would probably be less desirable for parapets, being mingled to a greater extent with mud and shells.

In considering measures for reducing the cost of the battery, I would strongly recommend a radical decrease in the thickness of the walls of the magazines and passages. There is no apparent reason why a thickness of five feet for these masses of concrete should not be practically as efficient as the eight feet recommended in the typical battery; this concrete is fully protected by its covering of sand, and seems to be very much more than sufficient to sustain the static load required, even under repeated shocks of firing. This would decrease the cost of the battery about $20,000 with equal practical efficiency.

It is recommended that the normal to the face of the battery make an angle of about 15 degrees (to the southward) with the line joining its central point with Thimble Shoal Light, in order to better face the deep parts of the channel.

In regard to changing the direction of the entrances as

suggested by the Division Engineer to the Western side of the battery, I am of the opinion that the disadvantage of having the entrances so much further from the direct line of communication with the shore batteries and fort, outweigh the danger of fire from the roads, especially as the entrances can be so easily protected from such fire. I am also of the opinion that wire entanglements put down at the opening of hostilities would serve better than a ditch and would cost incomparably less, particularly in view of the constant deterioration of the ditch by the drifting sand which would be blown into it in this exposed situation.

Taking the paragraphs of the first indorsement in order, therefore, I have the honor to suggest:-

1. That the reference plane of the battery proposed by Major Davis be lowered two feet with a resulting saving in cost of about $3,500;

2. That the entrances be left in the position originally proposed;

3. That the question of defense against surprise parties be left until the breaking out of hostilities, when numerous methods can be resorted to, such as wire entanglement charged with electricity from the dynamo;

4. That the question of power for the dynamo and drainage pump be deferred for the present;

5. That the thickness of concrete for the magazines and passages be reduced to five feet with a reduction in cost of about $20,000 and equal practical efficiency.

In regard to the three questions of the second indorsement, I am of the opinion:-

1. That the battery will need cover on three sides, and, on the fourth, it would be desirable to have it to guard against surprise and for the sake of symmetry;

2. That the quadrangular form is better adapted to this particular site, as explained in the body of the report;

3. That if the reference be lowered two feet, there will probably be no need of considering any method of obtaining sand from the bay, but that such a method would be entirely practicable.

A tracing is inclosed, showing the Section C-D modified in accordance with the preceding recommendation in regard to decreased elevation of the plane of reference.

Very respectfully,
your obedient servant,

W. M. Crosby

Captain, Corps of Engineers.

(1 inclosure.)
202 F. M.

surprise and for the sake of symmetry;

2. That the quadrangular form is better adapted to this particular site, as explained in the body of the report;

3. That if the reservoirs be lowered two feet, there will probably be no need of considering any method of obtaining sand from the bay, but that such a method would be entirely practicable.

A tracing is inclosed, showing the Section C-D modified in accordance with the preceding recommendation in regard to decreased elevation of the plans of reference.

Very respectfully,
Your obedient servant,

Captain, Corps of Engineers.

(1 inclosure.)
202 F. M.

Capt. THOS. L. CASBY,
Corps of Engineers, U. S. A.

U. S. ENGINEER OFFICE,
106 GRANBY STREET,
Norfolk, Va., November 20, 1895.

Brig. Gen. William P. Craighill,
Chief of Engineers, U. S. Army,
Washington, D. C.

General,-

In answer to the 2nd indorsement on a report by Major C.E.L.B.Davis, Corps of Engineers, dated Washington, October 5, 1895 (10372--9) and describing a proposed mortar battery on the Government reservation at Fort Monroe, Va., near the northern boundary of the same, I have the honor to state: that on Saturday, November 9th, I visited and inspected the proposed site, in company with Col. Peter C. Hains, Division Engineer Southeast Division, Lieut. Flagler and Mr. Ware.

The most important point to be considered was the change of plan from the quadrangular to the single line of pits, suggested in the indorsement referred to. It seemed to be more evident, upon actual inspection, that it possibly could be otherwise, that the compact quadrangular form of battery recommended by Major Davis is the best adapted to this particular site. An extension of the pits in a single line along the beach would entail perceptibly greater expense in clearing the land of the dense forest now covering the entire region, and such an extended battery could be less easily protected in the rear against the attack of boat parties, and from oblique rear fire from Hampton Roads, in case the enemy should succeed in passing Fort Monroe. Finally, the mortars would be less under central control and less

readily pointed simultaneously, this being a general consideration in favor of the quadrangular form. It does not appear that the expense of building the battery in extended line would be materially less and other considerations of expediency weigh against such a form in this particular case.

I would, however, recommend that the reference of the footings of the concrete be lowered two feet; that is, to one foot below the permanent level of ground water, it being improbable that sufficient moisture would be absorbed under these circumstances to render the magazines damp, especially if their inner surfaces be saturated with paraffine and painted with asphalt. On the other hand, it would be injudicious to sink the concrete deeper than this, as it is possible that there might be too little firm sand between the footings and the clay and quick-sand strata beneath, not to mention the increasing difficulty of laying concrete in greater depths of water. This depression of two feet in the reference plane of the battery would effect a saving of 16,000 cubic yards of sand, and bring the total required for the battery to 137,000 cu.yds., exclusive of the portion of the front parapet included in the dunes. The approximate saving in expense would be not more than $3,500. In this form, the reference of the magazine floors would be +10 ft., or two feet above extreme storm tides, and under these circumstances the mortar beds would still have natural drainage; the drains should not be carried directly into the back bay, however, because of frequent liability to flooding in season of extraordinary tides or storms, but into an intermediate tank having free egress to the bay in ordinary

weather, but which could be closed against storm tides, the tank to be then emptied by a small pump run by the boiler supplying the lighting plant.

It is thought that all the sand embankment can be obtained from the surrounding dunes by extending the available area along the outer sides of the dunes bounding the cemetery seaward; this would not interfere with the internal arrangements of the cemetery and would avoid the necessity of dredging sand from the bay. If, however, this is not permissible, the extra sand required can be pumped directly from the bay, and at less cost per cubic yard, although such sand would probably be less desirable for parapets, being mingled to a greater extent with mud and shells.

In considering measures for reducing the cost of the battery, I would strongly recommend a radical decrease in the thickness of the walls of the magazines and passages. There is no apparent reason why a thickness of five feet for these masses of concrete should not be practically as efficient as the eight feet recommended in the typical battery; this concrete is fully protected by its covering of sand, and seems to be very much more than sufficient to sustain the static load required, even under repeated shock of firing. This would decrease the cost of the battery about $20,000 with equal practical efficiency.

It is recommended that the normal to the face of the battery make an angle of about 15 degrees (to the southward) with the line joining its central point with Thimble Shoal Light, in order to better face the deep parts of the channel.

In regard to changing the direction of the entrances as

suggested by the Division Engineer to the Western side of the battery, I am of the opinion that the disadvantages of having the entrances so much further from the direct line of communication with the shore batteries and fort, outweigh the danger of fire from the roads, especially as the entrances can be so easily protected from such fire. I am also of the opinion that wire entanglements put down at the opening of hostilities would serve better than a ditch and would cost incomparably less, particularly in view of the constant deterioration of the ditch by the drifting sand which would be blown into it in this exposed situation.

Taking the paragraphs of the first indorsement in order, therefore, I have the honor to suggest:-

1. That the reference plane of the battery proposed by Major Davis be lowered two feet with a resulting saving in cost of about $3,500;

2. That the entrances be left in the position originally proposed;

3. That the question of defense against surprise parties be left until the breaking out of hostilities, when numerous methods can be resorted to, such as wire entanglement charged with electricity from the dynamo;

4. That the question of power for the dynamo and drainage pump be deferred for the present;

5. That the thickness of concrete for the magazines and passages be reduced to five feet with a reduction in cost of about $20,000 and equal practical efficiency.

In regard to the three questions of the second indorsement, I am of the opinion:-

1. That the battery will need cover on three sides, and, on the fourth, it would be desirable to have it to guard against surprise and for the sake of symmetry;

2. That the quadrangular form is better adapted to this particular site, as explained in the body of the report;

3. That if the reference be lowered two feet, there will probably be no need of considering any method of obtaining sand from the bay, but that such a method would be entirely practicable.

A tracing is inclosed, showing the Section C-D modified in accordance with the preceding recommendation in regard to decreased elevation of the plane of reference.

Very respectfully,
your obedient servant,

Thos. H. Carter

Captain, Corps of Engineers.

(1 inclosure.)
202 F. M.

In regard to the three questions of the second indorsement, of the opinion:

1. That the battery will need cover on three sides, and on the fourth it would be desirable to have it to guard against surprise and for the sake of safety;

2. That the quadrangular form is better adapted to this particular site, as explained in the body of the report;

3. That if the reference be lowered two feet, there will probably be no need of considering any method of obtaining sand from the bay, but that such a method would be entirely practicable.

A tracing is inclosed, showing the Section C-D modified in accordance with the preceding recommendation in regard to decreased elevation of the plane of reference.

Very respectfully,
Your obedient servant,

Captain, Corps of Engineers.

(1 inclosure.)
202 R. M.

SUBJECT: Fort Monroe Mortar Battery.

Office of the Chief of Engineers,
United States Army,

Washington, D. C., December 30, 1895.

Brig. Gen. Wm. P. Craighill,

Chief of Engineers, U.S.A.,

Washington, D.C.

General:

I have the honor to submit for your consideration an alternative plan for the mortar battery at Fort Monroe, Va., for which plans and estimates were submitted by Major Davis, dated Oct. 5, 1895, and by Capt. Casey, Nov. 20, 1895.

The site for the proposed battery is on a wooded, sandy neck of land near the north end of the Government reservation. The site is generally low, with a ridge of sand hills along its sea face. It is exposed to hostile ship fire through a sector of a circle containing 203° 30' between lines having bearings N 28° E and S 51° 30' W respectively. Of this sector, a sector of 47° 30' lies to the west of a line joining ~~Fort Monroe~~ the battery and Fort Wool, from which little or no fire is to be anticipated.

