special history study

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MASONRY FORTS OF THE NATIONAL PARK SERVICE

SPECIAL HISTORY STUDY

MASONRY FORTS OF THE NATIONAL PARK SERVICE

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UNITED STATES DEPARTMENT OF THE INTERIOR
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INTRODUCTION

At the request of former Director George B. Hartzog, we have made an examination of the masonry forts of the National Park Service to determine their condition and make recommendattions for their restoration and/or rehabilitation, along with estimates for the cost of the pertinent work.

In the course of this work we had the able assistance of Restoration Specialist Harry Martin, who provided estimates for the work needed at Fort Washington and Fort McHenry, and Historical Architect Norman Souder who provided all the information, including estimates, on Castle Clinton. We also had extremely fine and helpful cooperation from the members of the staffs of all the parks visited. It was this cooperation that greatly expedited our work.

From the point of view of historic preservation, examining these masonry forts was a dismal task. It was heartening to see the variety in styles of forts--no two of which were alike in design and/or construction--and the span of time they represented. But after looking at these forts and examining their condition it became obvious that the National Park Service has been remiss as a governmental bureau that is supposed to be engaged in historic preservation; indeed, one historian characterized the past restoration work on one prominent fort as no better than vandalism. And one would have to agree that this and other forts had received less than desirable treatment. For example, Castillo de San Marcos has had its terreplein paved with modern white cement, which is about as historic as placing Aunt Fanny's outhouse in the middle of the White House lawn. Fort Frederica and many other forts have been repointed with modern cement that does not even remotely match the surviving mortar, and it has been applied so sloppily that such work would be a disgrace to the greenest apprentice mason.

Perhaps the most serious charge against the National Park Service is the neglect to which the forts have been subjected. The castillos of San Juan National Historic Site in Puerto Rico are seriously threatened by sea erosion, a condition that did not spring up overnight. Yet no action other than studies of the problem have been programmed. The City

Gate and adjacent wall of San Juan collapsed and the Park Service had to rebuilt it. Surely it would have been cheaper to have stopped the erosion. Further north, in South Carolina, Fort Sumter has had to be shored up at one section, and this most prominent symbol of the Civil War has been in the National Park System for twenty-five years.

Indecision about the course that should be followed in the degree of preservation of these forts is another serious criticism that could be leveled against the Park Service. The soldiers' barracks in San Cristobal at San Juan National Historic Site is being rehabilitated, not becuase the historic fabric is deteriorating, but because room for interpretive developments is needed. Meanwhile, the great wall of San Cristobal is eroding on the exterior and the interior, and no work on it is programmed. The Park Service procrastinates in making up its mind about what it wants to do in preserving Fort Jefferson, while the ocean and storms keep eating at the largest coastal fort the United States ever built. Nor does the Park Service know what the course of restoration should be at the important Fort McHenry which has been in the System for forty years.

No remarks are being made about the badly deteriorated forts of Gulf Islands National Seashore, because that park is so new that the Service has not had time to program needed work. However, if the past can predict the future, the forts are in for a long wait and much more deterioration before any work is done on them.

Without question, the best looking and best preserved masonry fort in the National Park System is Fort Pulaski. The fort was restored in the 1930's and subsequent to that time the park employed a mason whose job was confined almost solely to keeping the brick fort in repair. The Superintendant of Castillo de San Marcos is now thinking about hiring a mason who will spend full time repairing the castillo while using historic-type materials and equipment, and dressed in period costume. This idea appears to us to be an imaginative partial solution to the proper rehabilitation of this most important fort.

The finger of blame for the poor state of the masonry forts should not be pointed at any one group or person in the Park Service; the finger should be pointed at every level. However, the chief blame can be laid at the feet of the management system of the Park Service which emphasizes transient management over permanent professionalism, at the severe expense of historic preservation. The all too frequent transfer of personnel in the parks and Regional offices has resulted in a continual changing of minds on what preservation should take place and their priorities, so that nothing ever happens. In the competition for money and personnel within the Service between natural, recreational, and historic areas, and between management and professional personnel, historic preservation has been a consistent loser. Management's accent on catchy and essentially meaningless terms such as "people-serving" and "environment" has led to an emphasis on development of expensive new facilities and not preservation of the historic resources that Congress has charged us with preserving in perpetuity.

The National Park Service faces a basic decision: Does it want to keep the masonry forts? If it decides in the affirmative, then the Service is simply going to have to face up to the problem, make decisions about what it wants done at these forts, and start laying plans to obtain the massive appropriations needed to do the necessary stabilization and rehabilitation work.

On the other hand, if the Park Service feels that it cannot afford these forts, then it is going to have to look at the whole activity of historic preservation and reach the conclusion that it will play a minor and dwindling role, perhaps to the point where there is no place for it in a National Park System wherein history has been reduced to play-acting. The masonry forts represent such a large segment of history, that to neglect them as we have is to admit that the National Park Service cannot or will not effectively handle the task of historic preservation.

We realize that the cost of rehabilitation and restoration of any one of these forts to a degree that will give an aura of their past glory is high, but it must be remembered that the work proposed is aimed at

correcting the inroads of weather, neglect, vandalism and normal aging of more than 100 years, in most cases. But once these forts are put into good physical condition, it will not be difficult nor exceptionally expensive to keep them that way, if manpower and appropriations are consistently applied to their maintenance. It will be foolish to put one of these structures into good condition and then forget about its maintenance, as is so frequently the case. It doesn't take long for a structure, whether masonry or wood, to deteriorate in a climate that has heavy rainfall, as is the climatic condition where the masonry forts are located.

SAN JUAN NATIONAL HISTORIC SITE

El Moro
San Cristobal
City Walls
El Canuelo

SAN JUAN NATIONAL HISTORIC SITE

San Juan National Historic Site embraces two massive forts, or castillos, the thick walls surrounding the old city of San Juan, outer defensive works and a smaller fort across the harbor channel. One is overwhelmed by the enormousness of these fortifications, all other forts within the National Park System appear like toys beside these defensive works. Indeed, there are no other fortifications in the Western Hemisphere that can compare in size to the ones in San Juan. Spain's other principal fortification in the New World, Cartagena, embraces more land, but in complexity and massiveness it can in no way compare to the works that are in San Juan.

For centuries Spain played a gigantic role in the exploration, settlement, and exploitation of the New World, and that country has left a large and enduring imprint on more than half of the Western Hemisphere, from the southern tip of South America northward to the southern part of the United States. For example, Spanish is the native tongue of more people in the New World than any other language.

A significant physical reminder of Spain's role in the New World is at San Juan in the form of the extensive fortifications. Placed here to guard the entrance to the Caribbean and to be a base to protect the riches bordering the "Spanish Lake" from incursions by other European powers, these fortifications had their beginning in 1539 and evolved, as changing conditions demanded, through the centuries to their present state. The Dutch and the British attacked San Juan several times through the centuries, and even those assaults that were successful, in the end, did not lead to permanent control by these other powers, for Spain continued to hold Puerto Rico until the late nineteenth century when it was wrested from her by the United States at the end of the Spanish-American War.

All of the fortifications comprising San Juan National Historic Site are an important symbol of the Spanish presence in the New World and of the contribution that country made to the culture of what became known as Latin America. Moreover, these defnesive works are a strong reminder of the centuries-long struggle between Spain and other European powers for control of the New World.

Sea Erosion

Today the physical historical remains embraced in San Juan National Historic Site are for the most part structurally sound. But there are key points in them that are threatened or in need of repair work. The most serious and immediate threat is that of sea erosion. At several points along the city walls, at El Morro, and at San Cristobal and its outer works, the sea is cutting under the foundation that supports the footing for these structures' walls and buttresses. Unless something is done soon to halt this cutting away of the bank, there is only one logical outcome of erosion; the walls will topple into the sea. In some places the erosion has cut so deeply into the bank that there are those who think certain sections of the forts should be closed for the safety of the visitor.

Representatives of the Corps of Engineers made a study in 1971 of this erosion problem, and their report, thorough and detailed in its analysis of the situation, recommends filling in these cavities with cementpacks, grouted rock, and riprap. We concur with their recommendations, and urge that the proposals in their report be undertaken with rapidity. A detailed breakdown of these repairs and the cost can be found in the estimates section following this narrative. We have revised the Corps of Engineers' cost figures to reflect normal inflationary rise in prices and additional erosion since the time of their inspection.

The Corps of Engineers' report also treated the condition of surface erosion which is eating away in several places at the foundation of the forts and associated structures. One of the first things that should be done is to repair damaged drains, all of which are historic. After that cavities should be cleaned out and filled with grouted rock. Gullies formed by surface erosion should be refilled with rock and dirt.

Wall Erosion

In a number of places on El Morro, San Cristobal, the city walls, and El Canuelo there is serious wearing away of the plaster covering the walls. At certain points the plaster has been gone so long that the stone is beginning to wear. The most serious consequence of the missing plaster is the eroding of the mortar from between the stones comprising the walls.

It would be much too expensive to attempt to replaster the walls of the fortifications. Indeed, to do so would take away the patina of antiquity the walls now possess. The walls, however, should be repointed at the more eroded mortar joints.

The continued wearing away of the mortar will, of course, contribute to the destruction of the historic fabric by permitting stones to slip out of position, thus doing damage to the main historic resource and resulting eventually in needed major and expensive repair work.

Terreplein

The covering plaster and cement on the upper gun deck has worn away in many places, permitting water to soak through the earth-fill of the walls. This water causes serious internal erosion and deterioration of the walls.

To prevent the water from penetrating the walls, the terreplein will have to be sealed with a cement-like covering. The walls are basic to the structures. If their innards are allowed to erode and deteriorate, they will eventually collapse and take with them the remainder of the structures.

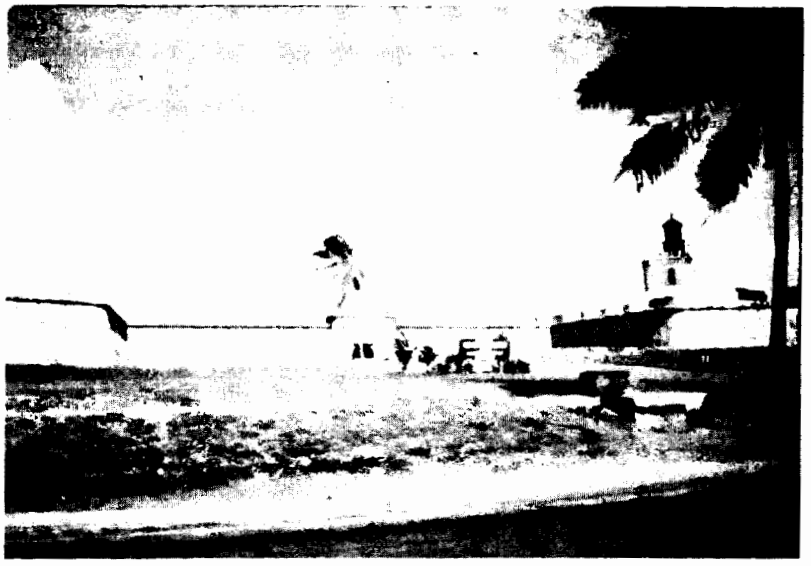
Vegetation

Many sections of the walls of the two main forts and the city walls are covered with vegatation, including ferns, vines, and trees. The

brick top of El Canuelo periodically becomes covered with vines, some with roots several inches in diameter. On several sections of the city wall trees are rooted in the stones well above ground level.

All of the vegetation should be removed from the forts and city walls, and a herbicide should be sprayed on the walls to hinder return of these growths.

The roots penetrate the stone walls of the castillos and the city walls as well as the brick roof of El Canuelo, pushing out the mortar and disaligning the stones and bricks. Moreover, the swaying of the more rigid growth, such as the trees, break up the stones. Displacing of the brick and stones weaken the structures, leading to severe damage and eventual expensive repairs.

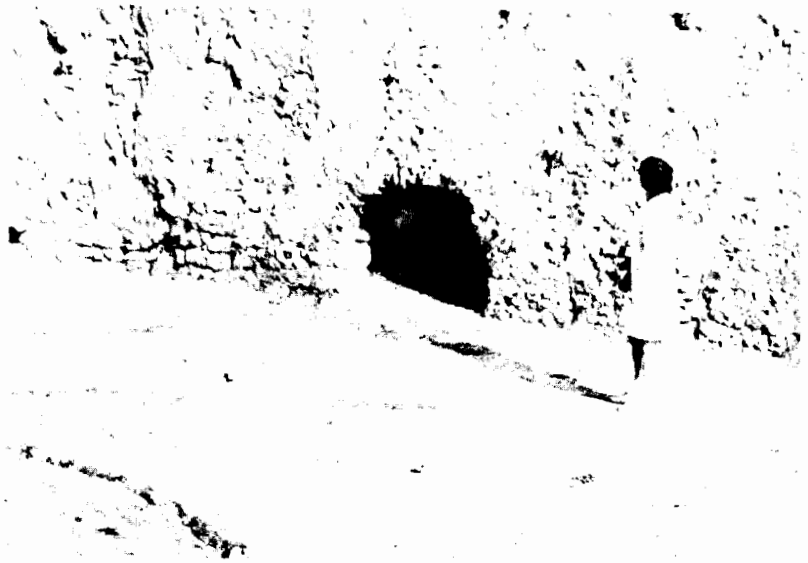


The low ramparts of the front curtain fail to give any indication of the massiveness of El Morro.

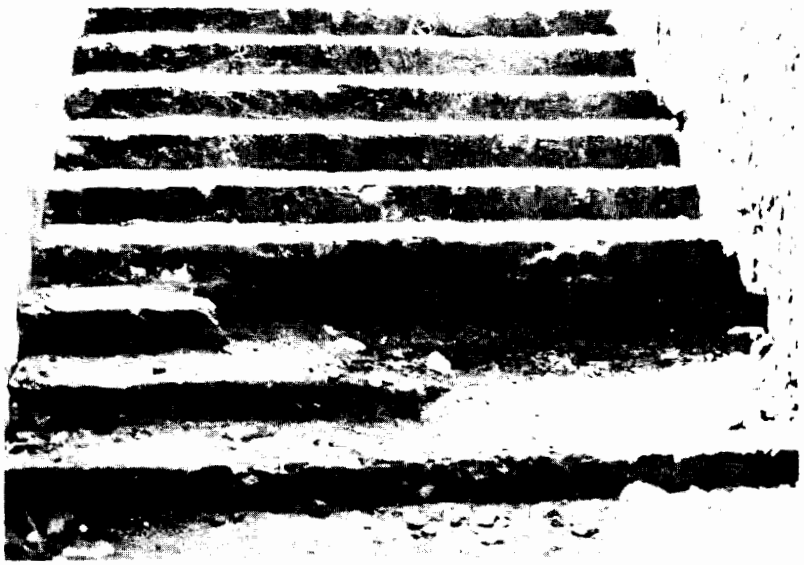
The true strength of El Morro is only revealed from the seaward approach. The action of the surf has eroded the protecting point dangerously close to the walls of the fort.

Large cracks have seriously weakened the seaward walls.

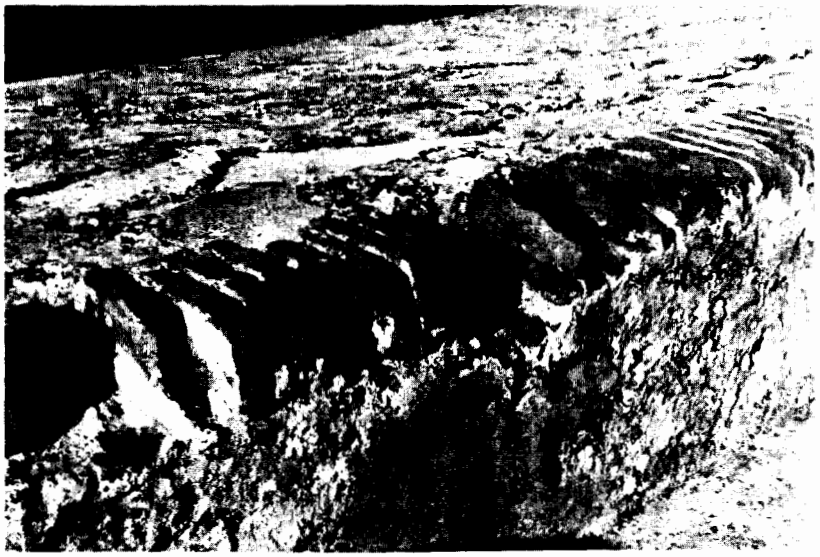
Drains constructed to carry off surface water have eroded and cannot carry out their original function



Most of the fort walls need repair and extensive repointing if they are to be preserved.



Conditions are hazardous to the visitor.



Conditions such as this accelerate the deterioration of the historic fabric.

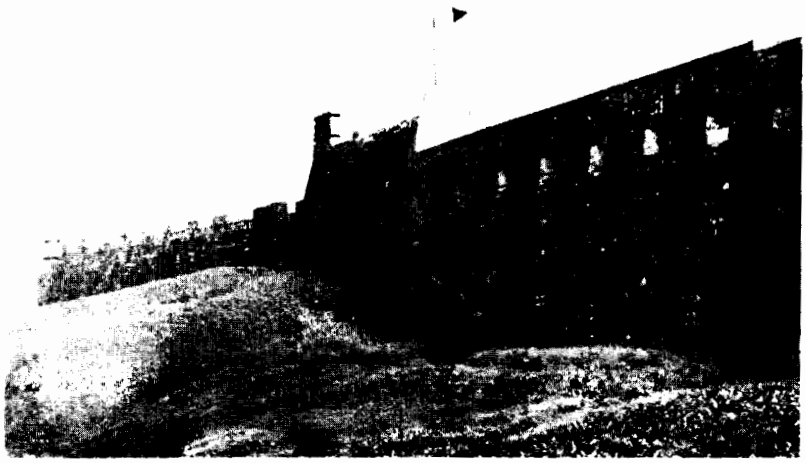
San Juan National Historic Site

El Morro Estimate and Suggested Project Schedule

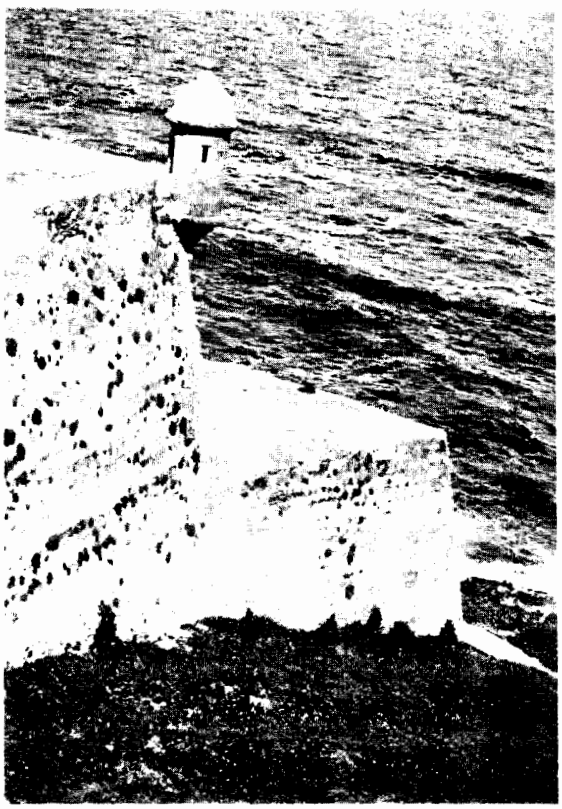
ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Repair, Repoint and Stabilize Masonry Walls		1,563,000.			1,563,000.		
2.	Vegetation Removal		94,000.		94,000.			
3.	Plaza Repair and Repointing		156,000.				156,000.	
4.	Repair, Waterproofing and Stabilization of Terreplein and Roof Decks		54,000.		54,000.			
5.	Foundation Repair and Stabilization		188,000.		188,000.			
6.	Repair and Replacement of Wood Construction		56,000.				56,000.	
7.	Repair and Replacement of Misc. Ironword and Historic Hardware		169,000.					169,000.
8.	Painting		4,000.					4,000.
9.	Rehabilitation of Utility Systems		94,000.				94,000.	
10.	Construct Breakwater		10,422,000.	10,422,000.				
11.	Erosion Control a) Fill Holes and Crevices, Place Gunite and							
	Intrusion Groute at North Slope	523,000.						

El Morro (cont'd)

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
	b) Construct Grade Beam, Fill Cavities, Place Riprap, Gunite and Intrusion Groute on North Exposure	244,000.						
	c) Repair and Protect Retaining Wall East and West of Steps on North Exposure, Install Grouted Rock, Earth Fill and Anchors	550,000.	1,317,000.		1,317,000.			
TOTAL:	NET COST BUILDING, BREAKWATER, AND EROSION CONTROL		$14,117,000.	$10,422,000.	$1,653,000.	$1,563,000.	$306,000.	$173,000.



The Great Wall on the seaward side of San Cristobal has deteriorated greatly since its construction in the late 18th century.



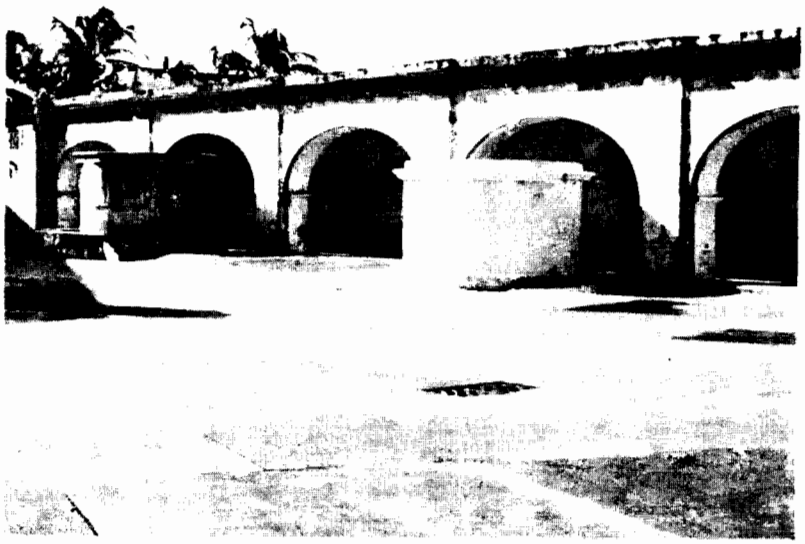
Erosion of the seaward side of San Cristobal is very evident in this photograph.

Surf, wind and rain are slowly eating away the soil on which San Cristobal is built.

The softer stones used in the construction of San Cristobal have completely disintegrated. The extensive growth of vegetation also contributes to the present condition.

