

Primary Battery File

National Archives, Washington D.C.

Record Group 77

Correspondence of the Chief of Engineers

Entry 103

File, Fort, Battery:

15 892

40022

Ft. Adams

Btly Edgerton - Greene

Subject: Req. allotment for plans & estimates for Mortar Battery.

U. S. Engineer Office,

MAJOR D. W. LOCKWOOD,
Corps of Engineers, U. S. A., in Charge.

Newport, R. I., July 21, 1896.

Brig. General Wm. P. Craighill,
Chief of Engineers, U. S. Army,
Washington, D. C.

General:-

In connection with Department letter of June 30th, 1896, Engr. Dept. File No. 15892, relative to the construction of a Mortar Battery at Fort Adams, R. I., I have the honor to submit the following:

It is not known how far below the surface of the ground rock exists at the proposed site, or in what condition it may be found; it is only supposable from the general character of the locality that the stratum of earth is generally thin or irregular in thickness. On account of the slope along the line of the battery crest, it may be more economical to establish the bottoms of the pits and the floors of their respective magazines &c., at different levels rather than in the same plane, and I desire to sink test pits to locate the level of the rock at each mortar pit. As plans and estimates are called for in advance of any regular allotment having been made, and as these preliminary operations are necessary to enable me to make the plans &c., I have the honor to request information as to whether the letter of June 30th, 1896 referred to above, authorizes me to make the expenditures necessary in the preparation of the plans &c., without special allotment. If this is not the case I would respectfully request that a special allotment of \$500 may be

made, to be used in preparation of plans and estimates, and paying expenses incident thereto.

Very respectfully,

Your obedient servant,

DW Lockwood

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

Through

Col. John M. Wilson,

Div. Engineer, N.E. Division.

337
RECEIVED
July 23 1896

15892
Newport, R.I. July 21, 1896.

DEPT.
Lockwood, Major D.W.
Corps of Engrs. U.S.A.

Refers to Department letter
June 30, 1896, Engr. Dept. File
15892, relative to the con-
struction of a mortar battery at
Fort Adams R.I.

Requests information as to
whether his letter authorizes
the expenditures necessary in
preparation of plans &c. without
special allotment.

If this is not the case
requests that special allotment
of \$500 be made for preparation
of plans and estimates and ex-
penses incident thereto.

From Col. J. M. Wilson, Annapolis

Received 27
OK

Rec'd back 26. Ea. Div. July 31, 1896
Rec'd back U.S. Engr. Office, Newport, R.I. JUL. 25, 1896
Rec'd back Ea. Div. July 29, 1896

1st indorsement
NORTH EAST DIVISION
ENGINEER OFFICE.
Washington, July 23, 1896.

Respectfully forwarded to
the Chief of Engineers.
In the absence and by direc-
tion of Col. Wilson.

John Stephen Durrill,
1st. Lieut. Corps of Engrs. U.S.A.
(337-No. Ea. Div.-1896)

2d indorsement.
Office, Chief of Engineers,
U. S. Army,
July 24, 1896.

Respectfully returned.
An allotment of \$500 is
hereby made for preparation of
plans and estimates, as herein
requested, from appropriation
for "Gun and Mortar Batteries",
Act June 6, 1896.

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

John M. Wilson
Acting Chief of Engineers.

15892
1.

Through Col. JOHN M. WILSON,
Corps of Engineers,
Division Engineer, Northeast Division.

2nd indorsement
NORTH EAST DIVISION
ENGINEER OFFICE.
Washington, July 24, 1896.

Respectfully transmitted
to Major P. W. Lockwood, Corps of
Engineers.

John M. Wilson
Colonel, Corps of Engrs, U.S.A.,
Division Engineer, N.E. Division
(337-No. Ea. Div.-1896)

Received U.S. Engineer Office, Newport, R.I. JUL. 25, 1896
4th indorsement.
U.S. Engineer Office,
Newport, R.I., July 29, 1896.

