

**Comparative Analysis,  
American Camp Fortifications,  
San Juan Island  
National Historical Park**

Prepared for the National Park Service,  
Columbia Cascades System Office,  
900 First Avenue  
Seattle, WA 98104-1060

by CEHP Incorporated  
1627 K Street NW, Suite 300  
Washington, DC 20006  
(202) 293-1774

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Prepared by CEHP Incorporated

Dale E. Floyd, Senior Historian  
William C. Beckner, Senior Associate  
Loretta Neumann, Editor

## **Introduction**

The National Park Service requested "a comparative analysis of the design, condition and preservation of a military earthwork . . ." constructed by the U.S. Army at American Camp, San Juan Island, Washington, in 1859. The contract allowed for only a few weeks of research in primary and secondary sources. Thus, besides published sources, visits were made to the National Archives' military records unit at Archives I and the Architectural and Cartographic Branch at Archives II; the Manuscript Division, Library of Congress; the library, photo and manuscripts units, U.S. Army Military History Institute, Carlisle Barracks, PA; and the San Juan Island National Historical Park's research collections. The staff of each of these repositories were quite helpful.

A great part of the overall research on fortifications at American Camp, San Juan Island, had already been completed earlier by National Park Service employees, contractors and other researchers. Thankfully, especially in the past two decades, interest in and study of Civil War period fortifications and their preservation has increased and produced some useful literature on the subject, although much more study is necessary. Because the fortifications at American Camp were erected in 1859, they are similar to Civil War fortifications since military fortification technology did not change between 1859 and 1861. For a definitive study on the fortifications at American Camp, however, an exhaustive search for materials is required.

I wish to thank all those who assisted me in my search for information and for all the advice and suggestions I received.

Dale E. Floyd

# **Analysis of the Fortifications**

## **Historical Background**

During the middle of the 19<sup>th</sup> century, both the United States and Great Britain claimed the San Juan Islands in Puget Sound. The British Hudson's Bay Company established a salmon-curing station on the island supporting its 1845 claim to San Juan. Simultaneously, the Oregon Territorial Legislature declared the San Juan Islands within its boundaries and, in January 1853, included it as part of Island County. When the Washington Territory was created in March 1853, San Juan became part of Whatcom County.<sup>1</sup> Both Americans and Canadians lived on the island, making the situation volatile.

Nothing much happened, however, until 1859 when an incident occurred that had the potential to ignite a major conflict between the British and Americans. On June 15, 1859, Lyman Cutlar, an American citizen residing on the island, found a pig that belonged to the Hudson's Bay Company rooting in his garden. He promptly killed it. Upon hearing of the incident, British authorities threatened to arrest Cutlar. Alarmed, American citizens requested military protection. The Military Department of Oregon commander, Brigadier General William S. Harney, promptly sent a company of 66 men of the 9<sup>th</sup> Infantry Regiment, under the command of Captain George E. Pickett, to the island. Pickett and his men landed on the island on July 27. They set up camp near the Hudson's Bay Company wharf, on the southeast side of the island. The governor of British Columbia, James Douglas, countered by sending three warships, under the command of Captain Geoffrey Hornby, to evict Pickett, hopefully without any armed conflict.<sup>2</sup> The combatant forces continued to increase in July and August. British Rear Admiral Robert L. Baynes, commander of British Naval Forces in the Pacific, stated upon arrival that he would not start a war over the death of a pig. Any new incident, however, could instigate fighting.<sup>3</sup>

On August 31, American forces on the island totaled 461. They were opposed by 2,140 British marines, sappers, and sailors. The British appeared to have the upper hand with five warships mounting 167 guns to backup its forces. The much smaller American force, however, had dug in and constructed fortifications on heights overlooking the harbor where the five British warships were moored.<sup>4</sup>

## **The Army Engineers**

Among the American troops dispatched to the island was a 10-man detachment of Company A, U.S. Army Corps of Engineers. They were under the command of Second Lieutenant Henry M. Robert. Except during the American Revolution and War of 1812 and a short time before and after the latter conflict, the U.S. Army had no engineer troops until 1846, when the War Department created Company A for service in the War with Mexico. Its value demonstrated in that conflict, the unit served honorably in peacetime too. All or some of the company remained at the U.S. Military Academy, at West Point, New York, accomplishing various duties, including demonstrating engineering work to the cadets.



The engineers left West Point in October 1858 for Fort Vancouver, Washington Territory. From Fort Vancouver, the engineers marched to a variety of locations in the northwest. They were back at Fort Vancouver when they received the following order sending them to San Juan Island:<sup>5</sup>

HDQrs. [Department of Oregon], Aug. 16, 1859  
Ft. Vancouver, W.T.

Special Order No. 85

I. The detachment of company A Engineers at Fort Cascade under the command of Second Lt. H.M. Robert will proceed without delay to San Juan Island, Puget Sound, and report for duty to Lieut. Colonel S. Casey, Commanding.

Brig. Gen, William S. Harney<sup>6</sup>

After receiving the above order, Lt. Robert issued his own order highlighting the importance of the engineers' mission:

Fort Vancouver, Aug. 18, 1859

Orders No. 2

I. Orders have been received placing this detachment on duty at San Juan Island in connection with Fortifications there to be erected. It is the only time in the history of our army that Engineer soldiers have had the charge of a work of the kind & the reputation of the Company & Corps is at stake. The Commanding Officer hopes that every man will do his duty as he will have to rely greatly upon their assistance.

Henry M. Robert  
2nd Lieutenant Engineers  
Comdg. Engineer Detachment<sup>7</sup>

The engineer company left Fort Vancouver on August 20 and disembarked on San Juan Island before noon on August 23. The unit located its camp and began clearing it for habitation. The next day the men brought the tools ashore. By August 25, they were ready to begin fortification work.<sup>8</sup>

### **Fortifications at American Camp**

Before the engineers arrived on San Juan Island, the American troops had already begun fortifying their position. (For a definition and description of various types of fortifications, see Appendix I.) Although Pickett had received orders to do so, he did not begin erecting fortifications when he arrived. But on August 15, Hornby wrote that Casey's men were "... continually landing supplies of all sorts, and have now on the beach large quantities of lumber fit for Gun platforms, ..." On August 16, Alfred Pleasanton, Acting Adjutant General, Department of Oregon, directed Casey to "have platforms made for your heavy guns, and cover your camp as much as possible by intrenchment, placing your heavy guns in battery on the most exposed approaches, the howitzers to be used to the best advantage with the troops, or in the camp, according to circumstances. He also wrote, "Select your position with the greatest care to avoid the fire from the British ship. In such a position your command should be able to defend itself against any force the British may land."<sup>9</sup>

On August, 22, after Casey received Harney's orders to entrench his camp, he decided to relocate to the rear (north) of Bellevue Farm. A forest and a dip in the ground offered more protection, and the adjacent high point would hold the 32-pounders. Capt. James Prevost, R.N., commander of HMS SATELLITE, reported that the new camp "is very strongly placed in the most commanding position in this end of the island, well sheltered and in the rear and on one side by the Forest, and on the other side by a Commanding eminence." Casey described his new location: "I have taken up a position near the Hudson's Bay establishment, and shall put my heavy guns in position to bear upon the harbor, and also on vessels which might take a position on the other side. Shells from the shipping may be able to reach us, and we may not be able to protect the camp from them; but I shall try."<sup>10</sup>

On August 25, William A. Peck, Jr., one of the engineer soldiers, reported that his detachment began "laying works for a fort." On August 27, he reported that the fort was "laid out of an irregular form 425 feet long by 125 feet wide; parapets 20 feet thick and at one face 22 feet above the natural ground; ditch 20 feet wide, not less than 8 feet deep." Two days later, though, Peck announced that alterations in the fort were underway and, on August 31, he reported that they were completed.<sup>11</sup>

Unfortunately, Peck did not provide dimensions of this altered fortification. No other contemporary instructions, orders, correspondence, maps or dimensions of the fortification have been uncovered. In 1887, Hubert Howe Bancroft provided the following dimensions of the fortification in a footnote: "The earthworks extended on the west waterfront 350 feet, on the southeast 100, on the east 100, and on the northeast 150 feet, the north side being left open, with the garrison ground in its rear. The embankment had a base of twenty-five feet, and a width at top of eight feet. Inside of the redoubt were five gun-platforms of earth, reaching to within two feet of the level of the parapet, each twelve by eighteen feet, two of them being at corners of the redoubt. The parapet was seven feet above the interior, and the slope of the interior twelve to fifteen feet, the exterior slope being twenty-five to forty feet, with a ditch at the bottom from three to five feet across." National Park Service historian Erwin Thompson wrote, in 1972, that "the redoubt is remarkably similar to Bancroft's description."<sup>12</sup>

From the beginning, the British observed the American fortification efforts, and their written observations provide some important details about that work. Captain Prevost reported that "... the hill south of the American Camp, has been marked out for fortifying, in several places it has been leveled, and working parties have been lately employed preparing for throwing up earth works." On September 7, *The British Colonist*, of Victoria, British Columbia, announced, "We learn, from a party who arrived yesterday from San Juan that 100 soldiers are engaged in throwing up a fortification on the summit of the hill, below the HB Company Station." One British citizen, William Moore, had firsthand observations as a prisoner forced by the Americans to work on the fortifications.<sup>13</sup>

The American company's commander, Lt. Robert, had set to work immediately to erect a fortification. After consultation with his superior officers, he devised plans for a fortification that he decided, based on his knowledge and experience, was necessary to defend the garrison given the existing circumstances and topography. Robert had graduated from West Point in 1857 and had little field fortification experience since his graduation. He thus had to base his fortification mainly on what he had learned at the military academy and what he had read.<sup>14</sup> While at West Point, Robert studied under Dennis Hart Mahan, Professor of Military Engineering from 1830-1871, whose courses taught mainly the theory of fortification. Mahan was a learned man who had spent years in Europe observing the military art and had read numerous treatises and manuals on the subject. In addition, he wrote and published a number of manuals on military and civil engineering subjects. Perhaps, his best known

manual was *A Complete Treatise on Field Fortification, with the General Outlines of the Principles Regulating the Arrangement, the Attack, and the Defense of Permanent Works*, first published in 1836 by Wiley & Long of New York City. *Field Fortification*, the abbreviated title by which the manual was generally known, appeared in various subsequent editions. While involved in the San Juan Island embroglio, a 1856 edition of *Field Fortification* was available, but at West Point Robert probably used an earlier edition of the manual.<sup>15</sup>

Also, while at West Point, Robert would have received practical military engineering instruction, including fortification construction, within the Department of Practical Military Engineering, formed in 1842. Officers and engineer soldiers instructed cadets, originally only those in the First Class, in constructing models as well as full-size fortifications, barriers, obstacles, gabions, and fascines. No record of exactly what Robert learned is available but diaries, journals, and correspondence of cadets at the U.S. Military Academy in the 1850s provide insight into the type of practical instruction they received.<sup>16</sup>

After studying his manual, the defensive problems of the American Camp and the specific topography, Robert designed a fortification to suit the situation. Next, he laid out the work on the ground between August 25 and 31.<sup>17</sup> The procedure for laying out a fortification was very formal at that time. Following are some descriptions of laying out a work from some of the manuals:

### **Manner of Throwing up a Work**

56. The foregoing chapters contain all that is requisite to determine the plan and relief of field works under all circumstances of variety of ground. To follow a natural order, the next steps will be to describe the manner of laying the work out on the field, which is termed profiling; the distribution of the workmen to excavate the ditch, and form the parapet; and the precautions to be observed in the construction.

57. Poles (Fig. 18,) having been planted at the angles of the work, and the height of the interior crest-marked on them, a line is traced on the ground, with a pick, showing the direction of the interior crests. At suitable distances, say from twenty to thirty yards apart, cords are stretched between two stout pickets, in a direction perpendicular to the line marked out by the pick; these cords should be exactly horizontal. A stout square picket is driven firmly into the ground, where the cord crosses above the pick-line, and a slip of pine, on which the height of the interior crest is marked, is nailed to the picket. The thickness of the parapet is measured on the cord, and a picket driven into the ground to mark the point. The base of the interior slope and tread of the banquette, are set off in a similar manner; and a slip of deal is nailed to each of the pickets. The height of the interior crest, and the tread of the banquette, are easily ascertained, from the position of the cord, and the interior crest; these points having been marked on their respective slips, the outline of the parapet is shown by connecting them by other slips, which are nailed to the uprights; the banquette slope, and exterior slope, will be determined by a similar process.

58. From the profile thus formed perpendicular to the interior crests, the oblique profiles at the angles can readily be set up, by a process which will suggest itself without explanation.

59. Having completed the profiling, the foot of the banquette, and that of the exterior slope, are marked out with the pick, and also the crests of the scarp and counterscarp. All the arrangements preparatory to commencing the excavation are now complete.<sup>18</sup>

A stick may be cut to measure lines, and stakes will be driven to show the slope and general form of the profile necessary in each particular case. Whatever the form is to be given to a work, it is traced upon the ground by laying off its angles according to the number of their degrees, and its sides are designated by little furrows dug with the mattock or spade along cords stretched in the proper direction. To profile a work is to figure upon the ground its elevation by means of poles and laths nailed together; (Fig. 127.) The officer who directs the work ought to take with him four or five soldiers who carry mattocks, 100 pickets, twenty poles ten or twelve feet long, twenty laths, some camp colors, and a cord 65 feet in length. There ought to be a carpenter, who carries hammer, nails, and a saw.