In addition to destroying the fabric of the [illegible] Sentry Box, the surf is cutting the foundation from under the structure.

Buttresses constructed to reinforce the walls are deteriorating at an equal rate



character of the fort would be greatly enhanced
the replacement of modern paving materials.

SAN JUAN NATIONAL HISTORIC SITE

San Cristobal Estimate and Suggested Project Schedule

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Foundation, Tunnel Repair and Stabilization		1,063,000	1,063,000.				
2.	Vegetation Removal		106,000.	106,000.				
3.	Repair, Repoint and Stabilize Masonry Walls		2,313,000.		2,313,000.			
4.	Plaza Repair and Repointing		19,000.				19,000.	
5.	Repair, Waterproofing and Stabilization of Terreplein and Roof Decks		1,094,000.			1,094,000.		
6.	Repair and Replace Misc. Metalwork and Hardware		219,000.				219,000.	
7.	Repair and Replace Wood Construction		107,000.				107,000.	
8.	Remove Navy Housing and Restore Historic Grade at El Abanico		344,000.					344,000.
9.	Painting		7,000.				7,000.	
10.	Rehabilitate Electrical System		55,000.					55,000.
11.	Rehabilitate Water System		44,000.					44,000.

San Cristobal (cont'd)

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
12.	Erosion Control a) Cliff Slopes: Repair Sea and Surface Water							
	Erosion, Fill Cavities and Construct Necessary Protection	48,000.						
	b) Devils Sentry Box: Repair Wall and Sea Erosion	18,000.						
	c) Fort Walls: Repair Undercutting and Erosion, Fill Cavities and Construct Protection	68,000.						
	d) La Princessa: Repair Walls, Fill Cavities and Construct Protection	155,000.	289,000.	289,000.				
	TOTAL: NET COST BUILDING AND EROSION		$5,661,000.	$1,458,000.	$2,313,000.	$1,094,000.	$352,000.	$444,000.

The erosion of the plaster from the face of the City Wall leaves the brick and stone work exposed to destructive weathering.

The foundation of the wall is seriously threatened at many locations. Vegetation on the face and top of the wall is destroying the mortar between the bricks and stones.

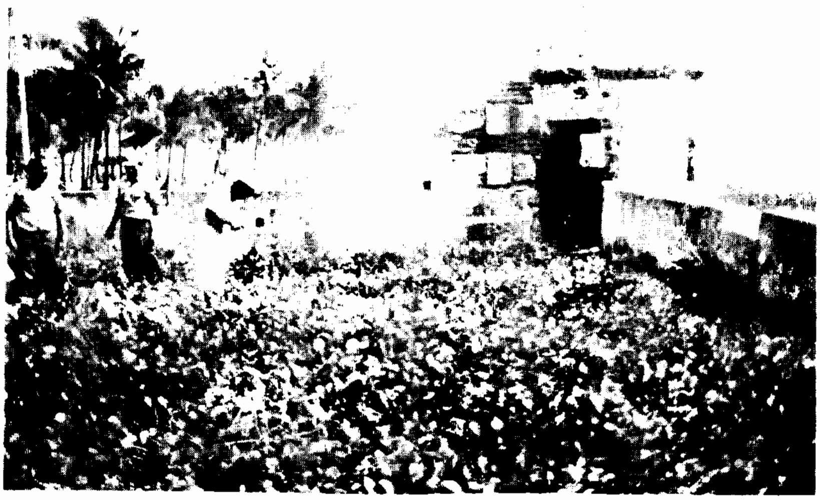
Trees have been permitted to grow on the City Wall. This may be an interesting feature but the ingrowth of the roots doom the wall to destruction if they are not removed.

SAN JUAN NATIONAL HISTORIC SITE

Estimate and Suggested Project Schedule, City Walls, San Juan

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Remove Vegetation		73,000.	73,000.				
2.	Foundation Repair and Stabilization		104,000.	104,000.				
3.	Repair, Repoint and Stabilize Masonry		1,706,000.	000,000.	376,500.	376,500.	376,500.	376,500.
TOTAL	NET COST CITY WALLS		$1,883,000.	$ 377,000.	$ 376,500.	$ 376,500.	$ 376,500.	$ 376,500.

[illegible] Cañuelo was built across the harbor entrance to prevent hostile landings on the western side of the harbor. General deterioration has reached a serious level.



Before any preservation work can be accomplished the vegetation must be removed from the terreplein and walls [illegible] the condition of the plaster and [illegible] brickwork

The plaster covering the parapet and walls has cracked from age, permitting water to enter the walls and causing internal deterioration

The surf has eroded the shoreline to within a few feet of the fort. Some repair has been made but it will be necessary to rebuilt the shore by the placing of riprap and fill.

The stairway from the terreplein and the lower rooms must be restored.

SAN JUAN NATIONAL HISTORIC SITE

El Canuelo Estimate and Suggested Project Schedule

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Remove Vegetation		2,000.	2,000.				
2.	Remove Debris and Material Resulting From Collapsed Terreplein From Interior of Fort		3,000.		3,000.			
3.	Repair and Waterproof Terreplein		29,000.		29,000.			
4.	Restore Cistern		7,000.				7,000.	
5.	Repair, Repoint and Stabilize Masonry Walls		38,000.			38,000.		
6.	Repair and Restore Wood Construction		3,000.					3,000.
7.	Restore and Replace Misc. Historic Metalwork and Hardware		3,000.					3,000.
8.	Painting		1,000.					1,000.
9.	Erosion Control: Place Fill, Riprap and Groute		49,000.	49,000.				
TOTAL:	NET COST EL CANUELO		$135,000.	$51,000.	$32,000.	$38,000.	$7,000.	$7,000.

ST. THOMAS NATIONAL HISTORIC SITE

Fort Christian

ST. THOMAS NATIONAL HISTORIC SITE

Fort Christian

Located in the town of Charlotte Amalie on the Island of St. Thomas, Virgin Islands, Fort Christian was built in 1680 by Denmark to defend the town. Like Christiansvaern at Christiansted on St. Croix, this fort is a typical brick and stone fort in design and is painted barn red.

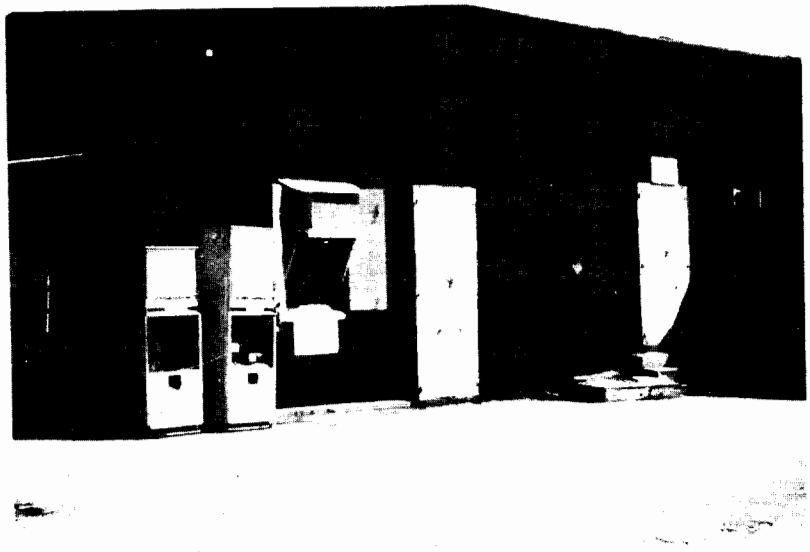
Though it has been established as a National Historic Site since 1960, the National Park Service has little control over the structure. There is a memorandum of agreement between the Park Service and the Virgin Islands government over the use of the fort, but it is general and certainly not clear on whose responsibility it is to maintain the building. A new and more specific agreement should be negotiated.

For some years the fort has been the headquarters for the Virgin Islands police. At the time we visited the structure there was tight security about the place because of certain prisoners being held there; consequently, our access to the fort was limited. We could only walk around the exterior of the fort and around the courtyard. As a result the estimates for repair work given herein are based on little more than a cursory examination of the structure.

It is obvious from this examination that much work will have to be done to the fort to return it to its historic appearance. Windows have been punched into walls where embrasures once were; shed-like appurtenances have been constructed against the fort; the courtyard has been paved with modern concrete; the interior of the fort has been adapted to meet the needs of its present use; and modern fixtures, as well as modern door and window coverings, dot the inside of the structures. These are but a few items that will have to be corrected.

Basically, the fort seems to be in sound condition and but minor repairs will be needed to the masonry. Please keep in mind that the following estimates are based on a limited examination of the structure.

The entire structure has been extensively altered for modern use.



The complete lack of respect for historic fabric is appalling.

This is one of several modern structures attached to the fort.

ST. THOMAS NATIONAL HISTORIC SITE

Fort Christian Estimate and Suggested Project Schedule

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Repair, Repoint and Restore Masonry Walls		359,000.	359,000.				
2.	Repair and Restore Wood Construction		188,000.				188,000.	
3.	Repair and Restore Roof and Terreplein		219,000.		219,000.			
4.	Restore Plaza (Courtyard)		44,000.				44,000.	
5.	Restore Floors		440,000.			440,000.		
6.	Restore Misc. Metalwork and Hardware		219,000.					219,000.
7.	Remove Exposed Electrical Wiring		13,000.		13,000.			
8.	Remove Exposed Water and Sewer Lines		14,000.		14,000.			
9.	Rehabilitate Utilities (Water, Sewer, and Electric)		107,000.		107,000.			
10.	Painting		19,000.					19,000.
TOTAL:	NET COST FORT CHRISTIAN		$1,622,000.	$ 359,000.	$ 353,000.	$440,000.	$232,000.	$ 238,000.

CHRISTIANSTED NATIONAL HISTORIC SITE

Fort Christiansvaern

CHRISTIANSTED NATIONAL HISTORIC SITE

Fort Christiansvaern

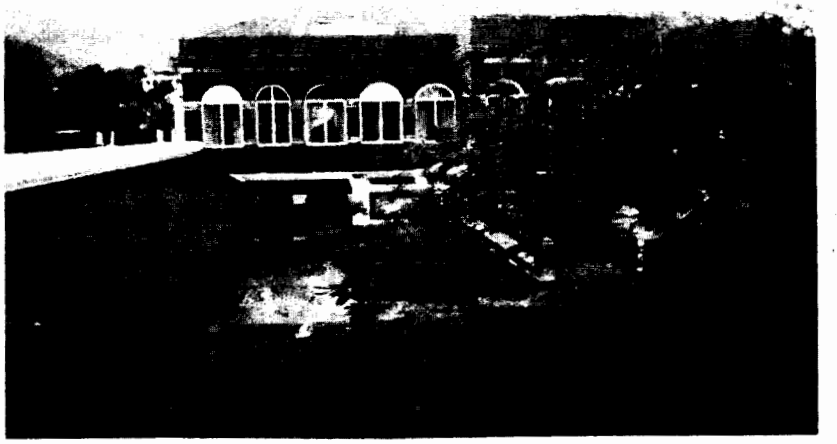
Fort Christiansvaern is one of the six structures included in the Christiansted National Historic Site on St. Croix, Virgin Islands. The fort was built by the Danish Westindien and Guinea Company during the period 1738--1749. Its purpose was to protect the harbor of Bassin around which the town of Christiansted grew during the second quarter of the 18th century so rapidly that in 1755 it replaced the earlier town of Charlotte Amalie on St. Thomas as the capitol of the Danish West Indies. Fort Christiansvaern today is structurally sound generally, however, finishes are run down and show deterioration. With the exception of the brick roofs of the stables and wagon shed and the terreplein of the west curtain, masonry work is limited to finishes and surface treatments and pavements.

The bulk of repairs required are on the wood portions of the fort. Structurally this includes the replacement of beams carrying the masonry decks and roof as well as the reconstruction of the more conventional roof over latrines, washhouse, etc. It also includes frames and sash, interior and exterior, as well as paneling and floors. This work will be the costliest part of the restoration of the fort.

It should be noted that Fort Christiansvaern has retained a high percentage of early hardware and sash even though at this stage these items present a ragged appearance.

In view of the fact that the fort is of considerable historical and cultural interest and that it can be restored at not too great an expense, we recommend that this cause be followed. An estimate of the needed work is as follows.

Over the years some restoration and stabilization work has been done on Fort Christiansvaern.

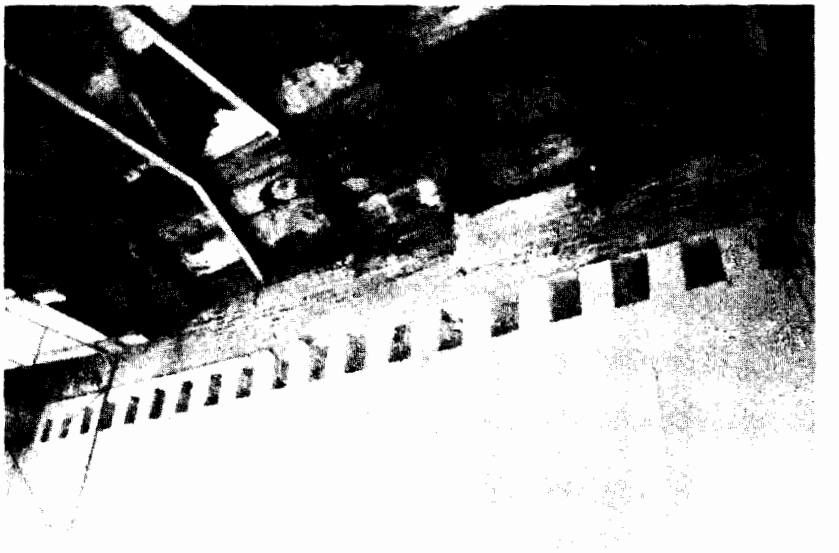


The second floor officers' quarters will be restored to their original condition.

The stables and stockyard will also be restored.

The visitor restrooms are now being improved and adequate water and sewer lines installed.

The windows, door and wood construction in general need repair and restoration.



The present metal covered hipped roof of the officers' quarters will be restored. Note the original roof joist pockets.

CHRISTIANSTED NATIONAL HISTORIC SITE

Fort Christiansvaern Estimate and Suggested Project Schedule

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Masonry Repair, Repointing and Restoration		169,000.		169,000.			
2.	Repair and Restoration of Floors		119,000.			119,000.		
3.	Restoration of Courtyard (Replace Concrete Surfaces)		32,000.					32,000
4.	Repair and Restoration of Wood Construction		91,000.	91,000.				
5.	Replacement of Deteriorated Metalwork and Hardware		66,000.					66,000
6.	Complete Restoration of Historic Roof		150,000.	150,000.				
7.	Restoration of Stables and Stableyard		200,000.				200,000.	
8.	Restoration of Historic Plaster		81,000.			81,000.		
9.	Repair and Waterproofing Terreplein		110,000.		110,000.			
10.	Reconstruction of Historic Dock and Laundry House		53,000.					53,000.
11.	Removal of Exposed Electrical Wiring and Plumbing Pipes		4,000.	4,000.				

Fort Christiansvaern (cont'd)

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
12.	Rehabilitate Utilities		31,000.	31,000.				
13,	Painting		6,000.					6,000.
TOTAL:	NET COST FORT CHRISTIANSVERN		$1,112,000.	$276,000.	$279,000.	$200,000.	$200,000.	$157,000.

FORT JEFFERSON NATIONAL MONUMENT

Fort Jefferson

FORT JEFFERSON NATIONAL MONUMENT

Fort Jefferson

The Army began building Fort Jefferson in 1846 and worked on it over the next 28 years, never completing the fort. The lower level of casemates was completed and armed, as was the upper gun deck or terreplein. The middle tier was not finished and today displays prominently its uncompleted embrasures of ragged bricks forming the general outlines of the gun ports.

This fort is located on Garden Key at the end of the long curving chain of Florida Keys. It was the largest of the coastal forts built to defend the shores of the United States. During the Civil War it became a prison, and after the war contained several involved in the Lincoln Assassination, including the falsely accused Dr. Samuel Mudd.

The upper tier, or terreplein, of Fort Jefferson is covered with sand and grass-type vegetation. The moat, formed by a brick counterscarp, still has water in it, though sand has blown into sections of it; one section, on the back side of the fort, has a sizeable portion filled with sand. Water swirls under some parts of the counterscarp and one segment, about 30 feet long, has been washed away, exposing the moat to the sea.

The fort never engaged in battle, but it stands today as a fine and remarkably complete example of nineteenth century fortifications. Today the fort is seriously threatened with deterioration, and something should be done to preserve it. However, in view of the isolation of the area and the attendant small annual visitaion, one is reluctant to think in terms of expensive restoration to the fort. Consequently, the action we recommend is that needed to slow deterioration of the old structure. If the recommended course of action is followed, deterioration of the fort should not go at a rapid pace for the next 25 or 30 years, and by that time conditions may change so that then there may be good reasons to save the whole fort. The Park Service should concentrate now its efforts on restoring only the front section of the fort and the two associated bastions, one of which was Dr. Mudd's cell. The four major causes of the fort's problems are: (1) exfoliation of the metal framing of the gun ports, (2) the damaged counterscarp, (3) leakage of water down from the terreplein, and (4) deterioration of the masonry from the atmosphere.

Metal Framing of Gun Ports

The heavy iron that is buried in the brick surrounding the gun ports is rusting and the resultant expansion is pushing the outer layer of brick away from the wall. In some places the brick has already fallen away, while the bricks around some of the ports are bulged out like huge blisters. Through the years this condition will continue until the bricks around each gun port will be pushed away from the wall to fall into the moat. Since the only section of the fort to be restored is the front section and its bastions, there is no need to be deeply concerned about the exfoliation of the metal gun port frames on the other five sides of the fort. However, the metal in the gun ports on the two sides flanking the front should receive some treatment to slow destruction of the gun ports. The metalwork should be wire-brushed as far as can be reached without removing the surrounding bricks, and the metal should then be coated with a preservative. On the other three sides the metal should be left to rust and to push away the bricks. Such action will do no harm to the basic structural strength of the fort's walls. The metal framing and shutters of the gun ports on the front side of the fort, however, should be removed and new components, treated with preservatives, should be installed and covered with brick as was done when the fort was constructed originally. Consideration should be given to replacing these features with material that is non-exfoliating.

In view of the desire to restore only one side of the fort--the front side--it will, of course, be necessary to restore the gun ports there to their original appearance so that in at least some of the casemates guns may be placed.

The Counterscarp and Moat

The counterscarp forming the moat appears to be in reasonably good condition. There is, however, one gaping hole in it where time and the sea have gnawed out a segment about thirty feet long. In addition, the gateway built into the wall to control the level of water in the moat now stands open, permitting the water to flow freely into and out of the moat. These two openings allow the water in the moat to rise and fall with the tide causing water action around much of the foundation of the fort, especially during storms.

Past efforts to repair and plug the break in the counterscarp have been only temporarily successful. It has been proposed that a bridge-like structure be erected at the broken section of the counterscarp, and let the water flow in and out during storms. This procedure, it would seem to us, would do nothing to inhibit the action of the water around the foundation of the fort proper. We, therefore, recommend that the damaged section of the counterscarp be rebuilt and a tide gate restored to control the ingress and egress of water into the moat. Moreover, in one or two places the sea has eroded the sand from beneath the foundation of the counterscarp. Though small, these holes should be plugged.

A recent examination of this section of the counterscarp has led one member of a private engineering firm to recommend that the holes be plugged with nylon bats inflated with cement. We suggest that a second firm be hired to determine the feasibility of this technique.[1] Controlling the flow of water in the moat will not stop the deterioration of the fort's foundation, but it will slow it considerably since there will be less swirling action of the water. Further, this work will not be expensive, and should add years to the life of the fort.

Terreplein

Water seeps down from the upper gun deck, or terreplein, through the walls of the fort, leaching mortar from between the bricks. In a number of places on the first and second level one can see stalagmites and stalactites froming from the lime in the mortar. This erosion, of course, is weakening the walls of the fort.

The sand on the terreplein should be stripped back and a waterproof membrane should be installed. The sand should then be placed back over the masonry to serve as the wearing surface. At the same time, since the bulk of it is on the terreplein, the water catchment system should be repaired. Exposed portions should be restored to historic appearance, but the remainder may utilize modern materials and techniques. The same type of repairs should be made to the cisterns.

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1. Joseph P. Welsh to Jack Stark, Cherry Hill, N. J., February 19, 1973, in files of Everglades National Park. Welsh is District Manager of the Soil Technology Department of Raymond International, Inc.

This work will not in itself halt deterioration of the fort, but it will appreciably slow it, stopping the water from seeping down into the interior of the wall and eroding the mortar within the structure. Perhaps just as important, this work will buy time by slowing deterioration to the point that should conditions change twenty years from now, the Park Service could decide upon a course that would aim toward a greater degree of restoration than now envisioned. It is essential to repair the catchment system and cisterns since this is the only source of fresh water for monument personnel and the visitors.

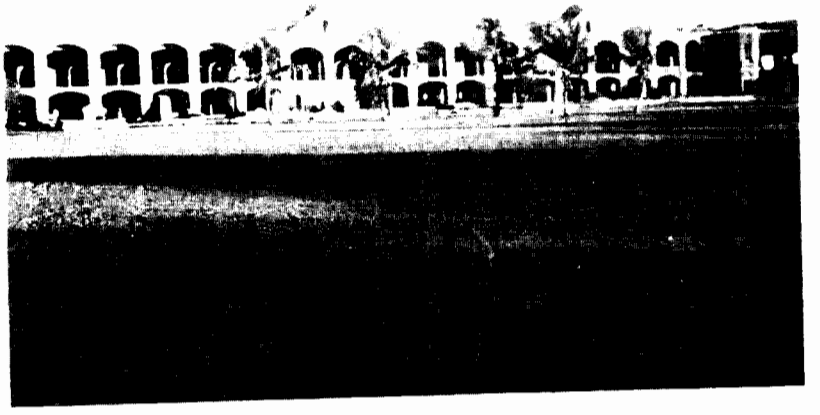
Miscellaneous

The remainder of the work at Fort Jefferson should consist of stabilizing foundations of structures in the courtyard, removal and/or repointing of bricks that are hazardous to visitor safety, stabilizing of the hot shot furnace, and stabilizing of the uncompleted powder magazine.

This work will be expensive, but beside providing an increased degree of visitor safety, holding the various structural remains mentioned above in their present condition will add depth and clarity to the interpretation of life and activity at the fort.