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

John M. Wilson
Major, Corps of Engrs.

Through
Col. John M. Wilson,
Corps of Engineers, U.S.A.
Div. Engr. N.E. Division.
15892-1

3rd indorsement.
NORTH EAST DIVISION
ENGINEER OFFICE.
Washington, July 29, 1896.

Respectfully forwarded to
the Chief of Engineers.

John M. Wilson
Colonel, Corps of Engineers, U.S.A.
Division Engineer, N.E. Division
(337-No. Ea. Div.-1896)

RECEIVED U.S. ENGINEER OFFICE

JUL 31 1896

Subject: Mortar Battery - Ft. Adams, R. I.

U. S. Engineer Office,

MAJOR D. W. LOCKWOOD,
Chief of Engineers, U. S. A., in Charge.

Newport, R. I., August 29, 1896.

Brig. General Wm. P. Craighill,
Chief of Engineers, U. S. Army,
Washington, D. C.

General:-

I have the honor to forward this day in a separate package, a tracing of plan and cross-sections of a Mortar Battery to be built on the Fort Adams, R. I. reservation just east of the redoubt, also one showing general location with reference to the Fort and its outworks.

With a view to diminishing the cost of construction, and for the reason that the main fire will be principally towards the front, the pits are arranged in line, separated by splinter proof passage ways leading to the magazines. These latter are deemed admissible in view of the fact that the battery will be exposed only to direct front fire, at least until after the main works of defense have been passed and hostile vessels have entered Narranagsett Bay.

Each pit has its own magazine and shell rooms, capable of containing 173 rounds of powder and projectiles per mortar.

Owing to the fact that the cost of the battery is limited to a certain amount, and having in view the requirements of magazine and shell storage, operating and other rooms required in the service of the battery and other essentials of first importance, it has been deemed expedient to provide cover, against penetration, entirely of earth, limiting the amount of concrete to what is absolutely necessary to insure protection against the explosion of pro-

jectiles that may have penetrated the earthen cover. The general characteristics of the locality permit of the earth cover being increased to any extent deemed advisable. The present map is only general in its character, showing the arrangement of the different parts of the battery. Details with regard to doors, trolleys, electric lighting & firing, and drainage will be submitted at an early date.

The estimated cost of the battery from the best information available at the present time is as follows:

Excavating and placing parapet, 21,000 yards earth at \$0.3375 per yard,	\$ 7,087.50
Rehandling 7,000 yards (grading) at \$0.30,	2,100.00
8,426 cubic yards natural cement concrete at \$6.00 per yard (including forming)	50,556.00
370 yards Portland Cement mortar for facing exposed surfaces at \$10.00 per yard,	3,700.00
Platforms (cost taken from San Francisco work),	30,000.00
160,000 lbs. Steel Beams etc., at \$0.05 per pound,	8,000.00
Trolleys and Shot Hoists,	2,500.00
Electric Light Plant,	6,000.00
Observation Station,	500.00
Cement Shed and Office,	750.00
Concrete Mixer,	1,000.00
Plant for conveying concrete materials, steel beams and timbers from dock to site of work,	2,000.00
Drainage,	1,000.00
Engineering and Contingencies,	9,806.50
Total:	\$125,000.00

Very respectfully,
Your obedient servant,

W. W. Lockwood

Through Major, Corps of Engineers, U.S.A.
Col. John M. Wilson,
Corps of Engineers, U.S.A.
Division Engineer, N.E. Div.

2 Inclosures, in separate package.

ENGINEER OFFICE, Northeast Division, RECEIVED <i>Aug. 31</i>	100
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OFFICE, CHIEF OF ENGINEERS

15892
SEP 2 1896

WAR DEPARTMENT,
Newport, R.I., Aug. 29, 1896.

