



What is an Earthwork? Forts and Fortifications



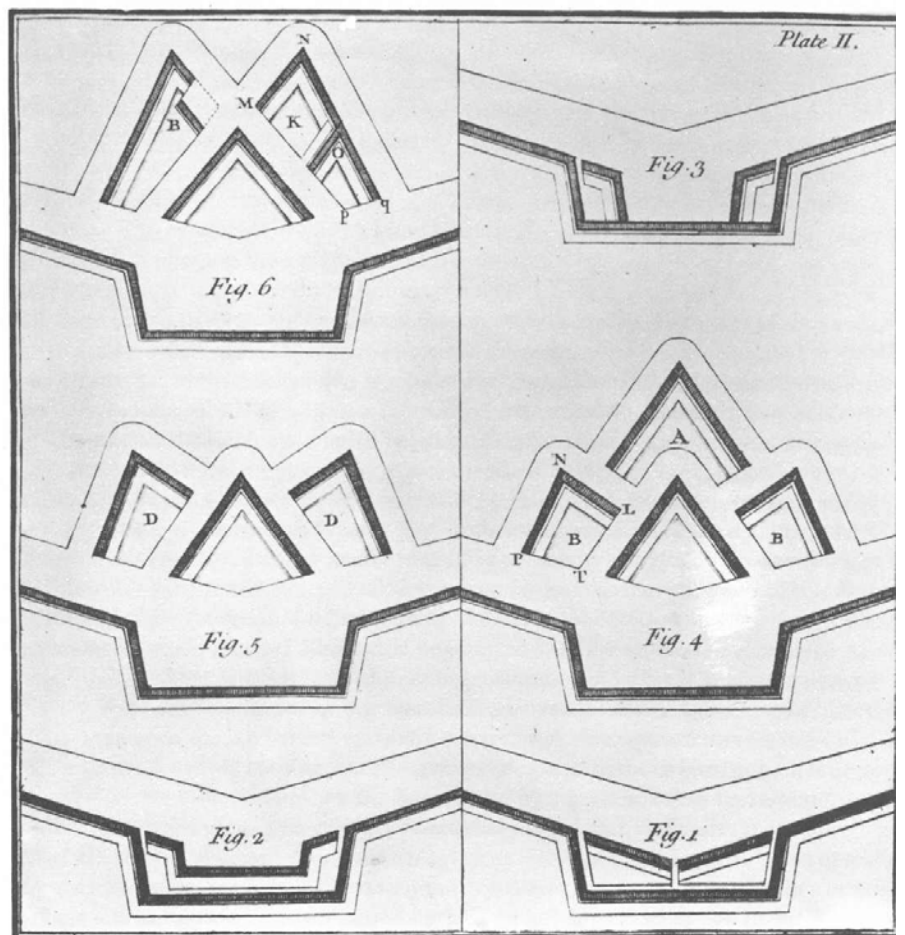
Washington's "Fort of Necessity"

On June 3, 1754, George Washington wrote to Virginia's Lieutenant Governor Robert Dinwiddie, "We have just finish'd a small palisaded Fort in which with my small Number's I shall not fear the attack of 500 Men." Thus began Washington's effort to protect his men and supplies as they advanced towards the French who were based out of Fort Duquesne (present-day Pittsburgh).

From our modern-day prospective Fort Necessity is less than desirable for use in combat. Its small size and location make it look vulnerable. The campaign combined with the abilities of Washington and his soldiers did shape the defensive measures they would take.

A Look at Forts in the Age of Vauban

During the eighteenth century (1700's) forts, fortifications and siege warfare were considered an art form. Military engineers took great pride in the development and design of forts and conversely in their ability to destroy them. The chief engineer to the French court, Sébastien le Prestre de Vauban (1633 - 1707), improved the classic design of forts during the Age of Enlightenment. He and his counterparts like Dutchman Menno van Coehoorn developed 'systems' which became standard practice for military engineers and officers over several decades. Using precise angles, ditches, ramps and mounds Vauban made attempts to create the perfect fortification. Even Vauban conceded every fort can be taken in siege.



Types of outworks (Muller 1746): Figs 1, 2, 3 – forms of tenailles; Figs 5, 6 – ravelin with tenaillons or lunettes; Fig 4 – ravelin with tenaillons (B) and bonnet (A).

Classical Design

The elements of fortification are based on creating differences in elevation (ditches and walls) to the advantage of the defender and detriment of the attacker. From these two features a whole series of defensive works are employed. Typical 18th century design begins with a square enclosure (although other geometric shapes were used) of earth, stone, brick or logs. At each corner is placed an angular projection call a bastion. Bastions allow defenders to maximize their firepower and eliminate 'dead ground.'

