23d Congress, 2d Session. [Doc. No. 86.] Ho. of Reps. War Dept.

FORTIFICATIONS IN BOSTON HARBOR.

LETTER

FROM

THE SECRETARY OF WAR,

ENCLOSING

The report of the Chief Engineer relative to the fortifications in Boston harbor.

January 13, 1835.—Read, and referred to the Committee of the Whole House to which is committed the bill (H. R. No. 600) *making appropriations for certain fortifications, &c. &c.*

January 16, 1835.—Printed by order of the House of Representatives.

War Department,
January 12, 1835.

Sir: In conformity with the resolution of the House of Representatives of the 8th instant, I have the honor to transmit a report from the Chief Engineer, communicating the information called for.

The resolution requiring my opinion upon the expediency of executing the repairs proposed in the report of the Board of Engineers, I beg leave to remark that that document, together with the first report of the Board, furnishes all the information in my possession upon this subject. Looking at these, I am satisfied that the defences of the harbor of Boston cannot be rendered complete without the repairs contemplated. But the proper time for doing this is a subject exclusively for the consideration of Congress.

The security of Castle island from the effects of the sea is highly important; and should Congress think proper to restrict the operations to that object, the sum of eight thousand dollars, which is asked for in addition to the amount now on hand, will be sufficient. Should they, however, decide that the reconstruction of the fort is now necessary, then an appropriation for about one-third of the sum estimated for by the Engineer Board will be necessary.

Very respectfully,
Your most obedient servant,
LEW. CASS.

Hon. John Bell,
Speaker of the House of Representatives.

[Gales & Seaton, print.]

AUTHENTICATED U.S. GOVERNMENT INFORMATION GPO

ENGINEER DEPARTMENT,

January 10, 1835.

SIR: In compliance with the resolution of the House of Representatives of the 8th instant, I have the honor to hand you herewith the report and estimate of the Board of Engineers for repairing Fort Independence, in the harbor of Boston.

The report and estimate contain all the information on the subject which can at this time be furnished. It may, however, be proper to state that Fort Independence is an important part of the defensive system adopted by the Board of Engineers for the protection of Boston harbor. The work is old, and in a dilapidated condition. To repair it properly, would amount almost to a reconstruction, as all its masonry requires to be rebuilt, its parapets, ramps, and slopes to be re-formed, and its gateways, posterns, and traverses renewed. The island on which it is situated is much exposed to the easterly storms which prevail on that section of the coast, and is liable to great injury from the encroachments of the water upon it. It is covered on the southeast by a stone wall, and was formerly protected on the northeast by a wharfing of timber: the latter, however, having decayed, that part of the island is again exposed, and it is proposed to cover it by the construction of a permanent wall. An estimate of the repairs required upon the island was made by a board of officers in 1831; but, owing to the impossibility of commanding the services of an officer of engineers to execute them until within the year 1833, this estimate was found to be insufficient, owing principally to the rise in the prices of the materials to be used. Another estimate was made within 1833, based upon what was supposed would be the average prices during the continuance of the work, and on the supposition, as in the former estimate, that the present plan of the work, in all its parts, would be retained. The first was $36,173 06, and the latter $56,094 80. It having been determined to convene the Board of Engineers in the fall of 1833, for the revision of several new works, it was deemed advisable to bring before it the condition of Fort Independence; and the report on that work, herewith submitted, is the result of their deliberations on the subject. It will be perceived that the Board recommend certain additions and improvements to the work as originally designed. These additions, the position of the fort in reference to the other points to be occupied for the defence of the harbor and city of Boston, renders necessary; especially as it must be occupied in time of war, not only for the purposes of general defence, but also as a general depot for stores and recruits, and for the establishment of military hospitals.

I am, sir, very respectfully,

Your obedient servant,

C. GRATIOT,

Chief Engineer.

Hon. LEWIS CASS,

Secretary of War.

NEWPORT, *March* 13, 1834.

SIR: In compliance with your instructions, the Board of Engineers have prepared the project, herewith submitted, for the repair and improvement of Fort Independence, on Castle island, in the harbor of Boston.