Lockwood, Major D. W.
Corps of Engrs. U.S.A.

wards tracing of plan and
is-sections of Mortar Battery
built on Ft. Adams reserva-
States general character of
and estimated cost of con-
struction.
States that details will be
submitted at an early date.
(2 inclos. tracings in sep. roll)

File
2 inclos & 2
(tracings)

RECD. OFFICE CHIEF OF ENGINEERS
SEP 10 1896

*Recd. track No. 5. Over Sep. 10, 1896.
Recd back U. S. ENGR. OFFICE, NEWPORT, R.I. SEP. 4. 1896
Recd. track No. 5. Over Sep. 2, 1896.*

3

1st indorsement.
NORTH EAST DIVISION
ENGINEER OFFICE,
Washington, Aug. 31, 1896.

Respectfully forwarded to
the Chief of Engineers with re-
commendation for favorable con-
sideration.

The proposed battery is to
consist of sixteen 12" B.L. Mor-
tars.

In view of the other perma-
nent works of defense in the
vicinity, it is believed that the
storage capacity of the maga-
zines and shell rooms, (173
rounds of powder and projectiles
per mortar) will be sufficient.

Colonel, Corps of Engrs. U.S.A.
Division Engineer, N.E. Division.
(428-No. Ea. Div.-1896)

2d indorsement.
Office Chief of Engineers,
U.S. Army,

Sept. 2, 1896.

Respectfully returned to Major
Lockwood, approved.

In the detailed plans provi-
sion should be made for lighting
the magazines, if necessary, by mag-
azine lamps having the usual pro-
tection.

The estimate for electric
lighting plant is too large, and is
not approved.
When such record as may be
necessary has been made, these pa-
pers will be returned to this of-
fice.

By command of Brig. Gen. Craigbill:

W. H. Black
Captain, Corps of Engineers.

15892

9
Inclos. 10 & 11 in sep. roll.

Through Col. JOHN M. WILSON,
Corps of Engineers,
Division Engineer, Northeast Division.

2d indorsement.
NORTH EAST DIVISION
ENGINEER OFFICE,
Washington, Sep. 2, 1896.

Respectfully transmitted
to Major D. W. Lockwood, Corps
Engineers,

W. H. Black
Colonel, Corps of Engrs. U.S.A.
Division Engineer, N.E. Division
(428-No. Ea. Div.-1896)

4th Indorsement.
U.S. Engineer Office,
Newport, R.I., Sept. 8, 1896.

Respectfully returned to the
Chief of Engineers, U.S. Army.
A special estimate will be
made for elec. plant and de-
tails with regard to lighting by
magazine lanterns. In connec-
tion with the first item, it may
be stated that the figures given
include the cost of necessary
plant for generating electricity
and also a storage battery.

Thro Major of Engineers.
Col. John M. Wilson,
Div. Engr. N.E. Division.
15892-9.

Subject:

U. S. Engineer Office,

MAJOR D. W. LOCKWOOD,
Corps of Engineers, U. S. A., in Charge.

Newport, R. I., Nov. 16, 1896.

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

General:-

I have the honor to submit the following with regard to the Mortar Battery at Fort Adams now in process of construction.

The templets for the holding down bolts in the pit farthest from the redoubt, (Pit No. 4) are completed and the bolts nearly all suspended ready to be set in concrete. The next pit is nearly excavated and will be ready by the time the templets can be removed from the pit, No. 4.

I hope to be able to complete these two pits before compelled to stop work on account of cold weather, but this will depend upon what the weather is for the next two weeks.

I would request, in view of the situation, that the base rings for eight mortars be sent to Fort Adams at as early a date as practicable.

The soil is of such a character that I do not believe it will stand during the winter, at any but a comparatively gentle slope, and if possible I intend to construct the extreme outer wall surrounding the magazines and shell rooms. As fast as the excavation will permit, the footings of walls &c., are being put in and

the walls themselves built. Up to date the conditions have not been such that the full capacity of the mixer could be utilized.

Very respectfully,

Your obedient servant,

D. W. Lockwood

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

Through Colonel John M. Wilson,

Corps of Engineers, U. S. Army,

Division Engineer, Northeast Division.