The sector of danger lies between lines N 28° E and the line joining the mortar battery and Fort Wool, having a bearing of S 4° W, and contains 156°.

By placing the face of the battery in a line having the bearing N 20° E, the limiting line of hostile ship fire from the north will be 8° outside this line, and the limiting line of probable fire from the south will be 16° outside this line. For the possible fire from the sector in rear of the ~~Ft. Monroe~~ battery-Ft. Wool line, defilade can be provided by traverses. The line N 20° E lies nearly parallel to the shore and to the line of sand hill crest, and a line perpendicular to it through the battery passes directly through the main ship channel entrance to Hampton Roads.

The site is exposed to attack by landing parties from the front (east) and left (north) flank. The rear is partly protected by Mill Creek, a land-locked, shallow basin, with muddy bottom and marshy banks. The right flank is protected by the other fortifications.

The site is large enough to permit a mortar battery of the "typical" plan or a mortar battery with the pits arranged in line behind the sand hills. The relative advantages of each type are as follows:

A. Hostile Shell Fire, Percussion Fuzes.

<u>Typical Battery</u>. With shots at right angles to the line of the crest, having a fall of 10° and passing immediately over the outer crest, the epaulement at the rear of each pit will catch the shot, which, in exploding, acts as the charge of a fougasse, throwing debris from the embankment and its concrete revetment into the pit in front. The vertical <u>height</u> of the dangerous space thus caused

is at least 12' from each pit, the zone for the rear pit being approximately 44' above the zone for the front pit. Thus all shots passing through a space 56' above the crest of the front pit and having a fall of 10°, may be divided into three classes, viz:

1. Those passing within 12' of the crest, which will strike the slope of the epaulement back of the front pit.

2. Those passing below a line 44' above the crest, which will strike the magazine traverse either on its front face or on top.

3. Those passing between lines 44' and 56' above the front crest will strike the face of the epaulement in rear of the rear pit.

Pits in Line. All shots passing over the crest with a fall of 10°, will strike harmlessly in rear of the rear cover of the pits.

B. Shells with Time Fuzes.

Typical Battery. In this the dangerous space is just double that for pits in a line.

C. Exposure of Magazine Traverses.

Fire from Front.

Typical Battery. The side of this traverse is directly exposed to shots passing over the superior crest of the front pits.

Pits in Line. The traverse is parallel to the line of fire from the front.

D. Arrangement of Magazines.

The distances to be traversed in supplying ammunition

are about the same for the two types.

E. Dispersion of Fire.

Typical Battery. To concentrate the fire, the guns in each pit must be given proper azimuths and charges for each point within range. Under these conditions the relative positions of the pits makes little difference in the ability to strike a given object at a given point.

F. Cover for Guns and Magazines.

Cover for guns the same in both types. In the single line the guns are better protected as they are not exposed to debris from shells bursting at rear. Magazines are better protected with pits in single line.

G. Volumes of Sand and Concrete.

Typical Battery.

Major Davis' estimate.		Capt. Casey's estimate.	
Embankment	210,000 cu. yds.	Embankment	137,000 cu. yds.
Concrete	22,300 " "	Concrete	(?)

Col. Hains states that battery should be set further back. If this were done the amount of embankment must be increased nearly to Major Davis' estimate.

Pits in Line.	Cut,	17,500 cu. yds.
	Fill,	170,500 " "
	Concrete,	20,905 " "

H. Space Occupied.

The space along the beach occupied by the typical battery is a little less than half that taken by the single line of pits.

Estimate of Cost of Proposed Battery, with Pits in Line.

(based partly on Major Davis' estimate.)

Concrete,	20,905 cu. yds., at $5.50	$114,977.50
Cut,	17,500 " " " 25¢	4,375.00
Fill,	(170,500-17,500) 153,000 cu. yds. at 30¢	45,900.00
Steel I beams,	(Maj. Davis), ...	4,740.00
Iron plates,	(Maj. Davis), ...	735.00
Drainage system,	(Maj. Davis), ...	1,550.00
Cut Stone Masonry,	80 cu. yds. at $50. (Maj. Davis),	4,000.00
Installation of concrete plant,	(Maj. Davis), ...	5,000.00
Ventilators,	(Maj. Davis), ...	1,125.00
R.R. track in battery,	(Maj. Davis), ...	1,000.00
Electric Light Plant,	(Maj. Davis), ...	3,500.00
		$186,902.50
	Contingencies, 10%	18,690.25
		$205,592.75

To this must be added for plant which will be needed for this and for the remaining battery construction.

R. R. track,	1 1/2 miles, (Maj. Davis),	$13,500.00
New locomotive,	" "	2,500.00
		$16,000.00

The total cost of the typical battery as estimated by

Major Davis, excluding the R. R. track and locomotive, is $251,235. The cost of the battery, as modified by Col. Hains and Capt. Casey, has not been estimated, but is somewhat less.

It is believed that a closer study would show that the above estimate for the single line of pits can be reduced safely. If fire from the sector west of the ~~Ft. Monroe~~ Battery-Ft. Wool line is not to be provided against at first, the traverses can be shortened and the cut materially decreased.

Defense against Landing Parties.

No special form of defence is provided for in the projects and estimates for the typical battery. Such defense can be provided for by an emplacement for a rapid fire gun at one or both flanks of the battery, and by surrounding the battery by a steel bar palisade 9.5' high in panels 7' long, with the panel posts and their struts set in concrete, as described in Part II, Woolwich Text Book, Ed. 1893, p. 25. This palisade will allow a small arm fire through it. A wire entanglement should also be placed around the battery outside the palisade.

A lookout for the battery commander can be provided directly over the relocator room in the middle of the front epaulement, similar to the conning towers provided on ship-board, sunk into the sand of the epaulement until only the crest is visible, and connected with the relocator room by a cylindrical shaft, containing a winding stairway. This can be covered with cast-iron

turtle-back armor, if so desired.

Estimates and detailed plans for these accessories have not been made, but can easily be supplied should the plans be approved.

The above is presented simply as a partial study - the details have not all been elaborated. It is believed that the estimated amounts of cut, fill and concrete are approximately correct.

To obtain the sand required for the fill, it is proposed to construct a barge, on shore or in the shoal water of Mill Creek, fit it with a sand pump, and pump the material as nearly as possible into place. It is believed that the depth of mud in the creek does not exceed about 2'. Experience elsewhere in pumping material of this kind has shown that the mud is carried away in suspension with the water and the sand is left almost clean in the fill.

The site in rear of the sand hills is reported as densely wooded. This should not be cleared to a greater extent than is absolutely necessary. The fills for the traverses can be made probably directly in and around the trees and brush with advantage.

In conversation with Capt. Casey he stated that his objections to the single line of pits were, first, on account of the increased length of beach front occupied, and, second, on

account of the delay which would be caused by the necessity for new detailed drawings and their cost.

He stated that in his opinion the space between the mortar battery and the fort is needed for fifteen to twenty additional guns. As but four are contemplated in the approved project, this objection seems but slight. Should the single line project be approved, work can be started at once and the detailed drawings prepared as the work progresses. Excepting the plan for drainage, it is believed that all data necessary for starting the work is provided in the accompanying sketch.

Very respectfully,

Your obedient servant,

W. H. Black

Captain, Corps of Engineers.

Dec. 30, 1895.

Black,
Capt. W. M.

Submits alternative plan for mortar battery at Fort Monroe, Va., for which plans and estimates were submitted by Major Davis Oct 5, 1895, and by Capt Casey Nov. 20, 1895.

1 inc. E.D., tracing and enc 1 of 370/V 1887 accompg.
Inclos. 18 in Chief Eng. Files, Dr. 58, Sheet 247

encs. 9-16, 18 & enc. 1 of 370/V 1887 accompg

B'd'd Eng'r Office, Balto. January 4 1896

B

1st Indorsement.

Office Chief of Engineers,
U. S. Army,
January 3, 1896.

Respectfully referred to Col. P. C. Hains, Corps of Engineers, Division Engineer of the Southeast Division, with request for prompt consideration and full remark.

W. P. Craighill
Brig. Gen. Chief of Engineers

Inclo. 17 of 10372.
Inclos. 9 & 15 accompg.
Inclos. 10-14, 16, & 18 and incl. 1 of 370/V 1887 in separate roll.

2d. Indorsement.
U. S. Engineer Office,
9 Pleasant street,
Baltimore, Md.
January 7, 1896.

Respectfully returned to the Chief of Engineers. If it be assumed that each individual group of mortars is to be aimed separately, there is no reason for placing them on the four corners of a rectangle as is done in the typical battery. On the contrary, as shown by Capt. Black, the advantages are in favor of their being in line.

The advantages of having the fire of the entire sixteen mortars directed by a single officer are no doubt great, and the moral effect of a volley of 12" shells falling around a ship, even if none hit, will also be great; and this constitutes the great advantage of the grouping shown on the typical plan.

The chances of hitting, however, are certainly not increased by aiming all the groups with a single azimuth, elevation and charge, but will be if each group is aimed separately. A vollery of sixteen such mortars is too expensive and the chances of hitting too uncertain to justify the introduction of known errors in range and azimuth, except in special cases.

It seems to me that if there be any case where the grouping in the typical plan is desirable, it is at this particular site. I therefore concurred with the district engineer that this form of battery is best suited to this locality. Whether the advantages compensate for the disadvantages, is a matter largely of individual judgment. There can be no doubt of one thing however, and that is, if the groups be placed in line, as suggested by Capt. Black, at least two groups of four mortars each could be put under a single officer's control, and this officer could direct the fire of eight mortars using a single azimuth, elevation and charge for the eight as is supposed to be done in the typical plan for sixteen.