The large amount of appropriations which will be requisite to complete the work, renders it incumbent on the Board to state their views of the importance of the position, and of the necessity of the changes indicated in the project.

The advantages of Castle island as the site of a work for the defence of Boston against an attack by water, were discovered at a very early period of our history, it having been constantly occupied for that purpose since (about) 1630. It is, in fact, favorably situated, in every respect, for the defence of the main channel, and possesses the further advantage of commanding the "President's roads." The necessity of an efficient marine battery on this position will neither be obviated, nor in any degree diminished, by the construction of the works projected for the defence of the outer harbor, while to the latter the fort on Castle island will serve as a second line of defence; it affords the only security against the smaller class of vessels, which, as is known, may enter the harbor through Broad sound. The Board are, therefore, of opinion that the work ought to be maintained, and so improved as to be secure from a coup de main.

For the detail of this project, the Board respectfully refer to the drawings (plan, elevations, and sections) which accompany this report. The principal constructions which an accurate survey of the fort, and a close examination of its present condition, have shown to be necessary, in order to its being suitably adapted to its object, may be briefly stated as follows:

1st. *Scarp wall.* A new face of granite to replace the old face of bricks, now in a state of entire decay, giving to the new face a batter of $\frac{1}{48}$ instead of $\frac{1}{9}$, which is that of the original face. This scarp, which varies from 11′ to 13′ around the greater portion of the work, to be carried up 12′ higher on an average, so that the new cordon and coping will be nowhere less than 22′ 4″, or greater than 30′, and averaging 26′ 6″ in height.

2d. *Casemates*, bomb-proof, to be substituted for the present quarters and barracks, which, from decay, would otherwise require to be rebuilt. In these casemates embrasures are provided for fourteen additional pieces of heavy cannon, bearing in the most favorable directions for the defence of the main channel.

3d. Other bomb-proofs, for magazines and storerooms. It is proper here to remark that the present magazine is in so ruinous a condition, owing to defects of construction, and long neglect, as not to be susceptible of reparation.

4th. A casemate for carronades in each flank, without which the foot of the scarp along the whole extent of every curtain, together with a considerable triangular space in front not being seen from the covering line, would be left undefended.

We have the honor to be, very respectfully, your obedient servants,

JOS. G. TOTTEN,
Lieut. Col. Eng's, Brevet Col.
S. THAYER,
Major of Eng's, Brev. Lt. Col.

Brig. Gen. CHAS. GRATIOT, *Chief Eng'r.*

ESTIMATE of the materials and workmanship, and of the funds required for the repair and improvement of Fort Independence, in Boston harbor, Massachusetts.

	Hammered stone.	Rubble stone.	Bricks.
1st. Masonry.			
Chemise on scarp wall, along the casemates between cordon and foundation of piers, length 729′, height 20′, width 5′ 2⅝″	38,273′	41,621′	
Face of scarp below chemise, between foundations of piers and new surface of ground, length 729′, height 5′ 6″, width 3′ 6″ - - - - -	10,026	4,011	
Face of scarp between old foundation and new surface, along N. E. curtain, and adjacent casemates, length 216′ 7″, height 5′, width 3′ - - -	-	3,250	
New face of old scarp sustaining earth, length 1,412′, height 14′ 6″, width 3′ -	51,185	10,237	
New wall built on old, length 1,412′, height 11′, width 6′ - - -	42,360	59,304	
78 counterforts, length 4′ 6″, height 11′, width 4′ 6″ - - - -	-	16,484	
Stone parapet, length 880′, height 5′ 6″, width 5′ - - - -	24,420		
Course of cordon under stone parapet, length 880′, height 1′, width 6′ 6″ -	2,640	3,080	
Cordon course along earth parapet, length 1,261′, height 1′, width 6′ - -	3,783	3,783	
Interior revetm't of parapet, length 1,261′, height 4′ 6″, width 2′ 6″ - -	-	14,186	
Foundations of revetment, length 1,261′, height 2′ 6″, width 3′ 6″ - -	-	11,033	
Casemates on N. E. and S. E. curtains, number of casemates 14, span 18′, total length of arches 650′, thickness 2′, height from floor to crown of intrados 14′, thickness of piers 5′ - - -	-	64,066	32,072
8 casemates on the south curtain for officers' quarters, alternately 21′ and 16′ span; total length of arches 280′, thickness of 21′ span 2′ 4,″ of 16′ span 2′, height from floor to crown of intrados 14′, thickness of piers 5′ - -	-	24,322	15,680
Gateway, width 8′, height 8′, span of arch 12′ 6,″ length 43,′ thickness of arch 1′ 8,″ thickness of piers 5′ - -	383	4,742	811