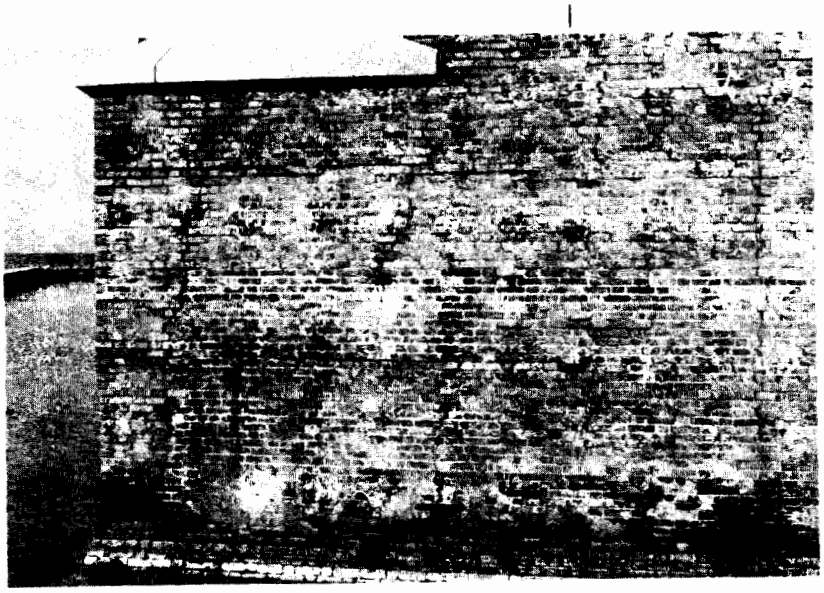
Officers' Quarters

The officers' quarters, now little more than a rubble pile, should be reconstructed to its historic appearance on the exterior, but the interior should be adapted as modern living quarters. Additional housing is needed for park personnel who are presently jammed into jury-rigged quarters in the casemates.



These two photographs can only suggest the magnitude of Fort Jefferson, the largest masonry fortification constructed by this country.

The sally-port and historic entrance of Fort Jefferson will be restored.



In places where the cracking of the walls is serious foundation repairs will probably have to be made. Other areas may only require minor wall repair and repointing of the cracks.

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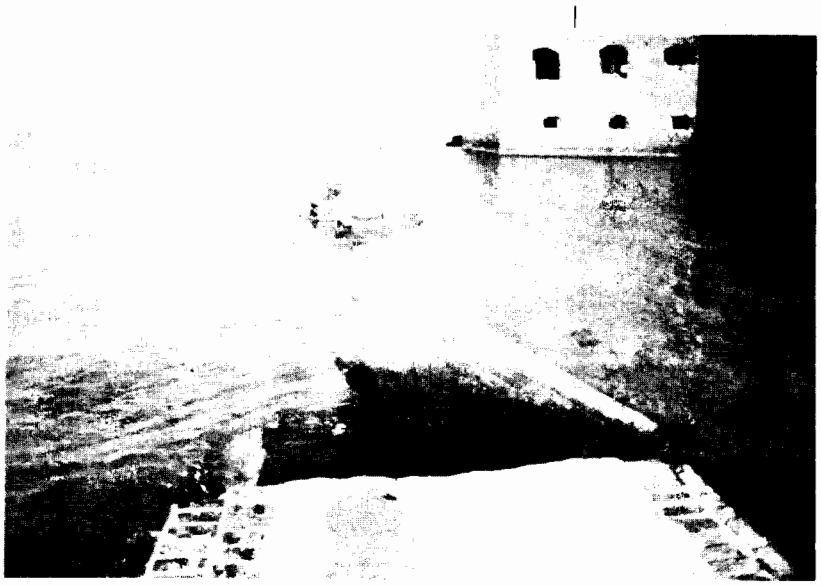
[illegible] stabilization of



To prevent future damage to the fort the counterscarp [illegible] be repaired and stabilized.

FORT JEFFERSON NATIONAL MONUMENT·

Fort Jefferson Estimate and Suggested Project Schedule

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Foundation Repair and Stabilization		1,066,000.	1,066,000.				
2.	Stabilization of Exterior Masonry Walls		823,000.		823,000.			
3.	Stabilization of Interior Masonry Walls and Ceilings (2 tiers)		1,084,000.			1,084,000.		
4.	Stabilization of Slate Floors (2 tiers)		220,000.			220,000.		
5.	Terreplein Waterproofing and Water Catchment System Repair		462,000.		462,000.			
6.	Cistern Repair and Restoration		121,000.				121,000.	
7.	Restoration of Sally Port, Reconstruction of Drawbridge and Historic Approach		480,000.				480,000.	
8.	Interior Restoration and Furnishing of One (1) Casemate Complete with Cannon		112,000.					112,000.
9.	Interior Restoration and Furnishing of Dr. Mudd's Prison Cell		15,000.					15,000.
10.	Stabilize Large Powder Magazine		23,000.				23,000.	
11.	Stabilize Hot Shot Furnace		22,000.				22,000.	

Fort Jefferson (cont'd)

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
12.	Restore Metal Embrasure Shutters and Embrasures on Front Curtain		235,000.		235,000.			
13.	Exterior Restoration of Front Curtain		295,000.				295,000.	
14.	Stabilization and Partial Removal of Exfoliated Metal Embrasure Shutters		109,000.		109,000.			
15.	Repair and Stabilization of Counterscarp (Outer Moat Wall). Includes Reconstruction of Missing Section		395,000.	395,000.				
16.	Rebuilding and Adapting of Third Officer's Quarters as N.P.S. Quarters		94,000.					94,000.
17.	Restoration of Other Misc. Ironwork and Hardware		16,000.					16,000.
18.	Painting		6,000.					6,000.
TOTAL:	NET COST FORT JEFFERSON		$5,578,000.	$1,461,000.	$1,629,000.	$1,304,000.	$941,000.	$243,000.

CASTILLO DE SAN MARCOS NATIONAL MONUMENT

Castillo de San Marcos

CASTILLO DE SAN MARCOS NATIONAL MONUMENT

Castillo de San Marcos

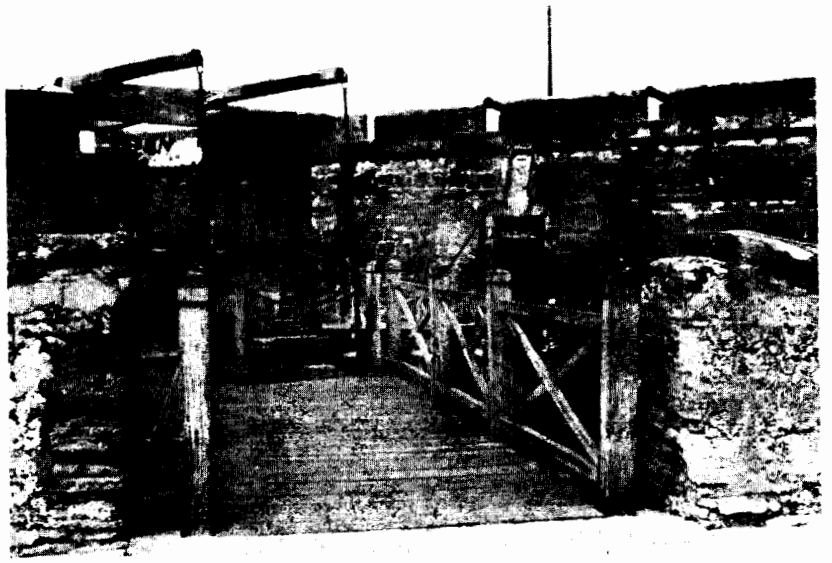
Probably no masonry fort in the National Park System has been more in the forefront of National Park Service thinking, for publicity purposes, than Castillo de San Marcos. Since the 1930's it has been the premier symbol in the United States of Spanish settlement in this country. Indeed, these remains are directly linked to the establishment of the first city in the present United States.

It comes as a distinct surprise to find the fort in its present condition. There are serious vertical cracks in the curtain of the fort, but preliminary investigations by Archeologist George Fischer indicate they do not extend much beyond the waterline in the moat. Consequently, the foundation may be in better condition than the cracks would indicate. Erosion of the curtain is much in evidence, particularly at mortar joints. This same erosion condition holds true for the counterscarp, which forms the outer wall of the water moat, the covered way which is beyond the counterscarp, and the sea wall. The ceilings and walls of the fort leak indicating internal erosion; indeed, in one room of the fort where museum artifacts are stored it has been necessary to build another room within the masonry room to protect the artifacts from moisture. To stop this leakage the Park Service a few years ago paved the terreplein with "Laycold." This glaring white asphaltic coating is not historic in texture , color, or appearance, and the only thing positive about it is the fact that it serves as a wearing surface to protect the coquina stones of the terreplein. It inhibits, but by no means halts, the flow of water into the interior of the castillo's walls.

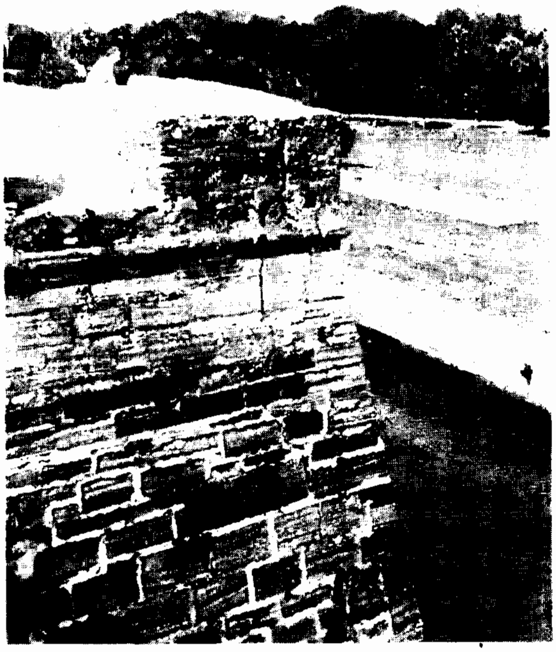
The woodwork is generally in fair condition, but some major repair work needs to be done. The drawbridge needs to have wood replaced, and many of the doors within the fort show signs of serious rot.

This masonry fort is much in the public eye, and it is the outstanding symbol in the National Park Service of Spanish penetration and settlement of the United States; consequently, we feel this fort should be fully and accurately restored. But since restoration work in the past has been haphazard, an orderly scheme of rehabilitation should be worked out. But it must be kept clearly in mind that any such work needs to be based solidly upon thorough historical and architectural research. The fact that Castillo de San Marcos National Monument is a Bicentennial park lends urgency to the need to begin work soon.

Cracking of the comina walls is undoubtedly due to foundation failure or movement over the years. The more serious areas will require repair and reinforcement to the foundation, in other areas repair and repointing will be sufficient to correct this damage.



The present condition of the restored drawbridges necessitates the replacement of the wood construction



Cracks such as this emphasize the need for prompt action to prevent the loss of large portions of the fort wall.

The concrete surface on [illegible] and the area w[illegible] [illegible] appearance.

Cracks permit water to enter walls and floors of rooms

CASTILLO DE SAN MARCOS NATIONAL MONUMENT

Castillo De San Marcos Estimate and Suggested Project Schedule

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Foundation Repair and Stabilization		79,000.	79,000.				
2.	Repair and Repoint Masonry Walls		235,000.		235,000.			
3.	Repair, Waterproof and Restore Terreplein		93,000.	93,000.				
4.	Repair and Partial Restoration Interior Floors		9,000.					9,000.
5.	Repair and Stabilization Interior Walls and Ceilings		103,000.			103,000.		
6.	Repair Drawbridges		17,000.			17,000.		
7.	Repair and Stabilization Counterscarp (Moat Wall)		122,000.				122,000.	
8.	Repair and Replacement of Wood Construction		9,000.			9,000.		
9.	Painting		4,000.					4,000.
10.	Repair and Stabilization of Misc. Metalwork and Historic Hardware		11,000.					11,000.

Castillo De San Marcos (cont'd)

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
11.	Repair and Stabilization Tide Gates (2)		27,000.				27,000.	
12	Repair and Repointing Seawall		104,000.					104,000
TOTAL:	NET COST CASTILLO DE SAN MARCOS		$813,000.	$172,000.	$235,000.	$129,000	$149,000.	$128,000.

FORT MATANZAS NATIONAL MONUMENT

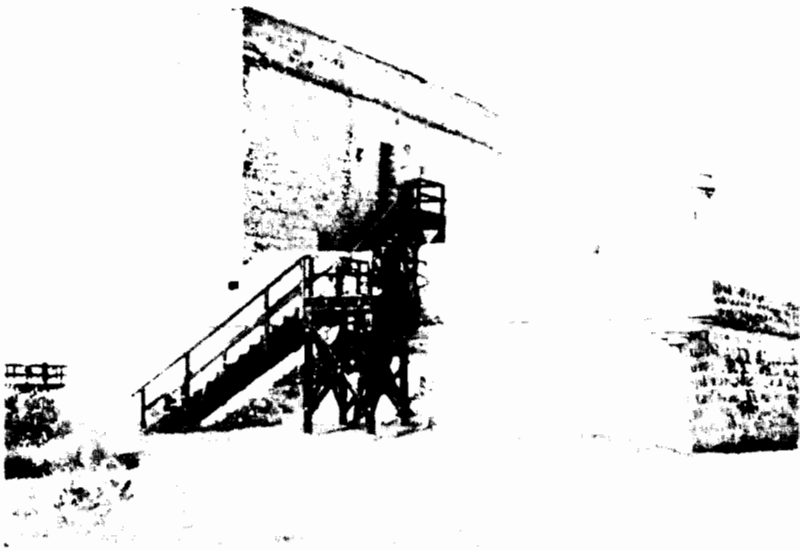
Fort Matanzas

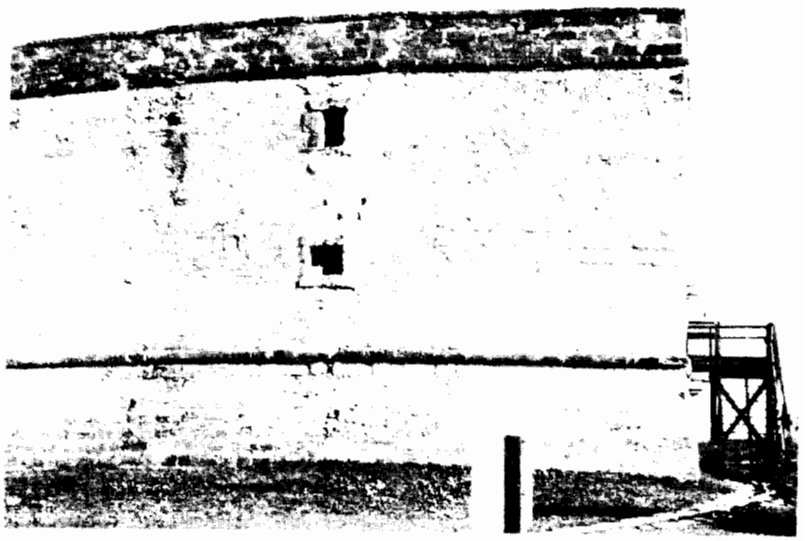
FORT MATANZAS NATIONAL MONUMENT

Fort Matanzas

This coquina structure was a watchtower built about 1742 by the Spanish of St. Augustine to warn that settlement of approaching enemy vessels. It is basically a three story building roughly 48 feet square. The first story which is solid except for a cistern supports the terreplein that could have held six cannon. From the terreplein one enters a room that probably served as quarters for the detachment stationed there. Above this is another small room that served as the detachment commander's quarters, and is entered by a wooden stairway from the terreplein. A ladder through the ceiling of this upper room leads to the observation deck.

Matanzas was restored in the 1930's. The degree of accuracy of the restoration has yet to be fully measured. Many of the wooden members placed in the structure at that time show marked signs of rotting and should be replaced. The beams in the second floor room have rotted. The wooden stairs leading from the ground outside the fort to the terreplein is deteriorating and needs to be replaced. Moreover, they are not historic in appearance. The stairway from the terreplein to the upper room is also rotting and it, too, lacks historical appearance. Safety for the visitor is an important reason to replace the wooden stairs. The stairways should be replaced only after a study has been conducted that will indicate a design of stairs more accurate historically.





The mortar joints have eroded and require extensive repointing.

FORT MATANZAS NATIONAL MONUMENT

Fort Matanzas Estimate and Suggested Project Schedule

* This estimate does not include replacement of the existing non-historic wood docks with a stone quay and groin which could be incorporated with item #8 for an additional $65,000. If the project is programmed separately it could bein excess of this.

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Foundation Repair and Stabilization		51,000.		51,000.			
2.	Masonry Repair and Repointing		19,000.			19,000.		
3.	Repair and Restore Terreplein		13,000.				13,000.	
4.	Repair and Restore Cistern		4,000.				4,000.	
5.	Repair and Restore Second Floor of Observation Tower		4,000.					4,000.
6.	Waterproof, Repair and Restore Observation Deck		5,000.					5,000.
7.	Reconstruct Wood Ladders and Doors (Provide Access Stair for Visitors)		3,000.					3,000.
8.	River Erosion Control (Install Riprap and Earth Fill) *		63,000.*	63,000.*				
9.	Misc. Ironwork and Hardware Restoration		3,000.		3,000.			
10.	Painting		1,000.					1,000.
TOTAL:	NET COST FORT MATANZAS		$169,000.	$63,000.	$57,000.	$19,000.	$17,000.	$13,000.

FORT FREDERICA NATIONAL MONUMENT

Fort Frederica

FORT FREDERICA NATIONAL MONUMENT

Fort Frederica

Founded in 1736 by Gen. James Oglethorpe as a barrier to the Spanish in Florida, the town of Frederica in time consisted of houses, taverns, barracks, and a fort. A wall surrounded the city.

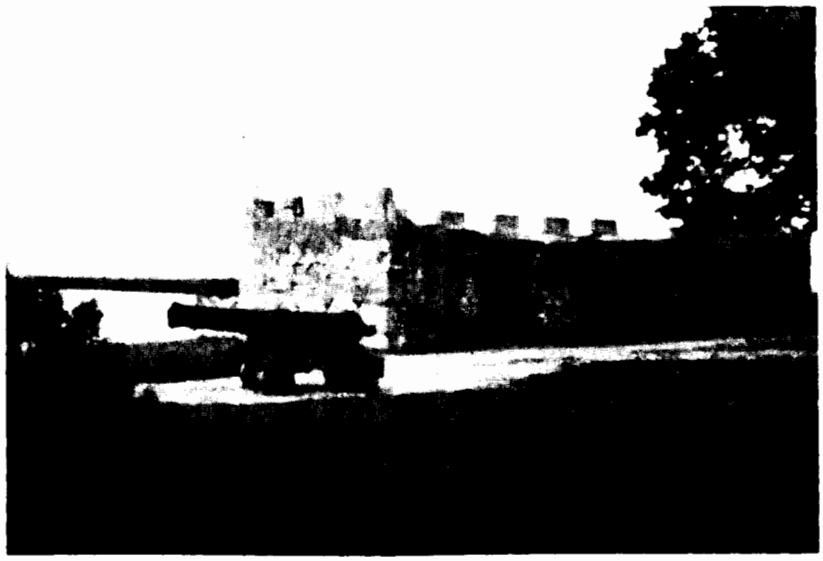
The fort has since disappeared and what remains of it today is a portion of the powder magazine, which had been built of brick and tabby. These remains are in remarkably good condition and will require little expenditure and work to bring them up to first class condition. The tabby is eroding in a few places and it will have to be repointed.

Below the fort the river has over the years changed course and has eaten away a sizeable portion of the bank. This erosion has been successfully halted by the installation of riprap with a partial surfacing of gunite running from low water to the level of ground on which the fort resides. This gunite cover blends in nicely with the natural bank. However, water washes under the riprap and slowly eats away at the earth behind it, causing occasional cave-ins. At such times the park has been filling in the holes with earth. This fill usually lasts for little over a year before another cave-in occurs. To solve the problem on a more permanent basis it will be necessary to extend the toe of the riprap deeper into the water to inhibit underwashing and to fill behind with additional riprap rather than earth as has been done in the past.

The remains of the fort are in good condition and the repair work necessary would have low priority among work needed on masonry forts generally, for others are in much more critical condition. But if the work on the powder magazine is done soon, the deterioration will be caught at an early stage and will, therefore, be much less expensive.

Presently the park has the erosion of the river bank under control, but a permanent solution to the problem would be the extension of the riprap lower into the water and the placing of rock and grout into the erosion holes. This work, however, would be more expensive than the

regular park budget could afford. A special funding for this project will be needed, but the work would have a low priority among that needed for masonry fortification generally. The rock and grout will be one initial expense whereas the present method of repairing the erosion will be a periodical expense.



Only a part of one of the Fort Frederica structures remain.

Cracks and holes such as this must be filled to stop internal deterioration of the walls.

Careless repointing of cracks creates an unsightly appearance.

Some repairs and repointing of the brick veneer is required.

FORT FREDERICA NATIONAL MONUMENT

Fort Frederica Estimate and Suggested Project Schedule

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Repair and Repoint Tabby Walls and brick vaulting.		5,000.		5,000.			
2.	Install Waterproof in Roof		3,000.		3,000.			
3.	Repair and Increase Depth of Seawall		50,000.	50,000				
TOTAL: NET COST FORT FREDERICA			$58,000.	$50,000	$8,000.			

FORT PULASKI NATIONAL MONUMENT

Fort Pulaski

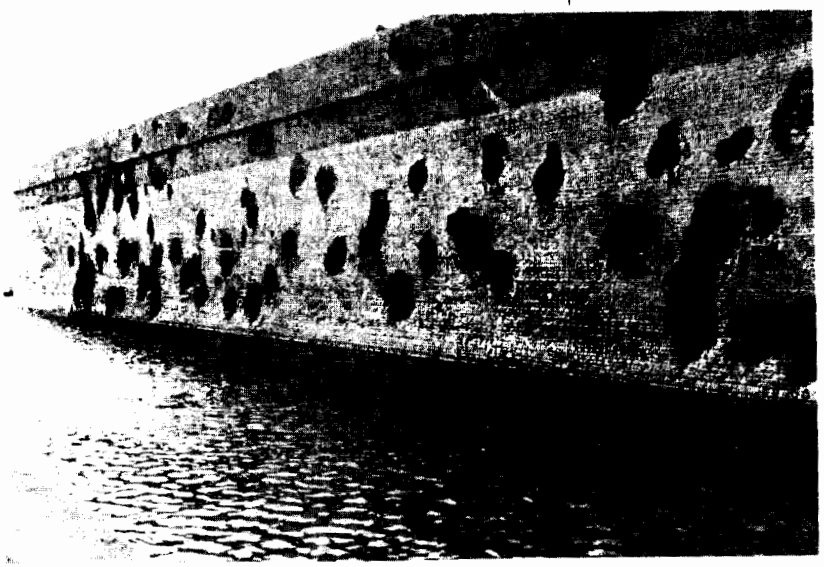
FORT PULASKI NATIONAL MONUMENT

Fort Pulaski

This brick structure, built as a coastal fortification, suffered severe damage from bombardment by the Federal fleet during the Civil War. The exterior walls are today generously pock-marked from this shell fire.