If the plan of Capt. Black be adopted, I think the cost could be very materially reduced by placing the magazines in the sand hills in front of the emplacement rather than on the flanks. I think also the battery should be located closer to the cemetery and perhaps reach some distance into it. The sand hills increase in height and area within the cemetery enclosure. The latter is much larger than it need be and could readily part with some of the space on the north end.

I am inclined to the opinion that mortar practice in actual hostilities will be so conducted as to require the separate aiming of each individual group of four. If this be the case, the advantages of the typical grouping will no longer hold except on sites exposed to an all-around fire, and the best system of grouping the fours will be determined by the relative advantages in other respects.

Peter C. Hains
Col., Corps of Engineers, U.S.A.

SUBJECT: Mortar Battery, Ft. Monroe, Va.

Office of the Chief of Engineers,
United States Army,
Washington, D. C. January 25,1896.

Brig.Gen.Wm.P.Craighill,
Chief of Engineers, U.S.A.,
Washington, D.C.

General:

I have the honor to submit herewith four sheets showing the plans and sections of the proposed mortar battery at Fort Monroe, modified in accordance with the recommendations contained in the indorsement of Colonel Hains, dated January 7,1896, together with a map of the site.

It may be noted that greater accommodations for the reserve reliefs of the garrison are provided in the new design, while the entire battery is shortened and the total volume of concrete is decreased by about 1000 yards. The new design gives a protection to the magazines equivalent to 90 feet of sand, and has shell room sufficient to accommodate all of the ammunition which the Board of Engineers reports is to be provided for the battery. The latrine recesses are not intended to be fitted for use at once. A relocator room in the central bomb-proof is to be connected with a lookout on the crest of the battery by a concrete

well containing a spiral stairway.

After a personal inspection of the site and interview with Captain Casey and his assistant, Lieutenant Flagler, I am convinced that the exact location of the battery can be determined best at Fort Monroe, in such a way as to make its cost of construction least -the front line of the pits having a true bearing N 20° E, and the right flank of the battery being carried into the cemetery as far as the most northerly of the graves at present there.

Very respectfully,

Your obedient servant,

W. H. Black

Captain, Corps of Engineers.

10372.

OFFICE OF CHIEF OF ENGINEERS

JAN 25 10372/23 1896

WAR DEPARTMENT.

Washington, D.C.
Jan. 25, 1896.

Black,
Capt W. M.

Submits, with remarks, four sheets showing the plans and sections of the proposed mortar battery at Ft. Monroe, modified in accordance with the recommendations contained in the ind. of Colonel Hains, dated Jan. 7/96, together with a map of the site.

4 Incs E. D.
File (3 b. pts & 1 tracing)
Incs. 24-27 accompy

RECD. OFFICE CHIEF OF ENGRS. NOV 23 1896

Inclos. 24-27 in Map Files, Dr. 55, Sheets 5-8, 52, Dos.

Recd. E.D. Norfolk, Va. Feb. 4. 1896.

Rec'd Eng'r Office, Balto. Feby 3, 1896

B

1st Indorsement.

Office Chief of Engineers,
U. S. Army,
February 1, 1896.

Respectfully referred to Capt. T. L. Casey, Corps of Engineers, through Col. P. C. Hains, Division Engineer of the Southeast Division, approved, subject to such minor changes as may be approved later.

The battery will be located in such a manner that the epaulement on the right flank shall extend into the cemetery as far as possible without interfering in any way with the graves now there.

As soon as the exact site has been selected, the battery will be plotted on the topographical map and forwarded to this office through the Division Engineer for approval.

After the necessary record has been made, these papers will be returned.

By command of
Brig. Gen. Craighill:

W. M. Black

Captain, Corps of Engineers.

10372
23

Inclos. 24-27 in separate roll.

2d. Indorsement.

U. S. Engineer Office,
9 Pleasant street,
Baltimore, Md.
February 3 1896.

Respectfully transmitted to Capt Thos. L. Casey, Corps of Engineers.

Peter C. Hains

Col., Corps of Engineers, U.S.A.
Div. Engineer, S. E. Division.

3rd indorsement.

U.S. Engineer Office,
Norfolk, Va., Nov. 19, 1896.

Respectfully returned to the Chief of Engineers, U.S. Army, with tracing and blue-prints mentioned within, accompanying.

The location of the battery is shown on the blue-print of the topographical map sent to the Department with letter of Sept. 4, 1896.

Thos. L. Casey
Captain, Corps of Engineers.

(4 inclos.) bl-pts & trcg. in sep. roll.

202-17-2 F.M.

RECD. OFFICE CHIEF OF ENGRS NOV 23 1896

Capt. Thos. L. Casey
Corps of Engineers, U. S. A.

U. S. ENGINEER OFFICE,
106 GRANBY STREET.

Norfolk, Va., December 1, 1896.

Brig. Gen. William P. Craighill,
Chief of Engineers, U. S. Army,
Washington, D. C.

General:-

I have the honor to state that I am prepared to set the base rings and index circles of 16 mortars, in the battery north of Fort Monroe, Va., at once. Thus far but one carriage with mortar complete has arrived at the post. The setting of the base rings will be much facilitated by the completion of rail connection with the Chesapeake and Ohio Railway, which will probably be done in about three weeks.

Very respectfully, your obedient servant,

Captain, Corps of Engineers.

OFFICE, CHIEF OF ENGINEERS 10372 OFFICE OF THE SECRETARY

DEC. 2 10372 1896

WAR DEPARTMENT

Norfolk, Va.,
Dec 1, 1896

Casey, Capt. T. L.

Is prepared to set the base rings and under circles for 6 mortars in the battery north of Fort Monroe. This part and the carriage with mortar complete has arrived.

OFFICE OF CHIEF OF ORDNANCE

DEC 9 9543 1896

Enc. 20.

WAR DEPARTMENT

File

RECD. BACK OFFICE CHIEF OF ENGRS. DEC 17 1896

RECD. OFFICE CHIEF OF ORD. Dec. 14, 1896

REPRODUCED BY THE NATIONAL ARCHIVES

1st *indorsement.*

Office Chief of Engineers,

U. S. ARMY,

December 5, 1896.

Respectfully submitted to the Secretary of War.

Active work on this battery for sixteen mortars began in April, 1896.

In the letter within, Captain Casey announces that the battery is ready to receive its armament. From the last report of operations received, (Nov. 20), it would appear that in addition to the completed masonry of the platform the status of the battery was as follows:

(Pits are numbered from the north, #1 being northernmost.)

Reports for October, 1896, and of November 11 to 20, 1896, and December 1, show that:

1, all excavations are complete;
2, all necessary sheathing for concrete is erected;
3, all mortar beds are ready for base rings;
4, walls are complete, I beams are set and concrete laid to height of two feet over ceiling of all rooms, passage and casemate space for pit No. 1;
5, walls are all complete up to reference of ceiling for pits Nos. 2 and 3;
6, all floors and foundations of walls are complete for remainder of battery pit No. 4.

Brig. Gen., Chief of Engineers

10372
70

Chief Clerk,

2d Indorsement.

War Department
December 9, 1896.

Respectfully referred to the Chief of Ordnance with request for information as to when armament for this battery can be supplied.

By order of the Secretary of War.

Chief Clerk

RECD BACK W. & R. DIV. WAR DEP.

9543-Enc.20 6 C

3d Endorsement

OFFICE OF THE CHIEF OF ORDNANCE
Washington, Dec. 9, 1896.

Respectfully returned to the Honorable Secretary of War.

Three (3) mortar carriages have recently been shipped for this battery, one from Sandy Hook Proving Ground, on Nov. 25th, and two from Watertown Arsenal on Nov. 28th.

The above, together with one previously issued to the Post, are Model 1894, and complete the carriages for one pit.

The twelve remaining carriages (Model 1896) are to be delivered from the first manufactured by Robt. Poole & Son Co., Baltimore, Md., and all should be supplied under the contract by February 1, 1897.

The total number of mortars necessary to complete the battery should be supplied by about Sept. 1, 1897.

D. W. Flagler

Brig. Gen. Chief of Ordnance.

RECD BACK W. & R. DIV. WAR DEP. DEC 17 1896

4th Endorsement.

War Department

December 11, 1896.

Respectfully returned to the Chief of Engineers inviting attention to the preceding endorsement of the Chief of Ordnance.

By order of the Secretary of War.

[illegible]
Chief Clerk

REC'D BACK M. & R. DIV. WAR DEP. DEC 11 1896

REC'D. OFFICE CHIEF OF ENGRS. DEC [illegible]

5th indorsement.

Office Chief of Engineers,
U. S. Army,

Dec.11,1896.

Respectfully returned to Captain Casey, inviting his attention to the 3d indorsement.

When such record as may be necessary has been made, this paper will be returned to this office.

A. Mackenzie
Acting Chief of Engineers.

10372
70

Rec'd. E.O. Norfolk, Va. Dec. 14, 1896

6th indorsement,
U. S. Engineer Office,
Norfolk, Va. Dec. 15, 1896.

Respectfully returned to the Chief of Engineers, U.S.Army, the necessary record having been made.

Thos. L. Casey
Captain, Corps of Engineers.

202-128 F.M.

REC'D. OFFICE CHIEF OF ENGRS. DEC 17 1896

U. S. ENGINEER OFFICE,
0 PLEASANT STREET, BALTIMORE, MD.

PERSONAL.

January 31 1896.

Captain Wm. M. Black,
Corps of Engineers, U. S. A.,
Office Chief of Engineers, U.S.A.,
Washington, D. C.

Dear Captain:

I return in today's mail the drawings of the mortar battery proposed by you for Fort Monroe, Va.