ESTIMATE—Continued.

	Hammered stone.	Rubble stone.	Bricks.
2 flank casemates 27′ span, thickness of arch 2′ 8″, height to crown of intrados 14′, thickness of piers (mean) 6′, thickness of rear walls 3′ 4″, mean length of arches 23′ - - - - -	-	17,097′	4,097′
8 flank casements 20′ span, thickness of arches 2′ 4″, height to crown of intrados 12′ 2″, mean length 21′, thickness of rear walls 3′, piers 5½′ - -	-	32,864	10,134
Principal magazine, length 46′; length of arch 40′, span 15′, thickness of arch 3′, height to intrados 10′ 10″, thickness of piers 6′ - - - -	-	14,090	2,460
2 magazines in bastion A, length of No. 1, 42′; of No. 2, 38′ in the clear; span 13′ 6′, thickness of arch 2′ 8″, height to intrados 12′ 9″, thickness of piers 5′ -	-	15,487	
Magazines and store rooms in bastion E; No. 1, mean length of arch 25′, span 12′, thickness of arch 2′ 8″; No. 2, mean length 18′, mean span 13′ 3″, thickness of arch 2′ 4″ - - - -	-	9,987	2,713
2 privies in bastion E, length of each 14′, span 12′ - - - -	-	3,864	1,428
Supporting walls over the ends of casemates along the scarp and parade wall	-	20,210	
Parade wall along casemates, length 577′ 6″, height 20′ 3′, width 1′, deducting openings for doors and windows=1,078′	10,721′	4,765	
Parade wall, backed by galleries, length 303′ 11″, height 20′ 3″, mean width 4′, deducting openings, and adding foundations, gallery 6′ wide, back wall 3′ wide, height 7′ 6″ to crown of arch - -	9,232	34,235	2,236
Parade wall, without galleries, length 30′ 8″, height 20′ 3″, mean width 6′; ramp walls, without galleries, length 171′, mean height 10′, mean width 3′ 7″, adding foundations - - -	3,805	9,875	
Coping of parade wall, including ramps, length 1,083′, width 2′, thickness 9″ -	1,626		
Galleries of communications to flank casemates, &c., total length 471′, span of arch 6′, thickness of arch 1′, height to crown of arch 7′ 6″, thickness of abutment wall 2′ 6″, adding foundations -	-	12,816	3,110

ESTIMATE—Continued.

	Hammered stone.	Rubble stone.	Bricks.
Steps, landings, platforms, &c. - -	5,400′		
14 gun embrasures, 22 carronade embrasures, dead arches over 36 embrasures, flues and arches over and under 44 fireplaces, 4 ovens, 4 cisterns, evacuators of smoke to casemates, &c. - -	-	10,000′	
Drain or sewer. Cylindrical drain under rampart 75′ long, 3′ diameter, 750 cubic feet; elliptical draw 6′×3′, and 240′ long = 3,600′ - - -	-	4,350	

Plastering.

Casemates for officers' quarters - -	16,466′	
Casemates for soldiers' barracks - -	23,172	
Casemates for principal magazine - -	1,588	
Casemates for other magazines and privies	6,716	
Ceiling of gateway - - -	634	
Total -	48,576 sq. ft. =	5.397 yds.

Cornices for officers' quarters = 780 running feet.