ENGINEER OFFICE, Northeast Division, RECEIVED Nov 17	1896
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OFFICE CHIEF OF ENGINEERS

15892
30
WAR DEPARTMENT.

Newport, R. I., Nov. 16, 1896.

ckwood, Major D.W.
Corps of Engrs. U.S.A.

Submits statement of con-
tion of work on Ft. Adams Mor-
r Battery now in process of
struction.

Requests that base rings
r eight mortars be sent to
Ft. Adams at as early date as
practicable.

For by Col. McMillen, Div. Eng.

RECEIVED CHIEF OF ENGINEERS
18 NOV 25 1896

*Rec'd back Mr. Engr. Nov 25, 1896
Rec'd back Mr. Engr. Nov 25, 1896.*

1st indorsement.
NORTH EAST DIVISION,
ENGINEER OFFICE.

Washington, Nov. 17, 1896.

Respectfully forwarded to
the Chief of Engineers with re-
commendation that the base rings
for mortars be sent to Fort
Adams as requested herein, as soon
as practicable.

John H. Wilson

Colonel, Corps of Engrs. U.S.A.
Division Engineer, N.E. Division.
(602-No. Ea. Div.-1896)

2nd Indorsement.

Office, Chief of Engineers,
U. S. Army,
Nov. 20, 1896.

Respectfully returned.
Application was made to the
Chief of Ordnance October 13,
1896, for the shipment of sixteen
12-inch mortar carriages to Fort
Adams. It is improbable that any
of these carriages will be deliv-
ered before the close of the pres-
ent working season.
The Chief of Ordnance has here-
tofore stated that the base rings
cannot be shipped in advance of
the other parts of the carriages.

No delay in the Engineer work
of the battery need be caused by
the delay in the receipt of the
base rings, as the platforms can
be prepared for their reception
and left temporarily to await
their arrival.

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

By command of Brig. Gen. Croiswill:

W. M. Black
Captain, Corps of Engineers.

15892
30

Through Col. JOHN M. WILSON,

Corps of Engineers,
Division Engineer, Northeast Division.

3rd indorsement.

NORTH EAST DIVISION
ENGINEER OFFICE.
Washington, Nov. 21, 1896.

Respectfully transmitted
to Major D. Wilckwood, Corps of
Engineers.

John H. Wilson

Colonel, Corps of Engrs. U.S.A.
Division Engineer, N.E. Division.
(602-No. Ea. Div.-1896)

4th indorsement.
U. S. Engineer Office,
Newport, R. I. November 23, 189

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

W. M. Black
Major of Engineers

15892
30

Through Col. J. M. Wilson,
Corps of Engineers, U.S.A.,
Div. Engr. N.E. Div.

3rd indorsement.

NORTH EAST DIVISION
ENGINEER OFFICE.
Washington, Nov. 25, 1896.

Respectfully forwarded to
the Chief of Engineers.

John H. Wilson

Colonel, Corps of Engrs. U.S.A.
Division Engineer, N.E. Divisio
(602-No. Ea. Div.-1896)

RECEIVED CHIEF OF ENGINEERS
NOV 25 1896

Subject:

U. S. Engineer Office,

Newport, R. I., October 7, 1898.

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

General:

In compliance with 1st indorsement, dated Office Chief of Engineers, U. S. Army, September 22, 1898, on p. c. extract of $\frac{15892}{75}$ and p. c. of 1-9 indts. thereon, I have the honor to submit the following remarks upon the report of a Board of Artillery Officers constituted to examine and report upon the condition of the 12-inch B. L. Mortar Battery, and its appurtenances, at Fort Adams, R. I.:

X ✓ 20. The bottoms of the annular spaces under the cover plates can be surfaced so as to drain more readily into the pits under the mortar at an expense of \$15 per mortar, or \$240 for the entire sixteen. Dirt that may collect in these spaces should be removed by hand so as not to clog the drains.