Field-works necessary or desirable in the operations of an army in the field to strengthen lines of battle, keep open lines of communication, protect bridges from destruction, &c., will generally be constructed under the supervision of engineers. They may have any extent, from a simple redan, or a battery, to a line or several lines of works, some of considerable magnitude, extending over a position of ten or twenty miles.<sup>19</sup>

*To throw up a work*, a line is first traced on the ground with a pick, showing the direction of the interior crest: poles having been planted at the angles of the work, with the height of the interior crest marked on them, cords are then stretched at distances of about thirty yards apart, horizontally between two pickets, perpendicular to the lines.<sup>20</sup>

Peck stated that construction of the fort began on September 1 and continued until November 7. Besides the engineer soldiers themselves, a detail of 100 men from the American Camp command was sent to work on the fortification; the size and makeup of this detail changed periodically. Prisoners of various types also were put to work on the fortifications. In general, all work on the fortifications was supervised by Robert and the engineer soldiers. In two months work, they accomplished much.<sup>21</sup>

From the start, the fortification was to include the eight 32-pounder artillery pieces on ship carriages from the ship MASSACHUSETTS. The troops landed the eight 32-pounders on August 13 but Pleasanton reported, "With our present appliances I find them rather difficult to manage." In the next few days, though, "the troops and civilian laborers briskly . . . manhandled the 32-pounders to the top of the ridge." Hornby reported, on August 15, "six of the heavy guns were now on the ridge and were overlooking the harbor where he was anchored." "By throwing up a parapet they would make them inaccessible to us whilst they could command the harbour. The other two big guns were placed so as to defend the [American] camp." Captain Prevost wrote, on August 22, that "on a ridge about 1/4 of a mile from the camp and about 200 yds. from our anchorage 8 32-Pounders have been placed."

Today, as in 1887 when Bancroft described it, the fortification contains five earthen platforms, reaching to within two feet of the level of the parapet, each 12 by 18 feet, two of them being at corners of the "fortification." These guns fired a salute of blanks when the Commanding General of the Army, Brevet Lieutenant General Winfield Scott, arrived. This probably was the only time these guns fired while on San Juan Island. By November 16, the guns were removed from the fortification and by December, they were back on the MASSACHUSETTS.<sup>22</sup>

Rock outcroppings are quite common around San Juan Island and many medium and large-size rocks remain in and around the fortification and in the ditch. Apparently, the soldiers, civilian laborers, and prisoners working on the fortification were clearing rocks, but work halted before it was completed. William Moore, a prisoner the Americans had forced to work on the fortifications, wrote that part of the time he worked in the trenches "rolling stones and shovelling earth . . ."<sup>23</sup>

One aspect of the American Camp fortifications that does not appear to be addressed much in previous studies and reports is the breastworks, as Peck referred to them, constructed around the camp. On September 14, Peck wrote: "A line of defense around the camp has been begun, composed of logs forming a breast high wall and put up in such a manner as will resist all rifle and other small missiles. The timber is here and little trouble to build it." Peck reported on September 19 that, "work continues around the camp on the breast work of logs, and on the fort." On October 4 he wrote: "I have been on the breastwork around camp with the entire police and prisoners force today, constructing that defense." Twenty days later, Peck reported the "breastwork around camp" for the last time but, apparently, work on it continued. No remains of the breastwork are visible, but archaeological investigations may establish their location and original appearance.<sup>24</sup>



General Scott halted fortification construction on November 7, 1859, after negotiations with the British. The fort was never completed, and no report by an engineer officer or other qualified individual records exactly what had been accomplished. The American Camp fortification was strong and added much to the security of the camp from attack and bombardment from the British ships.<sup>25</sup>

### **The Unanswered Questions**

What did they erect? Was the work near completion or was it far from finished? These and many other questions remain unanswered. Over the years, many experts have referred to the fortification as a redoubt. The fortification at American Camp, however, cannot be termed a redoubt because it is open on one side. Dennis Hart Mahan defined a redoubt as: "Any enclosed work of a polygonal form, without re-entering angles . . ." Henry L. Scott in his *Military Dictionary* described a redoubt as "works inclosed on all sides of a square, polygonal, or circular figure."<sup>26</sup>

After looking at the fortification's remains, it is quite apparent that the west side was left open, probably for easy entry and exit to the camp site and for the rapid movement of troops, supplies, and munitions. The open side was there in 1887, as Bancroft wrote that "on the north side [actually the west side] being left open, with the garrison ground in its rear." Robert also may have thought, as one author wrote, that half-closed works have an advantage because if taken, the original garrison's artillery and infantry can counterattack from the rear on the unprotected side. A fully enclosed work makes counterattack virtually impossible. In addition, the breastworks around the camp, which Peck kept referring to, helped protect the open side of the fortification by requiring that the enemy scale them and move through the camp before reaching the fortification. At the open side, two 32-pounders from the *Massachusetts* would greet any attacker who had traversed the breastworks and the camp. Most likely, Robert and other officers that he conferred with felt that the fortifications secured the garrison and the camp. Any British attack would most likely come from sailors and troops on the ships in Griffin Bay.<sup>27</sup>

While many people continue to refer to American Camp as a redoubt, no correspondence, reports, or documents have been located in which Robert himself refers to the fortification as a redoubt. Peck, an engineer soldier, does not call the fortification a redoubt anywhere in his journal; nor do British accounts refer to the fortification as a redoubt. Various Americans, both at the time and later, including William Daniel Walsh, another engineer soldier who was with the expedition, referred to the fortification as a redoubt. Also, in many instances during the Civil War, officers and men on both sides incorrectly referred to open works as redoubts.<sup>28</sup>

Actually, the fortification at American Camp most resembles a lunette. A good working definition of a lunette is "a work consisting of a salient angle with two flanks that are open to the rear." Lunettes were never intended to be anywhere near the size of the fortification at American Camp. Thus, it is doubtful that Robert set out to erect a lunette.<sup>29</sup>

The problem of what specific type of fortification was constructed at American Camp most likely will never be completely resolved. Since the fortification was not completed and no enlightening documents are available, no one definitely knows what the completed fortification was intended to be. Anyone, therefore, must look at what is present. Except for some erosion, not much of it has deteriorated. It was not reconstructed the same as similar facilities at other national park units.

Conclusions must be based on what remains. Part of the heights was leveled to accommodate the fortification. Next constructed was the ramparts of the fortification with a ditch or moat around it. The west side of the fortification, opening towards American Camp, was left open. Later, construction of an earth and log breastwork around American Camp was undertaken.

The Army Engineer in charge, Lt. Henry M. Robert, designed and began construction of fortifications at American Camp that he felt would provide the security necessary given any and all circumstances. He may very well have decided to erect a redoubt and later determined that leaving it open on one side towards the camp was better than entirely enclosing it. Peck's description of the fortification laid out as of August 27 does not mention that it was open on one side.<sup>30</sup> To protect the open side, Robert placed two guns to cover it and built breastworks around American Camp. Whatever Robert meant to erect, the fortifications that were actually constructed illustrate the specific work of Army Engineers. An Army Engineer decided what was the best defensive structure based on the various conditions and circumstances.

## **Overview of Research, Interpretation and Preservation**

### **Research Requirements**

A great amount of research on the fortifications at American Camp has already been accomplished. The possibility, however, of extant contemporary accounts and illustrations of the construction and appearance of these fortifications demands that further research be undertaken. If found, such accounts or illustrations can reveal specific details of the fortifications that are now unknown.

Extant contemporary accounts and illustrations may exist among numerous archives and manuscript collections in the United States, Canada, England, and possibly other countries from which observers came from or returned to. These observers may have been in the United States or British military services, or they may have been civilians. Discerning individuals' names and the whereabouts of their papers is a difficult and, potentially, unending task.

After the names of observers are ascertained, a variety of finding aids will be useful. The U.S. Library of Congress, *The National Union Catalog of Manuscript Collections* (Ann Arbor, Michigan: J.W. Edwards and Washington, DC, 1962-) and the U.S. National Historical Publications and Records Commission, *Directory of Archives and Manuscript Repositories in the United States* Second Edition (Phoenix, AZ: Oryx Press, 1988) are the main general guides to archives and manuscripts in the United States. Similar finding aids are available for Canada and England. Many repositories also have published guides to their own collections.

No matter what research is economically possible, thorough searches are necessary among the Special Collections and Archives, Library, United States Military Academy, New York; Manuscript Division, Library of Congress, Washington, DC; Public Records Office, London, England; the Public Archives of Canada, Ottawa, Canada; and the Provisional Archives of British Columbia, Canada. This research can be undertaken by National Park Service employees or by research contractors. Researchers should publicize their needs as much as possible; while doing their own research many researchers find information relevant to others and usually are quite willing to share with other researchers. Although it may take many years to complete, the possible yield in important information makes such research mandatory.

### **Interpretation**

The possibilities for interpretation of the fortifications at American Camp are great. Wayside exhibits, visitor center exhibits, videos, and living history would all be valuable. Wayside exhibits and other interpretive signs are successful at sites such as Fort Ward, VA; Fortress Rosecrans, TN; Fort Craig, NM; and Port Hudson, LA. Visitor center exhibits, exemplified by the one at Port Hudson, help to familiarize visitors with fortification technology and terminology that is foreign to most, including even the diehard Civil War enthusiasts. Videos such as the ones on Fort Granger, Franklin, TN, and the walking tour of Fort Fisher, Wilmington, NC, communicate much without requiring someone to be

present at all times for questions. Living history, not on the original site, demonstrating how a fortification is laid out and constructed and the life of engineer soldiers and others working on fortifications can be informative. One aspect that is important in interpreting a fortification is teaching that it is a structure just like a house or church or lighthouse, not just a pile of dirt. By illustrating how field fortifications were erected, with gabions and fascines, people will learn a great deal.

Although little has been done in interpreting the breastworks surrounding American Camp, they should be interpreted along with the main fortification itself. All these fortifications were mutually supporting and the work apparently went on concurrently. The interpretation of the breastworks is important in the overall study of the camp.

If someone wishes to visit sites to observe related fortification interpretation, Fort Ward, VA; Port Hudson, LA; Fortress Rosecrans, TN; Bentonville Battlefield, NC; Fort Fisher, NC; and Vicksburg, MS, are excellent examples. The staff at all these sites will also be able to provide a great deal of valuable information and advice. (See Appendix II for details on interpretive treatments.)

### **Preservation**

Today, Civil War and related fortifications are experiencing positive and negative preservation conditions. In the last two decades, interest in Civil War fortifications and their preservation has become strong and continues to increase. Many fortifications believed lost have been located, surviving because no one knew where they were, and forests and other cover on them functioned as protective camouflage. The discovery of these resources will, in most cases, greatly aid in the study and preservation of Civil War and related fortifications, including those at American Camp.

Unfortunately, however, the discovery of these fortifications can lead to their destruction. Once their location is announced, some individuals will use metal detectors to locate artifacts and dig them out, leaving destruction in their wake. Also, increased numbers of visitors accelerate deterioration because many of them like to walk on the ramparts and parapets. Owners of Civil War fortifications, whether public or private, have explored a number of methods to help preserve their sites.

Some sites that have instituted exemplary preservation programs are Fort Ward, VA (defenses of Washington, DC); Port Hudson, LA; Fortress Rosecrans, Stones River National Battlefield Park, Murfreesboro, TN; Fort Fisher, NC (what little is left); Fort McAllister State Park, near Savannah, GA; and Fort Duffield, KY. Visits to these sites and discussions with staff would be quite informative. Among the battlefields in the National Park System with Civil War fortifications that have undergone preservation work along with restoration are Richmond, VA; Gettysburg, PA; Petersburg, VA; Yorktown (Colonial), VA; Kennesaw Mountain, GA; Vicksburg, MS; Fort Union, NM; Fort Stevens, Washington, DC; Fort Marcy, VA; Andersonville, GA; Fort Foote, MD; Harpers Ferry, WV; and Fredericksburg, Chancellorsville, Wilderness, and Spottsylvania, VA. Discussions with staff at these parks also may be helpful.

Other war sites such as Fort Raleigh, NC (NPS); Fort Stanwix, NY (NPS); Valley Forge, PA (NPS); Ninety Six, SC (NPS); Moore's Creek, NC (NPS); and Fort Meigs, OH (state park), to mention a few, have accomplished fortification preservation with restoration. Many reports and studies on the history, preservation, restoration, and interpretation of the fortifications mentioned above are available.



The contractor has observed some techniques that definitely aid fortification preservation. For example, at Fort Ward, VA, bushes planted in the ditch and on the glacis in front of it prevents visitors from climbing the ramparts. It also resembles abatis that soldiers might have placed there to prevent the enemy from doing the same thing. Another preservation application that ideally channels the movement of visitors within and around a fortification is a boardwalk. Some fine examples of the use of these ramps or boardwalks are at Port Hudson, LA; Fort Ward, VA; and Fortress Rosecrans, TN. Fort Ward and Fortress Rosecrans use them sparingly but effectively. Boardwalks in a few areas at Port Hudson are quite efficient but are obtrusive.

The use of various grasses and other vegetation to deter visitors from walking on the ramparts and parapets has been effective in some locations, but the growths often prevent anyone from examining the fortification and they may disguise the structure. In one unrestored section of Fortress Rosecrans, the National Park Service has enhanced vegetation cover that hides the resource's fortification aspects and helps preserve them. However, a structure that does not resemble a fortification, due to preservation or other necessities, may lose its interpretive value.

Of course, there are some dismal preservation failures, such as at Blakely Battlefield near Mobile, AL. Reenactors are permitted to restore original fortifications, construct new ones on the battlefield, and reenact on the original site. Visits to these sites help demonstrate what not to do.

The Department of the Interior, National Park Service, Cultural Resources, Park Historic Architecture Division report, *Earthworks Landscape Management Manual*, prepared by Andropogon Associates, Ltd., Ecological Planning and Design (Washington, DC: The Government Printing Office, 1989), has ideas, suggestions, and examples pertaining to the preservation of field fortifications. Unfortunately, the examples presented were mid-Atlantic area locations only; thus, someone in another part of the country may find the examples of little or no use. The *Manual* did include other types of information about preservation that was useful to anyone. Currently, the National Park Service is revising the *Manual*, including examples from other sections of the country, and it should be released this year. As more sites undertake preservation programs, much more helpful literature should be available. The National Park Service also is promising earthwork preservation training beginning in the fall of 1996.

Other sources of useful information are studies on preservation techniques done by various agencies on the care and preservation of ancient earthworks such as Indian mounds. Interestingly, these ancient earthwork studies have now found that mothballing (planting grasses or other vegetation that hides resources) is unacceptable due to the destruction it causes. Some preservationists, however, now advocate mothballing for field fortifications as a new technique.