I think, as I said to you yesterday, that the amount of magazine room is unnecessarily large. I am aware that the Board of Engineers allow about the same amount, but I do not agree with the Board in respect to this matter. If a battery of 16 mortars fail to so damage an attacking fleet as to compel its withdrawal, by the expenditure of 100 rounds each, I think the mortar battery may be pronounced a failure. No fleet in existence can, in my opinion, stand 100 volleys from 16 rifled mortars at any practicable range without being so damaged or demoralized as to abandon the attack.

B

However, it costs but little to add this magazine space and it may come in use for something else. The passages from magazines to the wide passages I would make four rather than three feet wide.

A

I notice the magazines are 9 feet in clear height. I think 7 1/2 to 8 feet is ample.

C

I think the battery otherwise is all right.

Yours truly,

Peter C. Hains

Baltimore,
Jan. 31, 1896.

Hains, Col. P. C.

Returns, recomdg certain changes, the drawings of the mortar battery proposed by Captain W. M. Black for Fort Monroe, Va.

B

Capt. Thos. L. Casey
Corps of Engineers U. S. A.

U. S. ENGINEER OFFICE,
106 GRANBY STREET.

Norfolk, Va., August 17, 1896.

Brig. Gen. William P. Craighill,
Chief of Engineers, U. S. Army,
Washington, D. C.

General:-

I have the honor to state that the plans for mortar beds transmitted to me by Department letter of August 14, 1896, file #15920/1, indicate radical differences from those under which I have been constructing the platforms in pits 1 and 2 of the battery north of Fort Monroe. I would urgently recommend that I be permitted to proceed with the 8 platforms in pits 1 and 2 for the spring-return Buffington-Crozier carriage, as all the bolts are on hand, the dimension stone delivered and in process of cutting, the excavation made and sheeting and templets up; to change now would be expensive and entail considerable delay. The 8 platforms in pits 3 and 4 will be made on the new designs for the Gordon carriage. If this plan can be carried out we will eventually have half the battery mounted in one style and half in the other and the best possible opportunity will be afforded for testing the patterns of platform and carriage.

Very respectfully, your obedient servant,

Thos. L. Casey
Captain, Corps of Engineers.

Norfolk, Va.,
Aug. 17/96.

Casey, Capt. T. L.

The plans for mortar beds transmitted by E.D. letter of Aug. 14/96, indicate radical differences from those under which he has been constructing the platforms in pits 1 & 2 of the battery north of Fort Monroe. To change now would be expensive & entail considerable delay.

P.P. accompany

Letter, Aug. 20/96.

B

SUBJECT: Mortar Battery, Fort Monroe.

Office of the Chief of Engineers,
United States Army.

Washington, D. C., Aug. 20, 1896.

Capt. Thos. L. Casey,
Corps of Engineers,
Norfolk, Va.

Captain:

Referring to your letter of the 17th instant regarding mortar platforms for battery at Fort Monroe, you are informed that but four of the old model carriages are available for issue by the Ordnance Department, all others having been already issued. The remaining twelve carriages will be of the model of 1896, for which the proper platforms must be provided.

In this connection your attention is invited to Department letter of Jan. 8, 1896 (10372) in which a certain order of procedure was advised during the construction of the battery. Had this order been followed you would have received instructions relating to platform construction in ample time.

By Department letter of Jan. 25, 1896, you were directed to prepare the detail drawings and plans necessary for the construction of the battery and to submit the same for approval from time to time. No such detailed drawings have yet been received and you are directed to forward any such as may now be ready.

Detailed drawings of the mortar platform for the 1896

carriage will be sent you in a few days.

Very respectfully,

Your obedient servant,

Brig.Gen., Chief of Engineers.

15920
2

TELEGRAPH AT GOVERNMENT RATES

Washington, D. C. August 20 1896.

Captain Casey,

Engineers,

106 Granby street,

Norfolk, Va.

Four old model and twelve 1896 model mortar carriages can be sent you. Letter to-day.

Chief of Engineers.

Collect at U. S. Engineer Office, Norfolk, Va.

W

U. S. ENGINEER OFFICE,
166 GRANBY STREET,

Norfolk, Va., September 22, 1899.

Brig. Gen. John M. Wilson,
Chief of Engineers, U. S. Army,
Washington, D. C.

General:-

I have the honor to state that the battery for sixteen 12-inch mortars, at Fort Monroe, Va., has settled by compression of its sand foundations, gradually and evenly, nearly 2 inches. This settlement has taken place independently of the platforms which are isolated from the parapet and traverses by a lamina of sand 3 inches thick. The consequence of the settling therefore is the fact that with every storm the water flows into the battery shell-rooms and galleries through the wide entrances. I would propose to correct this defect by laying three to four inches of granolithic finish throughout the magazines and passages of the battery, sloping the surface externally toward the entrances to the battery. The cost of this will be about $10,000.

Secondly, - the interior of the battery is now damp at certain seasons by reason of condensation upon the walls (the direct leaks having been stopped by the constructions recently authorized), and I would recommend therefore that a system of large galvanized iron ventilating pipes be put through the battery leading to the central 16-inch chimney, and the damp air sucked out by means of a blower and engine placed in a sunken covered pit on the superior surface of the parapet. The engine for this work is already on hand, and the blow-

er and other work would cost $1,500.

I therefore recommend that an allotment of $11,500 be provided f for the purposes indicated, and believe that with these improvements the battery would be as efficient and perfect as it can be made.

Very respectfully,

Your obedient servant,

Thos. H. Cusey

Major, Corps of Engineers,

U. S. Army.

3610

Norfolk,
Sept. 22, 1899.

Casey,
Maj. C. E.

Re [illegible] Battery for 16 12" mortars at Ft. Monroe has settled, causing Casing in shell room & galleries, & suggests certain repairs, est. cost of about $10,000.

Recommends that a system of ventilating pipes be put through the battery, &c, at est. cost of $1,500.

Recommends an est. of $11,500 for the purposes above mentioned.

File.

Inclos. 104-106 accompg.

3 addl incs. accg.

Recd Engr Office Balto Dec 22. 1899.

Va, Sept. 27, 1899.
" Jan. 3, 1900.

1st *indorsement.*

Office Chief of Engineers,
U. S. ARMY,
September 26, 1899.

Respectfully returned.

The project outlined herein contemplates the expenditure of a large sum of money for repairs designed to correct defective drainage and ventilation. Available funds applicable to purposes of repair are practically exhausted and, while the Chief of Engineers is anxious to correct dampness in magazines as far as possible, he is unwilling to undertake large expenditures, unless satisfied that they are necessary and that the results will be commensurate with the cost.

A calculation of the floor area of magazines and passageways made from drawings on file in this office gives 1,074 square yards of granolithic flooring, for which Major Casey estimates $10,000, or nearly $10 per square yard. This estimate is evidently an error. As the object of raising the floors is to prevent the inflow of storm water through magazine entrances, it would seem that the same results might be obtained much more effectively and economically by the construction of an intercepting drain with removable grating across the entrances.

Major Casey is requested to forward drawings showing the actual references of floors of magazines, passageways and battery pits, and to reconsider his plans and estimates for correcting drainage.

The proposed system of ventilation is not clearly understood, and Major Casey is requested to forward detailed plans of the proposed installation, showing location and size of ventilating pipes, location and housing of engine and blower, with a description of the engine and blower proposed.

By command of Brig. Gen. Wilson:

10372
102

Captain, Corps of Engineers.

Recd E.O. Norfolk, Va., Sept. 27, 1899.

W

2nd indorsement.
U. S. Engineer Office,
Norfolk, Va., Dec. 21, 1899.

Respectfully returned to the Chief of Engineers, U. S. Army, with letter of even date, and plans as requested in the preceding indorsement.

Major, Corps of Engineers,
U.S. Army.

1191 F. M.
3 inclos., 2nd ind.,
2 trac'gs., sep. roll.
Thro:-Col. Peter C. Hains,
Corps of Engineers,
Div. Engr. S.E. Div.

3rd. Indorsement.
U. S. Engineer Office,
Baltimore, Md.
December 26, 1899.

Respectfully submitted to the Chief of Engineers, U.S.A.

In my opinion the method of providing drains as suggested in the endorsement of the Chief of Engineers, is preferable to the raising of the floors by a granolithic finish at a cost of over $4,000.

The ventilation of the magazines is highly desirable and I recommend this for approval.

Peter C. Hains
Col., Corps of Engineers, U.S.A.,
Div. Eng. S.E. Div.

4th *indorsement.*

Office Chief of Engineers,
U. S. ARMY,
December 29, 1899.

Respectfully referred to Maj. J. B. Quinn, Corps of Engineers.

The sum of $1,000 is hereby allotted from the appropriation for "Gun and Mortar Batteries", to be applied to the installation of an artificial system of ventilation at the mortar battery at Fort Monroe, Va., in accordance with the plans herewith, the funds to be derived from the following Acts:

U. S. ENGINEER OFFICE,
166 GRANBY STREET,

Norfolk, Va., September 29, 1899.

Brig. Gen. John M. Wilson,
Chief of Engineers, U. S. Army,
Washington, D. C.

General:-

I have the honor to state, in reference to the 1st indorsement, dated the 26th instant, file No. 10372/102, on my communication of September 22, relating to certain recommendations for the mortar battery at Fort Monroe, that on conversing with my foreman at Fort Monroe on the subject of laying granolithic paving within the mortar battery, I understood him to say that there were 27,000 superficial feet and that it would cost 39 cents per foot. I made out my estimate on this basis without further inquiry. This area includes, also, the passages under the traverses. As stated in the first indorsement, however, there has apparently been some miscalculation or misunderstanding which I shall fully investigate. The granolithic finish was recommended, not only as an expedient for keeping out water, but incidentally to provide a hard floor. The present floor is of roughly finished concrete and in places is rather friable under heavy weights, especially in those parts which have never thoroughly dried out. This has been a source of complaint in the use of the battery and would be permanently corrected by the granolithic finish.