Sheet lead for covering roofs of casemates, and for pipes to carry off the water.

For 18 casemates on N. E. and S. E. curtains -	21,600′
21′ and 16′ casemates on south front = superficial ft.	12,674
27′ flank casemates - - - -	2,300
20′ flank casemates - - - -	8,208
Magazines, store rooms, and privies, and for galleries of communication - - - -	10,994
	= 55,776 superficial

feet, weighing $2\frac{1}{2}$ pounds per superficial foot, equal to 139,400 pounds.

Recapitulation of masonry, &c.

1,392 cubic yards of hammered stone for face of parade wall, cordon, coping, steps, platforms, &c. &c. at $6 75 per cubic yard - - - -	$9,396 00
6,158 cubic yards of do. do. for face of scarp, stone parapet, and other purposes, at $4 per cubic yard -	24,632 00
15,756 cubic yards of rubble stone, at $2 per cubic yard	31,512 00
Laying 23,306 cubic yards of stone, at $3 50 per cubic yard, including lime, cement, sand, labor of making mortar, and attendance - -	81,571 00

Stone cutting.

69,455 superficial feet, for scarp and stone parapet, including coins and arch stones, and expense of repairing tools, at 20 cents per foot - - -	$13,891 00
20,198 superficial feet, for face of parade wall, arch stones, window and door sills, &c. &c. at 25 cents -	5,049 50
2,141 running feet of cordon, at $1 10 - - -	2,355 10
1,083 running feet, for coping of parade wall, at 85 cents	920 50
6,864 superficial feet for stairs, platforms, &c. &c. at 25 cents - - - - - -	1,716 00

Bricks.

89,603 cubic feet, of 26 bricks per cubic foot = 2,330,000, at $14 per thousand, including lime, cement, sand, labor of making mortar, and attendance - -	32,620 00

Plastering.

5,397 superficial yards, at 60 cents, including furrings and lathing - - - - - - -	3,238 20
780 running feet of cornices for officers' quarters, at 15 cts.	117 00

Sheet lead.

139,400 pounds, at 4 cents per pound, including laying and solder, (the pigs being furnished by Government)	5,576 00

2d. Carpenters, joiners, and glaziers' materials, &c.

Floors in officers' casemates -	5,540'	
Do. soldiers' casemates -	7,461	
Casemates of N. E. curtain -	2,160	
Magazines, &c. - -	2,502	
	17,663 superficial feet, at 10 cents per superficial foot - -	1,766 30
	Scantling for floors, 3,863 cubic feet, at 30 cents per cubic foot - - - -	1,158 90
	Centres for arches of casemates - -	200 00
	780 running feet of plinths and base mouldings, for officers' casemates, at 20 cents per running foot	156 00
1,664	plain base boards, for soldiers' casemates, and other furnished rooms, at 8 cents - -	133 12
	Gate to postern - - - -	150 00
8	doors to magazines, locks, &c., complete, at $30	240 00
18	do to galleries, &c. at $20 - - -	360 00
4	outside doors to officers' casemates, at $30 -	120 00
24	inside do do including architraves, bolts, locks, &c. at $20 - -	480 00
14	outside doors to soldiers' casemates, including same as above, at $20 - - -	280 00
10	inside doors to privies, at $10 - - -	100 00
40	windows to officers' casemates, 22 windows to soldiers' casemates, &c., and 20 other windows, containing altogether 1,852 superficial feet, at	

$1 per superficial foot, including glass, sashes, backs, elbows, architraves, shutters, and all other appurtenances - - - -	$1,852 00
Marble chimney pieces to officers' quarters, soapstone for fireplaces, and other fixtures -	1,000 00
Smithery, including materials - - -	2,500 00
Excavation and embankment, 37,000 cubic yards, at 25 cents - - - - -	9,250 00
	232,340 60
Expenses of superintendence and disbursement, and incidentals, 10 per cent. - -	23,234 06
	$255,574 66

Respectfully submitted.

S. THAYER,
Maj. Eng's, Lieut. Col.