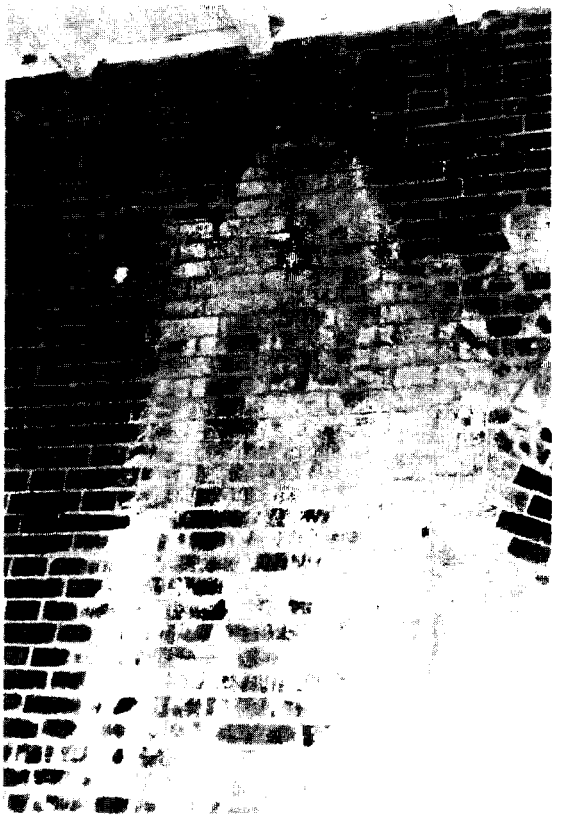
The fort was restored in the 1930's, and in subsequent years, the park had on its maintenance staff a mason who devoted his time to keeping the brickwork in repair. As a result the fort is in remarkably good condition. It is without question the best maintained masonry fort in the National Park System.

The woodwork of the fort is on the whole in good repair, but some of the wooden casemate floors, window frames, and doors are deteriorating and should be repaired to bring the fort up to full maintenance standards.

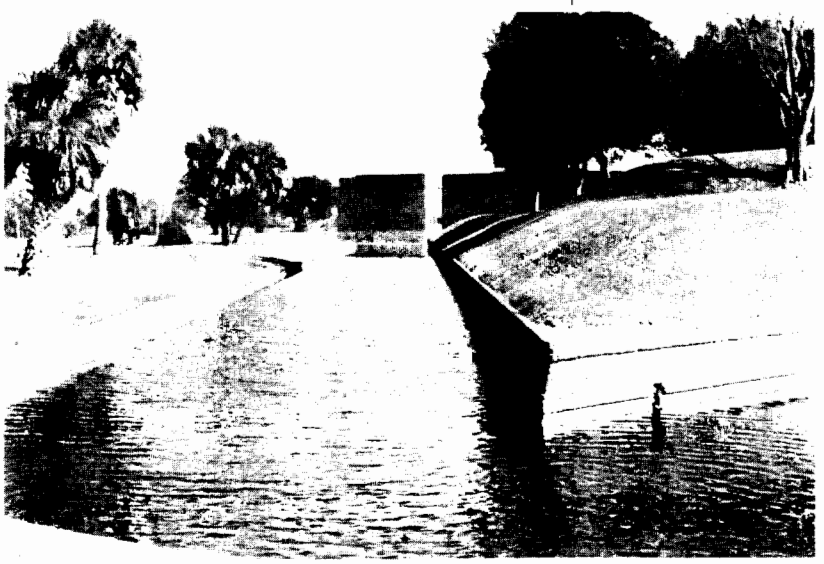


[illegible] maintenance program over the years has prevented [illegible] serious erosion to the masonry wall[illegible] of Fort Pulaski. However, a concentrated program of repointing is needed for preservation. There is no [illegible] to repair the damage sustained during the Civil War bombardment.

In some [illegible] brick should be replaced to stop [illegible] water into the [illegible] walls.



Conditions such as this have been caused by water entering from the [illegible] of the roof. Waterproofing and flashing repair is needed.



FORT PULASKI NATIONAL MONUMENT

Fort Pulaski Estimate and Suggested Project Schedule

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Masonry Repair and Repointing		394,000.	100,000.	100,000.	100,000.	94,000.	
2.	Repair and Restore Wood Construction		75,000.		50,000.	25,000.		
3.	Repair and Resurface Interior Walls, Powder Magazine		14,000.	14,000.				
4.	Waterproof Terreplein		47,000.	47,000.				
5.	Restore Six (6) Cisterns		19,000.				19,000.	
6.	Unplug and Repair Surface Water Drains.		9,000.	9,000.				
7.	Repair and Restore Tide Gate and Bulkhead		15,000	15,000.				
8.	Repair and Restoration Misc. Metalwork and Historic Hardware		4,000.			4,000.		
9.	Painting		2,000.			2,000.		
TOTAL: NET COST FORT PULASKI			$579,000.	$185,000.	$150,000.	$131,000.	$113,000.	

FORT SUMTER NATIONAL MONUMENT

Fort Moultrie
Battery Jasper
Fort Sumter

FORT SUMTER NATIONAL MONUMENT

Fort Moultrie

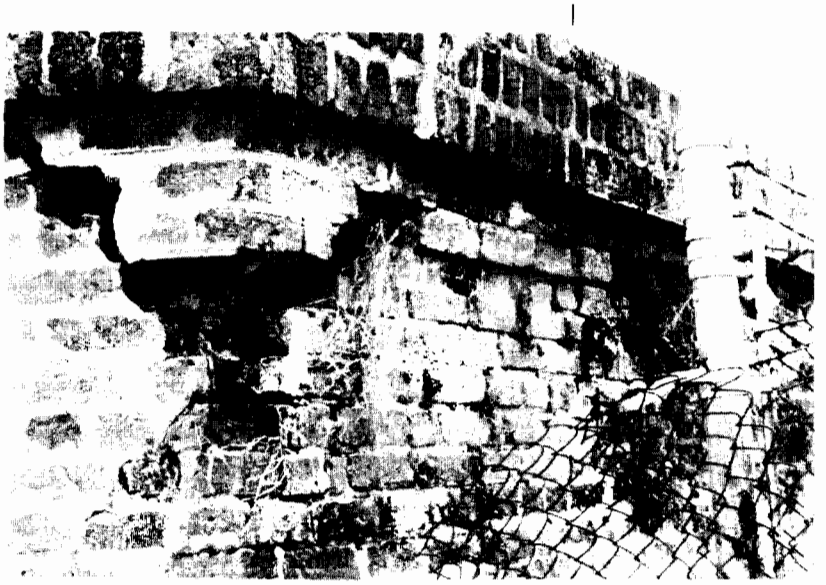
Though small, Fort Moultrie is one of the most complex of the masonry forts in the National Park System. It is a difficult fort to grasp and understand. The exterior of the fort exhibits a structure built in 1809, but once inside all one sees is 1870-1898 and later structures and armaments. The courtyard or parade of the fort has been well dotted with concrete and brick magazines and tunnels, and all of this has been covered with earth so that all that shows of these structures are entranceways and ventilator shafts. Resting on this overburden are series of gun emplacements, or batteries, designed for the long range artillery of the turn-of-the-century period. During World War II the defense establishment built a large concrete structure, several stories in height, that was part of the harbor protection system designed to keep enemy submarines away from U. S. harbors. It was built outside of but adjacent to the fort's walls, though it appears to be inside the fort. Much of the structure was covered with sand, but the building is so tall that it sticks well above ground, dominating the scene. Antennae and a signaling yardarm are perched on the summit of this structure, adding height and unsightliness to the fort.

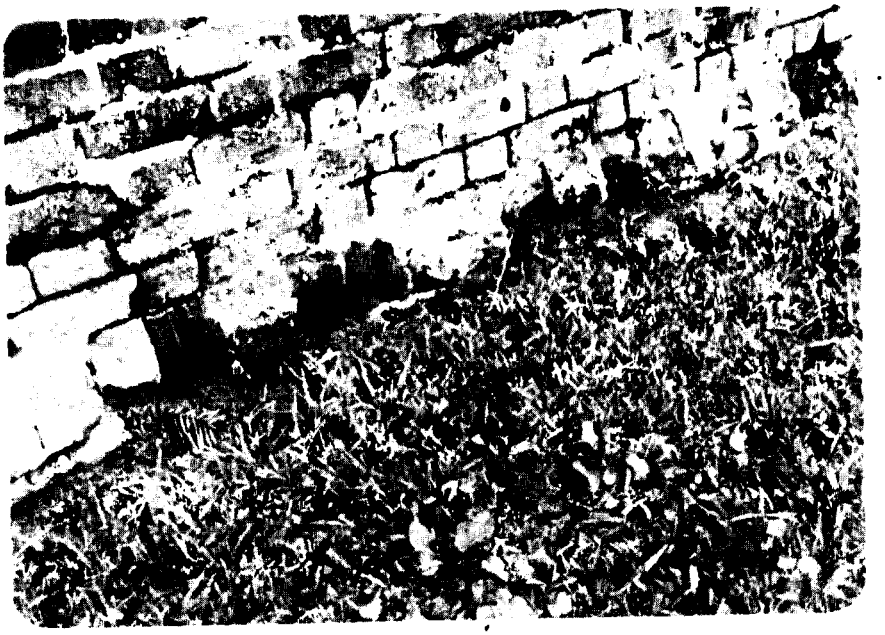
With all of these additions and intrusions, it is difficult, if not impossible, for the visitor to visualize the fort as a bastion fort symbolizing the second system of defense works. But to remove all the later additions and restore the fort to its original appearance would require an expenditure of funds gigantic in proportion. Perhaps for that practical reason, the approved master plan calls for restoring the fort to its appearance as of 1903-1910. To accomplish this objective and to render the fort into a good structural condition it will be necessary to remove the World War II harbor defense, or calibration, station and restore the exterior of the fort that the station apparently rests against, remove the foundation piers of the World War I position finding station southeast of the sally port, repair and restore Batteries Bingham, McCorkle, and Lord, restore gun platforms of the 1872-76 period, remove an early twentieth century latrine, and determine grade of the

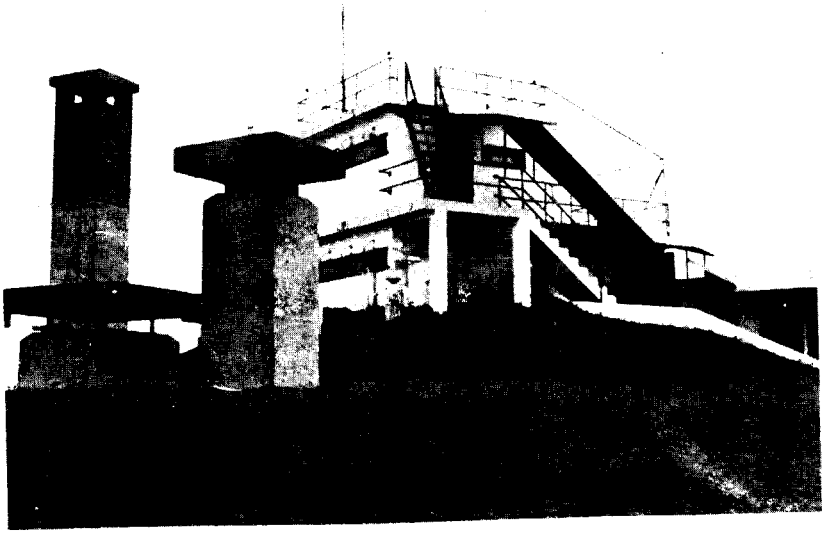
ditch that fronted the sea side of the fort in order to restore it. In addition, the concrete floor of the 1809 magazine should be replaced with a historically accurate brick floor. In many places on the exterior walls, or curtain, of the fort repointing of brick should be done to stop surface erosion. And in other spots it will be necessary to replace bricks that have fallen away. The southeast corner of the fort will have to be rebuilt since the pressure of the earth fill in the fort over the years has forced the wall out. To halt deterioration from rain water it will be necessary to remove earth from the area over the sally port and casemates, apply a waterproof membrane, and then replace the earth. And finally, much of the metal work throughout the fort should be repaired, and in some instances replaced.

The new master plan, still in draft stage, and the interpretive prospectus call for the main thrust of the story to be that of the evolution of harbor fortifications in the United States through World War II. This latter concept would permit the retention of most of the structures now at the fort, including the calibration station. Some of the earth fill inside the fort will have to be removed.

One crucial item that should have been taken care of years ago is the installation of the backflow valve in the fort's drainage system to prevent water from high tides flowing into the fort proper.







Most park facilities such as this restroom will also

FORT SUMTER NATIONAL MONUMENT

Fort Moultrie Estimate and Suggested Project Schedule

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Remove World War I Construction and Restore Site		122,000.	122,000.				
2.	Remove World War II Construction and Restore Site		191,000.	191,000.				
3.	Restore Civil War Emplacements, 1872-76 Gun Platforms and 1898 Batteries		219,000.			219,000.		
4.	Remove Other Modern Construction and Restore Site		3,000.				3,000.	
5.	Remove Concrete Floor in 1809 Magazine and Restore Brick Floor.		3,000.				3,000.	
6.	Reconstruct Southeast Bastion Point		4,000.				4,000.	
7.	Repair and Repoint Exterior Masonry Walls		157,000.		157,000.			
8.	Repair and Restore Missing Stone Parapet Cap		3,000.		3,000.			
9.	Repair, Repoint and Restore Interior Masonry Walls and Ceilings		6,000.		6,000.			
10.	Waterproof Terreplein		24,000.		24,000.			
11.	Repair and Replace Misc. Ironwork, Metal Doors and Historic Hardware		35,000.				35,000.	

Fort Moultrie (cont'd)

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
12.	Unplug and Repair Drain Lines. Install Backflow Valve.		7,000.		7,000.			
13.	Painting		3,000.				3,000.	
14.	Restore Historic Ditch		4,000.				4,000.	
TOTAL: NET COST FORT MOULTRIE			$781,000.	$313,000.	$197,000.	$219,000.	$52,000.	

Fort Moultrie Estimate and Suggested Project Schedule in Compliance with Revised Planning Report of April 2, 1973

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Partial Removal of Fill and Restoration of Parade		5,000.	5,000.				
2.	Restore WWII Control Post		45,000.	45,000.				
3.	Restore WWI and Associate Construction		40,000.	40,000.				
4.	Remove Non-military Construction and Restore Site		3,000.	3,000.				
5.	Remove Concrete Floor, 1809 Magazine, and Restore Brick Floor		3,000.			3,000.		
6.	Restore Civil War Emplacements, 1872-78 Gun Platforms and 1898 Batteries		219,000.	219,000.				
7.	Reconstruct South Bastion Point		4,000.		4,000.			
8.	Repair and Repoint Masonry		157,000.		157,000.			
9.	Repair and Restore Stone Parapet Cap		3,000.			3,000.		
10.	Repair, Restore, and Repoint Interior Masonry Walls and Ceilings		6,000.			6,000.		
11.	Waterproof Terreplein		24,000.		24,000.			

Fort Moultrie--Revised (cont'd)

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
12.	Repair and Replace Misc. Ironwork, Metal Doors, and Historic Hardware		35,000.			35,000.		
13.	Unplug and Repair Drain Lines; Install Back-Flow Valve		7,000.			7,000.		
14.	Painting		3,000.			3,000.		
15.	Partial Reconstruction of First Fort		250,000.			125,000.	125,000.	
16.	Restore Historic Ditch		4,000.			4,000.		
	TOTAL: NET COST FORT MOULTRIE		$808,000.	$312,000.	$185,000.	$186,000.	$125,000.	

FORT SUMTER NATIONAL MONUMENT

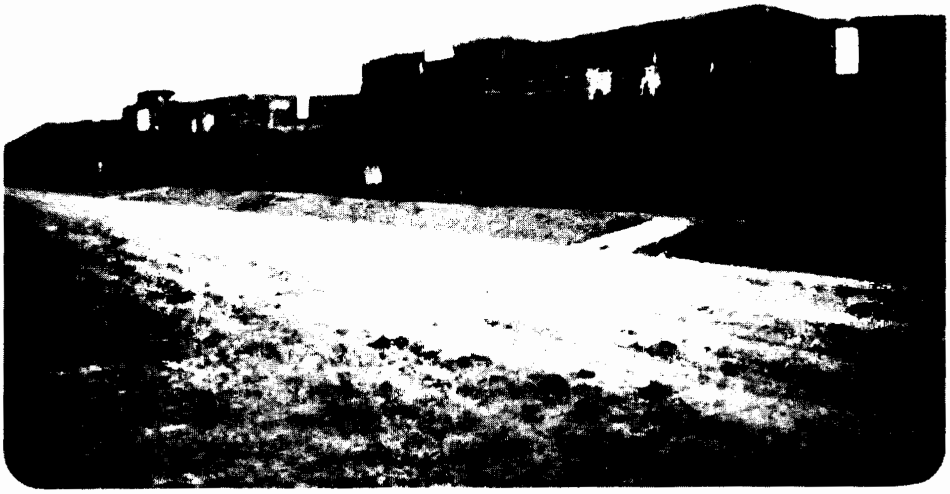
Battery Jasper

Located near Fort Moultrie, Battery Jasper, which is of the Spanish-American War period, is a massive concrete structure that had emplacements for 4 guns.

Today it is closed to visitation, primarily because it is unsafe. Much of the iron railings and iron walkways have either disappeared or have badly deteriorated. Most of the heavy metal doors are now gone, while the remainder have rusted badly. The rails and chain hoists that carried amunition from the powder magazines below to the guns above have rusted seriously, and sections of the overhead rails have been removed. The tar or asphalt that once served as a sealer on the top of the battery has in places been removed, and in other places it has cracked to an extent that it is no longer effective. Here and there are large cracks that apparently penetrate deeply into the concrete hulk and admit water to the rooms on the first level. Many of the concrete steps have cracked in places or have been badly chipped.

In order to restore this battery so that visitors may enter it, a number of repairs will have to be made. The cracks in the structure will have to be grouted, the top will have to be sealed with an asphalt-appearing substance, the walkways on the upper level will have to be rebuilt, and missing metal doors will have to be replaced; those now in place will have to be cleaned, treated, and put into useable condition. It is further recommended that one overhead rail system and its associated shell hoist be restored for interpretive purposes.

Battery Jasper is a good example of a Spanish-American War battery, and as such it is an important segment of, and graphically illustrates, the evolution of coastal defenses from the early nineteenth century to the early twentieth century.



Battery [illegible] is a massive concrete structure. Although it is [illegible] sound, extensive replacement of [illegible] walkways, stairs, and railings will be required to make it safe for visitation.

[illegible] is badly [illegible] allowing water to leak into the rooms. The [illegible] material installed by the [illegible] to [illegible] must be removed and new caulking installed.

FORT SUMTER NATIONAL MONUMENT

Battery Jasper Estimate and Suggested Project Schedule

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Minor Stabilization of Concrete Structure Including Floors.		24,000.	24,000.				
2.	Roof, Remove Existing Expansion Joint Sealant, Clean Joints and Cracks, Caulk and Reseal.		31,000.	31,000.				
3.	Restoration and Replacement of Metal Walkways, Bridges, Stairs, Railings, Doors and Frames, Misc. Metalwork and Historic Hardware.		126,000.		63,000	63,000		
4.	Partial Replacement and Restoration of Ammunition Hoist and Trolley.		12,000.				12,000.	
5.	Repair and Unplug Internal Drainage System, Replace Gratings.		4,000.				4,000.	
6.	Painting.		1,000.				1,000.	
	TOTAL: NET COST BATTERY JASPER		$198,000.	$55,000.	$63,000.	$63,000.	$17,000.	

FORT SUMTER NATIONAL MONUMENT

Fort Sumter

Fort Sumter, the symbol of the Civil War, is a disappointing fort to visit. Had it been left in its condition after the war, it would be a meaningful rubble pile testifying to Southern will and resistance. If it could have survived as originally constructed, architecturally it would have been an interesting structure.

What is there now is one story of a former three-tiered fort, and placed across its parade, from one side to the other, is a massive concrete battery, vintage 1898. One end of this battery known as Battery Huger is tied into the wall of the fort at the historic sally port, or entrance. As a result the Army found it necessary to cut another entrance into the fort. The old entrance is now completely sealed by the end of the battery, but there are remains that mark clearly the roadway from the water's edge to the entrance.

Battery Huger appears to be in very good condition, and it today houses the visitor center and museum. The interior of the battery has been exceptionally well adapted for this use.

The casemates along the lower tier of the fort are generally in poor condition and need much repointing and structural stabilization; indeed, one casemate is heavily shored up to prevent its collapsing. Only about half of the casemates of the lower tier are open, since sand has been filled in between Battery Huger and the side of the fort opposite the present-day entrance. Most of the embrasures in the casemates have been bricked closed.

The upper level of the fort is the exposed top of the first level casemates. One section of the parade contains the foundations and some walls of barracks originally built at the fort.

The fort was originally on an island in the harbor, but since 1865 the setting has changed. Fill from dredging Charleton Harbor has formed

almost a link between the island and the mainland so that the fort is virtually on a peninsula of land.

In view of the fact that the historical integrity of the resource has been violated both by destruction of the setting and drastic alteration of the historic structure, one is hard put to come up with a decision for the future of the fort. It would seem to us that there are three alternatives:

(1) Hold what is there now; keep Battery Huger, but stabilize the old fort's remains, including opening the embrasures.

(2) Remove Battery Huger and its associated structures from the fort, take away the sand fill, restore the original sally port and entranceway, and restore the present entrance to its historic appearance.

(3) Remove Battery Huger and its associated structures, restore the original sally port and entranceway, remove the present entrance, and partially rebuild the fort.

A rough overall cost figure for alternative 1 would be $1,300,000. and for 2 $1,700,000. while alternative 3 would be the most expensive at $1,842,000.