Beyond the fort wall existed ditches and outer works. Meant to befuddle attackers and deflect artillery the outer works allowed defenders to keep the besieging army at a distance in an effort to drain their resources. Redoubts, redans, lunettes, ravelins, blockhouses, palisades and moats are examples of outer works that added to the discomfort of the attackers. Some of these elements are found at Fort Necessity

Washington's plans for defense

The Great Meadows offers defensive advantages. The natural clearing provides feed and water for horses and cattle, plus protection from surprise attack. The creek beds are 'natural entrenchments' into which his men find cover and return fire. A last minute improvement is a circular stockade containing a storage cabin to protect the supplies. Yet this is not enough security for the Virginians.

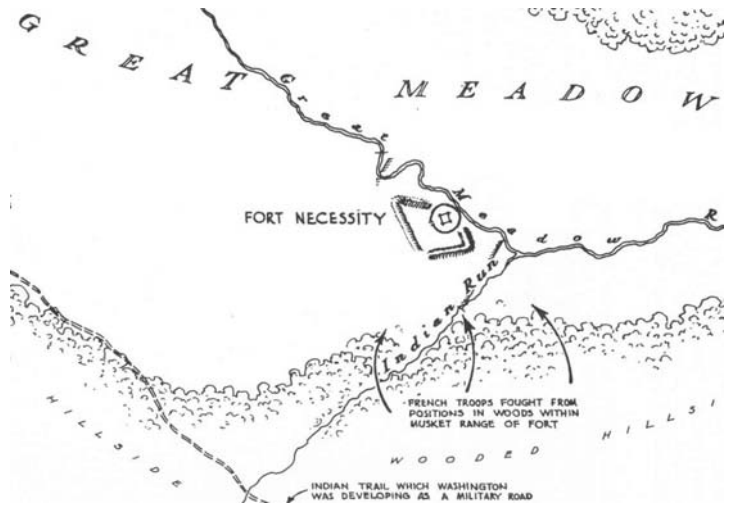
By July, Washington commands 400 troops. With the realization the present defenses are not adequate, work begins on new entrenchments days prior to the French attack. Two V shaped embankments five feet wide make a redoubt to enclose the stockade. Complementing the back and front edge of each earthwork is a ditch two feet

deep. The present height of the earthworks is misleading as archaeological evidence interprets taller embankments nearly five feet high when standing in the rear ditch. One fatal flaw confronts Washington. The stockade's proximity to the tree line (60 yards to the south and 80 yards to the west) puts it within effective musket fire. To correct this long sections of earthworks face these areas. Now the British can concentration their fire towards the enemy in these tree lines

Of less concern to Washington are two hillsides flanking Great Meadows. Containing thick forest and out of effective musket range they present no advantage to the French.

Fort Necessity in Battle

Eventually forcing the fort's surrender, the French hesitate launching any frontal assault against the earth enclosure as Washington's men fight tenaciously. The French commander Captain Louis Coulon de Villiers notes the fort "was advantageously enough situated in a meadow." Although Fort Necessity is a defeat for Washington, he makes the best of a situation at times out of his control and fraught with limited resources.



Protecting the Resource

Unfortunately for Fort Necessity, much of its original defenses are gone; reconstructed earthworks and stockade recreate the scene for our visitors. In some places throughout America there can be found original forts and defensive works with some protected as historic sites. And yet these are still under siege through the ravages of time and visitor pressure. Even Fort Necessity's reconstructed earthworks have eroded to half their built height over the last fifty years by visitor foot traffic.

What can you do to protect these historic resources? Stay on designated paths and avoid "social" trails through earthworks. Ward off the temptation to climb fort walls and earthworks. For added safety stay away from sharp drop-offs and closed areas within and around forts. All this helps to minimize the effects of erosion and keep these resources available for future generations to enjoy and better understand the past.

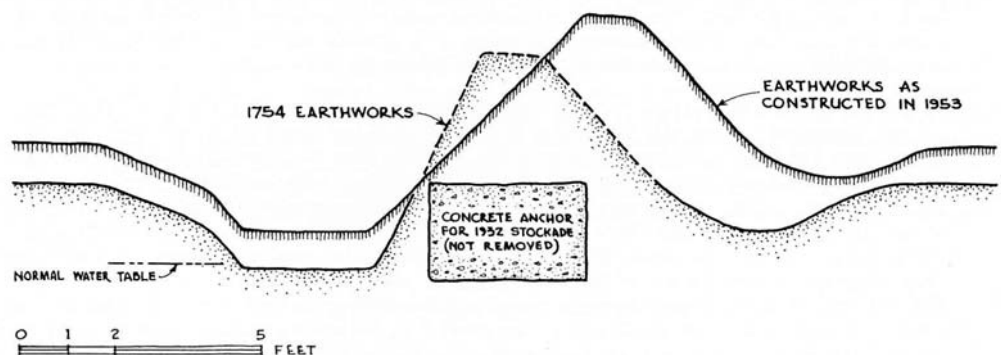


Fig. 26. Cross-section (parapet conjectural) of 1754 earthworks and earthworks constructed in 1953.