

historic structure report

HISTORICAL AND ARCHITECTURAL DATA

NATIONAL PARK SERVICE
DENVER LEARNING CENTER
BRANCH OF MICROGRAPHICS
LIBRARY COPY

D 762

NATIONAL PARK SERVICE
DENVER LEARNING CENTER
BRANCH OF MICROGRAPHICS

FORT McHENRY

NATIONAL MONUMENT AND HISTORIC SHRINE/MARYLAND

B&W Scans

5-2-2005



NATIONAL PARK SERVICE
DENVER SERVICE CENTER
BRANCH OF MICROGRAPHICS
LIBRARY COPY

HISTORIC STRUCTURE REPORT

FORT McHENRY

HISTORICAL AND ARCHITECTURAL DATA

FORT McHENRY NATIONAL MONUMENT AND HISTORIC SHRINE

MARYLAND

Prepared by

Erwin N. Thompson
and
Robert D. Newcomb

DENVER SERVICE CENTER
HISTORIC PRESERVATION TEAM
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR
DENVER, COLORADO

October 1974



PREFACE

This modified historic structure report discusses the history of the surviving historic structures at Fort McHenry National Monument and Historic Shrine, Maryland. Its primary emphasis is on the exteriors of the structures only. The present project (Project No. 5173, Package No. 105) calls only for their exterior preservation. Nevertheless, it has been necessary to step into the "interiors" on occasion, especially in relation to the underground drainage system, which is important in the preservation of earth and masonry fortifications.

Notice should be given to the long footnotes in the report. The writers had heard of the magnificent collection of copies of documents at Fort McHenry that had been amassed in 1957-58 by the Historical and Archeological Research Project Team (HARP). Research was undertaken in this huge collection. After the research was well underway and too far advanced to switch horses, it was realized that documentation would be complicated. For example, a post quartermaster's letter to Washington may be filed in a particular 3-ring binder in the collection, and the response from the Quartermaster General may be filed in another. Thus two sources from HARP, as well as the National Archives identification, had to be cited. The recommendation is made that future NPS researchers go directly to the National Archives and the other manuscript sources. This does not imply that the HARP collection is unimportant. It is indispensable in the day-to-day management and interpretation of the area. Every park should have a collection as complete.

Our thanks are extended to all the park staff at Fort McHenry for their boundless hospitality as well as their generous assistance throughout the weeks of research. Superintendent Harry O'Bryant and Historian Paul Plamann guided us through the HARP collection. Every other member of the staff, permanent or temporary, interpreter, administrator, and maintenanceman, made us feel at home. Thanks go, too, to the many wonderful citizens of the adjacent community of Locust Point who accepted us into their social activities. This community possesses a joy of life.

Many people in the National Archives enabled the completion of this report. Dr. Elaine Everley, Old Military Records Office, guided us patiently through the record groups. John Pontius and Mark Samuelson, Central Search Room, took great care of both the documents and us. Ronald Grim, Cartography, cheerfully arranged for us to see every map and plan of Fort McHenry on file.

A special thanks goes to Historian Edwin C. Bearss, NPS, who shared his extensive knowledge of coastal fortifications and documentary sources thereof. Our appreciation is also extended to Linda Wedel and Barbara Hudson of the Denver Service Center who changed this scrawl into an organized report.

E.N.T.
R.D.N.



TABLE OF CONTENTS

PREFACE	iii
LIST OF ILLUSTRATIONS AND MAPS: HISTORICAL DATA	ix
LIST OF ILLUSTRATIONS AND DRAWINGS: ARCHITECTURAL DATA	xi
I. ADMINISTRATIVE DATA	1
<u>HISTORICAL DATA</u>	3
INTRODUCTION	5
II. HISTORICAL DATA, PART I: GENERAL HISTORY	9
A. Historical Significance	9
B. Early History of the Site	9
C. Construction of Fort McHenry, 1794-1802	11
D. Fort McHenry Plan, 1803	17
E. Fort McHenry, 1803-1819	18
F. Plan of Fort McHenry, 1819	28
G. Maintenance and Construction, 1820-1839	29
H. Maintenance, 1840-1860	52
I. Civil War	60
J. Stronger than Ever, but Growing Obsolete, 1866-1890	65
K. A New Water Battery, 1872-1892	77
L. Decline and Abandonment, 1890-1912	78
M. Absentee Ownership and Restoration, 1912 On	82
III. HISTORICAL DATA, PART II: INDIVIDUAL STRUCTURES	89
HS 1, Commanding Officer's Quarters	89
HS 2, Magazine	91
HS 3, Junior Officers' Quarters	93
HS 4, Enlisted Men's Barracks	95
HS 5, Enlisted Men's Barracks	97
HS 6, Sally Port, including Guardrooms and Bombproofs	98
HS 7, Civil War Magazine	102
HS 12, Star Fort, including Drainage	104
HS 13, Ravelin	113
HS 14, Water Battery	114
HS 15, Flagstaff	118

IV. CONCLUSIONS AND RECOMMENDATIONS	119
A. General	119
B. Brickwork and Stonework	119
C. Modern Devices	119
D. Shutters	120
E. Specific Structures	120
1. Commanding Officer's Quarters, HS 1	120
2. Magazine, HS 2	121
3. Junior Officers' Quarters, HS 3	121
4. Barracks, HS 4	121
5. Barracks, HS 5	121
6. Sally Port, Guardrooms, Bombproofs, HS 6	121
7. Civil War Magazine, HS 7	122
8. Star Fort, including Drainage, HS 12	122
9. Ravelin, HS 13	122
10. Water Battery, HS 14	123
11. Flagstaff, HS 15	123
V. RECOMMENDATIONS FOR FURTHER STUDY	125
GLOSSARY OF FORTIFICATION TERMS	127
APPENDIX	131
Commanding Officers, Fort McHenry	133
BIBLIOGRAPHY	137
ILLUSTRATIONS AND MAPS	141
<u>ARCHITECTURAL DATA</u>	199
ABSTRACT	201
INTRODUCTION	203
I. GENERAL DESCRIPTION AND PRESENT CONDITION	205
A. Star Fort, HS 12	205
B. The Commanding Officer's Quarters, HS 1	206
C. Magazine, HS 2	206
D. Junior Officers' Quarters, HS 3	206
E. No. 1 Enlisted Men's Barracks, HS 4	207
F. No. 2 Enlisted Men's Barracks, HS 5	207
G. Ravelin, HS 13	207
H. Water Battery, HS 14	208
I. Civil War Magazine, HS 7	208
J. Conclusion	208

II.	RECOMMENDATIONS FOR STABILIZATION AND RESTORATION	209
	A. Star Fort, HS 12	209
	B. Commanding Officer's Quarters, HS 1	209
	C. Junior Officers' Quarters, HS 2	210
	D. Magazine, HS 3	210
	E. No. 1 Enlisted Men's Barracks, HS 4	210
	F. No. 2 Enlisted Men's Barracks, HS 5	211
	G. Ravelin, HS 13	211
	H. Water Battery, HS 14	212
	I. Civil War Magazine, HS 7	212
III.	COST ESTIMATE	213
IV.	PRESERVATION PRIORITY LIST	215
	ILLUSTRATIONS AND DRAWINGS	217
	<u>ARCHEOLOGICAL DATA</u>	265
I.	HISTORICAL ARCHEOLOGY AT FORT McHENRY	267
	A. Historic Drainage System	267
	B. Latrines	267
	C. First Well	268
	D. Addition to Commanding Officer's Quarters	268
	E. Early Guardhouse and Shot Furnace	268
	F. Tunnel in Ravelin	268
	G. Bastion Flagstaff	268



LIST OF ILLUSTRATIONS AND MAPS:
HISTORICAL DATA

Illustration

1.	Whetstone Point, 1792	142
2.	Bombardment of Fort McHenry, September 13-14, 1814	144
3.	Fort McHenry, September 1814	146
4.	Fort McHenry in peacetime, 1853	148
5.	Fort McHenry, 1862	150
6.	Another view of Fort McHenry during the Civil War	152
7.	Interior, Fort McHenry, <u>ca.</u> 1883-94	154
8.	Barracks, HS 4, <u>ca.</u> 1905-22	156
9.	Water battery, HS 14, <u>ca.</u> 1918	158
10.	Former junior officers' quarters, HS 3, <u>ca.</u> 1905-22	160
11.	Sally port, HS 6, 1927	162
12.	Front of commanding officers' quarters, HS 1, and magazine, HS 2, 1927	164
13.	Rear of barracks, HS 4, 1927	166
14.	Rear of barracks, HS 5, <u>ca.</u> 1905-22	168
15.	Terreplein behind barracks, HS 5, 1973	170

Map

1.	Profiles of a theoretical fort and of Fort McHenry	172
2.	Fort McHenry, 1803	174
3.	Fort McHenry, 1819	176
4.	Fort McHenry, 1819	176
5.	Fort McHenry, 1833	178
6.	Interior, Fort McHenry, 1834	180
7.	Fort McHenry, <u>ca.</u> 1834	182
8A-B.	Fort McHenry, 1840	184
9.	Enlisted men's barracks, HS 5, 1840	188
10.	Enlisted men's barracks, HS 4, 1840	190
11.	Magazine at Fort McHenry during the Civil War	192
12.	Plans for converting officers' quarters, 1894	194
13.	Plans for converting enlisted men's barracks, HS 5, 1894	196



LIST OF ILLUSTRATIONS AND DRAWINGS:
ARCHITECTURAL DATA

Illustration

1.	Star Fort	218
2.	Ravelin	218
3.	Sally port--rear	220
4.	Sally port--front	220
5.	Flagstaff	222
6.	Commanding officer's quarters	222
7.	Magazine	224
8.	Junior officers' quarters	224
9.	No. 1 enlisted men's barracks, HS 4	226
10.	No. 2 enlisted men's barracks, HS 5	226
11.	Water batterys	228
12.	Civil War magazine	228

Drawing

1.	Key--exterior fort walls and ravelin	230
2.	Star fort exterior walls	232
3.	Star fort exterior walls	234
4.	Ravelin and sally port exterior walls	236
5.	Star fort exterior walls, HS 12	238
6.	Commanding officer's quarters, HS 1	240
7.	Powder magazine, HS 2	242
8.	Junior officers' quarters, HS 3	244
9.	No. 1 enlisted men's barracks, HS 4	246
10.	No. 2 enlisted men's barracks, HS 5	248
11.	Key--plan of Civil War magazine	250
12-16.	Elevations of Civil War magazine	252
17.	Fort walls--exterior and interior	258
18.	Water batterys	260
19.	Top: New recommended section through rampart Bottom: Existing section through rampart	262



I. ADMINISTRATIVE DATA

Fort McHenry National Monument and Historic Shrine is of the First Order of Significance. The present project calls for a historic structure report and for preservation of the fortifications and the exteriors of the existing historic buildings. This modified historic structure report does not deal with the interiors of the structures. It is proposed to give preservative treatment to all the exterior earthen and masonry work of the fortifications and buildings as they now exist, and not to attempt to restore the fort to any particular time in its history.

There are no cooperative agreements or other documents that bear on this proposal.



HISTORICAL DATA

One characteristic shared by all the defensive works was a high degree of architectural straightforwardness and simplicity, which is in large part responsible for the fact that the still-visible relics, to the average viewer, are almost impossible to date and, often, even to discriminate as to era.

--Emanuel Raymond Lewis,
Seacoast Fortifications of the
United States, 1970

INTRODUCTION

Fort McHenry has been in the National Park System for forty years. During that time historians and architects have accomplished a considerable amount of research on the structural history of the fort. Among the more pertinent structural reports are Lee H. Nelson's excellent Historic American Buildings Survey: An Architectural Study of Fort McHenry and W. Richard Walsh's concise The Star Fort, September 1814. These reports, and several others, bring much to this latest report and their contributions are fully acknowledged.¹

The question arises why additional historical research is needed now. The answer lies in the rapid growth of the philosophy of historic preservation during the past 15 years. Planning in the late 1950s called for returning Fort McHenry to its appearance of 1814--the time of the British bombardment. This would have called for the reduction of the two-story buildings to one story, the removal of the covering archway over the sally port, the elimination of the guardrooms on both sides of the sally port, the removal of the extensive water battery, and more. From the point of view then prevailing these changes were desirable. The British attack and the writing of the Star Spangled Banner were, and are, the most important events that occurred at and near Fort McHenry. It was thought desirable by many interested persons to present the fort as it appeared at that climactic moment in its history.

Since then the National Park Service has assembled and published its administrative policies for historical areas. Of special importance to Fort McHenry--which had a long, varied, and important life as an active military post after the War of 1812--is the policy that states: "As to a historic structure, it is often better to retain genuine old work of several periods, which may have cultural values in themselves, than to restore the whole to its aspect at a single period."²

1. Lee H. Nelson, Historic American Buildings Survey: An Architectural Study of Fort McHenry (National Park Service, 1961), 112 pages with plates; W. Richard Walsh, The Star Fort, September 1814 (National Park Service, n.d., ca. 1958), 27 pages.

2. National Park Service, Administrative Policies for Historical Areas of the National Park System (Washington, revised 1973), p. 27.

This policy is most important when Fort McHenry's later history is concerned. It continued to function as a coastal defense installation for many years, and served as a prison for captured enemy soldiers and civilians during the Civil War; as a source of strength during the labor disputes of the late 19th century; as a recruiting base at the time of the Spanish-American War; as a source of troops for formal parades in Philadelphia and Washington, D.C.; and as a large military hospital during World War I. Furthermore, some of the structural additions since the 1814 attack are now approaching 160 years of age. These have acquired values of their own and they are deeply woven into the fort's fabric and history.

This report, then, attempts to capture the continuing structural history of Fort McHenry from its beginning to the present time. For the more recent period, from 1890 on, additional research in the military records became a necessity. Hopefully, one or two additional facts concerning the fort emerge herein; but the primary intent of this study is a recasting of the structural history from a specific date (1814) to a general, evolving history.

The National Park Service applied building numbers to most of the historic structures at Fort McHenry. These same numbers are used herein as the historic structure numbers:

- HS 1 Commanding Officer's Quarters (old "A")
- HS 2 Powder Magazine (old "B")
- HS 3 Junior Officers' Quarters (old "C")
- HS 4 Barracks (old "D")
- HS 5 Barracks (old "E")
- HS 6 Guardhouse (old "F") and Sally Port
- HS 7 Powder Magazine--Civil War (old "G")

For the purposes of this report, additional historic structure numbers are employed as a means of specific identification of other structures in the fort complex; it is hoped these will become part of the permanent record:

- HS 12 the Fort itself
- HS 13 Ravelin
- HS 14 Water Battery
- HS 15 Flagstaff

At the beginning of the plans and maps at the end of this historical data section are drawings of Fort McHenry and theoretical forts containing labels identifying the different parts of an earth-and-brick fortification. Also included is a glossary of fortification terms. This material is presented as an aid to readers who may not

be versed in fortification terminology. In this regard, one should note that some of the army officers at Fort McHenry in the early 1800s were confused as to the meanings of these terms. The present writer also had some bad moments in the beginning of the research.



II. HISTORICAL DATA

PART I: GENERAL HISTORY

A. Historical Significance

Fort McHenry, constructed 1794-1802 to guard the port of Baltimore, is one of the finest surviving examples of the First (i.e., earliest) American System of seacoast fortifications. During the War of 1812, a British fleet bombarded this fort but failed to take the harbor. A witness to the attack, Francis Scott Key, was inspired to write the "Star Spangled Banner." The fort survived as an active military post for another hundred years, serving the nation well in war and in peace.

B. Early History of the Site

The early history of the point of land upon which Fort McHenry would eventually stand is sketchy. The first known settler here was Charles Gorsuch who patented either 15 or 50 acres on February 24, 1661. He paid a "rent" of £1 sterling per annum. Apparently Gorsuch later abandoned the tract. On June 2, 1702, James Carroll patented the same tract at a rent of two shillings per year. Carroll gave the point the name of Whetstone, by which it was known for many years. In 1725 he sold the property to John Giles for £5.

Two years later an association of British ironmasters, the Principio Company, purchased from Giles "all the iron opened and discovered or shut and not discovered" at Whetstone Point. Apparently the Principio Company did not acquire the land itself but only any iron ore therein. With the outbreak of the American Revolution, this company's activities promptly stopped.

In the spring of 1776 the British sloop Otter sailed up the Chesapeake, alarming the citizens of Baltimore and vicinity. More or less under the direction of the Maryland Council of Safety, citizens and slaves began erecting fortifications on Point Whetstone as early as February. James Alcock received credit for drawing up plans for an 18-gun water battery. Messrs. Griest, Griffith, and Lodenslager supervised its construction. And Capt. Nathaniel Smith assumed command of the strong point.

At first the workers labored at constructing a water battery, which soon evolved into an upper and a lower battery. By the

middle of March 1776, the word "fort" also began appearing in correspondence received by the council. On March 16, for example, a letter announced: "Our Fort at Whetstone is ready to mount 8 guns, and we shall use every exertion to expedite it." However, that July, another letter indicated that the "fortification" was still incomplete. By the end of the year, plans for a magazine at Whetstone Point were well advanced, but this structure may not have been built. It would seem that by the summer of 1777 a fort at the point was in use. A number of references to it by then may be found in the council's correspondence.

In 1778 the council noted that prisoners were kept at the fort and, that same fall, it directed the removal of a hospital from Baltimore to the fort at Whetstone Point. However, as the war dragged on, the danger of attack at Baltimore seemed more and more remote. By 1781 some of the cannon had been removed and the Council of Safety was anxious to dispose of the lands there to help pay the salaries of the officers and men.

No detailed descriptions of the fort or the water batteries have been found. A 1781 map of the point shows a true star fort, without bastions, an upper and a lower water battery with a possible total of 27 embrasures, a flagstaff, and four buildings outside the star fort. A 1792 map shows a similar fort, a single battery, and no outbuildings (see illustrations). It is probable that the star fort and the batteries were of simple earthen construction with perhaps some timber reinforcement.¹

1. National Archives, Record Group 94, Medical History of Fort Mchenry, 1906-12, Record for July 1912, clipping from the Baltimore American, Aug. 25, 1912, hereinafter cited as NA, RG. Both a handwritten and a typescript account containing much the same information are to be found in the Fort Mchenry History and Archeological Research Project, 1957-58, Collection, volume for 1887, hereinafter cited as HARP; HARP, 1776, American Archives, 4, 4, 1167, "Correspondence, Proceedings, etc.," February 1776, Samuel Purviance, Jr., Baltimore, Feb. 1776, to Maryland Council of Safety; HARP, 1776, Archives of Maryland, Journal and Correspondence of the Maryland Council of Safety, 1775-1776, p. 244, Baltimore Committee, Mar. 13, 1776, to the Council; p. 434, Nath. Smith, Baltimore, May 20, 1776, to the Council; Journal and Correspondence . . . July 7-Dec. 31, 1776, William Lux, Baltimore Committee, July 7, 1776, to the Council; HARP, 1777, Journal and Correspondence . . . Jan. 1-Mar. 20, 1777, N. Smith, Baltimore, Aug. 22, 1777, to Governor Johnson; HARP, 1778, Journal & Correspondence of the Council of Maryland, Apr. 1, 1778-Oct. 26, 1779, p. 230, entry for Thursday, Nov. 5, 1778; HARP, 1880, Archives of Maryland, 45, Journal & Correspondence of the State Council of Maryland, 1780-81: Geo. P. Keepport, July 12, 1780 and Jan. 23, 1781, to Governor Lee (Red Book No. 30, Letters 6 and 32); Council, Mar. 29, 1881, to John Shaw (Liber No. 78, p. 100); and Council, Aug. 6, 1781, to Nathaniel Ramsey (Liber No. 78, p. 238); Nelson, Illustrations No. 1 and No. 2.

C. Construction of Fort McHenry, 1794-1802

War in Europe following the Revolution in France caused the United States government concern about the state of its coastal defenses. In the spring of 1794, the Congress passed legislation authorizing the erection of fortifications along the Atlantic coast. A report submitted to Congress recommended the modest expenditure of \$4,225 for the fortification of Baltimore:

Baltimore, Twenty-eight Pieces	
Parapets, embrasures, and platforms	
for batteries, for 28 pieces	\$2,015.44
A redoubt, with four embrasures	810.00
Two magazines	400.00
Block-house or barracks	500.00
Contingencies	500.00
	<u>\$4,225.44²</u>

Maryland's House of Delegates had already passed a resolution that if the United States wished to erect military works on Whetstone Point the governor would grant the necessary land, "with the consent of the owner of the sod." The federal government now accepted this offer. Secretary of War Henry Knox wrote Maryland's Gov. Thomas Sim Lee that he had appointed Maj. John Jacob Ulrich Rivardi to plan the fortifications for both Baltimore and Alexandria, Virginia. Rivardi was one of several French artillery and engineer officers who had immigrated in recent years. Since the United States did not yet have a military academy for training engineers, these French officers played an important role in the first system of fortifications.³

2. Emanuel Raymond Lewis, Seacoast Fortifications of the United States: An Introductory History (Washington, Smithsonian Institution Press, 1970), p. 21; HARP, Ft. McHenry Buildings, n.d. and 1781-1813, 2, American State Papers, 16, 61-62, 3d Congress, 1st Session, Fortifications 1794, No. 13, Report by Mr. Fitzsimmons, Feb. 28, 1794.

3. HARP, Ft. Whetstone, 1779-1904 (1A), American State Papers, 16, p. 71, Resolution, Maryland, By the House of Delegates, Dec. 25, 1793; HARP, 1794, Archives of Maryland, Brown Books, 716, 4, 27, Knox, Mar. 28, 1794, to Lee; Francis B. Heitman, Historical Register and Dictionary of the United States Army (reprint, Urbana, 1965), 1, 833. Rivardi did not enter the U.S. Army until 1798. His grade of major must have come from France. He served on active duty until 1802 and died in 1808.

Rivardi's instructions held him to the figure of \$4,225 for a total cost of construction. He learned that the garrison was intended to consist of one officer and 30 enlisted men. The specific orders concerning construction called for the simplest of fortifications: earthen parapets, plank embrasures, and timber magazines. Before beginning the work, Rivardi was to obtain the approval of the state governor.⁴

By mid-April Rivardi had prepared his plans, secured the approval of Governor Lee, employed a superintendent of construction, and overseen the beginning of work on a lower water battery. Upon his arrival in Baltimore he had inspected the remains of the 1776 fortifications. He found the 1776 lower battery in bad repair and the upper battery of poor design. Furthermore, someone had dug a huge pit in this area to obtain iron ore or red ocher. He planned to rebuild the two batteries according to his own design. The lower battery would contain 20 guns rather than its former 11; the upper battery would have about 8 pieces.⁵

More pertinent to this report is Rivardi's evaluation of the 1776 star fort:

The Star fort never was entirely finished, and the greater part of the ditch is filled up with the earth of the parapets; that kind of redoubt, always bad in itself, (the fires being oblique, and the salient as well as the entrant angles, indefensible) is rendered still more so, the perpendicular of construction being one-fourth, instead of one-third of the side of the polygone /sic/.

The implication is strong that the first fort had consisted of earthworks only, and that no masonry had been employed. Rivardi planned to construct two small bastions in order to flank most of "the entrant and salient angles." In one of the bastions he planned to construct an underground magazine, the gun "platform itself serving as a bomb proof." Apparently he did not plan to use brick in the walls of the ramparts: "I shall want 1,280 feet solid timber, for

4. HARP, 1794, American State Papers, 16, 1794, p. 87.

5. These two water batteries will not be treated in depth in this report for several reasons: they no longer exist; it is recommended they not be reconstructed; their history has already been fully covered in S. Sydney Bradford, The Outworks of Fort McHenry, September 12-14, 1814 (National Park Service, ca. 1958).

the facing of some part of the works, at one shilling a foot; 1,400 palisades to freize /sic/ and palisade the berm and ditch of those two sides of the redoubts which are not flanked /by the bastions/, besides the necessary timber for facing the embrasures and covering the platforms." Rivardi drew plans of the proposed work, forwarding one set to the Secretary of War. These plans have not yet been discovered.

A week later, he further informed the secretary that he was also constructing a frame barracks, 40 feet by 16 feet. Eighteen workmen were already on the job. And he had requisitioned 100 shovels, 30 pickaxes, 36 pickets (?), 70 wheelbarrows, 2 gins with blocks and falls, and 1 crowbar.⁶

Samuel Dodge, a civilian who was sometimes referred to as a lieutenant, became the superintendent of construction at Fort Whetstone, as it came to be called. Rivardi hurried on to Alexandria to plan its works. On May 19, 1874, Dodge reported that the lower battery was "nearly to its height" and that he had begun sodding it. He added: "Some part of the upper work is considerably forward and if the citizens continue to give the assistance /slave labor?/ they have . . . expect the chief of the work will be raised and [?] finished in about sixty days."⁷

During the summer of 1794, Dodge made several reports to Secretary Knox. While he discussed the batteries at length, he made very little reference to the fort itself. On one occasion he mentioned purchasing timber and plank for "the bridge." Whether he was referring to the bridge across the ditch to the sally port of the fort is unknown. By the end of the summer Dodge acknowledged sadly that all the work was far behind owing to much sickness among the workmen.⁸

6. HARP, Ft. Whetstone, 1779-1904 (1A), and Ordnance, 5, American State Papers, 16, 1794, 88-89, Rivardi, Apr. 13 and 20, 1794, to Sec. of War. In the fall of 1794, 25,000 bricks were purchased. Such a limited quantity was probably for magazines rather than ramparts. See HARP 1794, NA, RG 217, Miscellaneous Treasury Accounts, General Accounting Office, 1790-1894.

7. HARP, 1794, Maryland Historical Society, O. H. Williams Papers, (Williams?), Apr. 7, 1794, to Governor Lee; and Dodge, May 19, 1794, to Williams. O. H. Williams was a retired general, possibly now representing Governor Lee. It was Williams who actually hired Dodge.

8. HARP, Ft. Whetstone, 1779-1904 (1A), and Ordnance, 5, American State Papers, 16, 92, Dodge, July 6 and 10 and Sept. 14, 1794, to Knox.

Despite Rivardi's and Dodge's best efforts, the work at Whetstone Point had barely been started by the close of 1794. A few years later the Secretary of War estimated that only \$500 was spent on the fortification that year.⁹

The following year saw little improvement in the speed of construction. Less than \$1,000 was spent on the works in 1795. In January 1796 the Congress learned that a battery and a barracks had been constructed and some guns were mounted at Whetstone Point. The two calendar years, 1796 and 1797, also witnessed relatively little activity in construction. In February 1797, Congressman Samuel Smith (who would later be the major general in charge of the defenses of Baltimore, 1814) criticized the plans for the fortification. He complained that Rivardi (without mentioning him by name) had had too grandiose plans for the fort. The congressman pointed out that ships over 36 guns could not enter Baltimore's harbor because of the shallow channel. He complained, too, that no magazine had been built: "When the commander of the fort arrived there, he found 27 barrels [of powder] lying above his barrack. The cattle had also free intercourse with the barracks, nor was there any defense against them." However, he was willing to vote for funds to repair the works.¹⁰

9. This figure illustrates the difficulty of determining the actual money spent. Baltimore got \$5,200 that year for the fortification. Further, there are records indicating much larger sums having been spent for the works, gun platforms, barracks, etc.-- perhaps most of the money allocated. See: HARP, 1794, NA, RG 217, Misc. Treasury Accounts, GAO, 1790-1894, An Account of payments made for Materials; HARP, Ft. McHenry, Fiscal, 1794-1823, American State Papers, 16, 107 and 192, Statement of moneys transmitted from Treasury to agents for the fortifications, 1795; and Report of the Sec. of War, 1806.

10. HARP, Ft. McHenry, Buildings, 1781-1813, American State Papers, 16, 192, Report of the Sec. of War, Feb. 18, 1806; and Annals of Congress, 6, 2218-19, February 1797, S. Smith, statement. Samuel Smith was one of Baltimore's wealthiest citizens. He served in both houses of Congress for 40 years. He was in command of all the Baltimore defenses, including Ft. McHenry, during the British land and sea attack in 1814. Still later he was mayor of Baltimore. He died in 1839. See Heitman, 1, 903; and Allen Johnson, ed., Dictionary of American Biography (New York, 1964), 9, 341-42, hereinafter cited as DAB.

Congress, alarmed at the deteriorating relations with France in 1798, voted for much more than repair funds. It made \$250,000 available for coastal defense. Secretary of War James McHenry dispatched another French engineer, Maj. Louis Tousard, to Baltimore to review the works at Whetstone Point and to furnish "a plan and estimate if such additions thereto may be considered absolutely indispensable to the protection of the City." If Tousard prepared any plans they have not yet come to light. But construction activities increased greatly and by the end of 1798 the Army had spent \$18,000 on the works.¹¹

In 1799, a third French engineer, Jean Foncin, arrived in Baltimore. He disagreed with the plans of both Rivardi and Tousard. While this criticism of plans already approved by both the state and federal governments caused some embarrassment, Foncin succeeded in persuading all concerned that his concepts were best. While one does not know exactly the ways in which his ideas differed, the five-bastioned, pentagonal fort at Fort McHenry today reflects Foncin's plans. When Secretary McHenry left office he wrote of him:

I have employed on the Fortifications erecting at Baltimore, in the capacity of Engineer, a French Gentleman of the name of Foncin, and that evidence of ability in his profession by correcting errors of much consequence, in the original plan of the works, as well as of assiduity in Superintending and directing their progress, induced me to raise

11. HARP, Ft. McHenry, Buildings, 1781-1813, American State Papers, 16, 192, Report of Sec. of War, Feb. 18, 1806; and HARP, 1798, Library of Congress, James McHenry Papers, McHenry, July 7, 1798, to Mr. Alexis De Le [?], Baltimore. James McHenry entered the Revolutionary Army as a surgeon. He was a British prisoner of war for two years, then became assistant secretary to General Washington and, later, an aide-de-camp to General Lafayette. He served as Secretary of War from 1796 to 1800. Louis Tousard, born in France, also served in the Continental Army in the summer of 1777. Because of his gallantry in Rhode Island he was promoted to lieutenant colonel and awarded a life pension of \$30 per month. He left the Army in 1802. See Heitman, 1, 668 and 966; and DAB, 9, 341-42.

the compensation he was first engaged at. This Gentleman I would recommend to be continued in employ as heretofore.¹²

Carrying out Foncin's plans, the Army spent \$12,000 in 1799, \$53,000 in 1800, and \$8,185 in 1801 on the fortifications. In 1801 a Mr. Steele became the superintendent of construction and soldiers from the garrison performed much of the labor. The works were probably essentially finished by 1802, for the Army spent barely \$1,000 on them that year. The main work at this time seems to have been the construction of the officers' quarters, the enlisted men's barracks already having been built. That fall, lightning destroyed the flagstaff, and the post quartermaster appealed to the military agent in Philadelphia for funds to purchase a new one.¹³

A detachment of troops was stationed at Fort McHenry at least as early as 1797 under the command of Capt. Staats Morris. The earliest description of the garrison that has yet been found, dated June 20, 1802 (a few days after Morris left the Army), showed one company of artillery present:

Col. H. Burbeck, who had been in Washington
 10 days earlier
Capt. [?] McClellan, commanding officer
Lt. Samuel T. Dyson, quartermaster
Lt. James House
Lt. Clarence Mulford
Dr. Prescott Barron
4 sergeants
4 corporals
4 musicians
5 artificers

12. HARP, 1800, Library of Congress, James McHenry Papers, McHenry, Mar. 29, 1800, to President John Adams. Lewis, p. 40, spells the engineer's name as Fontin and notes that he went on from Fort McHenry to design Fort Independence on Castle Island, Boston.

13. HARP, Ft. McHenry, Buildings, 1781-1813, NA, RG 92, OQMG Consolidated File, Col. H. Burbeck, Washington, July 10, 1802, to Lt. S. T. Dyson, Ft. McHenry; Dyson, July 23, 1802, to Military Agent, Philadelphia; American State Papers, 16, 192, Report of Sec. of War, Feb. 18, 1806; HARP, 1801, Sec. of War Dearborn, Sept. 6, 1802, to Lt. Dyson, Ft. McHenry; HARP, Microfilm No. 47, NA, Office of Sec. of War, Military Book 1A, 1800-1803, Dearborn, Apr. 10, 1801, to Capt. Staats Morris.

56 privates
4 laundresses, then called washer women
1 hospital matron
Lt. House's male waiter (slave?)

Based on the available evidence, this report assumes that the masonry and earthen, five-bastioned, pentagonal fort; the two brick barracks; the two brick structures containing officers' quarters; and a magazine were all completed by 1802; and that the two water batteries, a frame hospital, and a frame barracks stood outside the fort. In his annual report for 1805 the Secretary of War reported that between 1794 and 1804 a total of \$95,073.12 was expended on the "regular fortification of mason work, with batteries, magazine, and barracks, erected principally in the years 1798, 1799, and 1800." By 1802 the fortification was known officially as Fort McHenry, after former Secretary of War James McHenry.¹⁴

D. Fort McHenry Plan, 1803

The earliest known plan of Fort McHenry is dated November 9, 1803. The cartographer did not sign his name. Lee H. Nelson has suggested that since the scale shown is a French measure, this map may be a copy of Forcin's plan.

Each flank of each of the five bastions has two gun embrasures; the fronts of the bastions have none. A well-defined ditch surrounds the fort on four sides; on the fifth side (east), or curtain, the ground is indicated as being low. A row of trees had been planted around the parade ground and another row grew on the terreplein; each of the bastions had six trees planted symmetrically. The purpose of these trees seems to have been to help bind together the earthen ramparts.¹⁵

14. HARP, Ft. McHenry, Buildings, 1781-1813, American State Papers, 16, 192, Reports of Sec. of War, Feb. 18, 1806; Ordnance, 5, NA, RG 92, OQMG, Consolidated File, Dyson, June 20, 1802, to William Sinnard, Philadelphia (an estimate of fuel for winter of 1802-3). During its construction the fort was usually referred to as the Fort at Whetstone Point, or Fort Whetstone.

15. HARP, 1958 B, S. Sydney Bradford, Supervising Park Historian, Ft. McHenry, Oct. 6, 1958, to Dr. W. Richard Walsh, Rockville, Md., quoting Ozanam, translated by Desaguliers, A Treatise of Fortification (Oxford, 1711).

Today's structures on the parade--the two barracks, the two officers' quarters, and the magazine--are shown on the plan. The commanding officer's quarters (HS 1) are smaller than they are today. The space between the two barracks is occupied by a "cistern," which seems to have been a roofed structure. As of 1803 a ravelin had not been constructed in front of the sally port. A bridge across the ditch joined the sally port to the road that led to Baltimore. While the plan vaguely suggests that a section of this bridge, next to the sally port, was removable or could be drawn up, a letter written in 1813 said that this early bridge was "fixed." The sally port itself appears to be unroofed. A flagstaff is shown at the approximate spot where archeologists eventually located its remains and where today's reconstruction stands.

The main drain from the parade, under the ramparts, toward the river, appears on the plan. This brick-lined tunnel, large enough for a short man to walk through upright, was in later years supplanted by a cast-iron pipe that ran underneath it. Another drain is shown leading from the ditch, through the counterscarp, to the glacis near the south bastion. No known trace of this drain exists today.

E. Fort McHenry, 1803-1819

Although the fort was still new, the barracks required over \$300 in repairs in 1803. That same year the quartermaster asked for permission to purchase a flag locally. He informed the military agent (forerunner of the quartermaster) in Philadelphia that the sailmakers in Baltimore wanted \$67 for a flag.¹⁶

For the next ten years, until the War of 1812, Fort McHenry witnessed routine maintenance and some minor construction. In 1805 a lieutenant at the fort complained of its "wretched situation" and said that the maintenance funds should be multiplied by three. Some minor construction occurred in 1807 at a cost of \$330. Whatever was built had a stone foundation (60 perches) and 16,400 bricks. Also in 1807 the barracks windows and floors were repaired.

16. HARP, 1803, NA, RG 92, OQMG, Consolidated File, Dyson, Ft. McHenry, Feb. 13, 1803, to military agent, Philadelphia; and William Irving, Superintendent's Office, Philadelphia, Mar. 25, 1803, to military agent; HARP, Ft. McHenry, Buildings, 1781-1813, American State Papers, 16, 184, statement of expenditures on fortifications for 1803; and NA, RG 77, OCE, Buell's Collection, Engineer Historical Papers, 1800-1819, Swift, Apr. 26, 1813, to Babcock, Item No. 45.

Apparently the flagstaff was repaired (or a new one erected) at Fort McHenry in 1811. An abstract of expenditures for the second quarter of that year showed the purchase of a spar for the staff at a cost of \$35. Also, the "dressing" of the flagstaff cost \$27.62. That fall "one Garrison Flag of the usual dimensions" was sent to Capt. George Armistead, now the commanding officer of the fort.¹⁷

Several purchase orders from 1811 give a sampling of the materials acquired for the upkeep of the fort:

bar iron	12 lbs. putty
½ ct. white lead	6 lbs. tallow
3 lbs. lamp black	1 box glass, 8 x 10
15 gal. linseed oil	2 sash tools
4 lbs. red lead	chimney sweeping ¹⁸
2 paint brushes	

In 1811 the Secretary of War described Fort McHenry as being "a regular pentagon of masonry, calculated for thirty guns, a water battery, with ten heavy guns mounted, a brick magazine that will contain three hundred barrels of powder, with brick barracks for two companies of men and officers; without the fort, a wooden barrack for one company, also a brick store and gun house."

17. HARP, 1805, NA, RG 92, OQMG, Consolidated File, Lt. I. B. Wallbach, Ft. McHenry, May 8, 1805, to military agent, Philadelphia; HARP, 1807, Journal N, 1/1/1807 to 1/23/1808, GAO, statement, Accountant's Office, Mar. 31, 1807; HARP, Ft. McHenry, Buildings, 1781-1813, NA, RG 92, OQMG, Consolidated File, Lt. G. Peter, Ft. McHenry, Oct. 3, 1807, to military agent, Philadelphia; and Maryland Historical Society, Winder Papers, Lt. ?, Aug. 1, 1812, to Col. William Winder; HARP, 1811, NA, RG 92, OQMG, Abstract of Expenditures, Ft. McHenry, Apr. 1-June 30, 1811; and Letter Book, Superintendent's Office, Philadelphia, 1809-1812, GAO, Supt. of Military Stores, Sept. 3, 1811, to military storekeeper, U.S. Arsenal.

18. HARP, Ft. McHenry, Fiscal, 1794-1823, American State Papers, 16, 310, Report of Fortifications, 1811; HARP, Ft. McHenry, Ordnance, 5, NA, RG 107, Records of Office of Sec. of War, Letters Received, S. Smith, Baltimore, Sept. 22, 1812, to William Eustis.

After the declaration of war in 1812, Samuel Smith inspected Fort McHenry and reported to Secretary of War William Eustis that the fortifications were in good order and the men, guns, and platforms were clean, neat, and in military condition: "Capt. Beall informed me that there were ten guns for which there were no carriages. I agreed with him that if attached they would be essential, especially for the lower battery where there is at present not one gun." Smith noted another serious deficiency:

Under the guns of the fort the bank of the river is high, under which the Enemy might land in the /night?/ perfectly under cover, and take the open batteries, scale the main fort & carry it by surprise or main force--about /5/4000 would shape the ground (or perhaps less) so as to form /a/ regular slope from the walls to the river--the works would then be tolerably complete, until that is done I should think it them /sic/ insecure.¹⁹

In 1813 British men-of-war sailed up and down Chesapeake Bay at will. Alarm spread through Baltimore and, suddenly, Fort McHenry's defenses seemed wholly inadequate. On March 13 Gov. Levin Winder appointed Samuel Smith as commanding general of Baltimore's defenses. That same day Smith wrote to Secretary of War John Armstrong that the fort's strength of 52 regulars was insufficient and that the heavy cannon lacked carriages. While he was already organizing a militia of 2,000 men, "it is absolutely necessary that at least one hundred & fifty regular Artillerists be ordered to the Fort." But Washington had no regulars available for Fort McHenry.²⁰ Smith inspected the fortifications again on March 18:

I have this instant returned from Fort McHenry. There is much to be done there. The gate is of pine & might be knocked down by a few strokes of an axe. There are within the Fort ten guns mounted. It requires six more guns to complete the Bastions. The outer works consist of two open batteries: one nearly

19. HARP, Ft. McHenry, Fiscal, 1794-1823, American State Papers, 16, 310, Report of Fortifications, 1811; HARP, Ft. McHenry, Ordnance, 5, NA, RG 107, Records of Office of Sec. of War, Letters Received, S. Smith, Baltimore, Sept. 22, 1812, to William Eustis.

20. HARP, Ft. McHenry, Ordnance, 5a, 1813, NA, RG 107, Sec. of War, Letters Received, S. Smith, Mar. 13 and 17, 1813, to Armstrong.

on a level with the water--it is faced with brick & has space for thirty guns. It ought to have at least twenty but has not one, nor has it any platform and yet it is the most important work against Ships attempting an attack or to pass. The other is immy /sic/ above this & its guns fire over the lower work-- is in full preparation for action and has ten guns mounted.

Smith recommended the acquisition of 200 boarding pikes so that the defending troops could knock down "assailants who may attempt to scale the walls."²¹

Before the end of the month the commanding officer, Maj. Lloyd Beall, received specific orders to fill in the embrasures in the bastions and to platform each bastion at a height sufficient to allow the cannons to be fixed en barbette, i.e., directly over the parapet. This apparently was done, for succeeding plans of the fort do not show the former embrasures and today no trace of them is to be found in the brickwork or stone coping. The orders also directed that brick traverses, or thick walls, be built before the gateway to the fort and before the door of the magazine within the fort. These traverses were to measure 12 feet in length, 8 feet in thickness at their bases, and slope 2 inches to each foot in height. The magazine traverse was to reach to the top of the window over the door; the other traverse was to be 6 feet high. In recent years archeologists have found the base of the magazine traverse.

The ditch surrounding the fort was to be deepened and, at a distance of 35 feet from the scarp, a 5-foot-high earthen counterscarp was to be thrown up. The ditch would then serve as a covert way for the defending infantry. During the British attack the following year, the infantry did in fact take position in the ditch, thereby indicating that a counterscarp of sorts had been built. A glacis "to the extent of musket shot, or as far as the ground may allow" was to be constructed around the fort. And Beall was to construct "a temporary Bridge across the Ditch which is to be removed at will." This would replace "the present fixed Bridge." Later plans of the fort suggest that only the section of the bridge nearest the sally port was removable.

21. HARP, Ft. McHenry, Furnishings, 1795-1958, NA, Office of Sec. of War, Letters Received, S-97(7), Smith, Mar. 18, 1813, to "Sir."

To do the work, Beall received permission to employ as many militia and as many citizens as could "work to advantage." The Secretary of War was prepared to fund the effort. However, General Smith was not optimistic about Beall's accomplishing the task: "Major Beall is not an Engineer, nor have I much knowledge of fortifications. We want an Engineer to be on the spot."²²

Colonel Decius Wadsworth visited Fort McHenry about this time and criticized the plans for improving the fortifications. He did not think much of the idea of a covert way and glacis for he did not believe the fort could hold out long if it were besieged. Instead, he urged that the sally port be given better protection by the construction of a "Work of Earth in Nature of a Ravelin." Further, a trench or passage "in Nature of a double Caponniere" should lead from the gateway to the batteries so as to provide safe communication between them. Finally, he said that "the heavy guns within the Fort should have been placed on the Faces of the Bastions and not on the Flanks which should have been reserved for the Field Pieces and Infantry." It is not believed that a trench to the batteries was built; but today's ravelin was constructed in front of the sally port that year. The ditch around the ravelin provided some protection for men moving from the fort to the upper battery.²³

In early May 1813, General Smith wrote a discouraging letter. He said that Colonel Wadsworth had "discharged one half the labourers. The work of course progresses, as if we were in a profound peace." Furthermore, Major Beall was not cooperating as fully as he might. He insisted that his company of 50 regulars have full run of the fort and both its barracks. Smith thought that at least 350 men, mostly infantry, should be in the fort every night. He finally wrote Beall's

22. HARP, 1813, U.S. Military Academy Archives, Col. J. Swift, Philadelphia, Mar. 27, 1813, to Maj. Lloyd Beall, Ft. McHenry; HARP, Ft. McHenry, Buildings, 1781-1813, NA, RG 77, OCE, Buell's Collection, Swift, Apr. 26, 1813, to "Babcock", Item No. 415; and HARP, Ft. McHenry, Personnel--Individuals, S. Smith, 1770-1813, NA, RG 107, Sec. of War, Letters Received, S-112 (7), Smith, Mar. 29, 1813, to Armstrong.

23. HARP, Ordnance, 5A, 1813, NA, RG 107, Sec. of War, Letters Received, Wadsworth, Apr. 13, 1813, to Armstrong. Wadsworth was chief of ordnance at this time. The ravelin was completed before February 1814, when Armistead asked permission to remove its gun platform. See HARP, 1814, NA, RG 156, Office of Chief of Ordnance, "SLR" 1801-20, Armistead, Feb. 15, 1814, to Wadsworth.

superior urging him to remove all women from the fort, "the confining the Soldiers of the Garrison to the number of rooms requisite to cover them from the weather, the stationing within the fort as many Artillerists as are necessary for the Guns and of the Infantry to repel an Assault. The assigning Quarters for the officers [should be] barely sufficient for Comfort not for ease."²⁴

Throughout the spring of 1813, Smith had the militia march out to Fort McHenry twice a week for training, "the Artillery at the Guns and the Infantry at the Curtains in the Fort." Major Beall cooperated in the training but continued to resist the housing of the militia within the fort. Perhaps because of Beall's attitude, he left Fort McHenry in the summer of 1813. Captain George Armistead replaced him as commander. That fall Capt. Samuel Babcock also left, having completed his assignment as supervising engineer of all the improvements and additions made at the post that year.²⁵

The invasion scare of 1813 highlighted the serious lack of a source of fresh water at the fort. For years a daily detail of soldiers had taken a rowboat to a city well and filled casks for the garrison. Engineers had made several attempts to sink a well but the water had consistently proven unwholesome. The Army's quartermaster officer in Baltimore, Maj. Paul Bentalou, approached the superintendent of the city's waterworks, John Davis, in search of a solution. Davis believed that he could dig a successful well and he and the Army reached agreement on a contract. Davis placed an ad in a local paper:

Laborers Wanted

A few good LABOURING HANDS, are wanted at Fort McHenry, to assist in sinking a well, to whom generous wages will be given.

24. HARP, 1813E, Columbia University, Samuel Smith Papers, Smith, Apr. 21, 1813, to "Sir" (Sec. of War?); and May 8, 1813, to Colonel Nichols.

25. HARP, Ft. McHenry, Ordnance, 5a, 1813, NA, RG 107, Sec. of War, Letters Received, B-89 (7), Beall, Mar. 19, 1813, to Armstrong; and Capt. S. Babcock, Dec. 1, 1813, to "Sir"; HARP, Ft. McHenry, Star Fort, 1813-14, NA, RG 77, OCE, Buell's Collection, Babcock, July 31, 1813, to Sec. of War, Inclo. 444.

Apply to Sergeant Holland, at
the Fort or to JOHN DAVIS, No. 74
N. Charles street.²⁶

He recalled the well-digging years later with "some little pride." He noted earlier failures: "But when the excavations . . . /reached/ forty or fifty feet . . . the strata where the water proceeded from was a soft, black, slippery, offensive soil, extending about six feet deep, and to where the water flowed in abundantly, and it appeared to defy any attempt of its being sunk deeper." But Davis had an idea:

I then consulted with Col. Arimtage /sic/, the commander of the fort, and Major Bentalow, to fix on the spot of excavation (this was in the middle of the interior fort) /actually it was/ in the corner of the parade between the two barracks/. The preparations were two strong main beams each forty feet long by about 20x20 inches square, were so placed in order to sustain any superincumbent weight that might be required; and a regular mining shaft of twelve feet in diameter was dug and excavated, with necessary carpenter work. The excavation and carpentry were regularly advanced to near the depth of forty feet, until the shaft arrived at the soft strata of mud and water. . . . Then was commenced a system of /blank/ prepared sufficiently long to pass through the soft strata into a more firm soil . . . downward eight to ten feet. This sheet piling was shod with iron, formed of staves from eight to ten inches broad by four inches thick, correctly worked, and grooved and tongued, so that when driven they formed a complete hoop, something like the interior of a large casket. This was a very difficult work to execute, but it was done in the most perfect manner, and when the mud and water and the soft soil were taken out, very few leaks . . . were presented, and it took the workmen but a short period, with their oakum, to cork the leaks, and to make the cask literally water-tight. . . . When the cask stood on solid ground . . . the depth was about sixty feet, and the solidity of the strata suggested a different course of continuing the excavation.

26. HARP, Ft. McHenry, Star Fort, 1813-14, NA, RG 107, Sec. of War, Letters Received, B-251 (7), Deputy QMG Paul Bentalou, Baltimore, July 17, 1813, to Armstrong; and Federal Gazette and Baltimore Daily Advertiser, Sept. 27, 1813.

A newspaper editor continued the description: "The strata being solid, it was determined to sink it further, with a diameter of six feet only. The strata of blue clay . . . permitted the well to be dug . . . so as to form a perfect cylinder." Davis resumed his narrative:

During the process of the last boring . . . the auger suddenly dropped down a few inches. It had penetrated to the depth of about five feet, and water suddenly rushed up by the side of the auger. The flow of water was quickly stopped by driving a plug into the hole.

The water proved to be pure and flowed at a regular rate of 18 gallons per minute. The entire well was bricked, and "a more perfect cylinder or tube could not be easily conceived." It was a major engineering feat and this 95-foot-deep well served the fort for many years.²⁷

The new ravelin, completed the summer before, became a subject of correspondence in February 1814. Colonel Wadsworth, Chief of Ordnance in Washington, wrote Armistead that the cause of the settling of the gun platforms on the ravelin was that the earthen rampart and parapet had been laid too soon after the masonry was finished: "It is not customary to lay Earth against the walls of a Fortification under 12 months after the Mason work is done, lest the walls should give way by the pressure before the Mortar is fully Cemented." Furthermore, the platforms and guns had been installed before the earth had had a chance to settle. The colonel's advice was to have the guns removed, the platforms raised, and a ditch dug parallel to the inner face of the parapet, about 12 to 18 inches deep, to collect water and drain it away from the exterior slope.²⁸

The British navy returned to the Chesapeake in 1814. In August the enemy ransacked Washington, D. C. The citizens of Baltimore waited nervously and prepared their defenses. The British

27. HARP, Ft. McHenry, Star Fort, 1813-19, typescript from a newspaper in the possession of Miss Florence P. Stadtler, Baltimore.

28. HARP, 1814, NA, RG 156, Office of Chief of Ordnance, SLR 1801-20, Wadsworth, Feb. 12, 1814, to Armistead; and Armistead, Feb. 15, 1814, to Wadsworth.

army landed September 12, and the royal fleet bombarded Fort McHenry for 25 hours, September 13 and 14. Baltimore held out; the British withdrew. Captain Armistead described vividly the effect of the bombardment on the fort:

I had arranged my force of 1,000 men as follows: the regular artillerists under capt. Frederick Evans, and the volunteers under capt. Nicholson, manned the bastions in the Star Fort, Capt. Bunbury, Addison's Redman's Berry's and Lt. Com. Pennington's commands were stationed at the lowest works, and the infantry under lt. col. Stewart and Major Lane were in the outer ditch, to meet the enemy at his landing, should he attempt one.

About 2 o'clock, P.M. Sept. 13 one of the 24 prs. on the south west bastion, under the immediate command of captain Nicholson, was dismounted by a shell, the explosion from which killed his second Lieut, and wounded several of his men--the bustle necessarily produced in removing the wounded and remounting the gun probably induced the enemy to suspect that we were in a state of confusion, as he brought in three of his bomb ships to what I believe to be good striking distance. I immediately ordered a fire to be opened.

.

During the bombardment, which lasted 25 hours, with two slight intermissions, from the best calculations I can make, from 15 to 1800 shells were thrown by the enemy. . . . About 400 fell within the works. Two of the public buildings are materially injured, the others but slightly. . . . our loss amounts only to four men killed, and 24 wounded.²⁹

The magazine within the fort apparently was not bombproof at the time of the attack. It received a direct hit which did considerable damage to the structure but not to the powder stored within. Which of the other structures Armistead had in mind when he reported

29. HARP, Ft. McHenry, Buildings, 1814-23, Federal Gazette and Baltimore Daily Advertiser, Sept. 28, 1814, Lt. Colonel Armistead, Sept. 24, 1814, to Sec. of War. Armistead was unable to report earlier because of illness.

heavy damage remains unknown. Even as the British ships sailed away, the Army began strengthening Fort McHenry. Brigadier Gen. William Winder wrote on September 18 that "there will be required to render the magazine here bomb proof 192,000 bricks and 40 brick layers." The War Department notified General Smith the next day: "It will be proper that the Fort be made bomb proof and that additional block houses be erected, it being understood that the requisite funds will be advanced to the Government by the City." Baltimore advanced the funds and the new construction began to take shape. However, the lack of a competent engineer caused some delays.

Four different projects got underway at this time: bomb-proofing the magazine by the addition of a thick, arched roof and thickened walls; building a bombproof over the well on the parade ground; and constructing two bombproofs for the garrison in the ramparts, one on each side of the sally port. Workmen completed the magazine on September 29, but it still lacked a frame roof a year later. Armistead prepared an estimate of materials and costs:

12,000 shingles @ \$16 --	\$192.
1,800 ft. Rafters @3 --	54.
4,000 ft. Planks @3 --	120.
120 lbs. nails @18 --	21.60
40 squares of framing & shingling @4.50	180.
Hauling timber	25.
	<u>\$592.60</u>

When a roof finally did cover the magazine its shingles were of slate-- a fire prevention measure.³⁰

The bombproof over the well was completed early in October 1814, but the personnel shelters apparently were incomplete at that time. In May 1815 Armistead wrote: "The work near Baltimore, Fort McHenry, is in a perfect state of repair as far as I can ascertain."

30. HARP, Ft. McHenry Buildings, 1814-23, Maryland Historical Society, Winder Papers, Winder, Sept. 18, 1814, to "Sir"; Ft. McHenry, Personnel--Individuals, S. Smith, 1814-1958, Library of Congress, Samuel Smith Papers, ?, War Dept., Sept. 19, 1814 to Smith; HARP, 1814, September, Library of Congress, Smith Papers, Smith, Sept. 29, 1814, to Sec. of War James Monroe; HARP, 1815, NA, RG 156, Office of Chief of Ordnance, SLR, 1801-20, Armistead, Nov. 12, 1815, to Lt. Col. George Bomford; and Lt. Rich Bache, Ft. McHenry, Nov. 24, 1815, to Bomford.

For a time following the war Congress was generous in its appropriations for coastal fortifications--due to the success of Fort McHenry's defense. While the details are lacking as to how the engineers spent the money, Fort McHenry received \$59,500 for the four years, 1816-1819.³¹

Lieutenant Col. George Armistead died at Baltimore in 1818. Captain James Reed, Artillery, assumed command of Fort McHenry, only to die one year later.³²

F. Plan of Fort McHenry, 1819

In 1819, Capt. William Tell Fouassin, U.S. Topographical Engineers, prepared a "Plan and Profiles of Fort McHenry." When compared with the 1803 plan, discussed above, several changes became apparent. The ravelin and its ditch now guard the sally port. The original ditch is now complete around the fort. The sally port appears to be covered with a roof, and the personnel bombproofs on either side of it are shown. The approach is via a bridge to the ravelin, a tunnel through the ravelin, and a second bridge to the sally port. The section of this bridge nearest the sally port appears to be removable (in both the plan and in a profile). The five bastions appear to be platformed and the westernmost bastion seems to have a small structure on it--possibly a sentry box. Both the plan and a profile show the tunnel and a major drain under the ramparts. (If a drain existed under the tunnel at that time, it was not the cast-iron pipe that was installed later.) On the parade ground the new bombproof over the well appears, and a small structure traditionally thought to have been a guardhouse, but which probably was a detached kitchen, stands next to the commanding officer's quarters toward the sally port. The counterscarp of the ravelin, the eastern bastion, and the southeast curtain seem to be more fully developed than the counterscarp around the rest of the fort. The flagstaff does not appear on the plan.