## **Recommendations**

The fortifications at American Camp, San Juan Island National Historical Park, are generally well-preserved. Since construction of the fortification was halted before completion, it has that appearance; the rocks lying around the fortification in different locations illustrate the unfinished condition. Some aspects of the fortification, such as the ditch, ramparts, parapet, and platforms, are easily identifiable and instructive.

In most national park units with field fortifications, reconstruction has occurred once, if not twice or possibly even three times; anyone would find it difficult to label these fortifications as original works. Apparently, no reconstruction of the fortifications at the American Camp has occurred, but additional research may be necessary to wholly determine if this is true.

Due to the location of the fortifications at American Camp on an island, visitation is limited, which correspondingly reduces deterioration and serves to benefit the resource. Of course, other factors such as wind, rain, and small fauna will harm the resource. In the contractor's opinion, however, the conditions at San Juan Island are beneficial to the preservation of the fortifications; deterioration will be much slower than at a variety of other similar sites with high visitation.

Following are some recommendations concerning the interpretation and preservation of these resources:

1. Create some new wayside exhibits providing more information about the fortifications and the Army Engineers that did the design and construction.
2. Prepare an exhibit for the visitor center area at American Camp that illustrates what Army Engineers duties and responsibilities were in the 1850s and how fortifications, especially those at American Camp, were designed and constructed.
3. Write a two-page handout, like others now available at the park, on military engineering at American Camp.
4. Plant appropriate bushes in the ditch (moat) of the fortification or in front of it at American Camp to prevent visitors from climbing the ramparts and walking on the parapet. The bushes should, if possible, resemble abatis.
5. Erect ramps/boardwalks within and possibly over one parapet of the fortification to channel and control movement inside.
6. Prepare a long range preservation plan for the fortifications at American Camp based on the particular needs and management and fiscal limitations at San Juan Island National Historical Park.
7. Continue looking for and actively soliciting contemporary accounts of the fortifications and their construction.
8. Undertake archaeological work to ascertain the original location and appearance of the breastworks around American Camp. Because it appears that these breastworks were an integral part of all the fortifications erected, they must be interpreted in concert with the others.

## **Appendix I**

### **Fortifications - Definitions and Descriptions**

In 1846, Army officer Henry W. Halleck defined fortification as "the art of disposing the ground in such a manner as to enable a small number of troops to resist a larger army the longest time possible." Another definition, from West Point Professor Dennis Hart Mahan: "All dispositions made to enable an armed force to resist, with advantage, the attack of one superior to its numbers, belong to the ART OF FORTIFICATION."

After defining fortification, most experts divide them into permanent fortifications (forts constructed of substantial materials such as brick and stone like forts Monroe, Jefferson, Sumter and Pulaski that were intended to defend an area for a long time or permanently) and temporary or field fortifications (works such as those constructed at Petersburg and Vicksburg, as well as the many trenches or hasty entrenchments built daily in 1864-65 for immediate use, to be held for a limited period of time). A few fortification authorities include a third fortification type, between permanent and temporary, the provisional or improvised fortification. This type is constructed of earth and more substantial materials, like wood and stone. These fortifications, like the Union defenses erected around Nashville including Fort Negley, were intended to last for some time.<sup>31</sup>

Temporary defenses or field fortifications are the most common and most numerous. They date back to prehistory when man first thought to throw-up earth or arrange logs to protect him from an enemy's onslaught. The Roman Army regularly used temporary defenses to protect their camps (castra) as they marched to the ends of their known world. Their limes, frontier boundary fortifications in most instances, were originally trenches that extended over the landscape for miles. As other armies and other cultures observed the Roman fortifications, many began using them in their own way.<sup>32</sup>

Before the 19<sup>th</sup> century, temporary defenses or field works or earthworks were basically of two types: siegeworks and deliberate fortifications. Siegeworks often were used in antiquity to take a city or other fortified point; Julius Caesar found them useful in his Gaelic Wars. Much later, a Frenchman, Marshal Sebastien le Prestre de Vauban, developed a system of siegeworks that would unfailingly reduce a stronghold. The principles that Vauban introduced in the 17<sup>th</sup> century generally were still followed in 19<sup>th</sup> and 20<sup>th</sup> century sieges.<sup>33</sup>

Deliberate defenses were erected not in line of battle but to protect a strategic point such as a depot, line of communication, or line of retreat. In recent years deliberate defenses are characterized by the United States' fire support bases in Vietnam or the Iraqi defenses in Kuwait. Although these recent deliberate defenses were erected in response to new technology, the military engineering principles for constructing them have remained basically the same.<sup>34</sup>

The 19<sup>th</sup> century saw the development of a third type of temporary defense, hasty entrenchments. These were tactical fortifications erected on the battlefield. In a very few instances, armies resorted to hasty entrenchments before the 19<sup>th</sup> century. However, the advent of the rifled shoulder arm, and to some extent the repeating rifle, precipitated the rapid adoption of hasty entrenchments. The old muzzle loader smoothbore shoulder arm generally had an effective range of 100 yards; a soldier could only fire a few rounds before the enemy had closed and hand-to-hand

combat ensued. Early on, the rifle increased effective range three, four, and fivefold; now a soldier could fire numerous rounds at an enemy before closing, allowing for many more killed and wounded. Given the additional range and rapid fire of the new shoulder weapons, the average soldier soon learned that he was much more likely to survive if he fought from a trench or other fortification than if he was in the open field in closed ranks. The hasty entrenchment rapidly changed warfare. After use in the Crimean, American Civil, Russo-Turkish, and Russo-Japanese wars, World War I illustrated the ultimate stalemate that such fortifications could cause.<sup>35</sup>

Deliberate defenses were, however, the most effective and defensible field fortifications. They often were divided into two types - open and closed, or enclosed. Some experts divided deliberate defenses into three types - open, half-closed, and closed. The closed fortification is usually the strongest but, if captured by the enemy, does not allow for a counterattack. Half-closed works provide some protection from enemy fire but encourage attack from the rear where they are open. Open works are the easiest to build but allow for flank attacks.<sup>36</sup>

In most instances, the closed work was preferred because it was the most defensible. If enough men and time were available, a star or bastioned fort was preferable, but in many instances, the redoubt was chosen because it was the easiest to build. The square, polygonal or round redoubt was, therefore, the most commonly used, closed field fortification. Although in Europe the redoubt was usually a part of a larger defensive system, in the United States, especially before and during the American Civil War, it was often an independent fort, generally constructed to defend a particular strategic site or line of communication.<sup>37</sup>

## **Appendix II**

### **American Camp Interpretive Treatment**

#### **Interpretive Treatment Considerations**

The most effective interpretive treatments require balancing the site's visitation patterns, the resource carrying capacity and the availability of operational resources to conduct interpretive activities. The interpretive and educational concepts provided in this document reflect the current and projected status of each of these characteristics defined and described below.

#### **American Camp Visitation**

Visitation patterns include such variables as size of group, total visitation, frequency of return visits, seasonality of visitation, visitor expectations and degree of visitor/staff interaction. Site visitation is described as mostly family groups or small groups (2-6 people) of friends. There are few large organized groups, i.e., tours, scouts, school classes, that request personal programs at the site. Total visitation is not an issue and most visitation occurs between late spring and early fall. Most visitors do not participate in interpretive programs with site staff or volunteers, although guided walks are provided on occasion. No changes are forecast in the visitation patterns, but some additional visitation may occur as a result of the site's outreach initiatives.

#### **American Camp Resource Carrying Capacity**

The resource carrying capacity is the maximum usage allowable while retaining sustainable conditions for the resources. Visitor traffic upon, and/or near, the fortifications is the most crucial measurement of carrying capacity for the site. Interpretive media should be designed to optimize the balance between the visitor experience and the resource's condition. Our investigations indicate that present use is not yet creating a negative impact to the fortifications. However, action should be taken now to benchmark fortification conditions for measuring future deterioration. Projections for reduced staffing make preservation actions and interpretive control measures a priority.

#### **American Camp Operational Resources**

Operational resources include the funds, supplies, materials equipment, facilities and staff, including seasonals and volunteers, that are available to carry-out the interpretive functions at the site. Some funding appears to be available for the development and renewal of interpretive media. Options for media presentations seem to be limited by the lack of equipment and the projected reduction of staff. New initiatives like "Parks as Classrooms" can place an increased burden on available staff and potentially increase the visitation. Even non-staffed "Parks as Classroom" traveling programs require a significant amount of administration time. While volunteers supplement staff capabilities, a sound volunteer program cannot expect more than four volunteer hours for every administrative staff hour.

## **Interpretive Framework Elements**

The American Camp elements of the interpretive approach include focal points, context, personalities, corollaries, settings, conditions, events, and themes.

### **Focal Points**

Focal points include significant tangible and intangible visitor perceptions of the site. Such focal points require some explanation and must be addressed through the interpretive media. For example, a visitor seeing the fortifications, and recognizing that the physical landscape has been altered, wants to know more about the fortifications. Similarly, the concept of the "Pig War," though an intangible, may be the visitor's perception of this event. Without further interpretation the visitor will have an incomplete picture of the site. Focal points also include people, artifacts, buildings and structures, landscapes, concepts. These are things that must be addressed for the interpretive experience to have value.

### **Interpretive Context**

Interpretive context is the relationship of the focal points to the conditions that existed at the time the event occurred. This may include a historic context that develops the causative historical factors leading to the events. The idea of someone dying over the killing of a pig seems an absurdity. The idea of dying to defend your rights against a foreign sovereignty's imperialism is patriotism. The context from which the visitor views the site will significantly impact the value of their experience.

### **Personalities**

Personalities, generally human, are the key figures involved in the significant event. The ability of the interpretive media to engender empathy for, and understanding of, the personalities involved in the conflict, significantly increases the visitor's experience. For example, information about Lt. Robert and his background, training, and responsibilities add perspective to the challenge he faced in constructing the fortifications.

Other figures include the U.S. Army Corps of Engineers and other American military officers involved in the incident; English military officers that were involved; islanders and territorial officials of note; other islanders, either individually, if information is available, or collectively, if lacking research; Hudson's Bay Company officials; personalities involved in the final territorial resolution such as American and English political figures; and Kaiser Wilhelm I of Germany.

### **Corollaries**

Corollaries or peripherals also add significantly to the interpretation of a site. Corollaries are information indirectly related to the primary themes or sub-themes of the interpretive message. The history of fortification technology, from the Roman times to the time of the "Pig War," is an example of a corollary that can add to the visitor's experience. Additional corollaries include the concept of "manifest destiny"; the Oregon Trail; the territorial dispute over the Northwest, and the "54 -40 or Fight" campaign; the impact of the California goldrush on the Northwest Territories; the history of the Hudson's Bay Company; the role and history of the U.S. Army Corps of Engineers.



## **Settings**

No event takes place in a vacuum. The setting may be the natural resources or a built environment. Understanding the influence of the setting on the event contributes to the visitor's comprehension of the interpretive message. The topography, availability of timber, geology, and similar aspects of the setting influenced the location and construction of the fortifications.

## **Conditions**

The conditions, and the influence they exerted on the event, range from human conditions such as state of mind, and the lack of equipment, food or water, to environmental conditions such as the climate. Certainly, the condition of being outnumbered by such a great margin contributed to the decision of the types of fortifications to build. Similarly, the access to timbers was instrumental in the fortification location decision.

## **Events**

Events include actions on both macro and micro scale that are significant to the interpretation of the resources. Killing the pig and building the fortifications were events within the context of the confrontation. The "Pig War" was an event in the context of resolving the territorial dispute. Other micro events may be highlighted as a means for illustrating a given story.

## **Themes**

The NPS officials are in the process of preparing an interpretive plan that appropriately focuses on the overall site. No effort has been made, therefore, to develop themes or sub-themes that relate specifically to the fortifications on the site.

## **A General Interpretive Approach**

For a visit to the American Camp site and fortifications to be meaningful, the interpretive media must draw the visitor beyond the farcical origin of the "Pig War." Visitor's attention should be focused on the issue of territorial sovereignty, and the dangers that faced the participants. The killing of a pig is an inane reason for starting actions that could have resulted in the death of soldiers. There were, however, many underlying circumstances that precipitated the engagement. National leaders from both sides were obviously appalled that an insignificant event could trigger such a response. This is borne out by the reaction from Washington after the incident, when General Harney was reprimanded for his over-reaction. The visitor who perceives the events as a reaction to the killing of a pig, will miss the historical significance of the site. It is incumbent upon the interpretive media to establish the event's context as a serious incident of dispute over the Island's sovereignty, rather than the death of a pig.

Keys to understanding context include: the strong independence of the people in the Territories; the suspicion by both the British and the Americans of each other's motives; the American settler's sense of isolation from the United States government; and the government's preoccupation with events leading to the Civil War.

## **Interpretation of the American Camp Fortifications**

Site visitation and available resources dictate an emphasis on non-personal interpretation. Given this constraint, the recommended interpretation for the site assumes three levels of visitor interest and involvement: level I provides basic information about the site; level II offers detailed information about directly related topics; and level III provides corollary information. The interpretive media chart below is laid out by priority of media type and subject.

### **Interpretive Media Chart**

<b>Level</b>	<b>Media Type</b>	<b>Subject Matter</b>	<b>Comment</b>
I	Visual, on-site exhibit	Overview of 1859 American Camp layout.	Need to locate visitors in a historical context (see notes 1 & 2).
I	Handout	Basic information about the fortification's focal points. This brochure should assume that the visitor has been oriented and has perspective on the site.	The brochure can be tied to a self-guided trail or stand alone as a handout.
I	Visual exhibit	Art reproductions of the landscape and conditions facing the soldiers in 1859.	Preference is to include these graphics in a free standing on-site exhibit. Can be included in handout if necessary (see notes 1&2).
I	Visual exhibit	Graphic of fortifications at the time work was completed in 1859.	Prefer on-site exhibit, but can be included in handout (see notes 1&2).
I	Audio tour	Basic story. The narrative should include context for the whole event and relate to more than just the fortifications.	Recommend this as a revenue rental, whether as separate tape/CD or as transmitted message.
II	Handout	Fortifications role in battle.	Addresses how fortifications protect soldiers from cannon fire, from attack by other soldiers and means of defeating a fortified enemy.
II	Handout	Engineering the fortifications.	Describe and illustrate the considerations for locating the site and creating this specific design. Also include the engineering formulae and techniques for building the structure.
II	Exhibit	Scale model or graphic representation. Cross section of the fortifications showing how they are constructed.	Material can be presented in a handout but is more effective as an exhibit.
I	Video	Historic overview of the entire event.	Shown at the visitor's center.
II.	Audio	A detailed description of the rationale for locating the fortifications, the challenges in engineering and constructing them	Should include information on the theory of fortification battles.