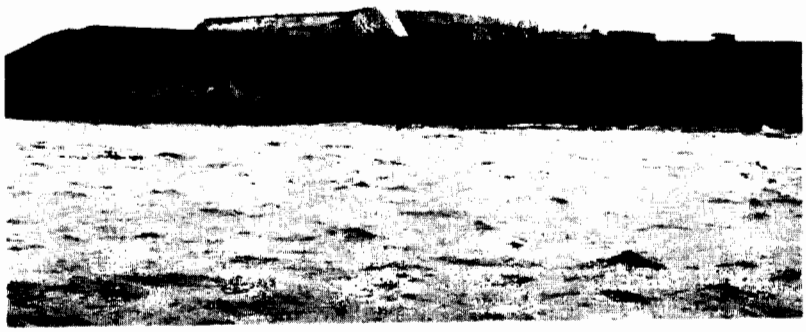
After due consideration we recommend alternative 1. Not only is it the least expensive course, but the historic setting has been so changed that to restore the fort to any stage remotely ressembling its historic appearance would be at best only telling a half truth. No matter what is done to the fort it will always be only a memorial of the historic events associated with it. Since it can only occupy a symbolic position, it makes just as much sense to leave it in its present condition than to restore it to any of its past appearances. Although we do not recommend the removal of Battery Huger, an estimate for this work has been included in our list of estimates.

The next best alternative, we feel, would be number 3. But the question remains: to what stage should it be restored? Should it be restored to its appearance one hour before the Confederates fired on it, or to its appearance when the Union forces surrendered it, or to its appearance when the Confederates evacuated the place in 1865? Any of these

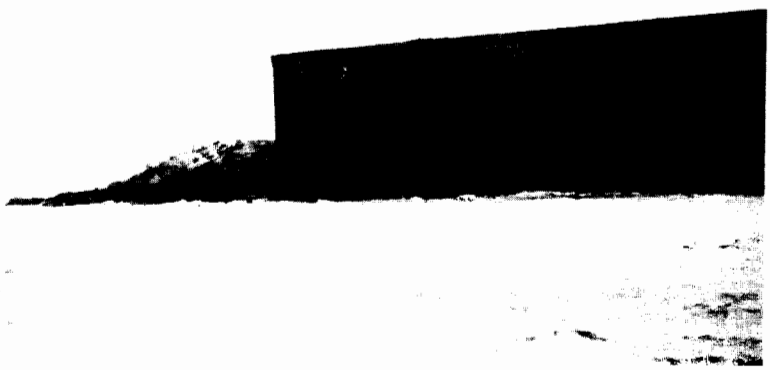
stages would be expensive; would Congress be willing to come up with the money for such work when the story to be told could be done just as effectively with dioramas?

The second alternative would be only a compromise between alternatives 1 and 3, and it would not be a very happy compromise.

The attached estimate is for alternative 3 since that alternative includes the estimates of work needed to accomplish the restoration prepared in each of the three.



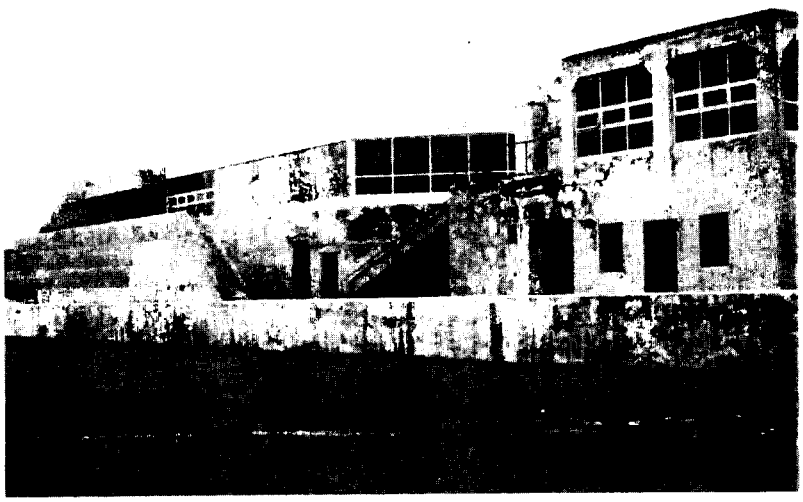
Fort Sumter is located in Charleston harbor on a very tight little island.



Serious foundation failure has occurred at one angle of the fort due to sea action.

Extensive repair and repointing of the masonry parapets is necessary to preserve the structure

The exposed second floor, now acting as the roof, must be waterproofed and repaired if deterioration of the historic fabric is to be stopped



Battery Huger now houses the visitor center and museum.

FORT SUMTER NATIONAL MONUMENT

Fort Sumter Estimate and Suggested Project Schedule

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Repair and Stabilize Foundations		750,000.		750,000.			
2.	Repair Flank Wall		17,000.			17,000.		
3.	Repair and Stabilize Casemates (Piers, Columns, Arches and Vaulting)		95,000.			95,000.		
4.	Remove Battery Huger and Restore Site		525,000.	525,000.				
5.	Clean, Repair and Waterproof Exposed Deck Now Acting as Roof		47,000.				47,000.	
6.	Repair, Repoint and Stabilize Exterior Masonry		125,000.				125,000.	
7.	Repair, Repoint and Stabilize Interior Masonry		70,000.					70,000.
8.	Repair and Restore Wood Construction		8,000.					8,000.
9.	Repair and Replace Misc. Ironwork and Historic Hardware		9,000.					9,000.
10.	Painting		2,000.					2,000.
11.	Reconstruct Portions of Structure Destroyed During Bombardment		125,000.			125,000.		
12.	Restore Sallyport and Entrance (Close Present Entrance		75,000.			75,000.		
	TOTAL: NET COST FORT SUMTER		$1,842,000.	$525,000.	$750,000.	$312,000.	$172,000.	$89,000.

GULF ISLANDS NATIONAL SEASHORE

Fort Barrancas
Battery San Antonio
Redoubt
Fort Pickens
Miscellaneous Batteries
Fort Massachusetts

Fort Barrancas

Built on top of the Spanish Fort San Carlos, Fort Barrancas was part of the defense system erected to protect the important naval base at Pensacola.

Today Fort Barrancas is a four-sided, earth-filled structure. A dry moat runs on three sides of the fort. On the bay side of Barrancas is Battery San Antonio, apparently all that remains of Fort San Carlos. Battery San Antonio is connected to Barrancas by a brick-lined tunnel that leads to the upper level of the fort. The tunnel is now bricked closed at both ends.

Access to the fort is by way of a wooden bridge (non-historic) over the moat and through the entrance that leads to the upper level of the fort. The earth-filled upper level is covered with weeds and small bushes. During the Civil Way and later, guns were mounted around the terreplein, and today the pintles and stone and traverse circles on the gun mounts are in remarkably good condition.

From the outside, the exterior, or curtain, of the fort appears to be in reasonably good condition. A few vertical cracks are visible, but they don't seem serious. However, when one gets inside the fort's walls, he forms a different opinion about the structural soundness of the fort.

At the middle level of the fort there is a passageway that runs from one side of the entrance completely around the interior of the fort's walls to the other side of the entrance. The passageway appears to be a series of gun rooms since each compartment has a slit as if for a rifle. One side of the passageway is the curtain of the fort and the other is a retaining wall, about six feet high, that keeps the sand of this earth-filled fort from spilling into the passageway. At the corners of the fort are powder magazines. These magazines are wood lined.

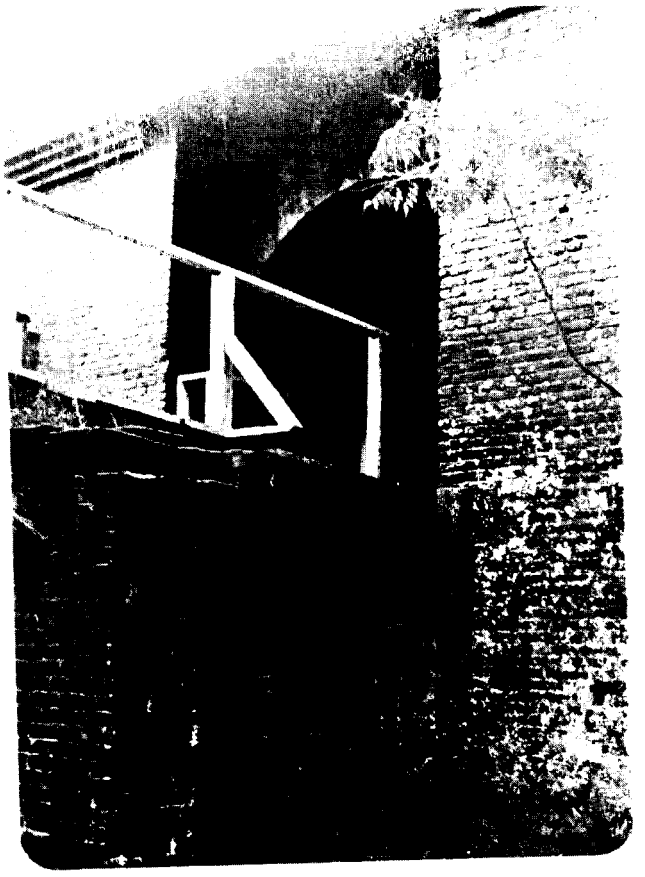
The curtain of the fort is not structurally tied to the vaults and arches of the passageway. As a result the curtain is falling away from the passageway. The most serious separation is now not more than four or five inches, but unless something is done the separation will increase.

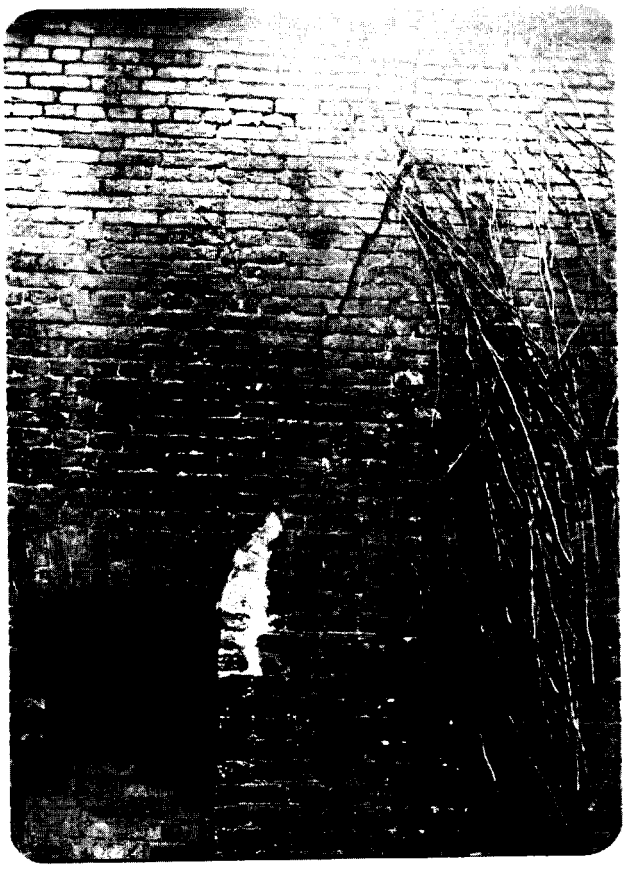
Cracks in the vaults and arches of the passageway are much in evidence, and one corner of the fort is shored up on the interior with heavy timbers. Cracks in the interior of the curtain are also prominent. The powder magazines seem in good condition, although one or two will need to have their wooden linings rebuilt.

A tunnel runs from the fort under the moat to the interior of the counterscarp. The long passageway in the counterscarp has loopholes and, at the corners, embrasures through which cannons could fire. Some of the embrasures have been closed with bricks. The brick lined passageway has long longitudinal cracks in the ceiling. The interior of the wall has seen much water pass through it and this water has eroded mortar from between the bricks with the result that there are many bricks in the overhead staying in place primarily through habit. In the present condition, it would be dangerous to take visitors into most of this passageway.

Much grouting on the interior and exterior of the fort and counterscarp will be necessary to restore some structural strength to the fort. There also should be considerable repointing. The corner of the fort that is shored up will have to be investigated closely and perhaps rebuilt. The powder magazines should be restored to their wood-lined condition, and the passage from Battery San Antonio to the fort should be opened at both ends. The bridge across the moat to the fort's entrance should be removed and a historically accurate one installed in its place. A sealer should be placed on the upper surface of the counterscarp. All embrasures should be opened.

Basically we propose stabilization of thi fort, which should bring the fort into adequate condition to provide for visitor safety and to interpret it effectively.





The foot walls are cracked in a number of places. In some cases correction of this condition will require excavation.

The interior of the fort is covered by vegetation, which [illegible] the present ground level inside the fort must be excavated [illegible] its grade.

In several places wall cracks extend completely through to the interior face.

If a curtain or exterior wall is not bonded to the vaulted ceilings of the gate rooms, it must be determined if this gap between the two surfaces was created by wall movement or construction error.

Repointing of the interior masonry will close the ceiling cracks such as this.

GULF ISLANDS NATIONAL SEASHORE

Fort Barrancas Estimate and Suggested Project Schedule

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Foundation Repair and Stabilization		265,000.	265,000.				
2.	Structural Repairs to Masonry Walls		612,000.		612,000.			
3.	Repair, Repoint and Stabilize Exterior Masonry Walls		251,000.			251,000.		
4.	Repair, Repoint and Stabilize Interior Masonry Walls and Ceilings		173,000.			173,000.		
5.	Repair and Stabilize Floors		58,000.				58,000.	
6.	Stabilize and Partially Restore Sally Port		119,000.				119,000.	
7.	Repair and Waterproof Terreplein		86,000.			86,000.		
8.	Restore Parade to Historic Grade		7,000.	7,000.				
9.	Repair and Partially Restore Magazines		29,000.				29,000.	
10.	Repair and Partially Replace Misc. Ironwork and Historic Hardware		17,000.				17,000.	
11.	Structural Repairs to Counterscarp and Waterproof Ceiling		203,000.					203,000.

Fort Barrancas (cont'd)

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
12.	Reopen and Stabilize Embrasures and Gun Ports		6,000.			6,000.		
13.	Remove Vegetation and Treat to Prevent Regrowth		11,000.	11,000.				
14.	Painting		1,000.					1,000.
TOTAL: NET COST FORT BARRANCAS			$1,838,000.	$283,000.	$612,000.	$516,000.	$223,000.	$204,000.

Battery San Antonio (Fort San Carlos)

In the eighteenth century, the Spanish built here Fort San Carlos. Apparently what survives is the fort's outer defenses which was called Battery San Antonio. The U. S. Army constructed Fort Barrancas over the site of Fort San Carlos. Battery San Antonio is a semi-circular structure with attendant moat. From the interior of the battery a wide brick stairway leads up to the terreplein which forms the back side of the fortification. The only apparent access to the battery is a passageway that runs from the interior of San Antonio up into the interior of Fort Barrancas located above and behind it. At one time Battery San Antonio was obviously restored, for the size and style of brick change. The lower half of the fort consists of wide and narrow bricks, similar to the ones found in El Morro at San Juan National Historic Site. The upper half is made up of bricks similar in size and design to those used in the later Fort Barrancas. How accurate the restoration was will not be known until a historic structure report is completed.

The fortification, including the moat's counterscarp, is solid and shows few signs of deterioration. Some bricks have been chipped away from the terre, lein, as well as from the counterscarp, supporting walls, and other places about the battery. Sand has been poured into the center of the battery and this sand reduces the size of the entrances into two large vaulted rooms at the rear of the battery. A concrete, box-like structure was once on the interior of the battery. In recent years it collapsed, or was destroyed, leaving large chunks of concrete inside the fortification. Thorny vines and other vegetation grow thickly in the battery as well as in the moat.

Sections of the fortification leak badly, particularly under the arch supporting the wide stairway leading to the upper terreplein.

The entrance of the passageway from Battery San Antonio to the interior of Fort Barrancas is partially bricked up to impede access to the fort. Sand has been placed behind this brick wall.

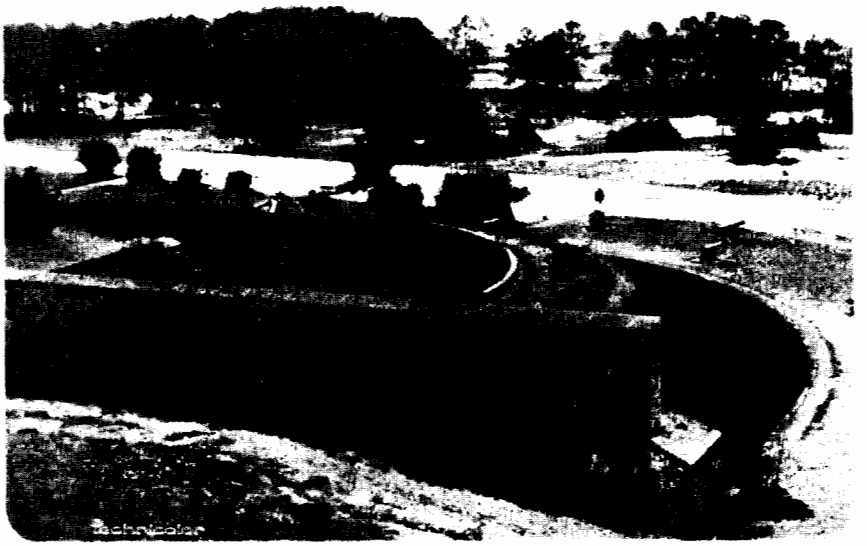
Until a complete study of the fort through the media of a historic structure report is completed, only the following work should be done:

(1) Remove vegetation from the interior of the battery and the moat.

(2) Remove the brick partially shutting off the passageway entrance and clean out the passageway to give access between the battery and Fort Barrancas.

(3) Remove sand and debris from interior of the battery and restore interior to original grade.

(4) Give high priority to a historic structure report.



This semi-circular structure is all that remains of the Spanish fort San Carlos and is believed to have been an outer fortification or battery.

The interior of the battery is overgrown and must be cleared. Vandalism has caused as much damage to the masonry structure as the passing years.

The upper deck and terrapleir will require extensive repair and re pairing.

GULF ISLANDS NATIONAL SEASHORE

Battery San Antonio Estimate and Suggested Project Schedule

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Repair, Repoint and Stabilize the Walls of the Battery, Counterscarp and Small Structure Within the Battery		68,000.		68,000.			
2.	Remove Fill and Concrete Debris from Interior of Battery and Restore to Historic Grade		6,000.	6,000.				
3.	Repair Terreplein. Repair and Waterproof Roof of Small Structure. Repair and Repoint Brick Stairs.		12,000.	12,000.				
4.	Stabilize and Repoint Interior Walls and Ceilings of Small Structure		5,000.			5,000.		
5.	Restore Doors and Frames Small Structure and Wood Construction		7,000.			7,000.		
6.	Replace Misc. Metalwork and Historic Hardware		3,000.			3,000.		
7.	Open and Restore Entrance to Barrancas Passageway. Clean out Passage and Stabilize.		9,000.			9,000.		
8.	Remove Vegetation from Interior of Battery, Walls, Moat and Counterscarp		5,000.	5,000.				
TOTAL: NET COST BATTERY SAN ANTONIO			$115,000.	$23,000.	$68,000.	$24,000.		

GULF ISLANDS NATIONAL SEASHORE

Redoubt

Located north of Fort Barrancas and near the landing field for the Pensacola Naval Air Station, Redoubt is presently an enigma. Little is known of its history and in its present condition it is a difficult defense work to understand.

Like its big sister fortification to the south, Redoubt is an earth-filled fort. An extremely thick and heavy growth of vegetation covers the earth-fill today.

The fort has a dry moat, and thick vegetation grows not only in the moat, but also on top of the counterscarp. Indeed, trees eight or more inches in diameter grow out of the brickwork of the fort and the counterscarp.

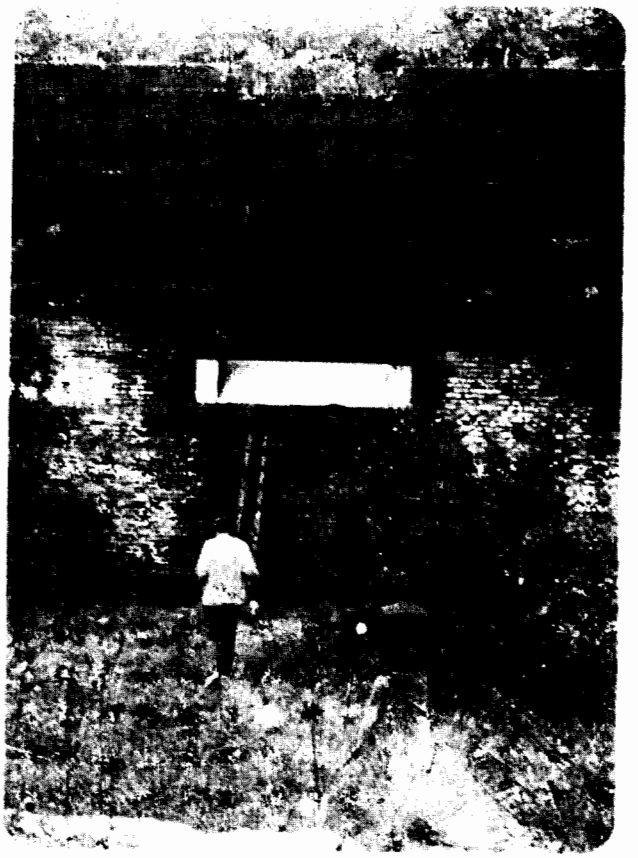
The drawbridge has long since disappeared and access to the fort is difficult. Once inside Redoubt the deterioration is more evident. The brickwork around the entrance, or sally port, is badly damaged. Granite blocks are strewn about, and sand has poured into the passageway, or series of gun rooms, that runs around and through the interior of the wall of the fort. Near the sally port this sand fills the gun rooms. In other parts of the fort the sand covers the floor of the passageways, raising the floor level to varying heights; in some places to the point where it is necessary to stoop in order to pass through the arch openings connecting the gun rooms.

In this interior passageway roots of trees growing on top of the earth-fill are much in evidence. Longitudinal cracks run overhead the length of the passageways. On one side of the fort the crack is so severe that the arches have slipped out of line, and the loss of symmetry is perceptible to the naked eye. Moreover, cracks on the interior extend through the thick brick wall and appear on the exterior. Water seeping into the interior of the fort has eroded mortar from between the brick and has contributed materially to the loss of structural integrity as exhibited by the numerous cracks.