31. HARP, Ft. McHenry, Star Fort, 1813-14, Baltimore City Archives, 1814, No. 518, Box 23, Smith, Oct. 5, 1814, to Committee of Vigilance & Safety, Ft. McHenry, Buildings, 1814-23, NA, RG 77, OCE, Buell's Collection, Armistead, May 10, 1815, to Swift, Item No. 556; Ft. McHenry, Fiscal, 1794-1823, American State Papers, 16, 50, No. 183, Statement of Expenditures, Jan. 1, 1816-Dec. 31, 1819.

32. HARP, 1818, NA, RG 96, "Post Rev. War, FMDD, SO, 1815-19," Dept. Order, Hdqrs., 4th Mil. Dept., Philadelphia, Apr. 28, 1818; and Heitman, 1, 820.

G. Maintenance and Construction, 1820-1839

During the 1820s modest changes and improvements occurred at Fort McHenry, climaxing with a burst of construction activity in 1829. In the summer of 1820 the Chief of Engineers gave approval to clean the well and install a new pump. That fall the guardhouse, wherever it was located, was converted to officers' quarters. The 1819 plan suggested a guardhouse between the two barracks, in line with and adjacent to the barracks, HS 5. Tradition holds that the guardhouse was the structure at the north end of the commanding officer's quarters. The guard was now housed in a wall tent. At the same time it was decided to make a hospital room out of an officers' kitchen--probably the kitchen that had been added to the end of the barracks, HS 4. Before long, however, this room again became a kitchen when a two-story hospital was built outside the fort.

In April 1822 the quartermaster, 1st Lt. H. W. Fitzhugh, inspected the officers' quarters at the fort. He counted five rooms for officers (two in the commanding officer's building, three in the junior officers' structure). The middle room in the junior officers' quarters, being larger than the other two, had been divided by a plank partition; a married lieutenant and his family lived here. Even the post commander, Maj. Jacob Hindman, had but one room at this time. One of the five rooms was set aside as the officers' mess. The post surgeon lived outside the fort in a small house--the first of many officers' quarters to be so located. Fitzhugh also mentioned two officers' kitchens. One was probably attached to the west end of a barracks, HS 4. The other possibly was at the north end of the commanding officer's quarters. Nearly all the quarters needed new floors, and some roofs leaked around the chimneys. Summing up the structures, Fitzhugh wrote: "These quarters are generally very small and inconvenient being but one story in height over each room in a small loft or lumber room which are occasionally used as bed rooms."³³

An inspector general of that year noted that one half of the parade had been turned into a flower garden and the shot, instead of being piled, formed the borders of the walks. He said that the

33. HARP, 1820, NA, RG 107, OCE, "SC", Ft. McHenry, 1811-37, Fitzhugh, June 21, 1820, to Captain Cross, Washington; Ft. McHenry, Furnishings, 1795-1958, NA, RG 92, OQMG, Consolidated File, Ripley, Baltimore, Nov. 15, 1820, to Captain Hook; Ft. McHenry, Buildings, 1814-23, NA, RG 92, OQMG, Consolidated File, Fitzhugh, Apr. 15, 1822, to QMG Jesup.

gun carriages on the ramparts had become "rotten and unfit for service." One year later he again reflected on the need for repairs on both the officers' quarters and the barracks. Apparently at this time some or all of the buildings at Fort McHenry had zinc roofs. Not everyone agreed that these were best. They cost a great deal, yet were subject to corrosion. If the roofs were relatively flat, they should be covered with metal; if the pitch was great they should be covered with slate. This recommendation eventually became the fact at Fort McHenry. The steep roof of the magazine became clothed with slate shingles; tin covered the flatter roofs of all the quarters when they acquired a second story.³⁴

Several complaints about the fort's dilapidated condition reached the ears of the Secretary of War in the early 1820s. As a result, the Office of the Chief of Engineers prepared an estimate of materials needed for repairs. This estimate gives data about the fort: An "observatory" of some sort either was planned for or existed over the main gate. Nothing more of this is known, unless it referred to the simple flat roof over the sally port. The upper water battery had a wooden gun platform that was 240 feet long and 24 feet wide. The dimensions of the lower battery's platform were 552 feet by 24 feet. The "outer bridge" that led from the road to the ravelin measured 37 feet in length and 12 feet in width; the "main" bridge, from the ravelin to the sally port, was 55 feet by 16 feet, and its "draw" bridge (hitherto referred to as "moveable") was 14 feet by 11 feet. This document also referred to the "outer gate." Whether this reference meant a gate in the ravelin or a gate at the entrance to the sally port is not known. Each wing of this double gate measured 9 feet by 6 feet and was covered with "iron rivets."³⁵

In 1824 Secretary of War John C. Calhoun issued a directive that defined the responsibilities of the several War Department offices. As theretofore the Chief of Engineers was in charge of the construction and repair of the fortifications proper; the Chief of Ordnance was responsible for ordnance and ordnance stores; and, as of now, the

34. HARP, Ft. McHenry, Buildings, 1814-23, NA, RG 159, Office of the Inspector General, 1814-42, Inspection Report, Sept. 22, 1822 and Inspection Report, 1823; HARP, 1823, NA, RG 92, OQMG, Consolidated File, I.M. [Porter?], Apr. 16, 1823, "In relation to the repairs to roofs of Quarters etc at Fort McHenry."

35. HARP, 1823, NA, RG 77, OCE, Letters Received, 564, "Estimate for Materials . . . Repair of Platforms, Bridges, Gate, etc."

Quartermaster General assumed responsibility for the construction and repair of storehouses and sheds. In fact the Quartermaster General became responsible for nearly all the buildings within and without the fortifications, including the barracks, officers' quarters, flagstaff, hospital, stables, storehouses, and more. This division of responsibility had little immediate effect on the day-to-day operations at Fort McHenry.³⁶

An inspector general, in July 1824, was not too impressed with Fort McHenry's condition. Flower beds occupied part of the parade ground. Vegetable gardens instead of cannon graced the bastions. He found shot either in small piles or arranged in decorative rows along the interior slope of the parapet, "a very bad and unmilitary disposition." At this same time the quartermaster in Baltimore noted that the officers' quarters, due to several officers being married, were quite overcrowded. Colonel Hindsman could not possibly have the quarters due his rank without inconveniencing the families. Even the sutler, or post trader, was hard up for living space. He temporarily occupied one room of the enlisted men's barracks and used its basement kitchen as his own. The records do not disclose where he displayed his wares.³⁷

A German visitor, the Duke of Saxe-Weimar Eisenach, described the fort in 1825. Undoubtedly influenced by the large fortresses of Europe, he found McHenry unimpressive. Yet he was an accurate observer:

The fort itself is very small, and ill-shaped; a pentagon with five little bastions, where at most but three large guns can be mounted; in front of the entrance is a little ravelin which defends nothing. There is no counterscarp; the ramparts are sodded. The fort is separated from the land by a wall, which might rather prove injurious than advantageous [in a land attack]. Near the water's edge there is a battery which can

36. HARP, Ft. McHenry, Buildings, 1824-34, NA, RG 92, OQMG, Consolidated File, Secretary Calhoun, Feb. 19, 1824, to "Sir", Ordnance Department.

37. HARP, Ft. McHenry, Buildings, 1824-34, NA, RG 159, Office of Inspector General, 1814-42, report of inspection, July 9, 1824; and NA, RG 92, OQMG, Consolidated File, AQM H. W. Fitzhugh, July 17, 1824, to QMG Jesup; and HARP, 1824, NA, RG 92, OQMG, Consolidated File, Fitzhugh, Nov. 18, 1824, to Jesup.

contain more than fifty guns for firing over the beach. There are also some furnaces for heating cannon balls. It was this battery which offered the greatest resistance to the British.

Since that time /1814/, the engineers have erected bomb-proofs on each side of the gate, as well as a bomb-proof powder-magazine, and a bomb-proof roof over the pump. The fort is in a decayed condition, and is to be abandoned on account of its unimportant situation.³⁸

In 1827 the Quartermaster General made available \$208 for constructing a new bridge across the ditch at Ft. McHenry. He neither described which of the two bridges was involved nor gave any specifications. It is assumed that the post quartermaster had the bridge constructed and that this is the bridge from the sally port to the ravelin, without a removable section, that appears in an 1834 drawing of the fort.³⁹ Years later an engineer said that two bridges were partially constructed by troop labor that summer at a cost of \$158.

The post quartermaster prepared an estimate for repairs in 1828. Such estimates were routine affairs at army posts and they did not always result in the work being accomplished. Nonetheless, it is of interest to know what structures stood in need of repairs at that time. The lieutenant asked for \$150 to build a new flagstaff, \$300 for repairs to the barracks and officers' quarters, and \$300 for repairing all the roofs and rainspouts. He also introduced the idea that a second company might be stationed at the fort. If so, he said, the officers' quarters would have to be raised by adding a second story. This would cost \$3,000.⁴⁰

38. HARP, Ft. McHenry, Buildings, 1824-34, Karl Bernhard, Duke of Saxe-Weimar Eisenach, Travels through North America during the years 1825 and 1826, (Philadelphia, 1828), p. 164.

39. HARP, Ft. McHenry, Buildings, 1824-34, NA, RG 77, OCE, Letters Received, S 1028, Memorandum of all Remittances made since 1827; and NA, RG 92, OQMG, "SP," Letters Received, 1818-57, Lt. C. Nelson, Baltimore, May 25, 1827, (to OQMG); HARP, 1840, NA, RG 77, OCE, Letters Received, S-1028, Capt. F. A. Smith, May 5, 1840, "An Account of Repairs."

40. HARP, 1828, NA, RG 92, OQMG, Consolidated File, Lt. J. B. Dusenbergh, AAQM, Estimate of Cost of Repairs, 1828.

About this time an officer prepared a detailed estimate for materials needed for the erection of a new guardhouse and a hospital kitchen, and for repairs to the hospital outside the fort. Construction material arrived in 1829, but a guardhouse was not built at this time. Nevertheless, the estimate is of interest in that it specifies the various kinds of materials available:

Guard House 30 by 22 feet	
180 feet joist 4 inch square	\$ 3.15
400 " " 11x6 inch	7.00
867 " " 10 inch square	15.17
1,782 " " 9 inch wide	31.18
630 " " 5x3 inch	11.03
1,350 feet scantling 3x4 inch	23.63
1,800 " 5/4 yellow pine flooring	38.50
3,000 " 4/4 common white pine	75.10
1,000 " white pine /cullings?/	12.50
600 " 8/4 white pine /prime?/	18.00
5,000 " /Suffolk?/ shingles	90.00
200 lbs. nails	14.00
100 feet /Spouling?/ best /?/	16.00
/Painting?/, glazing, & materials	37.50
Plastering & materials for 300 yds.	80.00
Locks, hinges, screws	15.00
/Hauling?/	30.00
	<u>\$537.66</u> ⁴¹

On January 24, 1829, Fort McHenry received the following building materials:

Weather boarding	4,400 feet	Plates 4x6	608 feet
Flooring plank	8,100 "	Plates, running measure	300 "
Shingles	60,400	Studs and rafters	4,456 "
Shingle nails	664 lbs	Joists	3,196 "
Nails for weather boarding	113 "	Sheathing	8,084 "
Flooring brads	188 lbs	Nails for sheathing	145 lbs
Scantling	700 feet	Posts	755 feet
		Lime	5 lbs. ⁴²

41. HARP, Ft. McHenry, Buildings, 1824-34, NA, RG 92, OQMG, Consolidated File, "Estimates for a Guard House," undated, but "1828-29" added anonymously.

42. HARP, 1829, NA, RG 92, OQMG, Consolidated File, Capt. J. Ripley, Jan. 14, 1829, Special Requisition on the QM Dept. for Ft. McHenry. Articles received at fort on Jan. 14.

An army engineer examined the masonry at the fort in 1829 and made certain recommendations to his Washington office. He noted that the two personnel bombproofs leaked. He supposed that a lack of roofs caused this, and recommended that a thin coat of "plaister of water cement" be put on the outside of the brick arches and a "wall of cement" be put on the interior walls. He also suggested that the "platform" over the gateway arch be enlarged so as to prevent the leaking that then existed in that area. Perhaps this platform was the observatory earlier referred to and the enlargement is the flat roof that now exists. He noted that the foundations of the sally port walls had been undermined and had fallen out. Here he recommended rebuilding the foundations and connecting them with a "counter arch."

He pointed out that the stonework in the ramparts was "open at the joints and the water passing thro' these openings has generally washed out the pointing near the top of the scarp wall and on one of the faces has injured the masonry so as to make it necessary to relay it to the depth of two feet from the top." He suggested that these joints be filled with broken slate and a mortar of water cement. Further, a thick wash of water cement on the face of the scarp would adequately seal the masonry. Finally, the ravelin, too, should receive a wash of water cement.⁴³

That same spring the quartermaster urged additions to and improvements on the several structures within the fort for which he was responsible. The four buildings serving as quarters should be raised to provide a full second story. Both structures containing officers' quarters would be enlarged by the addition of a two-story, 12-foot-wide annex extending the whole length of the buildings at their backs. All four structures would have a two-story piazza stretching along the full lengths of their fronts. Further, a two-story addition should be added to the end of the barracks nearest the junior officers' quarters. This addition would serve as a kitchen for the junior officers.⁴⁴

43. HARP, 1829, NA, RG 107, OCE, SC, Ft. McHenry, 1811-37, Capt. I. S. Smith, Apr. 17, 1829, to Gratiot.

44. HARP, 1829, NA, RG 92, OQMG, Consolidated File, Lt. S. B. Dusenberg, Feb. 24, 1829, Estimate of Repairs. Apparently a detached kitchen already stood at or near the northwest end of the barracks.

Inasmuch as the piazzas at Fort McHenry have recently (1973) been restored or reconstructed, the 1829 estimates of materials are of interest:

Commanding Officer's Quarters, HS 1

Piazza in front of the above, viz Two stories high.

2496 ft 5/4 heart flooring of Yellow pine.

59 Joists 9 Inches wide 18 ft. long, 2419 ft.
1000 ft. 4/4 white pine cullings [?]

12 posts to support the floor 6 Inches square
18 feet long

1700 feet 4/4 white pine pannel

72 pieces yellow pine scantling 3 Inches by 4
18 feet long

3 in. best Suffolk shingles

200 lbs. of nails

12 stones to support the posts.

Junior Officers' Quarters, HS 3

Piazza in front of the above Two Storys [sic]
high Eight feet wide

1592 ft. 5/4 heart yellow pine flooring

47 Joist 18 ft long 9 Inches wide 2021 feet

10 posts to support floor 6 Inches square
18 feet long 500 ft.

1500 ft. 4/4 white pine panel plank

1000 ft. 4/4 white pine [cullings?] plank

57 pieces 3 Inches by 4 Scantling 18 feet
long 1026 ft.

23 in. [sic] best Suffolk Shingles

55 yards plaistering [of?] the materials

Painting and materials

Barracks, HS 5

Piazza in front of Soldier's Barracks, No. 2

38 Joist 18 ft. long 9 Inches wide 1558 ft

1600 ft. 5/4 heart yellow pine flooring

13 posts 18 feet long, 6 inches square 702 ft.

93 pieces 3 by 4 Inches yellow pine scantling
18 feet long 1674 feet

2000 feet white pine pannel 4/4

1000 " do cullings

3500 best Suffolk Shingles
200 lbs. cut nails
87 yds. plaistering of materials
Painting of materials
13 stone to set posts on.⁴⁵

The above two reports initiated a burst of construction activity at Fort McHenry in 1829. The commanding officer, Capt. James Wolfe Ripley, assumed charge of the work. The Quartermaster General dropped the idea of adding to the rears of the quarters when he learned that the walls would be immediately next to the ramparts, thus reducing the circulation of air and increasing dampness in the buildings. The post surgeon supported the concept of a full second story on the quarters as a means of improving the health of the command:

I have had both a carpenter and a Bricklayer to examine the buildings, and they both agree . . . that the walls are sufficiently strong to build on, they also agree that to [?] the walls with brick would be cheaper than the [dutch?] roof proposed by me at your office. . . . The present walls of the building are fourteen inches thick, and they run up two feet above the upper floor consequently a wall nine inches thick and seven feet [high] would give the upper rooms a sufficient pitch to render them [strong?] and [?]. When it is recollected that a sufficient quantity of bricks can be obtained from the old sea wall in front of this work or from old Fort Covington . . . I am [convinced] it is the thing to do.⁴⁶

The troops departed Fort McHenry for the summer, as they had in other years, for a healthier environment farther inland. Construction continued during their absence. Ripley reported at the end of July that he had completed covering the gateway and it was now waterproof. Workmen had removed the earth covering of the personnel bombproofs and had found the bricks completely saturated with water. Ripley thought that water cement would not solve this problem and that a wooden covering would be more effective. He also said that the cordon had been repaired and the brick walls of the fort pointed and prepared to receive "a wash of cement."

45. Ibid. The piazza for Barracks, HS 4, has been omitted due to its similarity to that for HS 5.

46. HARP, Ft. McHenry, Buildings, 1824-34, NA, RG 92, OQMG, Consolidated File, Ripley, Apr. 25, 1829, to QMG Jesup; and Maj. M. M. [?], Surgeon, Ft. McHenry, June 1, 1829, to Jesup.

Work remaining included repairs to the sally port and the addition of coping to a wall around the magazine within the fort. (This is the only known reference to such a wall.) Ripley did not think much of this structure:

The Magazine (within the Fort) is entirely useless as such, having two others that are perfectly dry, and in good repair, I request permission to remove a small Traverse from the Door . . . in order to admit the light, as I wish to occupy it as an office or Store Room. The T is quite small, but so situated as to exclude the light from the Door and a window above the door.

The traverse came down, but whether Ripley used the structure as he desired is not known. In later years it continued to serve as a magazine.⁴⁷

General Gratiot, the Chief of Engineers, took exception to wood coverings for the bombproofs. He wanted the brickwork covered with sheet lead. Presumably his wishes became fact.

By late July, the second stories on the quarters were well underway. A setback occurred when "a sudden and powerful gust of wind passed over Fort McHenry and blew down the second story wall of one block of the soldiers Barracks which was at the time nearly completed for laying on the upper joists." While this incident caused the schedule to fall behind one week, all four quarters acquired their second floors and piazzas that year. It is assumed that the detached kitchen, traditionally said to have been a guard-house, at the north end of the commanding officer's quarters was incorporated with the main building at this time.⁴⁸

Nearly all the proposed work was completed by the end of 1829. Ripley reported then that he still required 2,200 square feet of sheet lead for covering the bombproofs and some planks for the bridges. But the sally port and the cordon had been completely repaired and a wash of cement had been applied to all the walls of the

47. HARP, 1829, NA, RG 107, OCE, "SC FT-MC," 1811-37, Ripley, July 25, 1829, to Gratiot.

48. HARP, Ft. McHenry, Buildings, 1824-34, NA, RG 77, OCE, Letters Sent, 1812-72, Gratiot, July 27, 1829, to Ripley; and NA, RG 92, OQMG, Consolidated File, Lt. L. B. Dusenberry, AAQM, Baltimore, July 2[9?], 1829, to Jesup.

1010 and the ravelin. The bridges, along with the gates, were still out of repair at the end of 1830, when another estimate of lumber found its way to Washington. Contractors installed a new (second?) pump in the well in 1830; otherwise the year was devoid of construction.⁴⁹

The old guardhouse between the barracks was now considered most unsatisfactory. In April 1831 it became the topic of considerable discussion. Its location was awkward, being behind the bombproof over the well and out of sight of both the sally port and the parade--guardhouses usually stood at or near the sally port. The officers at the fort wished either to repair it or, preferably, to build a new guardhouse in the ravelin directly in front of the gate. However, General Gratiot pointed out that no funds were available for any construction. This building would have to continue to function as a guardhouse.⁵⁰

49. HARP, 1830, NA, RG 107, OCE, "SC FT-MC," 1811-37, Ripley, Jan. 4, 1830, to Gratiot; RG 92, "OCG SP LR," 1818-57, Dusenbergl, July 5, 1830, to ?; and RG 77, OCE, Letters Received, T-278, Maj. M. M. Payne, Dec. 17, 1830, to Gratiot. The estimate for the bridges and gates was as follows:

- 5,034' yellow pine joists, 20' long
- 8 joists, 40' long
- 22 posts, 6" square, 5' long, yellow pine
- 1,350' yellow pine planks, 2"
- 700' white pine planks, 3"
- 1,000' " " boards, 1½"
- 700' oak plank, 3"
- 1 cwt 6" iron spikes
- 3 cwt iron.

The Office of the Chief of Engineers forwarded \$300 for the purchase of this material on Dec. 30, 1830.

50. HARP, Ft. McHenry, Buildings, 1824-34, NA, RG 92, OQMG, Consolidated Correspondence, Maj. M. M. Payne, Apr. 20, 1831, to Jesup; and NA, RG 77, OCE, Letters Sent, 1812-72, Gratiot, Apr. 30, 1831, to Ripley. The "old" guardhouse may have meant this existing structure or a former guardhouse--possibly the one north of the CO's quarters, although this latter building probably was added to the CO's quarters in 1829 to serve as a kitchen.

Lieutenant Henry Thompson, Corps of Artillery, arrived at Fort McHenry in the fall of 1833. Besides being the nephew of General Gratiot, he was an accomplished artist and a competent supervisor of construction. For the next six years he oversaw considerable improvements, repairs, and new fortification construction at the fort, first as an army officer, then, after his resignation in 1836, as a civil superintendent. On occasion he prepared excellent drawings of the fort for the benefit of his uncle in Washington.

Gratiot wrote him almost as soon as he arrived giving him specific instructions on constructing a stone wall around the interior slope of the ramparts, which hitherto had been but sodded earth. Inasmuch as this wall still stands, the letter is summarized in a later section of this report that deals with the fort proper.

Thompson started off 1834 by receiving \$900 "for bricks & paving, sodding or gravelling the Ramparts." This possibly referred to general sodding of walks on the paths (a banquette) on the terreplein leading from bastion to bastion--somewhat in the manner of brick walks on the parapet today.

The main drainage system from the inside of the fort under the ramparts, across the ditch and glacis, and to the river came under discussion that summer. Thompson recorded that this drain, or sewer, crossed the ditch at a height of 3 feet above its level. Also, its route across the glacis was not the most efficient for draining the area. He desired to lower it so that it would drain the ditch itself and to reroute it more directly across the glacis. He proposed an open drain. Before he completed his work at the fort, Thompson would construct a new drain consisting of an iron pipe sunk beneath the ground. In any case, Gratiot asked for \$885 "to repair (or change) part of the sewer . . . from the Glacis to the Sea Wall."⁵¹

51. HARP, Ft. McHenry, Buildings, 1824-34, NA, RG 77, OCE, Letters Sent, 1812-72, Gratiot, Sept. 20, 1833, to Thompson; HARP, 1834, NA, RG 107, OCE, "SC FT-MC," 1811-37, Thompson, Jan. 4, 1834, to Gratiot; HARP, Ft. McHenry, Star Fort, 1831-44, NA, RG 77, OCE, Letters Sent, 1812-72, Lt. W. H. C. Bartlett, Engr. Dept., June 16, 1834, to Thompson; and HARP, 1834, NA, RG 107, OCE, "SC FT-MC," 1811-37, Thompson, June 20, 1834, to Gratiot.

Lieutenant Thomas Lee, 4th Artillery, in the role of post quartermaster, described the buildings at Fort McHenry in 1834. He said that the two barracks were similarly planned, "of brick, two stories and contain each three rooms on a floor, of about 20x30 feet with fireplaces for burning wood, each room communicating by a staircase with a corresponding one of the same size above." He also mentioned the two-story addition to the barracks, HS 4, that served as a kitchen (below) and a servant's quarters (above) but which had no communication with the barracks. In the past, two of the upstairs rooms in the barracks, HS 4, had been used to house officers. This arrangement had proven unsatisfactory because there was no way to communicate with the servant's room which could otherwise have been converted into a kitchen for these quarters.

His description confirmed that the commanding officer's quarters had been enlarged, probably in 1829: "Two stories--the lower eight, the upper ten feet in height--contains five rooms, a kitchen & two staircases, viz--1st Kitchen /the old structure to the north/ 15x16 ft.--2d passage & staircase 10x16--3d Room 15x16--4th Room 17x16--5th passage & staircase 8x16--on the first floor--Second floor three rooms corresponding in size with those below." The junior officers' quarters were somewhat similar: "Two stories of the same height /as above/ . . . contains Six Rooms, one stair case, but no Kitchen, viz. first floor, 1st Room 14x16--2d passage & staircase 10x16, 3d room 16x16--4th Room 13x18. Second floor, three rooms as on first floor." Lee noted that these quarters had neither garret nor attic rooms for servants. Presumably slaves and other servants lived above the kitchens or someplace outside the walls.

Lee mentioned the guardhouse between the men's quarters, saying how inconveniently it was located. He said that it had but one cell for prisoners. Although both its roof and flooring required repairs, Lee thought that the structure could be converted into a company kitchen.⁵²

The drainage system under the ramparts continued to give trouble. In January 1835 the wall of the tunnel gave way. Thompson thought that the cause was water getting behind the wall and freezing. He also said that the fort's rats made this the area of their rendezvous and that they had disturbed the pavement considerably.

52. HARP, Ft. McHenry, Buildings, 1824-34, NA, RG 92, OQMG, Consolidated File, Lee, Nov. 7 and 19, 1834, to Jesup.

The wall of the tunnel was "a slight one being but one brick laid length-wise." Washington promptly authorized repairs.⁵³

While Thompson concerned himself with the fortifications, Lee continued to worry about the buildings. In 1835 he reached a decision concerning the guardhouse. He proposed to erect rooms over the two bombproofs on either side of the galley port. The rooms were to be "of such a height as not to appear from the exterior, by cutting away about fifteen feet (in length) of the arch preserving the present entrances to the vaults, the crown of the arch being too high to allow this construction to be made above it." He estimated that each room would require 1,700 cubic feet of brickwork:

To filling up the space & the present arch	
" build front wall 15x15, 18 in thick, Door 4x8	
" " end wall 23x16, 2 ft. thick, window 3x4½	
" " roof 25x15. Tin or Zinc owing to its inclination.	
" " Partitions (wood) 11x15, 7x8	} <u>thick</u> stuff
" " Flooring 24x15	

Which would cost, at most, say	
cutting away 1700 cub. ft. masonry	\$180.
33,000 Bricks laid	338.
500 ft. Rafters	10.
600 ft. N.C. Pine for partitions	24
1260 ft. N.C. pine for flooring	50
1000 ft. W.P. Common for Doors, etc.	30
1000 ft. Cullings; sheathing, scaffolding etc.	15
Painting & glazing	25
Roof, Zinc	70
Hardware	50
Carpenter's work	150
Hauling to fort	25
	<u>\$1017x2=\$2034</u>

Washington gave speedy approval. Lee began construction of the rooms on August 15, expecting to be finished by October 20. He continued to think that the old guardhouse could serve as enlisted men's kitchens, if it were repaired. However, by November, Thompson was writing that it would take him a week to tear down

53. HARP, Ft. McHenry, Star Fort, 1831-44, NA, RG 77, OCE, Letters Received, T-2404, Thompson, Jan. 9, 1835, to Gratiot.

the old guardhouse and remove the rubbish. Its demise apparently occurred at this time. The paint on the new guardrooms gleamed so brightly that Lee indulged himself in a new concern: "The painting of the work immediately joining the guardhouse has been unavoidably damaged. This I have renewed, & request authority to have two bridges painted . . . & which in their present condition bear a bad contrast with the new painting."⁵⁴

Thompson wrote of an interesting change at Fort McHenry in November 1835. Since its early days, the fort had trees growing on the ramparts. Now Thompson suggested to his uncle, the Chief of Engineers, that he order the removal of these trees. Indeed, Thompson was already cutting them down, "& by tommor eve. nothing but the parapet & Quarters will show." His conclusion to this letter demonstrates the unusual but fortunate (for Fort McHenry) circumstances of his position: "L. continues well, & joins me in love to aunt yourself & the Young Ladies," his cousins.⁵⁵

Several officers made recommendations for repairs and improvements at the fort during 1835. These may be summarized as follows:

Raising the parapets and counterscarp from 18 to 24 inches, taking this earth from the ditch, thus deepening it.

Laying traverse circles for the guns.

Replacing the magazine within the fort with a new one, as it was too damp and projected too far above the ramparts.

Constructing a furnace for heating shot within the fort.

Repairing the bridge to the fort and adding a drawbridge to it.

54. HARP, Ft. McHenry, Buildings, 1835-42, NA, RG 92, OQMG, Consolidated File, Lee, an estimate probably submitted with letter of July 10, 1835; Lee, Sept. 30, 1835, to Thompson; and Lt. Robert Archer, Oct. 24, 1835, to Jesup; HARP, 1835, NA, RG 77, OCE, Letters Received, T-2552, Thompson, Nov. 25, 1835, to "My Dear General."

55. HARP, 1835, NA, RG 77, OCE, Letters Received, T-2552, Thompson, Nov. 25, 1835, to "My Dear General."

Strengthening the gate to the fort and constructing a gate for the ravelin.

Improving the drainage system of both the fort and the ditch.

Mounting guns, as the fort was entirely defenceless.⁵⁶

About this time Thompson discovered that the ramparts and bastions of the fort did not all have the same elevation: "On examination I find that one part of the fort is at least 16 or 17 inches higher than the other so that the Guns will have to be in two planes. It would be impossible to place them in the same plane, one side would expose the traverse & foundation, or the other side would have to be taken down that much." Presumably, he employed two planes as he commenced the construction of traverses in the bastions at the end of 1835.⁵⁷

The year 1836 saw many major improvements and additions to the fortifications at Fort McHenry. Thompson's name would be linked to the fort's history because of his accomplishments during this period. He expended much effort in the construction of iron, granite, and concrete traverse circles, which demanded exact and firm placement of their pintles. The correspondence concerning this project became extensive during the next several years, but only a few extracts will be noted in this report. In January, Thompson wrote:

Should the weather be good the traverse Stones will be completed on Thursday (7th). The Pintle Blocks are completed with the ordnance Pintle Bolster on them for five carriages (we have mounted two carriages). The blocks are placed for three more carriages--making in all eight pintle blocks laid. I have three more at their places & will dig the holes as soon as it dries a little more.

56. HARP, 1835, NA, RG 77, OCE, Letters Received, F 172½, John Fenwick, Jan. 12, 1835, to Gen. A. Macomb; and Star Fort, 1831-44, NA, RG 77, OCE, Letters Received, G-667, Gratiot, Nov. 20, 1835, to Cass.

57. HARP, Ft. McHenry, Outerworks, VI B, 1831-37, NA, RG 77, OCE, Letters Received, T-2557, Thompson, Dec. 1, 1835, to "My Dear General"; HARP, 1835, NA, RG 107, OCE, "SC FT-MC," 1811-37, Thompson, Dec. 16, 1835, to "My Dear General."

When excavating for the pintle block in the south bastion, Thompson stumbled on an abandoned enlisted men's latrine: "I have met with an old Privy which was covered with Boards & earth 2 feet below the surface--it appears to be 5 or 6 deep. The extent of the hole we cannot discover--if it meets with your approbation I can remove the position so as to place the Gun on the face of the Bastion instead of the angle or place it in the angle at the point of the Bastion--the hole may require much stone to fill it up." This statement was the first reference to an enlisted men's latrine, even if an abandoned one.

General Gratiot was wholly against the idea of moving the gun position. He recommended either of two solutions: "either to throw an arch across the pit, if the walls are strong enough to resist the thrust or it be filled up with sand, thrown in successive layers of one foot, which must be rammed completely before the next is put on. The latter plan is the best." Which solution Thompson chose remains unknown.⁵⁸

By August the Army decided to abandon Fort McHenry temporarily in order to allow construction to proceed unhindered by the presence of troops. Also, Thompson became responsible for all new construction and repairs, regardless of possible quartermaster interests in the work.⁵⁹

Thompson undertook the construction of a new water battery in the fall of 1836. This battery is today's major work adjacent to the fort on the water side (east), generally but improperly known as the "Civil War battery" because of the improvements to it made at that later date: "The removal of the earth for the construction of the new Battery has been prosecuted with all the force that could be advantageously placed at it; the whole embankment will be completed I think by the end of the year, so that the parapet can be formed early in the spring." To continue the work he said he needed 1,200 perches of stone, 500,000 bricks, 2,500 feet of coping stone, and 300 feet of castiron pipe (for drainage?).⁶⁰

58. HARP, Ft. McHenry, Ordnance V, C, NA, RG 77, OCE, Letters Received, T-2577, Thompson, Jan. 5, 1836, to Gratiot; HARP, Ft. McHenry, Buildings, 1835-42, NA, RG 77, OCE, Letters Sent, 1812-72, Gratiot, Jan. 8, 1836, to Thompson.

59. HARP, Ft. McHenry, Buildings, 1835-42, NA, RG 77, OCE, Letters Sent, 1812-72, Gratiot, Aug. 12, 1836, to General Macomb; and Lt. J. Pickell, Baltimore, Nov. 8, 1836, to Actg. QMG, Maj. T. Cross.

60. HARP, 1836 (A), NA, RG 77, OCE, Letters Received, T-2766, Thompson, date lost, probably to Gratiot.

As the work progressed in 1837, Thompson prepared several estimates of costs. These shed some light on both the existing and proposed conditions at the fort. He recommended the filling in of the several cellars under the quarters because of their extreme dampness. He figured that this work, together with new flooring, would cost \$500. It is believed that the cellars were filled in about this time. (Architect Lee Nelson established their locations in recent times.)

Thompson also suggested that the roofs of the four quarters be re-covered with tin (wood shingles were used at this time) for safety reasons at a cost of \$475 per building plus a small additional cost for paint. This work, too, was undertaken, for Gratiot forwarded a sum of \$3,500 at this time in response to Thompson's letters.⁶¹

Another estimate by Thompson, in October 1837, states more clearly the works underway or contemplated:

For the Parapet of the Fort proper, & the requisite alteration of the present Gateway	\$1,500.
For completing the additional Battery	2,000.
For the traverses, Pintle Blocks, etc.	4,000.
For 2,000 perches of Stone to finish the Sea Wall	5,000.
For the Coping of the same	2,880.
For completing the Brick Boundary Wall (on the land side)	1,650.
For the Coping Stone to the same	2,750.
For building the service magazines (in new water battery)	5,475. ⁶²

At the end of the year Thompson set forth the work remaining to be done. On the fort proper he had yet to sod the parapet, to widen the sally port, and to alter the gateway so that it gave access to the new battery rather than to the ravelin via the bridge. As for the new battery, its parapet and slopes still had to be sodded, the glacis outside needed more work, and the traverse and pintle blocks were yet to be laid. He also proposed to close the passageway through the ravelin and to construct a ramp on steps to the main gate in place of the bridge. This ramp would be reached by cutting

61. HARP, Ft. McHenry, Buildings, 1835-42, NA, RG 77, OCE, Letters Received, T-2822, Thompson, Mar. 14, 1837, to Gratiot; and Gratiot, Apr. 6, 1837, to Thompson; and HARP, 1837, NA, RG 107, OCE, "SC FT-MC", 1811-37, Thompson, Apr. 5, 1837, to Gratiot.

62. HARP, 1837, NA, RG 107, OCE, "SC FT-MC", 1811-37, Thompson, Dec. 16, 1837, to Gratiot.

the Baltimore road through the glacis to the west--traces of this cut through the counterscarp may still be seen.⁶³

Besides these various estimates and plans, Thompson also reported on the work accomplished that year:

The Parapet of the Fort has been strengthened by a Brick Revetment three feet high with suitable foundation /This wall is still in place./--the Scarp Wall has been entirely repaired, the old Bricks where injured taken out & replaced with others & the whole wall pointed--the old Coping Stone which covered this wall has been removed, & a good substantial one substituted, of the Papapsco /nearby Patapsco River/ Granite properly dressed.

The Quarters have been . . . completely painted, and new Zinc Roofs in place of the former Shingle Roofs--the Pumps have been taken out & repaired, and the well cleaned--it may not be improper to add that I found the well 96 feet deep & the depth of the water 66 altho' the Season was very dry.

The additional Battery . . . in advance of the Fort is nearly complete--the Glacis, which is now under formation, & the sodding of the Parapet remain to be finished. . . . A large quantity of Earth had to be removed to form this work.⁶⁴

Thompson reduced the output of his correspondence in 1838, but he did have a progress report in October:

The Parapet of the Fort has been finished and sodded completely. The Traverse and Pintle Block for the ten Guns /on the bastions/ . . . have been laid, and are ready for the reception of the Guns--these blocks are of Granite. The banquette for Infantry /a raised earthen platform on the terreplein behind the parapet/ has been half finished, & the remainder will be completed this fall, except the necessary sodding.

63. HARP, 1837, NA, RG 107, OCE, "SC FT-MC", 1811-37, Thompson, Dec. 16, 1837, to Gratiot.

64. HARP, 1837, NA, RG 107, OCE, "SC FT-MC", 1811-37, Thompson, Oct. 24, 1837, to Gratiot.

The Revetment Wall, (of Brick) of the Water Battery /also still present/; as also the interior slope of the Parapet /of the new battery/ formed by laying Sods horizontally, & Pre cut to the proper slope, have been finished. The Glacis to this Battery has been formed, and there only remains the sodding of the exterior slope, & the preparations for mounting the Guns to complete it.

He also supplied the information that the distance from the ditch to the gateway was $5\frac{1}{2}$ feet. This datum was related to the construction of the ramp that had not yet been commenced. However, by January 10, 1839, Thompson reported that he had finished alterations to the stonework of the gateway and would have the gates up in ten days--"According to my tastes it is indeed very fine."⁶⁵

Thompson completed the construction work in 1839. His several reports of progress show his pride in the endeavor. In March he wrote:

1st Quarters etc. The Quarters are all in excellent condition--painted two years ago . . . & roofed with Zinc. . . .

The magazine /within/ is large, in good order, drier than those I have generally seen & has a Lightning Rod /no description available/, the only one at the Fort-- it requires a protection in front of the door.

There are two Guard Rooms with three Prisons /cells?/. Two pumps in the same well. . . .

Guns etc. There are twenty four 24 prs with their carriages all new--also 4 mortars in good order, but they require beds.

The number that will be required, & the calibre of the Guns awaits the decision of the Department--at least 30 of 24 prs or higher calibres. Traverses are laid for ten Guns in the fort /the bastions/ & I have ten more with the Blocks ready to be laid, & shall therefore require about 35. . . .

65. HARP, Ft. McHenry, Outer Works, 1838-45, NA, RG 77, OCE, Letters Received, T-140, Thompson, Oct. 29, 1838, to Gratiot; and Thompson, Oct. 31, 1838, to Captain Smith, CE; HARP, 1839, NA, RG 77, OCE, Letters Received, S-1028, Thompson, Jan. 10, 1839, to Smith.

To put Fort McHenry in a state of defence . . . four weeks sufficient altho' a larger time to finish the exterior slope of the Battery.

It is in contemplation to raise the Breast wall /apparently in the fort and in the new battery/. This would require more than the four weeks, but if absolutely necessary both works could be carried on at the same time.

The work remaining . . . is the Ramp to the Gateway-- the alteration of the Ravelin to close the opening--to complete the Banquette for Infantry--the exterior slope & /top?/ sloping of the Parapet of the Battery.⁶⁶

Thompson's target for completion of all the work was September 30. He did not quite reach that goal. Yet, the fort was in condition to receive the new post commander, Capt. Samuel Ringgold, a recent participant of the Seminole Wars in Florida:

I have not been able to meet to the day my report as to the completion of this work--if the weather continues good all will be done on Saturday (5th) /October/ except the sodding around the foot of the parapet of the old Fort which will occupy 3 men cart, Horse & Driver about a week more. . . . I shall move up on Thursday to the City, so that all will be ready for Capt. Ringgold.⁶⁷

Thompson's last annual report was dated October 17. Since it described in detail the last weeks of work it is quoted herein at length:

The breast height wall of the old Fort has been raised 18 inches, covered with Zinc /still to be seen/, and caped with sand stone--a new slope of 18 inches of Sodding put on the top, & joined to the slope of the

66. HARP, Ft. McHenry, Buildings, 1835-42, NA, RG 77, OCE, Letters Received, S-1028, Thompson, Mar. 21, 1839, to Smith.

67. HARP, Ft. McHenry, Outer Works, 1838-45, NA, RG 77, OCE, Letters Received, S-1028, Thompson, Oct. 1, 1839, to Smith. Fort McHenry had been reoccupied by troops from the Second Dragoons on May 2. They transferred on September 11.

former parapet. The Banquette for Infantry, has been completed--the ten traverses and foundation blocks, all of granite, have been taken up, and relaid in conformity with your plans--The scarp wall has been pointed with cement, & the whole coated with a Cement wash. The Bridges entering the Fort have been removed, and a Ram formed to the Gate Way, so as to make the entrance from the Ditch.

The former entrance thro' the Ravelin has been closed, the breast height wall of the Ravelin finished, the Parapet made and sodded, and the traverses etc. laid complete for Seven Guns on the ravelin, the access to the Ravelin being now by a flight of stone steps since removed.

In the outer Battery, the breast height wall has been raised 18 inches, with the necessary addition of the new Sodding also 18 in high, this wall, as well as that of the Ravelin has been covered with Zinc-- a great part of the old wall had to be taken down & renewed in consequence of its having settled considerably in many places--the Parapet has been completed & the exterior slope well sodded, & secured with stakes or ?. The slope from the Terreplein into the ditch from this Battery to the old Fort has also been sodded & secured. Today, no distinction between the Terreplein and the ditch can be made. The Traverses etc laid complete for thirty nine Guns in the new water battery.

I consider the altering sic & repairs to this Fort as complete except some few days work to the sodding of the outer slope of the Parapet of the old Fort which requires renewing, and also the laying of 56 Pintle Blocks, the latter having been suspended by your directions.⁶⁸

68. HARP, Ft. McHenry, Buildings, 1835-42, NA, RG 77, OCE, Letters Received, T-294, Thompson, Oct. 17, 1839, to Colonel Totten, Chief Engineer. Totten had replaced Gratiot as Chief Engineer.

In December 1839, Capt. Fred A. Smith, Corps of Engineers, summarized the appropriations and expenditures for Fort McHenry for the past 12 years:

Year ending Dec. 31	Appropriation	Amounts from Other Sources	Expenditures, including compensation of agent	Officer or Agent Superintending	Amount of Compensation	
1827	(not recorded)	\$ 208.	\$ 157.93	Maj. W. Gates, USA	--	
1828						
1829		750.	617.54	Capt. J. Ripley, USA	--	
1830		1,363.	797.06		--	
1831		--	748.47	"	--	
1832		30.	30.00	"	--	
1833		4,200.	4,759.44	Capt. H. Thompson	\$ 187.10	
1834		1,785.	1,046.00	"	102.78	
1835		40.	211.16	"	--	
1836		50,000	33,408.77	52,211.82	H. A. Thompson	1,248.87
1837			17,412.95	48,283.76	"	2,641.06
1838		32,415	4,582.00	17,162.55	"	1,882.01
1839		305.18	18,403.93	"	1,837.16	

Total available for expenditure: \$145,422.77.
 Of which \$33,349.77 was used to purchase land.
 Repairs and new construction: \$110,002.76.⁶⁹

Henry Thompson, at his residence in Baltimore, also recapitulated the costs of his undertakings at Fort McHenry:

Paid for Granite Stone for Sea Wall	\$ 9,074.82
" " " Coping for Fort	8,141.37
" " " " " Brick Wall	3,089.84
" " Bricks for Revetments	4,408.42
" " Lime	1,534.58
" " Lumber for Revetments	864.90
" " Stone Masons, "	8,009.67
" " Bricklayers, "	4,048.56
" " Carpenters, flooring & roofing Barracks	593.76
" " Expenses at Smith's Shop	1,005.70
" " Labor of Men	30,517.02

69. HARP, 1839, NA, RG 77, OCE, Letters Received, S-1028, Smith, Dec. 13, 1839, "Statement of the appropriations, expenditures, and compensation of the Agent in relation to the Repairs of Fort McHenry . . . to the conclusion of the work in 1839."

"	"	Hire of Horses and Carts	5,667.00
"	"	Horses, Carts, Tools, etc.	1,105.41
"	"	Forage	1,195.80
"	"	Transportation & Commutation of Officers	517.31
"	"	Agent & Superintendent	4,735.50
"	"	Compensation for Disbursing	2,873.83
"	"	Iron Gates & Pillars at Gateway (to grounds, not to fort proper)	1,487.56
"	"	Renewing the Wharf	1,033.58
"	"	Stone Traverses (45)	2,587.00
"	"	Blocks granite	475.00
"	"	Iron rails for circles	579.00
"	"	Zinc Roofs <u>/sic/</u>	1,740.15
"	"	Zinc for Revetments	469.71
"	"	Iron pipe	2,340.14
"	"	Setting Circles or Traverses	182.00
"	"	Cement	865.97
"	"	Cleaning Brick, Paints, & other miscellaneous things, including Steps to Ravelin, Ramp, and Gateway sill.	2,209.52
			<u>\$100,303.53.</u>

He added that in 1833-34 he spent \$5,014.59(?) in building the stone wall around the parade, altering the sewer, etc.⁷⁰

Thompson had one last word concerning his activities at the fort. In a response to a request from the Office of the Chief Engineer he recalled his years of work with pride, but not always with clarity:

The operations in the repairs of Fort McHenry were commenced with a few hands in the 1st of September 1836 & the force was gradually augmented until the 1st of November when the largest force commenced.

The exterior Battery was commenced the 15th October 1836, & different operations carried on until 1839. . . . The Revetment wall of this Battery was built that fall /1836/ & in 1837 the Parapet was formed. . . . 1839 the Revetment Wall was raised, the old wall having to be

70. HARP, Ft. McHenry, Buildings, 1835-42, NA, RG 77, OCE, Letters Received, S-1028, Thompson, Baltimore, Apr. 1846, statement to Captain Smith.

taken down nearly throughout in consequence of settling-- the Parapet formed, & the exterior slope sodded. The Traverses were also laid throughout the whole concern in 1839--finished October of this year. The Breast height wall was formed in the main work in 1837. The traverses laid for 10 Guns & the whole Parapet renewed and sodded. The Coping was commenced & finished this year also--In 1839 the Breast height wall was raised, the parapet renewed in the interior slope with sodding, & such of the exterior slope as required--The Traverses were also taken up & relaid.

.
The quarters . . . covered with Zinc & painted in 1837.

.
In 1839 the Bridges were taken away, a new entrance made through the Glacis, a ramp made into the Fort, the parapet of the Ravelin (where the road went thro',) built up & a flight of steps made into the Ravelin. Traverses etc. laid for seven Guns--The breast height wall built etc. etc.

In 1837 the Scarp walls were repaired & had to be repointed & part of the Exterior Battery which was altered that year & the next, by filling up in consequence of its having been determined to make the Glacis from the Parapet to the Sea Wall. [Here he is suggesting that a ditch had been dug outside the water battery.]

In 1836 the Sewer an iron pipe 18 in. diameter was laid from the Fort to the Water thro' the Sea Wall.⁷¹

H. Maintenance, 1840-1860

The twenty years before the Civil War were quiet as far as construction was concerned at Fort McHenry. The post commander argued for minor repairs and improvements, as he had in all other years.

71. HARP, Ft. McHenry, Buildings, 1835-42, NA, RG 77, OCE, Letters Received, S-1028, Thompson, Mar. 2, 1840, to Smith.

Inspecting officers came and went, describing the status quo and the fort's shortcomings. Higher officers attempted to define Fort McHenry's increasingly less important role in coastal defenses as developments in armament changed concepts of national security.

A lieutenant, reporting in 1840, pointed out that the ditch around the fort was somewhat irregular in width. He also noted that both the fort and the ravelin had a counterscarp, the latter averaging 5 feet 6 inches in height. This officer, and another a few months later, gave some details of the infantry banquettes that ran around the fort on the terreplein just below the parapet. They said that it was continuous around the fort except where interfered with by the gun traverses and by the main gate. It was 4 feet in width and its slope had a base of 2 feet.

Captain Fred Smith, Corps of Engineers, inspected the fort in May 1840. In addition to confirming Thompson's reports of work accomplished, he gave some further information concerning the fortifications. Concerning the personnel bombproofs, or casemates, he wrote: "There are but two--one on each side of the gateway & opening into the postern--supplied with ventilators thro' the terreplein (or rather slope which here occupies the place of a terreplein) but not lighted--the ventilation is not sufficient to allow them to be used for other than temporary shelter for men--the roofs do not leak." He said that the ramp to the sally port had a ratio of "1/6." Smith did not realize that the tunnel or small postern leading under the ramparts had originally been the main drain. He thought it simply a postern for the movement of troops and he did not consider it important enough to improve.

He observed two flights of steps leading from the parade ground to the terreplein; these were located in angles and appear on Thompson's plans of the fort. He said that the road to Baltimore was 10 feet wide where it passed through the counterscarp and glacis. Smith confirmed that at this time all the quarters were roofed with zinc. His most detailed description concerned the magazine. While this description will be quoted at length below, it is noteworthy here that he described a large window in the rear of the building directly opposite the door. This is the only notice of a window in this location. How long it had been there is unknown. Traces of it may be seen in the brickwork today. A year later, Smith said that Thompson had covered this window with a stout shutter, iron bars, and a wire gauge in 1839. Although Thompson had discussed building a shot furnace on the site of the old guardhouse between the two barracks, Smith's report was the first to acknowledge that the furnace had been built, but "has never been tried." He said

that the fort's drainage system was very good, referring to the new cast-iron, underground pipe.

Smith made a careful accounting of the armament situation. He said that Thompson had laid 10 traverses in the bastions, 1 in each shoulder angle, 7 in the ravelin, and 39 in the battery, a total of 56: "Lieut. Butler, Corps of Engrs. is at present engaged in laying the blocks for the pintles for all these 56. They are all arranged to allow a depression of 6° to the gun: with this depression the guns of the exterior battery sweep the ground in front & strike the water at a very short distance from the seawall." While no guns were then mounted, Smith listed the armament that had been established for Fort McHenry:

19	42-pounders	}	en barbette
11	32 "		
20	24 "		
7	8-inch seacoast howitzers		
2	heavy 13-inch mortars		
7	" 10 " "		
2	Coehorn 24-pounder "		
2	12-pounder field guns		
2	6 " " "		
1	24-pounder field howitzer		
1	12 " " "		
<u>7472</u>			

It will be recalled that after the War of 1812, a traverse or solid brick wall had been constructed before the magazine door and that several years later this traverse was removed. In 1841 this matter came to life again when Captain Ringgold argued that a new traverse should be built: "You are aware that a single shot might blow up the magazine & endanger the lives of everyone." Despite a flurry of correspondence, a new traverse apparently was not built.⁷³

72. HARP, Ft. McHenry, Outer Works, 1838-45, NA, RG 77, OCE, Letters Received, S-1028, Butler, Apr. 6, 1840, to Smith; HARP, 1840, NA, RG 77, OCE, Letters Received, S-1028, no signature, but handwriting appears to be Smith's, "Condition of Fort McHenry in May 1840." HARP, 1840, NA, RG 77, OCE, Letters Received, S-1028, Smith, May 5, 1840, "An Account of Repairs."

73. HARP, 1841, NA, RG 77, OCE, Letters Received, 1838-66, Ringgold, Sept. 17, 1841, to Totten.

In 1842 Lt. Col. R. E. De Russy became the superintendent of works for Fort McHenry. He looked over the fort but found little wrong with it. He recommended some pointing on the scarp brickwork, the grading and rolling of the terreplein of the battery, building a traverse for the magazine, constructing platforms in front of the guns to aid in their loading, and adding stops on the gun traverses to prevent the guns from turning too far. Most of these recommendations, but not the blind wall for the magazine, were eventually realized.⁷⁴

In 1842 Ringgold reported that one of two officers' privies, one on either side of the magazine, had burned to the ground. He asked that a brick structure replace it. Almost immediately the quartermaster let a contract for a new privy, presumably of brick.⁷⁵

That same year two additional shot furnaces were erected at Fort McHenry. These served the water battery and were located between the ramparts of that work and the scarp of the main fort. They were constructed from standard plans and completed by October 23.⁷⁶

Thompson's zinc roofs on the four quarters, although only six years old, had begun to come apart by 1843. The commanding officer complained that all these roofs leaked badly and that pieces of zinc up to a foot square were missing. The quartermaster investigated and decided that Thompson had applied the zinc improperly. He estimated that to reroof completely would take 35 squares of zinc for each building and a total cost of \$800. The exact date of replacement has not been determined; but the new roofing was tin rather than zinc. This new material would prove satisfactory.⁷⁷

74. HARP, 1842, NA, RG 77, OCE, Letters Received, De Russy, May 6, 1842, to Totten.

75. HARP, 1842, NA, RG 92, OQMG, Consolidated Correspondence, Capt. S. B. Dusenberry, AQM, June 11, 1842, to Jesup.

76. HARP, 1842, NA, RG 77, OCE, Letters Received, 1838-66, Lt. I. H. Trapin, CE, Baltimore, Oct. 11 and 23, 1842, to Totten.

77. HARP, Ft. McHenry, Buildings, 1843-62, NA, RG 92, OQMG, Consolidated File, Lt. Col. M. M. Payne, Ft. McHenry, Sept. 10, 1843, to Dusenberry; and Dusenberry, Sept. 11, 1843, to Jesup.

In October 1844, the engineer officer assigned to Baltimore, Lt. G. T. Beauregard (later to become famous as a Confederate general), gave a progress report of work accomplished that year:

The operations at this work were commenced on the 19th of August 1844 and have consisted, in grading and giving the proper fall to the Ditch [for better drainage] of the North, North East, & West fronts, and those of the Demi-lune [ravelin], resodding the counter scarp slopes and banquets [sic], releveling the Pintle blocks of the water battery, preparing the concrete foundations for the stone borders of the Pintle platforms, and preparing the clap boarding for the interior slopes of the parapets of the fort, water battery and Demi-lune.

This clapboard along the interior of the parapets must have given an unusual appearance to the fort. Whether it was primarily a decorative or protective (against the weather) device remains unknown. Beauregard also listed the work remaining to be done: constructing an outside door for the magazine and a door for the drainage tunnel or postern, repairing the walls of the sally port, grading the ditches to improve drainage, and repairing the terreplein and counterscarp on the southeast and northeast fronts. All this work was completed before the end of 1845.⁷⁸

Two months later he reported again, mentioning several additional matters concerning the fortifications. He said that "the outer gates of the main entrance gateway through the curtain of the N.E. front are found to be rotten at the bottom, they are too short by about 4½ inches, are warped, and consequently close badly the gateway--and they moreover do not admit of being severely fastened on the exterior, in case of necessity." The bricklayers had finished repaving the floor of the sally port, parts of the pavement of the parade, and the parade gutter. Concerning this brickwork, Beauregard wrote:

The brick pavement of the parade, especially about and immediately in rear of the officers quarters is in such a bad condition that it does not lead the water off into the parade gutter but allows it to settle and filter through the soil . . . leaving the bricks in some

78. HARP, 1844, NA, RG 77, OCE, Letters Received, 1838-66, Beauregard, Oct. 4, 1844, to Totten; HARP, 1845, NA, RG 77, OCE, Letters Received, 1838-66, Lt. H. W. Benham, Monthly Report for Repairs for July 1845.

spots entirely unsupported. I think that a new pavement would add greatly to the comfort of the quarters and to the appearance of the parade. The gutter in the middle of the ditches of the front and demi-lune ought also to be paved to the width of two or three feet.

He was worried, too, about the drainage system. Here he brought to attention for the first time in the records additional drainage ditches:

The Stone Masons . . . repaired the Drain opposite the north bastion of the N.E. front, but it was found to terminate suddenly underground at the distance of about 30 yds from the counterscarp thus affording no issue to the water of the N. front ditch, they were consequently made to pass temporarily through the drain at the salient of the Demi-lune ditch, but the first mentioned Drain ought to have been carried, underground, to the sea wall near the wharf, a distance of about 200 yds--but not having the funds . . . I was unable to carry it into execution.⁷⁹

Colonel De Bussy, Corps of Engineers, did not approve of Beauregard's ideas. He thought that nothing needed to be done to this drain opposite the north bastion. However, he recommended construction of a brick culvert under the road to Baltimore where it crossed the ditch along the northwest front of the fort. He also thought that lining the drains in the middle of the ditch with brick was entirely unnecessary. One presumes that his ideas took precedence over Beauregard's.⁸⁰

At the end of 1844 General Totten reflected on Fort McHenry's usefulness should the country be attacked. He pointed out with irony that the fort had "lately been put in perfect order, and was never in so good condition", but at the same time an enemy could ignore the fort, land on North Point, and attack Baltimore just as the British had attempted in 1814. While Totten did not suggest that Fort McHenry be abandoned at this time, he did recommend new fortifications toward the ocean. The army eventually did build new works closer to the sea.⁸¹

79. Ibid., Dec. 17, 1844.

80. HARP, 1845, NA, RG 77, OCE, Letters Received, 1838-66, Lt. H. W. Benham, Baltimore, Aug. 9, 1845, to Totten.

81. HARP, Ft. McHenry, 1843-62, NA, RG 77, OCE, Official Papers, 6, Extracts of letter, Totten, Dec. 28, 1844, to General Clinch.