III	Handout	Role and background of prominent personalities for American and British sides of the conflict.	May require one or more handouts. Could involve exhibit with vignettes of key figures supported by text.
III	Handout	A brief history of fortifications technology from the Romans to 1859.	
III	Handout	Lt. Robert and the roles and responsibilities of the US Army Corps of Engineers .	
III	Handout	Bibliography of commonly available literature, research and references to the event.	Important for visitors wishing to further investigate the event for themselves .
III	Handout	Numerous other subjects lend themselves to similar treatment and add to the visitors knowledge of the event.	

**Note 1.** Placing visuals on-site, as stand-alone exhibits, is a more effective means of orienting the visitor than including them as smaller pictures in a handout.

**Note 2.** Preservation of the fortifications is enhanced by use of an elevated boardwalk, or a well-defined and landscaped walkway. Free-standing exhibits should be placed adjacent to these walkways, but out of reach of visitors. For elevated boardwalks this means at least two feet from the boardwalk's edge, at an appropriate level for reading by those standing on the walk. For landscaped trails the exhibit should be on the far side of the vegetation. Keep in mind the visual access for wheel chair occupants. Visually impaired graphics can be addressed separately along the railing or through the audio narration.

### **Possible Interpretive and Educational Programming Topics**

Although fewer visitor contact programs are projected, the fortifications offer a number of presentation topics and activities that can be of value for group presentations, "Parks as Classroom" programs, or other educational activities. Many of the topics listed for handout can become interpretive programs. Others include:

- Historic reenactments (not located on the actual fortifications)
- Defense of the site, and factors to consider (distance that cannons fire, trajectory, etc.)
- Design and construction of the fortifications -- applying engineering principles (slopes, height, shape, etc.)
- Building scale models of the fortifications using similar materials (can be created as kits and used in classrooms)

- Conduct orienteering (compass and topo map exercises) with participants using methods available to Lt. Robert to layout the fortifications (can be done on site or at school grounds)
- Environmental problem solving using the fortifications and the landscape of San Juan Island to address land development compatibility with the resources
- Relate the site to a number of current events. For example, did the farmer have the right to kill the pig invading his crops? Does this relate to the question of property rights? Does it further relate to government restrictions on use of surface water craft such as Ski-Doos.

## Appendix III - Illustrated Glossary

### Fortification and Related Terms Used in the Report

**abatis.** An obstacle, often placed in the fortification's ditch, composed of sharpened and entangled branches cut from trees, functioning much as barbed wire entanglements. (see Figure 1)

**banquette.** A step, often referred to as the firing step, for infantry to step up and stand on when firing over the parapet at the approaching enemy. (see Figure 1)

Figure 1

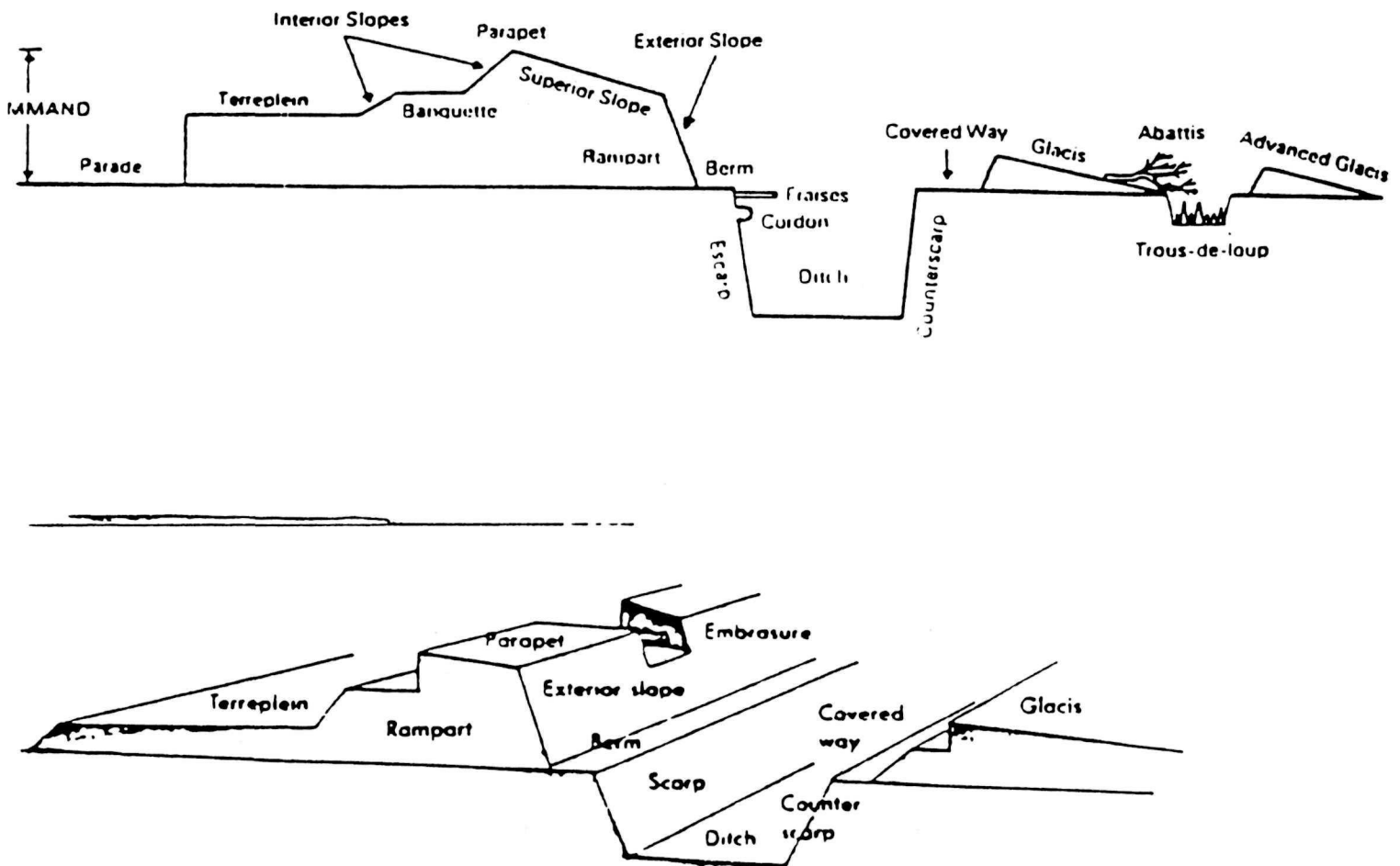
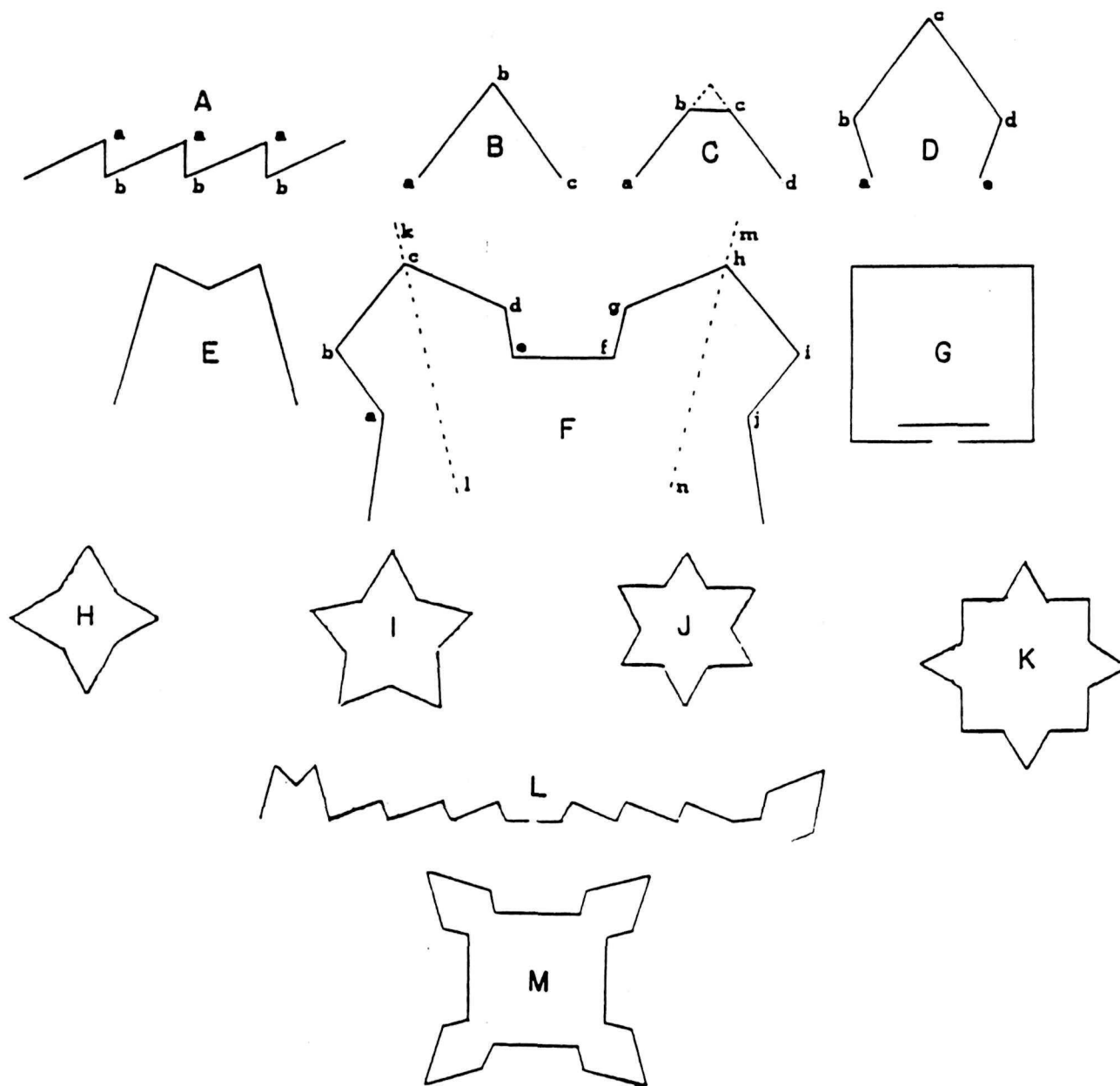


Figure 2, Fortification Types (adapted form Mahan's *Field Fortification*, by Fred Prouty)



- |        |                              |                                   |                                 |
|--------|------------------------------|-----------------------------------|---------------------------------|
| A      | Cremaillere or Indented Line | F                                 | Bastioned Fort                  |
| a      | Salients                     | ef                                | curtain                         |
| b      | Re-Enterings                 | abcde                             | Lunette                         |
| B      | Redan                        | fghij                             | Lunette                         |
| ab     | Face                         | kl, mn                            | Capitals                        |
| bc     | Face                         | G                                 | Redoubt (in this case a Square) |
| ac     | Gorge                        | Traverse protects Outlet of Gorge |                                 |
| C      | Redan with Pan Coupe (bc)    | H-K                               | Forms of Star Forts             |
| D      | Lunette                      | L                                 | Plan of indented line between   |
| bc, cd | Faces                        | Priest-Cap and Lunette Salients   |                                 |
| ab, de | Flanks                       | M                                 | Plan of Bastion Fort drawn from |
| E      | Priest Cap or Swallow Tail   | a square                          |                                 |

**barrier.** A series or system of obstacles devised to impede or halt the movement of the enemy.

**bastioned fort.** The strongest fort because the bastions allow for infantry and artillery fire defense of all of the works exterior. (see Figure 2)

**battery.** A defensive work for artillery which should provide cover for both the guns and the gunners.

**breastwork.** A defensive work erected above ground, about breast high, for infantry to stand behind and fire at the enemy.

**counterscarp.** The outer wall (slope) of the ditch or moat (see Figure 1)

**deal.** Fir or pine wood.

**deliberate fortifications.** Strategic defensive works constructed, not on the battlefield, for the protection of depots, lines of communication, lines of retreat, etc.

**ditch.** An excavation, resembling a trench, surrounding a fortification that may be dry or wet. (see Figure 1)

**earthwork.** A term for field fortifications, used much more today than in the period immediately before and during the American Civil War when field works was most prevalent.

**fascine.** Long cylindrical bundles of brushwood twigs closely bound (often referred to as fagots), designed to support and/or retain the earth of fortification elevations, such as parapets and obstruct ditches. (see Figure 3)

**Figure 3, Fascine**

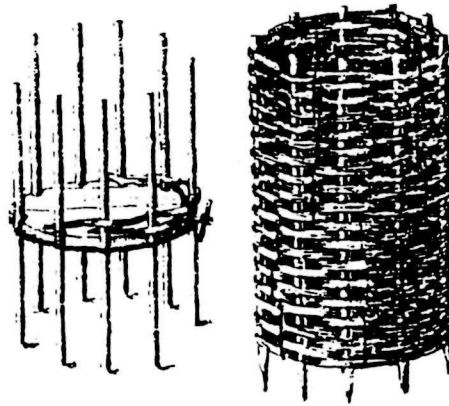


**field works.** This is the most often used term for field fortifications immediately before and during the American Civil War.

**field fortifications.** Defensive works constructed for a temporary period of time.

**gabion.** A cylinder of strong basket-work open at both ends, resembling a wicker basket, filled with earth and used to revet (sustain) the interior slopes of fortifications including the parapet. (see Figure 4)

Figure 4, Gabion



**gun platform.** A smooth horizontal surface on which artillery is placed for firing.

**hasty entrenchments.** Tactical defensive works erected on the battlefield to strengthen positions.

**howitzer.** A chambered cannon, with a barrel longer than a mortar, that fires shells of medium velocity with a low or high trajectory to hit targets that flat trajectories can't reach.