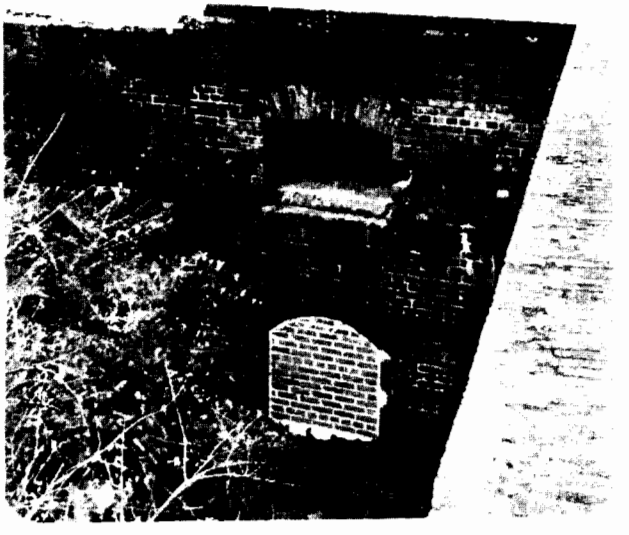
On two corners of this four-sided fort cracks indicate that probably the pressure of the weight of the sand is pushing the walls out at these points. A passageway under the moat connects the fort with the interior of the counterscarp. The inside of this section of the fort shows many cracks and damage from water seepage, and many of the openings to the moat have been bricked closed by the Navy to prohibit access to the interior of the fort.

Much work will be required to get this redoubt into condition to receive even the most limited visitation. It will be necessary to remove the vegetation from the moat, the interior surface of the fort, and the counterscarp. The drawbridge of the sally port will have to be restored, as will much of the granite and bricks forming the opening. The sand that has fallen into the interior passageway will have to be grouted, as will those in the wall. In addition to this patching, it will also be necessary to do much structural stabilization, such as pushing the arches back into place. The cracks in the curtain of the fort will also have to be grouted. The window and door openings now closed by brick patches should be removed and replaced by historic-type doors or grates.

In general the work proposed for this redoubt is that needed to slow deterioration of the structure and to bring it up to minimal standards of safety for visitation. And this work is necessary so that this style of fortification, which is different from the others of the park, can be interpreted.



It is proposed that the solid part
of [illegible]



GULF ISLANDS NATIONAL SEASHORE

Redoubt Estimate and Suggested Project Schedule

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Foundation Repair		288,000.	288,000.				
2.	Structural Repairs to Masonry		626,000.	326,000.	300,000.			
3.	Repair, Repoint and Stabilize Exterior Masonry Walls		244,000.		244,000.			
4.	Repair, Repoint and Stabilize Interior Masonry Walls		168,000.			168,000.		
5.	Repair, Reinforce and Repoint Interior Retaining Walls and Ceilings		107,000.		107,000.			
6.	Repair and Partially Restore Gun Room and Passage Floors		35,000.				35,000.	
7.	Stabilize and Partially Restore Sally Port		109,000.			109,000.		
8.	Repair and Waterproof Terreplein		87,000.			87,000.		
9.	Restore Parade to Historic Grade		54,000.					54,000.
10.	Repair and Partially Restore Powder Magazines		49,000.					49,000.
11.	Partially Repair and Replace Misc. Ironwork and Historic Hardware		19,000.					19,000.

Redoubt (cont'd)

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
12.	Structural Repairs to Counterscarp		140,000.				140,000.	
13.	Waterproof Counterscarp Ceiling		59,000.				59,000.	
14.	Reopen and Partially Restore Embrasures and Gun Ports		16,000.			16,000.		
15.	Remove Vegetation from Terreplein, Parade, Fort Walls and Historic Site and Treat to Prevent Regrowth		20,000.	20,000.				
TOTAL: NET COST FORT REDOUBT			$2,021,000.	$634,000.	$651,000.	$380,000.	$234,000.	$122,000.

GULF ISLANDS NATIONAL SEASHORE

Fort Pickens

Completed in 1834, Fort Pickens is a brick fort roughly 550 feet by 350 feet and is located on Santa Rosa Island, about 12 miles from Pensacola. During the Civil War it was held by the Federals, never surrenduring to the Confederates, despite several attacks. In the 1880's the fort served as a prison for Geronimo and a number of his Apache comrades. The terreplein is earth over brick vaults. Of the five bastions, one was completely destroyed in an explosion in 1899 and a second was badly damaged about the time of the Spanish-American War when the Army lowered it to get the walls out of the line of fire of the guns of Battery Pensacola. This latter massive concrete battery was inserted in the fort in the 1890's and it stretches diagonally across one end of the fort's parade. Although it abuts one interior section of the casemates, the battery does not appear to be connected to any part of the original fort structure.

Fort Pickens generally is badly deteriorated with large cracks in the ceiling of the casemate vaults and in the sally port. These cracks run through and across the casemates. In many sections the interior face of the fort is pulling away from the casemates; in some cases the walls have fallen away. Along one long side of the fort the earth that formed the terreplein has disappeared exposing the brick of the top of the casemate vaults. These tops are badly damaged and along this section the pulling away of the interior face of the fort from the vaults is most serious. When the State of Florida owned the fort it placed tension bars to hold the faces to the vaults, and to keep the vaults from collapsing due to the transverse cracks. These tension bars are most prominent, but they are doing an effective job of holding those sections of the fort together.

The area between Battery Pensacola and the end of the fort has been filled with sand, as are the rooms or casemates that served as officers' quarters along that side of the fort. Thick vegetation grows over the fill and on many sections of the fort, sending roots into the brickwork. The Ranger staff of the park is presently clearing away this growth.

There is much leaking on the interior of the fort. Stalagmites and stalactites formed from the lime in the mortar are much in evidence throughout the casemates.

There are many loose bricks in the overhead. Some brick in the overhead of the casemates and other rooms of the fort are gradually slipping out, and constitute, we feel, a hazard to the safety of visitors.

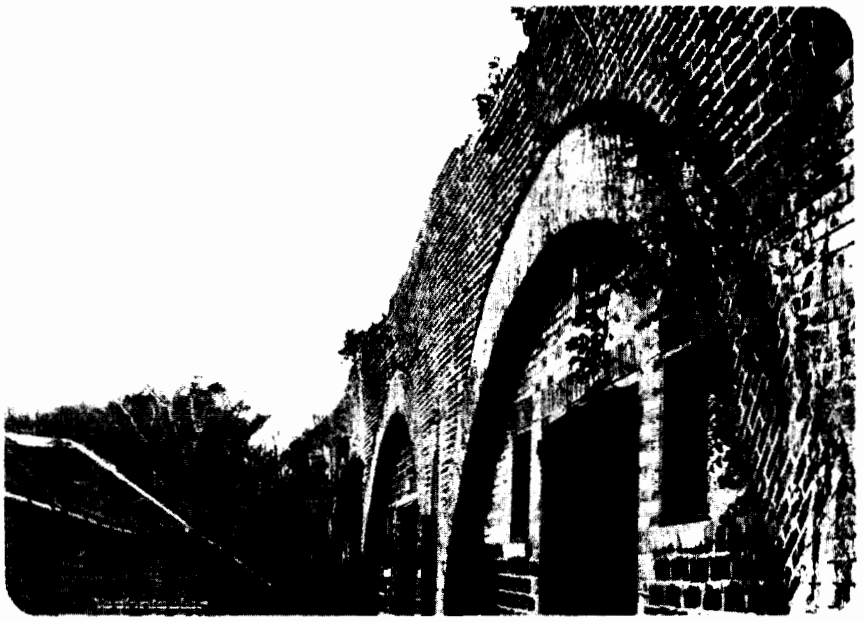
The fort has a dry moat on three sides. One section of the moat has been breached by the main access road into the Park. The counterscarp forming the outer side of the moat is a solid brick wall with earth fill behind it. Forward of the counterscarp is a brick wall rising up four or five feet, and it formed an outer defense work, affording protection for cannon and riflemen.

The curtain of the fort contains cracks, and at the corners of the bastions there are cracks on the exterior of the walls running from top to bottom. Probably this breaking is caused by the weight of sand on the terreplein and in the fort, especially since these cracks are most evident in that area where sand fill has been introduced into the fort.

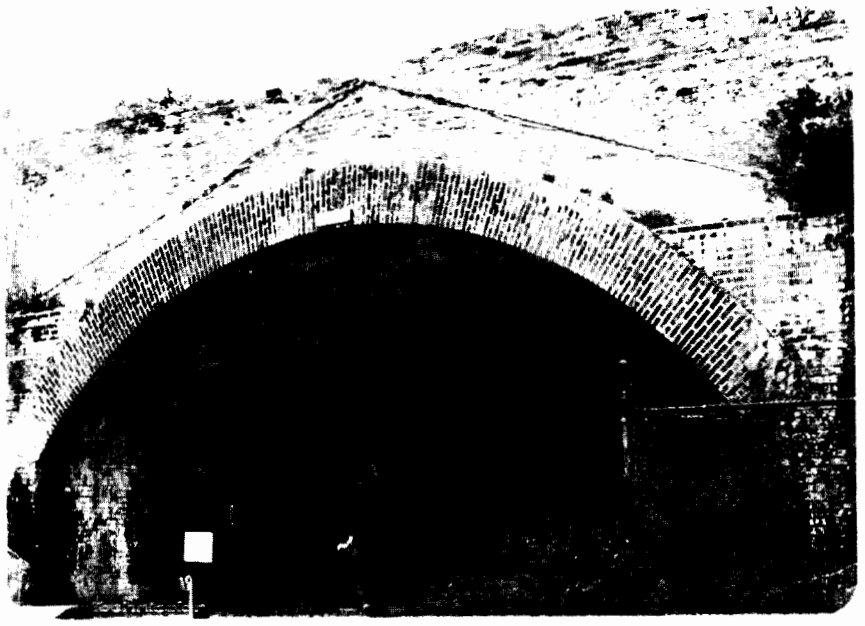
This fort is so badly deteriorated that to completely restore it would require an expenditure of huge proportions. To hold down the costs, we recommend that there be a general stabilization of the remains with a limited restoration of certain portions of the fort. A few courses of brick should be laid to form the configuration of battery which was destroyed in the explosion. Battery Pensacola, its associated structures, and the attendant earth fill should be removed. The sally port should be partially restored and the brick and concrete block that have been used to seal off embrasures, windows, and entrances should be removed. The removal of vegetation should continue. Such repair and repointing as will stabilize the brick work and impede leaking should be undertaken. Tension rods should be used where necessary to hold the fort together. Reinforced concrete vaulting should be placed over the casemates to support the weight of the earth fill that forms the terreplein.

In addition to vegetation in the moat, there is also a brick house-like building that was associated with the operation of the guns of Battery Pensacola. This building will have to be removed from the moat, as will the nearby concrete stand that supported a latter day stairway that ran from the top of the fort to the moat. These structures are of the Spanish-American War period or later, and detract considerably from the historic scene that the park is trying to create.

We recommend restoration of the fort to its suggested general appearance about the time of the Civil War. This is the period of its greatest historical significance, and the work we propose, with the exception of the removal of Battery Pensacola, is what is needed to stabilize or hold what now remains of the fort of the Civil War period



. . . wall on the interior curtain is separating from the main struc- . . . complete collapse can occur at any time. Where this condition ex . . . reinforcing must be installed and repairs made to make the area . . . for public visitation.



. . . . . wall has collapsed. Stabilization of the re- . . . . . make it possible for the visitor to see how the . . . . . of the casemates. . . . . system will also be ex- . . . .

This section was shot in the past year after it presented the collapse of the face wall

This section of the fort was destroyed by the Army for gun fire practice. It will only be stabilized in its present condition.

The terreplein must be repaired and waterproofed to halt deterioration from moisture.

It is proposed that this post-Civil War structure be restored.

The present entrance road was cut through the dry moat of Fort Pickens. It will be relocated and the destroyed sections of the counterscarp rebuilt.

This brick structure was associated with the operation of the guns of Battery Pensacola.

GULF ISLANDS NATIONAL SEASHORE

Fort Pickens Estimate and Suggested Project Schedule

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Remove Battery Pensacola and 1898 Fire Control Bldgs. and Restore Sites to Historic Grade and Appearance.		147,000	147,000.				
2.	Remove Fill From Officers' Quarters		11,000	11,000				
3.	Structural Reinforcement and Repair of Casemates and Terreplein		257,000		257,000			
4.	Waterproof Terreplein		123,000.			123,000.		
5.	Repair, Repoint and Stabilize Interior Masonry		93,000.			93,000.		
6.	Repair, Repoint and Stabilize Exterior Masonry		107,000.				107,000	
7.	Stabilization and Partial Restoration of Sally Port		34,000			34,000.		
8.	Restore Ramp to Terreplein		23,000.				23,000.	
9.	Restore Parade to Historic Grade		7,000.	7,000.				
10.	Restore Geronimo's Cell		8,000.				8,000.	
11.	Partial Repair and Restoration of Misc. Metal-work and Historic Hardware		9,000.				9,000.	

Fort Pickens (cont'd)

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
12.	Partial Repair and Stabilization of Floors		3,000				3,000.	
13.	Remove Present Road and Restore Dry Moat to Historic Grade		18,000					18,000.
14.	Stabilization and Partial Repair and Repointing of Counterscarp. Reconstruct Portion Destroyed to Construct Present Road.		48,000					48,000
15	Painting		2,000.					2,000.
16.	Remove Vegetation from Terreplein and Walls. Treat to Prevent Regrowth. Also Remove Vegetation from Historic Site.		16,000.	16,000.				
	TOTAL: NET COST FORT PICKENS		$906,000.	$181,000.	$257,000.	$250,000.	$150,000.	$68,000

MISCELLANEOUS BATTERIES

Batteries Cullum, Seives, Van Swearingen, and Scott

These batteries were built in the 1890's and are so physically close together that they could be considered as one fortification. These are thick structures of concrete and are basically quite sound. Deterioration is confined mostly to the iron work on these gun emplacements. Iron railings and iron stairways have rusted to the point of being dangerous. This rusted material, as well as metal doors, will have to be replaced before visitors can be allowed to these structures.

There is some leakage in the powder and shell rooms below the gun emplacements. At one time the Army had tar on top of these structures; indeed, patches of it remain today. It is, therefore, recommended that the top surface of the fortifications be covered with tar to halt leaking.

Battery Langdon

This World War II battery is a typical massive concrete coastal defense of the period, having two placements for gun. Buried in the structure, which is covered with sand and vegetation, are several rooms where the ammunition was stored.

The battery is structurally sound and needs no repair work. Both gun emplacements are open to the public now and can be left that way without danger to the buildings, or to the visitors.

We, therefore, recommend that nothing be done to this battery now.

Battery Worth

Built in 1893, this battery has two emplacements for 12-inch mortars. The structure is approximately three stories tall, being topped by a square observation room, and is a massive concrete structure. The lower level contains a maze of rooms.

The building is structurally sound and needs no repair work. Handrails about the structure are in good condition, but they are modern and should be replaced by ones that are similar to those used during the active years of the battery.

The battery is presently open to the public and it poses no danger to the safety of the visitor.

Battery Cooper

This battery is smaller than Battery Worth, but it has two emplacements for guns. It is basically a one-story building, similar in design to others of the Spanish-American War period. There are ammunition rooms on the ground level.

The structure is sound and needs no repair work except to replace handrails and metal stairs that have rusted. It is presently not open to the public, but before it is the aforementioned work will have to be done.

There are several concrete gun pad circles located among the dunes in the vicinity of this battery. They appear to require no stabilization or rehabilitation work.

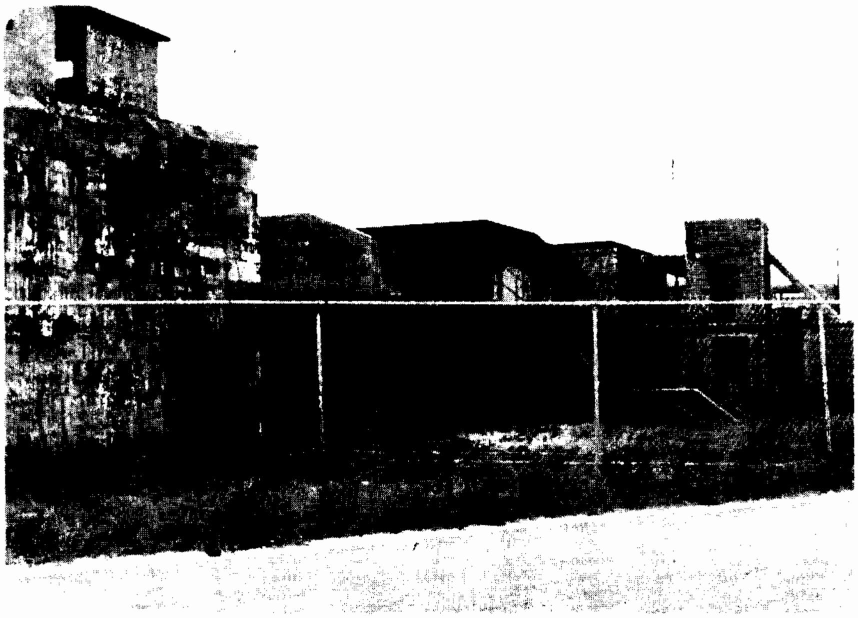
Battery Brown (Battery 234)

This battery is quite overgrown with brush. We did not go inside the building, but this massive concrete building is probably sound. It

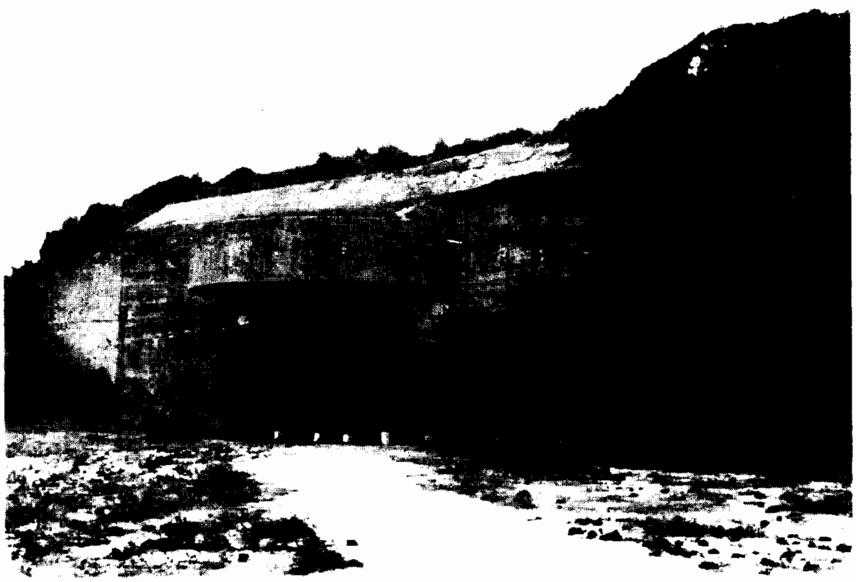
is not now open to the public, but should it be at some future time, the battery should be examined thoroughly then.

Miscellaneous Structures

Scattered about the park are a number of small concrete buildings and open, pad-like gun emplacements, dating from the Spanish-American War, World War I, and World War II. Although we did not examine all of them, the ones we did see indicate that nothing needs to be done to them to preserve these structures. They should be left for visitors to come across, speculate about, and maybe ask questions.

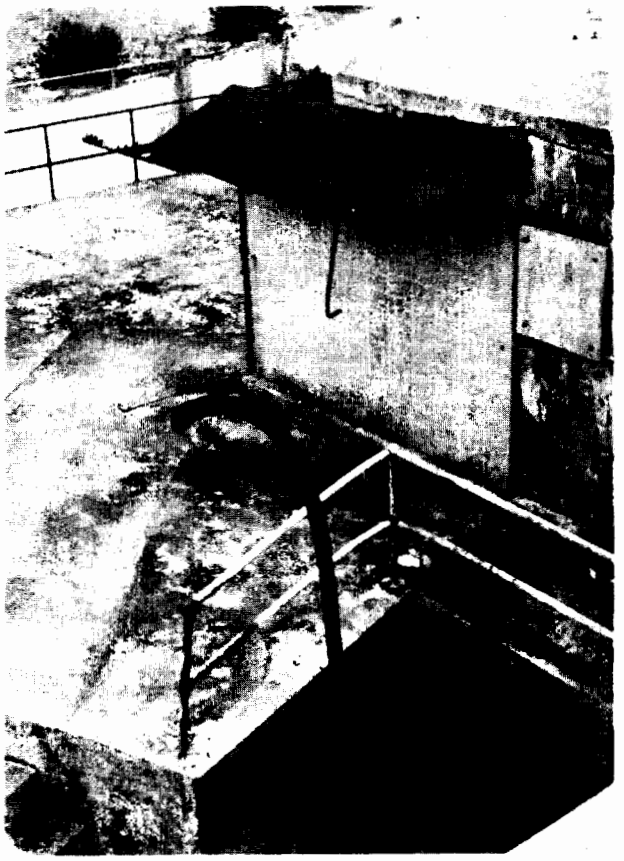


Partial view of the [illegible] connected batteries; Cullum, Seivers, Van [illegible] and [illegible]. The miscellaneous batteries throughout the island appear structurally sound.



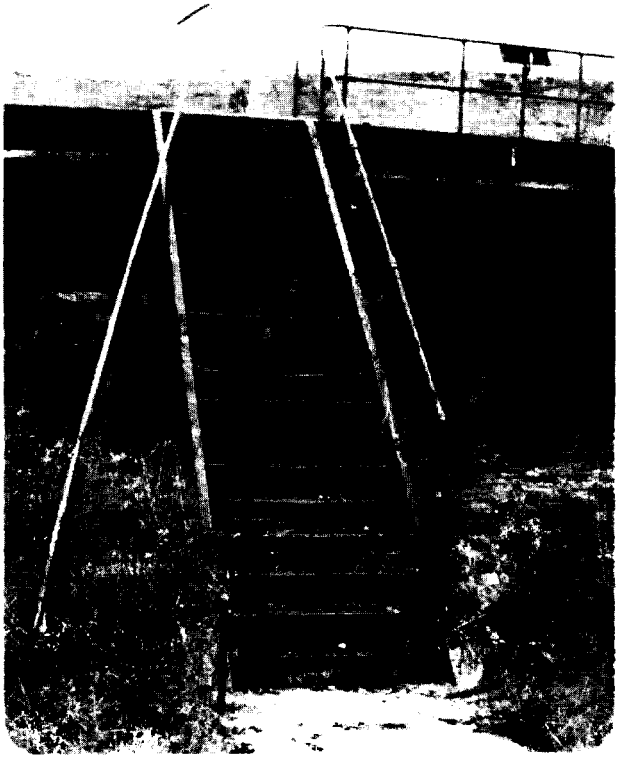
Battery [illegible] is an excellent example of the [illegible] emplacement fortifications on the island.

Cracking of the concrete roof decks appears to be the major problem with all the Batteries. The Army corrected this condition by applying a thick coat of roofing tar or asphalt which has since disintegrated. It is proposed that the roof decks be cleaned and a new application made to stop the leaking.