(2)

The orders given in the indorsement will be carried out.

Very respectfully,

Your obedient servant,

Thos. W. Cusack

Major, Corps of Engineers,

U. S. Army.

1192 F. M.

10372

Norfolk,
Sept. 29, 1899.

Casey,
Maj. T. L.

Referring to E. D. ind. of 26th inst, submits explanation of his est. for laying granolithic pavement, etc, in mortar battery, Ft. Monroe. There has apparently been some miscalculation or misunderstanding which he will fully investigate.

Orders given in E. D. ind. will be carried out.

File
K W

K

U. S. ENGINEER OFFICE,

166 GRANBY STREET,

Norfolk, Va., June 27, 1900.

Brig. Gen. John M. Wilson,

Chief of Engineers, U. S. Army,

Washington, D. C.

General:-

Referring to the 1st indorsement from your office, dated January 29, 1900, on extract from 10372/107, I have the honor to state that it is estimated that the sum of $170 will be required to make the necessary provisions for mounting emergency depression range-finders for the Mortar Battery, Redoubt A and at the Place of Arms, at Fort Monroe, Va., all of which have been transferred to the troops, I have no funds available to do the work.

The crest of the cover at the Mortar Battery is about 42 feet above mean low water, and, as the Lewis Type B depression position-finder is only graduated to 35 feet, it is not suited for this work. The Post Commander has in hand a Rafferty Position-finder graduated to 60 feet, and it is his desire that it be used instead of the Lewis instrument at this point, and that it be mounted in the tower in the center of the battery and that duplicate stations for the same instrument be provided at the north and south ends of the battery.

The following is an itemized estimate of the cost of the work at the three batteries above-mentioned:-

ESTIMATE FOR CONSTRUCTING DEPRESSION POSITION FINDER STATIONS FOR MORTAR BATTERY, REDOUBT A AND PLACE OF ARMS, AT FORT MONROE, VA.

Station in Observation tower at Mortar Battery.

2 Braces, 1 Plate, 2 Bolts, } 45 lbs. iron, at 3¢ per lb.,	$ 1.35
Machinist and blacksmith labor,	8.25
Cutting concrete,	1.25
Setting braces and instrument,	2.50
Total,	$ 13.35

Stations at north and south ends of Mortar Battery.

Excavating, filling, sodding, removing sand from slope, etc.,	$ 7.50
2 pieces heavy cast-iron pipe, 6" diam., each 8' long, at 50¢ per foot,	8.00
Making boxes, fitting and setting pipe, etc.,	7.75
2 cubic yards of concrete, at $6.50 per cu. yd.,	13.00
Platform, using old lumber,	7.00
Total,	$ 43.25

Stations at north and south ends of Redoubt A.

Removing sod, soil, clay, execavating sand and removing extra material from slope,	$ 10.00
2 pieces heavy cast-iron pipe, 6" diam., each 8' long, at 50¢ per foot,	8.00
Making boxes, boring, fitting and setting pipe, etc.,	10.50
2 cubic yards of concrete, at $6.50 per yard	13.00
80 feet platform along slope, using old lumber and posts, at 20¢ per lineal foot,	16.00
Total,	$ 57.50

Stations at north and south ends of Place of Arms.

Removing sod, soil, clay, excavating sand and removing extra material from slope,	$ 10.00
2 pieces heavy cast-iron pipe, 6" diam., each 8' long, at 50¢ per foot,	8.00
Making boxes, boring, fitting and setting pipe, etc.,	10.50
2 cubic yards of concrete, at $6.50 per cu. yd.,	13.00
80 feet platform along slope, using old lumber and posts, at 20¢ per lineal foot,	16.00
Total,	$ 57.50
Grand Total,	$171.60

Respectfully submitted,

Major, Corps of Engineers,
U. S. Army.

$\frac{860}{4}$ F.M.

Through:-
Colonel Peter C. Hains,
Corps of Engineers, U. S. Army,
Division Engineer, Southeast Division.

OFFICE OF CHIEF OF ENGINEERS

10372

860/6 F.M.

JUN 30 1900

10372/109

WAR DEPARTMENT

Norfolk, Va., June 27, 1900.

5057

Quinn, Maj. James B.

In compliance with E. D. instructions, submits est. for construction of depression position-finder stations at Fort Monroe, Va. Grand total $171.60

Room 97 — Index — File — HMA

K

REC'D, BACK, OFFICE CHIEF OF ENGRS. JUL 10 1900

Rec'd, H. E. O. Norfolk, Va., July 9, 1900

Rec'd Eng'r Office, Balto. June 28, 1900.

K. " " " July 6.

1st. Indorsement.

U. S. Engineer Office,
Baltimore, Md.,
June 28, 1900.

Respectfully submitted to the Chief of Engineers, U.S.A., and recommended for approval.

Peter C. Hains

Col., Corps of Engrs., U. S. A.,
Div. Eng. S.E. Div.

2d indorsement.

Office Chief of Engineers,
U. S. ARMY.

July 3, 1900.

Respectfully returned to Major Quinn.

The sum of $172 is hereby allotted from the appropriation for "Gun and Mortar Batteries", for installation of range and position finders, Act of May 25, 1900, to be applied to the installation of emergency type position finders at batteries at Fort Monroe, as indicated herein.

To be returned.

By command of Brig. Gen. Wilson:

Jas. A. Leech

10372/109

Major, Corps of Engineers.

Through Col. PETER C. HAINS,
Corps of Engineers,
Division Engineer, Southeast Division.

3rd. Indorsem[illegible]

U. S. Engineer O[illegible]
Baltimore, Md.,
July 6, 1900.

Respectfully transmitted to Maj. J.B.Quinn, Corps of Engineers, U.S.A., inviting attention to the foregoing indorsements.

Peter C. Hains

Col., Corps of Engineers, U.S.A.,
Div. Eng. S.E. Div.

Rec'd, E. O. Norfolk, Va., July 9, 1900.

4th indorsement.

U. S. Engineer Office,
Norfolk, Va., July 9, 1900.

Respectfully returned to the Chief of Engineers, U.S.Army, as directed in 2nd indorsement hereon.

James B. Quinn

Major, Corps of Engineers,
U.S.Army.

860/6 F.M.

REC'D, OFFICE CHIEF OF ENGRS. JUL 10 1900

All letters must be addressed to "The Chief of Ordnance, U. S. Army, Washington, D. C."

SUBJECT Mortar carriages at Fort Monroe, Va.

Office of the Chief of Ordnance Mi.

United States Army

Washington August 23, 1901.

In replying refer to No. 28164.
22653.

The Honorable

The Secretary of war.

Sir:

I have the honor to inform you that the mortar battery at Fort Monroe, Va., now consists of four 12-inch mortar carriages model of 1891, and twelve 12-inch mortar carriages, model 1896. In order to make this battery uniform as to carriages, and facilitate the ammunition supply, I have the honor to request authority to substitute for the four 12-inch mortar carriages model of 1891, four 12-inch mortar carriages, model of 1896, which are now under construction.

Very respectfully,

A. R. Buffington

Brig.Gen., Chief of Ordnance.

OFFICE OF THE SECRETARY — OFFICE OF ADJUTANT GENERAL

2211 SEP 10 1901 397728

WAR DEPARTMENT

Aug. 23, 1901.

Recd. HQA SEP. -3--1901 3231

Chief of Ordnance

Requests authority to substitute for the four 12-inch mortar carriages, model 1891, at the mortar battery Fort Monroe, Va. four 12-inch mortar carriages, model of 1896, which are now under construction.

8/3/01	Office of the Chief of Artillery.	237

REC'D AUG 24 1901 RECORD DIV. WAR DEPT.

Chief of Arty

Remk

Commanding General

OFFICE CHIEF OF ORDNANCE

23164 1901

490

WAR DEPARTMENT

Sept. 13:-1901.--Letters to Com. gen. dept. asc. Chief of Engrs. and C.O. Watertown Arsenal.

RECEIVED M.&R. SEP 1901

1st indorsement.

Headquarters of the Army, Washington, D. C. Sept. 3rd 1901.

To the Chief of Artillery.

2nd Endorsement.

HEADQUARTERS OF THE ARMY, Office of the Chief of Artillery, Washington, D. C. Sept. 3rd 1901.

Respectfully returned to the Assistant Adjutant General, Headquarters of the Army, recommending approval.

Chief of Artillery.

3rd indorsement.

Headquarters of the Army, Washington, D. C. Sept. 5 1901.

Respectfully submitted to the Secretary of War concurring in the 2nd indorsement.

Aide-de-Camp, for the Lieutenant General.

back

REC'D SEP 5 - 1901 RECORD DIV. WAR DEPT.

Chief Clerk,

4th Indorsement,
War Department,
September 7, 1901.

Approved.

G. L. Gillespie

Acting Secretary of War.

Rec'd Back, H.Q.A. SEP 9 1901

5th indorsement.

Headquarters of the Army, Washington, D. C. Sept. 9, 1901.

By the Lieutenant General to the Adjutant General for the necessary action.

Military Secretary.

MISCELLANEOUS DIV. REC'D SEP 10 1901 A. G. O.

W:MY

6th Endorsement.

War Department,
Adjutant General's Office,
Washington, Sept. 11, 1901.

Respectfully returned to the Chief of Ordnance, with reference to the action of the Acting Secretary of War in 4th endorsement.

By order of the Acting Secretary of War.

Major of Infantry,
Assistant Adjutant General.

ENGINEER OFFICE, U. S. ARMY,
CUSTOM HOUSE,

Southern Bell
Telephone 1031.

Norfolk, Va., November 3, 1902.

Brig. Gen. G. L. Gillespie,
Chief of Engineers, U. S. Army,
Washington, D. C.