**improvised fortification.** The Austrian term for a third type of fortification, between permanent and temporary, which was constructed of earth and more substantial materials, like wood and stone. These fortifications, like the Union defenses erected around Nashville, including Fort Negley, were intended to last for sometime.

**lunette.** A work comprising a salient angle with two flanks and the rear is open. (see Figure 2)

**mattock.** A digging tool, resembling a pick-axe, with the blade set at right angles to the handle used for loosening soil, cutting and removing roots, etc.

**moat.** A term used interchangeably with ditch.

**obstacles** Individual obstruction, such as chevaux-de-frize, palisade or abatis, used to impede or prevent enemy access to fortifications.

**parapet.** An elevation of earth or other material forming a wall to partially or wholly conceal soldiers and artillery from the enemy. (see Figure 1)

**provisional fortification.** The British term for a third type of fortification, between permanent and temporary, which was constructed of earth and more substantial materials, like wood and stone. These fortifications, like the Union defenses erected around Nashville, including Fort Negley, were intended to last for sometime.

**rampart.** The broad mass of earth or embankment surrounding or supporting a fortification forming the main body of the work usually surmounted by a parapet. (see Figure 1)

**redan.** A V-shaped work composed of two faces forming a salient angle with the rear open. (see Figure 2)

**redoubt.** An enclosed polygonal work without re-entering angles. (see Figure 2)

**scarp (escarp).** The inner wall (slope) of the ditch or moat. (see Figure 1)

**siegeworks.** Field fortifications erected in the course of attempting to take an enemy position by siege.

**star fort.** An enclosed work with salient and re-entering angles, receiving its name from the appearance of its form, allowing for covering fire to defend the ditch and salients. (see Figure 2)

**temporary defenses.** See field fortifications.

**32-pounder.** Ordnance specialists, of both the army and navy, have used a variety of methods to classify cannon, including by type, bore diameter and weight of the solid shot fired. Thus, when classified by the weight of the solid shot fired, a 32-pounder would fire a 32-pound shell. Actually a variety cannon with differing types, barrel sizes and bore diameters fired 32-pounder shells.

**trace.** To make a ground plan of a fortification.

**trench.** A furrow, often enhanced by a parapet constructed from the excavated earth, for concealing and protecting soldiers in warfare.

## Endnotes

1. Michael Vouri, "Royal Stand-off on Griffin Bay," Handout (San Juan Island National Historical Park, Washington: National Park Service, 1995 [?]), page 1; William A. Peck, Jr., *The Pig War: The Journal of William A. Peck, Jr.*, Edited by C. Brewster Coulter (Medford, OR: Webb Research Group, 1993), page 222; U.S., National Park Service, "San Juan Island Official Map and Guide," San Juan Island National Historical Park Brochure (Washington, DC: The Government Printing Office, n.d.).
2. U.S., National Park Service, "San Juan Island Official Map and Guide."
3. U.S., National Park Service, "San Juan Island Official Map and Guide."
4. U.S., National Park Service, "San Juan Island Official Map and Guide."
5. Raphael P. Thian, *Legislative History of the General Staff of the Army of the United States (Its Organization, Duties, Pay, and Allowances), from 1775 to 1901* (Washington, DC: The Government Printing Office, 1901), pages 497-500, 503-504; Dale E. Floyd, "Supervision of Fortification Construction, 1794-1820," *Periodical: Journal of America's Military Past*, XX (Summer 1993), page 23; U.S., The Engineer School, U.S. Army, Fort Belvoir, VA., *History and Traditions of the Corps of Engineers; Engineer School Special Text ST 25-1* (Fort Belvoir, VA: The Engineer School, 1953), pages 14-16, 18, 24-27; Peck, *The Pig War*, pages 94-95.
6. National Archives and Records Administration, Record Group 393, Records of United States Army Continental Commands, 1821-1920, Preliminary Inventory 172, Part I, Department of Oregon, 1858-1861, Entry 3576, General and Special Orders Issued, 1858-61, page 112.
7. U.S., Library of Congress, Manuscript Division, Henry M. Robert Papers, Microfilm Reel No. 1.
8. Peck, *The Pig War*, pages 95-100.
9. Henry W. Halleck, *Elements of Military Art and Science; or, Course of Instruction in Strategy, Fortification, Tactics of Battles, &c., . . .* (New York: D. Appleton & Co., 1846), page 327; Dennis Hart Mahan, *A Treatise on Field Fortification . . . Third Edition* (New York, NY: John Wiley, 1856), page 1; Augustus F. Lendy, *Treatise on Fortification. Or, Lectures Delivered to Officers Reading for the Staff* (London: W. Mitchell, 1862), pages 35-42; Gustav J. Fiebeger, *A Text-Book on Field Fortification* (New York: John Wiley & Sons, 1901), pages 1-2; Charles A. Struensee, *The First Principles of Field-Fortification: Containing Concise and Familiar Precepts for the Construction, Attack, and Defence of Field-Works; with a Preliminary Introduction to the Science of Fortification in General*, Translated from German (London: Bunney & Gold, 1800), pages 5-6; John T. Hyde, *Elementary Principles of Fortification* (London: Wm. H. Allen & Co., 1860), pages 139-151; Henry L. Scott, *Military Dictionary: Comprising Technical Definitions; Information on Raising and Keeping Troops; Actual Service Including Makeshifts and Improved Material; and Law, Government, Regulation, and Administration Relating to Land Forces* (New York: D. Van Nostrand, 1861), pages 297-298; C.B. Brackenbury, *Field Works, Their Technical Construction and Tactical Application* (London: Kegan Paul, Trench & Co., 1888), pages 32-38; Thomas F. Higgins, III., "Efficient Action in the Construction of Field Fortifications: A Study of the Civil War Defenses of Raleigh, North Carolina," M.A. Thesis (Archaeology), College of William and Mary, 1985, pages 12-15; George S. Clarke (Sydenham), "Provisional Fortification," Paper XIII, *Professional Papers of the Corps of Royal Engineers. Royal Engineers Institute Occasional Papers*, III (1879), pages 253-56 & plate; Chapter V--"Improvised Fortifications," in Moritz Ritter Von Brunner, *Permanent Fortification for the Imperial Military Training Establishments and for the Instruction of Officers of All Arms of the Austro-Hungarian Army*, Translated for the General Staff (London: Her Majesty's Stationery Office, 1911).



10. Alexis Henri Brialmont, *Hasty Intrenchments*, Translated by Charles A. Empson (London: Henry S. King & Co., 1872), page 1; Ian V. Hogg, *The History of Fortification* (London, England: Orbis Publishing, 1981), page 200; Struensee, *The First Principles*, pages 6-9; Benjamin Isaac, "The Meaning of the Terms Limes and Limitanei," *Journal of Roman Studies*, LXXVIII (1988), 125-47; R.G. Goodchild, "The Roman and Byzantine Limes in Cyrenaica," *Journal of Roman Studies*, XLIII (1953), 65-76.
11. Struensee, *The First Principles*, pages 6-9; Hogg, *The History*, page 200; U.S., Engineer School. *Pamphlet on the Evolution of the Art of Fortification, Engineer School Occasional Papers* No. 58. Prepared Under the Direction of William M. Black. Washington, DC: The Government Printing Office, 1919, pages 66-73; Marguerita Z. Herman, *Ramparts: Fortifications from the Renaissance to West Point* (Garden City Park, NY: Avery Publishing Group Inc. [for the Friends of the West Point (USMA) Library], 1992), pages 45-58; Sebastien le Prestre de Vauban, *A Manual of Siegecraft and Fortification*, Translated and Edited by George A. Rothrock (Ann Arbor, Michigan: University of Michigan Press, 1968).
12. Hogg, *The History*, pages 201-207; Fiebeger, *A Text-Book*, pages 2-3; Michael R. Convoy, "Dangerous Rings of Fire," *Vietnam*, VI (June 1993), pages 45-49; Gregory Fondant, "The Dreadnoughts Rip the Seldom Line," *Army*, XX (January 1992), pages 28-36.
13. Hogg, *The History*, pages 201-207, 182-199; Louis Charles Jackson, "Fortification and Siegecraft," *The Encyclopedia Britannica; A Dictionary of Arts, Sciences, Literature and General Information*, Eleventh Edition (New York: The Encyclopedia Britannica Company, 1910), Volume X, page 719; Higgins, "Efficient Action," pages 35-37; Fiebeger, *A Text-Book*, pages 3-6; Trudeau, Noah Andre Trudeau, "The Walls of 1864: Field Entrenchments Saved Robert E. Lee's Army--and Grant's as Well," *MHQ: The Quarterly Journal of Military History*, VI (Winter 1994), page 23-31; Arthur L. Wagner, "Hasty Entrenchments in the War of Secession," *Journal of the Military Service Institution of the United States*, XXII (February 1898), 225-46; Paddy Griffith, "The Battlefield and Its Fortifications," In Paddy Griffith, *Battle Tactics of the Civil War* (New Haven, CT: Yale University Press, 1989), 117-35; Edwin C. Bearss, "Field Fortifications," *Encyclopedia of the Confederacy*, Richard N. Current, Editor in Chief (New York, NY: Simon & Schuster Inc.), 624-27; David W. Rhyne, "War in the Lithosphere," *Army*, XXXVI (August 1986), pages 60-64, 68; Keith Mallory and Arvid Ottar, *The Architecture of War* (New York: Pantheon Books, A Division of Random House, 1973), pages 35-71.
14. Fiebeger, *A Text-Book*, pages 2-3; Higgins, "Efficient Action," pages 12-14; Lendy, *Elements*, pages 35-41; Scott, *Military Dictionary*, page 297; Brackenbury, *Field Works*, pages 38-44; Hyde, *Elementary Principles*, pages 140-151; H.D. Hutchinson, *Field Fortification: Notes on the Text-Books, Specially Designed and Arranged for the Use of Officers Preparing for Promotion Examinations* (Chatham, England: Gale & Polden, 1888), pages 65-72.
15. Halleck, *Elements of Military*, page 344-345; David Russell Wright, "Civil War Field Fortifications: An Analysis of Theory and Practical Application." M.A. thesis, Middle Tennessee State University, 1982, page 56; H.D. Hutchinson, *Field Fortification: Notes on the Text-Books, Specially Designed and Arranged for the Use of Officers Preparing for Promotion Examinations* (Chatham, England: Gale & Polden, 1888), page 70; James R. Hinds and Edmund Fitzgerald, "Fortifications in the Field and on the Frontier." *Periodical: The Journal of the Council on America's Military Past*, 9, Spring 1977, pages 46-47; Scott, *Military Dictionary*, pages 497-499.
16. Erwin T. Thompson *Historic Resource Study; San Juan Island National Historical Park, Washington*. Denver, CO: National Park Service, 1972. page 131; The National Guard, State of Washington. *Collection of Official Documents on the San Juan Imbroglia 1859-1872* (N.P., N.D.), Alfred Pleasanton, August 16, 1859, to Casey, page 23.
17. Thompson, *Historic Resource Study*, pages 60, 132; Michael Vouri, "American Camp: In War's Dark Shadow," Handout (San Juan Island National Historical Park, Washington: National Park Service, 1995 [?]), page 1.
18. Peck, *The Pig War*, pages 100-103.

19. Hubert Howe Bancroft, *The Works of Hubert Howe Bancroft*, Volume XXXII, *History of British Columbia, 1792-1887*, Reprint (San Francisco, CA: The History Company, Publishers, 1887), pages 624-625; Thompson, *Historic Resource Study*, page 134.
20. Thompson, *Historic Resource Study*, page 133; Research Collections, San Juan National Historical Park, San Juan Island, Washington, Erwin T. Thompson's Documents Collections, 1859, British Columbia Provisional Archives, KRS SA 5, 33, Copy, Admiral Baynes, Esquimalt, September 11, 1859; The National Guard, *Collection of Official Documents*, pages 53-54; Henry R. Crostie, November 30, 1859, to Governor Gholson, from Gholson Papers, University of Washington, Folder, Correspondence, 1859-60, among Erwin T. Thompson's Research Collections, 1859.
21. Thompson, *Historic Resource Study*, page 57; Don H. Doyle, "Rules of Order: Henry Martyn Robert and the Popularization of American Parliamentary Law." *The American Quarterly*, XXXII, Spring 1980, pages 3-18; Ralph C. Smedley, *The Great Peacemaker* (Los Angeles: Borden Publishing Company, 1955); William J. Taylor and Robert F. Croskery, "Robert and His Rules of Order." *Assembly*, XXXVIII (June 1979), pages 6, 23-24.
22. Stephen E. Ambrose, "Dennis Hart Mahan--A Profile," *Civil War Times Illustrated*, II (November 1963), pages 30-35; Thomas Everett Griess, "Dennis Hart Mahan: West Point Professor and Advocate of Military Professionalism, 1830-1871," Unpublished Ph.D. dissertation, Duke University, 1969; Wright, "Civil War Field Fortifications," pages 8-14; Frederick A. Mahan, "Professor Dennis Hart Mahan." *Professional Memoirs, Corps of Engineers, United States Army and Engineer Department at Large*, IX (January-February 1917), pages 72-76; Herman, *Ramparts*, pages 149-156; James L. Morrison, Jr., *"The Best School in the World": West Point, the Pre-Civil War Years, 1833-1866* (Kent, OH: Kent State University Press, 1986), page 95-98; all references to Mahan's *Field Fortification*, are to the 1856 edition unless otherwise stated. Although the publishers claimed otherwise, *Field Fortification* was not revised in its various editions, at least through 1860 [see page 9 in Edward Hagerman, *The American Civil War and The Origins of Modern Warfare* (Bloomington, IN: Indiana University Press, 1988)].
23. Morrison, *"The Best School,"* pages 98, 162; George P. Winton, "Ante-Bellum Military Instruction of West Point Officers, and Its Influence upon Confederate Military Organization and Operations." Ph.D. dissertation, University of South Carolina, 1972, pages 77-79; Wright, "Civil War Field Fortifications," pages 8-14; U.S. Military Academy, West Point, N.Y., *The Centennial of the United States Military Academy at West Point, New York*. (Washington, DC: The Government Printing Office, 1904), Volume I, pages 415-16; George S. Pappas, *To The Point: The United States Military Academy, 1802-1902* (Westport, CT: Praeger Publishers, 1993), page 300; Tully McCrea, *Dear Belle: Letters from A Cadet and Officer to his Sweetheart, 1858-1868*, Edited by Catherine S. Crary (Middletown, CT: Wesleyan University Press, 1965); Peter W. Houck, *Duty, Honor, Country: The Diary and Biography of General William P. Craighill, Cadet at West Point 1849-1853* (Lynchburg, VA: Warwick House Publishing, 1993); Morris Schaff, *The Spirit of Old West Point, 1858-1862* (Boston, MA: Houghton Mifflin, 1907).
24. Peck, *The Pig War*, pages 100-103.
25. Mahan, *Field Fortification* (1856), pages 32-35.
26. Scott, *Military Dictionary*, pages 296-297.
27. Henry D. Grafton, *A Treatise on the Camp and March with Which Is Connected the Construction of Field Works and Military Bridges. With an Appendix of Artillery Ranges, &c. for Use of Volunteers and Militia in the United States* (Boston: W.P. Pettridge and Co., 1861), page 30.
28. Peck, *The Pig War*, pages 103, 107, 109, 136; Thompson, *Historic Resource Study*, page 133; The National Guard, *Collection of Official Documents*, pages 53-54; Henry R. Crostie, November 30, 1859, to Governor Gholson, from Gholson Papers, University of Washington, Folder, Correspondence, 1859-60, among Erwin T. Thompson's Research Collections, 1859, San Juan Island National Historical Park Research Collections.