21. Wet magazines and galleries. This condition of affairs results, in the main, from condensation and the various rooms, &c., will be damp in warm, wet weather, unless some means can be devised for artificial ventilation or drying.

The entire roof of the work is covered with a layer of asphaltum, bitumen and sand. The front wall is drained at its base and near the top, and yet under certain conditions of the atmosphere, the roofs and walls of the powder magazines and shot galleries are wet. A north wind or cool weather will in a little while dry out the traverse galleries but the cross galleries remain damp.

The temporary magazine was made by closing the inner end of the passage or room in the west abutment; formerly this was dry, there being a free circulation of air through it when the outside door was opened, but when the inner end was closed and circulation of air interrupted, the walls became wet. If chimneys or air passages were opened at the south ends of the traverse galleries and fans placed in the cross galleries, the condition of the rooms would, in my opinion, be much improved.

22. Magazine floors. There would, so far as I can see, be no objection to putting an asphaltum floor in new works, but an asphaltum or wooden floor hardly seems necessary at present in view of the fact that the Board reports that "it is impossible to use the magazines at all for the storage of powder even for the shortest periods and when in cases. "

23. Trucks and railroads. I do not see any necessity for the arrangement proposed. In the first place, it may be a long time before the shell rooms are so full that the ordinary shot truck cannot be used without any difficulty for transferring projectiles when necessary in the galleries. Powder is taken from the magazines by hand, and can be handled on hand barrows if required to be transferred. With a railroad and trucks as recommended, projectiles would have to be moved on the trolley system to the proper traverse gallery before loading on trucks, then moved on railroad to traverse gallery beyond shell room where required, hoisted and run back. This would apply, however, only to one trolley in each gallery, the one furthest from the pits; on the other the trolley would have to be switched before loading the truck and after unloading.

It was assumed in planning these galleries, that the different kinds of projectiles would be apportioned to the different rooms in such a manner as to do away with the necessity for much transferring . As the trolleys are now arranged, projectiles can be brought to the doors of the traverse galleries, placed on the ordinary trucks and taken to proper trolley for placing them where required.

This would hardly require more time than where two switches have to be made.

24. Water supply. There is a penstock opposite the middle point of each pit at the foot of the slope in rear of the battery . No hose was furnished as it is a part of the perishable equipment of the battery, and I was not aware that it should be furnished by the Engineer Department. To furnish each penstock with hose, 100 feet to each, with nozzles and suitable connections would cost \$150 .

The spring mentioned by the board near pit 1 is intermittent, and is of no use whatever for the purposes mentioned by the board.

25. Sinks. The board recommends that sinks for officers and men be placed in the slope north of the battery, or in other words, in the battery itself. As the battery is not to be occupied as quarters for troops, the need of permanent sinks is not apparent. They would be expensive, and would be more or less of a nuisance at all times, particularly in summer, no matter how carefully constructed.

I would recommend that suitable sinks be constructed near the Light Battery stables for temporary use during drills,&c. I estimate the cost of these structures, suitable for all the re-

quirements of the situation at \$100.

26. A storage battery charged by using the current furnished by the City Illuminating Company has been installed, but it will be necessary to keep the apparatus, particularly the switch-board, under lock and key, to protect it from careless handling by incompetent persons. Evidences of this are apparent already. Had the board examined the openings in the walls near the doors of the magazines carefully, the use to be made of them would be made apparent. Each is furnished with a chimney leading up through the parapet, the intention being to furnish an additional means of lighting the magazines should the electric system be interrupted from any cause. The plan in view provides for a plate glass bull's eye between the lamp and the interior of the magazine.

27. Rings. No rings for holdfasts were contemplated. The carriages and mortars were mounted by the Engineer force without developing any necessity for them. They can be put in with little trouble but should have the inner end of the bolt swelled or provided with a head and washer and be cemented in. If put in, there should be 6 to a pit, and their cost in place would be \$50 each or \$1200 for all 4 pits.