General:

I have the honor to submit the following estimate for enlarging the wells at each pit of Battery Anderson (Mortar Battery) at Fort Monroe, Va., into which the drains from the mortar platforms lead, to improve the drainage system of each pit; also for providing 2-inch pipes to each platform of the battery to carry the wires for firing the mortars electrically, and for raising the surface of the concrete in pit D to the level of the foot-plates of the model 1896 carriages, which have recently been substituted for the 1891 type originally mounted.

ESTIMATE.

Cutting manholes through platforms to drain wells,-------$	25.00
Removing stone from drain wells,----------	20.00
Bracing concrete over drain wells,----------	10.00
Making manhole covers, etc.,----------	20.00
Cutting from platforms through to pits and putting in 2-inch pipe, conduit for electric wires,----------	50.00
Cutting center drains 10 feet longer,----------	20.00
Putting in 3,000 square feet granolithic work in northern pit to raise platform to height of foot-plates, @ 30¢ per square foot,----------	900.00
	$1,045.00
Contingencies 10%,----------	104.50
Total,----------$	1,149.50

Respectfully submitted,

James B. Cheney

Major, Corps of Engineers,

U. S. Army.

2009/1 F. M.

Through:

~~Colonel Peter C. Hains,~~

Corps of Engineers, U. S. Army,

Division Engineer, Southeast Division.

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y, as
lorse-
nclo-
l at

neers,
Army.

Norfolk, Va.,
November 3,1902.

QUINN,
Major James B.

Submits estimate($1,149.50) improving the drainage sys- at Battery Anderson,Fort Mon- ,Va.; for providing 2-inch es to each platform of the tery for carrying wires for ing the mortars electrically; for raising the surface of the crete in Pit D.

Inclo. 2d ind. Inc. E.D. (tracg) = notes

1st.Indorsement.
U. S. Engineer Office,
Baltimore, Md.,
Nov. 5, 1902.

Respectfully returned to Major James B.Quinn,Corps of Engineers, requesting information as to the necessity for doing the work contemplated, and for an explanatory sketch showing the work proposed.

Peter C. Hains

Col.,Corps of Engineers,U.S.A.,
Div. Eng. S. E. Div.

2nd indorsement.
Engineer Office,U.S.Army,
Norfolk,Va.,Nov.17,1902.

1. Respectfully returned to Colonel Peter C.Hains,Corps of Engineers,U.S.Army,Division Engineer, Southeast Division.

2. The Commanding Officer of the Post has complained that the existing drains do not carry off the water falling on each pit,and an enlargement of the wells in the center of each pit is suggested to overcome this defect. At the same time,it seems best that the wires used in firing the mortars should be run from the groove cut in the surface of the concrete so as to come up under the carriages,instead of leading therefrom to them exposed,as now arranged.

3. The foot-plates of the model 1896 carriages,which were recently substituted for the 1891 model originally mounted in Pit D,extend about 3 inches above its surface. It is proposed to raise the floor of the pit to a level with the foot-plates so that the ammunition trucks may have their proper height for the operations in loading.

4. A sketch,showing what is proposed,is submitted in a separate package.

James B. Quinn

Major,Corps of Engineers,
U.S.Army.

2009 F. M.
2

1 inclo.,2nd ind.,tracg.,in sep.pkge.

3rd.Indorsement.
U. S. Engineer Office,
Baltimore,Md.,
Nov. 21,1902.

Respectfully submitted to the Chief of Engineers,U.S.A.

In my opinion,this plan of drainage will not prove satisfactory. It is recommended that this paper be returned to the district engineer with request that he give the subject further consideration and endeavor to work up a plan that will prove more efficient.

Peter C. Hains

Col.,Corps of Engrs.,U.S.A.,
Div. Eng. S. E. Div.

4th

Office Chief of Engineers.
U. S. ARMY.

December 18, 1902.

Respectfully returned to Major Quinn, inviting attention to the 1st and 2d indorsements on the inclosed wrapper (inclosure 21), with request for information as to the cost of providing free drainage to the well, either by pipe connection to lower ground, or by pumping, using some form of steam or electric pump.

These papers to be returned.

By command of Brig. Gen. Gillespie:

Thomas V. Abbott
Major, Corps of Engineers.

13117
19

Inclo.21 accompg.
Inclo.20 in sep.roll.

Through Col. PETER C. HAINS
Corps of Engineers,
Division Engineer, Southeast Division.

5th.Indorsement.
U. S. Engineer Office,
Baltimore, Md.,
Dec. 20, 1902.

Respectfully transmitted to Maj. James B.Quinn,Corps of Engineers,inviting attention to the preceding indorsements.

Peter C. Hains

Col.,Corps of Engineers,U.S.A.,
Div. Eng. S. E. Div.

6th indorsement.
Engineer Office, U.S.Army,
Norfolk, Va., Mar. 4, 1903.

Respectfully returned to the Chief of Engineers, U. S. Army, with estimate and plans for providing free drainage to the wells at Battery Anderson, by piping, which is considered to be the most advantageous method, for the reason that the blind system of drainage in use cannot be relied on, owing to the clogging of the sand in the bottom of the pits with cosmic &c. The method proposed, while being rather more expensive, gives positive drainage and the drains can be kept open and effective. This system will be more certain and reliable than one where a pumping apparatus is essential.

James D. Inman

Lt.Col., Corps of Engineers,
U. S. Army.

209/2 F. M.

2 inclos. accompg.
2 in sep. pkge.
Through:
Colonel Peter C. Hains,
Corps of Engineers, U. S. Army,
Div. Eng., Southeast Div.

7th. Indorsement.
U. S. Engineer Office,
Baltimore, Md.,
March 10, 1903.

Respectfully submitted to the Chief of Engineers, U.S.A
Approval recommended.

Peter C. Hains

Col., Corps of Engineers, U.S.A.,
Div. Eng. S. E. Div.

8th Indorsement.

Office Chief of Engineers,
U. S. ARMY,

March 12, 1903.

Respectfully returned to Lieutenant Colonel Quinn, approved.

An allotment of $2,000 for the purpose is hereby made from the appropriation for "Gun and Mortar Batteries," for construction of gun batteries, Act of June 6, 1902.

The original drawing (Inclosure 20), being superseded, should be retained by Lieutenant Colonel Quinn. The other papers to be returned to this office.

By command of Eng. Gen. Wilson

Frank V. Abbot
Major, Corps of Engineers.

13117/19

Inclos. 21 & 30 accompg.
Inclos. 20 & 31 in sep. roll.

9th indorsement.
Engineer Office, U.S. Army,
Norfolk, Va., Mar. 16, 1903.

Respectfully returned to the Chief of Engineers, U. S. Army, as directed in the preceding indorsement, the original drawing, inclosure 20, having been retained at this office.

Lt. Col., Corps of Engineers,
U. S. Army.

2009 F. M.
2

2 inclosures accompg.
1 " sep. roll.

O/K

ENGINEER OFFICE, U. S. ARMY,
ROOM 2, CUSTOMHOUSE.

Norfolk, Va., March 25, 1903.

Brig. Gen. A. Mackenzie,

Chief of Engineers, U. S. Army,

Washington, D. C.

General:

1. I have the honor to submit the following report on broken platform bolts at Battery Ruggles, Fort Monroe, Va.

2. Battery Ruggles is a mortar battery, containing two pits of four mortars each. The battery was built in 1896, and was first designed to receive spring return carriages, model 1891. After the platforms in Pit "B" had been built, it was decided to mount carriages, model 1896, with specially designed base rings containing 12 outer and 12 inner bolts, so as to utilize the completed platforms.

3. The lengthening of the outer bolts to accommodate the new base rings was accomplished by extension bolts having a socket at one end, as shown on blue-print herewith.

4. Battery Ruggles has been out of service for some time, and was only recently put into commission in connection with the organization of the new Coast Artillery Companies at Fort Monroe. While cleaning up and overhauling his battery, the Company Commander discovered two of the bolts of the outer ring of mortar #1, Pit "B", broken just below the nuts. The location of the broken bolts is indicated upon the second blue-print herewith, and it is significant

that this location is approximately in the usual plane of fire used in target practice. One bolt was broken square off in the plane of the bottom of the nut, while the other was broken off about 3/8-inch below the plane of the bottom of the nut. Both fractures reveal a granular formation, one being quite fine, and the other rather coarse.

5. There is no information as to when the damage occurred, and it is quite possible that the mortar may have been fired with service charges after the breakage of the bolts. There is no visible evidence that the base ring has moved, and a careful examination of all the other bolts, both in mortar #1 and the other mortars, shows them to be apparently sound.

6. The direction of recoil under usual angles of elevation of mortars is such that little strain should be brought upon the base ring bolts. In seeking an explanation of the occurrence, it is thought that possibly the extension pieces may have been overheated when cut to length and the quality of the metal injured. The granular appearance of the fracture lends color to this supposition. The specifications called for medium steel of 50,000 pounds ultimate strength, but there is no record of actual tests of metal.

7. Another possible explanation of the occurrence lies in the fact that, owing to limited space, only a short wrench could be used in tightening up the nuts and a sledge hammer was used on the handle. This may have caused such an initial strain that the bolt could not stand any additional stress from firing.

8. In making repairs, it is proposed to cut out the concrete around the broken bolts to a depth of about one foot, so as to un-

cover the sockets of the extension pieces, cut off the sockets with hack-saws at a level at or slightly below the tops of the old bolts, so as to be able to wedge back the segmental locking pieces with which the old bolts are provided, and then to unscrew the sockets. By jacking up the upper roller path, the extension bolts may be withdrawn. Sleeve nuts with new extension bolts can then be put in place and the concrete restored.

9. It is estimated that the cost of repairs will be $200.00, and an allotment of this amount is recommended.

Very respectfully,

Your obedient servant,

Joseph C. Rider

Major, Corps of Engineers,

U. S. Army.

63/2 H. R.