29. Peck, *The Pig War*, 98, 138; Thompson, *Historic Resources Study*, pages 36, 52, 55, 60, 129-134, 159; David H. Miller, *San Juan Archipelago: Study of the Joint Occupation of the San Juan Islands* (Bellows Falls, VT: Wyndham, 1943), page 90; British Columbia, Provincial Archives, NW973.7 G 786, 3, Confidential State Documents, Extract from New York Times, September 24, 1859, San Juan Island National Historical Park Research Collections; Silas Casey to Alfred Pleasanton, HDQRS., San Juan Island, W.T., August 14, 1859, # 21, San Juan Island National Historical Park Research Collections; Silas Casey to Alfred Pleasanton, HDQRS., Camp Pickett, San Juan Island, W.T., August 22, 1859, #26, San Juan Island National Historical Park Research Collections.
30. The National Guard, *Collection of Official Documents*, pages 53-54; Henry R. Crostie, November 30, 1859, to Governor Gholson, from Gholson Papers, University of Washington, Folder, Correspondence, 1859-60, among Erwin T. Thompson's Research Collections, 1859, San Juan Island National Historical Park Research Collections.
31. Peck, *The Pig War*, pages 107, 109, 130, 135. Apparently, from the beginning the intention was to cover the camp with fortifications. On September 16, Pleasanton wrote Casey ordering him to "... cover your camp as much as possible by intrenchment," [Thompson, *Historic Resource Study*, page 23]. General Harney informed General Scott, on August 30, that "This command is busily engaged in placing its position under intrenchments ..." [Harney to Assistant Adjutant General, Headquarters of the Army, N.Y.C., among Erwin T. Thompson's Research Collections, 1859, San Juan Island National Historical Park Research Collections].
32. Peck, *The Pig War*, page 138; Thompson, *Historic Resources Study*, pages 66, 134. more on order to cease construction
33. Mahan, *Field Fortification* (1856), page 12; Scott, *Military Dictionary*, page 497.
34. Bancroft, *The Works*, page 624; Higgins, *Efficient Action*, pages 13-14; Peck, *The Pig War*, pages 107, 109, 130, 135; Thompson, *Historic Resources Study*, page 131.
35. Transcripts of three letters of William Daniel Walsh, Company A, Army Engineers, San Juan Island National Historical Park Research Collections, Letter dated February 11, 1861, Ft. Steilacoom, W.T., page 3.
36. Benjamin Franklin Cooling, III and Walton H. Owen, II, *Mr. Lincoln's Forts: A Guide to the Civil War Defenses of Washington* (Shippensburg, PA: White Mane Publishing Company, 1988), page 239; Scott, *Military Dictionary*, page 394.
37. Wright, "Civil War Field Fortifications," pages 12-14; Peck, *The Pig War*, page 102.

## **Bibliography**

### **Manuscript Sources**

#### **National Archives and Records Administration**

Archives I, Washington, DC

##### **Records Group 77, Records of the Office of the Chief of Engineers**

Microcopy 1703, General Information Index to names and Subjects, 1789-1889 (DeGrange Index)

Entry 1, Subject Index to Miscellaneous Letters Sent

Entry 4, Miscellaneous Letters Sent, 1812-69

Entry 5, Subject Indexes to Letters Sent to Engineer Officers, 1853-69

Entry 6, Letters Sent to Engineers Officers, 1812-69

Entry 17, Registers of Letters Received, 1826-70

Entry 18, Letters Received, 1826-66

Entry 99, Name and Subject Index to General Correspondence, 1894-1923

Entry 103, General Correspondence, 1894-1923

Entry 146, Letters and Reports of COL. Joseph G. Totten, Chief of Engineers, 1803-64

Entry 171, Land Papers, 1794-1916

##### **Record Group 92, Records of the Office of the Quartermaster General**

Entry 225, Consolidated Correspondence File, 1794-1890

Record Group 94, Records of the Adjutant General's Office, 1780's-1917

Microcopy 565, Letters Sent by the Office of the Adjutant General, Main Series, 1800-1860

Microcopy 617, Returns from U.S. Military Posts, 1800-1917

Microcopy 661, Historical Information Relating to Military Posts and Other Installations ca. 1700-1900

Microcopy 686, Index to General Correspondence of the Record & Pension Office, 1889-1904

Microcopy 698, Index to General Correspondence of the Adjutant General's Office, 1890-1917

Microcopy 711, Registers of Letters Received by the Office of the Adjutant General, Main Series, 1812-1889

Microcopy 903, Descriptive Commentaries from the Medical Histories of Posts

Entry 25, Document File, 1890-1917

Entry 464, Reservation File, Early 1800's-1916

Entry 501, Record and Pension Office Document File, 1889-1904

##### **Record Group 107, Records of the Office of the Secretary of War**

Microcopy 221, Letters Received by the Secretary of War, Main Series, 1801-1870

##### **Record Group 108, Records of the Headquarters of the Army**

Microcopy 857, Letters Sent by the Headquarters of the Army (Main Series) 18278-1903

Entry 2, Letters Sent, 1828-46, 1849-69, and 1873-1903

Entry 7, Letters Sent by Gen. Scott During an Expedition to the Pacific Northwest, 17 Oct.-12. Dec., 1859

##### **Record Group 159, Records of the Office of the Inspector General**

Entry 15, Letters Received, 1863-89

Entry, 16, Registers of Letters Received, 1863-89

Entry, 17, Indexes to Letters Received, 1863-89

**Record Group 391, Records of United States Army Mobile Units, 1821-1942**

Engineers, 1846-1918, 1st Battalion

Entry 1001, "The History of the First Engineers," 1776-1918

**Record Group 393, Records of United States Army Continental Commands, 1821-1920**

Department of Oregon, 1858-61

Entry 3570, Letters Sent, 1858-61

Entry 3571, Endorsements Sent, 1858-61

Entry 3572, Name and Subject Index to Entry 3573

Entry 3573, Register of Letters Received, 1858-61

Entry 3574, Letters Received, 1858-60

Entry 3575, List of Subjects Mentioned in Entry 3576, 1858-61

Entry 3576, General and Special Orders Issued, 1858-61

Archives II, College Park, MD

Maps in the custody of the Architectural and Cartographic Archives

**Library of Congress, Washington, DC**

Henry M. Robert Papers, Library of Congress, Manuscript Division, 1853-1927, 10 boxes

**U.S. Army Military History Institute, Carlisle Barracks, PA**

Manuscripts

U.S. Army, 9th Infantry Regiment, Order book, 1855-59. U.S. Army Miscellaneous Collection, 1783-1861

Photo Archives

Pig War Related Photographs

**San Juan Island National Historical Park Research Collections**

The Research Collections comprised copies of documents, including photographs, collected over the years. Numerous documents from this collection were useful in this research.

**Published Sources**

*Aide-Memoire to the Military Sciences.* Framed from Contributions of Officers of the Different Services, and Edited by A Committee of the Corps of Royal Engineers in Dublin, 1845-1846. Three Volumes. London: John Weale, 1846-52.

*Aide-Memoire to the Military Sciences.* Framed from Contributions of the Different Services, and Edited by A Committee of the corps of Royal Engineers, 1847-1849. Volume II. Second Edition. London: John Weale, 1853.

Ambrose, Stephen E. "Dennis Hart Mahan--A Profile." *Civil War Times Illustrated*, 2, November 1963, 30-35.

Ambrose, William S. *An Interpretive Earthworks Preservation Guide For Petersburg National Battlefield.* A Special Project submitted at Clemson University in partial fulfillment of the requirements for the degree of Master of Recreation and Park Administration, Department of Recreation and Park Administration. Prepared for U.S. Department of the Interior, National Park Service, Petersburg National Battlefield at Petersburg, Virginia. March 1976.

- Arbogast, Gordon W. "Engineering and West Point: The Early Years." *Assembly*, 50, September 1991, 28-31.
- Babits, Lawrence E. "A Confederate Earthwork's Internal Structure." *Military Collector & Historian*, 41, Winter 1989, 194-98.
- Bancroft, Hubert Howe. *The Works of Hubert Howe Bancroft*. Volume XXXII, *History of British Columbia, 1792-1887*. Reprint. San Francisco, CA: The History Company, Publishers, 1887.
- Barnard, John G. *A Report on the Defenses of Washington, to the Chief of Engineers, U. S. Army, Corps of Engineers, Corps of Engineers Professional Paper No. 20*. Washington, DC: The Government Printing Office, 1871.
- Bearss, Edwin C. "The Construction of Fort Henry and Fort Donelson." *West Tennessee Historical Society: Memphis Papers*, 21, 1967, 24-47.
- Bearss, Edwin C. "Field Fortification." In *Encyclopedia of the Confederacy*. Edited by Richard N. Current. Volume 2. New York: Simon & Schuster, 1993, 624-27.
- Biggs, Greg. "The 'Shoupade' Redoubts: Joseph E. Johnston's Chattahooche River Line." [The Preservation Report]. *Civil War Regiments: A Journal of the American Civil War*, 1, No. 3, 1991, 82-93.
- Bolger, Daniel P. "Fortification." In *Academic American Encyclopedia*. Danbury, CT: Grolier Incorporated, 1995, 238-41.
- Brackenbury, C.B. *Field Works, Their Technical Construction and Tactical Application*. London: Kegan Paul, Trench & Co., 1888.
- Brialmont, Alexis Henri. *Hasty Intrenchments*. Translated by Charles A. Empson. London: Henry S. King & Co., 1872.
- Brice, Martin. *Forts and Fortresses: From the Hillforts of Prehistory to Modern Times--the Definitive Visual Account of the Science of Fortification* (New York: Facts On File, Inc., 1990)
- Brice, Martin H. *Stronghold: A History of Military Architecture*. London, England: B.T. Batsford, Ltd., 1984.
- Brown, Leonard E. "Fortress Rosecrans: A History, 1865-1990." *Tennessee Historical Quarterly*, 50, Fall 1991, 135-41.
- Brown, Leonard E. *Forts DeRussy, Stevens, and Totten; General Background*. Washington, DC: Division of History, Office of Archeology and Historic Preservation, National Park Service, 1968.
- Brown, Leonard E. *National Capital Parks: Fort Stanton, Fort Foote, Battery Ricketts*. Washington, DC: Office of History and Historic Architecture, Eastern Service Center, National Park Service, 1970.
- Brunner, Moritz Ritter Von. *Permanent Fortification for the Imperial Military Training Establishments and for the Instruction of Officers of All Arms of the Austro-Hungarian Army*. Translated for the General Staff. London: Her Majesty's Stationery Office, 1911. [Chapter V--"Improvised Fortifications"]
- Buckholtz, Louis von. *On Infantry, Camp Duty, Field Fortification, and Coast Defence*. Washington, DC: Selmar Siebert, 1860.
- Chandler, David G. "The Development of Fortifications." In Cyril Falls. Editor. *Great Military Battles*. New York: Spring Books, 1969, 292-93.



Charbonneau, Andre. "The Redoubt in New France: A Contribution to the History of Fortification in North America." *Fort: The International Journal of Fortification and Military Architecture (The Journal of the Fortress Study Group)*, XVIII (1990), 43-67.

Clairac, Louis-Andre de La Mamie, chevalier de. *The Field Engineer of M. Le Chevalier de Clairac . . .* Translated from the French with Observations and Remarks on Each Chapter . . . by John Muller. Second Edition. London: Printed for John Millan, 1773.

Clairac, Louis-Andre de La Mamie, chevalier de. *The Field Engineer of M. Le Chevalier de Clairac . . .* Translated from the French with Observations and Remarks on Each Chapter . . . by John Muller. Second Edition. London: Printed for John Millan, 1760.

Coggins, Jack. "The Engineers Played a Key Role in Both Armies." *Civil War Times Illustrated*, 3, January 1965, 40-47.

Cooling, Benjamin Franklin, III and Walton H. Owen, II. *Mr. Lincoln's Forts: A Guide to the Civil War Defenses of Washington*. Shippensburg, PA: White Mane Publishing Company, 1988.

Craighill, William P. *The Army Officer's Pocket Companion*. New York: D. Van Nostrand, 1863.

Cupples, Douglas W. "Silent Sentinels: A Photographic Documentation of Existing Civil War Fortifications in West Tennessee." *The West Tennessee Historical Society Papers*, 41, 1987, 17-47.