28 & 30. Telephones and Electric Firing System.

When this battery was planned provisions were made for a relocating room and a commanding officer's room from which all the mortars could be fired. As far as possible the arrangements were made to meet what was considered at the time the requirements for handling the battery and fire control, although nothing very definite or authoritative on these matters was known.

As a member of the Board for selecting sites for Range Finders at Fort Adams, I knew what the general plan was and also that the Range Finder installed in the redoubt was intended to be only temporary, and for the instruction of the garrison. When the war broke out, it furnished the only means of directing the fire of the mortar battery, and as the installation of this Range Finder was only temporary, "temporary expedients" were resorted to to make it available.. A chance shot might have thrown the whole mortar battery out of action, but the Range Finder itself was the weakest point in the system, being the most exposed; broken wires could have been replaced in a few minutes, but the range finder disabled would have thrown the battery out permanently.

It is not apparent to my mind that burying wires underground is the better plan owing to the difficulty of locating faults and making repairs.

It would seem to me better to await something definite with regard to the way in which such a work is to be handled, before making permanent dispositions concerning the electrical devices to be used in firing, or transmitting messages with reference to range and direction.

✓ 29. Storage. One of the rooms in the East Abutment can be partitioned off and fitted with shelves and closets for \$500.

31. Hooks. As the pits are of the old type, the amount of space between the mortars and walls is limited, and sponges and rammers disposed as suggested by the board might be in the way. The fact that the Ordnance Department furnishes props for them would indicate the manner in which they are to be taken care of.

32. Steps. The entrance to the battery is by the east flank. The construction of the steps as suggested would be a convenience and would cost \$500.

33. Drain covers. Those provided are of the usual form and are believed to be all that is necessary for the purpose intended, namely, to prevent trash getting into the drains and clogging them.

The manhole covers do not require removal often enough to make this suggestion of any weight.

Very respectfully,

Your obedient servant,

W W Lockwood

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

Through

Brig. Gen. G. L. Gillespie,

Colonel, Corps of Engineers, U.S.A.,

Division Engineer, Northeast Division.

141
N-E-D
1898

Rec'd, N. Y., Oct. 8, 1898.

OFFICE CHIEF OF ENGINEERS

OCT 13 1898
WAR DEPARTMENT

Newport, R.I.
Oct 7, 1898

Lockwood
Major H.W.

Remarks upon report
of Board of Army Officers
on Motion Battery Artillery

Subject: Dampness in the mortar battery at Fort Adams ,R.I.

U. S. Engineer Office,

Newport, R. I., July 13, 1901.

Brig. Gen. G. L. Gillespie,

Chief of Engineers, U. S. Army,

Washington, D. C.

General:

I have the honor to submit the following report on the question of the dampness in the mortar battery at Fort Adams, R.I.:

A series of observations extending from October 21, 1900, to June 1, 1901, have been made, the weather conditions through this period being very favorable for determining whether the wet condition of the battery was due to infiltration or condensation. Both the fall and winter were dry and the spring exceptionally wet. Without entering into details, the following general conclusions may be stated:

The water from the first rains after the drought was absorbed by the earth covering the magazines and when saturation was obtained, the surplus moisture began to appear on the magazine ceilings and walls at first in small wet spots but gradually extending until the water began to drip from the ceilings and run down the walls; when dry weather followed a short rainy spell, ventilation would in a few days stop the dripping in the magazines which eventually dried out but subsequent rains would cause moisture to drop almost immediately. The excessive rains during the spring kept the battery in a very wet condition and it still continued so until May 25th.

Condensation was not possible during this period, due to the relative temperatures within the batteries and the outside air.

The mortar battery in its present condition is excessively wet. To make it water tight from without is practically impossible and it is therefore recommended that the magazines be lined in the same way as the magazines at Pensacola were treated. Estimates have been prepared on this basis and are submitted herewith, using copper for the ceiling instead of lead, as it is found that 16-ounce copper will be less expensive than the lead covering. There is not sufficient slope to the floors of the magazines and galleries to carry off the water that might collect and the cutting of the necessary drains is included in the estimate.