The miscellaneous ironwork has deteriorated to the point of being hazardous to the visitor. Much of it can be removed. When it is essential to the structure it will be restored.

In locations other than the roof cracks such as this can be sealed to stop the ingress of water.



Weak walls and railings must be restored for the safety of the visitors.

GULF ISLANDS NATIONAL SEASHORE

Misc. Batteries Estimate and Suggested Project Schedule (Batteries Worth, Cooper, Brown, Langdon, Cullum, Seivers, Van Swearinger, Scott and an Undetermined Number of Small Emplacements over the Island)

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Minimum Stabilization of Concrete Construction		17,000.		17,000.			
2.	Roof Repair to Stop Leaking		25,000.		25,000.			
3.	Remove, Repair and Replace Metal Walkways, Stairs, Ralls and Misc. Metal Construction as Required for Safety		85,000.	85,000.				
4.	Repair, Replace and Stabilize Metal Doors, Frames, Ammunition Hoists and Tracks		41,000.		41,000.			
5.	Vegetation Removal and Treatment to Prevent Regrowth		12,000.	12,000.				
TOTAL: NET COST MISC. BATTERIES			$180,000.	$97,000.	$83,000.			

Fort Massachusetts

Completed during the Civil War, this rather small, semicirucular, two tiered fort, is today in remarkably good condition. Certainly it is in the best state of preservation of all the forts of Gulf Islands National Seashore. At the same time it is the most threatened of the forts.

The exterior of the fort is made of two colors of brick, a tan brick composes the lower half and front face while a red brick was used in the upper portion of the fort. Granite capstones top the fort's walls. A grass-like vegetation covers the terreplein and is also growing through the cracks in the concrete capping between the gun emplacements and the outer curtain. In the courtyard there is a unique free-standing circular stairway that is architecturally interesting.

This fort was used for some years by a veteran's organization as a recreational facility featuring dancing and gambling. Although this use introduced modern features and intrusions, it probably also accounts for the reasonably good shape the fort is in today.

At one time Fort Massachusetts was situated solidly on an island, but in the intervening years since its construction the fort has been the victim of hurricanes and erosion. As a result only one small segment of the fort rests on dry land, with the bulk of the fort's foundation exposed to the action of the water. The most apparent effect of this exposure to the water is a collapsed floor of one of the casemates. Also, numerous cracks in the curtain of the fort testify to foundation failure.

In recent years efforts have been taken to mitigate the effect of sea erosion on the fort. A low sea wall of stones and concrete slabs has been placed around the fort. This wall, however, will only slow the deterioration of the foundation, and it has practically no effect on hurricanes and lesser storms which produce seas that top the sea wall.

In order to halt the erosion of the foundation it will be necessary to rebuild the island, and, accordingly, we recommend that sand fill, possibly from the Corps of Engineers harbor dredging activities, be obtained and placed between the fort and the sea wall. This is an immediate problem that should be attended to at once. We also recommend that another riprap sea wall be built about 100 feet from the present one and the intervening space filled with sand to give additional needed protection to the fort.

Because of the exposed position of Fort Massachusetts, the exterior bricks show more wearing than at other forts as a result of storm-engendered wind and water. The damage can be found on the brickwork in the courtyard, but it, of course, is more extensive on the curtain of the fort. It will be necessary to replace much of this brick and to repoint virtually all of these areas to restore reasonable structural integrity to the fort. The hot shot furnace in the courtyard has suffered this damage and needs restoration work.

Several capstones of the fort's outer curtain wall have fallen away, and most are laying on the ground below in useable condition. These stones should be restored to their former positions atop the fort.

Not only has there been leaking of water through the earth-filled section of the terreplein, but also through the cracked concrete capping of the upper tier of the fort. As in other forts this water has, and is, eroding the interior of the fort's walls. The most obvious evidence of this action is the leaching of the lime from the mortar holding the bricks in place in the casemates. In one place in the casemates the wall has become so weakened that it has been necessary to shore up one archway with heavy timbers. It will be necessary to repair the cracks in the concrete capping, or paved area, and apply a water proofing to this concrete as well as to the earth filled section of the terreplein.

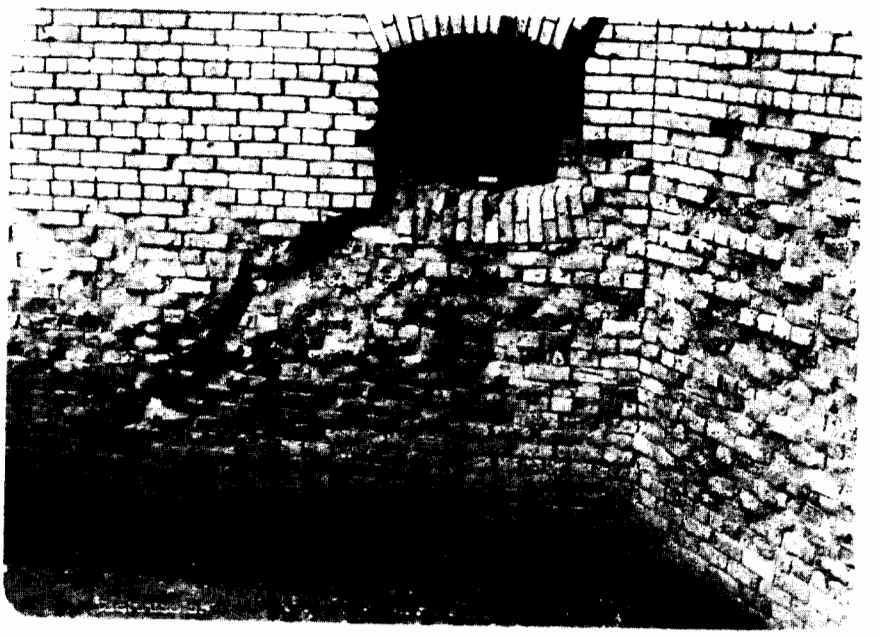
The gun embrasures are framed with metal and have metal shutters that could be closed or opened. All of this metal has rusted extnesively over

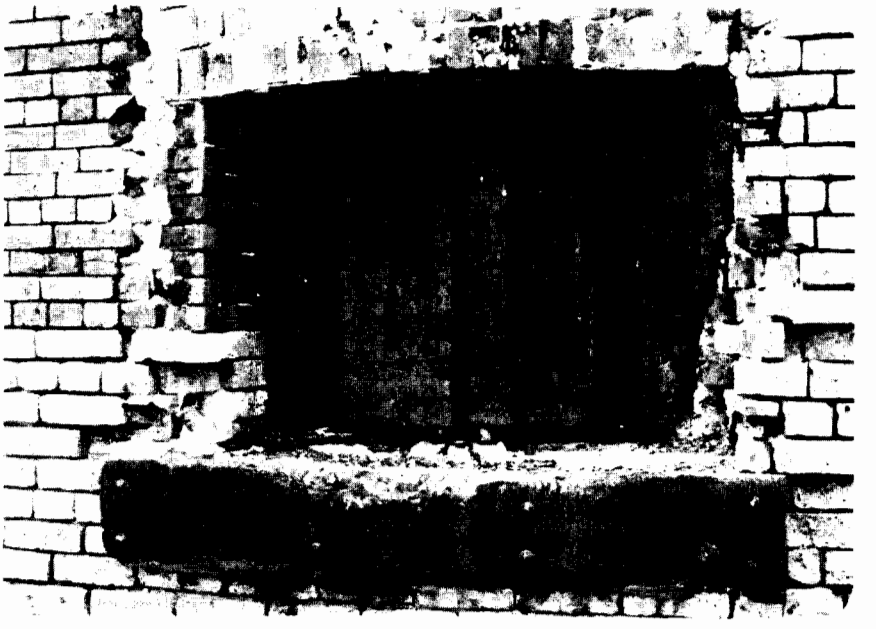
the years, so badly that it will have to be replaced. Fortunately, no part of this metal framing was buried in the brickwork; consequently, the exfoliating metal is not seriously damaging the surrounding brickwork as is the situation at Ft. Jefferson on the Florida Keys.

In essence, we propose full stabilization of the fort to hold what is now there (removing, of course, modern intrusions introduced by the veteran's group), primarily because the fort is in such a good condition that it will not be too expensive to do this work, and when finished the National Park Service will have a good coastal fort of unusual design.

Cannons [illegible] the shoreline until now the waters of the Gulf of [illegible] the [illegible] walls. At one point the foundation has [illegible] the [illegible] of the wall above are partial collapse of [illegible]

The sally-port will be restored as an operating feature of the fort.





The earth surfaces of the terreplein are covered with vegetation which must be removed before any work can be done. Note the splendid condition of the gun mounts.

The paved areas of the terreplein are eroded, permitting water to enter [illegible] will be waterproofed and resurfaced.

An attempt has been made to reduce the wave action against the fort walls. It is proposed that riprap be placed at some distance from the fort and the enclosed area partially filled to reestablish a beach barrier.

GULF ISLANDS NATIONAL SEASHORE

Fort Massachusetts Estimate and Suggested Project Schedule

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Foundation Repair and Stabilization		55,000.		55,000.			
2.	Structural Repair and Stabilization of Walls, Piers and Columns		75,000.		75,000.			
3.	Repair, Repointing and Stabilization of Exterior Masonry		90,000.			90,000.		
4.	Repair, Repointing, and Stabilization of Interior Masonry		15,000.			15,000.		
5.	Repair and Waterproof Terreplein		40,000.		40,000.			
6.	Restore Sally Port		48,000.				48,000.	
7.	Restore Embrasure Shutters		57,000.				57,000.	
8.	Repair and Replace Stone Cap and Misc. Stonework		5,000.				5,000.	
9.	Repair, Stabilize and Restore Misc. Ironwork, Historic Railings and Hardware		15,000.					15,000.
10.	Repair, Stabilize and Restore Wood Construction		4,000.					4,000.
11.	Repair and Restore Casemate Floors		9,000.			9,000.		

Fort Massachusetts (cont'd)

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
12.	Restore Hot Shot Furnace		5,000.					5,000.
13.	Painting		2,000.					2,000.
14.	Remove Vegetation and Treat to Prevent Regrowth		3,000.	3,000.				
15.	Erosion Repair and Control: Install Riprap and Fill		1,000,000.	1,000,000.				
	TOTAL: NET COST FORT MASSACHUSETTS		$1,423,000.	$1,003,000.	$170,000.	$114,000.	$110,000.	$26,000.

FORT WASHINGTON NATIONAL MONUMENT

Fort Washington

FORT WASHINGTON NATIONAL MONUMENT

Fort Washington

Begun in 1814 on the site of another fort, Fort Washington was designed to protect the nation's Capital. It served for a number of years and as changing military technology evolved, the defenses changed. Near the end of the nineteenth century, the army began building massive concrete batteries about the grounds. These batteries, eventually totalling eight, were designed to contain mortars and large breech loading cannons.

Today the brick Fort Washington stands, along with the abandoned, vine covered concrete batteries and their associated structures. Dotted about the ground are other buildings (quarters, houses, administration buildings, etc.) that are apparently associated with the early Fort Washington.

Work is now progressing on the restoration of Fort Washington. The redan is being repointed and repaired so that audiovisual equipment may be soon installed. The redan terreplein has had the earth stripped back so that a sealer could be laid on the masonry to inhibit leakage into the room below. The sealer has been installed and the workmen are now in the process of restoring the terreplein to historic grade with a brick wearing surface. This same process should be followed for all of the terreplein. Also, on the terreplein the gun platforms are in poor condition because of missing brickwork, and the stone and metal gun tracks (traverses) are in disarray and will have to be restored.

All the walls of the fort, including the curtain, show considerable signs of mortar erosion, caused primarily by water seeping into the walls and then freezing. In many places the stone and brickwork are falling away from the outer wall of the fort, and on several corners of the fort the outer layer of bricks are pulling away from the wall.

Presently the restoration crew is looking for the historic drains and as they find these drains the men are cleaning them out. After the drainage problem has been solved, it will be necessary to repoint the walls.

Much of the capstone of the curtain has disappeared or become in a sad state of repair. It will have to be replaced and repaired.

The bricks in the casemates are separating; the cause is not yet known. Probably it is due to water seepage. But nevertheless these areas will have to be repaired. Morover, water runs down through the brickwork and leaches lime from the mortar, for the ceilings have stalacmites and huge patches of lime.

There is strong evidence that there is a large void, caused by a water line break, in the northwest corner of the rooms adjacent to the fort's main entrance. The floor in that area is settling. This area should be investigated, and if indeed there is a hole, fill should be poured into it. Also the water line at the entrance should be relocated, for it is an intrusion upon the historic scene.

During the restoration of 1957058, the Park Service patched the fort with modern brick, which ruins the appearance of the fort. The brick of this patchwork will have to be removed and historically correct brick inserted in its place.

As mentioned previously, there are a number of historic structures of the second (1814-1870) Fort Washington period. There is no reason these buildings could not be restored on the exterior and adapted on the interior for present-day uses, such as park headquarters, museum, living quarters for park personnel, etc. These are charming old structures and should be saved and utilized.

Several of the massive concrete Spanish-American War period batteries could be used for maintenance and storage purposes. The other batteries should have their rusted iron railings and stairways replaced and visitors should be allowed to climb over and explore and wonder about these structures. All of these massive concrete batteries are basically sound and would require little expenditure. However, roots of trees and bushes

growing near them apparently have some effect on the structures; consequently, the area about the batteries should be cleared of this growth.

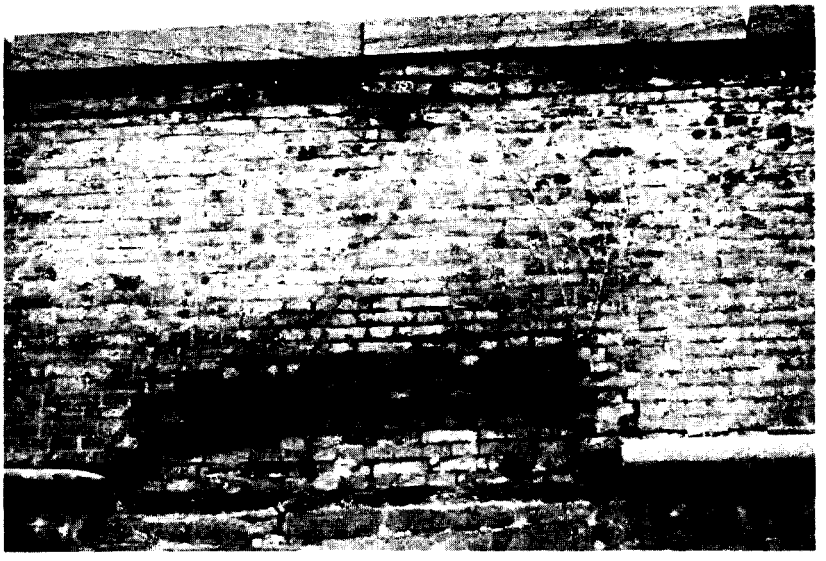
Below the southwest corner of the fort the earth is eroding and could have a disastrous effect upon the fort's foundation. To halt the erosion a log retaining wall is being put up. Unfortunately, this work has been halted; it should be resumed immediately so that the erosion will be stopped.

There is also an erosion problem along the east wall of the fort. The land is eroding down the slope and has already taken part of the road that runs at the base of the fort. Unless this erosion is halted soon, it will be eating at the foundation of this section of the fort.

The Park Service is already on the road toward restoring Fort Washington, this time following correct preservation guidelines and techniques. When this work is completed, the fort and its associated batteries will be an excellent historical display of a broad and diverse range of nineteenth century fortifications, fortifications built to protect the nation's Capital.

Sally port, Fort Washington. Note the deterioration of the brickwork and the modern brick patches which must be removed & replaced with reproductions of the original brick.

Exterior south wall of entrance gateway showing patch (door removed)



eteriorating brick above coping in south wall of fort.

Stalactites in main cell off guard room.

Note missing brick in east wall of southeast flank bastion.

FORT WASHINGTON NATIONAL MONUMENT

Fort Washington Estimate and Suggested Project Schedule

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Demolition		200,000	50,000	50,000	50,000	50,000	
2.	Stabilize Earthworks		90,000	42,000	28,000	12,000	8,000	
3.	Masonry Brick and Stone		925,000	250,000	250,000	250,000	175,000	
4.	Masonry, Relay Walks and Paved Areas		87,000		52,000	25,000	10,000	
5.	Drainage System, Fort Complex		54,000	41,000	13,000			
6.	Building Carpentry Work		205,000		120,000	85,000		
7.	Roof and Gutters		65,000		65,000			
8.	Painting		18,000			18,000		
9.	Parade Grounds, Lowering of Grade		8,000	8,000				
10.	Waterproofing		6,000	3,000	3,000			
11.	Plumbing		85,000		50,000	35,000		

Fort Washington (cont'd)

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
12.	Electrical Work		125,000		75,000	50,000		
13.	Miscellaneous Labor and Cartage		65,000	20,000	25,000	15,000	5,000	
14.	Restore Commandant's and 1st Sergeant's Quarters (outside Fort Complex)		255,000			200,000	55,000	
	TOTAL: NET COST FORT WASHINGTON		$2,188,000	$414,000	$731,000	$740,000	$303,000	

FORT McHENRY NATIONAL MONUMENT AND HISTORIC SHRINE

Fort McHenry

FORT McHENRY NATIONAL MONUMENT AND HISTORIC SHRINE

Fort McHenry

This brick star fort was blooded in the War of 1812 when the British attempted to subdue it, but the stubborn resistance of its garrison inspired Francis Scott Key to produce the "Star Spangled Banner".

In the years subsequent to this the fort continued to be in use and was modified as changing military technology and tactics required. During the Civil War batteries containing Rodman guns were installed just outside the fort, as were associated powder magazines. The guns, on their carriages and gun mounts, are still in place, and today form the best and most complete display of this type of battery any place in the National Park System.

The ravelin of the fort is made of brick and covered with earth. Today seepage of water into the rooms of the ravelin indicates serious internal erosion. Lime from the mortar shows on the brick interior, and patches of the walls have been darkened by the water. Exposed pipes carrying electrical wires detract from the historical appearance of the ravelin.

The powder magazines, like the ravelin, are made of brick covered with earth, and also like the ravelin, they leak badly, badly enough to require sump pumps to keep the water level down. One of the powder magazines has a wall bulging out, and without attention it will in time collapse. Another powder magazine has a wall leaning out and it, too, in time will have a similar fate.

The inside walls of the Civil War battery are pushing out, due probably to water seepage and freezing. These walls will in time be pushed down.

The star fort shows some vertical cracks on its curtain. Undoubtedly, there is internal erosion of the walls. Much of the problem could be solved by locating the historic drains and making them functional again.

The sea wall going around the peninsula of land on which the fort rests is eroding, eroding to the extent that even now stones must be replaced and repointing done.

There is no question on the course of action the Park Service should take with regard to the star fort. It is of prime historical significance and everything possible should be done to preserve it. The ravelin should have a sealer placed on top to stop leakage, and the interior brickwork should be cleaned and repointed. The historic drains of the fort itself should be located and cleaned out, and, if necessary, some should be rerouted. The curtain of the fort should be repaired, even to the extent of rebuilding portions of the wall. All exposed electrical wiring should be buried in the walls. The sea wall should be repaired as required to put it into first class condition.

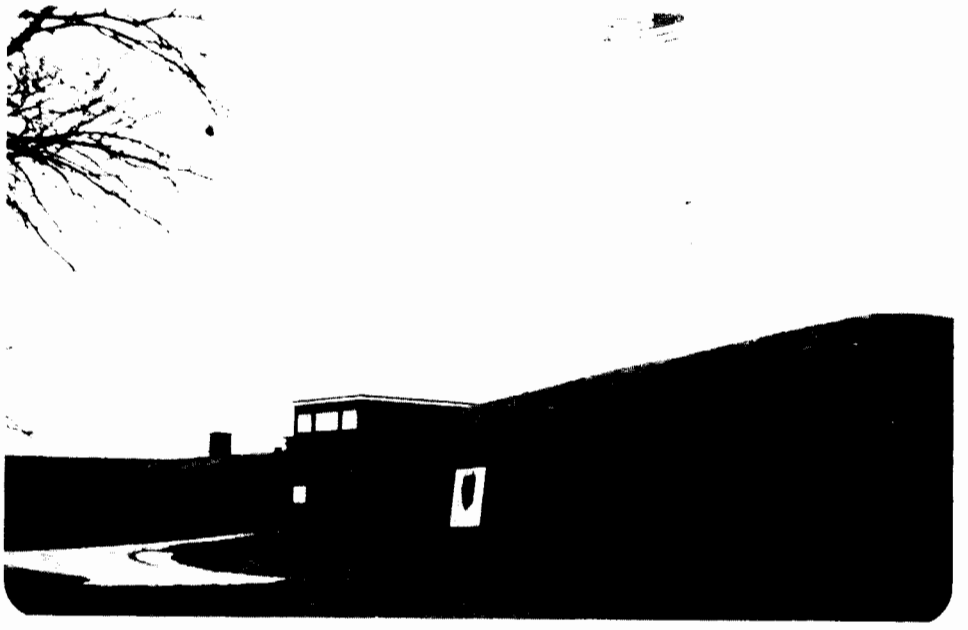
A basic decision is going to have to be made as to the fate of the Civil War battery; should it be removed becuase it was not part of the War of 1812 scene, or should it be left in place as a very fine display of a Civil War battery?

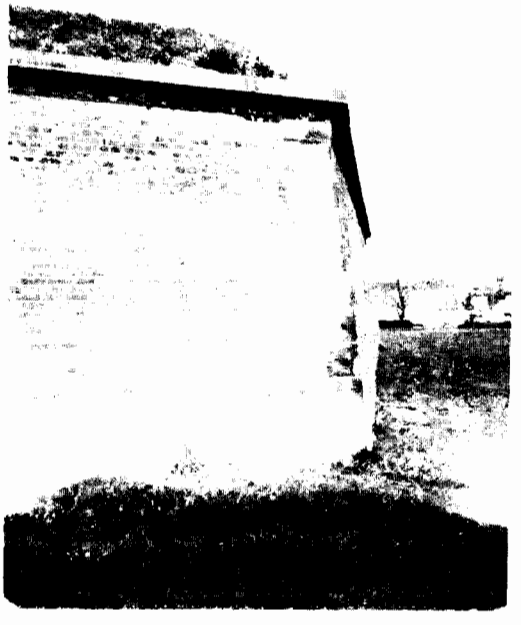
It is true the battery intrudes on the 1812 scene, but it is also true that it would be disgraceful to do away with the best battery exhibit in the Park Service today. One could argue that the battery could be moved to a Civil War fort. But which one? Where was there such a battery?