Although Fort McHenry's strategic role seemed to be declining, its regular garrison remained and, in addition, the fort became a recruit depot in late 1846.⁸²

The post quartermaster reported on the condition of the four quarters in mid-1853. In general, he said, they were in tolerable condition but they needed minor repairs. On the exteriors they required painting of woodwork, new locks on the doors, and some new window sashes. The magazine now needed a new lightning rod since the existing one was neither elevated sufficiently nor properly secured. Finally, he thought that the guardhouse flue should be relocated: "The smoke is carried off by the pipe running through a hole in the wall, and then by an elbow at the side of the building, producing an unsightly appearance as well as smoking when the wind is in a certain quarter."

Apparently the two rooms at the sally port served the following functions: the daily guard used one of them, its capacity being 15 noncommissioned officers and men; the other, divided into a "dark" and "light" prison room, could accommodate 8 prisoners. For some reason the post quartermaster needed 2,000 bricks for improvements on the guardhouse.

The quartermaster listed the supplies he needed for the quarters:

Officers' (two)

250 pounds of Paint at 10¢ per pound	\$25.00
12 brushes at 50¢ each	6.00
10 lbs putty at 5¢	.50
10 Gals linseed Oil at 87½¢	8.75
4 " Turpentine at 75¢	3.00
20 Lights at 10¢	2.00
1000 feet scantling at \$18	18.00
15 locks at \$2	30.00

Soldiers' (two)

250 pounds Paint at 10¢	25.00
12 brushes at 50¢	6.00
20 lbs. Putty at 5¢	1.00
10 gal. Oil at 87½¢	8.75
4 " Turpentine at 75¢	3.00

82. HARP, 1846, NA, RG 92, OQMG, Consolidated File, Dusenberry, Oct. 14, 1846, to Col. H. Stanton, AQMG.

150 lights at 10c	15.00
15 Sashes at \$3	45.00
10 hocks /locks?/ at \$2	20.00
1 Lightning rod (30 feet) at 15c	4.50 ⁸³

Several times over the years the brick fronts of the ramparts required repointing. The year 1856 was no different. The engineer officer reported that frost had caused the top 4 or 5 feet of the walls to bulge. He believed the problem minor enough to be solved by only slight rebuilding and repointing. He wished to give all the walls a fresh wash of cement. He also noted that the brick arch of the sally port seemed "to have given away about the center of its length," and that it could be repaired for \$25. The shot furnace on the parade ground was also out of repair, so much so that its arch probably should be relaid. The records do not disclose if these repairs were accomplished that year.⁸⁴

Since its earliest days, Fort McHenry had suffered from a lack of sufficient prison facilities. As of 1857 one of the two rooms adjacent to the sally port was in use as a "light" and "dark" prison. The post adjutant pointed out that McHenry often housed prisoners for other posts and that the number of occupants numbered from 12 to 30, who were "so crowded and deprived of proper breathing air or sleeping space as to be detrimental to health." A month later the quartermaster officer proposed adding a room to each of the existing ones. One of these additions would have three cells. He estimated the total cost of the brick, wood, and iron at \$510.50. Other officers revised the estimate upward to \$1,200; General Totten gave his approval, and by October 1857 the new rooms stood completed, much as they appear today.⁸⁵

83. HARP, Ft. McHenry, Buildings, 1843-62, NA, RG 92, OQMG, Consolidated File, Donaldson, AQM, June 30 and July 8, 1853, to Jesup.

84. HARP, Ft. McHenry, Buildings, 1843-62, NA, RG 77, OCE, Letters Received, B-6780, Captain Brewerton, Apr. 15, 1856, to Totten.

85. HARP, 1857, NA, RG 77, OCE, Letters Received, 1838-66, 1st Lt. John Mullan, Post Adj., May 20, 1857, Orders No. 37; Donaldson, AQM, June 13, 1857, Estimate for Guard House; and Maj. H. Brewerton, July 27, 1857, to Totten; "SPLOE-1812-69," Totten, Aug. 10, 1857.

One other problem that arose in 1857 was the drainage around the magazine, especially the narrow area behind it. The ground there had settled so much that water would not drain off. This water got under the magazine and, as a result, "a heavy blue mould covers everything in the magazine and powder stored there one month hardens into a lump." The officers could not decide if this was an engineer's problem or a quartermaster's. Hopefully, they solved the matter.⁸⁶

I. Civil War

Despite bursts of construction activity at Fort McHenry over the years, its strategical importance seemed less and less. General Totten had already recommended new fortifications closer to the sea. But the Civil War changed all that, almost overnight. In the spring of 1861, Confederate sentiment ran strong in Baltimore. On April 19 a pro-Southern mob stoned the Sixth Massachusetts Regiment as it passed through the city streets. Union volunteer troops soon flooded into Fort McHenry, at one time reaching over 1,000 in strength. Huge 15-inch Columbiads were mounted, not toward the water, but toward the city. While Baltimore quickly settled down, the fort continued to see much activity, including duty as a prisoner of war camp. By July 1861, Harper's Weekly was able to report:

Fort McHenry is now in very good condition to resist any assault. When the Baltimore riot occurred . . . it was in very bad condition. . . . It is a small work, of the old style, surrounded by a dry ditch, and scarcely provided with any defenses on the landward side, from which, when it was built, an attack was never contemplated. But now, thanks to the energy of Major William W. Morris . . . it may defy attack from any quarter. Barricades have been erected to guard the entrance. An abattis of trees, with projecting branches, has been erected around the fort. Several platforms have been extemporized under the curtain which was originally intended only to shelter infantry. Sand-bag guards have been placed over the door and window of the magazine. Gutters have been provided to roll hand-grenades upon the heads of an assailing force. Fresh guns have been mounted, and I observe that all the mortars and a part of the Columbiads on the landward side are kept loaded. . . .⁸⁷

86. NA, RG 92, OQMG, Consolidated File, Box 632, AQM Donaldson, July 3, 1857, to Lt. Col. H. Brooks, CO, Ft. McHenry.

87. Harper's Weekly, July 13, 1861, p. 436.

In his annual report for 1861, the Chief Engineer confirmed much of the above description and added several details. He said that a palisade had been erected across the ditch at the gorge of the demilune and at the extremities of the water battery. The two personnel bombproofs at the sally port, he reported, now served as magazines. All the drains of the fort had been relaid. For the first time in years, all the armament was mounted. Finally, a new artesian well had been dug in the center of the parade.

When workmen began to remodel the bombproofs as magazines, they found several feet of chips, dirt, and water in them. Apparently, too, they found small drains leading from these bombproofs, through the ramparts, to the ditch outside the fort. Indeed, on this curtain today are some cast-iron pipes extending through the scarp. These have not yet been investigated. One post officer became alarmed that the entrances to these bombproofs were in the sally port, "the common thoroughfare," where men were smoking while passing through. It would seem, however, that these entrances remained in use. In August the Baltimore engineer announced that he would hire a stonemason to build ventilators for the two new magazines. Other than that, they were complete and could store 1,200 barrels of powder as well as some fixed ammunition.

The artesian well was in use by October 1861. The workmen had to bore to a depth of 142 feet, but succeeded in obtaining "an abundant supply of pure, fresh water." This supply supplemented the old well in front of the barracks.⁸⁸

1st. Guns etc. Mounted

I en barbette

- 2 10-in. chambered Columbiads, as follows
 1 in bastion No. 3 (main work)
 1 " " " 5 (" ")
- 6 8-in S.C. Howitzers, as follows
 1 in bastion No. 1 (main work)
 1 " front No. 1 (out work)
 1 " angle between Fronts No's 1 & 2 (out work)
 1 " front No. 2 " "
 1 " " " 3 " "
 1 " angle between fronts No. 3 & 4 " "

88. HARP, Ft. McHenry, Star Fort, 1845-73, NA, RG 77, OCE, Annual Report to Sec. of War, 1861 and 1862; HARP, 1861, NA, RG 77, OCE, Letters Received: [J. D. Shutz?], Ft. McHenry, June 20, 1861, to Totten; Major Brewerton, Baltimore, Aug. 6 and 13, and Oct. 12, to Totten.

- 19 42-pdr. Iron Guns, as follows
- | | | |
|---|-----------------------------------|-------------|
| 1 | in Bastion No. 1 | (main work) |
| 1 | " front No. 6 | (out work) |
| 9 | " " " 7 | " " |
| 1 | " angle between fronts Nos 7 & 8 | " " |
| 1 | " front No. 8 | " " |
| 1 | " angle between fronts Nos. 8 & 9 | " " |
| 3 | " front No. 9 | |
| 1 | " " " 10 | |
| 1 | " " " 11 | |
- 16 32 pdr. Iron guns, as follows
- | | | |
|---|---------------------------------|------------|
| 2 | in Front No. 1 | (out work) |
| 2 | " " " 2 | " " |
| 3 | " " " 3 | " " |
| 6 | " " " 4 | " " |
| 2 | " " " 5 | " " |
| 1 | angle between fronts Nos. 5 & 6 | " " |
- 13 24-Pdr. Iron Guns, as follows
- | | | |
|---|------------------|-------------|
| 2 | in Bastion No. 2 | (main work) |
| 1 | " " " 3 | " " |
| 2 | " " " 4 | " " |
| 1 | " " " 5 | " " |
| 1 | " Front " 3 | (out work) |
| 1 | " " " 4 | " " |
| 2 | " " " 5 | " " |
| 3 | " " " 6 | " " |
- 1 12-Pdr. Brass Field Howitzer
in Bastion No. 4 (main work)
- 1 12-Pdr. Brass Mountain Howitzer
in Bastion No. 1 (main work)
- 2 6-Pdr. Brass Field Guns
1 in Bastion No. 3 (main work)
1 " " " 5 " "
- These pieces are mounted upon their appropriate carriages and en barbette by means of platforms erected for the purpose

II Field Guns--Mounted on Field Carriages

- 1 6-Pdr. Brass Field Gun, on the parade inside the fort.

III Mortars

- 1 8-in. Siege Mortar
in Bastion No. 1 (main work).
- 1 10-in. Siege Mortar
in Bastion No. 2 " "
- 9 10-in. E. C. Mortars, heavy, as follows
 - 1 in Bastion No. 4 (main work)
 - 3 on rempart between bastions Nos. 4 & 5 (main work)
 - 1 in Bastion No. 5
 - 3 on wooden beds fabricated at the post outside
of main work in front of the curtain connecting
bastions Nos. 4 & 5, between it and the counterscarp.

2nd. Guns on the spot, not mounted, but supplied with carriages, and ready for mounting

None.

3rd. Guns without Carriages & carriages without guns

- 1 8-in. E. C. Howitzer)
- 14 32-pdrs. Iron Guns) on skids, on the ramparts
- 11 24-pdrs. " ") near Bastions Nos. 1 & 2.

Mortars

- 2 10-in. S. C. Mortars, light, on the ramparts
near Bastions 1 and 3.
- 1 24-pdr. barbette carriage, no traverse circle

4th. Gun centers and circles, ready--for armament etc.

None.

- 2 Traverse Irons (the stones are broken)
 - 2 Pintle Blocks (with pintles)
- (These were taken up when 2 10-in.? Columbiads were mounted).

Note: The fourteen 32-pounder Iron Guns, the one 8-in. S. C. Howitzer and the two 10-in. S. C. Mortars, light, all without carriages; it is proposed to use as part of the armament of the intrenchments now constructing on Federal Hill near downtown Baltimore.⁸⁹

89. HARP, Ft. McHenry, Ordnance, 5, D, 1838-79, NA, RG 77, OCE, Letters Received, B-8845, Brewerton, Sept. 17, 1861, to Totten.

Early in 1863, the Army began construction of the large detached magazine that still stands in isolated splendor near the west boundary of the historic grounds. Its general plans were based on those for the magazine at Fort Jefferson, Florida. By September the great main arch of brick was completed. By the end of the year, laborers had nearly completed pouring the cement that covered the brick arch. Unfavorable weather prohibited completion of the work until the following year. The Chief Engineer reported in 1864 that the magazine had been in use since June although workmen still had some minor work to complete.⁹⁰

Brigadier Gen. Richard Delafield became the Chief of Engineers in 1864. That November he reviewed the magazine situation at Fort McHenry. He was concerned that the new detached magazine was too far removed from the water battery, and he was somewhat puzzled as to why it had not been built behind the battery as had originally been planned. Regardless, Delafield considered it imperative that additional magazines, located within the battery, be constructed. These would be all the more needed when five 15-inch guns were mounted. He concluded: "I do not anticipate serious difficulty in draining these structures, as a cut or gallery for this purpose may be made through the covert way parapet, and drains inserted."⁹¹

Although the Civil War was drawing to a close, a board of engineers planned magazines and traverses for the water battery.⁹² The board recommended three magazines and three traverses; each of the latter would be large enough to have one or two guns mounted on it. The board noted that five center-pintle platforms had already been prepared for the 15-inch guns, and that the other 27 platforms were being modified. It recommended that 10-inch rifles

90. HARP, 1863, NA, RG 77, OCE, Letters Received, B-19566, 1838-66, Brewerton, Feb. 14, 1863, to Totten; and Report of Operations on Detached Magazine for September 1863; HARP, Ft. McHenry, Star Fort, 1845-73, NA, RG 77, OCE, Annual Report to Sec. of War, 1863, III, 466; HARP, 1864, NA, RG 77, OCE, Letters Received, 1838-66, Return for Detached Magazine for December 1863; and Annual Report to Sec. of War 1864, III, 526. Detailed description of construction will be discussed in separate section below.

91. HARP, 1864, NA, RG 77, OCE, Delafield, Nov. 23, 1864, to Captain Turnbull, CE, Baltimore.

92. Here, traverse means a mound of earth located so as to reduce damage of incoming shot. If a bomb hit any given place, the traverse would keep the explosion confined to that area.

and 10-inch Columbiads occupy these latter positions. Just as Fort McHenry had received improvements after the War of 1812 was over, so would these improvements be completed after the Civil War.⁹³

In his annual report for 1865 the Chief of Engineers summarized the improvements accomplished and anticipated at Fort McHenry:

Operations . . . during the year, have been confined to the alteration and improvement of the armament and platforms. Five granite centre pintle platforms for fifteen-inch guns have been placed in position in the demi-lune and water battery, and thirty of the old pattern platforms for lighter calibres, of the water batteries, have been heavily reinforced.

During July and August, of the ensuing year [1866], it is expected to have the fifteen-inch gun platforms ready for mounting the guns; seven of the lighter calibre ready for eight-inch guns, and all the remaining platforms of the main work and water battery reinforced; the breast height walls of fifteen-inch gun recesses built up, and the parapets of water battery reformed and repaired.⁹⁴

J. Stronger than Ever, but Growing Obsolete, 1866-1890

By 1866 a guardhouse stood outside the fort proper. An inspector general took one look at it and was horrified: "I found a large hole in the floor of the building through which the Prisoners are in the habit of escaping every day." The commanding officer immediately took corrective action by having the ordnance supplies removed from one of the old prison rooms adjacent to the sally port and the prisoners moved into it.⁹⁵

93. HARP, 1865, NA, RG 77, OCE, Letters Received, B2270, Col. Henry [?], "Report of the Bd. of Engineers of 1865 with reference to Fort McHenry."

94. HARP, Ft. McHenry, Star Fort, 1845-73, NA, RG 77, OCE, Annual Report to Sec. of War, 1865, IV, 144-45.

95. HARP, Ft. McHenry, Buildings, 1863-72, NA, RG 159, Office of Inspector General, Letters Received, 1866-89, Lt. Col. Joseph Roberts, CO, Feb. 7, 1866, to Col. Adam E [?], AAG, MM Dept., Baltimore; and 1st Lt. J. W. Eckels, AAIG, Feb. 12, 1866, to Maj. Gen. John Rawlins. It should be mentioned that the hundreds of Civil War POWs had also been housed outside the fort.

The engineer started construction on three new magazines and two bombproofs in the spring of 1866. The laborers came across a bed of high quality iron ore. The engineer proposed selling this ore and using the proceeds for the construction. Washington approved this scheme promptly. On another occasion, when excavating a bombproof, the crew ran into a vein of quicksand. They had to cut a 160-foot drain through the parapet to the seawall, drain off the quicksand, and ram 2 feet of earth in its place. The annual report for 1867 declared all the work essentially finished:

Reinforcing of pintle centers for four front pintle platforms was completed as also the substitution of the low for the high traverse circles for the same guns, which made the battery ready for its armament. The magazines and bomb-proofs and other traverses have been essentially completed, the thickness of the parapet and the rectification of its slopes, as well as the re-grading of the terreplein, has been carried nearly to completion.

This 1866-67 project marked the last major construction concerning the old fort. From then on the record dealt with minor repairs and improvements. New construction would take place outside the fort walls, where a large number of structures already stood.⁹⁶

In the summer of 1867, the tin roofs and the outside woodwork of the four sets of quarters within the fort were painted. The estimates included 300 pounds of white lead, 100 pounds of Brandon red, 20 gallons of linseed oil, 10 gallons of turpentine, 20 pounds of chrome green, and 10 pounds of patent dryer.⁹⁷

96. HARP, 1866, NA, RG 77, OCE, Letters Received, Maj. W. P. Craighill; May 21, 1866, to Delafield; HARP, 1866A, NA, RG 77, OCE, Letters Received 1838-66, Report of Operations for September 1866; HARP, 1867, NA, RG 77, OCE, Annual Report to Sec. of War for 1867, IV, 284.

97. HARP, 1867, NA, RG 92, OQMG, Consolidated Correspondence, C. C. Coleman, Baltimore, Apr. 1, 1867 to Maj. A. S. Kimball, Depot QM, Baltimore; HARP, Ft. McHenry Buildings, 1863-72, NA, RG 92, OQMG, Consolidated File, Col. H. Brooks, June 28, 1867, inspection report.

For the next several years, a considerable body of correspondence was generated concerning three structures in the old fort: the guardhouse, the artesian well, and the privies. The post surgeon commented on the guardhouse in 1868. He said that the two rooms to the west of the sally port were occupied by prisoners but that the space was "entirely too small for the present strength of the garrison." The average number of prisoners at this time was 24. He continued: "The ventilation being by means of windows is imperfect. No lights are allowed and in winter a stove is furnished. It is scrubbed out every morning, frequently white-washed and disinfectants plentifully used. On the other side of the archway /east/ is the guard-room--a comfortable room . . . communicating by means of a door of iron bars with three cells . . . intended for solitary confinement."

In 1873 another post surgeon became worried about the lack of ventilation in these rooms. He recommended that additional ventilators be placed in the roofs. Perhaps because of his concern, a three-officer board was appointed to examine the guardhouse. The board's description of the functions of the rooms differed from the surgeon's above: "Upon one side of the sally port lie the rooms for the officer of the guard and the general prison room, on the other side the guard room and the cells--three in number." Both the prison room and the guardroom were ventilated by a door, two grated windows, and two 10-inch stovepipe holes in the roof (each). The corridor in front of the cells was lighted and ventilated "by a small grated opening on the outside wall eight feet from the floor." The cells themselves each had a small opening in the rear wall, 1 foot below the ceiling. The average number of prisoners was then only 10; sometimes the number reached 20, and on occasion as many as 3 prisoners occupied each cell.

The board concluded that the guardhouse was too small, the lighting and ventilation were inadequate, and the overcrowding contributed to a breakdown of morals. Yet, because of its location in the ramparts, the guardhouse could not be improved to any significant degree. The board recommended the construction of a new guardhouse outside the fort.

The Army moved slowly. The quartermaster constructed a new guardhouse in 1878. One year later he reported: "The old guard rooms and prison rooms, in the gorge of main work, have been converted into commodious offices, with new floors, plastering, papering, etc; new tin roofs have been placed on these, as well

as over the sally-port, together with a new and complete system of gutters and spouts."⁹⁸

The artesian well in the center of the parade underwent considerable improvement at that same time. In 1868 the post surgeon noted that a manually-operated force pump lifted water from the 142-foot well to a 3,322-gallon storage tank, also on the parade ground. Iron pipes led from the tank to various hydrants both within and without the old fort. The old well in the corner of the parade was still in use at that date.

In 1872 the quartermaster pointed out that the force pump, worked by a brake, demanded the constant, back-breaking labor of the enlisted men from morning until night. Even then, the supply of water was inadequate. He prepared an estimate for a steam pump. This steam engine was in operation by 1873; from then on its clanking and roaring disturbed the occupants of the old fort. In true army tradition, only the lowest-ranking officers were then quartered within the fort.⁹⁹

Earlier in this report mention was made of the discovery of an abandoned latrine in one of the bastions. That being an exception, the records of Fort McHenry do not mention enlisted men's privies until 1868. In that year the post surgeon wrote: "The sinks for the men are all situated on the sea wall, but the original intention of having the refuse carried away by water is not entirely fulfilled." Probably, the latrines had been located on the sea wall for much of the fort's existence. By 1870, however, an enlisted man's privy stood in the moat, on the east side of the ravelin. The post surgeon complained that it was impossible to keep this one "sweet": "In warm

98. NA, RG 94, Medical History of Fort McHenry, 832, 1868-74, report by Surg. Josiah Simpson; HARP, Ft. McHenry, Buildings, 1863-72, NA, RG 92, OQMG, Consolidated File, SO No. 135, Hdqrs., Dept. of the East, July 18, 1873; HARP, 1878A, NA, RG 77, OCE, Letters Received, Maj. W. P. Craighill, Dec. 7, 1878, to Brig. Gen. A. A. Humphrys; HARP, 1879, NA, RG 77, OCE, Letters Received, Craighill, July 12, 1879, to Brig. Gen. H. G. Wright.

99. NA, RG 94, Medical History of Ft. McHenry, 1868-74, "Artesian Well at Fort McHenry"; HARP, 1872, Lt. M. Crawford, AAQM, Dec. 9, 1872, to Maj. C. G. Sawtelle, Ch. QM, 3d Dist. D.E.; HARP, Ft. McHenry, Buildings, 1863-72, NA, RG 92, OQMG, Consolidated File, Sawtelle, Sept. 19, 1873, to Col. R. C. Drum, Dept. of East.

weather it is extremely offensive," even though it was cleaned out from time to time. Still it was a necessary evil, as the privies on the sea wall were an uncomfortable distance away, especially in bad weather.

Another post surgeon was thoroughly dismayed by the privy in the ditch in 1873: "The pit is overflowing with excreta and the building very much out of repair. If the presence of this latrine . . . is a matter of necessity I would respectfully recommend that the pit be cleaned and the building be repaired and thoroughly whitewashed. Its complete destruction or removal . . . would be preferable." His argument won the day. Later he wrote that the pit had been filled and use of this latrine was discontinued.¹⁰⁰

From the military records of the 1870s various details concerning structural history emerge. An inspector general listed all the fort's armament, mounted and unmounted, in 1879 (S.B., below, means Smooth Bore):

No.	Type	Caliber	Mounted	Dismounted
6	Brass Field Guns	6 pdr. S.B.	6	
14	" " "	12 " S.B.	14	
1	" Mountain Howitzer	12 pdr.		1
1	" Field "	"	1	
10	Iron Guns Parrott	20 pdr. Rifled	10	
2	" Field Guns	6 pdr. S.B.		2
9	" Guns, Garrison	24 pdr. S.B.		9
7	" " "	32 pdr. S.B.		7
13	" " "	42 pdr. S.B.		13
5	" Sea Coast Howitzers	8-in.		5
2	" Columbiads	10-in.	2	
7	Rodman Guns	15-in.	5	2
7	" "	8-in.		7
4	Iron Siege Guns	4½-in Rifled	4	
13	" Guns, Garrison	32-pdr. "		13
1	Coehorn Mortar	24 pdr.	1	
1	Siege Mortar	8-in M 1841	1	
1	" "	10-in "	1	
4	" "	" M 1861	4	
7	Sea Coast "	" M 1841	5	2
3	" " "	" M 1861	3	
118			57	61

100. NA, RG 94, Medical History of Ft. McHenry, 1868-74, report by Surgeon Simpson, 1868; report by AA Surg. H. C. Yarrow, June 1870; Post. Surg. D. Buche, July 1, 1873, to Post Adj.; and Buche, Oct. 3, 1874, to Surgeon General, USA.

This same officer gave a general description of the fortifications:

Proper care taken of the fortification. Persons not permitted to walk on the slopes. Animals not allowed to graze on the Slopes. Grass on Slopes frequently mowed. Spots of dead grass replaced by fresh sod. Grass not burned on any portion of work. No earth, sand, or ashes placed against woodwork. Floors, platforms, bridges etc. well swept down. Terrepleins and Casemates in good order. . . . Sidewalks in good order.¹⁰¹

The enlisted men's barracks probably underwent some minor exterior repair in 1875. In addition to replacing and fixing doors and windows, the workmen were to install new gutters and spouts. The estimate for this last read: "Spouting 4" down spout 9" Gutter best. Charcoal [terne?] tin 140'." Two years later the tin roofs of all four quarters required repairs. Apparently all this work was carried out. An inspector general wrote: "The officer's quarters and barracks inside of the Fort, have been put in perfect repair since my last report."¹⁰²

When a magazine had been built in the ravelin after the Civil War, two wooden stairs had been erected as access to the gun platforms on the ravelin. By 1877 these stairs had so rotted that the engineer officer found it necessary to replace them. At the same time he repaired "the small connecting slope at South end of East face /of the ravelin, it/ having caved in after the violent storm of Jan'y 31st."

Other improvements in the late 1870s included repairing the slate roof and repointing the walls of the Civil War magazine; stuccoing the inside of the east wall of this magazine; spreading 7,000 bushels of oyster shells as a "top dressing" for the roads

101. HARP, 1870, NA, RG 159, Office of Inspector General, Letters Received, 1866-89, IG D.B. Sacket, Apr. 28, 1870, report of inspection.

102. HARP, 1875, NA, RG 92, OQMG, Consolidated File, Estimate for repairs at Ft. McHenry, for FY ending June 30, 1876; HARP, 1877, NA, RG 92, OQMG, Consolidated File, IG Richard Arnold, Apr. 2, 1877, report of inspection; and NA, RG 159, Office of Inspector General, Letters Received, 1866-89, Arnold, Sept. 25, 1877, report of inspection.

and walks; installing new double wooden doors for the magazines; and placing a new roof of corrugated tin over the arch of the sally port.¹⁰³

By 1879 all the enlisted men at Fort McHenry lived in barracks outside the fort proper. The old officers' quarters inside the fort were still much in demand, there being 15 officers assigned to the post and only 11 sets of quarters both within and without the fort. Two second lieutenants, at the bottom of the officers' ladder of rank, unhappily received two rooms each in the old enlisted barracks, HS 4, next to the old junior officers' building. Each of these "apartments" consisted of one downstairs and one upstairs room. Aghast at the condition of these quarters, both lieutenants wrote letters of complaint to the post quartermaster. They requested a complete renovation of the interiors and a few changes that affected the exteriors. These latter consisted of cutting a window in the upper-floor room at the east end of the building, and constructing an additional chimney for heating this room. The physical evidence confirms that at least the window was cut in the east end wall.¹⁰⁴

The 1880s marked a steady deterioration of the drainage system for the fortifications. Earlier this report made reference to a drain leading northward from the vicinity of the ravelin toward the river. In 1880 an agitated post surgeon reported that someone had removed the grating from where this drain had been tapped, near the ravelin, and was dumping kitchen slops and "night soil" into it. The same doctor noted that the old privy between the fort and the ravelin was again in use. He urged the thorough and frequent disinfection of it.

The engineers took four years to act on the surgeon's complaint regarding the drain near the ravelin. In 1884 they announced: "The cess-pool at the salient of the ditch of the demi-lune has been dug

103. HARP, 1878, NA, RG 77, OCE, Letters Received: Craighill, Mar. 2, 1878, report of operations for February 1878; June 10, 1878, report of operations for May 1878; and Capt. C. B. Phillips, July 13, 1878, annual report of operations to June 30, 1878; HARP, 1878A, NA, RG 77, OCE, Letters Received, Craighill, Dec. 7, 1878, to Humphreys; HARP, 1879, NA, RG 77, OCE, Letters Received, Craighill, June 3, 1879, to Actg. Ch. of Engrs.

104. NA, RG 92, OQMG, Consolidated File, 2d Lt. W. P. Edgerton, Nov. 10, 1879; and 2d Lt. E. E. Gayle, Dec. 1, 1879, both to Post Adjutant, Ft. McHenry.

out, the brick-work rebuilt and a grating placed, and the drain leading therefrom and underground to the slope in front has been repaired at its exit." Other drains in or about the fort that were repaired in 1884 included the drain from the two bombproofs and magazine No. 3 in the water battery. These drains led to an otherwise unidentified cunette, or trench, that may have run along the main ditch.

At the end of 1880 a junior officer recommended the rebuilding of 100 yards of the brick surface gutter at the foot of the parade wall. The bricks were so displaced as to cause the water to stand in pools behind the quarters. His suggestion was approved and this work was completed by May 1881 at a cost of about \$60. Perhaps the workmen did not know their trade well. Three years later an engineer officer wrote: "The brick pavement and gutters inside the main work and sally port are in poor condition and almost useless in their present state for the purpose of drainage." He estimated \$395 to do the work properly. Again, the Chief of Engineers gave approval. Presumably the workmen succeeded, for the subject was dropped from the correspondence.

By 1881, one of the enlisted barracks, probably HS 4, had become the residence of the families of married enlisted men. The post surgeon observed that these families were using a privy that was not yet connected with water pipes. Possibly he was referring to one of the old officers' privies adjacent to the magazine. He recommended supplying this latrine with a quantity of unslaked lime. He also said that solutions of chloride zinc and copperas should be used on the main drain under the postern. That December, the engineer officer reported that this main drain had been cleared from end to end.

Despite all this effort, the drainage system remained poor. In 1887 an officer exclaimed that all the magazines in the water battery were too wet to store powder. Indeed, he said, "the surface drainage about the fort is as bad as could be." He thought he could identify the problem. Apparently untrained soldiers had carried out most of the repairs, whereas skilled workmen were essential for this kind of work. A senior engineer officer agreed with him, and further stated that nobody had a clear understanding of the fort's drainage system:

Should it ever be thought necessary to employ a Sanitary expert to recommend a complete system . . . it would be expedient first to ascertain what is now there. In the course of time under different administrations, sometimes of the Q.M. Dept. sometimes the Engineer Department, sometimes a Commanding Officer, much work has been done and undone in the way of constructing

sewers, laying pipes underground for various objects, removing them, changing them etc. Very much of this work has not been a subject of record on maps or plats, and . . . nobody knows what is under the soil of Ft. McHenry.

This pithy remark remains very much the truth at Fort McHenry today.¹⁰⁵

By 1880, metal pipes conducted water from the artesian well to a number of hydrants outside the fort. Once the steam-powered pump began operating, improvements of and extensions to this water system were made. For example, in 1882 workmen laid a water supply pipe from the sally port to the post trader's store, to the east near the sea wall. Until then the store had been supplied with water by a small pipe that ran inside the main drain to the sea wall.

In 1883 a captain described the water system in detail, accompanying his report with a map showing the pipelines:

The principal supply of water is furnished by an artesian well sunk in the center of the parade ground of the old Fort. The well is 142 feet in depth, 12 inches in diameter 92 feet down, 88 feet of 8 inch pipe extending to 138 feet, double pipe 46 feet. The water is forced by a steam engine of 8 horse-power, from a depth of 30 feet into 2 tanks adjoining the well; one, an iron one, holding about 3300 gallons and the other a wooden one, about 8000 gallons; from thence it is distributed through iron Pipes to all the officers Quarters, the Hospital, Barracks and Bathhouses of enlisted men outside the Fort. The houses and barracks inside the Fort, with the exception of two sets Officers

105. NA, RG 94, Med. Hist. of Ft. McHenry, 833, 1874-81, Surg. J. R. Gibson, Record for March and July 1880; 834, 1881-94, Record for August 1881, and for June 1883; HARP, 1880-85, NA, RG 77, OCE, Letters Received: 1st Lt. T. Turtle, Dec. 13, 1880, to Craighill; Craighill, Dec. 31, 1881, Report of Operations for December 1881; for August 1883; and for December 1884; HARP, 1884, NA, RG 77, OCE, Selected Letters, Fortifications, 1882-84, Craighill, Aug. 30, 1884, to General Newton; HARP, 1887, NA, RG 159, Office of Inspector General, Letters Received, Lt. Col. L. Livingston, Aug. 5, 1887, Report of inspection; NA, RG 92, OQMG, Consolidated File, Craighill, May 11, 1888, to Ch. of Engrs.

Quarters, in which $\frac{1}{2}$ " iron water pipes have been lain, derive their supply from a Hydrant situated in front of the well.¹⁰⁶

The steam engine on the parade ceased to whistle and clank in 1884, when the City of Baltimore extended its water system to the gate of Fort McHenry. Once more, quiet and peace descended on the quarters in the old fort.¹⁰⁷

As they had for nearly a century, the fortifications themselves demanded almost constant repairs in the 1880s. An 1882 report made the interesting observation: "The walls of the fort were color-washed." About that time the engineers cleaned out the bombproofs on either side of the sally port. Some drain had developed a leak, causing these vaults to become "filthy with bilge water." The following summer witnessed a multitude of tasks completed: repairing the slopes of the magazine [No. 3?] and traverse in the covered way of the southeast front of the main work; mowing and resodding of all the slopes and the glacis; laying concrete floors in the old guard-rooms (now offices); repointing and repairing the scarp of the fort and the ravelin; repairing the sodding of the parapets; repairing the gutters from the curtain on each side of the sally port; and repointing the wall around the detached magazine.¹⁰⁸

The engineer officer undertook little work in 1884. He did repair the coping of the main work and the ravelin, and placed coping on the ramp leading to the east bastion where the flagstaff then stood. He also relaid the stone steps leading to the terreplein from the parade. (There were two flights of such steps: one between HS 2 and HS 3, the other between HS 4 and HS 5. Presumably, he repaired both flights. An 1885 report mentioned "the wooden guard-rail to the roadway." Whether these rails guarded the ramp from the sally port to the road remains unknown. That same year

106. NA, RG 94, Med. Hist. of Ft. McHenry, 834, 1881-94, Asst. Surg. J. M. Dickson, Report for May 1882; NA, RG 92, OQMG, Consolidated File, Capt. J. L. Clem, Dec. 18, 1883, Report on the water supply.

107. HARP, 1887, NA, RG 92, OQMG, Consolidated File, unsigned, undated, "Office Brief as to Water Supply."

108. NA, RG 94, Med. Hist. of Ft. McHenry, 834, 1881-94, Surg. J. M. Dickson, Record for May 1882; HARP, 1883, NA, RG 77, OCE, Selected Letters, Fortifications, 1882-84, Craighill, July 2, 1883, to General Wright; HARP, 1883, NA, RG 77, OCE, Letters Received, Craighill, Sept. 1, 1883, Report of operations for August 1883.

saw continuing minor repairs such as re-laying some of the brick pavement on the parade ground.¹⁰⁹

The four structures containing quarters within the fort underwent some changes of function during the 1880s. The old commanding officer's quarters (HS 1) were refurbished and two rooms on the upper floor served as offices for the commanding officer and the post adjutant. (These offices had recently been located in the old guardrooms adjacent to the sally port.) Before the 1880s were over, married enlisted men moved their families into the lower floor of this structure.

The magazine (HS 2) continued to serve its primary function, even though several other magazines were also available. The responsible officers usually reported its condition as being good.

The junior officers' quarters (HS 3) do not seem to have been occupied in the early 1880s. In 1886, however, the post commander expected the arrival of two new second lieutenants and requested the thorough repair of the old building in order to house them. Although the quartermaster carried out the improvements, married soldiers moved into this building also. By 1888, it was again vacant.

Officers had occupied the old enlisted men's barracks (HS 4) some years earlier. With the construction of additional quarters outside the fort, this building again became vacant. By the early 1880s its 6 rooms had been cut up into no fewer than 18. It, too, housed enlisted men's families in the 1880s.

The other barracks (HS 5) was in such a state of disrepair that it stood abandoned, except when for a short time it, too, housed married men's families. At the end of the decade, the quartermaster prepared lengthy estimates for the repairing of this structure to again serve as a barracks. This work was not undertaken. A few years later, this structure became a storehouse.

From both the estimates and completion reports for repairs and remodeling during this period, several structural details may be gleaned. At least one door in the old commanding officer's quarters

109. HARP, 1884, NA, RG 77, OCE, Letters Received, Craighill, July 1, 1884, Report for June 1884; Dist. Engr. Off., Baltimore, Selected Letters, Craighill, July 3, 1884, Annual report for 1884; HARP, 1885, NA, RG 77, OCE, Letters Received, Craighill, Jan. 1, 1885, Report for December 1884; and Craighill, Feb. 1, 1885, Report for January 1885.

had a transom over it. By this time an outside stairway led to the second-floor porch of the barracks, HS 4. An estimate for this same building called for: "130 feet of 12" Gal. Tin Gutter, 92 feet of 3" Gal. Tin Spouting, and 30 wrought iron hooks." One estimate called for the application of "brick paint" to the exteriors of all four quarters. A new stairway was built at the rear of the old junior officers' quarters; whether this led to the parade level or to the terreplein (more likely) is not known.

Although the old barracks, HS 5, was not reconditioned as planned, the estimates for materials are of at least passing interest:

5000' Ga. Pine 1" flooring for interior
1200' " " " " porch floor
8 Porch columns 12" turned
2000' Va. Pine 3x12" joists for lower floor
3000' 3x4" Va. Pine scantling for partitions
1500' linear ft. White Pine Washboards
1000' 7/8"x4" White Pine /Casings?/
1500' Washboard moulding
11 inside doors & frames complete
6 outside " " " with transoms
26 box window frames 12x14" with sash,
glass, weights, blinds, jambs, rope
for 18" brick wall
400' White Pine 1½" x 12" for steps
2000' ½ Va. Pine Ceiling for porches
Hardware, nails

30 squares of tin roof
200' 13" G. I. Gutters
80' 4" G. I. Spouting
2000 hard brick laid
40 gal. mixed paint
200 lbs. Venetian red
125 lbs. brick paint
20 gal. linseed oil
5 gal. turpentine¹¹⁰

110. HARP, 1884-88, NA, RG 92, OQMG, Consolidated File: Clem, Report of Inspection, Mar. 31, 1884, and Mar. 31, 1886; 1st C. G. Woodward, Mar. 31, 1887, Report of Inspection; NA, RG 92, OQMG, Consolidated File, 1st Lt. R. D. Potts, Sept. 14, 1886, to Post Adj.; Woodward, Apr. 11, 1887, Report of Inspection; Woodward, Dec. 11, 1888, Historical Sketch of Ft. McHenry.

The old guardrooms flanking the sally port now had a new function. They served the post quartermaster as storerooms "for mineral oil and unserviceable property." By the end of the 1880s the steam pump and the storage tanks had been sold at public auction and removed from the parade ground. A plan drawn at this time indicated that some sort of roof covered the passageway from the south end of the old junior officers' quarters (HS 3) to the old officer's kitchen room at the west end of the barracks (HS 4). Two other developments in the 1880s should be noted: The quartermaster erected lampposts with coal oil lamps on the military grounds, at least one of which stood inside the fort; and the post fund supplied the cash necessary to plant 100 silver maple trees on the grounds of the post.¹¹¹

K. A New Water Battery, 1872-1892

In 1872 or 1873, the Corps of Engineers undertook the construction of a new water battery at Fort McHenry. The engineers located it northeast of the fort, near the sea wall, on approximately the same site where the lower water battery had stood during the War of 1812. The original plan for this massive earthen work called for the placement of twenty-five 15-inch guns. By 1876 a parapet sufficiently large to cover 10 guns, 3 traverse magazines, and the terreplein had been completed. That year the Army suspended all funding for this work. An engineer recommended in 1878 that this battery be completed, but his plea fell on deaf ears. Again, in 1892, the Baltimore district engineer also urged completion of this battery and the installation of modern guns. That the Army never renewed work on this battery was indicative of the declining importance of Fort McHenry as a coastal fortification. This massive earthwork continued to dominate the sea wall until well after World War I.¹¹²

111. NA, RG 94, Med. Hist. of Ft. McHenry, Surgeon's Report for January and March 1883; HARP, 1888, NA, RG 92, OQMG, "RB FM," Woodward, Dec. 11, 1888, Historical Sketch of Fort McHenry, with plan.

112. HARP, Ft. McHenry, Ordnance, 6, 1880-1958, unsigned, undated account, "Defenses of Baltimore," filed under 1886, and said to come from NA, RG 77; HARP, 1878, NA, RG 77, OCE, Letters Received, Capt. C. B. Phillips, July 13, 1878, to Humphreys; NA, RG 77, OCE, Document File, 1890-1892, No. 3386, Craighill, Report for year ending June 30, 1892.

1. Decline and Abandonment, 1890-1912

The year 1890 began with renewed discussion of renovating the old barracks, HS 5. This time the plans called for the construction of a latrine behind the barracks, in that narrow space between the building and the revetment. The same plans discussed the reconversion of the old commanding officer's quarters back to officers' quarters again. As far as it is known, neither concept was realized.¹¹³

Colonel Craighill, Corps of Engineers, reported that in fiscal year 1892, \$1,173.18 had been spent on repairs. The main items affecting the fortifications included constructing new wooden steps (two flights?) up to the terreplein of the ravelin; re-forming 1,000 square yards of the slopes of the old water battery; repairing damage caused by slippage on the earthen side slopes of magazine No. 3 in the water battery; cleaning out the ditches of both the main work and the water battery; and putting a gray wash on the scarp of the fort and the ravelin.¹¹⁴

Despite the fact that two new 8-inch rifled guns were mounted in the old water battery (on platforms 20 and 21) in 1893, this was a poor year for appropriations. Colonel Craighill received only \$599 for repairs. Out of this amount he was to accomplish the following concerning the exteriors of the works:

New doors and locks for magazine no. 3 and traverse no. 4.
Clean and repair drain pipes for magazines and ravelin.
Clean main ditches of fort and water batteries and re-form slopes.

It is presumed that all projects were completed.¹¹⁵

In one of his sanitation reports in 1893, the post surgeon noted that the old quarters inside the fort were in use as either storehouses or quarters for married men's families. He did not think the

113. NA, RG 92, OQMG, Consolidated File, Woodward, Apr. 10, 1890, "Estimate of xx [sic] required for repairs."

114. NA, RG 77, OCE, Document File, 1890-92, No. 3386, Craighill, Report for year ending June 30, 1892.

115. NA, RG 77, OCE, Document File, 1893-94, No. 612; Craighill, Jan. 6, 1893 to Brig. Gen. T. L. Casey; Capt. J. D. D. Knight, June 26, 1893, to Craighill.

latter function was at all satisfactory, owing to the building's dampness, poor condition, and defective ventilation. Another "dampness" problem existed at this time. The magazines and bomb-proofs in the water battery had so much water standing in them that Colonel Craighill purchased a pumping apparatus on the open market for \$30.93 to dry them out.¹¹⁶

A drastic change occurred to the old junior officers' quarters in 1894. The quartermaster general allotted \$675 for modification of the structure, and \$820 for the construction of a two-furnace bake oven within it. As a result the historic building changed from a two-story residence to a one-story bakery (see illustrations).¹¹⁷ At this same time the old commanding officer's quarters was thoroughly remodeled. Its first floor became the ordnance storehouse; the second floor housed subsistence stores. Across the parade, the old barracks, HS 5, had both floors rearranged to house various types of quartermaster supplies and the quartermaster's office (see illustrations).¹¹⁸

As the century came to an end, the Chief of Engineers reported another development at Fort McHenry: "All the exposed brick masonry /has been/ scraped and painted with magnite, a cold-water paint, which has adhered very well." Just what that did to the appearance of the fort the general did not say.¹¹⁹

The flagstaff, then located on the east bastion, became the topic of much discussion early in the new century. The post quartermaster first brought the subject up when he asked for \$40 to paint it. Department headquarters turned him down because he had used the wrong account number. This bureaucratic red tape probably was not the stimulus that led Capt. Charles Gerhardt at Fort McHenry to propose memorialization of the flagstaff.

116. HARP, 1893, NA, RG ?, AGO, "MRD 1800-1916 RF," Surg. C. B. Ewing, Sanitary report, June 30, 1893; NA, RG 77, OCE, Document File, 1893-94, No. 3815, Register of Letters Received (Craighill, Sept. 7, 1893).

117. NA, RG 92, OQMG, Document File, 1890-1914, No. 69160, QMG, Aug. 13, 1894, an endorsement; and Contract with John T. Brooks, Baltimore, Sept. 28, 1894.

118. NA, RG 92, OQMG, Document File, 1890-1914, No. 80815, IG J. C. Breckinridge, Feb. 13, 1895, to QMG.

119. HARP, 1899, "HD 56 C I S 1899-1900, 871," Annual Report of the Chief of Engineers, USA, 1899, p. 818.

Gerhardt believed that the flagstaff was then located at the exact spot where it had been during the bombardment in 1814. Also, he implied that Francis Scott Key had written the "Star Spangled Banner" at the fort rather than in Baltimore. Gerhardt recommended that "a bronze tablet be erected near the flagstaff giving on one half a short history of the event and the name of the author and on the other the song in full, or a number of bronze plates could be put around the lower part of the staff about breast high."

Major Medorem Crawford, the post commander, enthusiastically endorsed Gerhardt's letter, adding that large numbers of persons visited Fort McHenry annually because of its historical significance. The department commander added his thoughts: "A flag staff, as tall as possible and in proper proportion, should be erected on the very spot in question and from this a flag should fly at all times, day and night."

Gerhardt's letter made the rounds of the general staff in Washington. A fly flew into the ointment when the letter reached Brig. Gen. John Patten Story, the Chief of Artillery. Story pointed out that Key had not written the anthem at Fort McHenry. More importantly, Story did some research on his own and was "not able to verify the statement of Capt. Gerhardt that our flag is now displayed at the same point it was flying at the British bombardment." While one does not know what sources Story had access to, his problem can well be understood today. The only plan of the fort before the War of 1812 showing the flagstaff placed it in the corner of the parade, where a replica now stands. The first postwar map showing the flagstaff located it in the bastion where it stood when Gerhardt wrote his letter. Exactly when the army moved the staff still remains unknown.

The quartermaster general had his own ideas. He recommended the construction of an iron or steel shaft, not less than 100 feet high, and a granite monument bearing a bronze tablet such as Gerhardt had suggested. The Secretary of War's office approved the quartermaster general's concept. As the planning progressed, Fort McHenry supplied data on its existing flagstaff: It was 80 feet high. The main mast was 55 feet high. The length of the top mast was 25 feet. The diameter at the base of the staff measured 2 feet. The staff was built of Norway pine, and it was not guyed.

The new flagstaff was not acquired, but a tablet to Francis Scott Key was installed at Fort McHenry by May 7, 1909.¹²⁰

Gerhardt's idea came to life just in time. Even before the plaque was installed, the Baltimore News, in 1906, announced that the Army was preparing to turn Fort McHenry over to the Bureau of Animal Industry for use as "a cattle pen"--actually as a cattle quarantine station. Both the editor and the artillery district commander, Col. Harry R. Anderson, were aghast at the plan, partly because of the Star Spangled Banner's history, and partly because the fort served as Anderson's supply center.

The army proceeded with its plans and announced that the fort would be abandoned on March 31, 1907. Mindful of this, the post quartermaster ceased to make all but emergency repairs to the structures of the post. Then, on March 20, he learned that Fort McHenry was not to be abandoned after all. His interest in repairs immediately picked up and he recommended repairing the tin roofs of the structures within the fort. His letter listed the existing functions of the four former quarters: The old commanding officer's quarters served as the commissary office and storehouse (apparently its role as ordnance storehouse had ceased); the junior officers' quarters was still a bakery; the former barracks, HS 4, still was in use as quarters for noncommissioned officers on the staff and their families; and the other barracks, HS 5, was the quartermaster's office and storehouse.¹²¹

120. NA, RG 92, OQMG, Document File, 1890-1914, Nos. 163864 and 206275; Capt. M. G. Spinks, May 22, 1902, to the Adj., Ft. McHenry; Capt. Charles Gerhardt, Feb. 21, 1905, to the Military Secretary; Crawford, Feb. 21, 1905, an endorsement; Brig. Gen. F. Grant, Dept. of the East, Feb. 24, 1905, an endorsement; Brig. Gen. J. Story, Chief of Artillery, Mar. 7, 1905, an endorsement; QMG, Aug. 23, 1905, an endorsement; Actg. Sec. of War, Aug. 24, 1905, an endorsement; Post QM, Ft. McHenry, June 29, 1905, an endorsement; an incomplete document, May 7, 1909, announcing installation of the tablet.

121. HARP, 1906, clipping from Baltimore News, Nov. 26, 1906, "Flag Should Always Fly"; NA, RG 92, OQMG, Document File, 1890-1914, No. 234571, Maj. J. T. Knight, OQMG, Feb. 12, 1907, to Ch. QM, Dept. of the East; No. 206275, 1st Lt. J. D. Watson, Ft. McHenry, Mar. 20, 1907, to Ch. QM, Dept. of the East; and No. 206275, Watson, Apr. 27, 1907, estimate of repairs.

The post quartermaster failed to mention that the strength of the post at that time consisted of only 1 officer and less than 15 enlisted men. This skeleton force lasted from April 1806 to May 1807, when a battery from the Coast Artillery arrived for duty.

Fort McHenry continued as an active post for five more years. Then, on July 13, 1912, a telegram arrived at Fort McHenry announcing an end to more than 100 years of military history:

Following from War Department, July 12 repeated, quote--

Issue orders relieving 141st Company . . . from duty Fort McHenry . . . to Fort Strong, Mass. for station. Fort McHenry . . . will be turned over to caretakers to be furnished by Quartermaster's Department.¹²²

M. Absentee Ownership and Restoration, 1912 on

Five years later the Army returned to Fort McHenry in unprecedented numbers. In a short time General Hospital No. 2, with 13,000 beds, covered every available square foot of military terrain. The impact of this massive construction could have been disastrous to the historic structures had it not been for the alertness of the construction quartermaster officer. He wrote in his completion report:

During the construction work of this project all the /above ground/ historical landmarks have been religiously respected, and the General Hospital No. 2 has been built entirely around the original Fort and its landmarks without any encroachment, so that should it ever be deemed advisable to raze the present hospital buildings, Fort McHenry will remain intact as one of the landmarks of American History.

The quartermaster was as good as his word. All the historic structures within and without the old fort emerged from this experience virtually unscathed.¹²³

122. NA, RG 94, Med. Hist. of Ft. McHenry, 836, 1906-12, Record for July 1912.

123. HARP, 1917, NA, RG 92, OOMG, Capt. M. A. Hockman, Constr. QM, Completion Report, Construction of General Hospital No. 2, 1917-19.

The Army did not give up ownership of Fort McHenry during the post-World War I years; it did give the City of Baltimore permission to use the grounds as a recreation area. During this period the city made some changes in the detached magazine, a portion of which became a bathhouse.

In 1925 authorization was given to make Fort McHenry a national park, under the administration of the United States Army. Toward the end of the 1920s the Army began giving consideration to restoring the old fort. The first step the military took was anything but restoration. Brigadier Gen. William E. Horton wrote the adjutant general in December 1928 requesting authority to remove the partly completed water battery dating from 1873. He gave three reasons for its removal: It was not connected with the War of 1812, it obstructed the view of the harbor, and the general needed its materials elsewhere. The Army approved; the battery disappeared.¹²⁴

The Army then began in earnest to restore the fort and its structures. This work took nearly all of 1929. Although the Army was not in the historical restoration business, it made a serious effort to return the structures to their former appearances, not as they had been in 1814, but generally toward the maximum physical development of the active military period. The officers in charge of the work prepared two reports describing their efforts:

Physically, the old fort is a fine example of the military architecture of the end of the Eighteenth Century, being laid out on the plan of a regular pentagon with a bastion at each angle, forming in effect a five pointed star. It is a barbette work with brick masonry, scarp capped with a heavy projecting granite coping, the corners of the bastions being of sandstone. Each front measures about two hundred and ninety feet between the points of the bastions. The parade is a regular pentagon of about one hundred and fifty feet on each side surrounded by a well-laid granite wall about five feet high supporting the ravelin /terreplein?/ in front of which a brick masonry wall about three feet high, with sandstone coping over sheet zinc, acts as a retaining wall for the curtain of sodded earth extending to the top of the scarped interior walls.

The level of the parade is about 33 feet and the top of the bank above the scarped walls is about forty-five feet above mean low water mark. A wide ditch, 13 feet below the coping of the masonry wall, surrounded the fort, on the outer edge of which was a bank eight

124. HARP, 1927, NA, RG 94, AGO, Correspondence FM, 1927-39, Brig. Gen. W. E. Horton, Dec. 8, 1928, to AG.

feet high with an earth platform for riflemen. Sloping away on all sides was the turfed glacis. The ditch was never used as a water moat and, in fact, parts of it were never completed.

In 1894, all the fine old two-story porches to the buildings in the old fort were removed, except one Barracks, HS 4, and the buildings much altered, both on the exterior and interior.¹²⁵

Lieutenant Clifford Smith, construction quartermaster at Fort George C. Meade, Maryland, took charge of the restoration work and served in that capacity until April 15, 1929, when he transferred to Puerto Rico. Captain H. N. Williams then took over and saw the work to its completion:

Repairs to Fortifications

Casemate magazines were all cleaned out and repaired. New iron gates were installed on each entrance to the battery magazines; these iron gates are still in place. The 19th century doors were wooden. Brick rampart walls around inside of outside cannon battery was sic pointed up and repaired. Cannon were all painted and cleaned up.

Repairs to Star Fort Outside Wall

The brick-work on the exterior wall of Star Fort was in very bad condition, due to water getting behind bricks and bulging them out. This was one of the major items of cost, as, in many cases, it was necessary to completely rebuild the wall for some distance. Possibly this was the occasion when Portland cement was used for pointing.

Repairs, Alterations and New Work Inside of Star Fort Enclosure.

Buildings

Considerable changes had been made in the buildings inside of the Star Fort during the long time since the original construction, and required

125. HARP, 1927, NA, RG 94, AGO, Correspondence FM, 1927-39, L. W. Leisenring, OQMG, compiler, Mar. 12, 1929, "Fort McHenry, Maryland."

considerable work to restore them as they were originally built. . . .

The brick walls had bulged in many places, and required tearing down and rebuilding. In many places, the walls required iron rod braces run from front to back of buildings [these may still be seen]. All brick work on all buildings required repointing [Portland cement?].

New tin roofs were installed on all buildings, and gutters and downspouts were installed, as of original construction. [These tin roofs were recently replaced by the National Park Service.] The original spatter blocks, or granite stone, were found and installed at foot of all downspouts. [Some may still be found in place.]

The original porches on these buildings had been removed [except on the Barracks, HS 4]. These porches were all reconstructed, requiring special millwork. [The park replaced all porches in 1973.]

The brick floors on the first floor of all buildings had been removed. These were all replaced. [Actually, during the active military period all these floors were wooden.] Fireplaces had been bricked up, in many cases, and they were all restored according to original design. One original kettle hook in fireplace, was found, and new kettle hooks were made of the same design . . . and installed in all fireplaces.

The window frames and openings, in many places, had been moved and changed. All the stairs between first and second floors had been changed. Doors and openings had been bricked up and moved. These were all restored by purchasing special millwork and hardware similar to original installations. [But transoms were not reintroduced.]

New wooden floors were installed on second floors of all buildings, using lumber similar to that originally used.

The lathing on second floor walls and ceilings were repaired, and the entire second floor of all buildings was replastered. The two hallway entrances of 'A' building [HS 1] were lathed and plastered.

On the west end of second floor, Building 'D' HS 47 was converted into quarters for additional Caretaker. . . .

All interior and exterior woodwork of all buildings were thoroughly painted, as were all plastered walls and ceilings of the second floor. The first floor walls of all buildings were white washed. Stairs to the second story, and wooden floors in second story of all buildings, were thoroughly varnished. All tin roofs, gutters and drain pipes were painted.