Dawson, Will. *The War That Was Never Fought*. Princeton, NJ, 1971.

Day, W.A. "The Breastworks at Petersburg." *Confederate Veteran*, 29, May 1921, 173-75.

De Martemont, C. Malorti. *The Theory of Field-Fortification*. London: T. Egerton, Military Library, 1810.

"The Defence of Field Works." *Army and Navy Journal*, 2, September 3, 1864, 20-21.

Douglas, Howard. *Observations on Modern Systems of Fortification, Including that Proposed by M. Carnot, and a Comparison of the Polygonal with the Bastion System*. London, England: J. Murray, 1859.

Doyle, Don H. "Rules of Order: Henry Martyn Robert and the Popularization of American Parliamentary Law." *The American Quarterly*, 32, Spring 1980, 3-18.

Duane, James C. *Manual for Engineer Troops*. New York: D. Van Nostrand, 1862.

Duffy, Christopher. *Fire and Stone: The Science of Fortress Warfare, 1600-1860* (North Vancouver, British Columbia, Canada: David & Charles, 1975).

Dunnigan, Brian Leigh. *Forts Within A Fort: Niagara's Redoubts*. Youngstown, NY: Old Fort Niagara Association, Inc., 1989.

Dwight, Henry O. "In the Trenches: Each Man His Own Engineer." *Civil War Times Illustrated*, 4, October 1965, 4-7, 30-31.

Eisterhold, John A. "Fort Heiman: Forgotten Fortress." *The West Tennessee Historical Society Papers*, 28, 1974, 43-54.

Elting, John R. "Field Fortification." *The Encyclopedia Americana International Edition*. Danbury, CT: Grolier

Incorporated, 1994, 627.

"Engineering Operations of the Army of the Potomac." *Army and Navy Journal*, 1, November 7, 1863, 162-63.

Farrow, Edward S. *Farrow's Military Encyclopedia: A Dictionary of Military Knowledge; Illustrated with Maps and About Three Thousand Wood Engravings*. Three Volumes. New York: Military Naval Publishers Company, 1895.

Fastabend, David A. "G.F.R. Henderson and the Challenge of Change." *Military Review*, 69, October 1989, 66-77.

Featherstonhaugh, A. "Notes on the Defences of Petersburg." In Great Britain, Army, Corps of Royal Engineers. Papers on Subjects Connected with the Duties of the Royal Engineers . . . Woolwich, England: W.P. Jackson, 1839-76, New Series, 14, 1865, 190-94.

Fiebeger, Gustav J. *A Text-Book on Field Fortification*. First Edition. New York: John Wiley & Sons, 1901.

Fiebeger, Gustav J. *A Text-Book on Field Fortification*. Third Edition. New York: John Wiley & Sons, 1913.

"Field Intrenchments." *Army and Navy Journal*, 6, November 7, 1868, 184-85.

Floyd, Dale E. "Army Engineers in the Civil War." In *Military Engineering and Technology: Papers Presented at the 1982 American Military Institute Annual Meeting, U. S. Army Engineer Center, Fort Belvoir, Virginia*. Manhattan, KS: MA/AH Publishing, 1984, 23-32.

Floyd, Dale E. *Military Fortifications: A Selective Bibliography; Bibliographies and Indexes in Military Studies, Number 4*. Westport, CT: Greenwood Publishing Group, Inc., 1992.

Floyd, Dale E. "The Place of Fortifications in the Civil War," *Midwest Region Battlefield Update* [National Park Service] 3 (May 1994), 2-3.

Floyd, Dale E. "The Place of Fortifications in the Civil War with Emphasis on Kentucky," *Heritage Spirit* [Kentucky Heritage Council], 3, September-October 1994, 9-12.

Floyd, Dale E. "Supervision of Fortification Construction, 1794-1820." *Periodical: Journal of America's Military Past*, 20, Summer 1993, 23-33.

"Forts of Sand or Masonry: Which?" *Army and Navy Journal*, 1, September 5, 1863, 25.

Foster, Wilbur F. "The Building of Forts Henry and Donelson." In L. Ridley Bromfield. *Battles and Sketches of the Army of the Tennessee--1861-1865*. Mexico, MO: Missouri Printing and Publishing Co., 1906, 64-66.

Fraser, Lieutenant. "Notes on the Combined Use of Entrenchments, Defended Posts, and Redoubts, for Strengthening Positions. War of 1870-71." Paper II. *Papers on Subjects Connected with the Duties of the Corps of Royal Engineers*, New Series, XXI, (1873), 1725 & plates.

Gilbert, Cathy A. *Historic Landscape Report: American Camp and British Camp, San Juan Island National Historical Park, Washington*. Seattle, WA: Cultural Resource Division, Pacific Northwest Region, National Park Service, 1987.

Gillmore, Quincy A. *Engineer and Artillery Operations Against the Defense of Charleston Harbor in 1863: Comprising the Descent Upon Morris Island, the Demolition of Fort Sumter, the Reduction of Forts Wagner and Gregg, with Observations on Heavy Ordnance, Fortifications, etc., Corps of Engineer Professional Paper No. 16*. New York: D. Van Nostrand, 1865.



Gillmore, Quincy A. *Official Report to the United States Engineer Department, of the Siege and Reduction of Fort Pulaski, Georgia, February, March, and April, 1862, Corps of Engineers Paper on Practical Engineering No. 8.* New York: D. Van Nostrand, 1862.

Gillmore, Quincy A. *Supplementary Report to Engineer and Artillery Operations Against the Defences of Charleston Harbor in 1863.* New York: D. Van Nostrand, 1868.

Goodchild, R.G. "The Roman and Byzantine Limes in Cyrenaica." *Journal of Roman Studies*, 43, 1953, 65-76.

Grafton, Henry D. "Field Fortification." Chapter II in Henry D. Grafton. *A Treatise on the Camp and March with Which Is Connected the Construction of Field Works and Military Bridges. With an Appendix of Artillery Ranges, &c. for Use of Volunteers and Militia in the United States.* Boston: W.P. Fetridge and Co., 1854, 23-38.

Great Britain, War Office. *Manual of Field Fortification, Military Sketching, and Reconnaissance.* London: HMSO, 1871.

Gregory, V.J. "Divided Waters." *Military Review*, 44, February 1964, 87-96.

Griess, Thomas E. "Dennis Hart Mahan: West Point Professor and Advocate of Military Professionalism, 1830-71." Ph.D. dissertation, Duke University, 1969.

Griffith, Paddy. *Battle in the Civil War: Generalship and Tactics in America 1861-65.* Nottinghamshire, England: Fieldbooks, 1986.

Griffith, Paddy. "The Battlefield and Its Fortifications." In Paddy Griffith. *Battle Tactics of the Civil War.* New Haven, CT: Yale University Press, 1989, 117-35.

Hagerman, Edward. *The American Civil War and The Origins of Modern Warfare.* Bloomington, IN: Indiana University Press, 1988.

Hagerman, Edward. "The Evolution of Trench Warfare in the American Civil." Ph.D. dissertation, Duke University, 1965.

Halleck, Henry W. *Elements of Military Art and Science; or, Course of Instruction in Strategy, Fortification, Tactics of Battles, &c., . . .* New York: D. Appleton & Co., 1846.

Haller, Granville O. "Reminiscences of the San Juan Island Imbroglio." *Journal of Military Service Institution of the United States*, 25, July 1899, 36-44.

Hawkins, R.S. "A Boundary Affair in the Far West." *Royal Engineers Journal*, 98, June 1984, 98-110.

Herman, Marguerita Z. *Ramparts: Fortifications from the Renaissance to West Point.* Garden City Park, NY: Avery Publishing Group Inc. [for the Friends of the West Point (USMA) Library], 1992.

Higgins, Thomas F., III. "Efficient Action in the Construction of Field Fortifications: A Study of the Civil War Defenses of Raleigh, North Carolina." M.A. (Archaeology) thesis, College of William and Mary, 1985.

Hinds, James R. and Edmund Fitzgerald. "Fortifications in the Field and on the Frontier." *Periodical: The Journal of the Council on America's Military Past*, 9, Spring 1977, 41-48.

*A Historical and Archaeological Research and Assessment of and Recommendations Concerning the Confederate Redoubts at Grenada Landing on Grenada Lake, Mississippi. Final Report.* Published for the Department of the

Army, Corps of Engineers, Vicksburg, Mississippi by the University of Mississippi, April 15, 1975.

Historical Evaluation and Research Organization (HERO). *The Value of Field Fortifications in Modern Warfare*. Volume I. DNA 5054F-1. By Trevor N. Dupuy, Grace P. Hayes, C. Curtiss Johnson, Paul Martell, Thomas Betsock and Robert McQuie. Dunn Loring, VA: HERO [Prepared for Director, Defense Nuclear Agency, Washington, DC], 1979.

Hogg, Ian V. *The History of Fortification*. London, England: Orbis Publishing, 1981.

Hunt, Ora Elmer. "Entrenchments and Fortifications." In *The Photographic History of the Civil War*. New York: The Review of Reviews Co., 1911, Volume 5, 194-218.

Houck, Peter W. *Duty, Honor, Country: The Diary and Biography of General William P. Craighill, Cadet at West Point 1849-1853*. Lynchburg, VA: Warwick House Publishing, 1993.

Hughes, James Quentin. *Military Architecture*. Second Edition. Liphook, Hant, England: Beaufort Publishing Ltd., 1991.

Humfrey, I.H. *An Essay on the Modern System of Fortification*. London: John Weale, 1838.

Hutchinson, H.D. *Field Fortification: Notes on the Text-Books, Specially Designed and Arranged for the Use of Officers Preparing for Promotion Examinations*. Chatham, England: Gale & Polden, 1888.

Hyde, John T. *Elementary Principles of Fortification*. London: Wm. H. Allen & Co., 1860.

Isaac, Benjamin. "The Meaning of the Terms Limes and Limitanei." *Journal of Roman Studies*, 88, 1988, 125-47;

Jackson, Louis Charles. "V. Field Fortification." In *The Encyclopedia Britannica: A Dictionary of Arts, Sciences, Literature and General Information*. Eleventh Edition. Volume X Evangelical Church to Francis Joseph. New York: The Encyclopedia Britannica Company, 1910, 716-23.

Jebb, Colonel. *Practical Treatise on Strengthening and Defending Outposts, Villages, Houses, Bridges, &c., in Reference to the Duties of Officers in Command of Picquets, as Laid Down in the Field Exercise and Evolutions of the Army*. Fifth Edition. London: William Clowes and Sons, 1857.

Johnson, John. *The Defense of Charleston Harbor, Including Fort Sumter and the Adjacent Islands, 1863-1865*. Charleston, SC: Walker, Evans and Cogswell, 1889.

Johnson, W.C. and E.S. Hartshorn. "The Development of Field Fortifications in the Civil War." *Professional Memoirs, Corps of Engineers, United States Army and Engineer Department at Large*, 7, September-October 1915, 570-602.

Knollys, William W. *Hand-Book of Field Fortification Intended for the Guidance of Officers Preparing for Promotion and Especially Adapted to the Requirements of Engineers*. Philadelphia, PA: George Gebbie, Publisher, 1873.

Krick, Robert K. "Fire and Stone." In *Touched by Fire: A Photographic Portrait of the Civil War*. Edited by William C. Davis. Boston: Little, Brown and Company, 1986, Volume 2, 111-58.

"The Last Shot." *Military Review*, 55, December 1975, 49-55.

Lendy, Augustus F. *Elements of Fortification: Field and Permanent, for the Use of Students, Civilian and Military*. London: John W. Parker and Son, 1857.

Lendy, Augustus F. *Treatise on Fortification. Or, Lectures Delivered to Officers Reading for the Staff*. London: W. Mitchell, 1862.

Lesser, W. Hunter. "Preliminary Archaeological and Historical Investigations of Cheat Summit Fort." *West Virginia Archaeologist*, No. 31, Spring 1981, 31-37.

Lippitt, Francis J. *A Treatise on Intrenchments*. New York: D. Van Nostrand, Publisher, 1866.

Lochee, Lewis. *Elements of Field Fortification*. London: The Author, 1783.

*Look to the Earth: Historical Archaeology and the American Civil War*. Edited by Clarence R. Geier, Jr. and Susan E. Winter. Knoxville, TN: University of Tennessee Press, 1994.

Lord, Francis A. "Army and Navy Textbooks and Manuals Used by the North during the Civil War." *Military Collector & Historian*, 9, Fall 1957, 61-67; Winter 1957, 95-102.

Lowe, David. "Surviving Siegeworks at Port Hudson, Louisiana." *The Parapet: The Newsletter of the Civil War Fortification Study Group* 1 (July 1993), pp15-21.

Macaulay, John S. *A Treatise on Field fortification and Other Subjects Connected Duties of the Field Engineer*. London: James Fraser, 1834.

Macksey, Kenneth. "Fortifications." In Kenneth Macksey. *The Penguin Encyclopedia of Weapons and Military Technology: Prehistory to the Present Day*. New York: Penguin Books USA Inc., 1993, 140-42.

Mahan, Dennis Hart. *A Complete Treatise on Field Fortification, with the General Outlines of the Principles Regulating the Arrangement, the Attack, and the Defense of Permanent Works*. New York: Wiley & Long, 1836.

Mahan, Dennis Hart. *A Treatise on Field Fortification* . . . Third Edition. New York, NY: John Wiley, 1856.

Mahan, Dennis Hart. *A Treatise on Field Fortification, Containing Instructions on the Method of Laying Out, Constructing, Defending, and Attacking Intrenchments, With the General Outlines Also of the Arrangement, the Attack, and Defence of Permanent Fortifications*. Third Edition, Revised and Enlarged. New York: John Wiley, 1861.

Mahan, Dennis Hart. *A Treatise on Field Fortification, Containing Instructions on the Method of Laying Out, Constructing, Defending, and Attacking Intrenchments, With the General Outlines Also of the Arrangement, the Attack, and Defence of Permanent Fortifications*. Third Edition, Revised and Enlarged. New York: John Wiley, 1863.

Mahan, Frederick A. "Professor Dennis Hart Mahan." *Professional Memoirs, Corps of Engineers, United States Army and Engineer Department at Large*, 9, January-February 1917, 72-76.