The galleries in which the projectiles are stored are so wet, that the commanding officer states that it keeps his entire force constantly employed in looking after and keeping in good condition the 760 projectiles on hand. He requests that a temporary shed be erected in the rear of the battery for the storage of these shells, and plans and estimates for such a structure are submitted herewith, with recommendation that it be built.

If the estimate for lining the magazines be approved and authorized, there is available for this purpose an unexpended balance of \$176 from an allotment made July 29, 1899, from the Preservation and Repair Act of March 3, 1899, also \$400 remaining on hand unexpended on July 1, 1901, from allotment made from appropriations for Preservation and Repair, making to total amount necessary to

be allotted for all the magazines, \$1,724.

Very respectfully,

Your obedient servant,

George G. Gault

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

2 inclos. 1 in sep. roll.

Through Col. Chas. R. Suter,

Corps of Engineers, U.S.A.,

Division Engineer, Northeast Division,

Army Building, New York, N.Y.

RECEIVED 10 10 1917

REC'D. OFFICE CHIEF OF ENGRS. JUL 26 1901

Subject: Lining magazines.

U. S. Engineer Office,

Newport, R. I., June 25, 1902.

Brig. Gen. G. L. Gillespie,

Chief of Engineers, U. S. Army,

Washington, D. C.

General:

1. In compliance with instructions contained in letter of the 22nd ultimo, I have the honor to forward herewith tracing showing the method of lining the magazines of the 8-inch batteries at Fort Rodman and the magazines at Battery Greene, Fort Adams, R.I.
2. The use of brick and metal for such purposes was suggested in a letter from the office of the Chief of Engineers describing the method pursued at Pensacola, Florida. In both cases in this district, brick was used for the walls and sheet copper for the roof.
3. In the method of construction, the effect of the blast was considered and to prevent the wall from being knocked in against the original concrete walls, headers were distributed and to prevent the wall from falling towards the middle of the room, due to the same cause, galvanized iron ties were introduced.
4. At Fort Rodman, a system of drainage had been constructed when the battery was being built, with outlet in the magazine about in the center of the room. In this case, gutters of concrete were constructed with openings into pipes leading to this central drain

2-

opening, the slope used being 1 ^{about inch} foot in ten, for gutters and pipes. A new floor, itself with a slope of 1 ^{rather than} foot in 10 ^{inch}, so as to give proper drainage for any water that might get on the floor, was put in. The side walls were built of brick laid as stretchers for ⁴ 5 courses and then a course with headers and stretchers, one header to two stretchers. All headers received 3 treatments of the Sylvester process so as to render them non-absorbent. The bricks were immersed in the solution until no air bubbles appeared, taken out and dried, the brick being subjected to this treatment 3 times in succession. The 3 lower courses of ^{stretchers} headers over the gutter were treated in the same manner. The ceiling of sheet copper was placed as indicated in the tracing with slopes either way from the center, securely held in place by galvanized angle iron and a galvanized flat iron and secured to the side walls by galvanized iron angle irons held in place by brass expansion bolts. To allow passage for water that leaked through on to the roof and which passed down to the side walls, curves were cut in the concrete forming drains.

5. To reduce condensation to a minimum, openings were left in the wall just above the gutter with a view of permitting the air in the magazine going to the back of the lining wall as readily as to the front. Bricks were left out in the upper course, so as to allow circulation. So far as Fort Rodman is concerned, it has been very successful. Where formerly water constantly dripped in after every rain, the rooms have remained perfectly dry and the condensation has not been sufficient to show on the floor.

To what extent, however, this latter may obtain during the muggy days of the summer remains to be seen.