Additional electric wiring was installed in all buildings in Star Fort enclosure. . . .

The bombproofs at the Sally Port were cleaned out and the drains from them cleaned and connected to catch basins. New stairways were built leading down into the bombproofs, and new doors, built according to original design, were installed at their openings. The lighting system into the bombproofs was repaired, and new switches installed.

Information was furnished that there was originally a well and pump in the center of the Star Fort enclosure . . . and after some speculative digging, the pump was found several feet under ground; also it was discovered that the well had been filled up. This well was cleaned out, and a new pump installed, which is now in operation. Apparently, the Army was unaware of the first well in the corner of the parade.

New brick walks were laid inside of Star Fort enclosure in front of, and around all buildings. Not necessarily reflecting any specific historic period.

It was necessary to do considerable rebuilding of the inside wall of the Star Fort enclosure wall, and replacing of the stone copings of both the inside and outside walls of the enclosure wall, which had become broken. These all required zinc flashing installed under them.

Brick gutters were laid inside of the Star Fort enclosure, to take off all surface and roof drain water, and connected to drain. The drain through the tunnel, which runs from inside to outside of enclosure through wall, was cleaned out and repaired.¹²⁶

Implied in the above report, but not stated explicitly, was the reconstruction of the second floor of the junior officers' quarters, lately the bakery.

The War Department transferred Fort McHenry to the Interior Department in 1933. The fort and the other structures were, at that time, very much in the same condition as they appeared at the end of the 1929 restoration. Since 1933, the National Park Service has administered Fort McHenry National Monument and Historic Shrine. The major activity of the National Park Service during the past 40 years has been to maintain the structures as they existed when the Service accepted responsibility for their perpetuation as a historic site commemorating an important moment in the formation of the United States of America. Within the past year or so the roofs have been retinned and painted and the porches have been reconstructed.

126. HARP, Ft. McHenry, Buildings, 1879-1958, (depository?) no signature, Sept. 13, 1930, to the AG, Washington, subject: Improvements at Ft. McHenry, Maryland.



III. HISTORICAL DATA

PART II: INDIVIDUAL STRUCTURES

In this section, the structural data as found in the historical records is arranged chronologically by individual structure. Under "Sally Port," material referring to the adjacent Guardrooms and Bombproofs is also listed. Data concerning the drainage system of the entire complex will be found under "Star Fort." The missing numbers below have been assigned by the park to modern buildings.

HS 1	Commanding Officer's Quarters
HS 2	Magazine
HS 3	Junior Officers' Quarters
HS 4	Enlisted Men's Barracks
HS 5	Enlisted Men's Barracks
HS 6	Sally Port, Guardrooms, and Bombproofs
HS 7	Civil War (Detached) Magazine
HS 12	Star Fort and Drainage
HS 13	Ravelin
HS 14	Water Battery
HS 15	Flagstaff

HS 1, Commanding Officer's Quarters

The original, single-story, two-room structure was built about 1800. By 1819 a small detached structure stood at its north end. This small building has traditionally been interpreted as an early guardhouse. However, this report considers it to have been a detached kitchen for the commanding officer. An 1824 report on officers' quarters refers to such a kitchen.

1822: Roof of commanding officer's quarters leaked where it joined chimneys--wood shingles on roof at this time. Outside woodwork required painting. New locks needed on doors.

1824: Roof needed repairs.

1828: Estimate prepared for repairs to roof and new spouts.

1829: Estimate prepared to add second floor, a 12-foot-wide addition to rear of building, and a two-story piazza to the front. Another report said that the existing brick walls were 14 inches thick and ran 2 feet above the upper (garret) floor. The new upper-story walls were planned to be 9 inches thick and to rise 7 additional

feet. This work was accomplished in 1829 except that the addition to the rear was never built. The kitchen unit was incorporated with the main building by enclosing the space between them to make a hall. The building now consisted of six rooms and two two-story hallways.

1837: Zinc roof put on. (Roof had been wood shingles.)

1843: Roof leaked badly.

1853: Piazzas and blinds (shutters?) needed repainting.

1856: Roof referred to as tin.

1867: Roof needed repainting, as did the outside woodwork. Painting completed by June.

1877: Tin roof required repair.

1884: By that year two rooms on upper floor were being used as the offices for the commanding officer and adjutant. A new door frame and a transom were needed. Married men's families occupied lower floor.

1885: New tin roof required. Spouting needed repairing.

1887: Two rooms still used as commanding officer's and adjutant's offices. Rest of building used as married men's quarters. Exterior needed painting.

1888: Work planned. New box window frames and sashes. New door and window casings. New blinds (shutters?) and transoms. New ceilings and floors on the porches. Painting the "whole building" on the exterior.

1888: A report this year referred to this structure as the administration building and said that the two offices were on the upper floor.

1890: Some discussion about this structure again becoming officers' quarters.

1893: Structure still serving as administrative offices.

1895: Post quartermaster allotted \$2,300 to remodel this structure and HS 5 into storehouses. The old commanding officer's quarters became a quartermaster storehouse and office.

1905: Structure identified as being the quartermaster and commissary storehouse. Roof, tin. Walls, brick. Lighted by electricity. It had water and sewer connections.

1907: Condition described as good. Needed repairs to gutters and downspouts.

1908: Said to have 12 windows and 8 doors.

1929: Brick walls had bulged in many places, and required tearing down and rebuilding. Iron rod braces were installed in some of the interior structures. These ran from front to back. All brickwork was repointed. New tin roofs, gutters, and downspouts installed. Original spatter blocks, of granite, were found and put in place at ends of downspouts. Porches reconstructed. Window and door apertures were opened where bricked up. All windows and doors "restored." Exterior woodwork and metal painted. Electrical wiring installed.

HS 2, Magazine

1805: A report noted loose powder in the "store," used to fire the morning gun.

1813: Orders given to build a traverse in front of magazine door: "12 feet long & 8 feet thick at the Base, sloping two inches to each foot in height." It was to reach to the top of the window over the door.

Sept. 18, 1814: (After the bombardment, during which the magazine was hit.) An estimate said it would take 192,000 bricks and 40 bricklayers to make the magazine bombproof.

Sept. 29, 1814: Bombproofing of magazine completed.

Nov. 24, 1815: Still no roof over the magazine.

1829: Magazine was considered useless. Post commander wanted to remove the brick traverse (above) and convert magazine into an office or storeroom. The chief engineer agreed.

ca. 1835: Plan of doorway to magazine prepared. Did not show a traverse.

1835: Chief Engineer Gratiot said that the magazine was unsafe because it was too damp and it projected several feet above the rampart.

1839: Post engineer said the magazine was in good order and dry. It had the only lightning rod at the fort. He thought it should have some kind of protection in front of the door.

1839: Roof described as being made of slate. A "ventilator or window" was located in the rear wall. (This has since been bricked in, but traces still may be seen.) This opening needed a window shutter. There were two "good & strong" doors.

1840: A report stated that there was a large window in the rear wall of the magazine, directly opposite the door: "This window is secured by a strong shutter & padlock on the exterior, a row of iron bars set into the masonry, about 1 foot within, and an iron gauge? on the interior." Another 1840 report stated that the iron bars were seven-eighths of an inch in diameter.

1841: A new demand arose to erect a traverse before the magazine door. The Chief Engineer advised a temporary expedient of "a few inclined timber backed with earth."

1842: A report stated that the magazine doors were of wood.

1842: A wooden officers' privy adjacent to the magazine burnt down. The post commander wanted a new one made of brick.

1844: Plans made for a new outside door. (Probably built, as was a new inside door.)

1853: Request for a new lightning rod over the magazine, "the present one not being elevated enough or properly secured to ensure the safety of the quarters."

1856: "The blinds to Officers sinks in the Garrison are old & decayed--these might be made of close boards, but that ventilation is deemed essential."

1856: Ventilator over the door bricked up. Recommendation made to reopen it as magazine was damp.

1857: An inspector found that the ground behind the magazine had settled and the water gathering there was draining under the magazine.

1861: Sandbags placed "over" the door and window of the magazine.

1863: Minor repairs made to slate roof.

1879: Doors and window frames painted. Slate roof repaired.

1888: Still considered to be a magazine. Capacity--150 barrels of powder.

HS 3, Junior Officers' Quarters

Single-story, three-room structure built about 1800.

1822: Roof leaking where it joined chimneys. Outside woodwork required painting. New locks needed on doors.

1824: Roof needed repairs. It had a detached kitchen by this year.

1828: Estimate prepared for repairs to roof and new spouts.

1829: Estimate prepared to add second floor, a 12-foot-wide addition to the rear of the building, and a two-story piazza to front. Another report said that the existing brick walls were 14 inches thick and ran 2 feet above the upper floor. The new upper-story walls could be 9 inches thick and rise an additional 7 feet. Building raised to two full floors; addition to rear not built.

1834: A proposal made to extend the piazza of this structure so that it would join to the kitchen unit at the end of the barracks, HS 4. This possibly was done; a plan of this general period indicates a covered way joining the two structures.

1837: Zinc roof put on. (Roof had been wood shingles.)

1842: A second lieutenant asked that a new window shutter be placed on the west window of his quarters, also shutter fastenings. He also thought the exterior woodwork needed painting, and the doors could use new locks. He mentioned, too, that the "plastering" had fallen off the porch.

1843: Roof leaked badly.

1853: Piazzas and blinds (shutters?) needed repainting.

1856: Roof referred to as tin.

1867: Roof needed repainting, as did the outside woodwork. Painting completed by June.

1877: Tin roof required repair.

1886: Inspection report stated that the ceiling of the porch on the first floor needed replacement and the ceiling on the second-floor porch needed repairs. Two new window shutters and new spouting and gutters required.

1887: Building occupied by married enlisted men and families. A new floor was laid on a small back porch. The shutters, spouting, and gutters (above) were supplied.

1887-88: Work done. New upper window frames, sashes, and blinds; new casings to doors and windows; painting of exterior woodwork; and new ceiling on porches.

Work to do. New tin roof and concealed gutters on rear of building.

1888: A report said that the cost of repairs accomplished (interior and exterior) amounted to \$496.21. It added that the building was then vacant.

1894: Decision made to convert this structure to a one-story bakery. \$675.36 allotted for this purpose. Contract let in September, \$820.

1905: This structure was now a bakery. Had two chimneys and a roof ventilator. One story.

1907: Condition of bakery described as good.

1913: \$8 authorized to repair roof.

1929: Brick walls had bulged in many places, and required tearing down and rebuilding. Iron rod braces were installed in some of the interior structures. These ran from front to back. All brickwork was repointed. New tin roofs, gutters, and downspouts installed. Original spatter blocks, of granite, were found and put in place at ends of downspouts. Porches reconstructed. Window and door apertures were opened where bricked up. All windows and doors "restored." Exterior woodwork and metal painted. Electrical wiring installed. Building restored to two full stories.

HS 4, Enlisted Men's Barracks

This single-story, three-room barracks was built about 1800. Had small low rooms above.

1803: Repairs made to (both?) barracks, \$316.18.

1823: Barracks said to be old and needing frequent repairs.

1824: Roof needed repairs.

1828: Estimate prepared for repairs to roof and new spouts.

1829: Estimate prepared to add a two-story kitchen to the northwest end of this barracks. This kitchen unit would serve the junior officers' quarters, HS 3. The estimate also called for adding a second floor and a two-story piazza to the barracks. Another report said that the existing brick walls were 14 inches thick and ran 2 feet above the upper floor. The new upper-story walls could be 9 inches thick and rise an additional 7 feet. Work completed this year.

July 1829: A strong wind blew down the nearly completed upper-story walls of one of the two barracks.

1837: Zinc roof put on. (Roof had been wood shingles.)

1843: Roof leaked badly.

1853: New locks needed on the doors. Fifteen window sashes needed for both barracks.

1856: Roof referred to as tin.

1867: Roof needed repainting, as did the outside woodwork. Painting completed by June.

1875: Repairs needed, including 4-inch spouting and 9-inch "Gutter best." Porch railing needed replacing. Doors and windows required repairs. One coat of paint was needed on the old work, three coats on the new.

1877: Tin roof required repairs.

1880: Two rooms (one upstairs, one down) at the east end of this barracks were converted into officers' quarters. A window was cut in the east-end wall of the upper room.

1883: New columns, flooring, and tin roofing required for the upper porch.

1885: New tin roof and repairs to gutters and spouting required.

1886: "Stairway leading to porch to be flashed with tin and painted." Also, a new galvanized iron gutter needed at rear of building. At this time building was occupied by noncommissioned staff officers. An estimate called for these materials: 2 pair window shutters, 6 frames of glass, 130 feet of 12-inch galvanized tin gutter, 92 feet of 3-inch galvanized tin spouting, and 30 wrought-iron hooks.

1887: Structure being used by enlisted men's families. Gutters and spouting were repaired. The exterior needed paint.

1887-88: Work done. New box window frames, sashes, blinds, and casings for half the building; new door casings; and painting of exterior woodwork.

Work to do. Gutters and spouting on rear of building.

1888: A report referred to the work done in 1887 and said that the building was now considered to serve as two sets of officers' quarters. Cost of the total work \$1,114.80. It did not say if the quarters were occupied.

1893: New request for funds to repair this structure to serve as two sets of officers' quarters.

1905: Only structure within fort to still retain its two-story porches. Still in use as noncommissioned staff officers' quarters.

1907: Repairs needed to porch (\$25).

1929: Brick walls had bulged in many places, and required tearing down and rebuilding. Iron rod braces were installed in some of the interior structures. These ran from front to back. All brickwork was repointed. New tin roofs, gutters, and downspouts installed. Original spatter blocks, of granite, were found and put in place at ends of downspouts. Porches reconstructed. Window and door apertures were opened where bricked up. All windows and doors "restored." Exterior woodwork and metal painted. Electrical wiring installed.

HS 5, Enlisted Men's Barracks

Erected about 1800 as a single-story, three-room barracks, with small garret rooms above.

1803: Repairs made to (both?) barracks, \$316.18.

1819: Plan of fort suggests an extension to the south end of barracks. This probably was the detached guardhouse that stood between the two barracks and in line with HS 5.

1823: Barracks said to be old and needing frequent repairs.

1824: Roof needed repairs.

1828: Estimate prepared for repairs to roof and new spouts.

1829: Estimate prepared to add a second story and a two-story piazza to this barracks. Another report said that the existing brick walls were 14 inches thick and ran 2 feet above the upper floor. The new upper-story walls could be 9 inches thick and rise an additional 7 feet.

July 1829: A strong wind blew down the nearly completed upper-story walls of one of the two barracks.

1837: Zinc roof put on. (Roof had been wood shingles.)

1842: Roof leaked badly.

1853: New locks needed on the doors. Fifteen new window sashes needed for both barracks.

1856: Roof referred to as tin.

1867: Roof needed repainting, as did the outside woodwork. Painting completed by June.

1875: Repairs needed, including 4-inch spouting and 9-inch "Gutter best." Porch railing needed replacement. Doors and windows required repairs. One coat of paint was needed on the old work, three coats on the new.

1877: Tin roof required repair.

1884: The covered porch required "to be lathed and plastered." Also, its flooring needed repairs.

1886: New roof needed.

1887: Structure occupied by enlisted men's families. New gutters and spouting required. Exterior needed paint.

1888: Plans prepared to convert structure back to a barracks. Exterior work to be done. New porch floors, new doors and frames, new window frames and blinds, new tin roof including porches, new ceilings for porches, new railing on porch, repairs to chimneys, and painting exterior.

Estimate of materials.

1,250 ft. Georgia pine, 1-inch flooring, for porches
8 porch columns, 12-inch, turned
6 outside doors and frames, complete
26 box window frames, 12- by 14-inch, with
sash, glass, weights, blinds, jambs,
and rope for 18-inch brick wall.
2,000 ft. $\frac{1}{2}$ Virginia pine ceiling for porches
30 squares of tin roofing
200 ft. 13-inch G.I. gutters
80 ft. 4-inch G.I. spouting

December 1888: Structure still occupied by enlisted men's families.

1890: Continued discussion about reconverting this building to a barracks. A four-seat latrine was to be constructed behind the structure.

1905: Described as being the quartermaster office and storehouse.

1908: Said to have 16 windows and 5 doors.

1929: Brick walls had bulged in many places, and required tearing down and rebuilding. Iron rod braces were installed in some of the interior structures. These ran from front to back. All brickwork was repointed. New tin roofs, gutters, and downspouts installed. Original spatter blocks, of granite, were found and put in place at ends of downspouts. Porches reconstructed. Window and door openings were opened where bricked up. All windows and doors "restored." Exterior woodwork and metal painted. Electrical wiring installed.

HS 6, Sally Port, including Guardrooms and Bombproofs

1803: Plan of fort indicates that sally port was a simple, unroofed passageway through the ramparts.

1813: Gate made of pine. Could be knocked down with an axe.

1814: Immediately after British bombardment, work commenced on building two personnel bombproofs, one on either side of the sally port.

1819: Plan of fort indicates a roof over the sally port.

1823: Estimate prepared for an observatory over the main gate. This same document mentioned iron rivets for the double gate entrance.

1829: A report stated that the two bombproofs leaked because no roofs stood over them. The report recommended a thin coat of "plaster of water cement" on the exterior of the arches and a "wall of cement" on the interior. This same report said that the platform over the sally port should be extended 2 or 3 feet on all sides to prevent leakage in that area. Also, the foundations of the sally port had been undermined and had fallen out. It recommended that these side wall foundations be connected by a counter arch.

1829: The arch of the sally port was re-covered with an unnamed material at a cost of \$51.20. The earth covering was removed from the personnel bombproofs and the bricks found to be thoroughly saturated with water. The Chief Engineer suggested covering the bombproofs with sheet lead and forwarded the funds for its purchase. Another report implied that the covering of the archway was also sheet lead.

1835: Gate to sally port needed strengthening.

1835: Estimate prepared for guardrooms on each side of the sally port and over the bombproofs. This required cutting off 15 feet "in length" of the bombproof arches,

the crown of the arch being too high to allow this construction to be made above it:

It would be necessary (on each side) to cut away about 1700 cub. feet Brick work.

To build an arch /for the sally port?/ 15 ft. long, 8 wide, 7 high 18 in Thick.

To filling up the space & the present arch [?]

To build front wall 15x15, 18 in. thick,
Door 4x8.

To build end wall 23x16, 2 ft. thick,
window 3x4½.

To build roof 25x15. Tin or Zinc owing to
its small inclination.

To build Partitions (wood) 11x15, 7x8, thick
double stuff.

To build Flooring 24x15, thick double stuff.

Which would cost, at most, say

Cutting away 1700 cub. ft. masonry	180.
3 ,000 Bricks laid	338.
500 ft. <u>Rafters</u>	10.
600 ft. <u>/N.C.?</u> Pine for partitions	24.
1260 ft. " " " flooring	50.
1000 ft. W.P. Common for Doors etc	30.
1000 ft. Cullings, sheathing, scaffolding, etc.	15.
Painting & glazing	25.
Hardware	50.
Roof, Zinc	70.
Carpenter's work	150
Hauling to fort	<u>25</u>
	1017x2=\$2034

1835: Construction of these guardrooms began August 15.
They were nearly completed by September 30.

1837: Request for funds to widen the sally port.

1840: The two bombproofs had ventilators through the terre-
plein; this system was not sufficient for the bombproofs to be
used for any length of time. They were not lighted. The two
guardrooms at this time each had a prison room in the rear.

1844: Bricklayers repaved the floor of the sally port and
repaired the sidewalls.

1853: A small flue is required to be built in the wall of
the Guard House and prison room. These rooms are heated in
winter by stoves, and the smoke is carried off by the pipe running
through a hole in the wall, and then by an elbow at the side of
the building, producing an unsightly appearance as well as smoking
when the wind is in a certain quarter.

1856: An inspector thought that the arch of the sally port
had given away about the center of its length and the fastenings
of the doors were in disrepair.

1857: Proposal made to add two rooms to the guardrooms, one on each side of the sally port. These rooms constructed by that fall.

1861: The two personnel bombproofs were converted into magazines. A stonecutter made "caps" for the ventilators of these bombproofs.

1866: During Civil War, POWs were kept in a prison outside the fort. This practice continued after the war. In 1866 the post commander said that he was removing ordnance supplies from one of the old prison rooms at the sally port and reconverting it to prison use.

1868: The two rooms on the west side of the sally port were in use as prison rooms. The first room on the east side of the sally port was the guardroom; the other room contained the cells. The officer of the guard did not have a room at this time. The average number of prisoners was 24.

1873: Post surgeon recommended additional ventilators be placed in the roofs of the guardhouse.

1873: One of the rooms on the west side of the sally port was now used by the officer of the guard. The average number of prisoners was now 10.

1878: Chief of Engineers authorized \$125 for remodeling the guardhouse rooms. They were to serve as offices for the commandant. These changes were completed in November.

1879: A new corrugated tin roof and a new system of gutters and "leaders" placed over the arch of the sally port. Also new tin roofs put on the former guardrooms.

1882: The former personnel bombproofs (and Civil War magazines) were cleaned out. Leaks had caused them to fill with bilge water. Also, a new water supply pipe was laid from the sally port to the post trader's store.

1888: A report stated that the two guardrooms to the west of the sally port were quartermaster storerooms used to store mineral oil and unserviceable property. Use of the east guardrooms not mentioned.

1891: Contract awarded for repairs to the tin roof over the sally port.

1893: Old guardrooms described as being in such bad condition as to be practically valueless.

1903: Roof and brickwork of sally port needed repair. A few months later a roof of one of the old guardrooms caved in--rotten timber. \$236 allotted for repair.

1917: Entrance doors to fort rebuilt.

1929: Old personnel bombproofs were cleaned out; their drains were also cleaned and reconnected to the catch basins. New stairways built leading down into them. New doors, "built according to original design," installed at their openings. Electrical system repaired.

HS 7, Civil War Magazine

1863: Construction began 1863.

July 1863: Bricklayers laid 4 feet of the walls, to springing line of main arch. Hinge blocks and door sills laid. One 12-inch ring of main arch built up 4 feet. Carpenters made trusses for main arch center and put up center. Main arch center completed, put in position, and sheathing finished. Laborers concreted side walls and walls of anteroom.

August 1863: First ring carried over and keyed. Second, third, and fourth rings carried up to altitude of 60+ from springing line. Carpenters made frames for ventilators and completed three solid doors. Laborers concreted foundations for exterior wall.

September 1863: Main, anteroom, and doorway arches completed. Side walls carried up 10 feet above foundation, rear wall 4 feet, and front wall and anteroom walls 13 feet. The supporting wall for the middle of floor built. Carpenters removed the great center and put up smaller ones. The concrete filling of walls and backing of arch progressed equally with the walls.

October 1863: Side walls carried up to full height, and end walls to same level. Work began on the exterior wall that surrounded magazine. Stonecutters fitted flagging on foundation of exterior wall. Carpenters fitted, painted, and placed frames for gauze in ventilators. Floor put down in magazine.

November 1863: Bricklayers finished their job in main work and completed about one-third of exterior wall. Carpenters prepared roof beams.

December 1863: Concrete put over main arch--nearly completed when cold weather set in. The remainder of the arch was covered with sand and a temporary roof placed over that. Copper gutters partly finished. Stubs for interior lining placed. Inner door hung.

January 1864: Carpenters putting in interior lining. Roof gutters put in place. Slate put on the roof of the anteroom.

February 1864: Interior of magazine completed. Work resumed on the concrete covering of the arch. Magazine put into use February 18.

April 1864: Work continued on exterior wall. Work underway on the "lightning-conducting arrangement."

May 1864: Exterior wall four-fifths finished. Paving of area between magazine and exterior wall half done.

June 1864: Exterior wall nearly completed. Capacity of magazine 1,150 barrels of powder.

1878: Repairs made to slate roof.

1878: The east, north, and west walls were repointed. The entire rain gutter was repaired.

1879: South wall was repointed. The inside face of the east side of the brick wall around the magazine was coated with stucco. The joints of the stone coping on all this wall were pointed; the doors, window frames, and roof bargeboards were painted. Once again, the slate roof was repaired.

1883: The enclosing wall was repointed inside and out and a few bricks replaced.

1891: Contract awarded for repairs to the slate roof.

1893: Some slates on roof loose.

1900s: A small fire occurred in roof of magazine. Damage was repaired.

1930s: City of Baltimore made alterations in courtyard at south end of the structure and used this area as dressing rooms for bathers.

HS 12, Star Fort, including Drainage

1799: Foncin inspected existing works. He did not like them. He planned to erect a brick-faced, five-bastion, pentagonal fort enclosing a powder magazine and barracks.

1803: Plan of fort shows the works approximately as they are today. Postern through ramparts shows on plan. Ditch around the fort incomplete on east and southeastern sides. Trees growing on the terreplein, bastions, and parade. Two gun embrasures appear in each bastion.

1805: An inspection report said the fort was in wretched condition.

1813: Embrasures in bastions filled in. Guns now fired en barbette from platforms.

1813: Orders given to dig out the ditch further, out to a distance of 35 feet, and to raise a 5-foot counterscarp on the outside of the ditch so as to make the ditch a covert way for defending infantry. Also, a temporary bridge was to be built across ditch to sally port. This movable bridge to replace the present fixed bridge. Glacis to be improved beyond counterscarp.

1813: An inspecting officer said that the guns in the bastions should be on the faces rather than on the flanks.

1814: During the British bombardment, infantry manned the ditch around the fort, and artillerymen manned the bastions. Southwest bastion was hit by a shell causing some casualties and dismounting a gun.

1822: Gun carriages on the ramparts said to be rotten.

1823: A repair estimate said that the main part of the bridge from the ravelin to the sally port was 55 feet long by 16 feet wide. The drawbridge portion measured 14 feet by 11 feet.

1824: Gardens planted in the bastions. Shot arranged in rows along the interior slope of the parapet.

1825: A visitor wrote that there was no counterscarp.

1827: Estimate prepared for a new bridge "over the ditch."

1829: A report stated that a revetment in the vicinity of the magazine did not have a coping and that damage from the weather would require rebuilding the top 2 feet and adding a coping. Also, the cordon stones near the top of the scarp needed repointing, as did the masonry to a depth of 2 feet below the cordon. It recommended filling the joints "with broken slate and mortar of water cement and a thick wash of water cement being laid on the face of the scarp."

1829: Cordon repaired and the scarp repointed. Later a wash of cement was applied to all the walls.

1830: Both bridges said to be badly decayed, along with the gates.

1833: Plans made to build a stone revetment wall "for the interior slope of the Rampart," i.e., around the parade ground and behind the structures. The stone coping was to be procured from "the Connecticut quarries." The wall was to be well pointed with hydraulic cement, using a large proportion of sand. The wall was then to be backed with chips of stone laid with care and without mortar. The coping was to be 4 inches thick and at least 1½ feet wide. It was to project 4 inches over the wall. "The earth over the coping to come out to the plane of the wall which will be without batter, & to be from 4 to 6 inches thick and well sodded." Estimated cost \$4,249. (At that time the interior slope was simply sodded.)

1834: An estimate of \$885 submitted to repair part of the sewer from the glacis to the sea wall: "The sewer across the ditch would be much improved by putting a new one, say two feet square, in lieu of the present one which is raised three feet above the level of the ditch, & high enough for a man to pass through apparently, the postern through the ramparts/--the top of the new one to be on a level with, or a little below the surface of the ditch, so that all the drainings which run into the ditch might easily be drawn into the sewer." Cost would be \$400 if uncovered, \$500 if covered.

1835: Part of the wall of the postern, then called the sewer, gave way. Caused by water getting behind it, then freezing. Rats had disturbed the pavement in the sewer. The wall was quite thin, being "a slight one . . . but one brick laid length-wise."

1835: No drawbridge by this time. The Chief Engineer suggested one.

1835: \$20 requested to repaint the bridges.

1835: Chief Engineer Gratiot inspected Fort McHenry and wrote: "The Parapets and covertway should be raised from 18 to 24 Inches /apparently he was referring to the counterscarp/; and the difficulty of Escalade increased by drawing the earth for these objects from the ditch." He also suggested removing the trees from the ramparts and constructing a better drainage system for the fort (no details given). He said: "This Fort . . . is a pentagon of 100 yards on each side; and only fifteen feet relief above the bottom of the ditch."

1835: Trees in the fort were cut down.

1835: The Chief Engineer wrote to the fort: "It is proposed to modify the covering line /?/, by which more space on the rampart is to be gained, and the parapet considerably thickened at the crest." He added: "For the Bastions the direction of each gun will bisect the shoulder."

1835: Engineer Thompson discovered "that one part of the fort is at least 16 to 17 inches higher than the other so that the Guns will have to be in two planes."

1835: When digging in the south bastion in order to place pintle blocks, the engineer discovered an old privy, covered with boards and earth and 2 feet below the surface. It appeared to be 5 or 6 feet deep. The chief engineer recommended doing one of two things: "Either to throw an arch across it, if the walls are strong enough to resist the thrust or be filled up with sand, thrown in successive layers of one foot, which must be rammed completely before the next is put on. The latter plan is the best." An 1840 report stated that sand had been used.

1836: An 18-inch iron pipe sewer was laid from the fort, under the postern, to the sea wall.

1837: A 3-foot-high, brick breast-height wall built, which strengthened the parapet. Scarp entirely repaired, "the old Bricks where injured taken out & replaced with others & the whole wall pointed--the old Coping stone which covered this wall has been removed, & a good substantial one substituted, of the Papasco Granite properly dressed." Traverses were laid for 10 guns and the parapet renewed and resodded. Scarp repaired and washed with cement.

1838: The height of the entrance to the fort from the ditch was measured at 5½ feet.

1838: Following measurements sent to Washington:

average length of the fronts, 291 feet
coping stone--6 inches thick, and projected
on face 6 inches
coping at the angles projected from 9 to 10 inches
batter of scarp of fort-- $1\frac{1}{2}$ to 1
batter of scarp of ravelin--2 to 1
coping of ravelin--6 inches thick & projected
6 inches

1838: Parapet completed and fully sodded. Banquette for infantry half finished.

1839: Engineer Thompson described the postern as "the poorest apology for a thing of the kind I ever saw, & the whole wants altering & enlarging." Apparently he did not know that it had originally been built as a drainage sewer.

1839: Ten traverses and pintle blocks laid in the bastions. Breast-height wall of the fort was raised 18 inches, covered with zinc, and capped with sandstone. "A new slope of 18 inches of sodding put on the top, & joined to the slope of the former parapet." Infantry banquette finished. Scarp pointed with cement and coated with a cement wash. Bridges to fort removed and replaced with a ramp.

1840: An officer noted that the counterscarp of the ditch was laid out in an irregular manner. Also, the infantry banquette was 4 feet wide and its slope had a base of 2 feet.

1840: A report stated that there was no infantry banquette along the front of the fort that had the sally port. Also, that the ramp was "1/6 with the ditch." This report was the first to specify that two ramps, one on either side of the sally port, led to the terreplein. The road to Baltimore, which cut through the counterscarp and the glacis to the west, was said to be 9 feet wide.

1842: An inspecting officer noted that the scarp needed some pointing.

1844: The ditch on the north, northeast, and west fronts was graded so as to give it the proper fall. The counterscarp slopes and banquettes were resodded. Clapboarding was prepared for lining the interior slopes of the parapet. Four of these fronts were clapboarded by December 17th; the fifth was supposed to be finished by the end of the year.

1844: Plans made for a new door to the small postern. This was installed. A fence or railing was placed on the counterscarp of the northeast, north, and west fronts to keep cows and horses off the slopes. Bricklayers repaired parts of the parade and the parade gutter. Laborers constructed two culverts under the road in the ditch of the northeast front.

1844: Recommendation made that the gutter in the middle of the ditches of the fort and the ravelin be paved to the width of 2 or 3 feet.

1844: Stone masons repaired the drain opposite the north bastion of the northeast front, "but it was found to terminate suddenly underground at the distance of about 30 yds from the counterscarp thus affording no issue to the water of the N. front ditch, they [?] were consequently made to pass temporarily through the drain at the salient of the demi-lune ditch." The engineer thought that the first-mentioned drain should be extended to the sea wall near the wharf, 200 yards away.

1845: Recommendation that the clapboard on the interior slopes of the parapets be painted.

1845: Masons repointed the revetment wall in the rear of the officers' quarters, part of the scarp of the east face of the north bastion, and both faces of the ravelin. The "pavement" and drains of the interior of the fort were repaired. Parapet and banquette resodded. Clapboard on interior slopes of parapet painted.

1861: "Several" gun platforms built in the ditch--probably on the land side, i.e., west, with regard to Baltimore. Gutters (in the parapet?) were made down which to roll hand grenades upon an assailing force.

1861: A report mentioned small drains through the scarp on the sally port curtain. Iron pipes still protrude in this area.

1861: The gorge of the ravelin was connected to the fort by two lines of palisades.

1870: Inspector General's report: "Persons are not permitted to walk on the slopes. Animals are not allowed to graze on the Slopes. Grass on the slopes frequently mowed. Spots of dead grass replaced by fresh sod. Grass not burned on any portion of work."

1870: Enlisted men's latrine located "in the moat facing the sally port." Considered a great nuisance. All latrines were cleaned out yearly.

1880: The post surgeon reported: "Attention is invited to the condition of the Surface drain leading from the Fort. Where this drain is tapped near the demilune, the grating has been removed, and the pipe made the place of deposit for Kitchen refuse slops, and at times it is believed made the receptacle of night soil."

1880: The privy in the ditch near the ravelin was again in use.

1880: An officer at the fort wrote:

I find that the surface 'gutters' at the foot of the parade wall of the fort were intended [?]. The bricks in many places have become displaced so as to break the continuity of the slope of the gutter and cause the water to form in small pools, where it is frozen. . . . these gutters passing as they do immediately in rear of several sets of quarters. . . .

Before the offensive gutter is repaired a large quantity of debris deposited in the rear of a building undergoing repairs [probably the barracks, HS 4, being converted to officers' quarters] should be removed.

Repairs would consist of the taking up and the re-laying of the gutter. The repair of 100 yards would answer present purposes . . . I estimate . . . \$60,000.

1881: The above was accomplished.

1881: One of the privies adjacent to the magazine was being used by enlisted men's families.

1881: An engineer officer reported that the drain leading from the parade had been cleaned. Also, "an effort was made to clean the drain of the vaults but it was found that flushing the vaults appeared to be the only thing necessary and the means for this could as readily be applied by the garrison as by the hired force and the effort was discontinued." One is not certain as to what the vaults were.

1882: "The walls of the fort were color-washed." Later that year an estimate of \$1,000 was made for repointing all the scarp. The glacis was said to need regrading as it was unsightly. Also, the exterior slope and the revetment of the parapet of the fort needed resodding. However, funds were not available.

1883: Lampposts and coal oil lamps installed. Lamps were lit January 4. At least one lamppost was inside the fort.

1883: Brick walls repaired. Drains renovated. Parapets repaired. Scarp, etc., color-washed. Gutters leading from the curtain on each side of the sally port were repaired.

1883: The engineer wrote: "The main work contains Eight (8) old platforms which have been re-inforced but they were afterwards abandoned by the advice of the Board of Engineers and now remain with pintles and old traverse stones. The mortar platforms are of wood and for drill purposes only. New platforms are on hand but not set."

1883: The engineer officer also reported: "The cess-pool at the salient of the ditch of the demi-lune has been dug out, the brick-work rebuilt and a grating placed, and the drain leading therefrom underground to the slope in front has been repaired at its exit."

1883: A report stated that ½-inch iron pipes provided water from the artesian well in the center of the parade into the two officers' quarters buildings, HS 1 and HS 3. Also that the enlisted men's barracks got their water from a hydrant in front of the well.

1884: Oyster shells spread over the roads of the post.

1884: The coping of the ramp leading to the "flag staff bastion," i.e., the east bastion, was repaired.

1884: Slopes of the parapet of fort were "repointed," resodded, and mowed. Gutters and drains were cleaned and paved with bricks where necessary. A month later a report stated that the brick pavement and gutters inside the main work were in poor condition and almost worthless. Repairs would cost \$395.

1885: Following drains repaired: from bombproof traverses No. 1 and No. 2, in water battery, to cunette; and from magazine No. 3, in water battery, to cunette. Repair of gutters and pavement on parade was begun. Stone steps leading from the parade to the terreplein were relaid.

1885: Repairs underway in February on brick pavement on one side of the parade and in the corner near the flagstaff bastion, i.e., northeast corner; the sustaining walls of the two ramps leading from sally port to the terreplein; the coping near the steps (to the terreplein?); and the wooden guardrail to the roadway.

1887: A senior officer reported: "The surface drainage about the fort is as bad as could be. . . . It is work that cannot be done by the Troops."

1888: The engineer officer complained that nobody understood the underground drainage system at Fort McHenry, because of poor record keeping over the years.

June 1891: Work in progress: Repairs to drains and slopes; gray wash on walls of scarp.

1892: Ditches cleaned and put in order.

1892: Post surgeon's report: "The underground passage leading from the old fort to the water battery contains standing water in a state of decomposition. This is probably due to the choking of a drain leading from the passage."

1893: \$100 allotted for cleaning out and repairing the drain-pipes in the service magazines and ravelin. Another \$100 allotted for the same in the fort and water battery. \$50 allotted for repairing the exterior slope of the water battery.

1893: The engineer officer wrote the Chief of Engineers:

The breast height of the main work and exterior battery is chiefly of brick, finished by a low earthen slope which has hitherto been sustained by sods laid flat.

In some cases at other forts this low slope has been faced with shingles on stone slabs or otherwise. I request to be informed what method is now preferred for works in this latitude, as much of the slope needs repair at Fort McHenry.

The Chief of Engineers' office replied:

It is thought that the most satisfactory method is the one you describe as followed at Fort McHenry, viz using a low earthen slope sustained by sods laid flat.

The standard drawings for such slopes represent them as being 2 on 1. During peace, these might be flattened to 1 on 1 with advantage and, in time of war, a temporary revetment might be used and the slope made vertical.

1893: All slopes in bad condition.

1917: Earth parapet sodded. "All exposed brick masonry scraped and painted with magnite, a cold-water paint, which has adhered very well."

1929: NPS Archeologist G. Hubert Smith discovered (1958) that the ditch around the fort had been filled to 2 feet 6 inches with railway or industrial cinders. He thought this might have been done by the Army in 1929 when it restored the fort.

1929: On the eve of restoration an officer described the fort:

It is a barbette work with brick masonry, scarp capped with a heavy projecting granite coping, the corners of the bastion being of sandstone. Each front measures about two hundred and ninety feet between the points of the bastions. The parade is a regular pentagon of about one hundred and fifty feet on each side surrounded by a well-laid granite wall about five feet high supporting the ravelin in front of which a brick masonry wall about three feet high, with sandstone coping over sheet zinc, acts as a retaining wall for the curtain of sodded earth extending to the top of the scarped interior walls. The level of the parade is about 33 feet and the top of the bank above the scarped walls is about forty-five feet above mean low water mark. A wide ditch, 13 feet below the coping of the masonry wall, surrounded the fort, on the outer edge of which was a bank eight feet high with an earth platform for riflemen.

1929: The scarp walls were in very bad condition, due to water getting behind bricks and bulging them out: "It was necessary to completely rebuild the wall for some distance." New brick walks were laid inside the fort in front of and around all buildings. Zinc flashing installed under all coping that needed repair. Brick gutters laid inside fort so as to take off rainwater; these were connected to the drain. The drain under the tunnel was cleaned out and repaired.

1961: Archeologist John Cotter identified a brick drain across the parade.

HS 13, Ravelin

1813: Orders given to erect a work to protect the gate. Instructions said that this brick traverse was to be: "12 feet long & 8 feet thick at the Base, sloping two inches to each foot in height," and to be 6 feet high. It is not known if this traverse was ever built.

1813: An inspecting officer recommended an earthen ravelin in front of the gate. Apparently it was built before the end of 1813.

1814: Ravelin in disrepair because earth had been laid against the brick wall before the mortar was fully cemented. The earth had since sunk unequally. An ordnance officer recommended removing the guns, raising the platforms, and digging a ditch parallel to the inner face of the parapet to collect water and to prevent settling toward the exterior slope.

1823: Estimates made for repair of bridge from road to ravelin. Said to be 37 feet long and 12 feet wide. The outer gate had two wings, each 9 feet by 6 feet.

1825: Ravelin described as a little one that defended nothing.

1829: A recommendation was made to apply a wash of water cement to the masonry walls. This was accomplished that year.

1831: Recommendation made to build a guardhouse in ravelin. This was not done.

1835: The gate to the ravelin was missing. The Chief Engineer suggested building one.

1839: Bridge to ravelin removed. Tunnel through ravelin was closed and the parapet in this area built up. A flight of steps (material unknown, but probably stone) built to top of ravelin. Breast-height wall built in ravelin and covered with zinc, and the parapet sodded. Traverses laid for 7 guns.

1840: The counterscarp of the ravelin had a slope of one base to two perpendiculars. Its height was variable, averaging 5 feet 6 inches.

1840: A single flight of steps, cut into the ravelin, led from the ditch to the terreplein of the ravelin.

1844: Clapboarding was prepared for lining the interior slope of the parapet. Work finished by December.

1844: Outer gates found to be rotten at bottom. Also they were $4\frac{1}{2}$ inches too short, warped, and incapable of being fastened securely on the exterior.

1866: Magazine built in ravelin. This construction is discussed under "Water Battery." In October, with construction of magazine No. 1 well along, the retaining wall of the ravelin was rebuilt.

1878: Temporary repairs made to earthwork, "the small connecting slope at South end of East face having caved in after the violent storm of Jany 31st." The two wooden stairs (put in when the magazine was built in 1866) up to the terreplein of the ravelin were found to be rotten. They were replaced.

1883: Repointed the scarp and gorge walls of the ravelin. Resodded the exterior slopes of its parapet.

1891: Contract awarded for repairs to the steps of the ravelin.

1891: A gray wash being put on the walls of ravelin.

1892: New wooden steps up to terreplein completed. Grass cut on slopes.

HS 14, Water Battery

1836: Work began on the new water battery this year. In November it was hoped that the main embankment would be completed by the end of the year and the parapet formed in early spring, 1837. Materials needed for the work: 12,000 perches of stone, 500,000 bricks, 2,500 feet of coping stone, and 300 feet of cast-iron pipe.

1837: Parapet constructed.

1839: The revetment, or breast-height wall, had to be taken down, because of settling. It was rebuilt 18 inches higher than before and covered with zinc, but not coping. Also the parapet was reformed with 18 inches of sodding on top of it. The exterior slope was sodded, and the 39 gun traverses laid. The slope from the terreplein of the battery into the ditch was sodded.

1842: An inspecting officer noted that the terreplein of the battery had never been properly finished and needed grading and rolling.

1844: Clapboarding was prepared for lining the interior slope of the water battery's parapet. Work finished by December.

1861: An abatis was constructed on the exterior slope of the water battery. And the battery was joined with the fort by palisades.

1864: Need for magazines in water battery pointed out.

1865: Five granite center-pintle platforms for 15-inch guns placed in the ravelin and water battery. Reinforcement of remaining platforms underway. The breast-height walls for the 15-inch guns were built up. Parapet re-formed and repaired.

1865: Plans prepared for three magazines and two bombproofs for battery. The two bombproofs were to serve also as traverses and each was to have two guns mounted on it. Also, there was to be an earthen traverse. (One of the magazines was actually built in the ravelin.)

April 1866: Stonecutters cutting steps for new magazines.

May 1866: Excavating for foundations of new magazines. Workmen ran into a bed of iron ore.

July 1866: Stone cutting and setting. Ten hinge blocks and 10 blocks for lock-bolts cut, also 4 door sills, 3 stairway platforms, and 3 winding steps. Eight hinge supports headed into blocks and 8 blocks prepared with holes for hinge support. Steps set at entrance to magazine No. 3. For support of floor joists, 125 lineal feet of flagging laid on foundation of magazine No. 2; 340 cubic feet of old traverse stones laid in walls of magazine No. 2, and steps set in stairway; 115 lineal feet of flagging laid on foundations of magazine for support of floor joists.

Brickwork. Main arch built, ventilator on top, and area walls carried up to level of the springing lines of their arches in magazine No. 3. The walls and the main arch carried up 3 feet in magazine No. 2. Walls raised 5 feet in one of the bombproofs, to level of springing lines.

August 1866:

Magazine No. 1 (located in ravelin). 240 cu. ft. Old traverse stones set in wall; 18 steps and 2 door sills cut

and set; hinge and lock blocks cut. Brick side walls built up and main arch turned and completed. Brick end wall built up 7½ feet. Brick area and vestibule walls built up to springing lines. Flooring laid. Flagging over drain cut and laid.

Magazine No. 2. Two door sills and six steps cut and set. Brick main arch completed and brick walls raised 3 feet higher. Brick area walls and vestibule walls built up to springing lines. Flooring laid.

Magazine No. 3. Two door sills cut and set. Doors half finished. Brick vestibule, area, and passageway arches completed. All brick walls finished. Concreting completed. Flooring laid.

Bombproof B. End walls raised 3 feet. Stone steps cut. Centers for area and passageway arches put in place.

September 1866:

Magazine No. 1. Hinge and lock blocks set. Drip grooves cut in coping for front wall. Sills for doors trimmed and set. Brick front wall built up 28 feet including vestibule arch and walls and doorway arches. Brick rear wall completed. Vestibule and doorway centers removed after completion of arches. Four doors half finished. Main arch covered with 3 feet of concrete; ventilating flue formed; walls concreted as built. Sixteen feet of earth filled in around magazine.

Magazine No. 2. Flagging for coping of entrance walls dressed and fitted. Flagging for entrance pavement cut. Brick passage and vestibule arches turned. Brick walls at ends of vestibule and passageway built up 10 feet. Carpenters set in place centers for vestibule and passageway arches and removed them when arches were completed. Laid floor joists. Main arch was covered with 3 feet of concrete. The walls were concreted as built; earth filled in rammed around magazine to level of terreplein and the whole earth covering carried up to 4 feet high.

Magazine No. 3. Flagging for coping of entrance passage walls cut and dressed. Brick end walls completed. Carpenters laid vestibule floors and completed six doors. The concrete was covered with bitumen. Earth was carried up.

Bombproof A. Excavation delayed because of quicksand. A trench was cut through the parapet to the sea wall, 160 feet long. Quicksand drained off and replaced with 2 feet of rammed earth.

Bombproof B. Main walls raised to springing of arch. One 9-inch ring of arch was completed; another was three-quarters finished. Side walls were built up 4 feet above springing line of arch. Entrance archway was turned. Entrance and center put in place. Wall was coated with bitumen and cemented as built. Earth was filled in and rammed to the springing of the main arch.

October 1866: Two circles of the water battery, disturbed by excavation for magazines and bombproofs, were reset.

Magazine No. 1. Four stone newels for stairs cut and some coping cut and set. Front wall completed. Retaining wall of ravelin terreplein rebuilt. Interior and exterior doors hung. Concreting and covering with bitumen continued.

Magazine No. 2. Cheek stones for outer door cut and set. Walls at ends of vestibules and entrance arches built up. Ventilating flues completed. Interior doors were hung. Blacksmith made rivets, hasps, and hinges for outer door.

Magazine No. 3. Interior doors hung.

Bombproof A. Twelve steps cut. Holes for traverse iron bolts drilled. Brick drain built from front to rear of foundation. Side walls built up 4 feet to springing of arch. End walls built up to soffit of arch. Arch center put in place.

Bombproof B. Brickwork completed. Arch center removed.

1866: At end of the year the battery was ready to receive its 15-inch guns on center-pintle platforms.

1878: Three double wooden doors were constructed for the magazines in the water battery.

1881: Repairs made to slopes of a large magazine in the water battery--probably magazine No. 3.

1883: Repairs made to slopes of magazine No. 3. Also, repairs made to the doors of the magazines and bombproofs.

1887: All magazines too damp for storing powder.

1891: Contract awarded for repairs to the doors of the magazines and the bombproofs.

1892: About 1,000 square yards of the slopes were repaired and re-formed where damaged by slippage--same for magazine No. 3. Doors of magazines scraped and painted.

1893: \$60 allotted for new doors and locks for magazine No. 3 and "Traverse No. 4."

1929: Magazines cleaned out and repaired. New iron gates were installed on each entrance. The "brick rampart wall" around the inside of the battery was pointed up and repaired. Cannon were cleaned and repaired.

HS 15, Flagstaff

April 1, 1795: Ensign for fort acquired, \$40.10.

September 6, 1802: A request for funds to erect new flagstaff. Old one destroyed by lightning.

1803: Plan of fort showed flagstaff where present reconstruction stands. On March 25th authority was given for the fort to acquire a garrison flag.

1811: One garrison flag "of the usual dimensions" sent to the fort.

1828: Estimate prepared for a new flagstaff, \$150.

1839: An inspecting officer recommended a new flagstaff because the present one was in danger of falling down.

1882: By then several people claimed to have the flag that flew at Fort McHenry during the British bombardment. A citizen of Washington, D.C., W. W. Moore, became upset at all these claims. He wrote a letter to the editor stating that he had been at Fort McHenry during the bombardment:

The writer hereof can truthfully affirm that one and the same flag waved over Fort McHenry during the whole of that protracted assault. It was neither shot down nor hauled down. The writer beheld it from early morn of the 13th of September until after night, and again beheld it at daylight the next morning. . . . It was a new flag of unusually large dimensions, and, though it suffered some damage, including two large rents, it continued to float triumphantly.

1902: \$40 requested to paint the flagstaff in the east bastion.

1905: The chief of ordnance was unable to determine if the site of the flagstaff in 1905, in the east bastion, was the same as the flagstaff's location in 1814.

1911: Staff said to be 90 feet high. \$40 recently spent on it.

1973: This flagstaff in the bastion stands no more. The present flagstaff is a reconstruction of the one that appears on the 1803 plan of the fort.

IV. CONCLUSIONS AND RECOMMENDATIONS

A. General

All coastal fortifications underwent spurts of construction activity, usually just after a war or after a threat of war. Fort McHenry experienced this immediately after the British bombardment in 1814 and after the Civil War. All the new works, additions, repairs, and modifications at Fort McHenry down to its termination as an active-duty base in 1912 are an important part of its structural history. The preservation of these structures as they were inherited by the National Park Service is a viable approach to the question of what to preserve or restore. This approach need not prohibit the removal of some late additions to the structures, such as exposed electrical wiring (which may date from as early as the 1890s or as late as 1929).

B. Brickwork and Stonework

Almost from the beginning, masonry work at Fort McHenry was an annual undertaking. The replacement of individual bricks, the rebuilding of portions of walls, the re-laying of coping, the repointing of masonry, even the washing of brick walls with gray cement were carried out as funds were available. With the exception of its earliest years, Fort McHenry must often have had a patchwork appearance.

Unfortunately, the army quartermasters eventually used Portland cement in repointing the brickwork. Present-day restoration specialists have indicated that this cement is harder and stronger than the bricks themselves and cannot be removed without severe damage to the bricks.

Recommend that the replacement of bricks and repointing procedures reflect the historical appearance. For most of its history, the fort was not a shining example of perfect masonry work. Future restoration and preservation of the masonry could reflect this diversity in its appearance. However, such an approach need not prohibit any attempt to match the new bricks with the old for size, quality, and color.

C. Modern Devices

Recommend the removal or concealment of all modern devices about the fortifications. These include such things as exposed

electrical wiring, the water fountain, the furnace room for the commanding officer's quarters (HS 1), and modern locks on the doors. Although the present nonhistoric identification plaques on some doors are painted the same color as the doors and are unobtrusive, consideration might be given to their removal and the employment of other identification methods.

D. Shutters

It has not been possible to determine whether all windows in the historic structures had shutters. Shutters did exist, undoubtedly on all the first-floor front windows--to provide privacy for privates and captains' ladies alike. It is possible that shutters existed for windows on both floors at the rear of the buildings, since a person standing on the terreplein could look into the second-floor windows. It is also possible that the second-floor front windows had shutters, since two or more officers shared the verandah on that floor.

Recommend that shutters be placed on all windows.

E. Specific Structures

1. Commanding Officer's Quarters, HS 1

When the kitchen structure was incorporated with the commanding officer's quarters, no interior doorway was cut into the south wall of the kitchen. To get from the former single-story kitchen to the new hall adjacent to it, a person had to go out one back door and in another. A brick addition was built onto the rear of the building to enclose these two doors. This addition was apparently of two stories. Recommend that the possibility of reconstructing this addition be investigated, especially if it should be large enough to house the furnace that heats this building. The furnace is now in a modern metal shed that should be removed.

At present the ground-floor kitchen room is interpreted as the post administrative office. While the post commander and adjutant had two offices in this building in the 1880s, these were on the second floor. Recommend that in future interpretive planning consideration be given to interpreting this room as a kitchen--the original function, possibly as old as the main structure itself. (The writer is aware of his impertinence here. The kitchen itself is not "exterior preservation," the purpose of this report.)

The original structure had a door opening onto the parade ground. This door is now a window.

2. Magazine, HS 2

Recommend a study of the feasibility of exhibiting the foundation ruins of the traverse that was built in front of the magazine door after the British bombardment, and of one or both of the officers' latrines that stood on either side of the magazine.

Also recommend that an architectural decision be made concerning the opening of the bricked-in window at the rear of the magazine. Whether this window was installed prior to or during the reinforcement of the building in 1814 remains unknown. Its presence was taken for granted by 1839. Insufficient data has been found to reconstruct a lightning rod. In conclusion, it is noted that the primary function of this magazine, and others, was to store kegs of powder, not cannon balls.

3. Junior Officers' Quarters, HS 3

Recommend no reconstruction of a covered passage from the junior officers' quarters to the officers' kitchen that was attached to the barracks, HS 4. There is insufficient historical documentation for reconstruction.

4. Barracks, HS 4

As long as the modern restrooms in this building are considered a requirement, recommend that the present unobtrusive signs remain. Recommend the retention of the window cut in the second story of the east end of the building in 1880.

5. Barracks, HS 5

Recommend general preservation measures.

6. Sally Port, Guardrooms, Bombproofs, HS 6

Recommend the cleaning out and reopening of the ventilator shafts that lead down to the bombproofs on the south side of the complex. Recommend removal of the asphalt and the replacement of the historic brick pavement on the sally port floor. Recommend consideration be given to removing the two pieces of angle iron that guard the inside corners of the sally port--probably against trucks. While the date of the installation of this iron is presently unknown, likely it was after the Army abandoned the post.

Recommend a physical investigation, if necessary, to locate the drains and catch basins mentioned in 1929.

7. Civil War Magazine, HS 7

Recommend restoration of the south end of this complex to its original plan. (This section was converted to bathhouse purposes after the fort was deactivated.) Further recommend any necessary work on the brick walls and copper gutters, etc. Recommend no reconstruction of "lightning-conducting arrangement," as the details are lacking.

8. Star Fort, including Drainage, HS 12

Recommend all necessary repairs, rebuilding, etc., to all masonry: scarp, revetment wall, coping, breast-height wall, etc. Recommend any necessary reshaping of parapet, banquette, and terreplein. Recommend archeological investigation and any restoration of all known or to-be-discovered drainage systems.

Recommend that the 1939 ramp to the sally port be investigated by archeologists in order to determine original paving material, if any. Depending upon the results, recommend the present asphalt be removed and the ramp restored to its original appearance.

Should the idea become feasible, recommend the acquisition of proper carriages for the two guns in the east-northeast bastion now resting on concrete blocks.

If feasible, recommend the reconstruction of the 4-foot-wide earthen infantry banquette behind the parapet and on the terreplein. (Its exact height above the level of the terreplein is not known at this time.)

Recommend archeological investigations of the bastion latrine and the privy in the ditch near the ravelin.

Recommend that the two flights of stone steps (one of which, at least, is modern) to the terreplein be retained. Stone steps were to be found here in the historic period.

9. Ravelin, HS 13

Recommend an archeological investigation be made of the former entrance tunnel that ran through the ravelin.

Recommend that consideration be given to reconstructing the two flights of wooden steps that once led up to the terreplein of the ravelin. (It is not possible to reconstruct the original flight of stone steps because of the 1866 magazine.)

10. Water Battery, HS 14

Recommend necessary restoration and preservation to masonry and earthen work, e.g., the earth over magazine No. 3 has slipped; the brick wall of another structure is on the verge of collapse.

The breast-height wall of the water battery never had coping. Recommend its present appearance be maintained; it is topped with hard bricks.