If the decision to remove the battery is made, it will undoubtedly be broken up and a gun and carriage given to this fort and another gun and carriage given to that fort. The value of the battery is its wholeness; it loses a considerable amount of its value in small pieces. Consequently, we recommend that the battery be left in place.

If the battery remains in place, it will be necessary to stabilize the inside wall of the parapet, and stabilize the walls of the powder magazines. Also, a sealer should be placed over the powder magazines to stop the seepage of water.

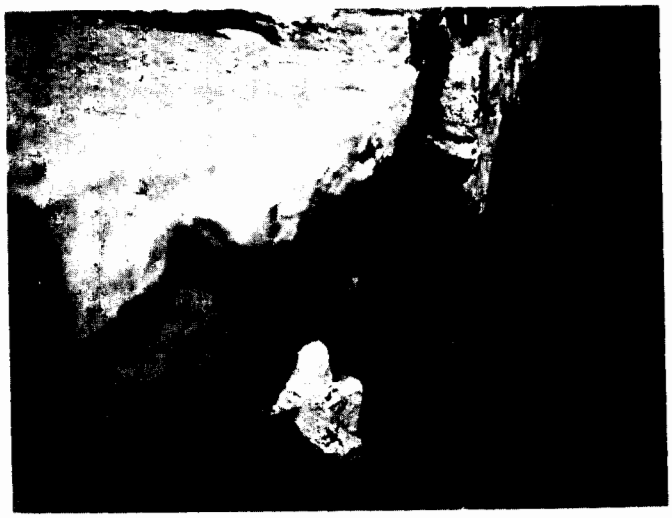
Because of its association with the writing of the National anthem, there is no question of the historical significance of the star fort, and the work we propose is directed toward preserving this structure in a first class condition.



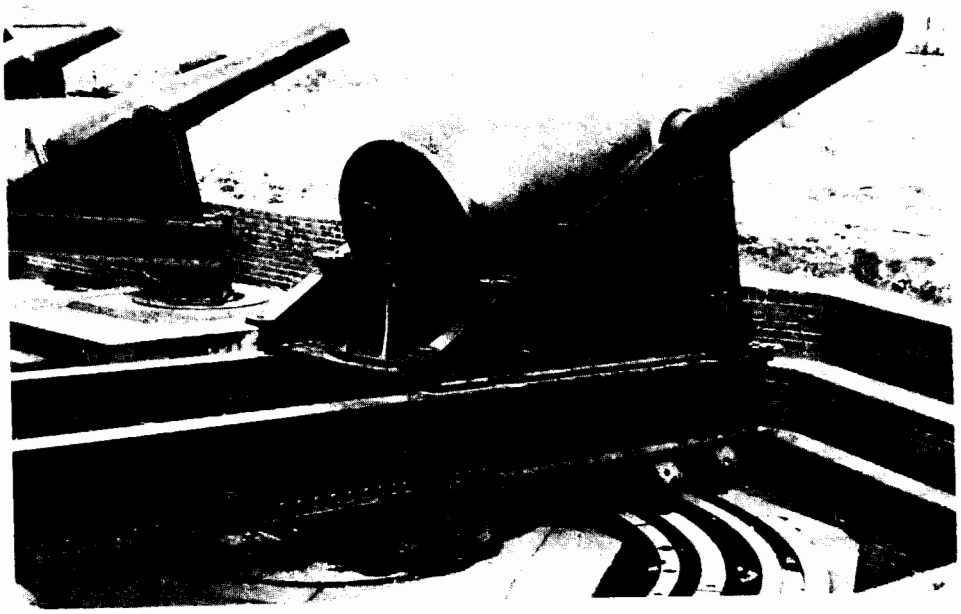


The worst erosion in the masonry walls has occurred at the grade line.

The wood portions of the buildings are in very bad condition. Such areas must be promptly repaired or replaced.



The repair of the sea wall should be given a very high priority.



The Civil War batteries also need attention if the metalwork is to be preserved.

FORT McHENRY NATIONAL MONUMENT AND HISTORIC SHRINE

Fort McHenry Estimate and Suggested Project Schedule

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Demolition		65,000	65,000				
2.	Stabilize Earthworks		45,000	30,000	15,000			
3.	Masonry, Stone and Brick Pointing		120,000	60,000	60,000			
4.	Masonry, Sea Wall Rehabilitation		85,000	85,000				
5.	Masonry, New Brickwork		25,000	15,000	10,000			
6.	Ironwork, Main Gate and Fencing		12,000		12,000			
7.	Roofing, Gutters Restoration		15,000	15,000				
8.	Drains within Fort		12,000	12,000				
9.	Masonry, Walks and Paved Area (Fort)		200,000	100,000	100,000			
10.	Casement Rehabilitation		25,000	25,000				
11.	Casemates Rehabilitation		20,000	10,000	10,000			

Fort McHenry (cont'd)

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
12.	Painting		5,000	2,500	2,500			
13.	Building Carpentrywork		8,000	5,000	3,000			
14.	Plumbing		15,000	15,000				
15.	Electrical Work		50,000	30,000	20,000			
16.	Miscellaneous Labor and Cartage		10,000	5,000	5,000			
	TOTAL: NET COST FORT McHENRY		$722,500	$484,500	$238,000			

FORT POINT NATIONAL HISTORIC SITE

Fort Point

FORT POINT NATIONAL HISTORIC SITE

Fort Point

Erection of Fort Point began in 1853, and within the next few years the Army constructed a three tiered fort, irregularly polygonal in shape, with two bastions. The fort's purpose was to guard San Francisco Bay.

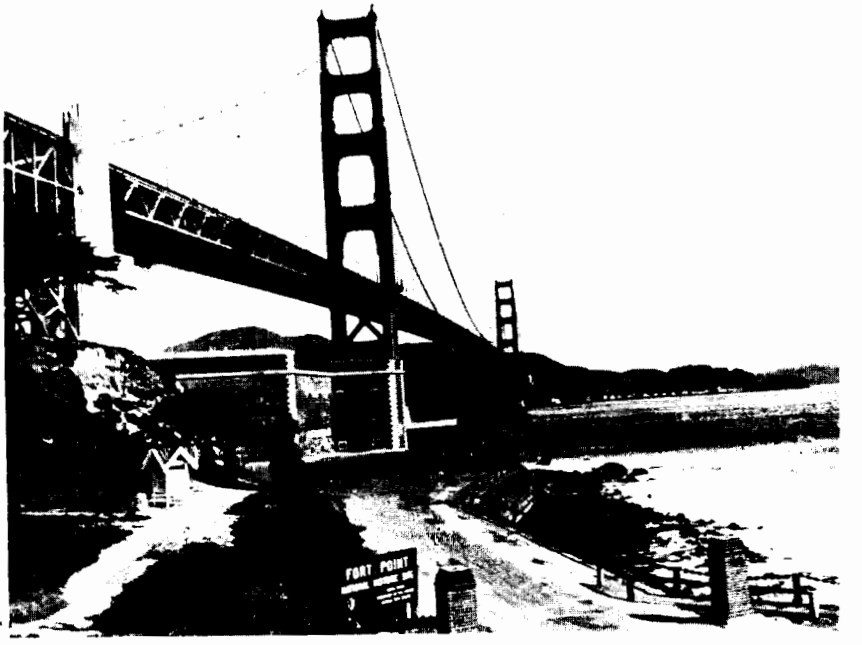
It is basically a brick structure with a stone foundation. The first tier is also of stone. Casemates are on all sides of the fort and on all tiers except the gorge. On this latter side is the sally-port and various rooms--quarters, jail, hospital, offices, etc.

One reaches the various levels or tiers by stone circular stairways located at three places inside the fort. A metal lighthouse sits atop the circular stairway at the northwest bastion. One reaches the various tiers on the side of the fort where the rooms are by an iron stairway at the east corner of the fort. Iron railings form galleries on the parade side of the rooms of the second and third tiers. Generally, the masonry work of the fort appears to be in remarkably good condition, but there are some needed repairs, as well as necessary replacement of both brick and stone masonry and repainting here and there. Repairs are required on the concrete passageways and stairways and the stone courtyard.

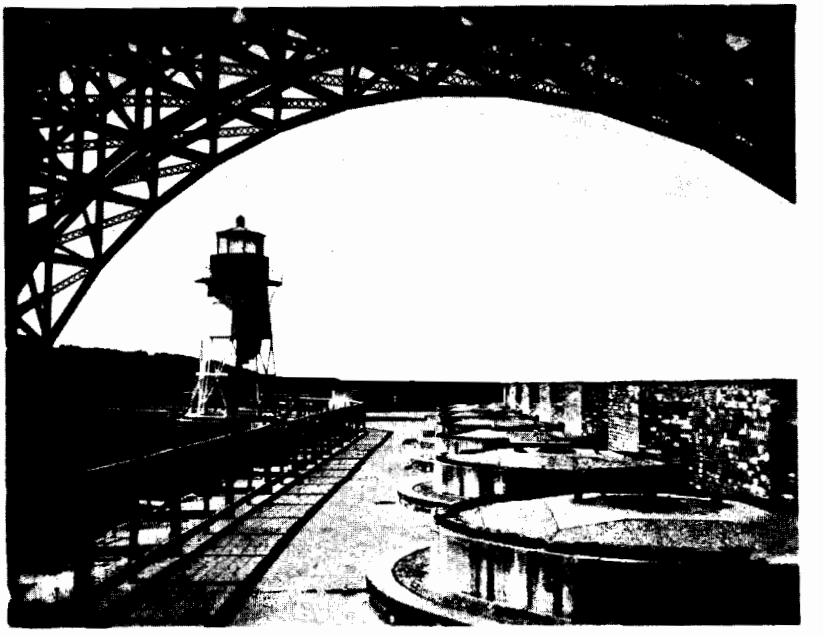
The ironwork of the galleries, both railings and columns, need, for the most part, to be replaced, not only for appearance but also for the safety of the visitor. The interior rooms need considerable carpentry and plastering work. Much of the hardware will have to be replaced. Windows require extensive glazing. Practically all the painting will have to be renewed. Quite a few repairs are needed to the gun mounts on the barbette tier.

Work has begun on Fort Point to make it safe for visitors. Temporary repairs have been made to the iron gallery railings, and barriers have been installed on the courtyard side of the casemates of the upper tiers and the barbette. The rusted metal lighthouse, which formerly had iron plates dangling dangerously in the breeze, has been restored beautifully.

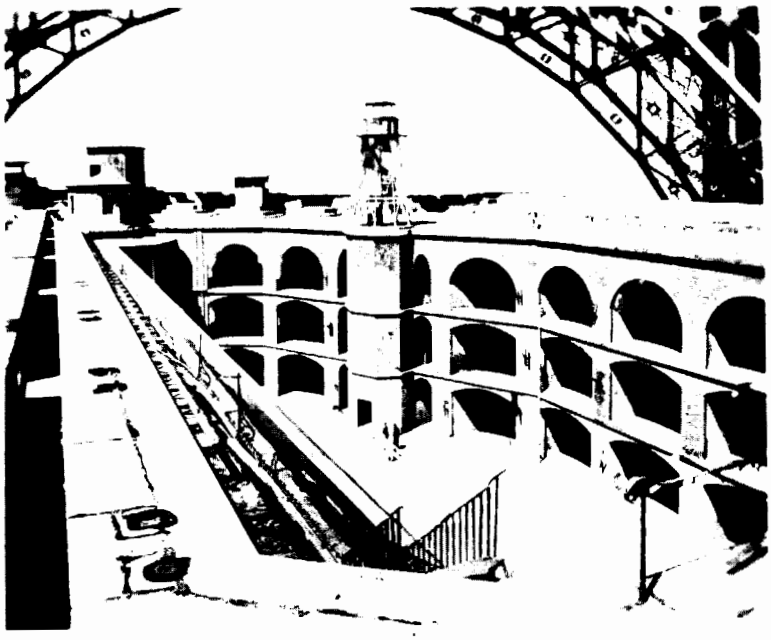
Of all the forts visited, we were most encouraged by the progress that has been made on the restoration of Fort Point. Proper programming has put this work on the right course, and work is progressing as funds become available.



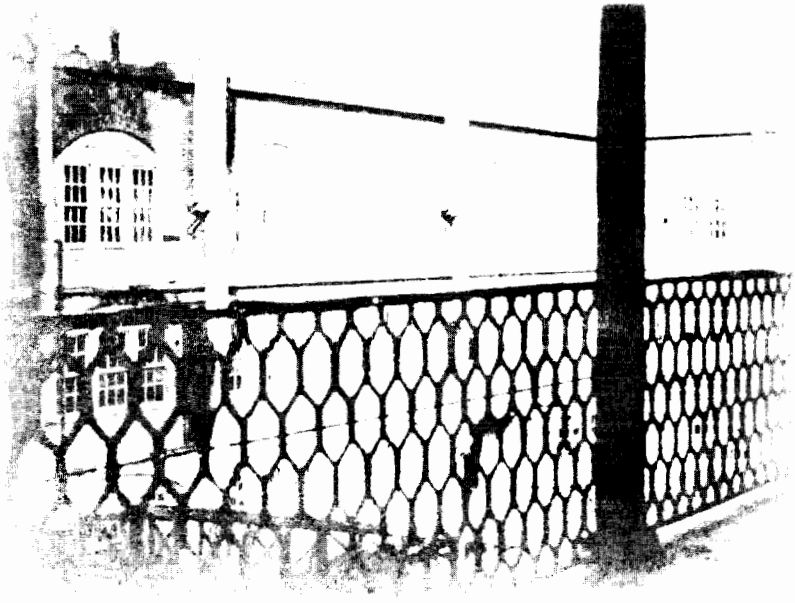
A general view of Fort Point showing its position relative to the Golden Gate Bridge. Falling or thrown objects from the bridge pose a serious hazard to the visitor.



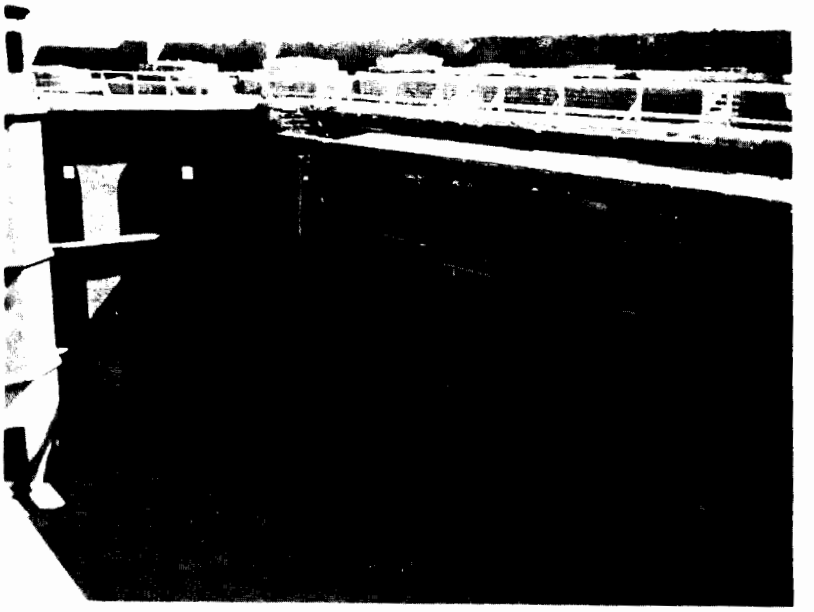
Restoration of the lighthouse was recently completed. Temporary safety railings on the barbette will be replaced with permanent construction.

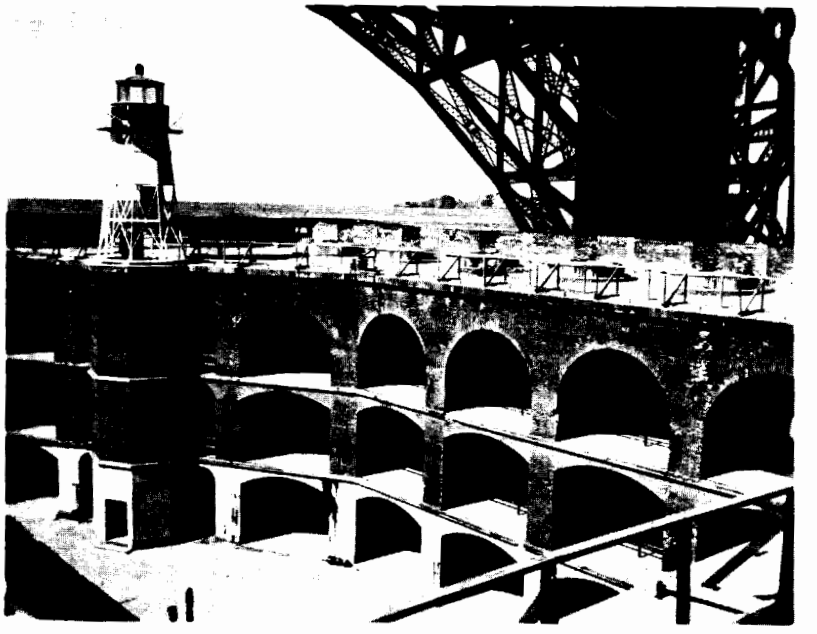


The metal stair and guard railings, seen in the foreground, have deteriorated beyond repair and will be replaced. Note the condition of the lighthouse before restoration. Deterioration of the brickwork can be seen on the face of the casemates.



This photograph, taken in the late 1920's, shows the original balcony railing. Reproductions of the rail will be installed in all original locations.





These two photographs show the installation of temporary wood safety railings at the barbette, casemates, and where the historic railing is missing from the balconies. All steel railing will be replaced with reproductions of the historic rail.

FORT POINT NATIONAL HISTORIC SITE

Fort Point Estimate and Suggested Project Schedule

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
1.	Demolition		233,000.	233,000.				
2.	Concrete Work		155,000.		155,000.			
3.	Masonry, Stonework and Pointing		419,000.	419,000.				
4.	Ironwork and Structural Steel		434,000.		434,000.			
5.	Carpentry		271,000.			271,000.		
6.	Roofing and Waterproofing		77,000.			77,000.		
7.	Lathing and Plastering		77,000.				77,000.	
8.	Painting		139,000.					139,000.
9.	Armament Mounts		201,000.				201,000.	
10.	Courtyard Paving (stone)		93,000.					93,000.
11.	Rehabilitation of Magazines and Tunnel		124,000.			124,000.		

Fort Point (cont'd)

ITEM NO.	ITEM	ITEM COST	TOTAL COST	1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
12.	Bridge		46,000.				46,000.	
13.	Misc. Labor and Cartage		116,000.	24,000.	24,000.	24,000.	23,000.	21,000.
TOTAL:	NET COST FORT POINT		$2,385,000.	$676,000.	$613,000.	$496,000.	$347,000.	$253,000.

CASTLE CLINTON NATIONAL MONUMENT

Castle Clinton

Castle Clinton

Castle Clinton was erected in 1811 and was one of a chain of forts built in upper New York harbor to protect the city against possible attack from the British. The fort, then known as West Battery, was never under attack and the War of 1812 passed without incident.

After the war, West Battery was renamed Castle Clinton in honor of DeWitt Clinton. In 1821, after the Army no longer had a use for it, the fort was converted into a concert hall, and the structure became known as Castle Garden. The remodelled fort was the site of many historic performances, including the American debut of Jenny Lind.

From the mid-nineteenth century until after 1890, Castle Garden was an immigrant depot and was abandoned after the erection of the Ellis Island facility. In 1896 the structure was again altered and reopened as the New York Aquarium, a function which it served for forty-five years.

The fort is circular in design and is constructed of red sandstone or a log and stone foundation. It was set in what was at that time the harbor and was approached by a causeway. The eight-foot thick walls were designed to carry additional tiers of casemates, which were never built.

Castle Clinton has been a landmark in New York's Battery Park and will be restored to the fort period with exhibits illustrating its subsequent uses.

The first portion of the restoration was accomplished in 1968 and 1969 when the circular covering over the casemates was erected. Also at that time, the two massive stone segments housing the powder magazines and privies, and the exterior of the sallyport were restored. The cost of this contract was $515,000.

The proposed restoration project will accomplish the completion of Castle Clinton and place it in a maintenance status. A contract to accomplish this work was to be let this year, but an unsuccessful bidder challenged the low bid and since that time the work has been in limbo with no sure knowledge of when it will be resolved.

REPORTS EXAMINED

Reports Examined

Alexander, William M., Civil Engineer. "Physical Status Report (Part I) Historic Structure, Fort Jefferson National Monument." National Park Service, May, 1970.

Bearss, Edwin C. "Historic Structure Report, Fort Point, California." National Park Service: Historic Preservation, Denver Service Center, 1973.

Corps of Engineers, U. S. Army, Office of the District Engineer, Jacksonville, Florida. "Condition Reconnaisance and Study of Required Protection Work for the National Historic Site San Juan, Puerto Rico," May 13, 1971.

Corps of Engineers, U. S. Army, Office of the District Engineer, Jacksonville, Florida. "Survey Report on Fortification Walls, Fort Brooke, San Juan, Puerto Rico," April 12, 1956.

"Draft of Administrative Data Section of Historic Structure Report for Fort Moultrie, Architectural Date." National Park Service: Historic Preservation, Denver Service Center.

Manucy, Albert, "Historic Structure Report (Part I) for Fort Jefferson National Monument." National Park Service, August 10, 1965.

"Statement of Management and Planning (Management Objectives) Fort Jefferson National Monument." National Park Service, June 28, 1971.

Miscellaneous Drawings, Files, and Master Plans at all areas visited.

APPENDIX

United States Department of the Interior
NATIONAL PARK SERVICE
DENVER SERVICE CENTER
7200 W. Alameda
Denver, Colorado 80226

IN REPLY REFER TO:

H2215-CD-THP

Memorandum

To: Director, Southeast Region

From: Historian F. Ross Holland, Jr., Denver Service Center

Subject: Memorandum of Understanding, Southeast Forts Study

On October 31, Historical Architect Russ Jones and I met in your office, along with Denver Service Center Director Glenn Hendrix and members of your staff, to discuss the scope of the subject study.

It was agreed that the study would be essentially as outlined in Associate Director, Professional Services, Connally's memorandum of October 19. That is, the final report would be "a detailed analysis indicating at each fort what work has to be done, how much it will cost, and a justification of why it is needed." In addition, Mr. Hendrix pointed out that Director Hartzog wanted the report to contain a time schedule for the accomplishment of the work proposed.

You stated that you would like to have a copy of the report at the time a copy is sent to WASO. It was agreed that a copy will be sent you at that time. It is anticipated that a final draft of the report will be finished by January 15, 1973.

F. Ross Holland, Jr.