78 H. R.
2 bl.pts.accompg.
Through:

Lieut.-Colonel Dan C. Kingman,

Corps of Engineers, U. S. Army,

Division Engineer, Southeast Division.

13117
50
63
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Norfolk
4 22

Norfolk, Va.,
March 25, 1908.

K U H N,

MAJOR JOSEPH E.

Submits report in reference to broken platform bolts at Battery Ruggles, Fort Monroe, Va. Estimates cost of repairs at $200.00 and recommends allotment of this amount.

2 Inclos. E. D. (8 pcs)

Inclos. 51 & 52 noted in Map Files.
Ford by Col. Kingman

R 93
Dam Hunt

Incs. 51 and 52 accpg.

1st indorsement.
OFFICE OF DIVISION ENGINEER,
SOUTHEAST DIVISION,
Savannah, Ga.,
March 27, 1908.

Respectfully forwarded to the Chief of Engineers, U. S. Army, with the recommendation that the proposed method of repair be adopted, and that the sum of $200 be allotted for the purpose.

Dan C. Kingman
Lieut. Col., Corps of Engineers,
Div. Eng., S. E. Div.

2 enclos. accompng.

2d indorsement.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
WASHINGTON.
April 1, 1908.

1. Respectfully returned to Major Kuhn, approved.

2. Major Kuhn is authorized to do the work, paying for the same from funds now in his hands pertaining to the appropriation for "Preservation and Repair of Fortifications." There is no legally applicable unallotted balance from which an allotment of $200 could be made.

By command of Brig. Gen. Mackenzie:

Thomas V. Abbott
Lieut. Col., Corps of Engineers.

13117/50
Inclos. 51 & 52 accompg.
To be returned through the Division Engineer.

O/K

3rd indorsement.
Engineer Office, U.S. Army,
Norfolk, Va., Apr. 4, 1908.

Respectfully returned to the Chief of Engineers, U.S. Army, the necessary record having been made.

Joseph E. Kuhn
Major, Corps of Engineers,
U.S. Army.

63/3 H. R.

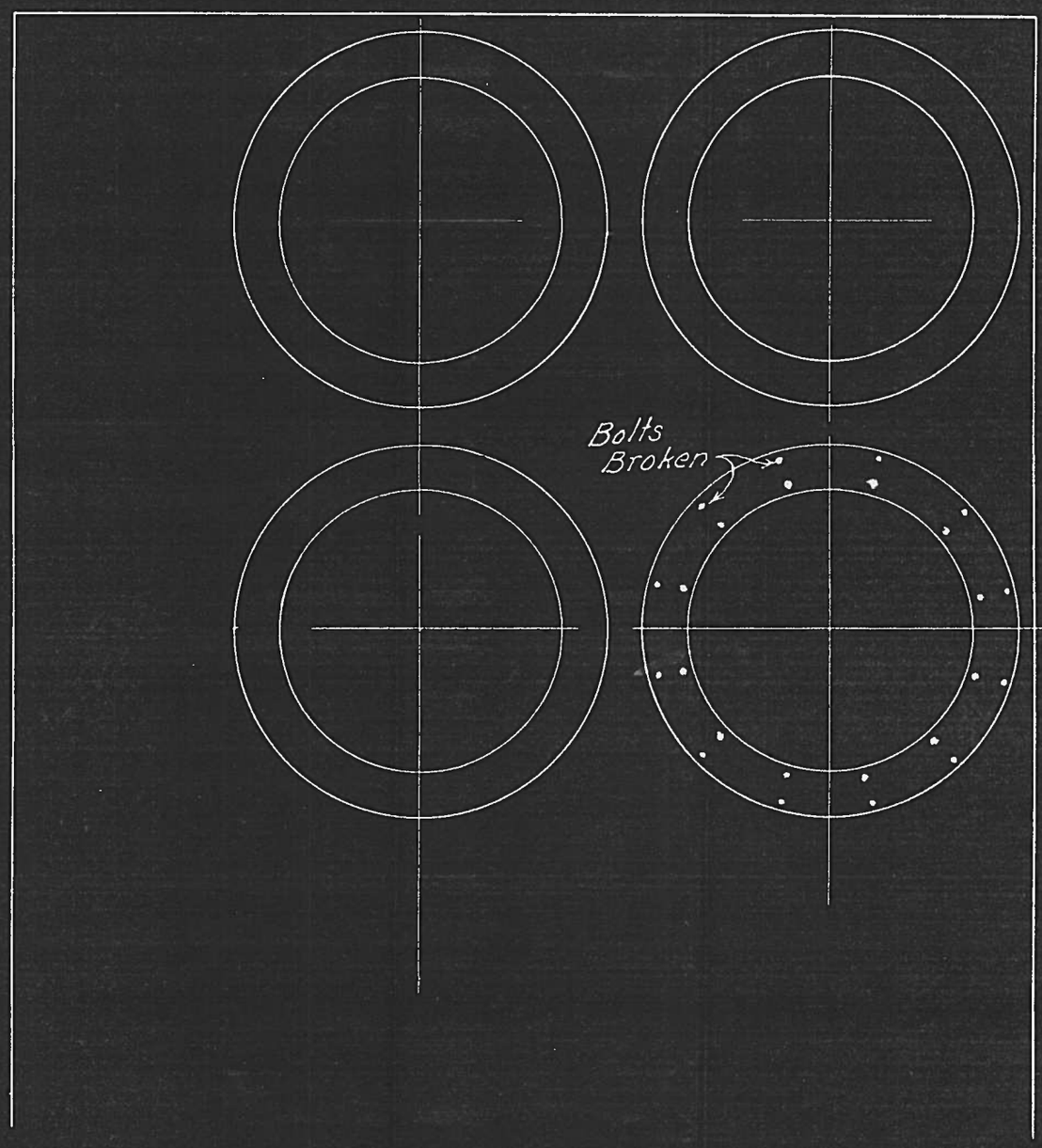
2 bl. pts. accompg.
Through:
Lieut. Col. Dan C. Kingman,
Corps of Engineers, U.S. Army,
Division Engineer,
Southeast Division.

4th indorsement,
OFFICE OF DIVISION ENGINEER,
SOUTHEAST DIVISION,
Savannah, Ga.
April 7, 1908.

Respectfully returned to the Chief of Engineers, U. S. Army, the necessary record having been made.

Dan C. Kingman
Lieut. Col., Corps of Engineers,
Div. Engr., S. E. Div.

2 enclos. accomp'g.

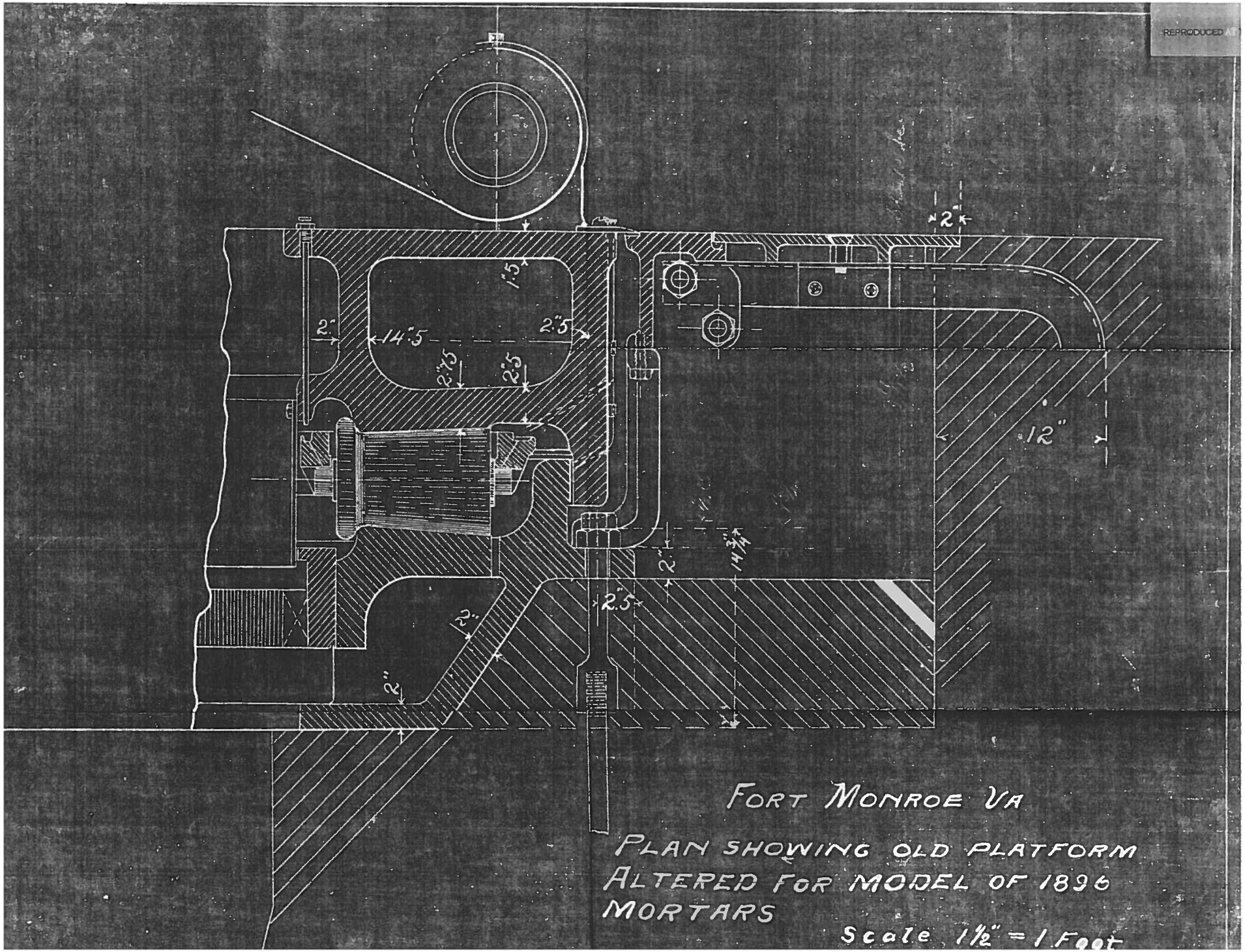


FORT MONROE, VA.