6. At Battery Green, though the same method of construction was adopted, with the exception that ⁵~~six~~ courses of stretchers were used before headers were introduced and the roof made to slope from one side to the other on account of the extreme length of the magazine, the result has not been so satisfactory. There was no drainage system in the battery. The concrete was found to be exceedingly hard and the best that could be done was to construct a new drain from one ^{end} side of the magazine to the various ^{drains} exterior^{to}s of the battery. The magazines, adjacent galleries and rooms are very much wetter than at Fort Rodman with the result that there was always a greater amount of dampness in the atmosphere on the interior of this battery than in either of the batteries for the 8-inch guns at Fort Rodman and the effects of condensation on the lining have been very apparent. The addition of a new floor carrying the level of the present floor up above the gutter will it is believed materially affect the amount of moisture that is now apparent at the bottom of the gutter and which must come from seepage from the original concrete walls of the magazines. The original estimates did not include doing this but under a recent letter from the office of the Chief of Engineer it is hoped that funds may be obtained for this purpose. While the conditions are not as satisfactory as at Fort Rodman, percolation has entirely ceased and the magazines are so much better than the

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were that the work done has more than paid for itself.

Very respectfully,

Your obedient servant,

Geo W. Geophaly

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

2 inclos.(tracings.)

40022

14

WAR DEPARTMENT

1025 THE BOARD OF ENGINEERS.

37

RECEIVED JULY 18, 1902.

Newport, R.I.

Goevals, for Geo. W.

I compliance with E.D. letter of July 23, 1902, forwards, with certain remarks, tracings showing the method of lining the magazines of 8" batteries at Ft. Rodman and the magazines at Battery Greene, Ft. Adams, R.I., etc Inclos. E.D. (tracings).

Inclos. 8 to Genl. Custer as per telegram. Sept. 1902.

Inclos. 9 + 40025, and tracings. Also 1000 in the 1000.

RECD. OFFICE CHIEF OF ENGRS. AUG 14 1902
RECD. OFFICE CHIEF OF ENGRS. JUL 23 1902
Inclos. 5 & 6 in sep. roll.

1st indorsement.

Office Chief of Engineers,

U. S. ARMY.

July 2, 1902.

Respectfully referred to The Board of Engineers, for its information.

These papers to be returned.

J. A. McEachern

Bvt. Gen., Chief of Engineers,

U. S. Army.

40022
4
Inclos. 5 & 6 in sep. roll.

2d indorsement

The Board of Engineers,
Army Building,
New York City, July 11, 1902.

Respectfully returned to the Chief of Engineers, contents noted.

Ans. R. Custer
Colonel, Corps of Engineers,
President of the Board.

1025
37
Inclos. 38 & 39 in sep. roll.

RECD. OFFICE CHIEF OF ENGRS. JUL 12 1902

3rd indorsement.

Office Chief of Engineers,

U. S. ARMY.

July 21, 1902.

Respectfully returned to Major Goethals.

It is proposed to print this paper in the technical appendix to the Annual Report, and for this purpose a second copy is requested. On page 2 the word "headers" is used where it is thought "stretchers" is meant; it has been changed in pencil. If the original word is correct, the pencil notation should be removed.

In the drawings it is noted that the "elevation" of the brickwork shows Flemish bond, while the description is a modified American bond. It is not necessary to redraw the tracings, but a note should be added to show that the correct arrangement of bricks is shown in section and not in elevation. These papers to be returned.

By order of the
Acting Chief of Engineers:

40022
4
Inclos. 5 & 6 in sep. roll.
Frederic V. Colburn
Major, Corps of Engineers

4th indorsement.

U. S. Engineer Office,
Newport, R.I., August 12, 1902

Respectfully returned to the Chief of Engineers, U. S. Army, with copies, in duplicate of this letter. A new drawing has been made showing the bond as actually existing in the work which it is requested be substituted for the one forwarded originally.

W. M. McEachern
Major, Corps of Engineers.

Inclos. 5, 6 & 3 addl.

40022
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RECD. OFFICE CHIEF OF ENGRS. AUG 14 1902