It is noted that all bombproofs and magazines had double wooden doors. They now have iron gates. Recommend an architectural feasibility study to determine wisdom of installing reconstructions of the original doors.

11. Flagstaff, HS 15

No firm evidence exists as to the location of the flagstaff during the British bombardment in 1814. The last specific evidence before the bombardment showed it to be at the same site as the present reconstructed flagstaff. The earliest specific evidence following the bombardment showed the flagstaff to be on the east bastion. Recommend no changes in the present flagstaff site.



V. RECOMMENDATIONS FOR FURTHER STUDY

1. Recommend a historic structure report on the interior parade ground at Fort McHenry. Different commanders at the fort changed the landscaping of the parade ground many times over the years. No analysis of this feature has yet been made. Also, the historic elevation(s) of the parade should be determined. Changes in elevation may have affected the drainage system.

2. Recommend an "interior" historic structure report for each of the six structures within the fort. No systematic study of the appearances and functions of these buildings over the full range of the fort's history has been made. Such studies would be important to future master and interpretive planning.

3. Recommend a modified historic structure report or a grounds study that would include a brief structural and functional history of all the buildings, mostly outside the fort, that once existed but have since disappeared. Besides being of value to interpretive and master planning, such a study would give an increased understanding of the various remaining structures within the fortifications.



GLOSSARY OF FORTIFICATION TERMS

Abattis (Abatis). A means of defense formed by cutting off the smaller branches of trees felled in the direction from which the enemy may be expected. The ends of the larger branches are sharpened and the butts of the trees fastened by pickets or imbedded in the earth.

Banquette. The bank of earth in rear of the parapet on which infantry troops stand to fire. At Fort McHenry the banquette was not built until 1839, behind the parapet of the main work.

Bastion. A work consisting of two faces and two flanks, all the angles being salient. Fort McHenry had five, one at each corner of the pentagon.

Bombproof. A structure of sufficient thickness and strength that bombs cannot penetrate them. Fort McHenry had four for personnel in its heyday: one on each side of the sally port and two in the 1830s water battery.

Breast-Height Wall. The interior slope of a parapet. Eventually, the breast heights at Fort McHenry were made of brick.

Coping. The highest or covering course of a wall. The coping at Fort McHenry projected out over the wall.

Gordon. 1) An ornamental projecting course along the junction of a parapet with a rampart; 2) The coping of a scarp wall, which sometimes projects beyond the face of the wall a few inches.

Counterscarp. The vertical or nearly vertical side of a ditch nearest to the besiegers, and opposite the scarp or escarp. While generally faced or revetted in permanent works, it was simply an earthen work at Fort McHenry.

Covert Way (Covered Way). A corridor or banquette running along the top of the counterscarp, protected by an embankment whose outer slope forms the glacis. The defending infantry used it as a place of security or as a means of moving from point to point. Because of the lowness and nature of the counterscarp at Fort McHenry, the military sometimes considered the ditch itself to be the covered way.

Cunette. A trench in the bottom of a dry ditch. At Fort McHenry it served as a drain.

Curtain. That part of the rampart or wall between two bastions or two gates. Five curtains at Fort McHenry.

Demilune. See Ravelin.

Double Caponiere. A covered passage across the ditch of a fortified place. If protected on only one side, it is single; if on both sides, it is double. It was wanted at Fort McHenry to provide safe passage from the fort to the early water batteries.

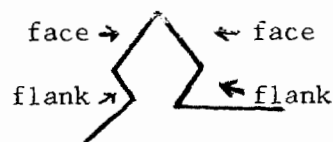
Embrasure. At Fort McHenry, an opening in the parapet through which the guns on the bastions were pointed.

En Barbette. At Fort McHenry, guns on the bastions set on platforms high enough as to enable the guns to fire over the parapet, rather than be worked through an embrasure.

Entrant angle. An angle inverted toward or pointing into the fortification.

Exterior slope. The slope given to the outside of a parapet. At Fort McHenry there were exterior slopes on the outside of the main work parapet, the water battery parapet, and the ravelin parapet.

Face of bastion and Flank of bastion. The faces were the two parts of the bastion that made the salient angle. The flanks were the two parts that joined the faces to the ramparts. One could fire from the flanks along the curtains.



Front. The side of the fort presented to the enemy. At Fort McHenry the engineers often called the five sides of the pentagon the "fronts."

Glacis. A slope of earth, usually turfed, that inclines from the covered way towards the country. Its object is to bring assailants into a conspicuous line of fire as they approach the fort; also to mask the general works of the place.

Gorge. At Fort McHenry the one gorge was that space between the ravelin and the fort proper.

Interior slope. The inclination toward the inner part of a work which is given to the earth forming the parapet or rampart, i.e., the back side of the parapet. Infantry troops lean against the interior slope when firing.

Magazine. Storehouse for powder. Fort McHenry had five: one pre-War of 1812; one Civil War; three post-Civil War.

Parapet. Breastworks of earth, brick, stone, or other material. The main fort, the ravelin, and the water battery at Fort McHenry each had its parapet.

Postern. A passage, usually vaulted, under the rampart, to afford a communication from the interior into the ditch. Fort McHenry had two: the large sally port or main entrance, and a small postern leading through the east rampart. This latter originally served as the main drain from the interior; after construction of the 1830s water battery, this small and awkward tunnel served as communications from the fort to the battery.

Rampart. Broad embankment or mass of earth surrounding a fortified place. A rampart forms the body of the place. The parapet is on its exterior edge. It, too, has an interior slope just as the parapet has. At Fort McHenry the ramparts are essentially the fort. The exterior (scarp) was brick-faced. On the interior a granite retaining wall about 5 feet high was built around the base of the interior slope. This revetment gave more space behind the buildings within the fort.

Ravelin. A work constructed beyond the main ditch, opposite a curtain, composed of two faces and forming a salient angle. It has its own ditch and, usually, counterscarp. Fort McHenry had one ravelin (or demilune) that covered the sally port.

Redoubt. A small fort of varying shape, usually of a temporary nature. The term is vague, being applied equally to detached posts and to a strong position within another fort.

Salient angle. The projecting angle formed by the two faces of a bastion.

Sally Port. The gate or passage by which the garrison of a fort may make a sally on besiegers. At Fort McHenry it was the main gateway into the fort. At first it apparently was a single opening through the ramparts. Later an arch covered it. (See Postern.)

Scarp (Escarp). The faces of the fort on the inside of the ditch. At Fort McHenry the scarp is bricked. To the casual visitor the scarp is the fort when viewed from the outside.

Shot furnace. A furnace for heating cannon balls prior to firing them. The idea was to set fire to wooden ships.

Shoulder angle of bastion. The angle formed by one face and one flank of the bastion.

Star fort. An inclosed field work, in shape like the heraldic representation of a star. The first fort at Whetstone Point was probably a true star fort. Today's fort, while often called a star fort, is not truly such; it is a pentagon with five bastions.

Terreplein. The broad surface which remains on the rampart after constructing the parapet and the banquette. The terreplein at Fort McHenry was not especially broad.

Traverses. Mounds of earth, higher than a man, 18 feet thick, placed at intervals on a rampart to stop shot which may enfilade. Fort McHenry has only one true traverse of this nature, in the 1830s water battery. The magazines in this battery could also serve as traverses. This fort also had a brick traverse in front of the interior magazine's door, and planned a brick traverse to cover the sally port--where the ravelin was eventually built.

Traverse circle. In gunnery, a circular plate of iron fastened to a bed of solid masonry on which the traverse wheels, which support the gun chassis, roll.

Water battery. A battery consists of two or more guns; a water battery is simply one nearly on a level with the water. During the War of 1812, Fort McHenry had two water batteries--the lower, on the river's edge; and the upper, which fired over the lower. These fell into disuse and were eventually leveled. In the late 1830s the present water battery, adjacent to the fort, was constructed.

APPENDIX



Appendix

Commanding Officers, Fort McHenry

The following list of post commanders is incomplete for the early days of the fort. Also, it does not list those officers who acted in that position while the actual commanding officer was absent. The rank of colonel indicates that a regiment was headquartered at Fort McHenry.

The first "consolidated morning report" to identify clearly the commanding officer was dated December 27, 1814: Maj. George Armistead, Corps Artillery.

The next report was dated March 27, 1815: Capt. Frederick Evans, 2d Artillery.

September 1815: Capt. Isaac Roach, Jr., 23d Infantry
October 1815: Maj. George Armistead
October-December 1820: Maj. Jacob Hindman, Corps Artillery
February-April 1821: Capt. R. A. Zantzinger, Corps Artillery
July 1821-July 1822: Maj. Jacob Hindman
August 1822-April 1824: Capt. Francis S. Belton, 2d Artillery
May 1824-February 1827: Maj. Jacob Hindman
March 1827: Capt. R. A. Zantzinger
April-October 1827: Capt. William Gates, 2d Artillery
November 1827-January 1828: 1st Lt. Samuel B. Dusenberry,
4th Artillery
February-March, 1828: Capt. M. M. Payne, 4th Artillery
April-October, 1828: Capt. John Erving, 4th Artillery
November 1828-February 1829: Capt. James W. Ripley, 4th Artillery
March 1829-May 1832: Capt. M. M. Payne
June-October 1832: Capt. James W. Ripley
November 1832-March 1834: Lt. Col. John B. Walbach, 1st Artillery
April-December 1834: Capt. John Erving
January 1835-April 1836: Col. John R. Fenwick, 4th Artillery
May-June 1836: Asst. Surg. T. Henderson
July 1836: Capt. E. L. Hawkins, 7th Infantry
August 1836: Col. John R. Fenwick
September 1836-?: Capt. Henry A. Thompson, 4th Artillery
May-September 1839: Lt. Robert C. Shelton, 2d Dragoons
October 1839-May 1842: Capt. Samuel Ringgold, 3d Artillery
June 1842: 1st Lt. Morris L. Miller, 3d Artillery
July-September 1842: Capt. J. M. Washington, 4th Artillery
October 1842-July 1843: Lt. Col. J. B. Crane, 4th Artillery
August 1843-November 1844: Lt. Col. M. M. Payne, 4th Artillery
December 1844-June 1845: Capt. Samuel Ringgold
July-August 1845: 1st Lt. C. Q. Tompkins, 3d Artillery

September 1845: 1st Lt. F. E. Hunt, 4th Artillery
 October 1845-October 1846: Maj. F. L. Benton, 4th Artillery
 November 1846: 1st Lt. J. B. Magruder, 1st Artillery
 December 1846-March 1847: 1st Lt. H. Ridgely, 4th Infantry
 April 1847-May 1848: Capt. H. Swartwout, 2d Artillery
 June-September 1848: Lt. Col. Y. S. Belton, 3d Artillery
 October 1848-September 1850: Maj. Thomas Childs, 1st Artillery
 October 1850-November 1852: Capt. Francis Taylor, 1st Artillery
 December 1853-April 1856, Lt. Col. John S. Gardner, 1st Artillery
 May-September 1856: Maj. Francis Taylor
 October 1856-August 1857: Capt. Horace Brooks, 2d Artillery
 September 1857-May 1859: Capt. William H. French, 1st Artillery
 June 1859-February 1860: Surg. Charles McDougall
 (No returns March-December 1860)
 January 1861: Capt. Josh A. Haskin, 1st Artillery
 February 1861-April 1861: Capt. John C. Robinson, 5th Infantry
 May 1861-July 1863: Maj. William W. Morris, 4th Artillery
 September 1863-February 1864: Col. P. A. Porter, 8th N. Y. Vol.
 Artillery
 March 1864: Maj. James H. Willat, 8th N. Y. Artillery
 April 1864: Lt. Col. W. W. Bates, 8th N. Y. Artillery
 May-September 1864: Col. William W. Morris
 (No returns October 1864-April 1865)
 March-April 1865: Col. Daniel Macauley, 11th Indiana Vet. Vols.
 May 1865: Maj. John F. Mount, 7th N. Y. Artillery
 June 1865: Capt. Frank H. Larned, 2d Artillery
 July 1865: Maj. Lewis R. Stegman, 1st U.S.V.V.
 August-October 1865: Lt. Col. W. W. Sanders, 1st U.S.V.V.
 November-December 1865: Col. Charles Bird, 1st U.S.V.V.
 January-July 1866: Lt. Col. Joseph Roberts, 4th Artillery
 August 1866-October 1868: Col. H. Brooks, 4th Artillery
 November 1868: Capt. Frederick M. Follett, 4th Artillery
 December 1868-February 1869: Maj. Joseph Stewart, 4th Artillery
 March 1869-October 1872: Col. H. Brooks
 November 1872-November 1876: Lt. Col. W. H. French, 2d Artillery
 December 1876-January 1877: Capt. Edward R. Warner, 3d Artillery
 February 1877: Capt. J. Gales Ramsay, 2d Artillery
 March 1877-July 1879: Col. William F. Barry, 2d Artillery
 July 1879-March 1880: Lt. Col. Albion P. Howe, 2d Artillery
 April-December 1880: Col. Romeyn B. Ayres, 2d Artillery
 January 1881-April 1882: Lt. Col. A. P. Howe
 May-June 1882: Maj. Loomis L. Langdon, 2d Artillery
 June 1885-July 1886: Maj. E. C. Bainbridge, 3d Artillery
 August 1886-March 1887: Maj. Richard Lodor, 3d Artillery
 April 1887-May 1891: Lt. Col. L. L. Livingston, 3d Artillery
 June 1891: Capt. Edward C. Knower, 3d Artillery
 July 1891: Capt. John R. Myrick, 3d Artillery

August 1891-April 1892: Lt. Col. E. C. Bainbridge, 3d Artillery
May 1892-April 1893: Maj. Joseph G. Ramsay, 3d Artillery
May-June 1893: Capt. Richard P. Strong, 4th Artillery
July 1893-February 1898: Maj. George B. Rodney, 4th Artillery
March-April 1898: Col. E. B. Williston, 6th Artillery
May 1898: Capt. R. P. Strong, 4th Artillery
June 1898-March 1899: Maj. William P. Vost
April 1899-May 1900: Maj. Frederick Fuger, 4th Artillery

June 1900-May 1901: Capt. Peter Leary, Jr., 4th Artillery
June 1901: Capt. Wilmot E. Ellis, 90th Co., CA
June 1901-July 1902: Maj. William Ennis, Artillery Corps
August 1902: Capt. M. G. Spinks, Artillery Corps
September 1902: Capt. W. E. Ellis, Artillery Corps
October 1902-July 1903: Col. David H. Kinzie, Artillery Corps
August 1903: Capt. Wilmot E. Ellis, 90th Co., CA
September 1903-May 1906: Maj. M. Crawford, Artillery Corps
June 1906: 1st Lt. James A. Thomas, 39th Co., CA
July-August 1906: 2d Lt. Lewis Turtle, 39th Co., CA
September 1906-March 1907: 1st Lt. James A. Thomas
April-June 1907: 1st Lt. James D. Watson
July-September 1907: Capt. Jacob E. Wyke, 141st Co., CAC
October 1907-September 1909: Maj. Elmer M. Hubbard, CAC
October 1909-June 1911: Maj. George F. Landers, CAC
July 1911-July 1912: Capt. Charles G. Wheatly, 141st Co., CAC



BIBLIOGRAPHY

Earlier this report discussed the difficulties encountered in documenting data because of the manner in which the historical collection is arranged and filed at Fort McHenry. These same problems arise in preparing the bibliography. Since the time the collection at Fort McHenry was compiled by the Historical and Archeological Research Project (HARP) Team, some of the depositories possessing the original material have changed their methods of cataloging. In some instances the identification of the HARP was seemingly incomplete, or abbreviated with mystifying initials.

To identify clearly the material used at Fort McHenry, this bibliography is divided into two parts: the HARP material (identified exactly as it is in the collection), and all other material.

The HARP collection consists of 264 large, three-ring binders arranged both by subject matter and chronologically.

Part I: HARP Materials

1. Manuscript Material

Baltimore. City Archives. Correspondence and documents pertaining to Baltimore's early history. Box numbers are given in the specific citations.

_____. Fort McHenry National Monument and Historic Shrine. Correspondence by the HARP staff concerning historical matters.

_____. Maryland Historical Society. O. H. Williams Papers and William Winder Papers.

New York City. Columbia University Library. General Samuel Smith Papers.

Washington, D.C. Library of Congress. James McHenry Papers and Samuel Smith Papers, both on Xerox.

_____. National Archives. Record Group 77. Office of the Chief of Engineers, Letters Sent; Letters Received; Annual Reports to the Secretary of War; Buell's Collection, Engineer Historical Papers, 1800-1819; and Selected Letters, Fortifications, 1882-1884.

- _____ . Record Group 92. Office of the Quartermaster General, Consolidated Correspondence File.
- _____ . Record Group 94. "Post Revolutionary War, FMDD, SO, 1815-19"; and Adjutant General's Office, Correspondence, FM, 1927-1939.
- _____ . Record Group 107. Office of the Secretary of War, Letters Received. Also listed under Record Group 107 are: Office of the Chief of Engineers, "SC," Fort McHenry, 1811-1837; and "SC FT-MC."
- _____ . Record Group 156. Office of the Chief of Ordnance, Selected Letters Received, 1801-1820.
- _____ . Record Group 159. Office of the Inspector General, Letters Received (mostly inspection reports).
- _____ . Record Group 217. General Accounting Office, Miscellaneous Treasury Accounts; and Accountant's Office, Journal "N."
- _____ . Microfilm No. 47, Office of the Secretary of War, Military Book 1A, 1800-1803.

West Point. United States Military Academy Archives. Correspondence of Col. J. G. Swift.

2. Published Materials

American State Papers, Military Affairs. 7 vols. Washington, 1832-61.

(Annals of Congress) Debates and Proceedings in the Congress of the United States, 1789-1824. 42 vols. Washington, 1834-56.

Archives of Maryland, Journal and Correspondence of the Maryland Council of Safety, 1775-1776; July 7-Dec. 31, 1776; Jan. 1-Mar. 20, 1777; and April 1, 1778-Oct. 26, 1779.

Baltimore American. Aug. 25, 1912.

Bernhard, Karl, Duke of Saxe-Weimar Eisenach. Travels Through North America during the years 1825 and 1826. Philadelphia, 1828.

Desauguliers, ----- . A Treatise of Fortifications. Oxford, 1711.

Federal Gazette and Baltimore Daily Advertiser. 1813-14.

Part II: Other Materials

1. Manuscript Material

National Archives:

Washington, D.C. National Archives. Record Group 77. Office of the Chief of Engineers, Document File, Indexes, 1894-1923, 1890-1892, and 1893-1894.

_____. Record Group 92. Office of the Quartermaster General, Consolidated Correspondence File, 1794-1915, Fort McHenry, 5 boxes, 630-34; Document File 1890-1914, Index, 2 boxes, 564 and 565.

_____. Record Group 94. Medical Histories, Fort McHenry, volumes 832-36, June 1, 1868-July 1912.

_____. Microfilm No. 617. Returns from U.S. Military Posts, 1800-1916, Rolls 674-80, Fort McHenry, Returns, November 1814-July 1912.

2. Other Material

Bradford, S. Sydney, and Mullaly, Franklin R. Fort McHenry Historical and Archeological Research Project, 1957-1958. National Park Service: Fort McHenry, 1958.

Bradford, S. Sydney. The Outworks of Fort McHenry, September 12-14, 1814. National Park Service: Fort McHenry, 1958. Deals with the outworks only down to 1814.

Coles, Harry L. The War of 1812. Chicago: University of Chicago Press, 1966.

Harper's Weekly. Sept. 21, 1889, p. 759; and July 13, 1861, p. 436.

Heitman, Francis B. Historical Register and Dictionary of the United States Army . . . 1789 . . . 1903. 2 vols. Washington: Government Printing Office, 1903. Reprint. Urbana: University of Illinois Press, 1965.

Johnson, Allen, ed. Dictionary of American Biography. 11 vols. index, supplement 3. New York: Charles Scribner's Sons, 1964.

Lewis, Emanuel Raymond. Seacoast Fortifications of the United States: An Introductory History. Washington: Smithsonian Institution Press, 1970.

- Lord, Walter. The Dawn's Early Light. New York: W. W. Norton and Company, 1972.
- Manucy, Albert. Artillery Through the Ages, A Short Illustrated History of Cannon, Emphasizing Types Used In America. National Park Service Interpretive Series, History No. 3. Washington: Government Printing Office, 1949. Reprint 1962.
- Mulcahy, James M. Fort McHenry: Historical and Archeological Research Projects. National Park Service, 1957-58. A long report, 282 pages with plates and maps.
- National Park Service. Administrative Policies for Historical Areas of the National Park System. Washington: Government Printing Office, revised 1973.
- Nelson, Lee H. Historic American Buildings Survey: An Architectural Study of Fort McHenry. National Park Service, 1961. The best structural history of Fort McHenry in existence. 112 pages, plus plates.
- Smith, G. Hubert. Archeological Explorations at Fort McHenry, 1958. National Park Service, 1958. 83 pages, plus plates.
- Walsh, W. Richard. The Star Fort, September 1814. National Park Service, 1958. 27 pages.
- Weigley, Russell F. History of the United States Army. New York: Macmillan Company, 1967. Includes a good general discussion of the fortunes of seacoast fortifications.

ILLUSTRATIONS AND MAPS

Illustration No. 1.

Whetstone Point, 1792, from "Plan of the Town of Baltimore and Its Environs," by A. P. Folie. The Revolutionary fort is shown as a true star fort. A single battery with some sort of fortification in advance of it guards Baltimore. The road from the city may be seen. It is apparent that the new Fort McHenry was built on the same site as this one.

Courtesy, Fort McHenry NM&HS.
Park Neg. 1555.

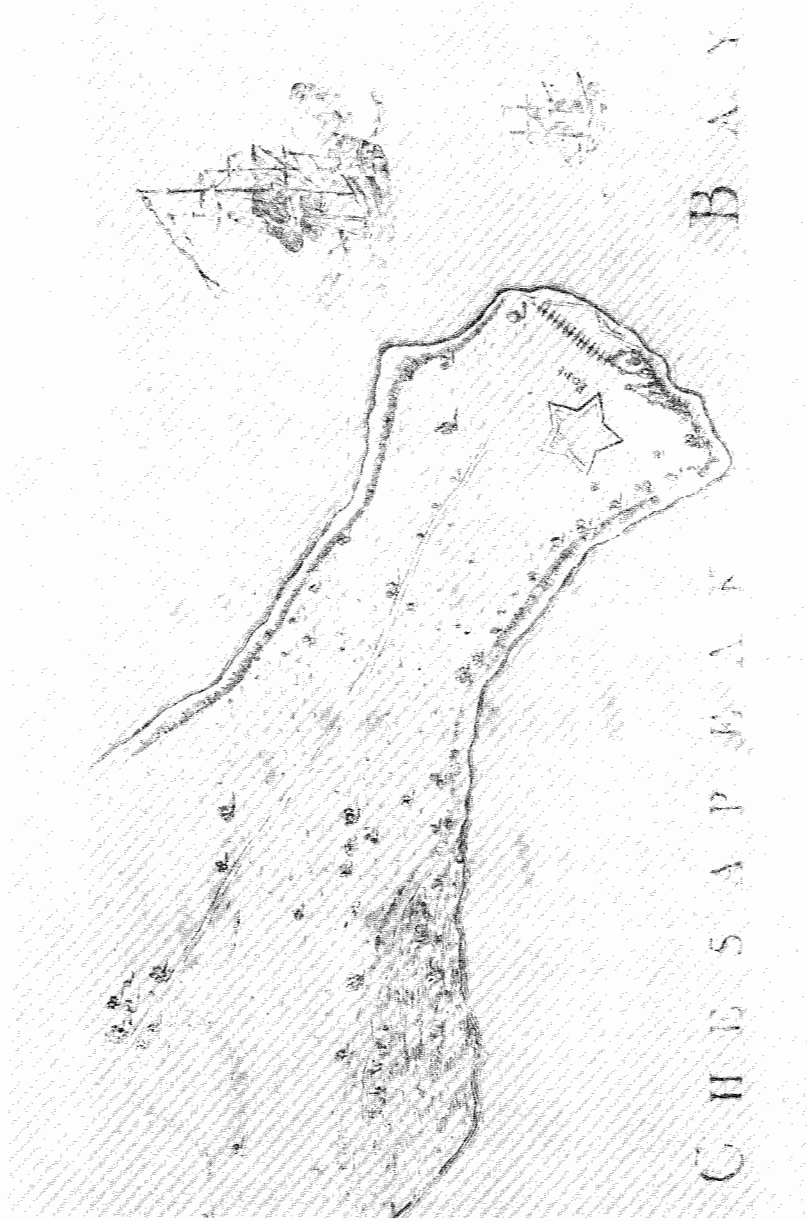
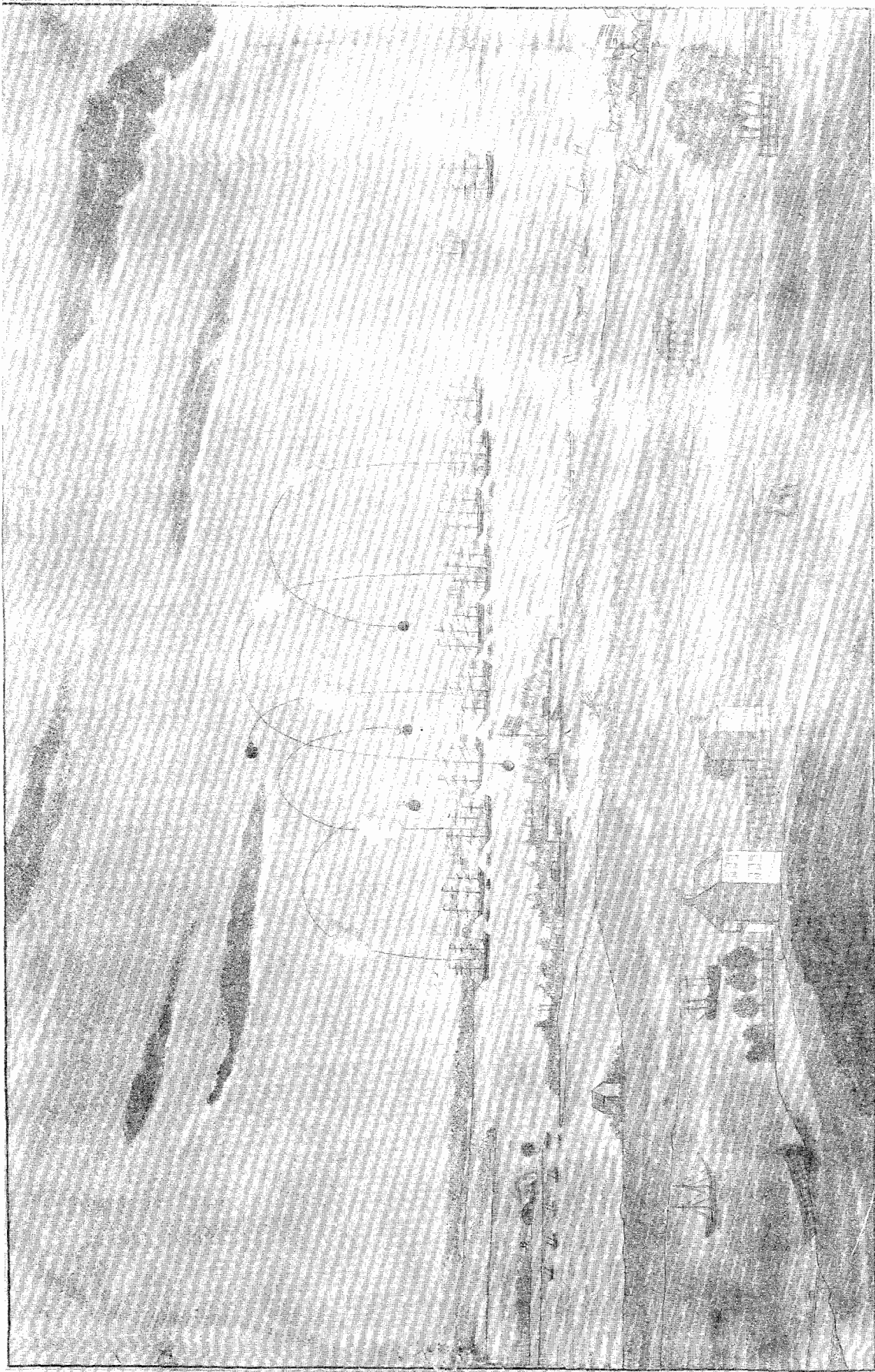


Illustration No. 2.

Bombardment of Fort McHenry, September 13-14, 1814. Original drawing is at the Peale Museum, Baltimore. Of interest are the trees depicted growing from the top of the fortifications and a small but increasing number of military structures outside the fort. The magazine, not yet reinforced, and the quarters, still one story, do not stand above the parapets as much as they would in later years. The two-story structure is thought to be a tavern near the fort that preyed on the garrison for many years. The scale and perspective of this drawing bear little relation to reality.

Courtesy, Fort McHenry NM&HS.
Park Neg. 1313.



A VIEW OF THE BOMBARDMENT OF FORT MCHENRY, near Baltimore, by the British fleet, taken from the
Observatory within the Command of Commodore Barron's Castle, on the morning of the 12th Sept. 1814, which lasted 24 hours, &c.
When from 1 to 1000 shells in the night attempted to land by force, &c. were repulsed with great loss.

*(Engraved by
 N. P. Currier
 from a drawing
 by J. M. W. Turner
 Esq. in 1814.)*

Illustration No. 3.

Fort McHenry, September 1814. Artist unknown. Again, trees are shown on top of the ramparts. Both the lower and the upper water batteries are shown. Apparently the earth between them has been greatly disturbed. The sally port is shown unprotected; the ravelin was not built until after the war. One cannot be certain which building is depicted; possibly it is the barracks, HS 5. Note the dormer windows in the still 1½-story structure.

Courtesy, Fort McHenry NM&HS.
Park Neg. 1165.

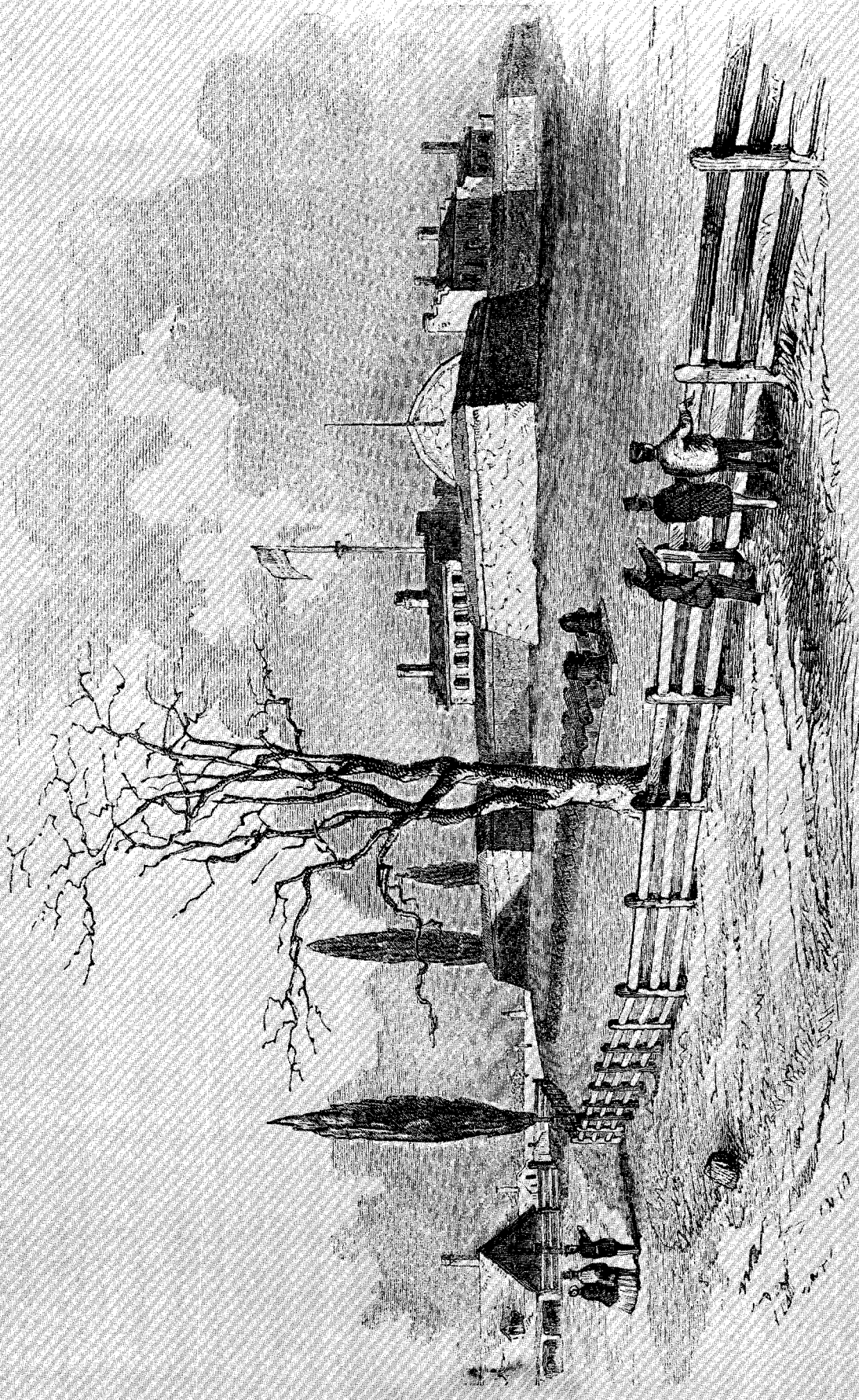
July 5th



Illustration No. 4.

Fort McHenry in peacetime, 1853. Few, if any, guns are mounted; but they are present and could be mounted quickly if war came. The quarters now have two stories and the reinforced magazine projects high above the parapet. The staff rising from the magazine may be the lightning conductor discussed in the military records. Two trees are still shown growing from the top of the ramparts. The flagstaff stands in the east bastion. The addition to the rear of the commanding officer's quarters (to the left of the magazine) does not appear, although it is believed to have existed by that date. The print was acquired from the Enoch Pratt Free Library, Baltimore.

Courtesy, Fort McHenry NM&HS,
Park Neg. 1024.



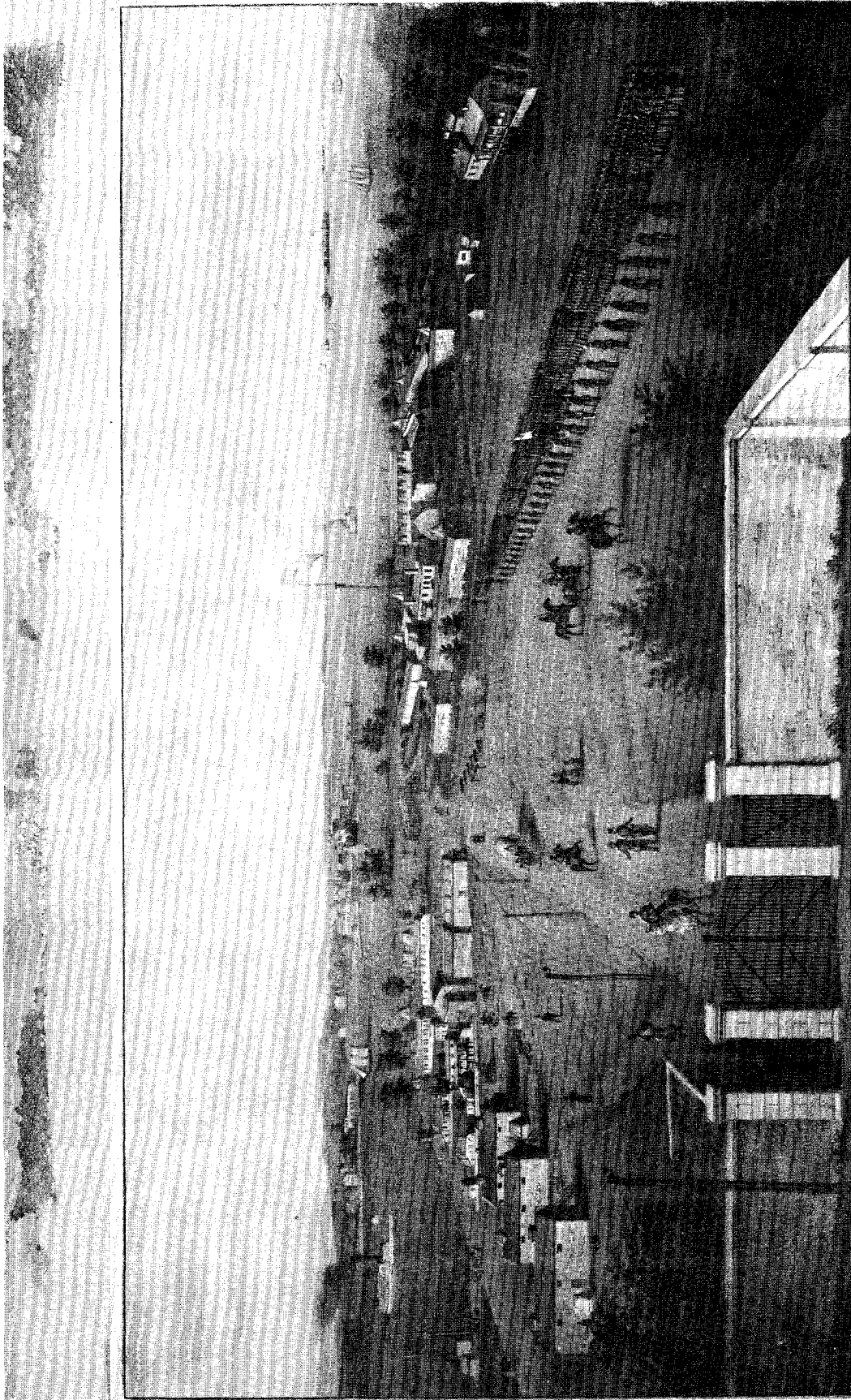
FORT M'HENRY, BALTIMORE, MARYLAND.

[For description, see page 337.]

Illustration No. 5.

Fort McHenry, 1862, by E. Sachse and Company. In addition to watching over Confederate sympathizers in Baltimore, the post served as a prisoner of war camp. Note the rail fence around the fortifications that kept horses off the slopes. Tents (for guards?) appear on the bastions. The small, two-story addition to the rear of the commanding officer's quarters may be seen. All guns are mounted on the bastions and ravelin.

Courtesy, Fort McHenry NM&HS.
Park Neg. 1026.



Left as Photo by J. S. Moore. Right as Photo by J. S. Moore. Middle as Photo by J. S. Moore. Right as Photo by J. S. Moore.

FORT MC HENRY, BALTIMORE, MD

Gen. J. A. DIX, Com. in Chief of this Dept.

W. W. MORRIS, Col. 2^d Artillery Com. of the fort.

FW 11212

S. M. ALFORD, Col. 3^d N. Y.

Illustration No. 6.

Another view of Fort McHenry during the Civil War. A tent may be seen on the right bastion; the top of another stands in front of the magazine. The abattis around the counterscarp is shown. The two-story addition to the commanding officer's quarters is defined clearly.

Courtesy, National Archives
U.S. Signal Corps photo No. 111-SC-90819.

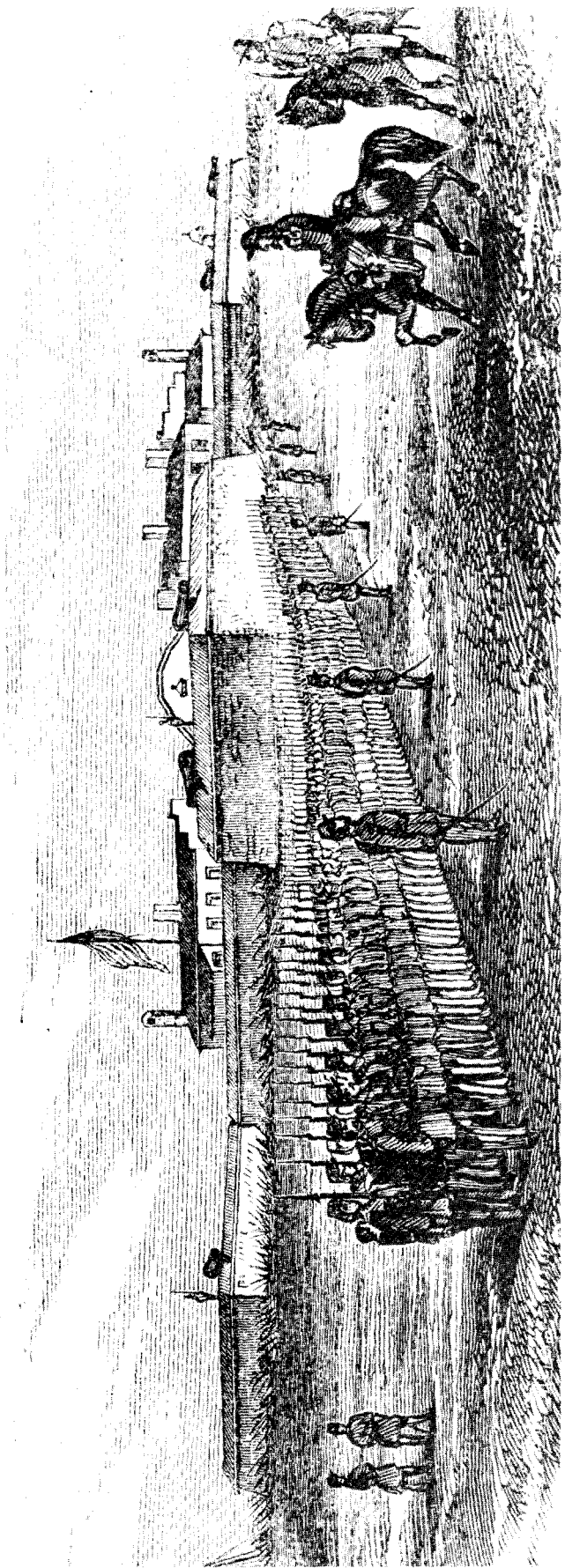


Illustration No. 7.

Interior of the fort sometime between 1883, when the lamp post was installed, and 1894, when the junior officers' quarters, HS 3 (center of photo), was lowered to one story to become a bakery. The two structures to the left are the barracks, HS 5 and HS 4, then occupied by married enlisted men's families. One has to guess about the outline around the magazine door. It may be a shadow of the former traverse; however, many years had passed since the brick traverse had been removed. On the extreme right is the now-dilapidated commanding officer's quarters, HS 1. The white walk across the parade ground may be covered with crushed oyster shells then in use at the post. Some equipment of the former steam pump for the artesian well remains on hand.

Courtesy, Maryland Historical Society.



Illustration No. 8.

Barracks, HS 4. Date of photograph unknown, but thought to be between 1905 and 1922. This is the one structure on the parade to retain its two-story porch, which appears here to have been painted a dark color. Note the stairway leading from the upper porch, to the left. This stair was a fairly late addition, probably dating from the period this building served as quarters for enlisted men's families. To the right, a corner of the one-story bakery may be seen, as well as the connecting passageway to the old officers' kitchen attached to the end of the barracks.

Courtesy, National Archives
Record Group 77, office of the Chief of Engineers.

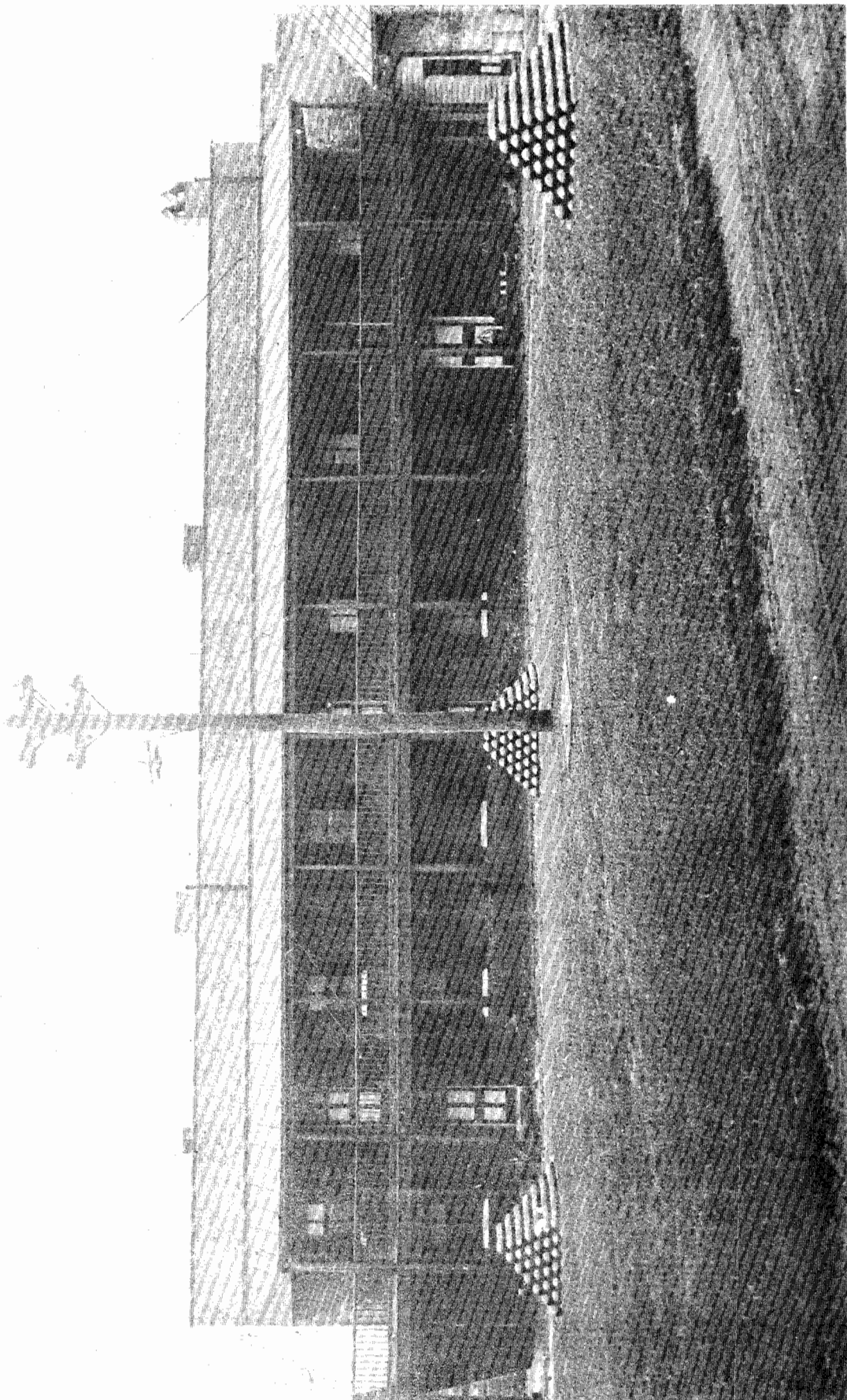


Illustration No. 9.

The water battery, HS 14. This photo is said to be from World War I period, about 1918. It is noted, however, that none of the general hospital buildings appear on the glacis. What is apparent is the complete lack of maintenance of the parapet and other sodding. The Armistead statue has since been moved.

Courtesy, Fort McHenry NM&HS.
Park Neg. 1071.

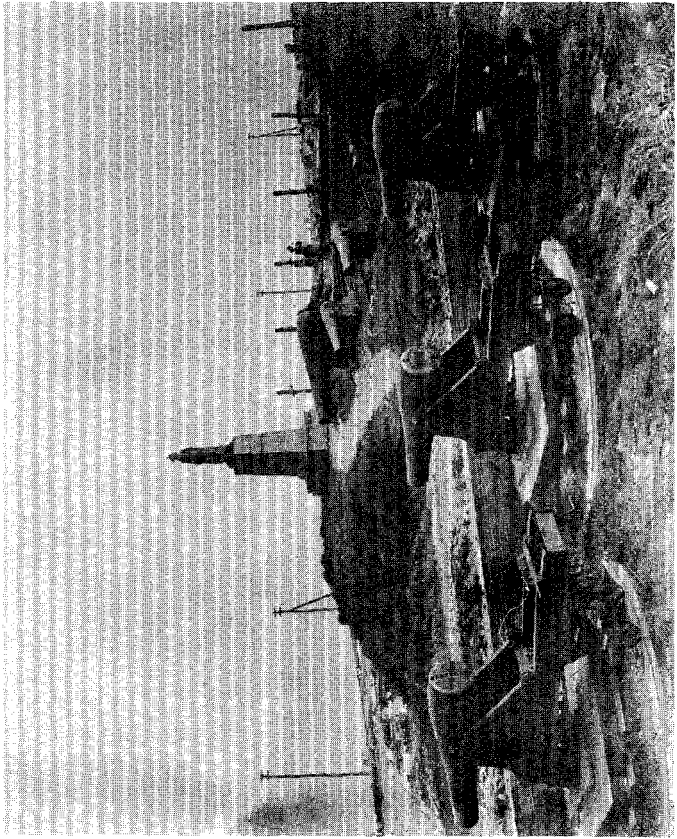


Illustration No. 10.

Former junior officers' quarters, HS 3, here a one-story bakery. This photo is thought to have been taken between 1905 and 1922, possibly before the last troops left in 1912.

Courtesy, Fort McHenry NM&HS.
Park Neg. 1276.

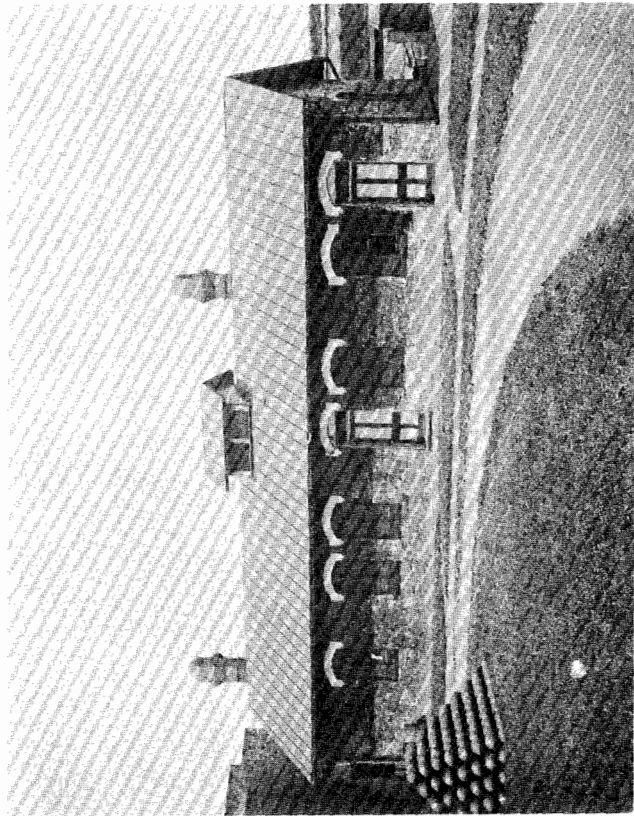


Illustration No. 11.

Sally Port, HS 6, 1927, on eve of restoration by the Army. Note advanced deterioration of the scarp to the left of the entrance. The ditch here is deeper than it is today. The entrance to one of the bombproofs may be seen directly in the entranceway.

Courtesy, Fort McHenry NM&HS.
Park Neg. 1361.

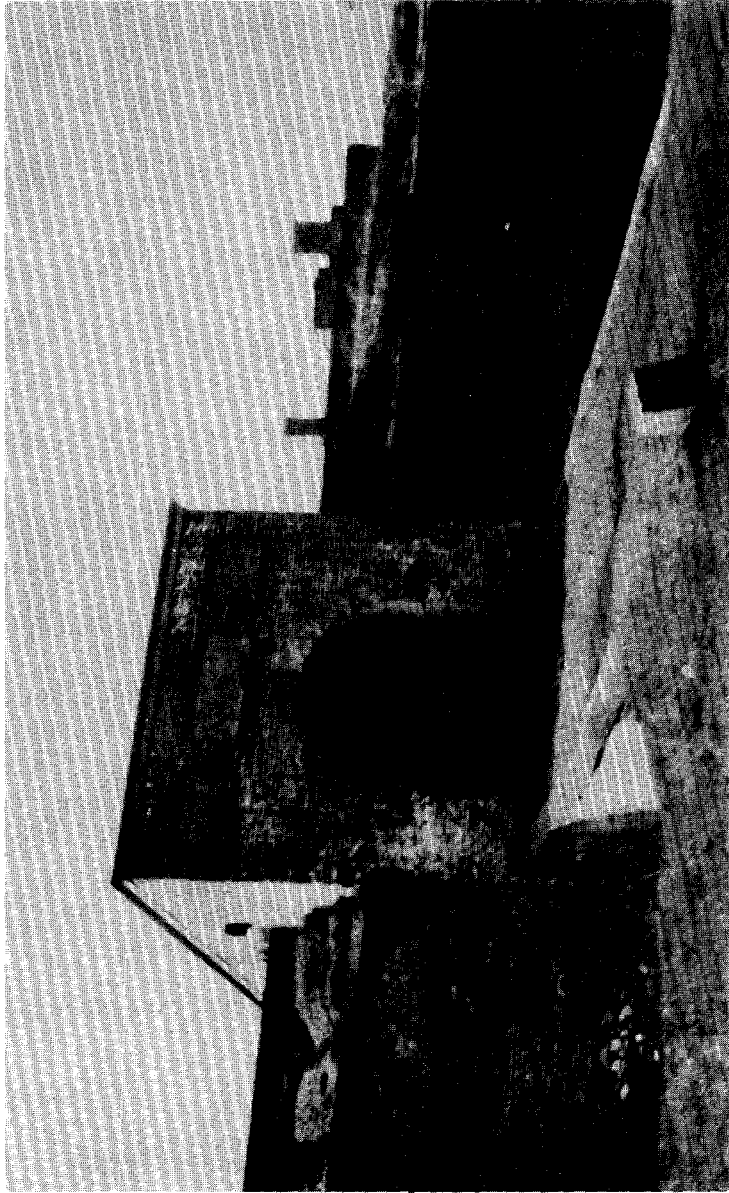


Illustration No. 12.

Front of the commanding officer's quarters, HS 1, and magazine, HS 2, 1927, before restoration by the Army. The large double door was undoubtedly installed by the Army when it used this structure as a subsistence storehouse. Even the former doors to the second-floor porch have been changed to windows.

Courtesy, Fort McHenry NM&HS,
Park Neg. 1358.

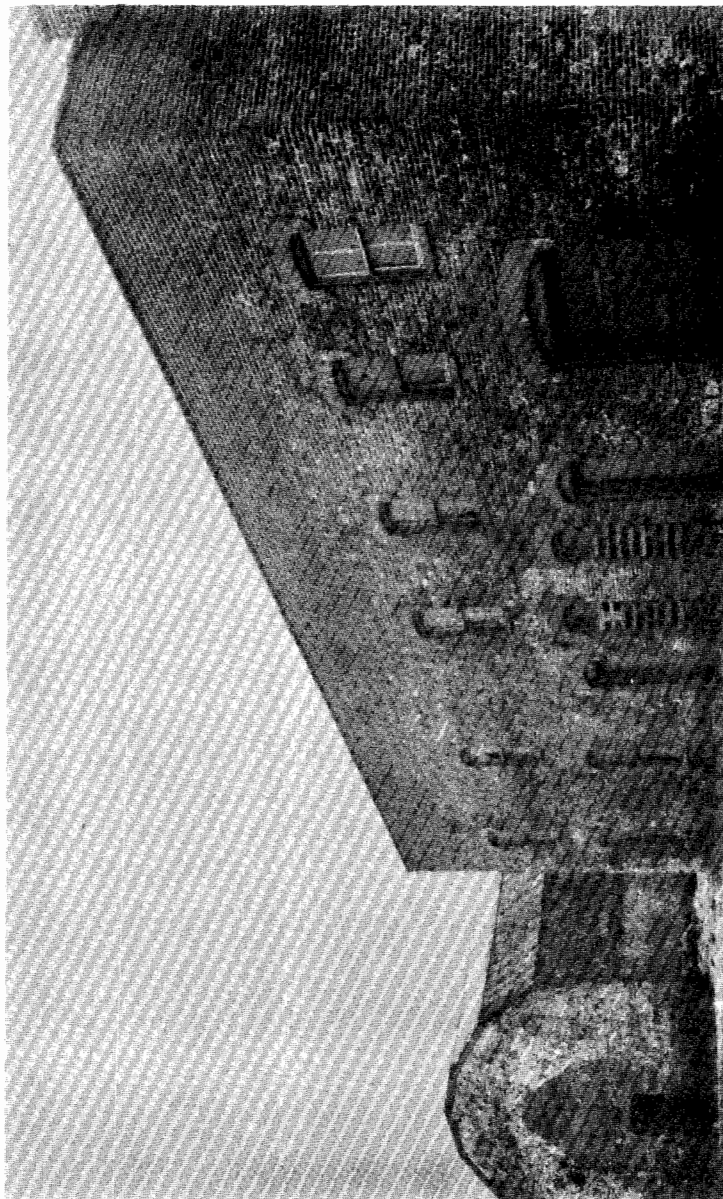


Illustration No. 13.