Sketch showing location of broken Anchor bolts at

Pit B. Battery Ruggles

Scale 1/8 in = 1-Foot



Noted - Map Files

With
63
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P.V.P.

Engineer Office, U.S. Army
NORFOLK, VA.
Received MAR 19 1908

OFFICE, CHIEF OF ENGINEERS
MAR 30 1908
13117
51
WAR DEPARTMENT

08

REC'D DIV. ENG. OFFICE S.E. DIVISION SAVANNAH, GA. APR 6 19

K

ENGINEER OFFICE, U. S. ARMY,
ROOM 2, CUSTOM HOUSE,

Norfolk, Va., June 22, 1904.

Brig. Gen. Alexander Mackenzie,
Chief of Engineers, U. S. Army,
Washington, D. C.

General:

1. I have the honor to report that the Post Commander at Fort Monroe, Va., has requested that important modifications be made at Battery Anderson (Mortar Battery), at his post, these modifications consisting in widening the entrances to the shell rooms in Pits "C" and "D".

2. When this battery was constructed, Pit "D" was constructed first, and the entrance to the shell room was made 4 feet wide. This was considered insufficient, and, in constructing Pit "C", it was widened to 6 feet. This was still considered insufficient, and in Pits "A" and "B" the widths of the entrances were made 8 feet in each. The Post Commander now reports that these narrow entrances in Pits "C" and "D" cause considerable inconvenience, and has requested that the walls be cut away, so as to make them the same width (8 feet) as in Pits "A" and "B". These proposed modifications meet with my approval.

3. The estimated cost of this work is as follows:

Cutting out concrete and existing ceiling beams,	$400.00
New steel beams,	90.00
Amount carried forward,	$490.00

Amount brought forward,	$490.00
Placing beams and putting new concrete around them,	10.00
Alterations to existing beams,	30.00
Additions to existing damp-proof ceiling,	50.00
80 square feet new granolithic flooring,	24.00
Dressing and whitewashing new walls,	10.00
Removing and altering trolleys,	60.00
Contingencies,	51.00
Total,	$725.00

Very respectfully,

Your obedient servant,

Herbert Maulsby

Captain, Corps of Engineers,

U. S. Army.

2256/22 F. M.

Through:

Colonel W. A. Jones,

Corps of Engineers, U. S. Army,

Division Engineer, Chesapeake Division.

OFFICE OF CHIEF OF ENGINEERS 2256 23 F.M.

JUN 27 51781 1904

WAR DEPARTMENT.

Norfolk, Va.,
June 22,1904.

9806

WINSLOW,
Capt. E.Eveleth.

As requested by the Post Commander at Fort Monroe,Va., in whose recommendations he concurs, submits estimate ($725) for widening the entrances to the shell rooms in Pits "C" and "D", Battery Anderson.

Recommd
Fiche
Mr Brown note
Mr WB

REC'D BACK, OFFICE CHIEF OF ENGRS. JUL 11 1904

Received back, Eng'r Off., U. S. Army, NORFOLK, VA. JUL 8 1904

Rec.Eng.Of.Balto.June 23,1904.
4." " " " " 30. "

1st. Indorsement.
U.S.Div.Eng.Office,
Baltimore, Md.,
June 23,1904.

Respectfully submitted to the Chief of Engineers,U.S.A.
Approval recommended.

W A Jones

Col.,Corps of Engineers,U.S.A.,
Div.Eng.,Chesapeake Div.

2d *indorsement.*

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
WASHINGTON.
June 29,1904.

1. Respectfully returned to Captain Winslow, approved.
2. Captain Winslow is authorized to transfer the necessary funds for the purpose from any gun and mortar battery, or preservation and repair allotments in his hands, provided he can, without additional allotment by this office, complete the work originally covered by such allotments, as well as the work described within.
3. The allotments so transferred should be reported, with the return of this paper to this office.

By command of Brig. Gen. Mackenzie:

Thomas V. Abbott
Major, Corps of Engineers.

51781

Through Col. W. A. JONES,
Corps of Engineers,
Division Engineer, Chesapeake Division.

3rd. Indorsement
U.S.Div.Engineer Office,
Baltimore, Md.,
June 30,1904.

Respectfully transmitted to Capt.E.Eveleth Winslow,Corps of Engineers,inviting attention to the preceding indorsements.

W A Jones

Col.,Corps of Engineers,U.S.A.,
Div. Eng. Ches. Div.

K 4th indorsement.
Engineer Office,U.S.Army,
Norfolk,Va.,July 9,1904.

Respectfully returned to the Chief of Engineers,U.S.Army,with the information that the sum of $725 has been transferred from the unexpended balance of the allotment of $14,800 made Dec.2, 1902,E.D.43492/1,from the appropriation for "Gun and Mortar Batteries," Act of June 6,1902, for constructing emplacements for "two 15-pdr.guns at Fort Wool,Va.",for widening the entrances to shell rooms in Pits "C" and "D",Battery Anderson, under the within estimate.

E. Eveleth Winslow

Captain,Corps of Engineers,
U.S.Army.

2256/23 F. M.

REC'D. OFFICE CHIEF OF ENGRS. JUL 11 1904

6/47 H. R.

War Department.
UNITED STATES ENGINEER OFFICE,
ROOM 2, CUSTOMHOUSE,
Norfolk, Virginia. April 10, 1914.

From: The District Engineer Officer, Norfolk, Va.

To: The Chief of Engineers, U. S. Army, Washington, D. C.
(Through the Division Engineer, Southeast Division.)

Subject: Interior lining of mortar batteries at Fort Monroe, Va.

1. During the calendar year 1903, the mortar batteries at Fort Monroe, Va., were given an interior "damp-proof" ceiling. The papers on this subject bear E. D. file mark 13117.

2. This dampproofing consisted of an interior, corrugated iron ceiling, having ridges along the center lines of the rooms and galleries and sloping to and into the side walls. Within the side walls gutters were cut, and for the emptying of these gutters, down-spouts were inserted in the side walls, emptying into deep gutters along the sides of the rooms and galleries. This corrugated iron was supported by beams and tees, and had, of course, the necessary valleys at the intersections of the rooms and galleries. It was thoroughly painted when installed, and, while the paint was still wet, cork was blown into the exposed surface, with the idea of reducing condensation.

3. In general, this dampproofing has worked fairly well. Condensation has been almost negligible, and, under ordinary conditions, seep water was caught by this roof and carried away. However, the concrete of these batteries, constructed of Rosendale cement, was very porous, and much seep water finds its way through the mass of concrete, and when it issues from the concrete ceilings it is heavily charged with carbonate in solution, and, before the installation of the dampproof ceiling, this carbonate was deposited as stalactites or stalagmites. After the installation of this interior ceiling, the stalagmite had a tendency to form in the valley gutters, in the gutters cut in the walls, and in the down-spouts. Sooner or later, dams were formed in these waterways, thus choking back the water, which found its way through the porous joints in the ceiling, and, in consequence of this formation, it has been necessary, not infrequently, to cut into the side walls, or to partially remove the ceiling, so as to clean out the various gutters and spouts.

4. The defect just noted is, however, negligible, compared with the main defect, which is that the ceiling, in the entrance galleries at least, is unable to withstand the blast effect of the mortars, and is bent up in places, and sucked down in others, almost every time the mortars are fired. This is quite frequent during the summer season, as these batteries are used for target practice, not only by the garrison

at Fort Monroe, but also by the troops from the Potomac, the Baltimore and the Delaware districts. Furthermore, these batteries are used, to a greater or less extent, for experimental purposes.

5. From these frequent firings, the roofs of the entrance galleries have been damaged many times. Where possible, the damages have been repaired, with the result, however, that the roofs have gotten into such a shape that, in the entrance galleries, further repair of the existing roofs has become impracticable, and the ceilings, in their present condition, do more harm than good, catching the seep water in some places where it would probably do no harm, and dropping it down in places where it is objectionable.

6. I have now received a request from the Artillery authorities at Fort Monroe for the removal of so much of these interior ceilings as are in the entrance galleries; and, after an inspection of the ceilings there, I think this advisable, and I recommend that I be granted authority to do it.

E. Robert Hamilton
Lt. Col., Corps of Engineers,
U. S. Army.

OM.Jr.

1st Ind.

N-4/69

Office Div. Engr., S. E. Div., April 20, 1914 -- To the Chief of Engineers.

Forwarded, concurring in the recommendation of the District Officer.

W Haughton
Colonel, Corps of Engineers.

RRR/BHB

2nd ind.

13117/76

Office C. of E., April 24, 1914 - To the District Engineer Officer, NORFOLK, VA.

1. Approved.

2. To be returned through the Division Engineer.

By command of the Chief of Engineers:

Robert O. Bolenter
Captain, Corps of Engineers.

EEW/K

3rd Ind.

6/48 H. R.

U. S. Engineer Office, Norfolk, Va., Apr. 27, 1914.- To the Chief of Engineers, U. S. Army.
(Through the Division Engineer, Southeast Division.)

Returned, noted.

Lt. Col., Corps of Engineers,
U. S. Army.

REC'D BACK OFFICE of DIV. ENG S. E. DIV APR 28 1914

BK

4th Ind.

N-4/69.

Office Div. Engr., S. E. Div., April 28, 1914 - To the CHIEF OF ENGINEERS.

Noted.

Colonel, Corps of Engineers.

GENL. OFFICE CHIEF OF ENGRS. APR 30 1914