Mainfort, Robert C., Jr. *Archaeological Investigations at Fort Pillow State Historic Area: 1976-1978, Research Series No. 4*. Nashville, TN: Division of Archaeology, Tennessee Department of Conservation, 1980.

Mallory, Keith and Arvid Ottar. *The Architecture of War*. New York: Pantheon Books, A Division of Random House, 1973.

McCabe, James O. *The San Juan Water Boundary Question*. Toronto, 1965.

McCormick, Charles H. *General Background: Forts Mahan, Chaplin, Dupont, Davis*. Washington, DC: Division of History, Office of Archeology and Historic Preservation, National Park Service, 1967.

McCrea, Tully. *Dear Belle: Letters from A Cadet and Officer to his Sweetheart, 1858-1868*. Edited by Catherine S. Cray. Middletown, CT: Wesleyan University Press, 1965.

McFall, Lawrence. *The Fortifications of Danville, Virginia During the War Between the States 1861-1865*. Danville, VA: N.P., 1984.

Miller, David H. *San Juan Archipelago: Study of the Joint Occupation of San Juan Island*. Bellows Falls, VT: Wyndham, 1943.

Miller, David V. *The Defense of Washington During the Civil War*. Buffalo, NY: Mr. Copy, 1976.

Mitcham, Samuel W., Jr. "Fort Beauregard, Louisiana: Confederate Strongpoint on the Ouachita." *Louisiana History*, 22, No. 2, 1981, 183-87.

Milton, William F. *A History of the San Juan Water Boundary Question as Affecting the Division of Territory between Great Britain and the United States*. New York, 1869.

Morgan, Mark. "Forts and Fortification." *Encyclopedia of the Confederacy*. Richard N. Current, Editor in Chief. New York, NY: Simon & Schuster Inc., 616-24.

Morrison, James L., Jr. *"The Best School in the World": West Point, the Pre-Civil War Years, 1833-1866*. Kent, OH: Kent State University Press, 1986.

Muir, C.H. *An Historical Sketch of Permanent Fortifications. A Lecture Delivered before the Class of Officers at the United States Infantry and Cavalry School, Fort Leavenworth, Kansas, October 29th, 1896. Class 1895-'97*. Fort Leavenworth, KS: United States Infantry and Cavalry School, 1897.

Murray, Keith A. *The Pig War*. Tacoma, WA: Washington State Historical Society, 1968.

The National Guard, State of Washington. *Collection of Official Documents on the San Juan Imbroglia 1859-1872* (N.P., N.D.)

Nichols, James L. *Confederate Engineers*. Tuscaloosa, AL: Confederate Publishing Company, Inc., 1957.

Olszewski, George J. *Historic Structures Report: Forts Carroll and Greble, Washington, D.C.* Washington, DC: Office of History and Historic Architecture, Eastern Service Center, National Park Service, 1970.

Pappas, George S. *To The Point: The United States Military Academy, 1802-1902*. Westport, CT: Praeger Publishers, 1993.

Peck, William A. *The Pig War and Other Experiences of William Peck--Soldier 1858-1862--U.S. Army Corps of Engineers: The Journal of William A. Peck, Jr.* Edited by C. Brewster Coulter (Senior Editor) and Bert Webber (Special Editor). Medford, OR: Webb Research Group, 1993.

Piron, F.P.J. "The Systems of Fortification Discussed and Compared." *United States Service Magazine*, 5, January 1866, 34-40; February 1866, 108-14; March 1866, 225-34; April 1866, 328-32.

Pleydell, J.C. *An Essay on Field Fortification: Intended Principally for the Use of Infantry, Showing How to Trace Out on the Ground, and Construct in the Easiest Manner, All Sorts of Redoubts and Other field Works . . .* Translated by J.C. Pleydell from the Original Manuscript of an Officer of Experience in the Prussian Service. London: Printed for J. Nourse, 1768.

Prickett, Nigel J. "British Army Field Fortifications of the New Zealand Wars." *Fort*, 22, 1994, 111-27.

*Rabbits, Redoubts, and Royal Marines: An Interdisciplinary Approach to Resources Management Problems at San Juan Island, National Historical Park*. Prepared by a Team from the National Park Service, Pacific Northwest Region. Seattle, WA: Pacific Northwest Region, National Park Service, 1984.

Reilly, John C., Jr. *The Iron Guns of Willard Park, Washington Navy Yard*. Washington, DC: The Government Printing Office, 1991.

Rhyne, David W. "War in the Lithosphere." *Army*, 36, August 1986, 60-64, 68;

Rice, Edmund. *A System of Rapid Field Intrenchments for Infantry*. Washington, DC: The Author, 1874.

Robinson, Willard B. *American Forts: Architectural Form and Function*. Urbana, IL: University of Illinois Press, 1977.

Robinson, William M., Jr. "Drewry's Bluff: Naval Defense of Richmond 1862." *Civil War History*, 7, June 1961, 167-75.

Scaife, William R. and William E. Erquitt. *The Chattahoochee River Line: An American Maginot*. Atlanta, GA: William R. Scaife, 1992.

Schaff, Morris. *The Spirit of Old West Point, 1858-1862*. Boston, MA: Houghton Mifflin, 1907.

Schweninger, Joseph M. "Fort Davidson and the Battle of Pilot Knob." *Fortress: The Castles and Fortifications Quarterly*, Issue No. 17, May 1993, 37-45.

Scott, Henry L. *Military Dictionary: Comprising Technical Definitions; Information on Raising and Keeping Troops; Actual Service Including Makeshifts and Improved Material; and Law, Government, Regulation, and Administration Relating to Land Forces.* New York: D. Van Nostrand, 1861.

Seymour, Digby Gordon. *Divided Loyalties; Fort Sanders and the Civil War in East Tennessee.* Knoxville, TN: University of Tennessee Press, 1963.

Shea, William L. "The Camden Fortifications." *Arkansas Historical Quarterly*, 41, Winter 1982, 318-26.

Shiman, Philip Lewis. "Engineering Sherman's March: Army Engineers and the Management of Modern War, 1862-1865." Ph.D. dissertation, Duke University, 1991.

Smedley, Ralph C. *The Great Peacemaker.* Los Angeles: Borden Publishing Company, 1955.

Smith, George. *An Universal Military Dictionary; A Copious Explanation of the Technical Terms & c., Used in the Equipment, Machinery, Movements, and Military Operations of an Army.* London: J. Millan, 1779.

Smith, Samuel D., Fred M. Prouty and Benjamin C. Nance. *A Survey of Civil War Period Military Sites in Middle Tennessee, Tennessee Department of Conservation, Division of Archaeology, Report of Investigations No. 7.* Nashville, TN: Division of Archaeology, Tennessee Department of Conservation, 1990.

Sprague, Roderick. *San Juan Archaeology.* Two Volumes. Moscow, ID: Laboratory of Anthropology, University of Idaho, 1982.

Stocqueler, J.H. *The Military Encyclopedia; Technical, Biographical, and Historical Dictionary, Referring Exclusively to the Military Sciences, The Memoirs of Distinguished Soldiers, and the Narratives of Remarkable Battles.* London: Wm. H. Allen & Co., 1853.

Straith, Hector. *Treatise on Fortification and Artillery.* London, England: Waller & Co., 1850.

Struensee, Charles A. *The First Principles of Field-Fortification: Containing Concise and Familiar Precepts for the Construction, Attack, and Defence of Field-Works; with a Preliminary Introduction to the Science of Fortification in General.* Translated from German. London: Bunney & Gold, 1800.

(Sydenham) Clarke, George S. *Fortification: Its Past Achievements, Recent Developments, and Future Progress.* London, England: J. Murray, 1890.

(Sydenham), George S. Clarke. "Provisional Fortification." Paper XIII. *Professional Papers of the Corps of Royal Engineers. Royal Engineers Institute Occasional Papers.* III (1879), 253-56 & plate.

Taylor, William J. and Robert F. Croskery. "Robert and His Rules of Order." *Assembly*, 38, June 1979, 6, 23-24.

Thatcher, Joseph M. "Chevaux-de-frise: Hardware and Construction." *Military Collector & Historian*, 38, Winter 1986, 169-72.

Thian, Raphael P. *Legislative History of the General Staff of the Army of the United States (Its Organization, Duties, Pay, and Allowances), from 1775 to 1901.* Washington, DC: The Government Printing Office, 1901.

Thompson, Erwin N. *Historic Resource Study: San Juan National Historical Park, Washington.* Denver, CO: Denver Service Center, National Park Service, 1972.

Trudeau, Noah Andre. "The Walls of 1864: Field Entrenchments Saved Robert E. Lee's Army--and Grant's as Well."



*MHQ: The Quarterly Journal of Military History*, 6, Winter 1994, 23-31.

Tucker, Spencer. *Arming the Fleet: U.S. Navy Ordnance in the Muzzle-Loading Era*. Annapolis, MD: Naval Institute Press, 1989.

U. S. Army, Transportation Corps, Fort Eustis, Public Affairs Office. *Ft. Crafford*. Fort Eustis, VA: USATC, 1977.

U.S. Congress. Serial Set of Congressional Publications, Various Volumes.

U. S. Congress, Joint Committee on the Conduct of the War. *Report*. 6 Volumes and Supplement. Washington, D.C.: The Government Printing Office, 1863, 1865-66.

U. S. Engineer School. *Engineer Operations in Past Wars*. 2 Parts. Fort Humphreys, VA: Engineer School, 1926.

U. S. Engineer School. *History and Traditions of the Corps of Engineers' Engineer School ROTC Text ST25-1*. Fort Belvoir VA: Engineer School, 1953.

U. S. Engineer School. *Pamphlet on the Evolution of the Art of Fortification, Engineer School Occasional Paper No. 58*. Prepared Under the Direction of William M. Black. Washington, DC: The Government Printing Office, 1919.

U. S. Department of the Interior, National Park Service, Cultural Resources, Park Historic Architecture Division. *Earthworks Landscape Management Manual*. Prepared Andropogon Associates, Ltd., Ecological Planning and Design. Washington, DC: The Government Printing Office, 1989.

U.S. Military Academy, West Point, N.Y. *The Centennial of the United States Military Academy at West Point, New York*. Volume I. Washington, DC: The Government Printing Office, 1904.

U. S. Military Commission to Europe, 1855-56. *Report on the Art of War in Europe in 1854, 1855, and 1856*. By Richard Delafield. Washington, DC, 1860.

U.S. National Park Service, "San Juan Island Official Map and Guide," San Juan Island National Historical Park Brochure (Washington, DC: The Government Printing Office, n.d.).

U. S. War Department. *Atlas to Accompany the Official Records of the Union and Confederate Armies*. 3 Volumes. Washington, DC: The Government Printing Office, 1891-95. [drawings of fortifications]

Vauban, Sebastien le Prestre de. *A Manual of Siegecraft and Fortification*. Translated and Edited by George A. Rothrock. Ann Arbor, Michigan: University of Michigan Press, 1968.

Viele, Egbert L. "Field Fortifications." Chapter IX in Egbert L. Viele. *Hand-book for Active Service; Containing Practical Instructions in Campaign Duties, for the Use of Volunteers*. New York: D. Van Nostrand, 1861, 92-148.

Viele, Egbert L. *Hand-Book of Field Fortifications and Artillery; Also Manual for Light and Heavy Artillery with Illustrations*. Richmond, VA: J.W. Randolph, 1861.

Vouri, Michael. "American Camp: In War's Dark Shadow." Handout. San Juan Island National Historical Park, Washington: National Park Service, 1995[?].

Vouri, Michael. "Royal Stand-off on Griffin Bay." Handout. San Juan Island National Historical Park, Washington: National Park Service, 1995[?].

Wagner, Arthur L. "Hasty Entrenchments in the War of Secession." In The Military Historical Society of Massachusetts.

*Civil and Mexican Wars 1861, 1846.* Volume 13 of the *Papers of the Military Historical Society of Massachusetts*. Boston: The Military Historical Society of Massachusetts, 1913, 127-53.

Wagner, Arthur L. "Hasty Entrenchments in the War of Secession." *Journal of the Military Service Institution of the United States*, 22, February 1898, 225-46.

Walden, Geoffrey R. "The Defenses of Cincinnati." *Blue & Gray Magazine*, 3, April-May 1986, 19-29.

Walden, Geoffrey R. "The General's Tour of the Civil War Defenses in Northern Kentucky (Constructed to Defend Cincinnati)." *Blue & Gray Magazine*, 3, April-May 1986, 30-33.

Wilhelm, Thomas. *A Military Dictionary and Gazetteer, Comprising Ancient and Modern Military Technical Terms, Historical Accounts of all North American Indians, as well as Ancient Warlike Tribes; also Notices of Battles from the Earliest Period to the Present Time, with a Concise Explanation of Terms Used in Heraldry and the Offices Thereof. The Work also Gives Valuable Geographical Information, Compiled from the Best Authorities of all Nations, with an Appendix containing the Articles of War, Etc.* Revised Edition. Philadelphia, PA: L.R. Hamersly & Co., 1881.

Wills, Mary A. *Confederate Batteries Along the Potomac*. Commissioned by the Prince William County Historical Commission, June, 1978. Reprinted, 1983.

Wills, Mary A. *The Confederate Blockade of Washington, D. C., 1861-1862*. Parsons, WV: McClain Printing Co., 1975.

Winn, Thomas H. and Ron Loughry. "Restoration, Preservation, Research: Fort Defiance/Fort Bruce." *The Tennessee Conservationist*, 51, January-February 1985, 3-4.

Wright, David R. "Civil War Field Fortifications: An Analysis of Theory and Practical Application." M.A. thesis, Middle Tennessee State University, 1982.

Wright, William C. *Confederate Upper Battery Site, Grand Gulf, Mississippi, Excavations, 1982; Archaeological Report No. 13*. Jackson, MS: Mississippi Department of Archives and History and Grand Gulf Military Park Monument, 1984.

Yule, Henry. *Fortification for Officers of the Army and Students of Military History with Illustrations and Notes*. London: William Blackwood and Sons, 1851.