Rear of barracks, HS 4, 1927. Again, this was the only structure to retain its porches. The stairway was a fairly late addition. The window in the end wall was installed at the request of a second lieutenant in 1880 when he was quartered here.

Courtesy, Fort McHenry NM&HS,
Park Neg. 1357.

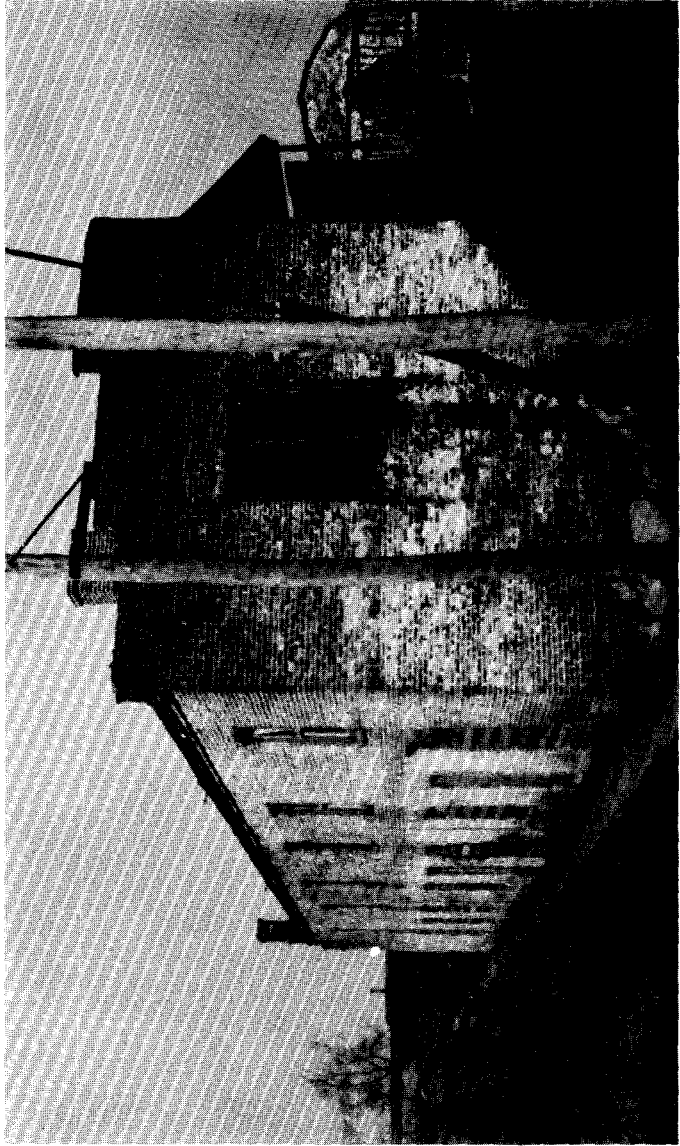


Illustration No. 14

Rear of barracks, HS 5, probably between 1905 and 1922.
Note stairs to worn terreplein.

Courtesy, Fort McHenry NM&HS.
Park Neg. 1274.

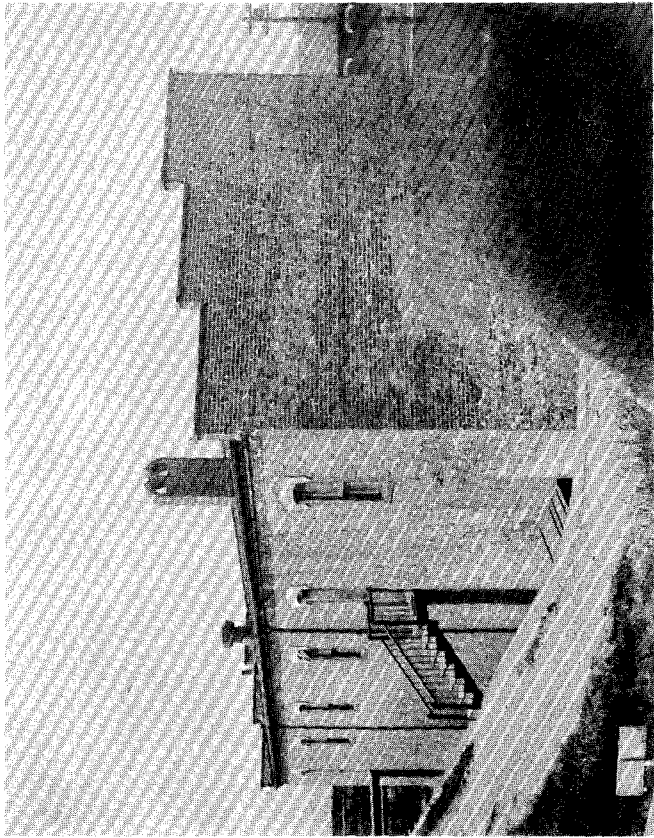
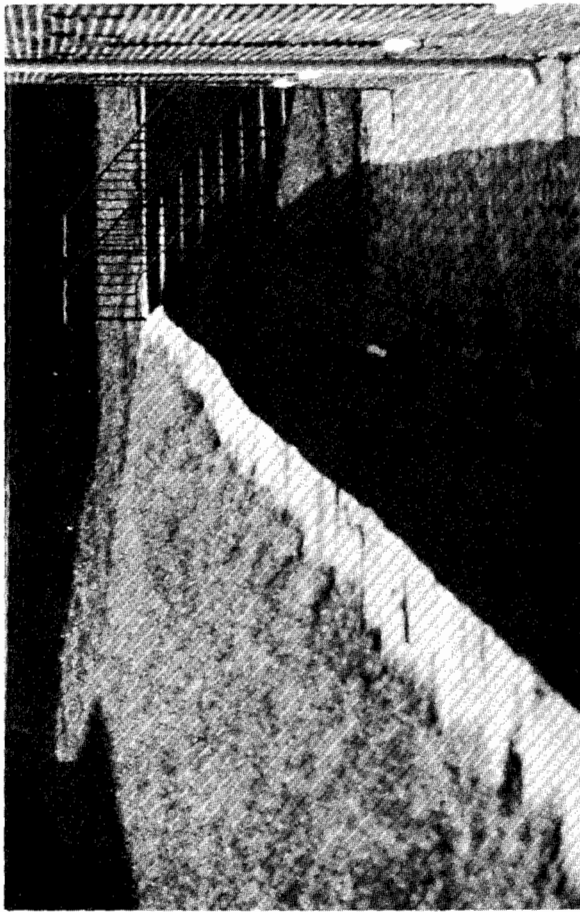


Illustration No. 15.

Terreplein behind barracks, HS 5, 1973. Note complete absence of 4-foot-wide infantry banquette. The flight of steps is a modern reconstruction of historic ones from the parade to the terreplein.

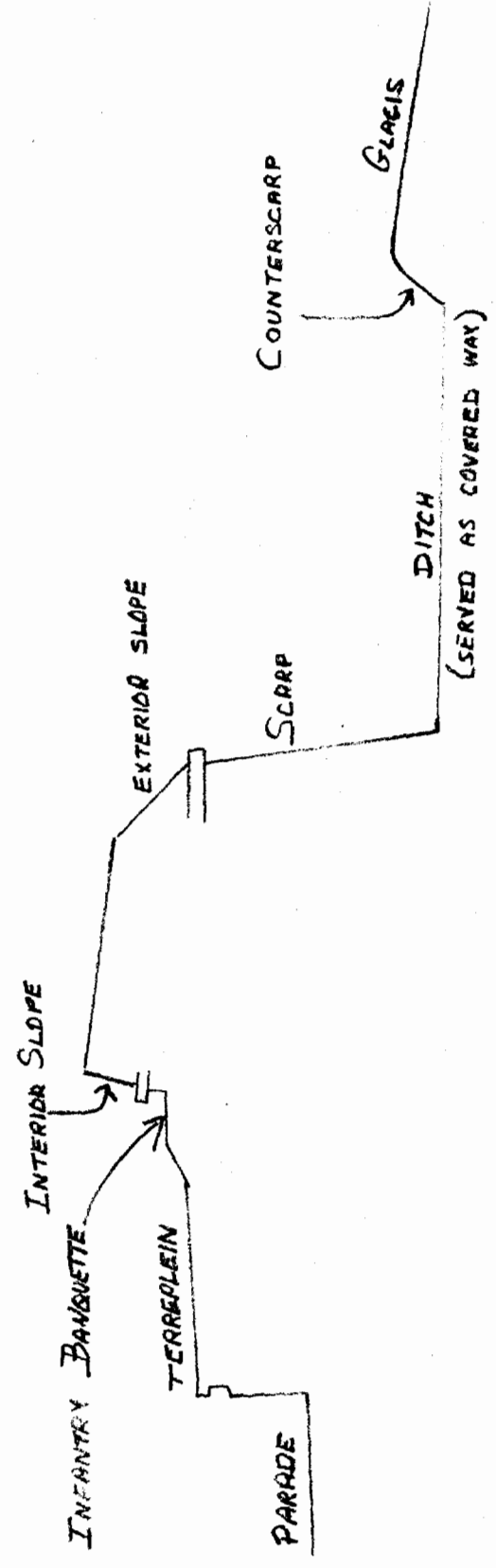
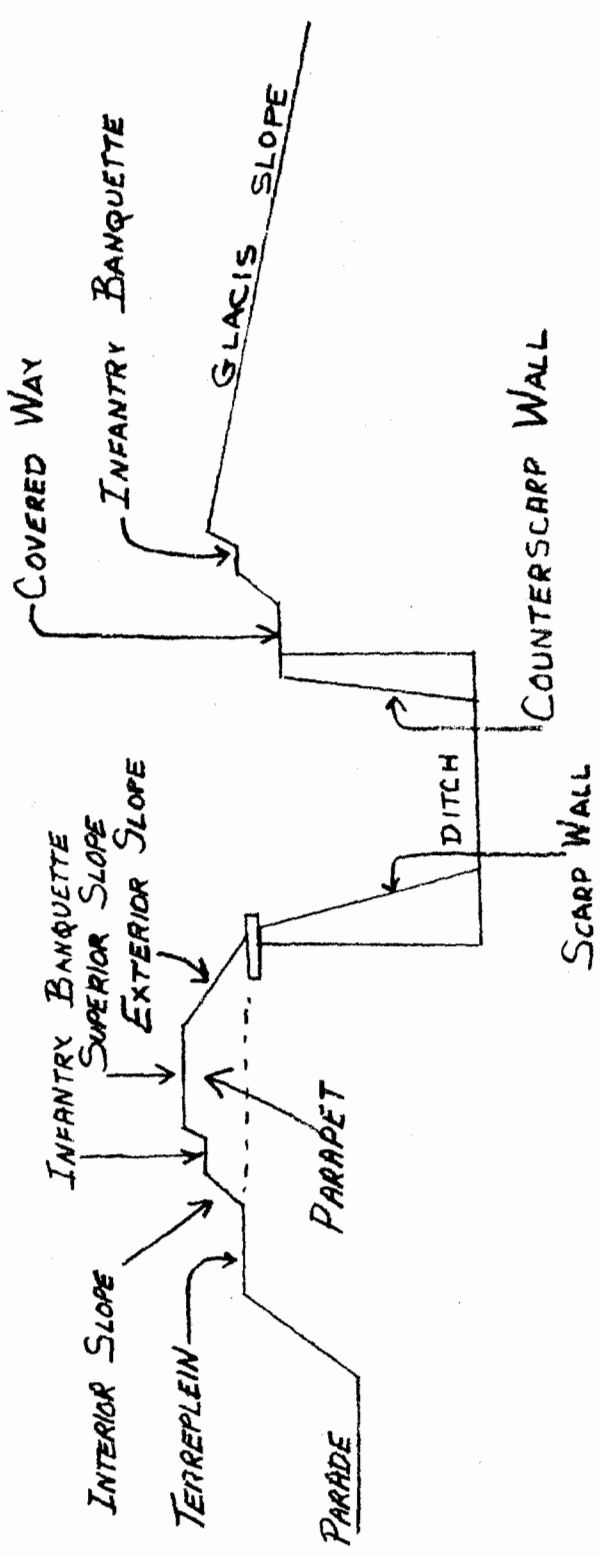
Courtesy, National Park Service.



Map No. 1.

Above: Profile of a theoretical earthen-and-masonry fortification.

Below: Profile of Fort McHenry (ditch not to scale).



Map No. 2.

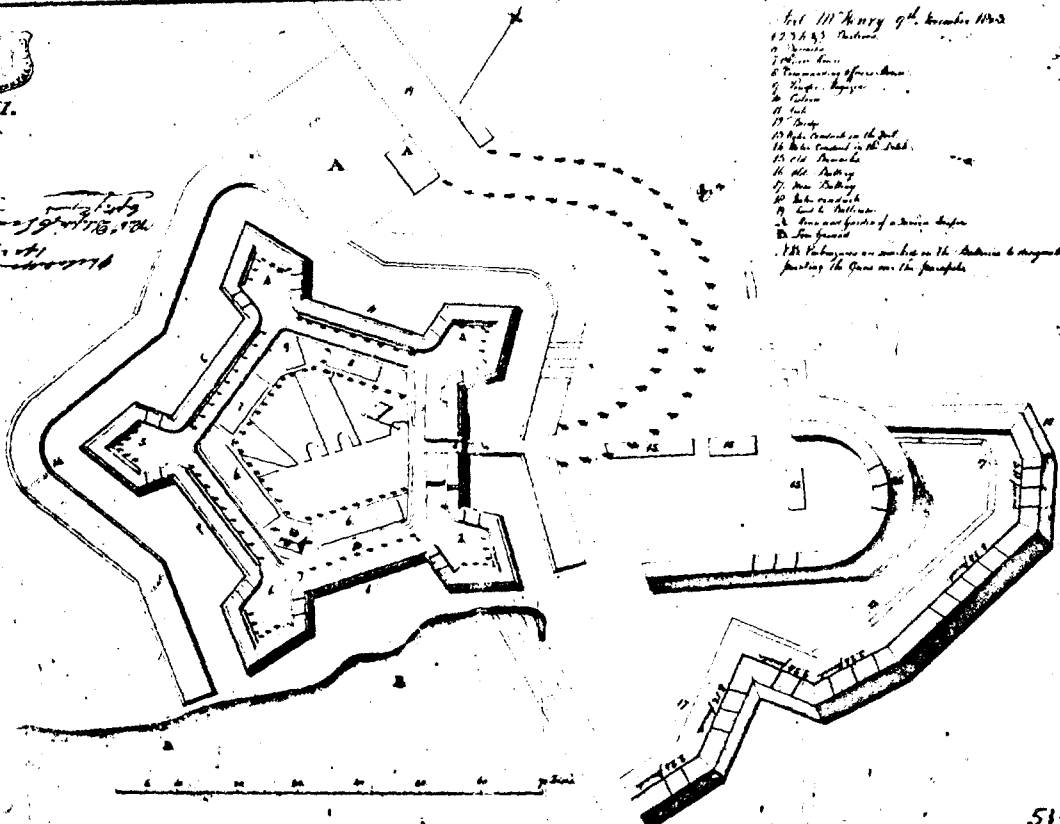
Cartographer unknown, but map is dated November 9, 1803, and is the earliest plan of the completed fort. Flagstaff is located in corner of parade where the present reconstructed staff stands. The sally port appears to be unroofed. No ditch or counterscarp yet exists on the east (water) side. The commanding officer's kitchen building does not appear. A cistern is located between the two barracks.

Courtesy, National Archives
Cartography, Record Group 77,
Drawer 51, Sheet 1.



Drawer II.
Sheet J.

Handwritten notes:
2000 ft
1/4 mile
2000 ft



Artillery Battery

- 1. Entrance
- 2. Magazine
- 3. Barracks
- 4. Kitchen
- 5. Storehouse
- 6. Chapel
- 7. Well
- 8. Guardhouse
- 9. Battery
- 10. Bastion
- 11. Bastionette
- 12. Bastionette
- 13. Bastionette
- 14. Bastionette
- 15. Bastionette
- 16. Bastionette
- 17. Bastionette
- 18. Bastionette
- 19. Bastionette
- 20. Bastionette
- 21. Bastionette
- 22. Bastionette
- 23. Bastionette
- 24. Bastionette
- 25. Bastionette
- 26. Bastionette
- 27. Bastionette
- 28. Bastionette
- 29. Bastionette
- 30. Bastionette
- 31. Bastionette
- 32. Bastionette
- 33. Bastionette
- 34. Bastionette
- 35. Bastionette
- 36. Bastionette
- 37. Bastionette
- 38. Bastionette
- 39. Bastionette
- 40. Bastionette
- 41. Bastionette
- 42. Bastionette
- 43. Bastionette
- 44. Bastionette
- 45. Bastionette
- 46. Bastionette
- 47. Bastionette
- 48. Bastionette
- 49. Bastionette
- 50. Bastionette
- 51. Bastionette
- 52. Bastionette
- 53. Bastionette
- 54. Bastionette
- 55. Bastionette
- 56. Bastionette
- 57. Bastionette
- 58. Bastionette
- 59. Bastionette
- 60. Bastionette
- 61. Bastionette
- 62. Bastionette
- 63. Bastionette
- 64. Bastionette
- 65. Bastionette
- 66. Bastionette
- 67. Bastionette
- 68. Bastionette
- 69. Bastionette
- 70. Bastionette
- 71. Bastionette
- 72. Bastionette
- 73. Bastionette
- 74. Bastionette
- 75. Bastionette
- 76. Bastionette
- 77. Bastionette
- 78. Bastionette
- 79. Bastionette
- 80. Bastionette
- 81. Bastionette
- 82. Bastionette
- 83. Bastionette
- 84. Bastionette
- 85. Bastionette
- 86. Bastionette
- 87. Bastionette
- 88. Bastionette
- 89. Bastionette
- 90. Bastionette
- 91. Bastionette
- 92. Bastionette
- 93. Bastionette
- 94. Bastionette
- 95. Bastionette
- 96. Bastionette
- 97. Bastionette
- 98. Bastionette
- 99. Bastionette
- 100. Bastionette

511



51-1

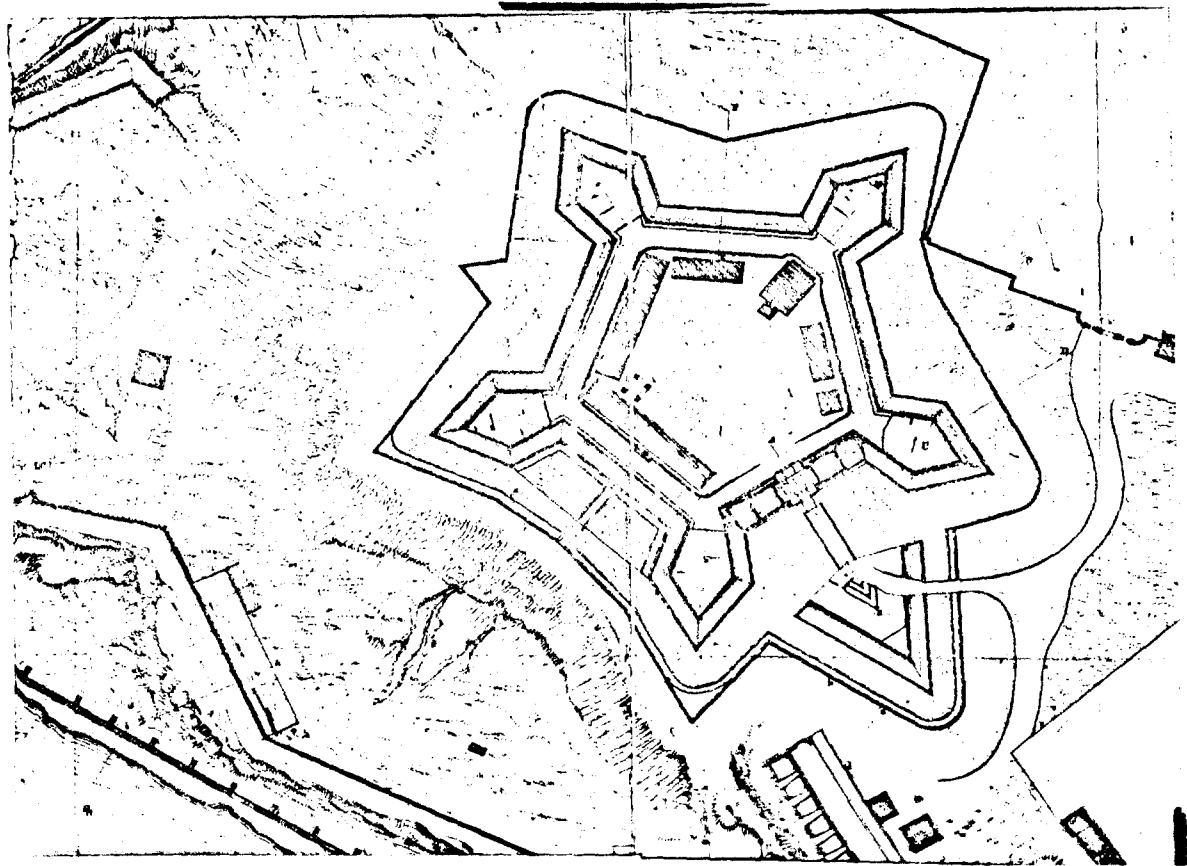
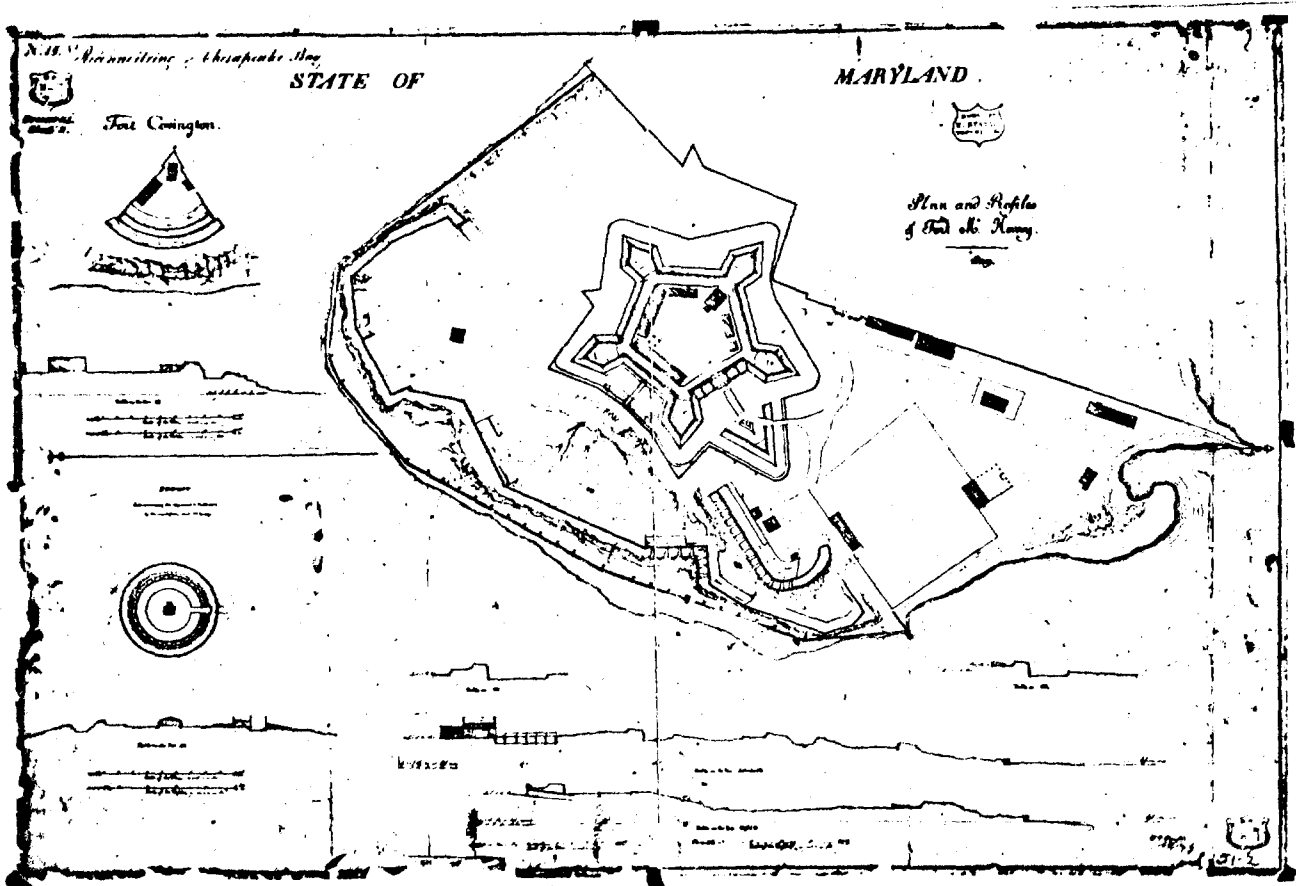
Map No. 3.

By William Tell Poussin, 1819. Flagstaff does not appear. Sally port has been covered and a bridge leads to a ravelin in front of the sally port. The commanding officer's kitchen is shown (traditionally called the guardhouse). The barracks, HS 5, has been extended--this addition is probably the guardhouse (actually an independent structure). The four dots between the two barracks represent the well.

Courtesy, National Archives
Cartography, Record Group 77,
Drawer 51, Sheet 2.

Map No. 4.

An enlargement of Poussin's 1819 plan of the fort.



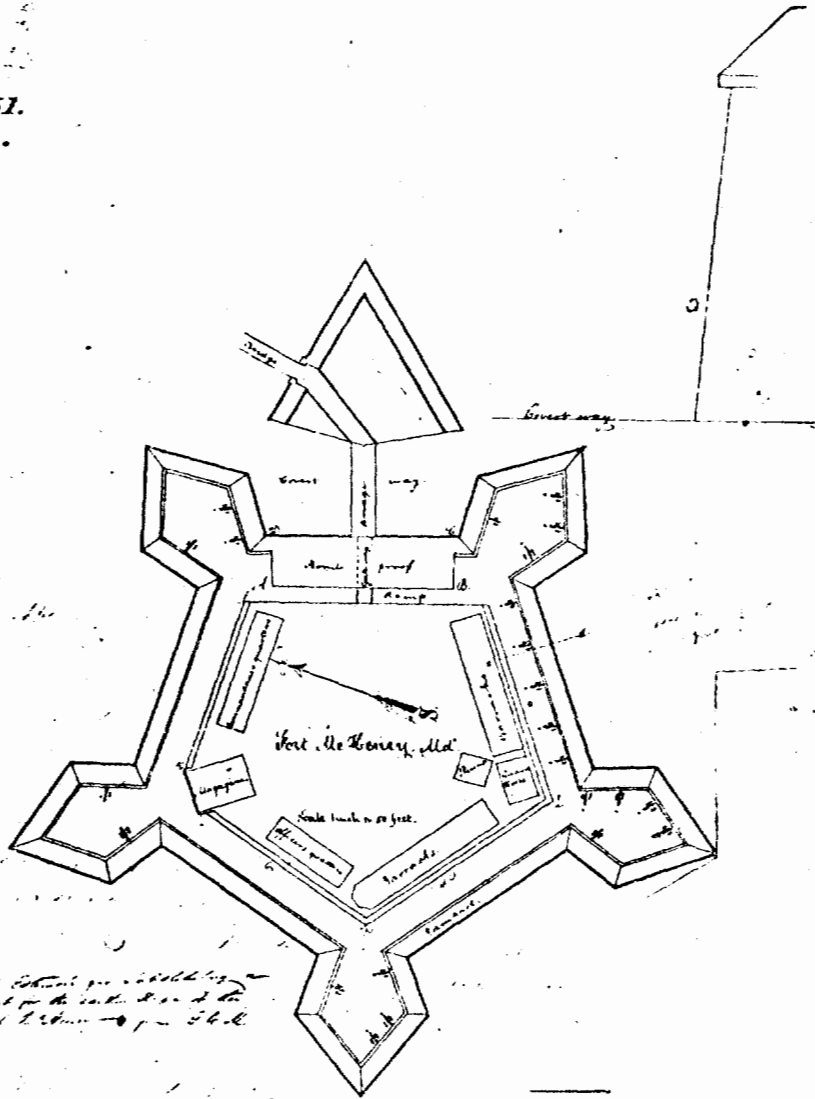
Map No. 5.

Plan of Fort McHenry, about 1833, possibly drawn by Henry Thompson. Bottom sketch shows plan for constructing a wall around the parade. The commanding officer's kitchen is shown as being part of his quarters.

Courtesy, National Archives
Cartography, Record Group 77,
Drawer 51, Sheet 4.

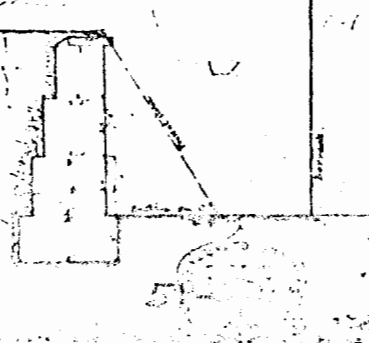


Drawer 51.
Sheet 4.



Original and returned for a building in
 57th Regiment for the building of the
 Hospital & other buildings for the
 57th Regt.

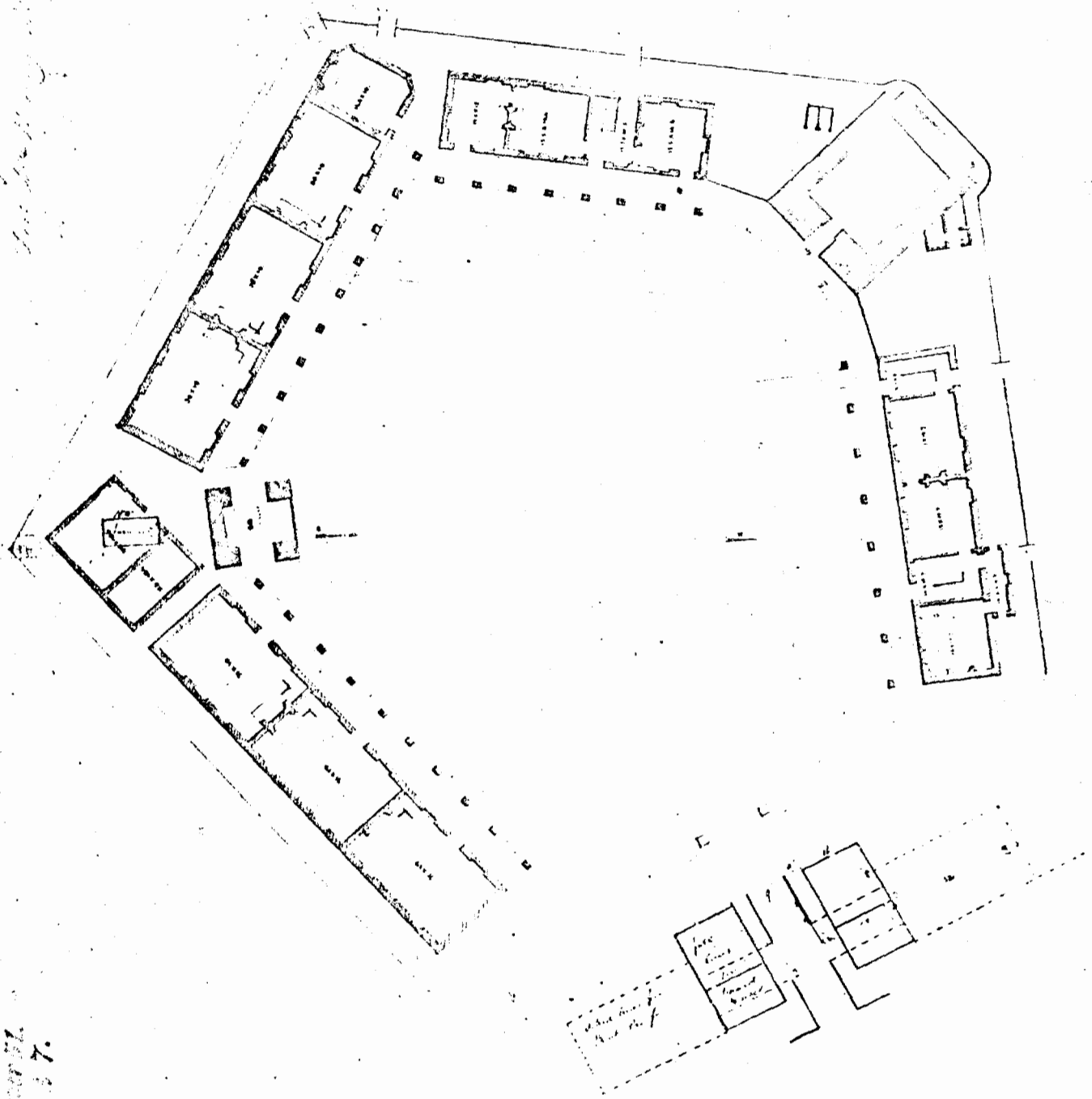
Estimate
 57th Regt. 1814
 1st Regt. 1814
 2nd Regt. 1814
 3rd Regt. 1814
 4th Regt. 1814
 5th Regt. 1814
 6th Regt. 1814
 7th Regt. 1814
 8th Regt. 1814
 9th Regt. 1814
 10th Regt. 1814
 11th Regt. 1814
 12th Regt. 1814
 13th Regt. 1814
 14th Regt. 1814
 15th Regt. 1814
 16th Regt. 1814
 17th Regt. 1814
 18th Regt. 1814
 19th Regt. 1814
 20th Regt. 1814
 21st Regt. 1814
 22nd Regt. 1814
 23rd Regt. 1814
 24th Regt. 1814
 25th Regt. 1814
 26th Regt. 1814
 27th Regt. 1814
 28th Regt. 1814
 29th Regt. 1814
 30th Regt. 1814
 31st Regt. 1814
 32nd Regt. 1814
 33rd Regt. 1814
 34th Regt. 1814
 35th Regt. 1814
 36th Regt. 1814
 37th Regt. 1814
 38th Regt. 1814
 39th Regt. 1814
 40th Regt. 1814
 41st Regt. 1814
 42nd Regt. 1814
 43rd Regt. 1814
 44th Regt. 1814
 45th Regt. 1814
 46th Regt. 1814
 47th Regt. 1814
 48th Regt. 1814
 49th Regt. 1814
 50th Regt. 1814
 51st Regt. 1814
 52nd Regt. 1814
 53rd Regt. 1814
 54th Regt. 1814
 55th Regt. 1814
 56th Regt. 1814
 57th Regt. 1814
 58th Regt. 1814
 59th Regt. 1814
 60th Regt. 1814
 61st Regt. 1814
 62nd Regt. 1814
 63rd Regt. 1814
 64th Regt. 1814
 65th Regt. 1814
 66th Regt. 1814
 67th Regt. 1814
 68th Regt. 1814
 69th Regt. 1814
 70th Regt. 1814
 71st Regt. 1814
 72nd Regt. 1814
 73rd Regt. 1814
 74th Regt. 1814
 75th Regt. 1814
 76th Regt. 1814
 77th Regt. 1814
 78th Regt. 1814
 79th Regt. 1814
 80th Regt. 1814
 81st Regt. 1814
 82nd Regt. 1814
 83rd Regt. 1814
 84th Regt. 1814
 85th Regt. 1814
 86th Regt. 1814
 87th Regt. 1814
 88th Regt. 1814
 89th Regt. 1814
 90th Regt. 1814
 91st Regt. 1814
 92nd Regt. 1814
 93rd Regt. 1814
 94th Regt. 1814
 95th Regt. 1814
 96th Regt. 1814
 97th Regt. 1814
 98th Regt. 1814
 99th Regt. 1814
 100th Regt. 1814



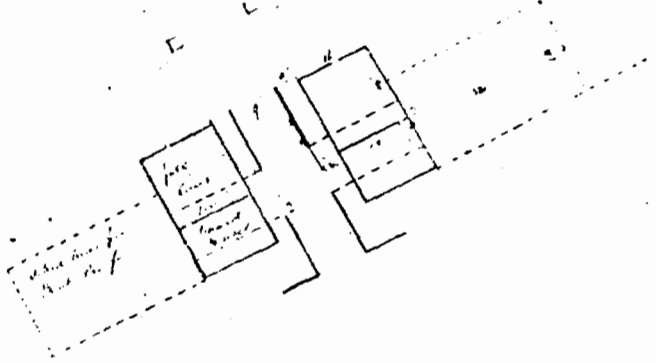
Map No. 6.

Plan of interior of Fort McHenry, 1834, probably drawn by Henry Thompson. A shot furnace is superimposed on the guardhouse. Note that the commanding officer's kitchen does not have a doorway leading directly to the adjacent hall. The small structures on either side of the magazine are officers' latrines.

Courtesy, National Archives
Cartography, Record Group 77,
Drawer 51, Sheet 7.



1000 7.



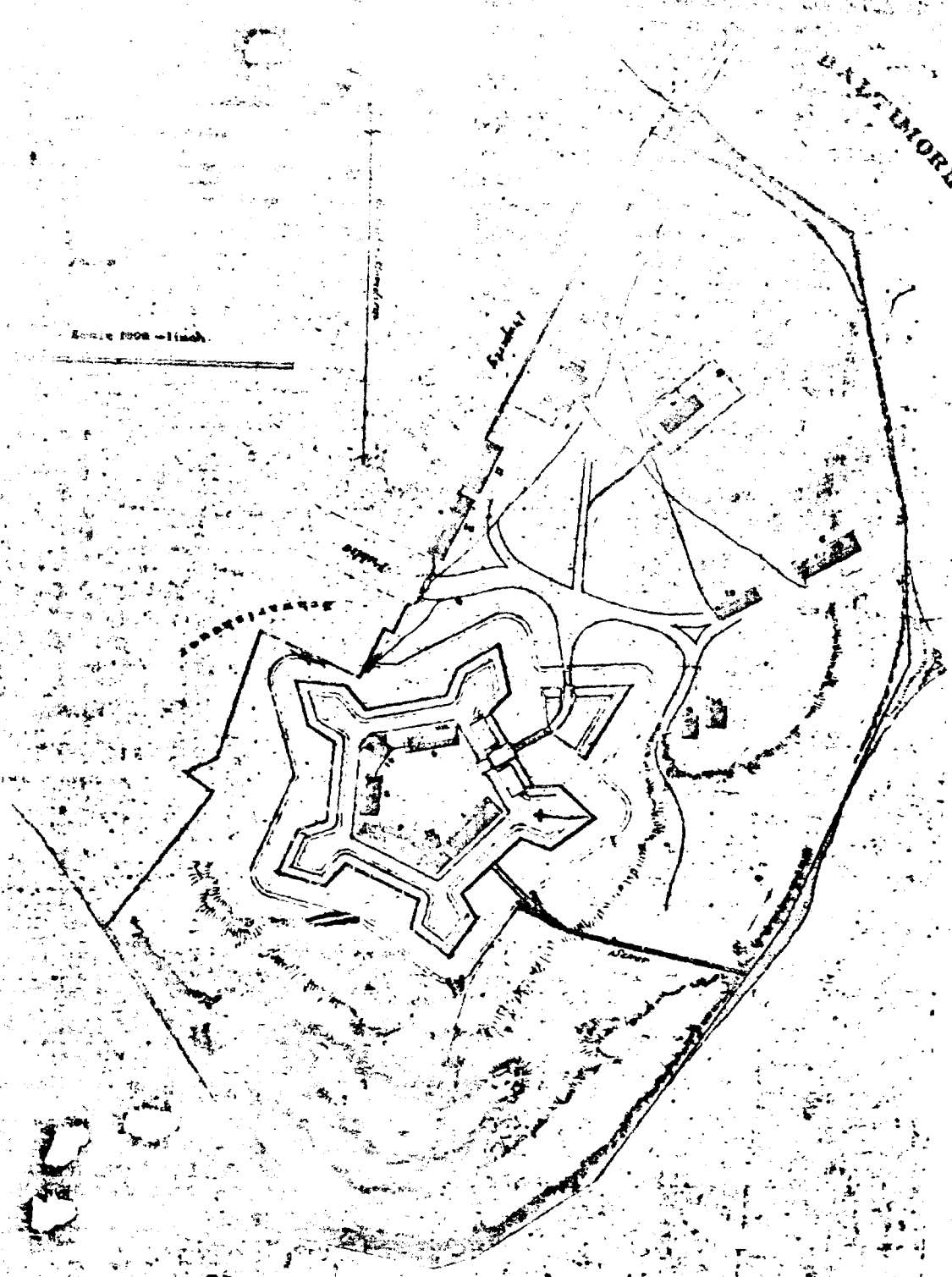
Map No. 7.

Another plan of Fort McHenry, probably drawn in 1834 by Henry Thompson. Note the drain leading to the sea wall and the increasing number of structures outside the fort.

Courtesy, National Archives
Cartography, Record Group 77,
Drawer 51, Sheet 5.

BALTIMORE

Scale 1:500 - 1 inch



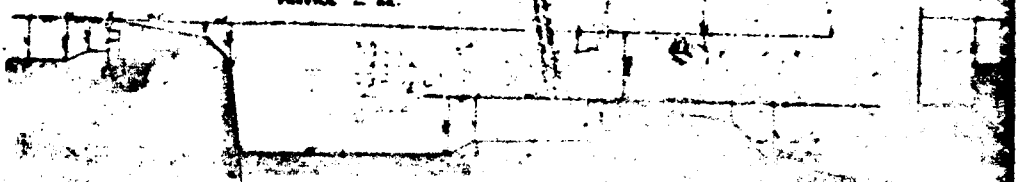
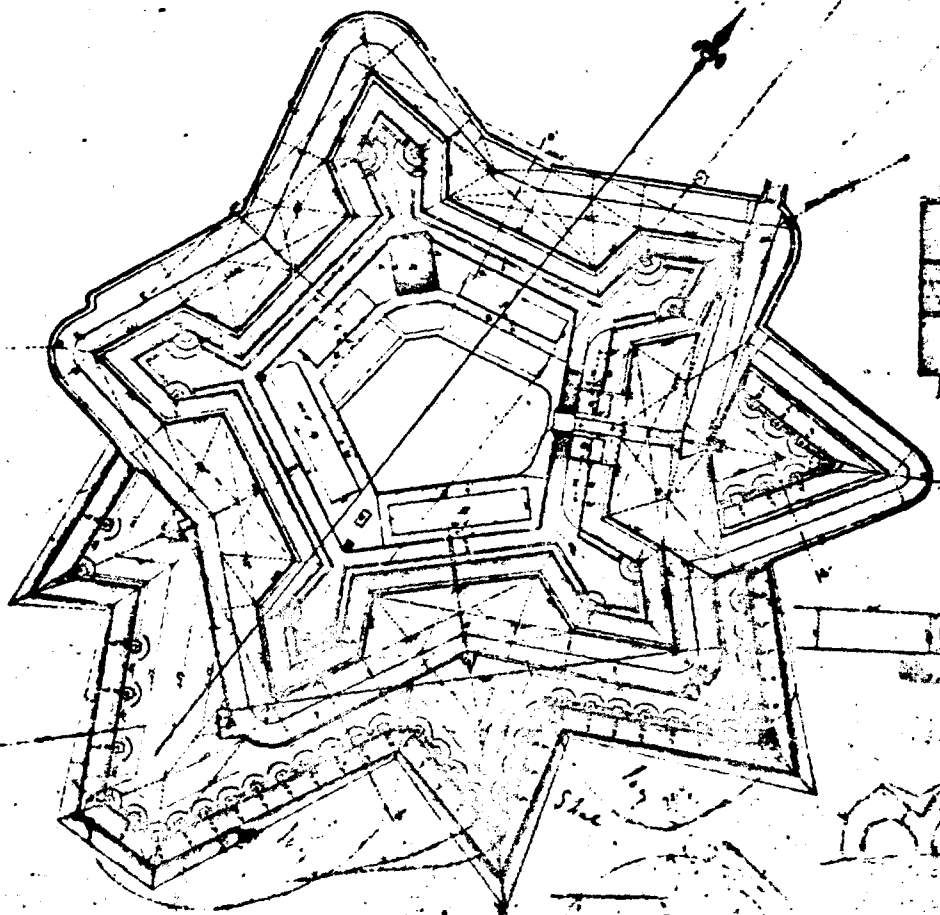
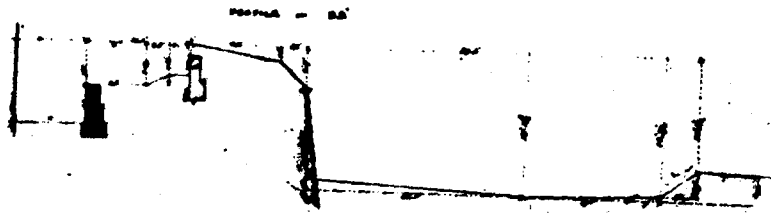
PATAPSCO RIVER

Maps Nos. 8A and 8B.

A detailed plan of Fort McHenry in 1840, by Capt. Henry Thompson. Note profiles of the fort and the water battery and of the drainage postern; also a cross section of the long-since-reinforced magazine.

Courtesy, National Archives
Cartography, Record Group 77,
Drawer 51, Sheet 14.

Drawer 51.
Sheet 11.





FORT M^CHENRY

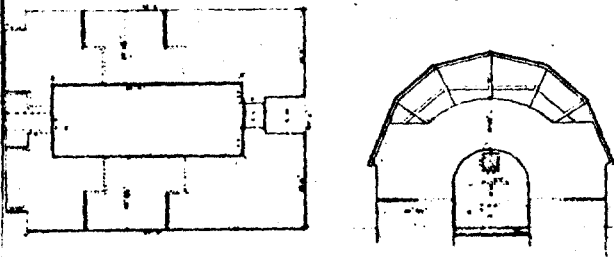
BALTIMORE

from dimensions furnished by
Capt. H^C Thompson

drawn by
H. C. Smith,
Capt. Eng.
No. 2280

SECTION.

SECTION.



The structure is a masonry structure of sand & gravel from and above ground, and is a part of the fortification.
The structure is a masonry structure of sand & gravel from and above ground, and is a part of the fortification.
The structure is a masonry structure of sand & gravel from and above ground, and is a part of the fortification.
The structure is a masonry structure of sand & gravel from and above ground, and is a part of the fortification.
The structure is a masonry structure of sand & gravel from and above ground, and is a part of the fortification.
The structure is a masonry structure of sand & gravel from and above ground, and is a part of the fortification.

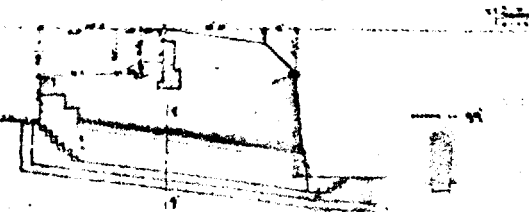
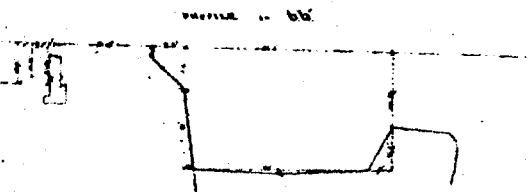
LEGEND

WOOD - SECTION		Red C. - CONCRETE MASONRY
OF PL'S FLAG		R - REINFORCED
PAVING - SAND & GRAVEL		Dead H. - SOLDIERS' BARRACKS
BRICK - SECTION		F - FURNACE FOR SHOTS
OF PL'S FLAG		G - GROUND WORK - FOR THE BATTERY
BITUMEN (Asph)		H - CALCULATED TO BE IN LINE WITH THE BATTERY
SLATED ROOF		K - CONCRETE WALLS
IRONED - STEEL WORK		L, J. - FINISH
ROUNDER - ROUND WALL		
CONCRETE FLOOR		
WOODEN FLOORING		
OF - BRICKWORK		
PAVING & BRICKWORK		
OF - BRICKWORK		
OF - BRICKWORK		
OF - BRICKWORK		
OF - BRICKWORK		



Scale of One Inch to 10 Feet

Scale of One Inch to 10 Feet



Handwritten notes or signatures at the bottom of the page, including a date '1862' and other illegible text.

Map No. 9.

Drawings of the enlisted men's barracks, HS 5, 1840.

Courtesy, National Archives
Cartography, Record Group 77,
Drawer 51, Sheet 17.

BUILDINGS.

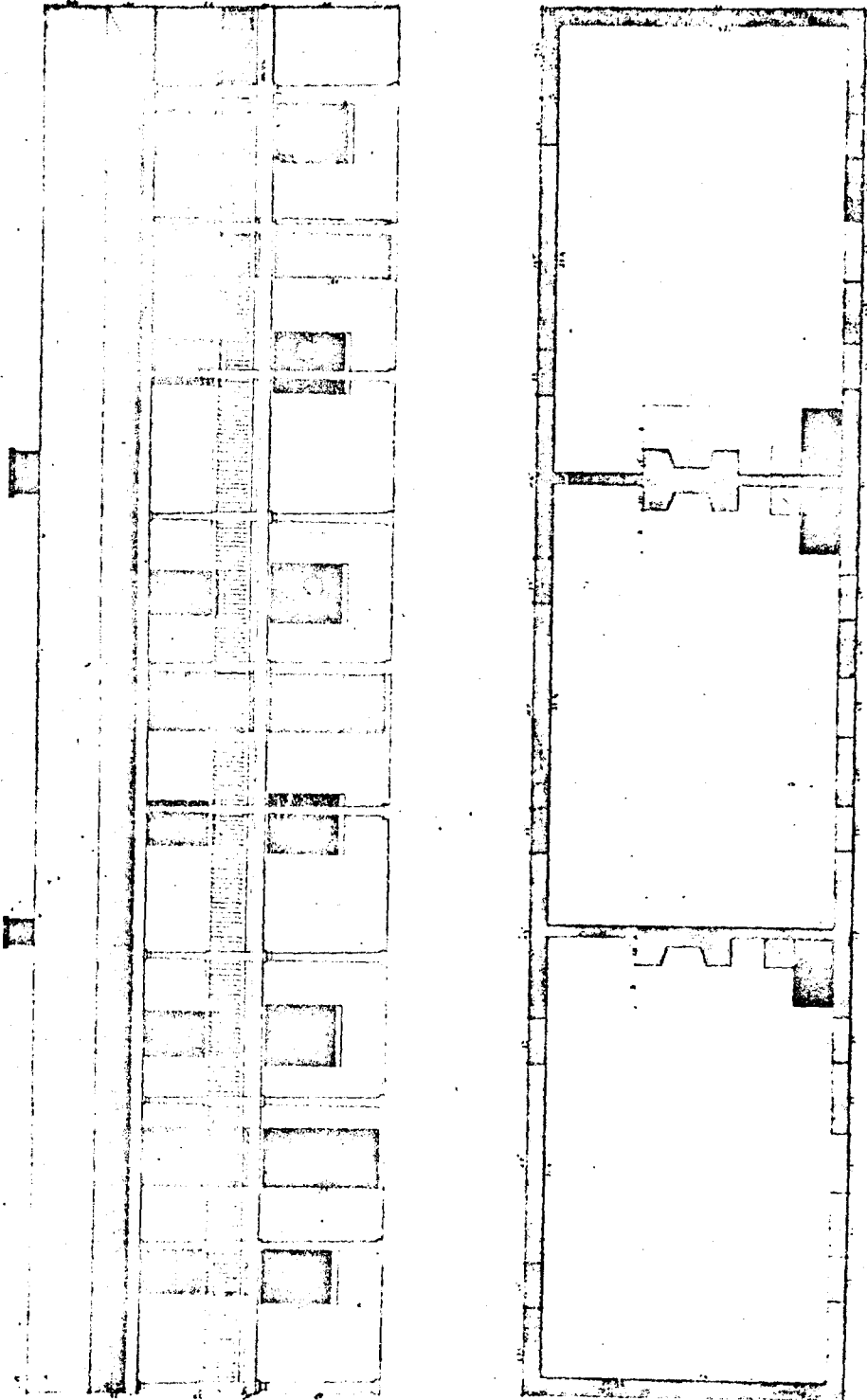
MARYLAND.

*Drawn 51.
Sheet 17.*

BALTIMORE HARBOR.

PLANS AND ELEVATIONS
OF
Soldiers Barracks
FORT MONROE

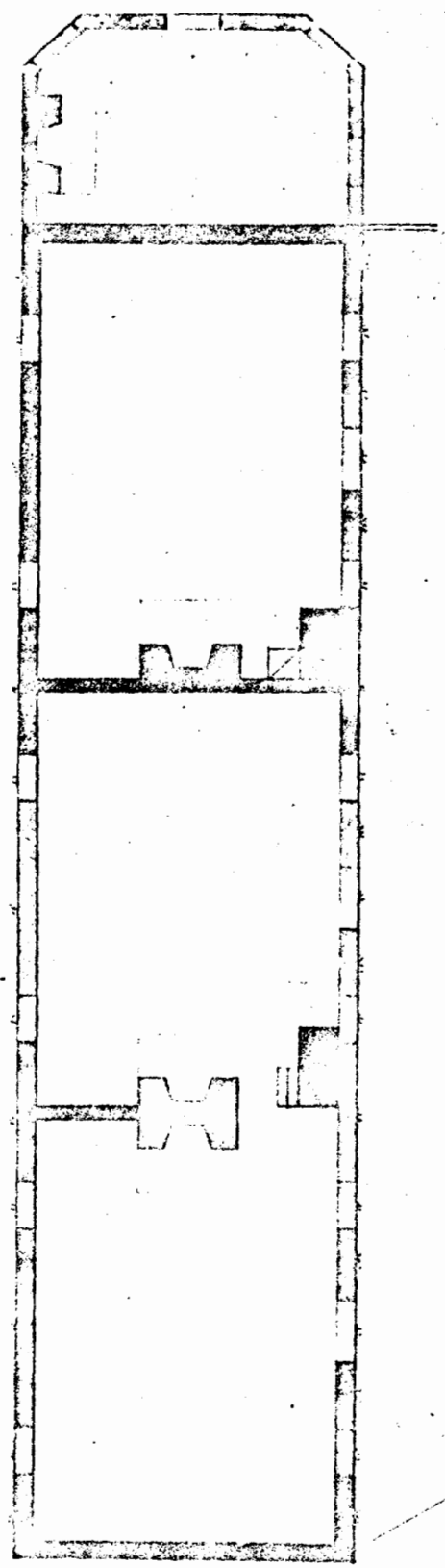
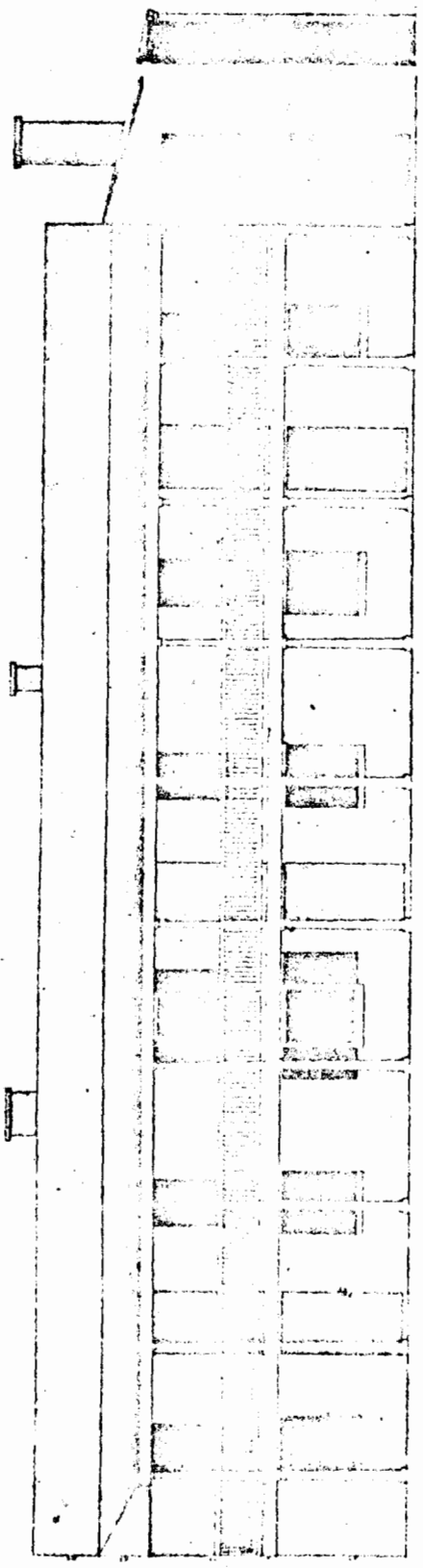
Scale 1/4" = 10'



Map No. 10.

Drawings of the enlisted men's barracks, HS 4, 1840. The addition to the right is a kitchen and servant's quarters for the junior officers' quarters.

Courtesy, National Archives
Cartography, Record Group 77,
Drawer 51, Sheet 17.



Map No. 11.

One of several sheets showing the plans for the large detached magazine constructed at Fort McHenry during the Civil War.

Courtesy, National Archives
Cartography, Record Group 77,
Drawer 51, Sheet 28.

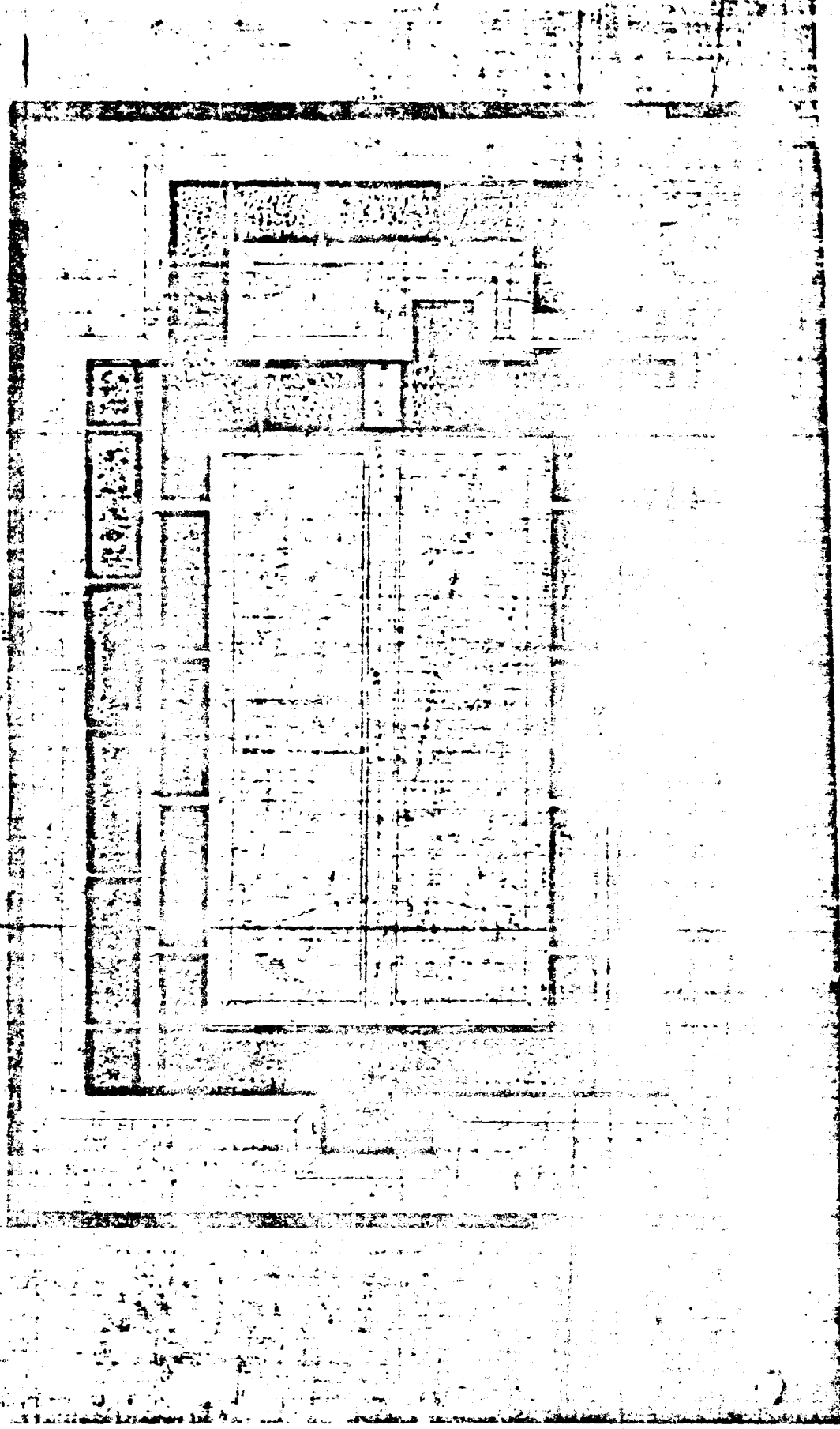
Sheet 51.
Sheet 58.

MAGAZINE at NOTIFICATION

PLAN

Scale 3/8" = 1' 0"

Arch. 1/2" = 1' 0" and 1/4" = 1' 0" and 1/8" = 1' 0" and 1/16" = 1' 0"

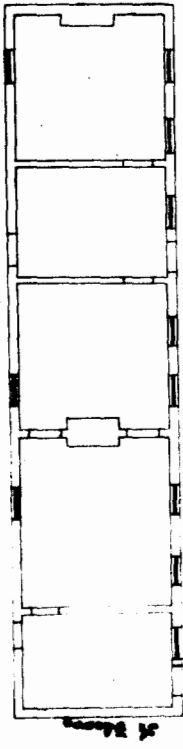
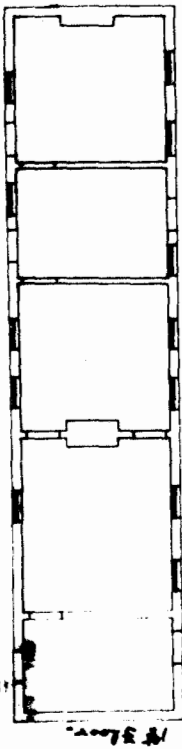


Map No. 12.

Plans for converting the commanding officer's quarters into a storehouse and the junior officers' quarters into a bakery, 1894.

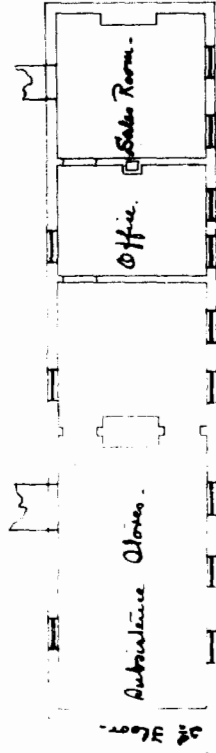
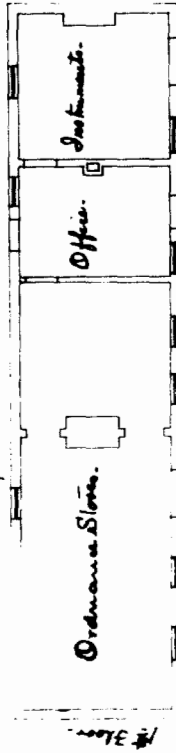
Courtesy, National Archives
Cartography, Record Group 77,
Misc. Fort File, Series B-83.

Building No. 10
Old Fort.



Parade Front.
Scale, 1/16 in. = 1 foot.

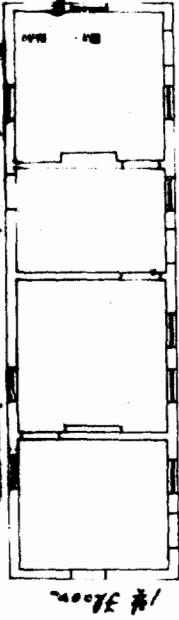
Proposed Alterations.



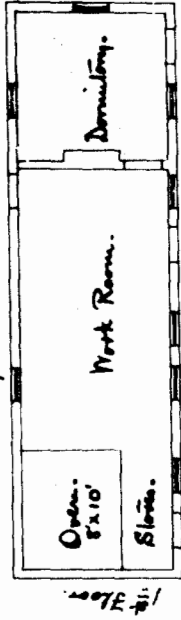
Parade Front.

In accompany report of Annual Inspection of Public Buildings,
Fort McHenry, Md.,
April 20, 1894.

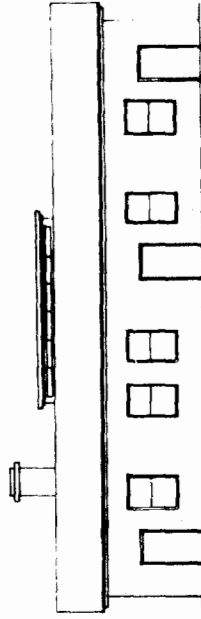
Building No. 10, Old Fort, 2 Story building.



Proposed Alterations.



Parade Front.



As altered for Fort Bakery.

In accompany report of Annual Inspection of Public Buildings,
Fort McHenry, Md.,
April 20, 1894.

Scale, 1/16 in. = 1 foot.

Map No. 13.

Plans for converting the enlisted men's barracks,
HS 5, into a quartermaster storehouse, 1894.

Courtesy, National Archives
Cartography, Record Group 77,
Misc. Fort File; Series B-84.

Building No. 13, Old Fort

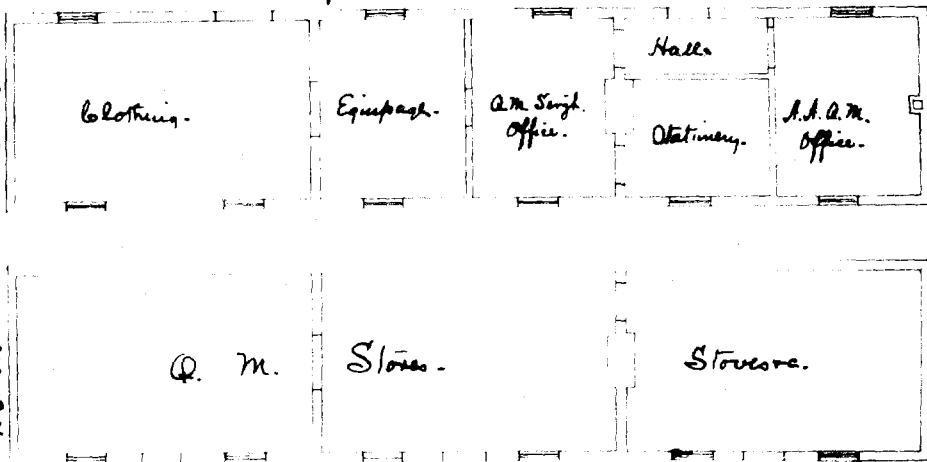
2^d Floor

1st Floor

Proposed Alterations-

Two wings from
Main plan. To
2^d Floor

1st Floor



Parade Front.

In accompany report of Annual Inspection of Public Buildings,

Fort M'Henry, Md.,

April 20, 1894.

By J. H. ... authorized
Commissioner of the Interior.

Scale 1/10 in. = 1 foot.



ARCHITECTURAL DATA



ABSTRACT

Although a study of architectural detail at Fort McHenry has been written, it did not include a thorough study of the drainage problem. Investigation of this matter would throw a great deal of light on numerous problems related to deterioration of materials, waterproofing, and the appearance of the masonry.

Decisions made concerning the preservation of the existing materials are in some way related to water drainage techniques and their application. A comprehensive study of the historic drain and the present-day drainage problems should be made before any new preservation work is undertaken.

Also, there should be installation of adequate fire and burglary detection systems and relocation of supporting utilities as needed for all the structures within the fort. These detection devices should be installed on both the first and second floors of the Commanding Officer's Quarters, Junior Officers' Quarters, No. 1 Enlisted Men's Barracks, and No. 2 Enlisted Men's Barracks.



INTRODUCTION

In the fall of 1973 a study was begun to obtain data to be used for the preservation and stabilization of the exterior masonry walls of the Star Fort, its buildings, the ravelin, the water battery, and the Civil War magazine. Work to be carried out also included development of the fort's historic drainage system, installation of an adequate fire and burglary detection system, installation of a visitor audio system, and relocation of supporting utilities.

This report will attempt to provide information on solutions to the above-mentioned projects.

This report is a supplement to Lee H. Nelson, Historic American Buildings Survey: An Architectural Study of Fort McHenry, NPS, 1961. That report deals primarily with the physical history of the Star Fort and its successor on Whetstone Point, in Baltimore, from 1776 to 1857.



I. GENERAL DESCRIPTION AND PRESENT CONDITION

A. Star Fort, HS 12

The Star Fort structure composed of brick, stone, mortar, earth, and sod is in relatively good condition. The massive expanse of outer scarp brick walls are in good condition and do not appear to have any problems of misalignment, settling, cracking, or structural failures. However, some surface materials and capstones need to be restored. Brick units are hand pressed clay and are in most instances well preserved and intact.

In general, mortar joints are in good to fair condition. Due to an earlier phase of mortar restoration, the unfortunate selection of a dark gray mortar was made to replace the original mortar.

A variety of living plants are now growing from the mortar joints of the walls and need to be removed.

Stone quoining at outside corners of the fort has deteriorated, leaving some stones with uneven surfaces. There are no structural failures at these corners. Some of the mortar in the joints is missing and needs replacing.

At the base of the north wall is a small, but very badly damaged, area of brick. An area of about 12 square feet at the base of the wall is coming loose, probably due to a combination of water penetration and freezing temperatures. These areas should be rebuilt and waterproofed to control further damage to this area.

Capstones on the exterior walls have been pushed out of alignment due to pressure of the earth fill and sod. About 25 to 50 percent of these stones need realignment and new mortar.

Two 10-foot lengths of electrical conduit exist at the surface of the exterior wall and are a distraction to the historical concept of the fort. Determination of the purpose of conduits should be made. Conduits should be relocated and concealed if this utility is vital to the structure.

The bombproof shelters below the sally port incorporate a series of masonry ventilation ducts with outlets located at the grade line inside the fort. These outlets now are partially filled with broken stone and brick.

A brick walk extends along part of the top of the parapet wall. This walk has settled in some spots and permits water to accumulate rather than drain from the parapet.

B. The Commanding Officer's Quarters, HS 1

This structure is a plain, rectangular, two-story brick masonry building with a wooden porch extending the total length of the front elevation. The roof form has parapet walls on three sides with the main surface sloping to the rear of the building. Wood framing supports both the second floor and roof. Door and window frames are wooden. The present heating system is located in a metal building at the rear of the quarters. The park would like to have this structure removed and obtain heat from the adjoining building instead. About 10 per cent of the brick and mortar at the exterior wall needs replacement. Also, the parapet walls at the end elevations need brick replacement. The general condition of the building is good. A new metal roof and a new wooden porch were recently installed on this structure.

C. Magazine, HS 2

This is a rectangular structure of brick masonry, windowless, with massive brick walls. It has a brick vaulted roof with a wood framed structure supporting a slate surfaced roof. There is one single entry door of wood. The structure is in very good condition. About 10 percent of the mortar at the exterior walls needs replacement. All the 1- by 10-inch wood fascia on the structure needs replacement due to its present condition of cracking, warping, and pulling loose from its location on the building.

D. Junior Officers' Quarters, HS 3

This is a plain, rectangular, two-story brick masonry building with a wooden porch extending the total length of the front elevation. The roof form has parapet walls on three sides with the main surface sloping to the rear of the building. Door and window frames are wooden. Wood framing members support both the upper floor and roof. About 20 percent of the brick and mortar at the rear exterior wall needs replacement. In addition, about 10 percent of the mortar and brick needs replacement at the two chimneys. An old air conditioner, located at a window in the rear of the building, should be removed. A new metal roof and a new wooden porch were recently installed on this structure.

E. No. 1 Enlisted Men's Barracks, HS 4

This is a plain, rectangular, two-story brick masonry building with a wooden porch extending the total length of the front elevation. The roof form has parapet walls on three sides with the main surface sloping to the rear of the building. Wood framing members support both the upper floor and roof. Doors, door frames, windows, and window frames are all constructed of wood. About 10 percent of the bricks and mortar needs replacement at the exterior walls. The building is in good condition. Parapet walls at the side elevation are leaning away from the building and should be rebuilt, straightened, and repointed with new mortar. Some old electrical conduits exist on the exterior walls and should be removed. A new metal roof and a new wooden porch were recently installed on this structure.

F. No. 2 Enlisted Men's Barracks, HS 5

This is a plain, rectangular, two-story brick masonry building with a wooden porch extending the total length of the front elevation. The roof form has parapet walls on three sides with the main surface sloping to the rear of the building. Wood framing members support both the upper floor and the roof. Doors, door frames, windows, and window frames are all constructed of wood. About 10 percent of the bricks and mortar needs replacement at the exterior walls. The building is in good condition. A new metal roof and a new wooden porch were recently installed on this structure.

G. Ravelin, HS 13

The two leading faces of the ravelin are about 132 feet long. Back faces of the ravelin are about 67 to 68 feet long. This structure, composed of brick, mortar, earth, capstones, and sod, is in relatively good condition.

The massive brick walls need plant removal at mortar joints and repointing of mortar. Some capstones have slipped out of place and need realignment.

The magazine, which is located underground and below the ravelin's west wall, has water penetration into its side walls. This water penetration into the walls of the magazine, if not stopped, will eventually deteriorate the mortar joints of the walls. A water drainage system above the bombproof shelter should be developed to disperse the surface rainwater. Sod at the parapet is eroded and its contours are not uniform.

H. Water Battery, HS 14

This is a fortification of earth, brick, bombproof shelters, and magazines elongated and random in form. The low brick walls are in very poor condition. Some are leaning out of line while others are cracked and unstable.

The bombproofs are not waterproof and have water standing on their floors. Pumps have been installed to reduce the amount of standing water.

Some earth and sod above the bombproofs has slipped away and settled. Water is no doubt entering the bombproofs because of this erosion.

I. Civil War Magazine, HS 7

This is a large massive brick masonry building with a gable roof. The structure is windowless and has one main door. Exterior walls are totally brick masonry. The roof surface is slate tile. There is an 8-foot-high brick masonry wall around the total perimeter of the structure. The building has an elaborate copper gutter which is in poor condition.

The brick masonry in general is in fair condition, though there is some brick and a considerable amount of mortar missing.

In more recent times a comfort station was added between the perimeter wall and the main building. However, this facility is not being used, is in very poor condition, and should be removed.

J. Conclusion

Throughout most of its history, Fort McHenry National Monument and Historic Shrine has undergone numerous physical modifications which reflect the changing events of time.

The designer of these structures provided a solution to his problem by selecting materials that were readily available, economical, and reasonably durable. The basic purpose of the Star Fort--fortification--dictated its massive structural form. Due to this massive form, it has withstood the ravages of time. However, because there were intervals in history when little or no maintenance was done due to lack of funds, some materials are in a state of advanced deterioration.

II. RECOMMENDATIONS FOR STABILIZATION AND RESTORATION

The following list of recommendations refers to current preservation problems at Fort McHenry National Monument and Historic Shrine.

A. Star Fort, HS 12

1. Remove sod and earth at top of parapet.
2. Replace earth to original contours at top of parapet and install new sod.
3. Reset capstones at exterior rampart walls where stones have slipped out of alignment and repoint joint.
4. Reset capstones at top of breast-height walls where stones have slipped out of alignment and repoint joints.
5. Reconstruct breast-height walls where brick has slipped out of alignment and repoint all missing mortar.
6. Repoint all missing mortar at the exterior rampart walls.
7. Reconstruct all areas of brick that have slipped out of alignment at the exterior rampart wall.
8. Clean all brick and stone quoining at the exterior rampart walls.
9. Remove all existing conduit from face of exterior rampart walls.
10. Reconstruct revetment walls where walls are out of alignment and repoint mortar.
11. Apply some toxin on brick walls to retard organic growth activity.

B. Commanding Officer's Quarters, HS 1

1. Replace all deteriorated brick at exterior walls.
2. Repoint all missing and loose mortar at exterior walls.

3. Repoint parapet walls at end elevations with mortar.
4. Replace all wooden windows where the wood has become deteriorated and weakened.
5. Replace all wooden doors where the wood has become deteriorated and weakened.
6. Remove metal building from rear of quarters.
7. Provide new facility to replace existing heating facility.

C. Junior Officers' Quarters, HS 2

1. Replace all deteriorated brick at exterior walls.
2. Repoint all missing and loose mortar at exterior walls.
3. Repoint parapet walls at end elevations with mortar.
4. Replace all wooden windows where the wood has become deteriorated.
5. Replace all wooden doors where the wood has become deteriorated and weakened.
6. Remove air conditioner in window at rear of building.

D. Magazine, HS 3

1. Replace all deteriorated brick at exterior walls.
2. Replace all deteriorated mortar at exterior walls.
3. Replace 1- by 10-inch wood fascia at front and rear of buildings.

E. No. 1 Enlisted Men's Barracks, HS 4

1. Replace all deteriorated brick at exterior walls.
2. Replace all deteriorated mortar at exterior walls.
3. Repoint parapet walls at end elevations with mortar.
4. Replace all wooden windows where the wood has become deteriorated and weakened.

5. Replace all wooden doors where the wood has become deteriorated and weakened.
6. Remove all conduits from surface of exterior walls.

F. No. 2 Enlisted Men's Barracks, HS 5

1. Replace all deteriorated brick at exterior walls.
2. Replace all deteriorated mortar at exterior walls.
3. Repoint parapet walls at end elevations with mortar.
4. Replace all wooden windows where the wood has become deteriorated and weakened.
5. Replace all wooden doors where the wood has become deteriorated and weakened.

G. Ravelin, HS 13

1. Replace all deteriorated brick at exterior walls.
2. Replace all deteriorated mortar at exterior walls.
3. Remove sod and earth at top of parapet.
4. Replace earth to original contours at top of parapet and install new sod.
5. Reset capstones at exterior rampart walls where stones have slipped out of alignment and repoint joints.
6. Reconstruct breast-height wall where brick has slipped out of alignment and repoint all missing mortar.
7. Reset capstones at top of breast-height wall where stones have slipped out of alignment and repoint joints.
8. Clean all brick and stone quoining at the exterior rampart walls.
9. Apply toxin on brick walls to retard organic growth activity.
10. Remove sod and earth at terreplein.
11. Replace earth to original contours at terreplein and install new sod.

H. Water Battery, HS 14

1. Reconstruct all brick walls where brick has slipped out of alignment.
2. Repoint all brick walls with missing mortar.
3. Replace all earth that has slipped away from the bombproof shelters.
4. Waterproof the bombproof shelters.
5. Remove all large plants growing near the bombproof shelters.

I. Civil War Magazine, HS 7

1. Replace all deteriorated brick at exterior walls.
2. Replace all deteriorated mortar at exterior walls.
3. Replace gutters and downspouts.
4. Remove existing walls and roof of obsolete comfort stations.
5. Replace brick at exterior wall where comfort station doors and windows now exist.
6. Reconstruct roof framing at fascia where existing framing has deteriorated.

III. COST ESTIMATE

These estimates are for the preservation and stabilization of the exterior masonry walls of the Star Fort, its buildings, the ravelin and the water battery (including the Civil War magazine), and the earthworks of the fort, ravelin, and water battery. Included also are estimates for the development of the fort's historic drainage system, installation of an adequate fire and burglary detection system, and relocation of supporting utilities.

A figure of \$365,000 reflects the total cost of all preservation recommended in the report. However, only \$93,000 has been programmed for this fiscal year. This amount is recommended for use on priority items No. 1 and No. 2 as indicated below.

Repoint brick walls (Fort)	\$24,750.00
" " " (Buildings)	10,920.00
Realign capstones	5,600.00
Remove plants on walls and spray toxic	3,275.00
Clean cornerstones and clean mortar on face of stones	850.00
Rebuild existing inner brick walls	14,600.00
Remove and replant sod on top of parapet wall	17,250.00
Recontour top of parapet wall	4,650.00
Remove and reconstruct brick walk	<u>8,250.00</u>
Total construction	\$89,150.00



IV. PRESERVATION PRIORITY LIST

1. Repoint with lime mortar and native sand all loose and missing mortar on the exterior walls of the Star Fort, ravelin, and the six fort buildings. Replace all missing or broken bricks in all of these walls. Realign all capstones that have slipped out of position and repoint their mortar joints. Remove all plant material from wall surfaces and spray these surfaces with plant toxins. Clean corner quoins and remove old mortar on flat surfaces of stones. Reconstruct all inner fort walls where walls have become unstable and moved out of alignment.

2. Remove sod, brick walk, and earth from top of parapet at Star Fort and ravelin. Recontour top of parapet and replant sod for better soil control and maintenance. Replace brick walk.

3. As part of the development of an effective drainage system for the fort, an investigation of the historic drainage system should be made. Also, soil samples should be taken from the Star Fort walls, parade ground, and moat around the exterior of the fort walls. It is obvious that an underground drainage system around the perimeter of the inside of the fort would be a great help in carrying off surface water. Install new electrical conduit, telephone conduit, audio and public address system conduit, and fire and burglary detection system conduit in underground concrete encasement.

4. Reconstruct brick walls at water battery and provide waterproofing materials at bombproof shelters and magazines. Reconstruct areas where sod and earth have slipped away from the bombproof shelters.

5. At the Civil War magazine repoint loose and missing mortar at all exterior walls, reconstruct roof gutters, reconstruct roof framing at gutters, and remove existing bathhouse rooms.



ILLUSTRATIONS AND DRAWINGS

Illustration No. 1.

Star Fort.

Illustration No. 2.

Ravelin.

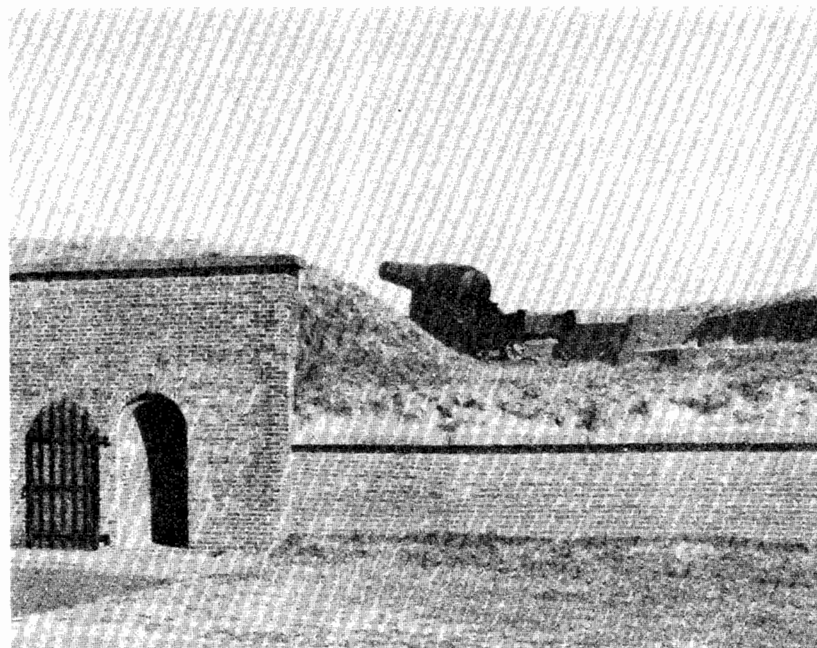
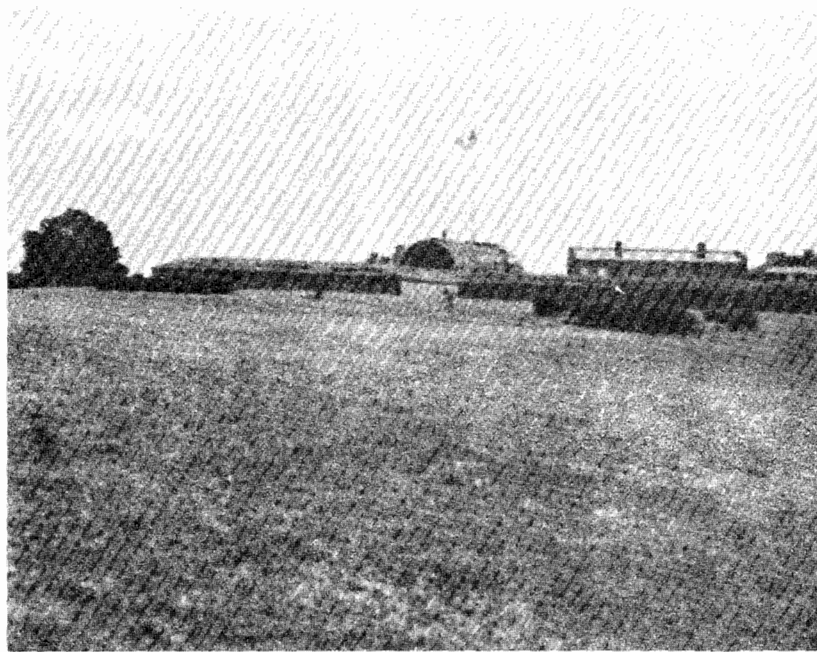


Illustration No. 3.

Sally port--rear.

Illustration No. 4.

Sally port--front.

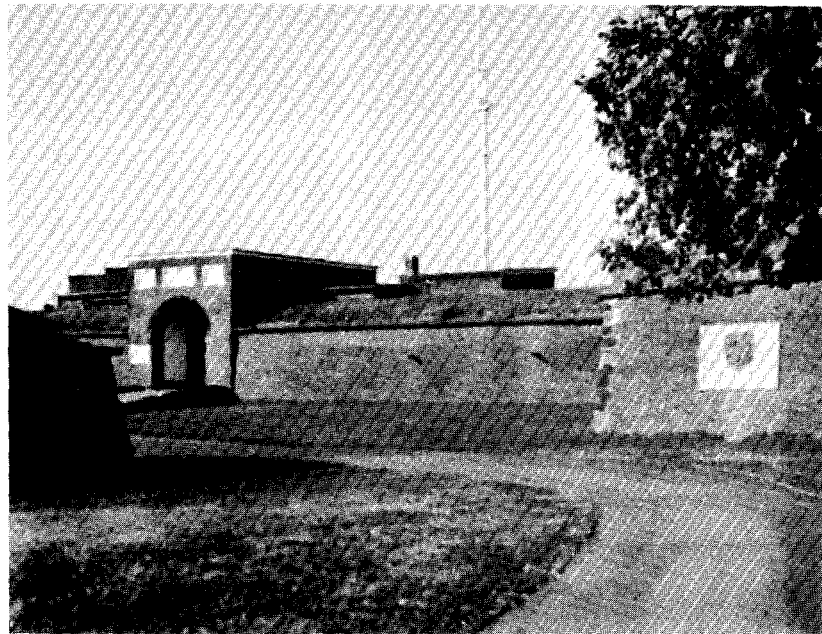
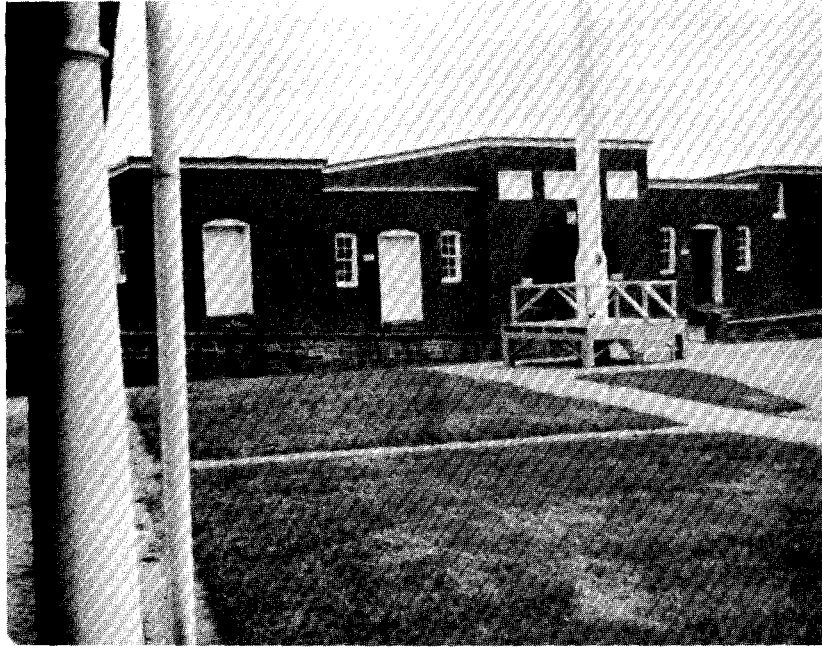


Illustration No. 5.

Flagstaff.

Illustration No. 6.

Commanding officer's quarters.

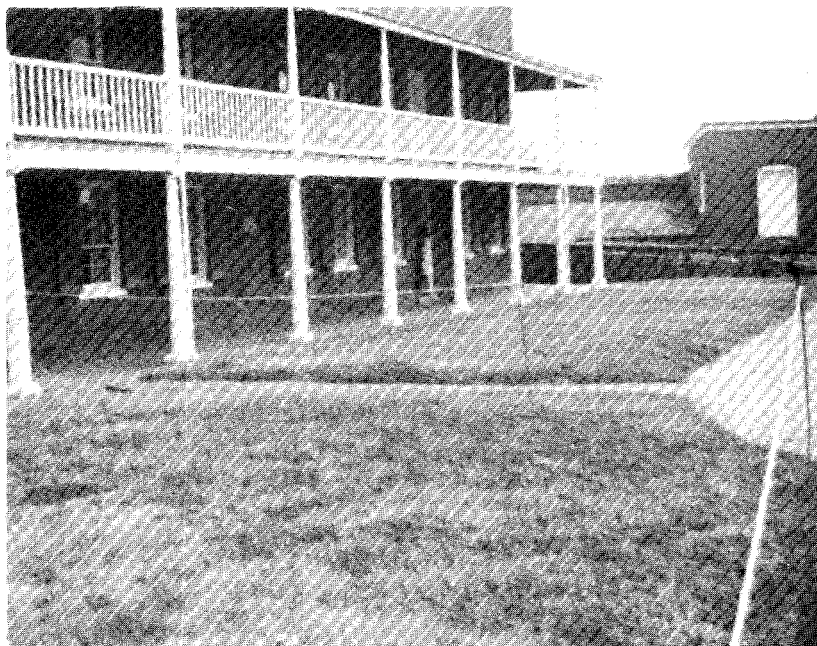
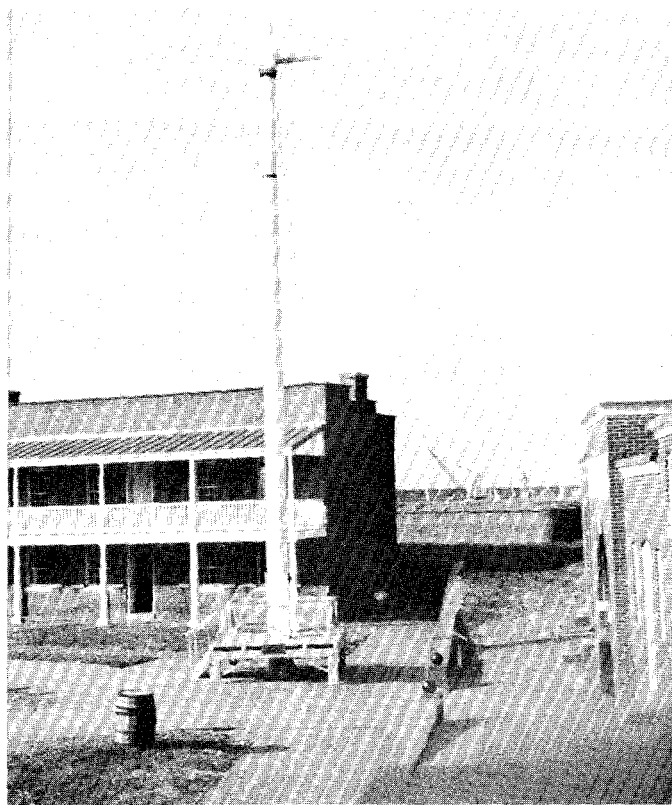


Illustration No. 7.

Magazine.

Illustration No. 8.

Junior officers' quarters.

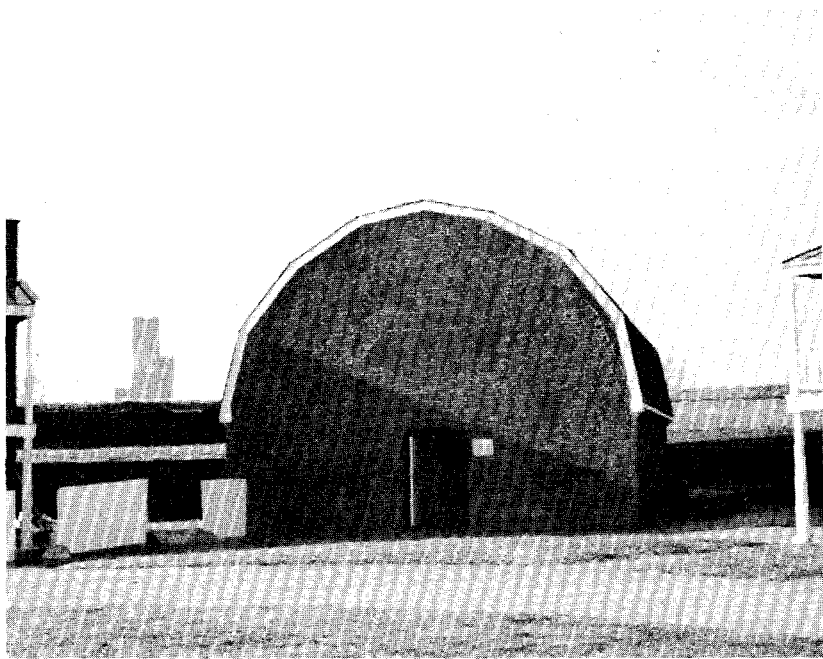


Illustration No. 9.

No. 1 enlisted men's barracks, HS 4.

Illustration No. 10.

No. 2 enlisted men's barracks, HS 5.

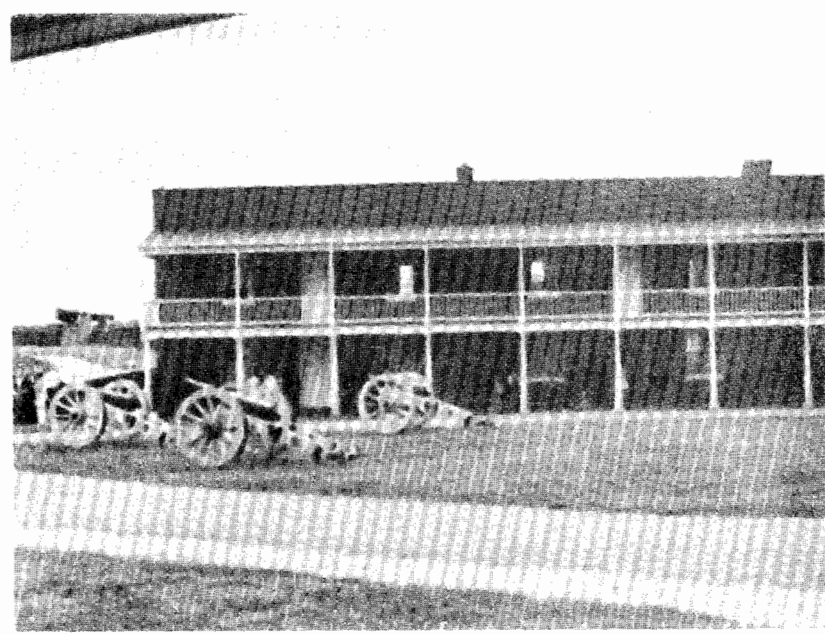
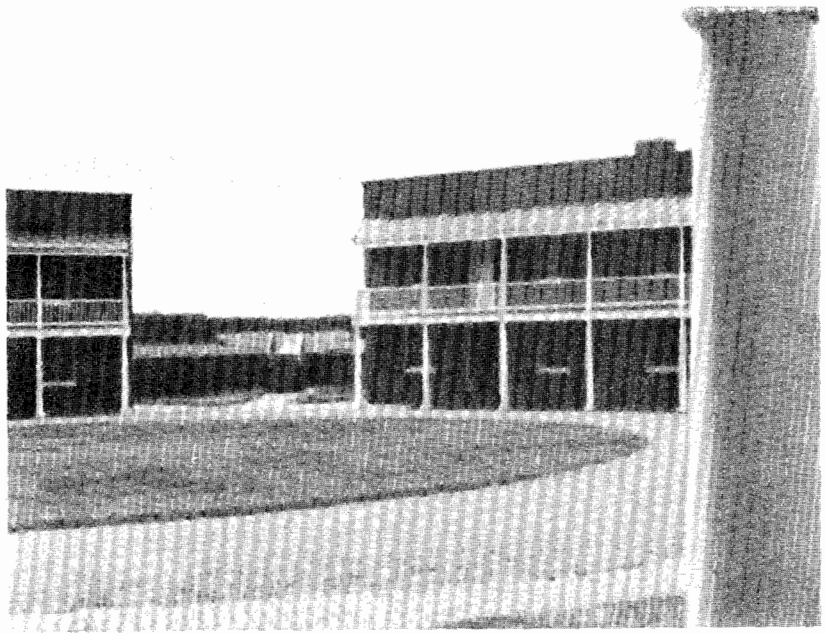


Illustration No. 11.

Water batterys.

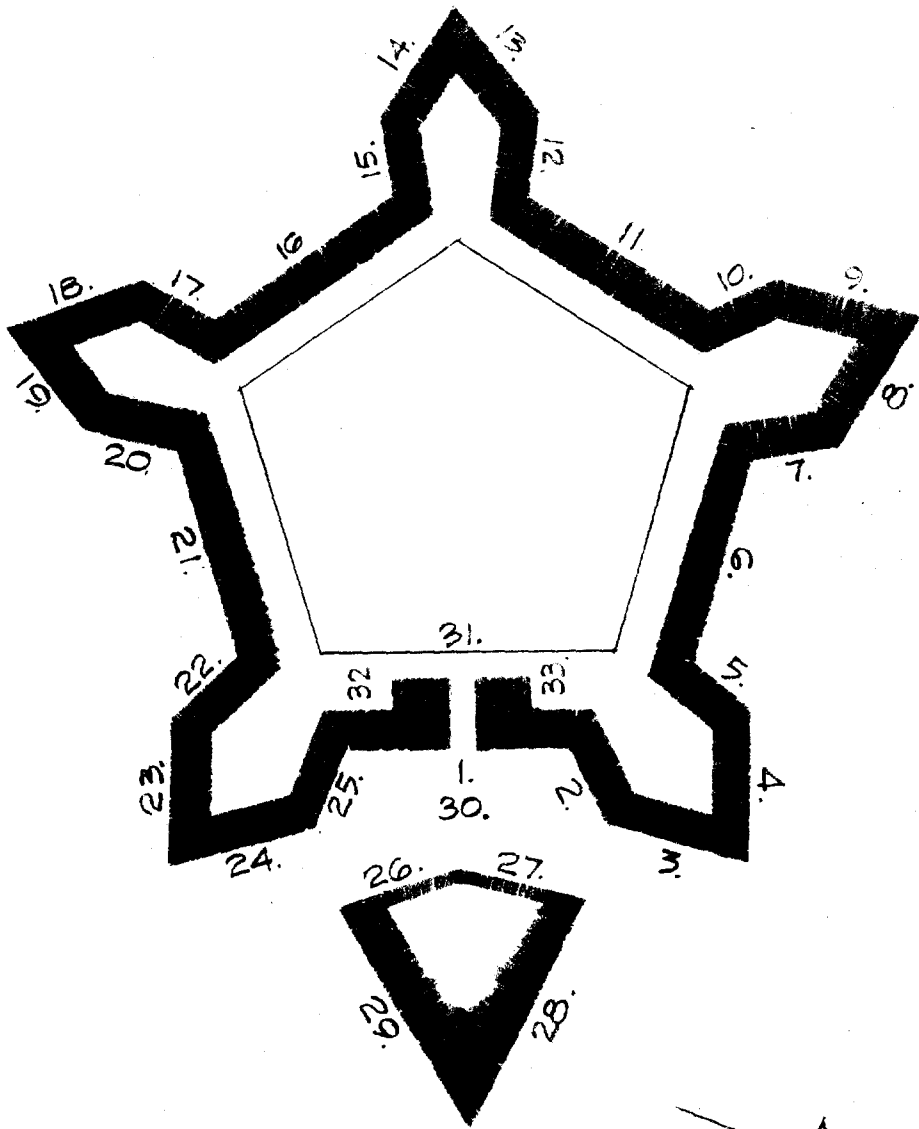
Illustration No. 12.

Civil War magazine.



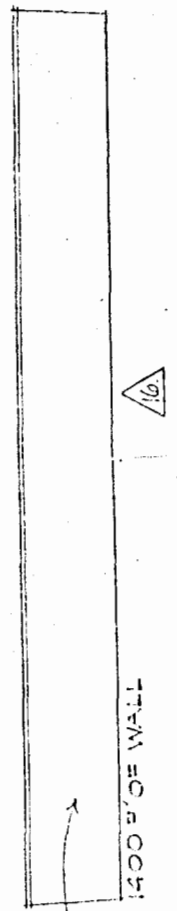
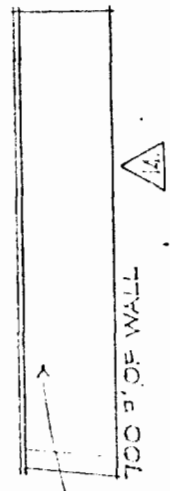
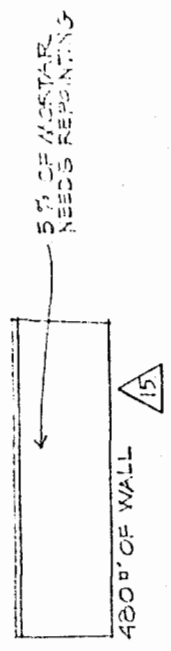
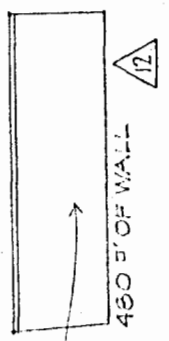
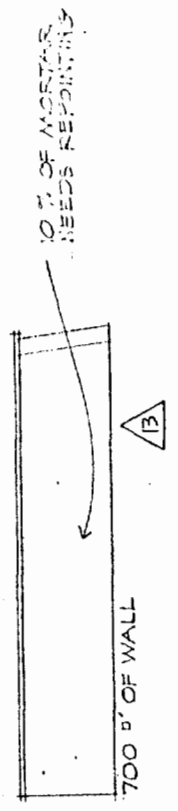
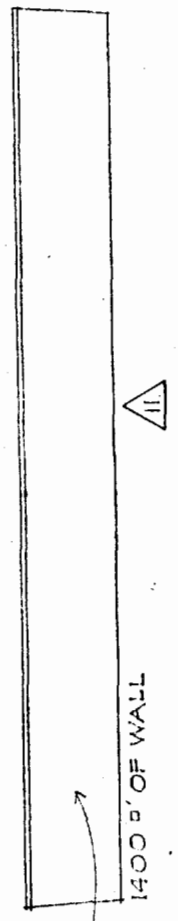
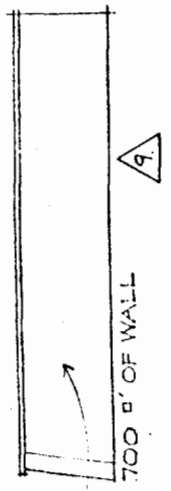
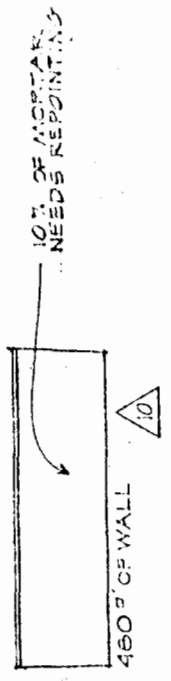
Drawing No. 1.

Key--exterior fort walls and ravelin.



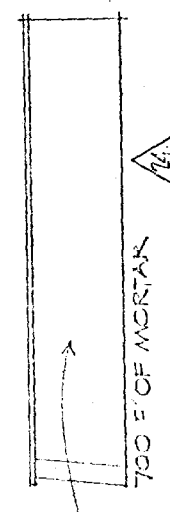
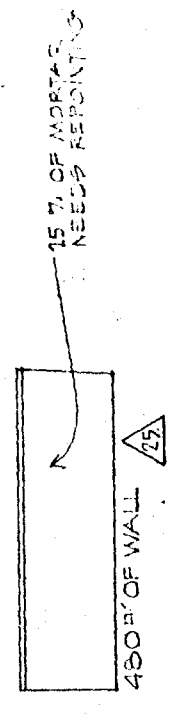
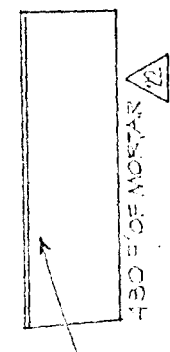
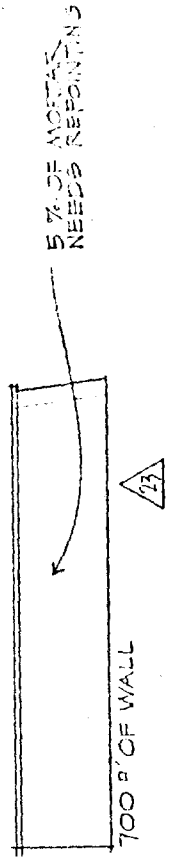
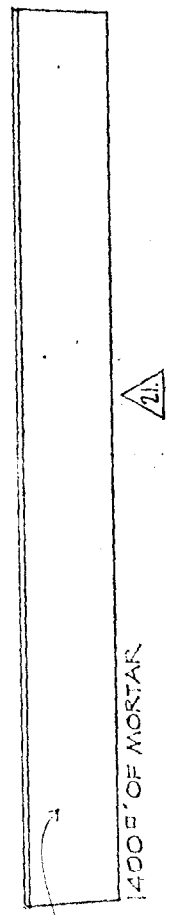
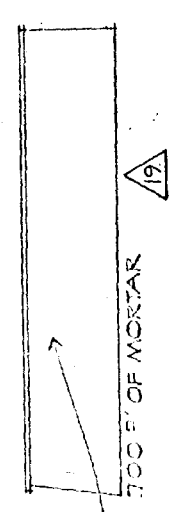
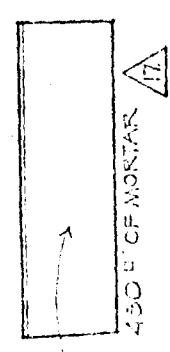
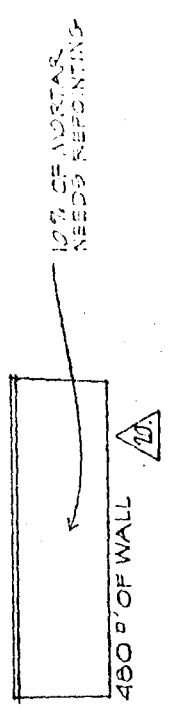
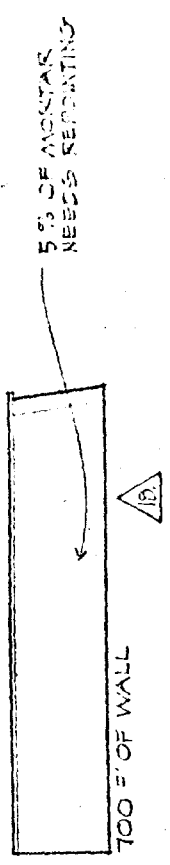
Drawing No. 2.

Star fort exterior walls.



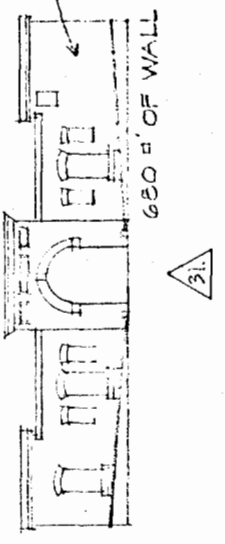
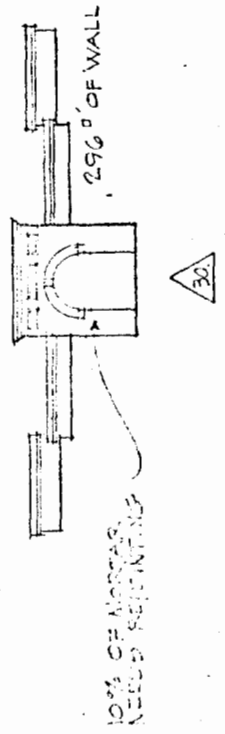
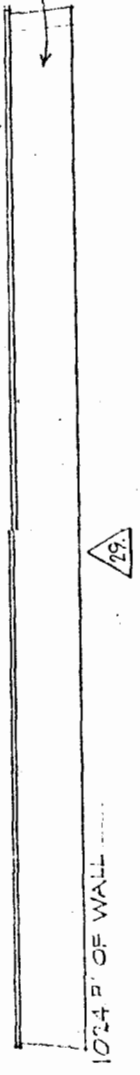
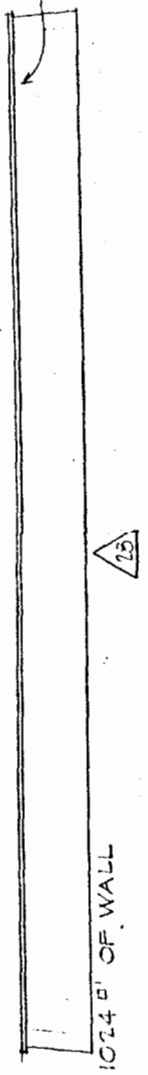
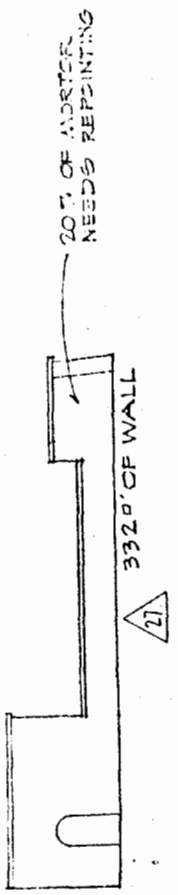
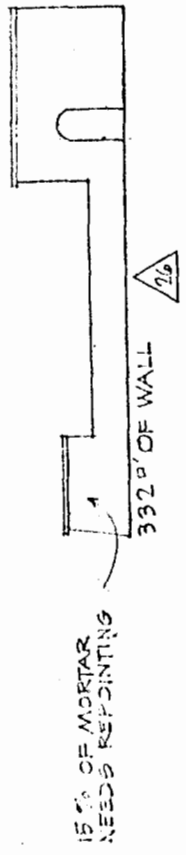
Drawing No. 3.

Star fort exterior walls.



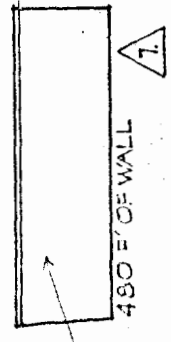
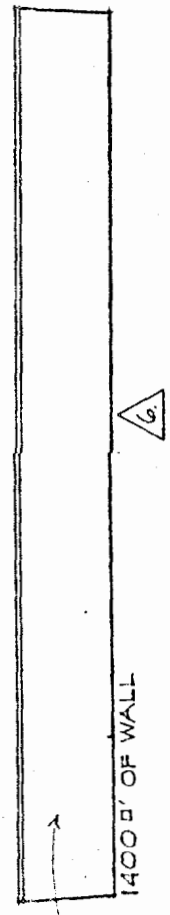
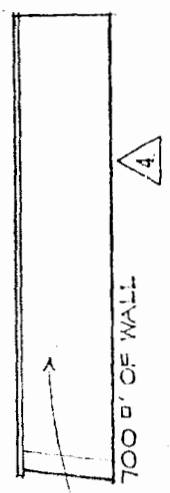
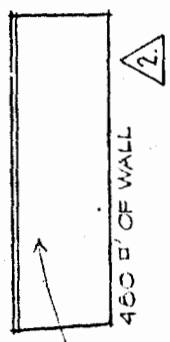
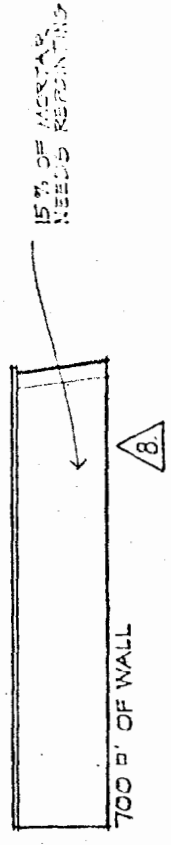
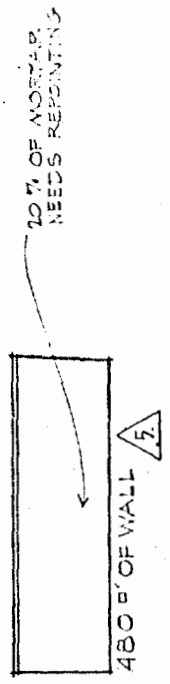
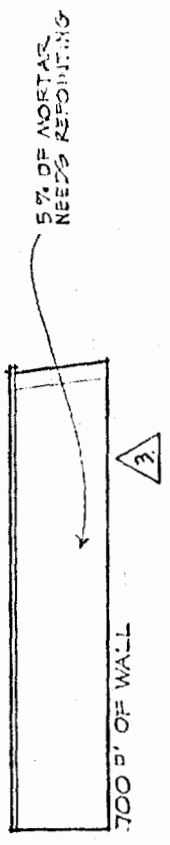
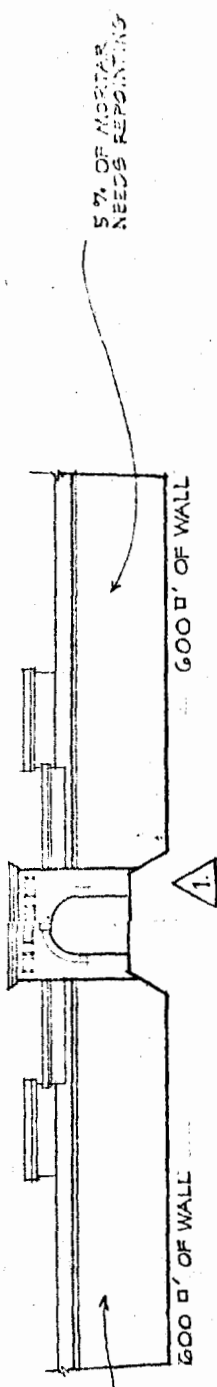
Drawing No. 4.

Ravelin and sally port exterior walls.



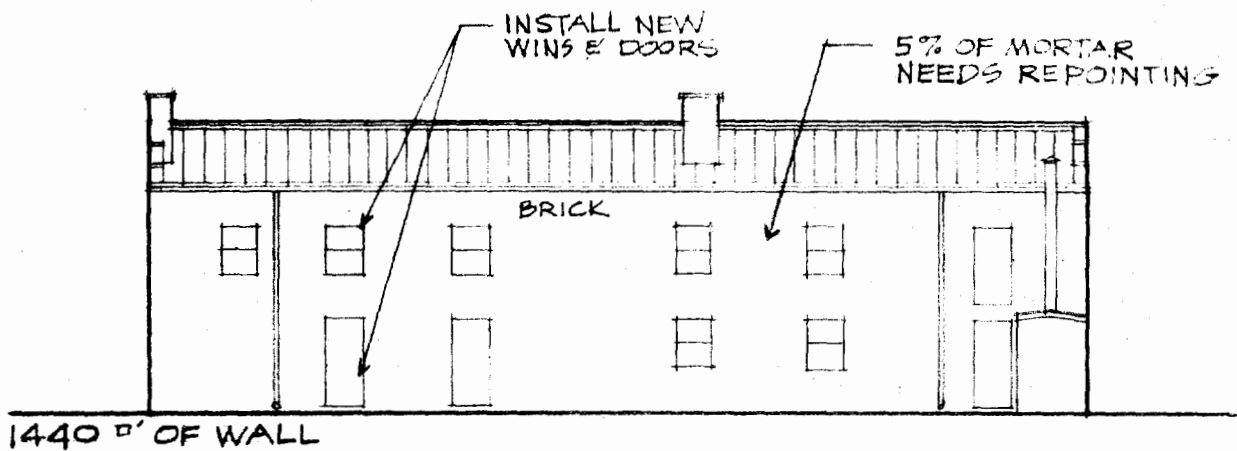
Drawing No. 5.

Star fort exterior walls, HS 12.

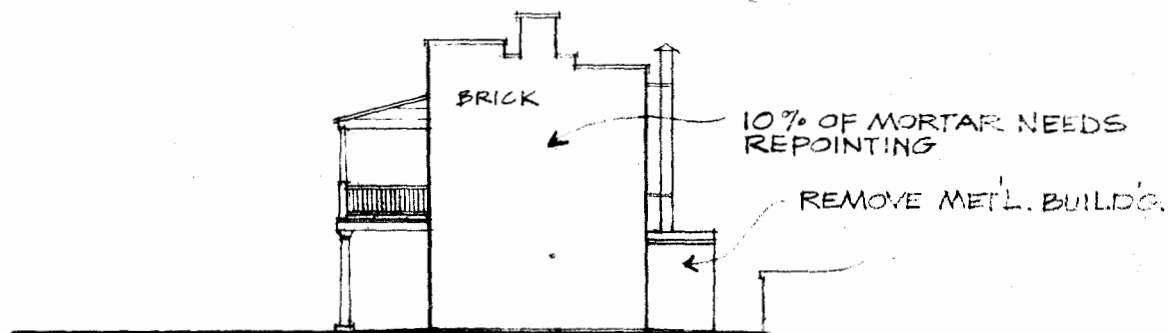


Drawing No. 6.

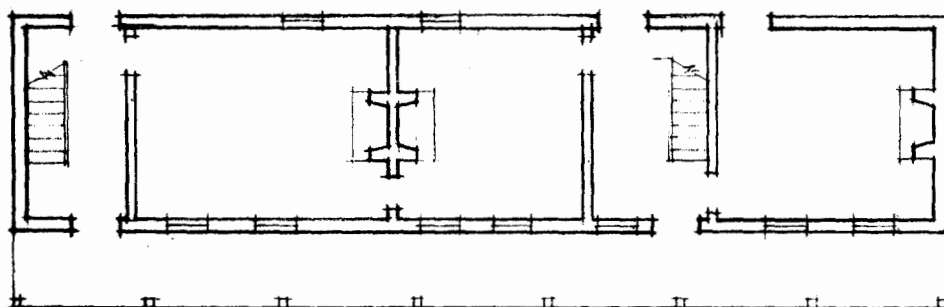
Commanding officer's quarters, HS 1



REAR ELEVATION



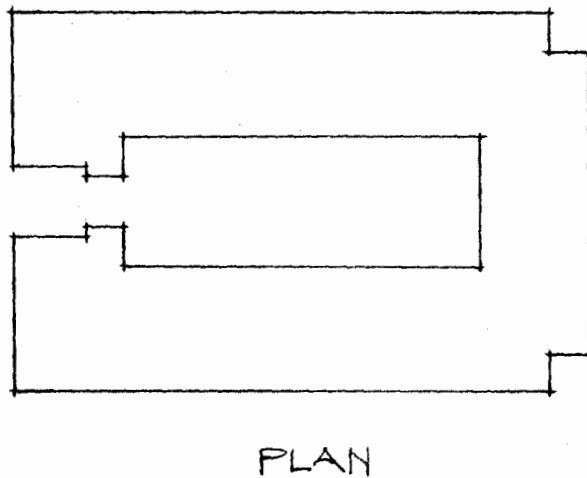
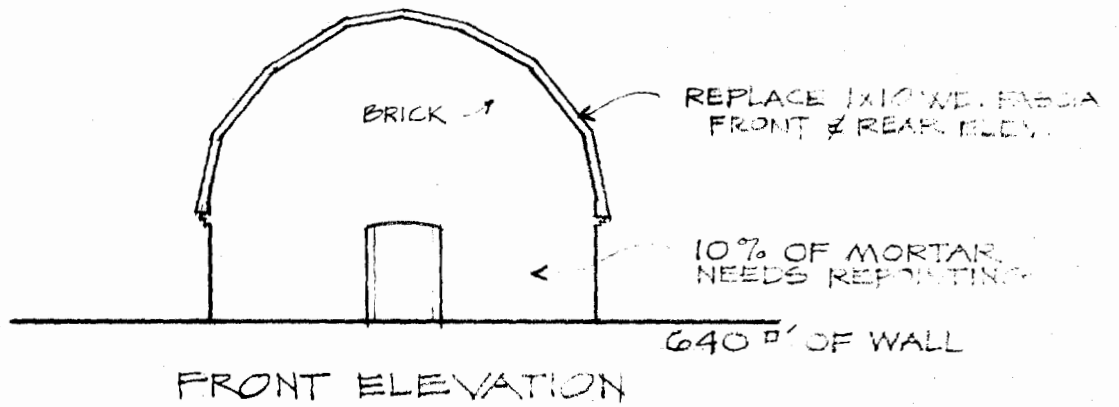
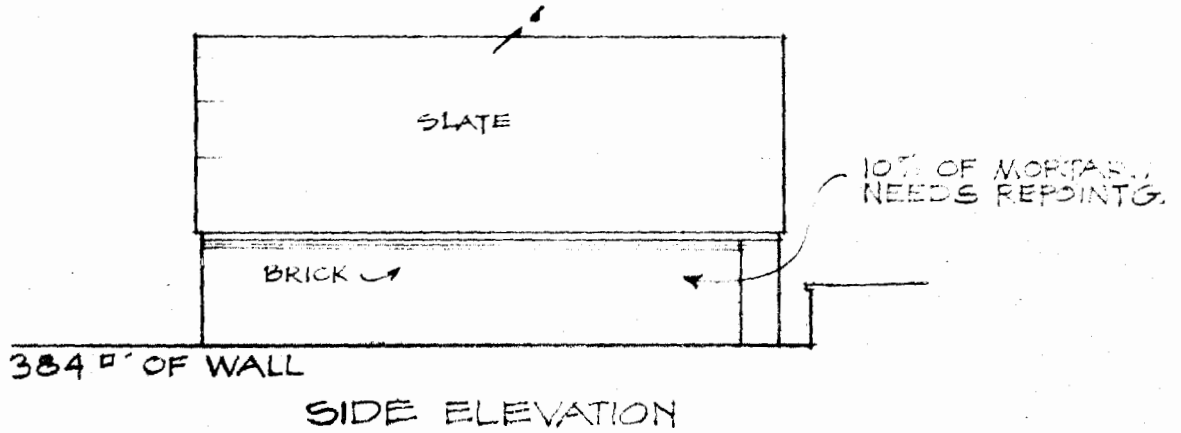
SIDE ELEVATION



PLAN

Drawing No. 7.

Powder magazine, HS 2.



Drawing No. 8.

Junior officers' quarters, HS 3.

INSTALL NEW
WINS & DOORS

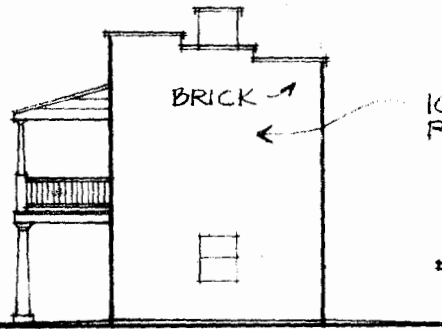
REMOVE
EXIST. A.C.

BRICK

15% OF MORTAR
NEEDS REPOINTG.

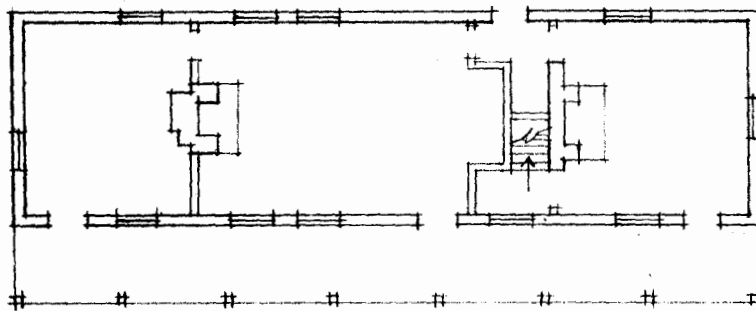
1152' OF WALL

REAR ELEVATION



432' OF WALL

SIDE ELEVATION



PLAN

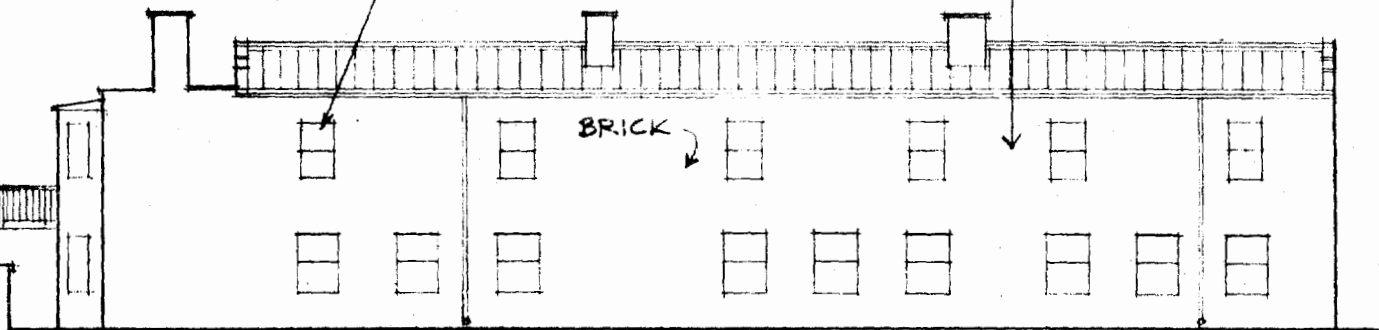
Drawing No. 9.

No. 1 enlisted men's barracks, HS 4.

INSTALL NEW WINDOWS

15% OF MORTAR
NEEDS REPOINTING.

BRICK

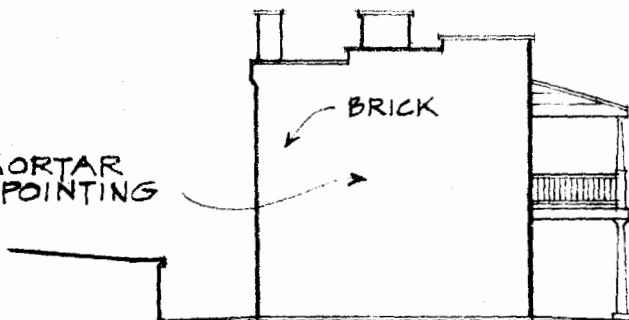


2120 \square ' OF WALL

REAR ELEVATION

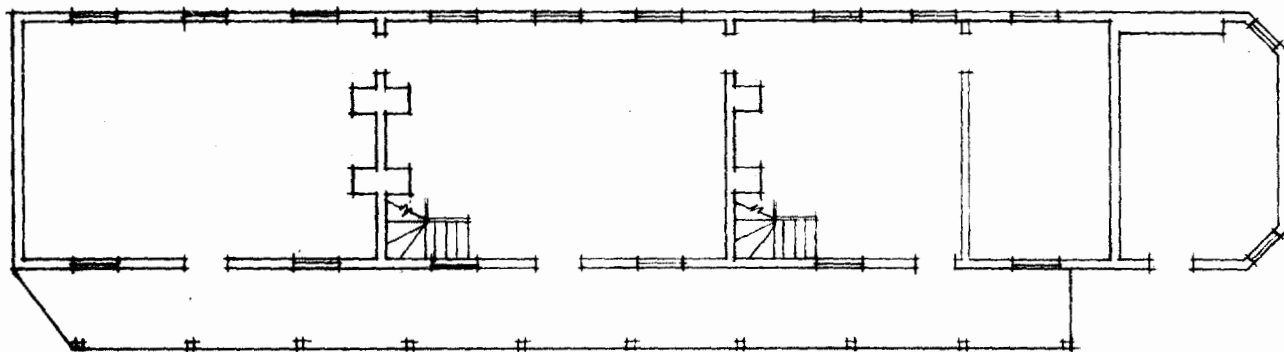
20% OF MORTAR
NEEDS REPOINTING

BRICK



484 \square ' OF WALL

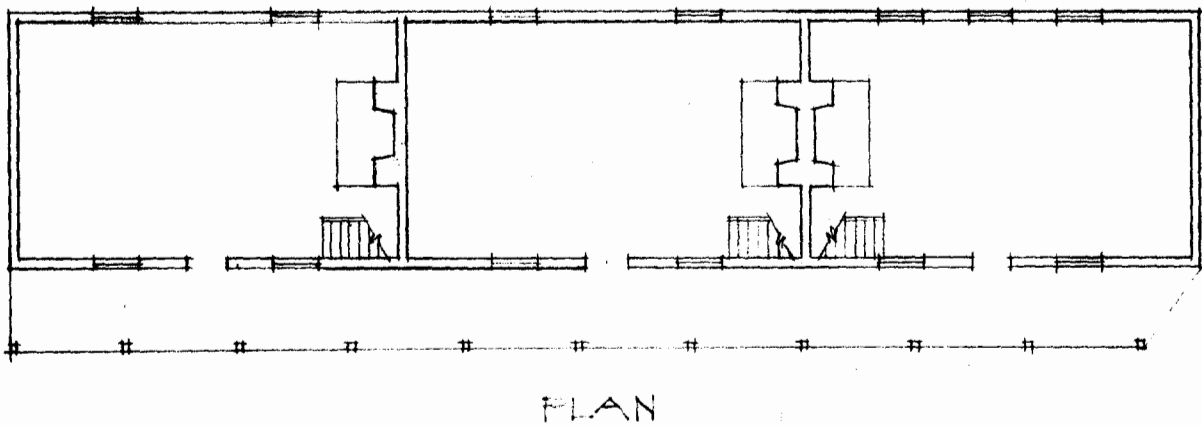
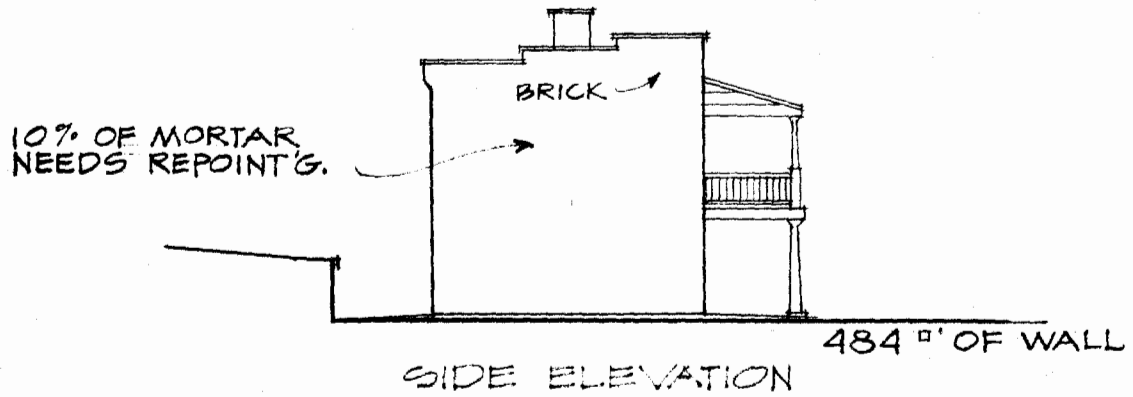
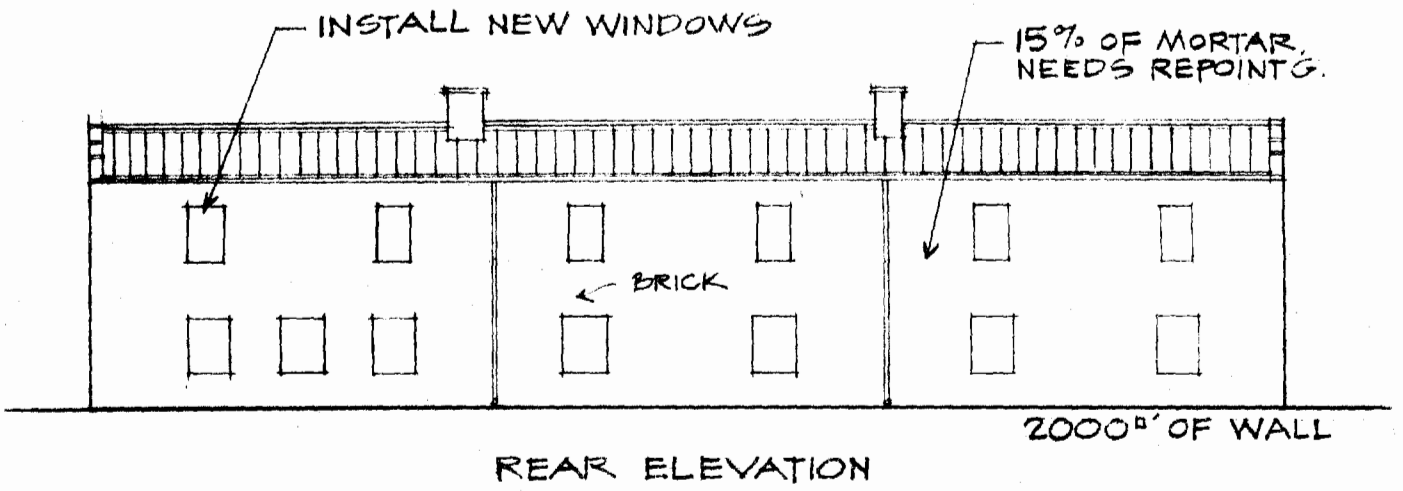
SIDE ELEVATION



PLAN

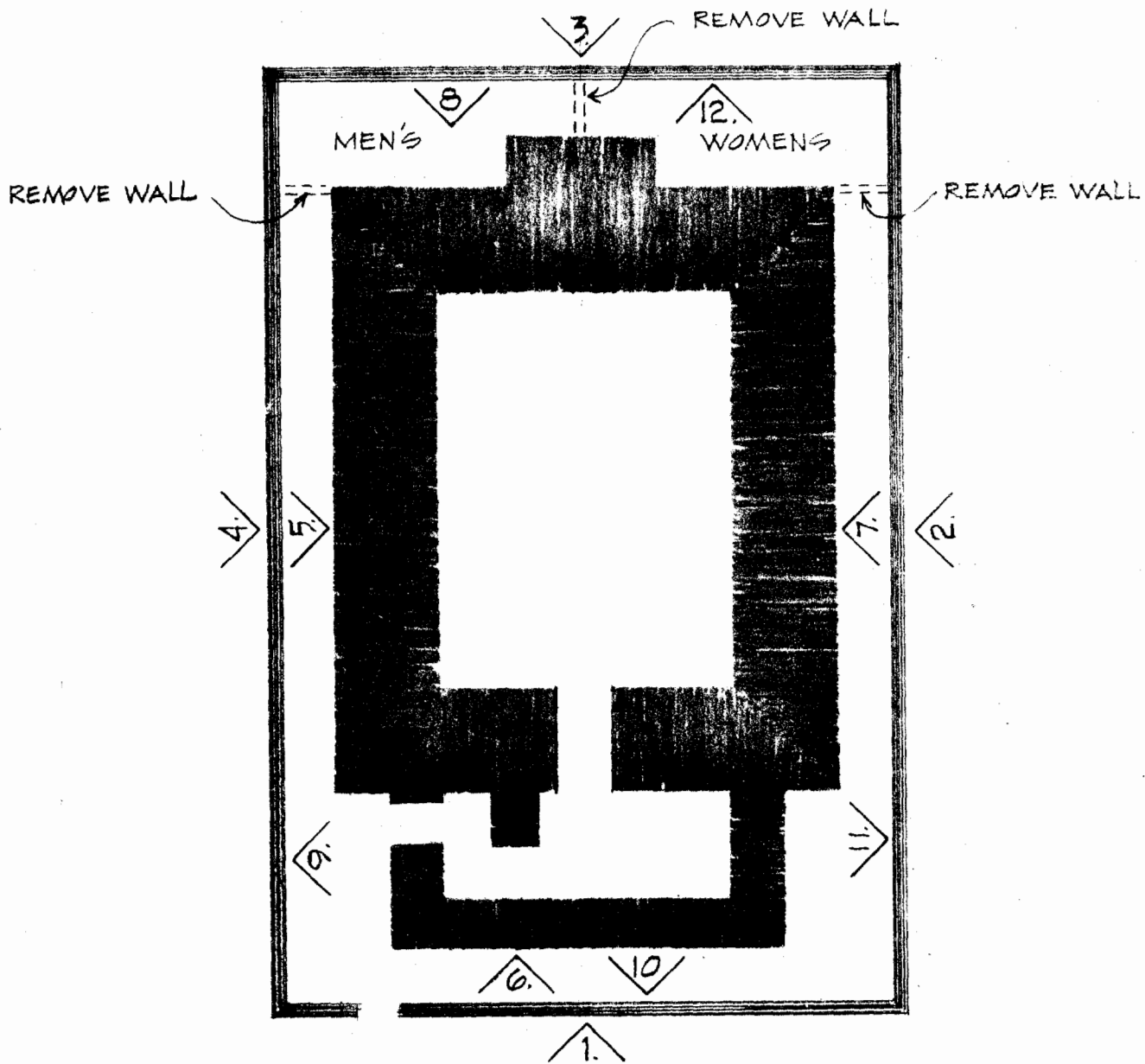
Drawing No. 10.

No. 2 enlisted men's barracks, HS 5.



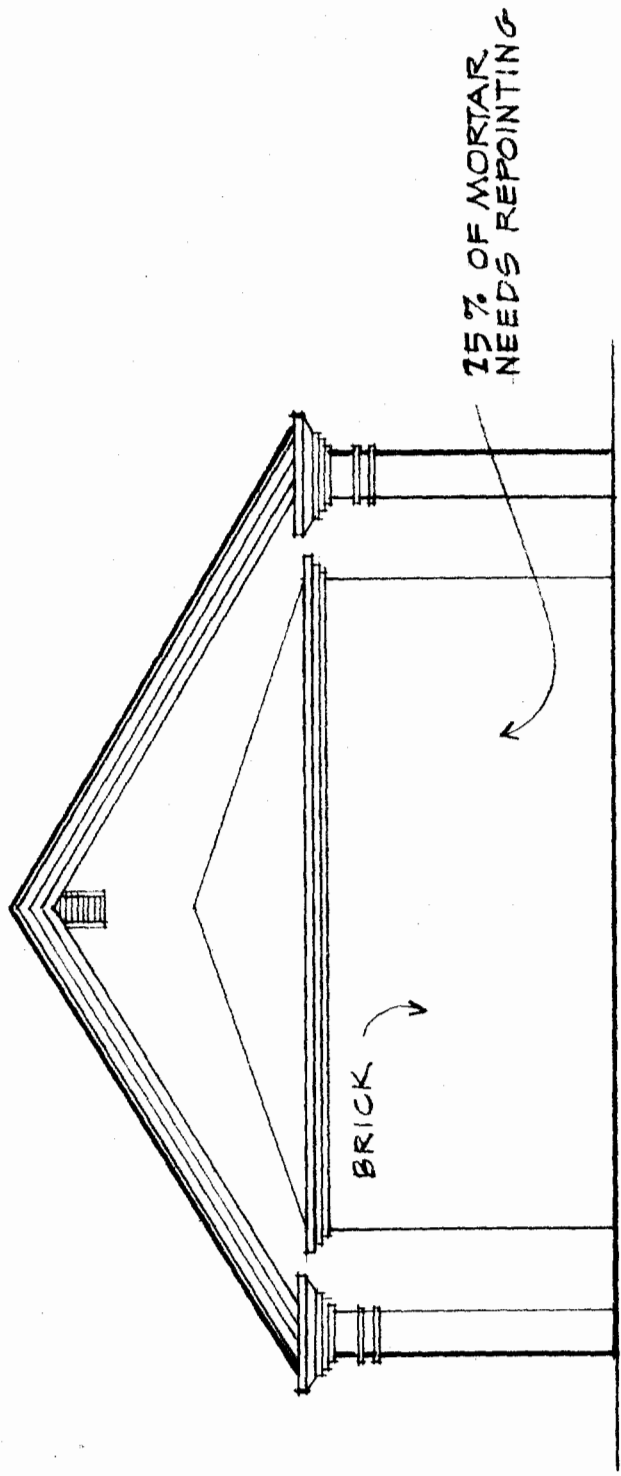
Drawing No. 11.

Key--plan of Civil War magazine.



Drawings Nos. 12-16.

Elevations of Civil War magazine.



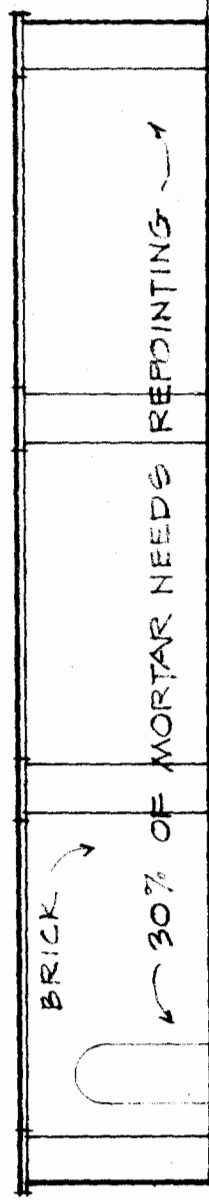
2736 P' OF WALL

BRICK

75% OF MORTAR
NEEDS REPOINTING



FRONT ELEVATION - MAGAZINE



1600 P' OF WALL

BRICK

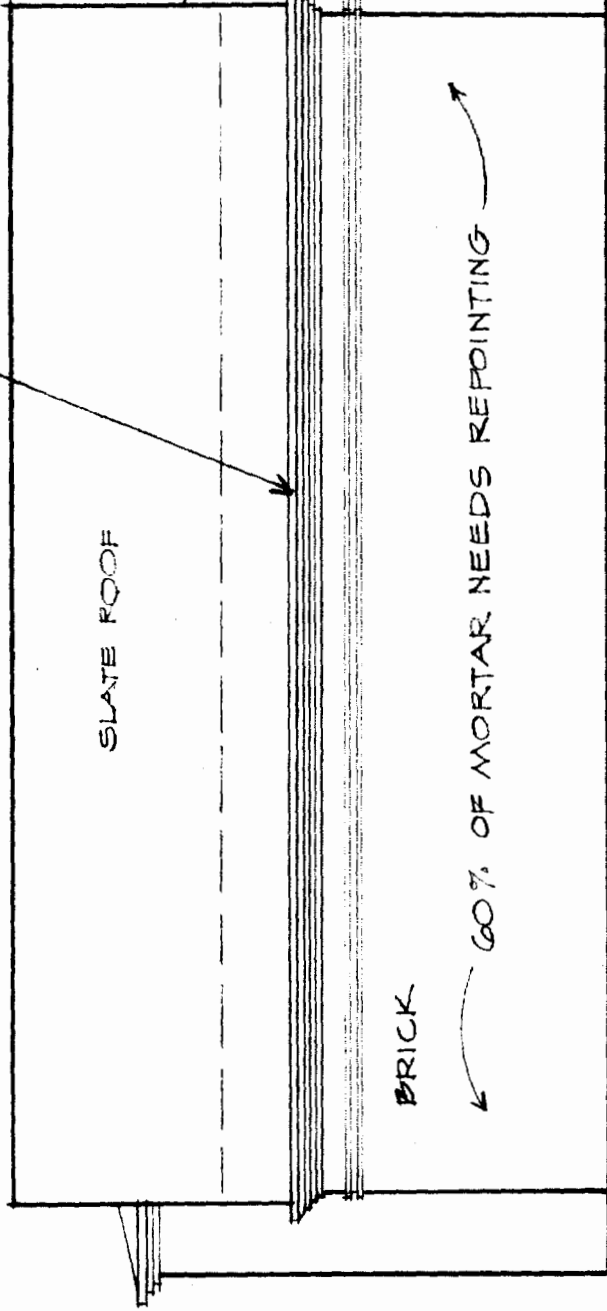
30% OF MORTAR NEEDS REPOINTING



PERIMETER WALL

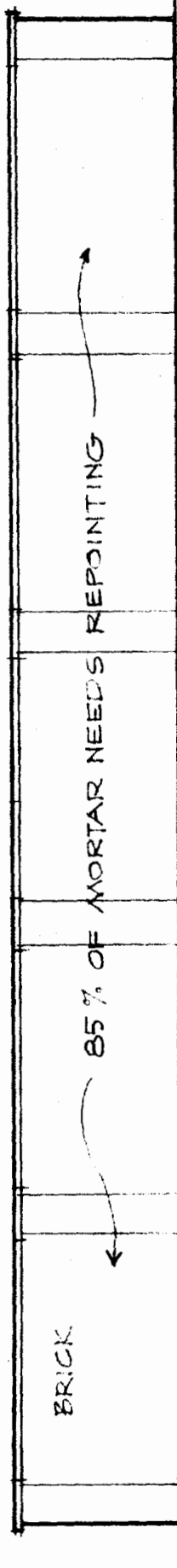
REPLACE EXIST. COPPER GUTTER

INSTALL NEW ROOF FRAMING



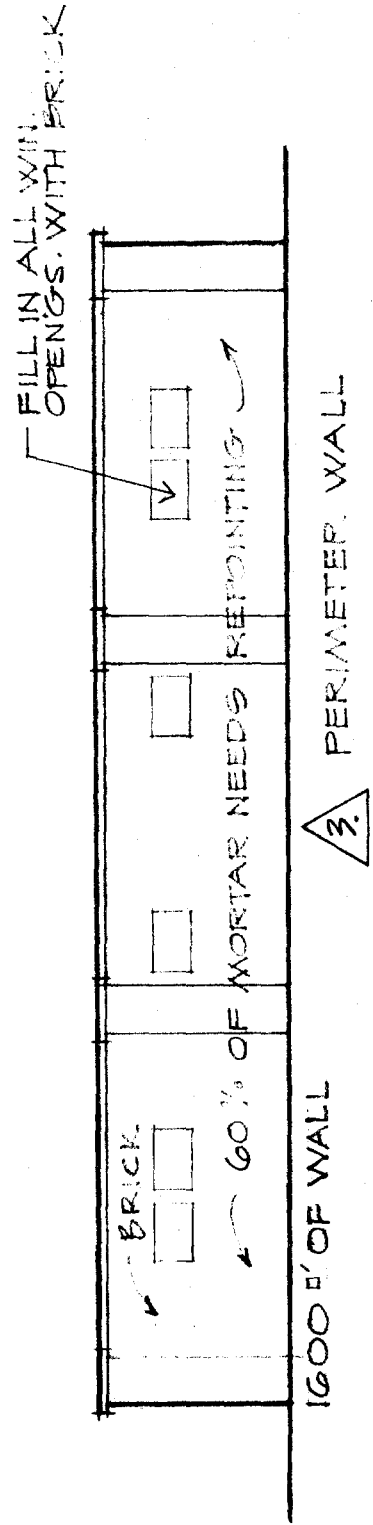
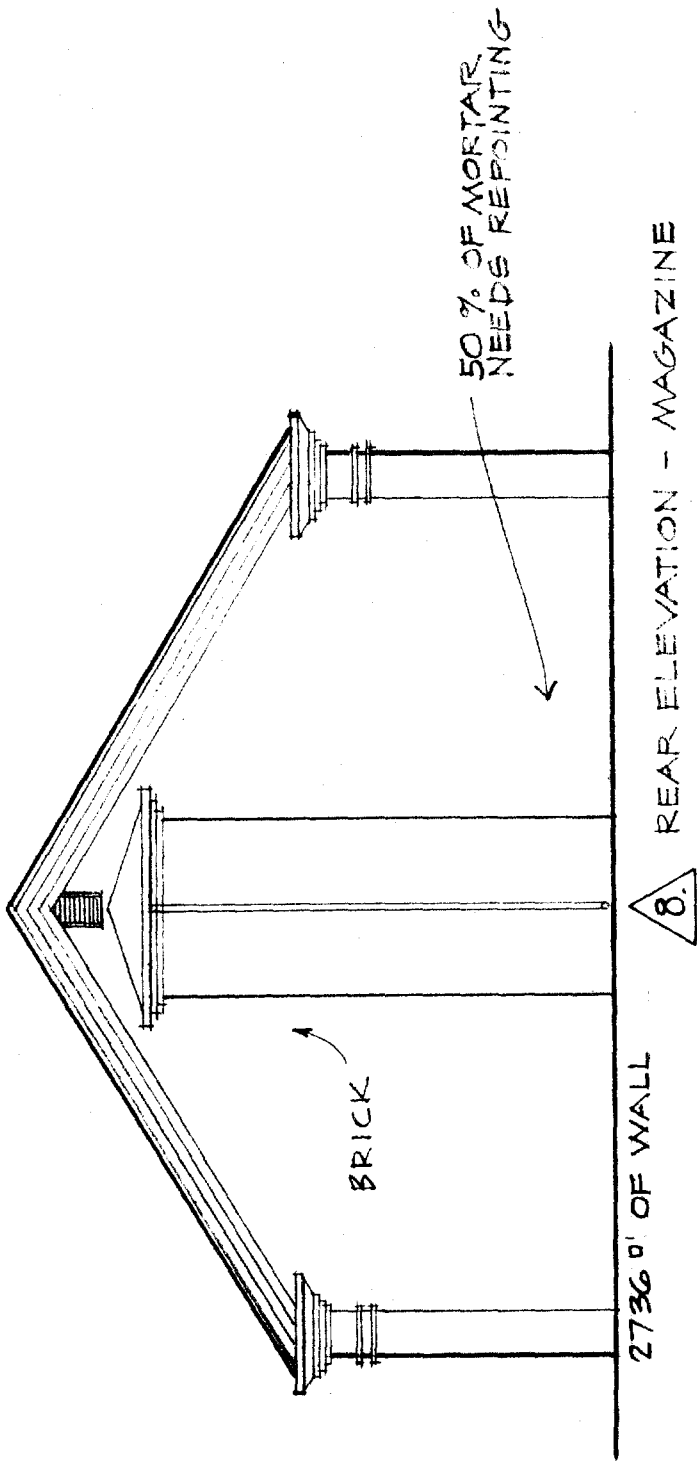
3020 0' OF WALL

9. SIDE ELEVATION - MAGAZINE



2368 0' OF WALL

4. PERIMETER - WALL



REPLACE EXIST. COPPER GUTTER

SLATE ROOF

BRICK

10% OF MORTAR NEEDS REPOINTING

3020 P' OF WALL

7. SIDE ELEVATION - MAGAZINE

FILL IN DOOR OPEN'G. WITH BRICK

15% OF MORTAR NEEDS REPOINTING

BRICK

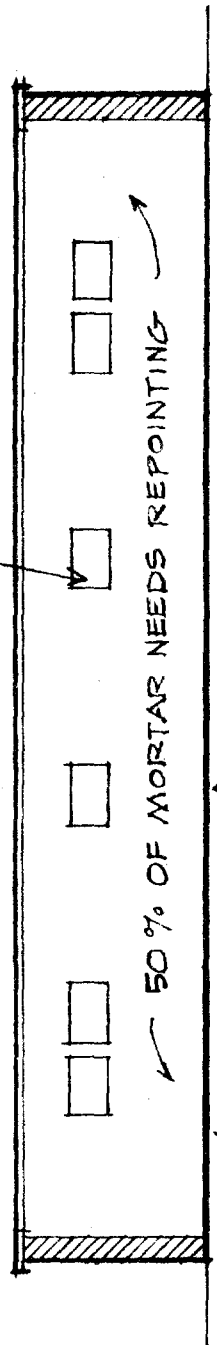
2368 P' OF WALL

2. SIDE ELEVATION - WALL





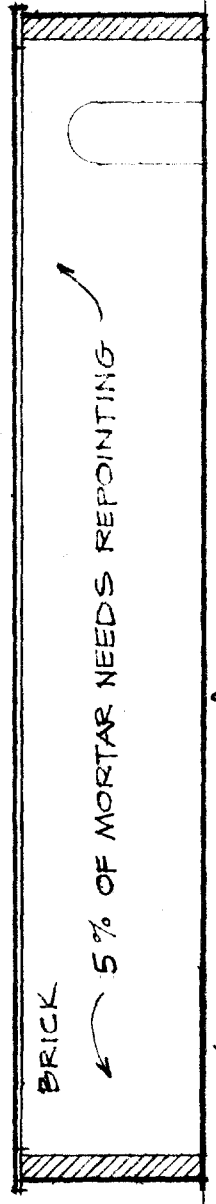
FILL IN ALL WIN. OPENG. WITH BRICK



1324' OF WALL



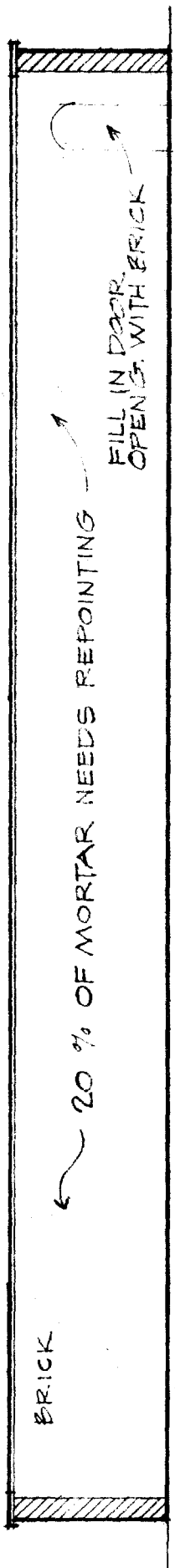
PERIMETER WALL



1324' OF WALL



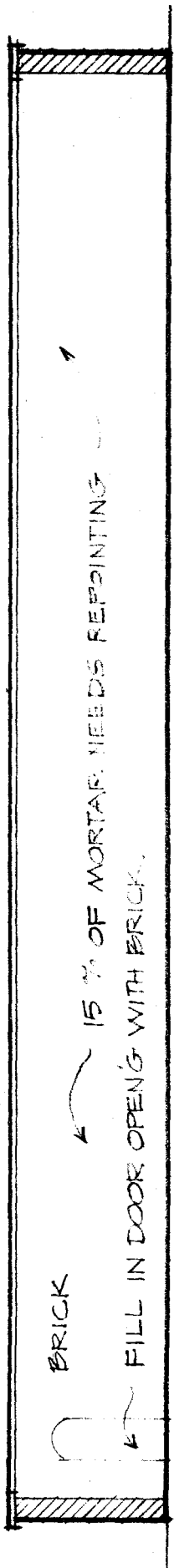
PERIMETER WALL



2304' OF WALL



PERIMETER WALL



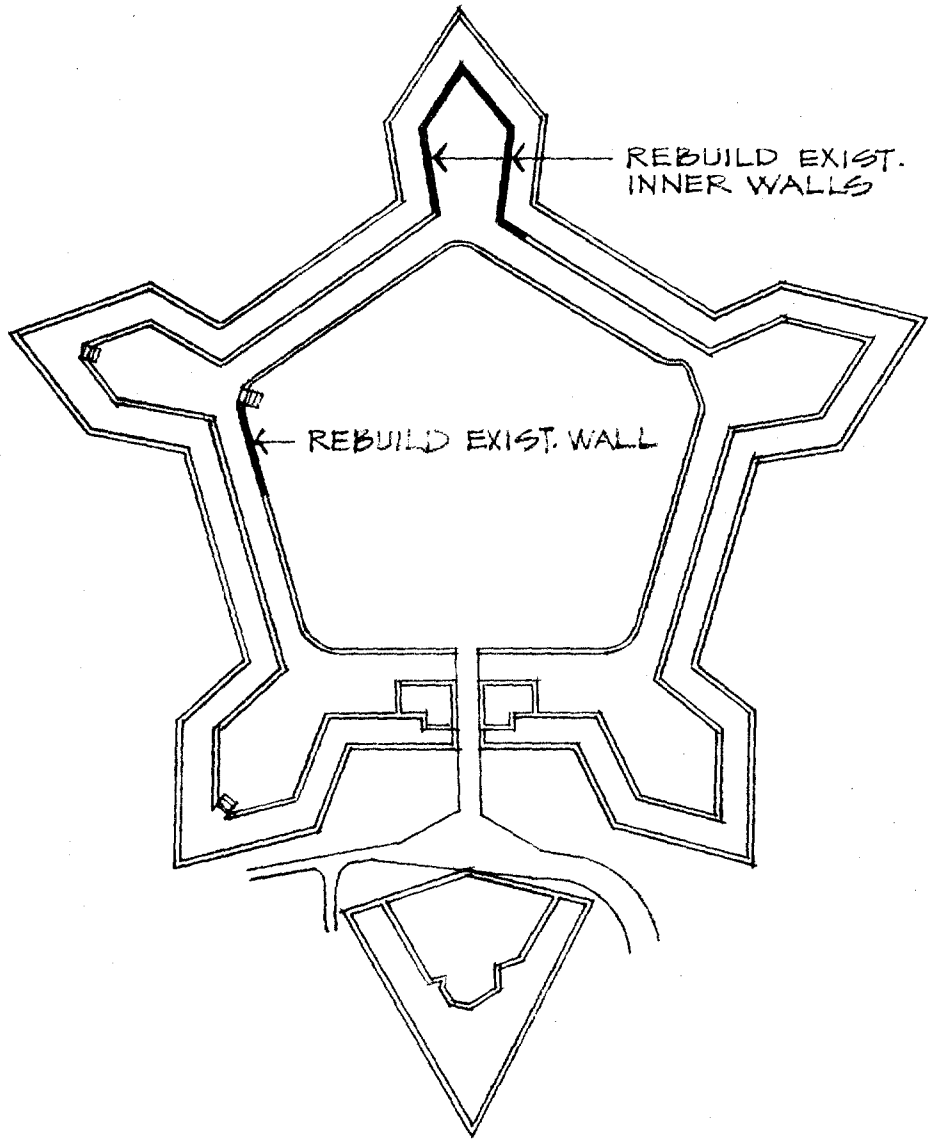
2304' OF WALL



PERIMETER WALL

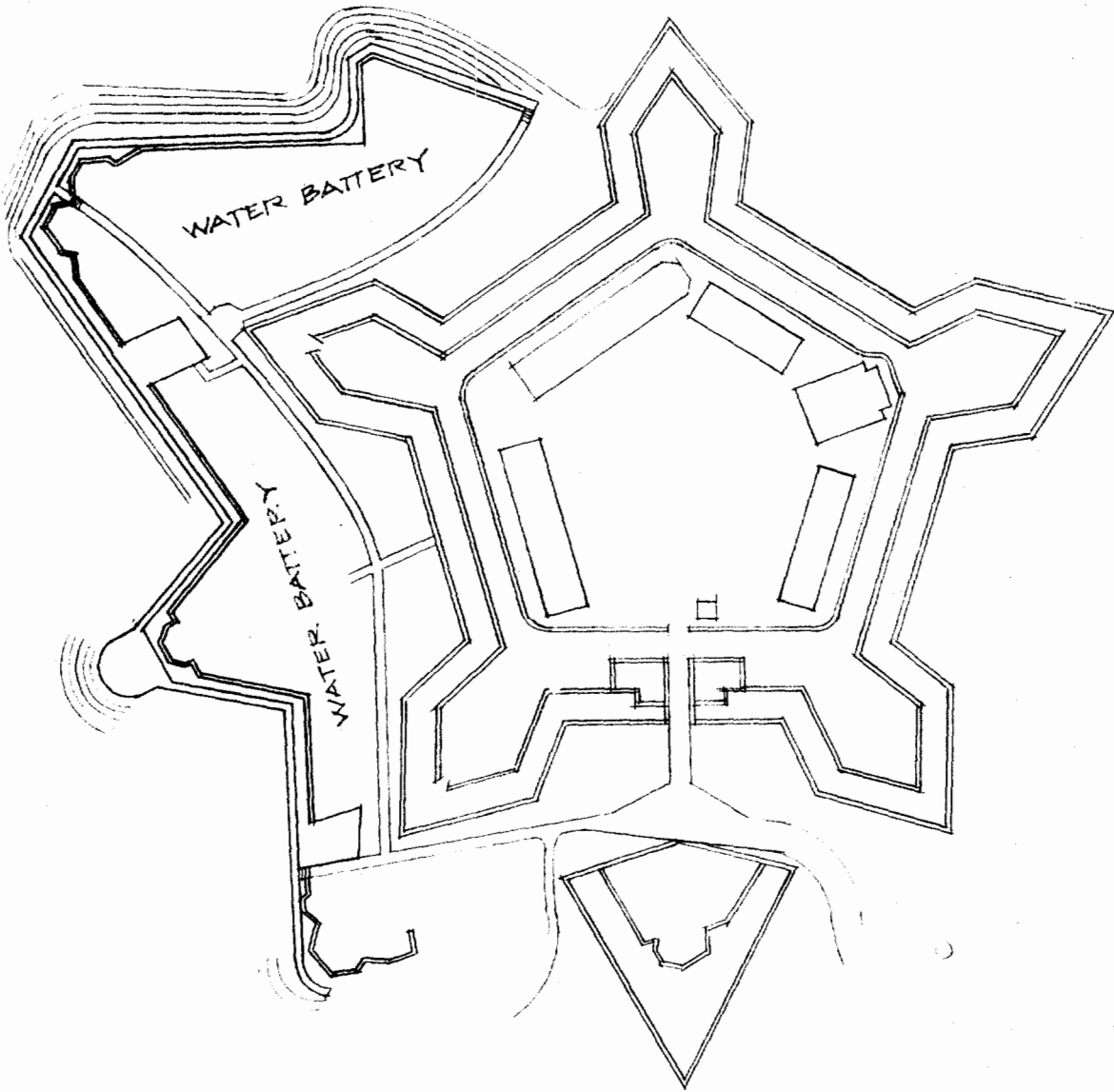
Drawing No. 17.

Fort walls--exterior and interior.



Drawing No. 18.

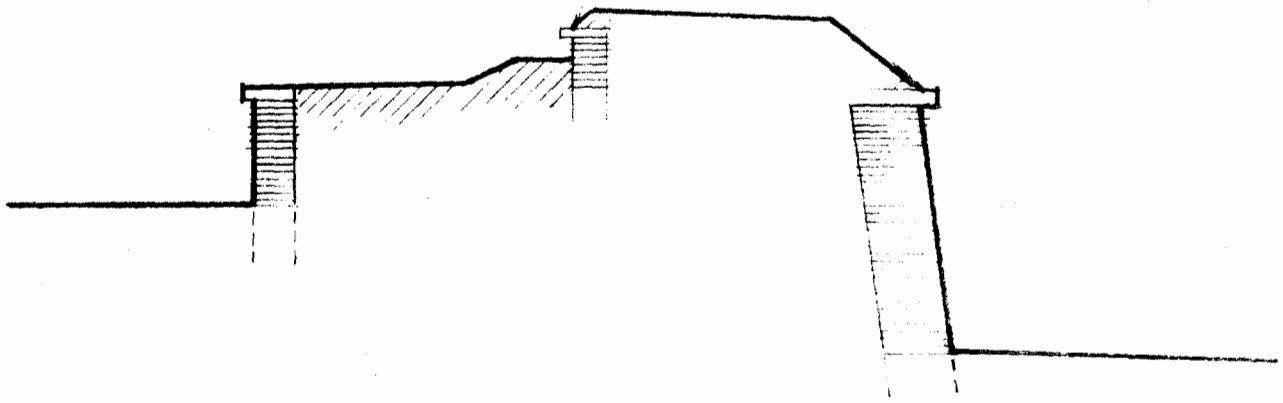
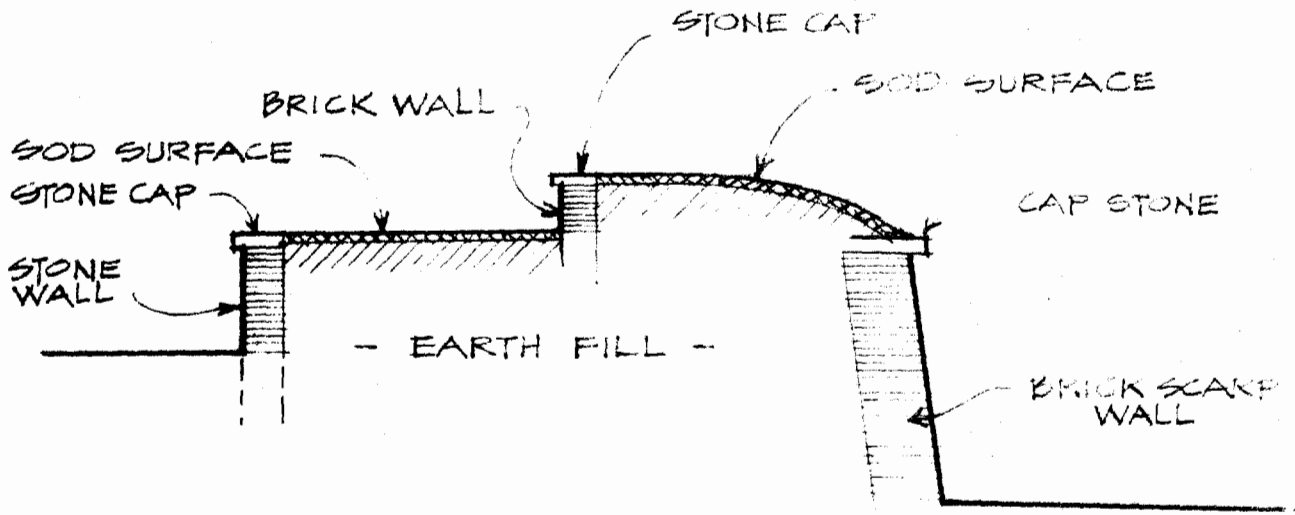
Water batterys.



Drawing No. 19.

Top: New recommended section through
rampart.

Bottom: Existing section through
rampart.





ARCHEOLOGICAL DATA



I. HISTORICAL ARCHEOLOGY AT FORT McHENRY

In 1888 an army colonel struggled to learn about the drainage and sewage systems at Fort McHenry. Finally, in despair, he wrote: "Very much of this work has not been a subject of record on maps or plats, and . . . nobody knows what is under the soil at Fort McHenry."

While the National Park Service has undertaken some important archeology at Fort McHenry, the colonel's observation is still important. A number of archeological projects are planned for Fort McHenry and some of them must be accomplished before preservation work is undertaken: an investigation of the historic drainage system that is important to continuing preservation; and a determination of any historic features in areas where new underground wiring systems may be laid.

A. Historic Drainage System

Proper drainage is of the utmost importance to the preservation of earthen-masonry fortifications. The historic drainage system at Fort McHenry has not been systematically investigated. In the beginning the system was meant only to drain off rainwater; later it became a sewage system as well. The major element was a large drain pipe leading from the parade ground, under the ramparts, across the glacis, to the bay about 400 yards away. When a water battery was built in 1867 its underground magazines are believed to have been hooked into this drain. Other later drains led from the dry moat toward the river. All this system should be investigated and rehabilitated where necessary.

B. Latrines

Within the ramparts, two officers' latrines were found, one on each side of the magazine. At first these were pit toilets; later a sewer was installed, linking these to the drainage system, above. Outside the ramparts, in the dry ditch, and adjacent to the ravelin an enlisted men's latrine stood for a period of time. It, too, was a pit toilet and might prove to be an important deposit of artifacts. All three should be identified.

C. First Well

This most important feature, installed just before the British attack, was located in a corner of the parade ground. Serious engineering problems were encountered in its construction, and its successful completion was considered a remarkable feat. Its location should be pinpointed. If it is still intact, part of it should be excavated and its remarkable construction history should be interpreted.

D. Addition to Commanding Officer's Quarters

A small room or passageway once stood at the rear of the commanding officer's quarters. Its major function seems to have been that of a passageway from the kitchen to the rest of the house. Its precise location and size should be determined. It is possible that this ell could be reconstructed to house a furnace now installed in a modern shed in this general area.

E. Early Guardhouse and Shot Furnace

These two structures were located, successively, on the same site--between the two enlisted mens' barracks. Their foundations should be identified and marked.

F. Tunnel in Ravelin

At one time the only way to enter the fort was to pass through a tunnel in the ravelin in front of the sally port. The army eventually closed this passageway. It should be investigated, measured, photographed, etc.

G. Bastion Flagstaff

While today's flagstaff is located on the site of the original staff and probably where the flag flew during the British attack, a flagstaff stood in the east bastion for most of Fort McHenry's existence. This site should eventually be excavated and recorded.





